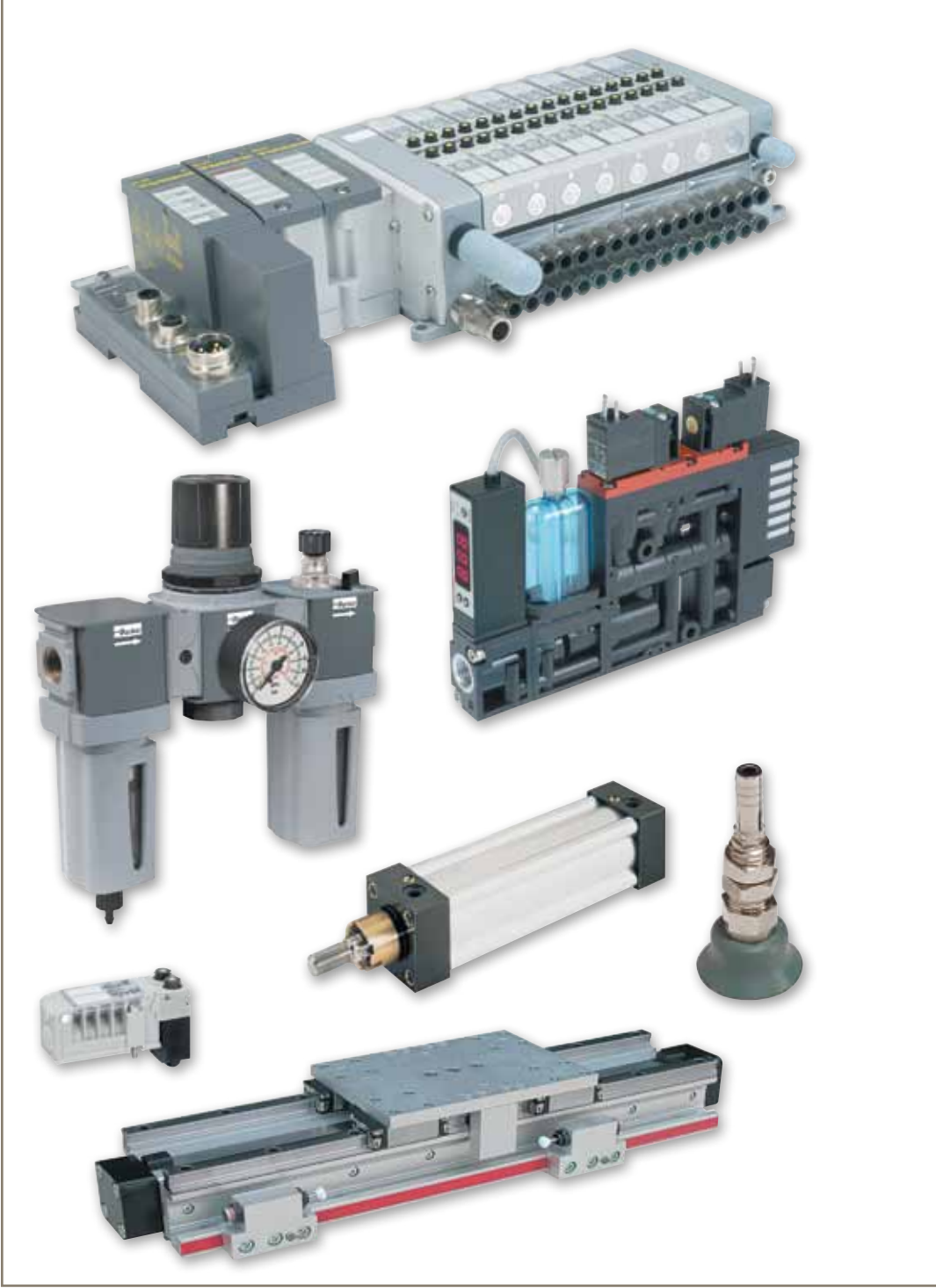


aerospace  
 climate control  
 electromechanical  
 filtration  
 fluid & gas handling  
 hydraulics  
**pneumatics**  
 process control  
 sealing & shielding



# Pneumatic Products U.S.

A complete range of pneumatic system components

Catalog PDN1000-2US



ENGINEERING YOUR SUCCESS.

# The Parker 5-Year Extended Warranty

**P**arker Hannifin Corporation will extend its warranty on all pneumatic components to sixty (60) months providing they are correctly installed and protected by Parker pneumatic filters which are properly maintained. Components covered by this warranty include all cylinders, valves and pneumatic automation components manufactured by Parker in any of our global facilities. This warranty covers our components anywhere in the world you may ship your equipment.

Parker's obligation under this warranty is limited to the replacement or repair of any failed components. The buyer understands that the seller will not be liable for any other costs or damages.

The buyers of quality Parker components and filters benefit by having ONE source for all pneumatic needs - Parker.



*Yoon Chung*  
Yoon "Michael" Chung  
President  
Automation Group







DISTRIBUTION NETWORK

At Parker, we have the largest global distribution network in motion and control, with over 7,500 distributors serving more than 422,000 customers. To find the distributor nearest you, please visit our DISTRIBUTOR LOCATOR at <http://www.parker.com/pneu/distributor>



**ENGINEERING YOUR SUCCESS.**

**⚠ WARNING**

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application including consequences of any failure, and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

**Offer of Sale**

The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. This offer and its acceptance are governed by the provisions stated on the separate page of this document entitled "Offer of Sale".

**Introduction & Product Index** **A**

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**A**

**Tie Rod Cylinders**

**3MA Series - Economy NFPA Cylinder**



B6

- Bore sizes 1-1/2 through 5 inch
- 18 standard mounting styles
- Pressures up to 250 PSIG
- Temperatures -10°F to 165°F
- Aluminum body construction

**4MA / 4ML Series - Flexible NFPA Cylinder**



B16

- Bore sizes 1-1/2 through 8 inch
- 20 standard mounting styles
- Pressures up to 250 PSIG
- Temperatures -50°F to 250°F
- Aluminum body construction

**3MAJ / 4MAJ - Rodlock Cylinder**



B40

- Bore sizes 1-1/2 through 8 inch
- 17 standard mounting styles
- Pressures up to 100 PSIG
- Temperatures -10°F to 165°F
- Aluminum body construction

**4MNR Series - Non-Rotating Cylinder**



B58

- Bore sizes 1-1/8 through 4 inch
- 14 standard mounting styles
- Pressures up to 250 PSIG
- Temperatures -10°F to 165°F
- Aluminum body construction

**P1D Series - ISO 15552 / ISO 6431**



B65

- 5 available for maximum flexibility
- Bore sizes 32mm through 200mm
- 10 standard mounting styles
- Pressures up to 145 PSIG
- Temperatures -10°F to 250°F
- Aluminum body construction

**Round Body Cylinders**

**SR / SRM / SRD / SRDM Series - Non-Repairable**



B83

- Bore sizes 5/16 through 3 inch
- 28 mounting styles
- Pressures up to 250 PSIG
- Temperatures -10°F to 165°F
- Stainless steel body construction

**SRX Series - Position Feedback**



B109

- Bore sizes 1-1/16 through 3 inch
- Continuous position feedback
- Pressures up to 150 PSIG
- Temperatures 40°F to 165°F
- Stainless steel body construction

**P1L Series - Repairable**



B117

- Bore sizes 20mm through 100mm
- 9 mounting styles
- Pressures up to 145 PSIG
- Temperatures -10°F to 250°F
- Aluminum body construction

**P1A Series - ISO Non-Repairable**



B132

- Bore sizes 10mm through 25mm
- 5 mounting styles
- Pressures up to 145 PSIG
- Temperatures -40°F to 302°F
- Stainless steel body construction

**P Series - Repairable**



B136

- Bore sizes 1-1/8 through 4 inch
- 4 mounting styles
- Pressures up to 150 PSIG
- Temperatures -10°F to 250°F
- Aluminum body construction

Pictorial Index

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Vacuum Products

Valve Products

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## Compact Cylinders

### P1Q Series - Economy Compact Cylinder



- Bore sizes 12mm through 100mm
- 4 flexible mounting options
- Pressures up to 10 PSIG
- Temperatures 23°F to 158°F
- Aluminum body construction

B143

### P1M Series - Compact Cylinder



- Bore sizes 12mm through 100mm
- 6 mounting options
- Pressures up to 145 PSIG
- Temperatures -4°F to 250°F
- Aluminum body construction

B151

### LP / LPM Series - Compact Cylinder



- Bore sizes 9/16 through 4 inch
- 6 mounting styles
- Pressures up to 150 PSIG
- Temperatures -10°F to 200°F
- Aluminum body construction

B163

## Guided Cylinders

### P5T Series - Compact Guided



- Bore sizes 16mm through 100mm
- Pressures up to 145 PSIG
- Temperatures 0°F to 250°F
- Aluminum body construction
- Flexible porting: top, rear, side

B169

### P5T2 Series - Heavy Duty Compact Guided



- Bore sizes 12mm through 100mm
- Pressures up to 145 PSIG
- Temperatures 0°F to 250°F
- Aluminum body construction
- Through hole mounting

B176

### P5L Series - Guided



- Bore sizes 20mm through 100mm
- Direct mounting
- Pressures up to 145 PSIG
- Temperatures 0°F to 250°F
- Extruded aluminum body construction

B183

### HB Series - Heavy Duty Guided



- Bore sizes 1-1/2 through 2-1/2 inch
- Thrust, reach and compact versions available
- Air service pressure up to 250 PSIG, hydraulic service up to 750 PSIG
- Temperatures 0°F to 250°F
- Aluminum body construction
- Rod lock version available

B209

### P5E Series - P1D ISO Guided



- Bore sizes 32mm through 100mm
- Pressures up to 145 PSIG
- Temperatures 14°F to 165°F
- Aluminum body construction
- Rod lock version available

B217

**A**

Pictorial Index

**Rodless Cylinders**

**OSP-P Series - Band Type Rodless**



- Bore sizes 10mm through 80mm
- Pressures to max. 8 bar
- Temperatures -10°F to 80°F
- Aluminum body construction

B223

**Rotary Actuators**

**PV Series - Vane Rotary**



- 8 model sizes
- Single or double vane models
- Pressures to 150 PSIG
- Temperatures 30°F to 250°F
- 7 to 1800 lb-in output torque

B270

Actuator Products

**P1X Series - Band Type Rodless**



- 7 bore sizes 16mm through 63mm
- Integral sensor mounting rail
- Pressures 7 to 100 PSIG
- Temperatures 40°F to 140°F
- Aluminum body construction

B241

**PRN(A) Series - Vane Rotary**



- 5 miniature and 4 standard models
- Temperatures -23°F to 176°F
- 1.33 to 2355 in-lb torque at 100 PSIG

B274

Vacuum Products

**P1Z Series - Magnetically Coupled Rodless**



- 3 bore sizes 16mm, 20mm & 32mm
- Pressures 29 to 100 PSIG
- Temperatures 15°F to 140°F
- Stainless steel body construction

B253

**PTR Series - Rack & Pinion Rotary**

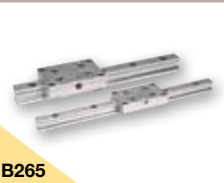


- Bore sizes 1 through 3-1/4 inch
- Pressures to 250 PSIG
- Temperatures 0°F to 250°F
- 39 to 2281 lb-in output torque

B279

Valve Products

**GDL Series - Rails & Cassettes**



- 6 sizes available
- Speed up to 10m/s (33 ft/s)
- Temperatures -10°C to 80°C
- Aluminum alloy rail
- Aluminum body construction

B265

**HP Series - Large Rack & Pinion Rotary**



- 2 large bore models
- 3 standard rotations
- Pressures to 100 PSIG
- Temperatures 0°F to 250°F
- 4500 and 10,000 lb-in output at 100 PSIG

B282

Air Preparation Products

Dryer Products

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Safety Guides, Offer of Sale

**P1V-S Series - Air Motors**



- Power from 20 through 1200 watts
- Speeds 5 to 24,000 RPM
- Pressures to max. 7 bar
- Temperatures -30°C to 100°C

B285

**Grippers**

Grippers



- Stroke ranges: 0.12 to 6.0 inches
- Grip forces: up to 2800 lbs
- Operating characteristics:
  - Single acting
  - Double acting
  - Spring assist and spring return

B288

**Electronic Sensors**

Sensors

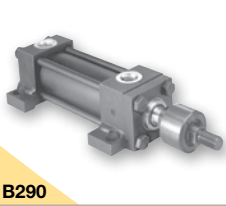


- Solid state
- Reed
- NAMUR
- Proximity

B294

**Actuator Accessories**

Linear Alignment Couplers



- 12 standard thread sizes
- Maximum reliability for trouble-free operation, long life and lower operating costs
- Increased cylinder life by reducing wear on piston and rod bearings
- Stainless steel versions available

B290

**Shock Absorbers**

Shock Absorbers



- Miniature - self-compensating
- Heavyweight - soft contact and self-compensating
- Miniature - soft contact and self-compensating
- Magnum series - adjustable
- Heavy - self-compensating
- Heavy - adjustable

B316

**4TK Series - Air-Oil Tanks**



- 6 standard bore sizes
- Lightweight aluminum / fiberglass design
- 2 fluid flow baffles reduce agitation and aeration
- 8 standard mounting styles

B291

**PRL Series - Stand Alone Rodlock**



- 5 different sizes
- Large holding forces
- 2 different mounting styles
- Case-hardened rod material available

B292

**A**

**Vacuum Cups**

**PFG Flat Cups**



- Precision molded single lip flat cup for smooth or slightly curved surfaces.
- Low profile design makes flat pads ideal for fast response
- Cup Sizes: 1.5mm to 200mm

C4

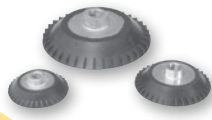
**PBG Bellows Cups**



- Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, curved surfaces, and flexible products
- Cup sizes: 10mm to 150mm

C17

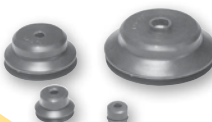
**P5V-CFS Flat Cups**



- Precision molded double lip flat cup for slightly curved surfaces
- Double lip for additional security. If outside lip bends and loses its seal, the inner lip remains sealed.
- Outer ribs prevent the cup lip from being cut
- Cup Sizes: 50mm to 150mm

C29

**PJG Short Bellows Cups**



- Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, curved surfaces, and slightly flexible products
- Shorter stroke provides fast response
- Cup sizes: 6mm to 80mm

C30

**PCG Multiple Bellows Cups**



- Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, or curved surfaces
- 2-1/2 bellows design minimizes contact pressure applied to products
- Cup sizes: 5mm to 90mm

C42

**PUGB Flat Swivel Cups**



- 30° swivel single lip flat cup for smooth surfaces, slightly curved surfaces, and flexible products
- Rigid stem or level compensator provides good stability for horizontal lift
- Cup Sizes: 60mm to 100mm

C50

**Vacuum Generators**

**MCA, CV, CV-CK Inline Generators**



- MCA: Light weight vacuum generator
- CV: Basic aluminum body vacuum generator
- CV-CK: Basic aluminum body vacuum generator with mechanical switch for part present confirmation

C54

**CHF Inline Generators**



- CHF- High Flow Series is a multistage vacuum generator
- Intended for high flow vacuum applications
- Ideal for porous applications
- Standard with flow thru exhaust mufflers to reduce clogging in dirty environments

C56

**MC22 Integrated Generators**



- Compact vacuum generator includes vacuum and blow-off solenoids and vacuum filters
- Optional check valve and MPS-23 pressure sensor
- Air-economizing function with MVS-201 pressure sensor
- Inline version can be mounted on manifolds up to 8 stations

C58

**MC72 Integrated Generators**



- Light weight vacuum generator includes vacuum and blow-off solenoids.
- Includes check valve, vacuum filter and optional MPS-23 pressure sensor
- Air-economizing function with MVS-201 pressure sensor
- Inline version can be mounted on manifolds up to 5 stations

C61

**CEK Integrated Generators**



- Air-economizing functions with emergency stop logic that maintains degree of vacuum with loss of output power
- Includes vacuum and blow-off solenoids, check valve, vacuum filter and optional MPS-23 pressure sensor
- Inline versions can be mounted in manifolds up to 5 stations

C64

**CVXCEK Integrated Generators**



- Basic 2 station CEK generator manifold with additional electrical capabilities
- Integrates MPS-23 sensor for on board air-economizing programming
- M12 electrical wiring package with optional 18-pin single connection

C67

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## Vacuum Generator Accessories

### MPS-23 Integrated Generator Sensors



C69

- 0 to -30 inHg, -14.7 to 72.5 PSIG
- Output type: (2) NPN / PNP
- Media: air, non-corrosive gas
- IP65
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

### MVS-201 Integrated Generator Sensors



C71

- 0 to -30 inHg, -14.7 to 72.5 PSIG
- Output type: (2) NPN / PNP
- Media: air, non-corrosive gas
- IP65
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

### FSV Metered Flow Sensing Valve



C73

- Pick and place randomly placed products
- Minimize vacuum loss when cup seal is lost
- Direct mounting to cups
- 1/8 to G3/8 connection
- Integrated bronze filter

### CH01 One Way Check Valve



C74

- Poppet design
- Low leakage
- Low cracking pressure

### VF & VFL Vacuum Filters



C75

- Filters the vacuum system to protect the components from damaging particles absorbed from the environment
- Elements easily replaced

### VFP Vacuum Filters



C76

- Provides easy monitoring, economy and safety
- 10 micron porous plastic element prolongs element life
- Shatterproof and airtight
- Replaceable filter element

## Vacuum Silencers



C77

- Pressure up to 128 PSIG
- Temperature 41°F to 132°F (5°C to 55.5°C)
- Silencing effect 20 dB

## Pressure Sensors / Cables

### MPS-33 Pressure Sensors



C78

- 0 to -30 inHg, 0 to 145 PSIG
- Output type: (2) PNP or (1) NPN with analog
- Media: air, non-corrosive gas
- IP50
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

### MPS-34 Pressure Sensors



C80

- 0 to -30 inHg, 0 to 145 PSIG
- Output type: (2) PNP or (1) NPN with analog
- Media: air, non-corrosive gas
- IP50
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

### SCP01 Pressure Sensor



C82

- Stainless steel body
- Compact construction
- Shock and vibration proof
- Resistant to pressure spikes
- Accuracy +/- 0.5% FS

### SCPSD Pressure Sensors



C83

- CV-CK is a Venturi Generator with adjustable open contact mechanical switch for vacuum confirmation.
- Great for low cost vacuum confirmation

## Cables



C85

- M8, M12 male / female connector
- Length: 2m or 5m
- Cover: PVC or PUR
- Connection type: swivel straight or angled
- IP67 swivel connector

**A**

**Direct Acting Valves**

**XM Series - Direct Acting**



D4

- Inline or stacking
- 1/8 inch ports
- Pressures 0 to 125 PSIG
- Temperatures 32°F to 125°F
- Flow - .15 Cv

**15mm Series - Direct Acting**



D8

- Subbase or manifold
- 1/8 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 140°F
- Flow - .033 to .05 Cv

**Inline Valves**

**Viking Lite Series - Inline**



D11

- Inline or bar manifold
- 1/8 through 3/8 inch ports
- Pressures 22 to 145 PSIG
- Temperatures 14°F to 122°F
- Flow - .6 to 2.5 Cv

**Viking Xtreme Series - Inline**



D19

- Inline or bar manifold
- 1/8 through 1/2 inch ports
- Pressures VAC to 232 PSIG
- Temperatures -40°F to 140°F
- Flow - .7 to 2.7 Cv

**B Series - Inline**



D43

- Inline, subbase or bar manifold
- 1/8 through 3/4 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 120°F
- Flow - .75 to 7.0 Cv

**ADEX Series - Inline**



D68

- Inline, subbase or bar manifold
- M3, M5, 1/8 inch ports
- Pressures VAC to 100 PSIG
- Temperatures 32°F to 122°F
- Flow - .1 to .47 Cv

**Inline – continued**

**N Series - Inline Poppet**



D78

- Inline mounted
- 3/8 through 1-1/2 inch ports
- Pressures 30 to 250 PSIG
- Temperatures 0°F to 200°F
- Flow - 3.6 to 29.9 Cv

**Subbase & Manifold Valves**

**Moduflex Series Valves**



D89

- Inline or stacking
- 4mm tube, 1/4, 3/8 inch ports
- Pressures VAC to 120 PSIG
- Temperatures 5°F to 140°F
- Flow - .18 to .80 Cv

**Isys Micro Series**



D113

- Subbase or manifold
- 4mm through 1/4 tube
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 120°F
- Flow - .35 Cv

**Isys ISO Series**



D124

- Subbase or manifold
- 1/8 through 3/4 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 120°F
- Flow - .55 to 6.0 Cv

**Fieldbus Systems**



D166

- Fieldbus interface for Isys and Moduflex valves
- Up to 256 inputs
- Up to 256 outputs
- Digital or analog

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## Subbase & Manifold – continued


### DX ISOMAX Series



- Subbase or manifold
- 1/8 through 3/4 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 14°F to 140°F
- Flow - .55 to 4.15 Cv

**D185**

### Valvair II Series




- Subbase or manifold
- 3/8 through 1-1/2 inch ports
- Pressures VAC to 225 PSIG
- Temperatures 0°F to 200°F
- Flow - 1.9 to 12.0 Cv

**D198**

## Manual / Mechanical Valves


### Directair 2 & 4



- Manual / mechanical
- 1/8 and 1/4 inch ports
- Pressures VAC to 150 PSIG
- Temperatures 32°F to 175°F
- Flow - .20 to .84 Cv

**D208**


### Viking Xtreme



- Manual / mechanical
- 1/8, 1/4 and 3/8 inch ports
- Pressures:  
 Type A & B - VAC to 232 PSIG  
 Type C & D - VAC to 174 Psig
- Temperatures -40°F to 140°F
- Flow - .5 to 2.7 Cv

**D218**

### 42 Series




- Manual / mechanical
- 1/4 and 3/8 inch ports
- Pressures VAC to 150 PSIG
- Temperatures 0°F to 140°F
- Flow - 1.3 to 2.9 Cv

**D225**

## Manual / Mechanical – continued


### M0 Series



- Air Pilot, Manual / mechanical
- 1/4 and 1 inch ports
- Pressures VAC to 225 PSIG
- Temperatures -15°F to 200°F
- Flow - .5 to 1.25 Cv

**D227**


### LV / EZ Lockout Valves



- Port sizes 3/8 through 1-1/4 inch
- Max. supply pressure 300 PSIG
- Max. operating temperature 175°F
- Cv from 3.7 to 14

**D231**

### Brass Poppet, Sliding Seal




- 4-way, 3-position rotary disc, direct air operated valves
- Pressures 0 to 150 PSIG
- Temperatures 18°F to 200°F
- Flow - 2.5 to 6.2 Cv

**D233**

## Valve Accessories


### Control Panel Products



- A wide variety of push buttons and selector switches
- Visual indicators
- Foot pedal switches
- Modular pneumatic / electric push buttons

**D236**

### Sensing / Limit Switches



- Limit switches in a variety of sizes and configurations
- Pressure switches with many adjustable ranges
- Components designed specifically for pneumatic technology using pressure variation, air bleen or blocking for detection

**D240**

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**A**

Pictorial Index

## Global Modular Air Preparation

### Global Modular FRL's



- Port size: 1/4 through 3/4 inch
- Maximum supply pressure: 300 PSIG
- Operating temperature: -13°F through 150°F
- Flows to 212 SCFM
- Filters, regulators, filter / regulators, lubricators and accessories

E3

## Dryers

### Dryer Products



- Refrigeration (10-2400 SCFM)
- Inline desiccant (15-60 SCFM)
- Regenerative desiccant (3-800 SCFM)
- Heatless desiccant dryers
- Zero loss & timer drains
- Auto electrical drain valves

F3

Actuator Products

## General Industrial Air Preparation

## Accessories

Vacuum Products

### Miniature, Compact, Standard, Hi-Flow



- Port size: 1/8 through 3 inch
- Maximum supply pressure: 250 PSIG
- Operating temperature: -14°F through 176°F
- Flows to 2900 SCFM
- Filters, regulators, filter / regulators, lubricators and accessories
- 4" & 6" Separators & filters

E40

### Ball Valves / Plug Valves



- Forged brass, general purpose, industrial ball valves
- Stainless steel, general purpose, industrial ball valves
- One piece extruded brass body plug valves

G3

Valve Products

## Stainless Steel Air Preparation

### Hose & Fittings

### Stainless Steel FRL's



- Port sizes: 1/4 and 1/2 inch
- Stainless steel construction handles most corrosive environments
- Fluorocarbon seals standard
- Meets NACE specifications MR-01-75/ISO 15156
- Filters, regulators, filter / regulators, and lubricators

E101



- 801 General purpose hose
- Push-on hose barb fittings

G4

Air Preparation Products

Dryer Products

### Integrated Fittings

## Precision & Proportional Regulator Air Preparation

### Precision & Proportional Regulators



- Port sizes: 1/4 through 2 inch
- Maximum supply pressure: 300 PSIG
- Operating temperature: -40°F through 200°F
- Flows to 1600 SCFM
- Electronic proportional

E108



- Flow control regulators
- Inline check valves
- Blocking valves
- Threshold sensors

G5

Accessories

Application Engineering Data

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### Miscellaneous Accessories




- Tank valves & air chucks
- Mufflers & silencers
- Relief valves
- Quick exhaust / shuttle valves
- Pressure switches
- Blow guns
- Ports from M5 through 3/4 inch

G10



## Accessories – continued


### Quick Connect Couplers



- Industrial interchange nipples  
–1/4" to 3/4" body size
- Sleevematic couplers  
–1/4" to 1/2" body size
- Saffromatic couplers  
–1/4" to 3/4" body size
- Economatic quick connect couplings  
–1/4" body size

G14

### Tubing & Fittings



- Push-to-connect, Prestolok composite fittings
- Push-to-connect, Prestolok metal fittings
- Pipe fittings
- E: instrument grade tubing, N: flexible tubing, FRPE: flame resistant tubing, NR: semi-rigid high strength tubing, U: polyether base tubing

G17

### Application Engineering Data

- Fluid Power Graphic Symbols
- Valve Product Selection Data
- Technical Data
- Application Engineering Data

H1

### Safety Guides, Offer of Sale

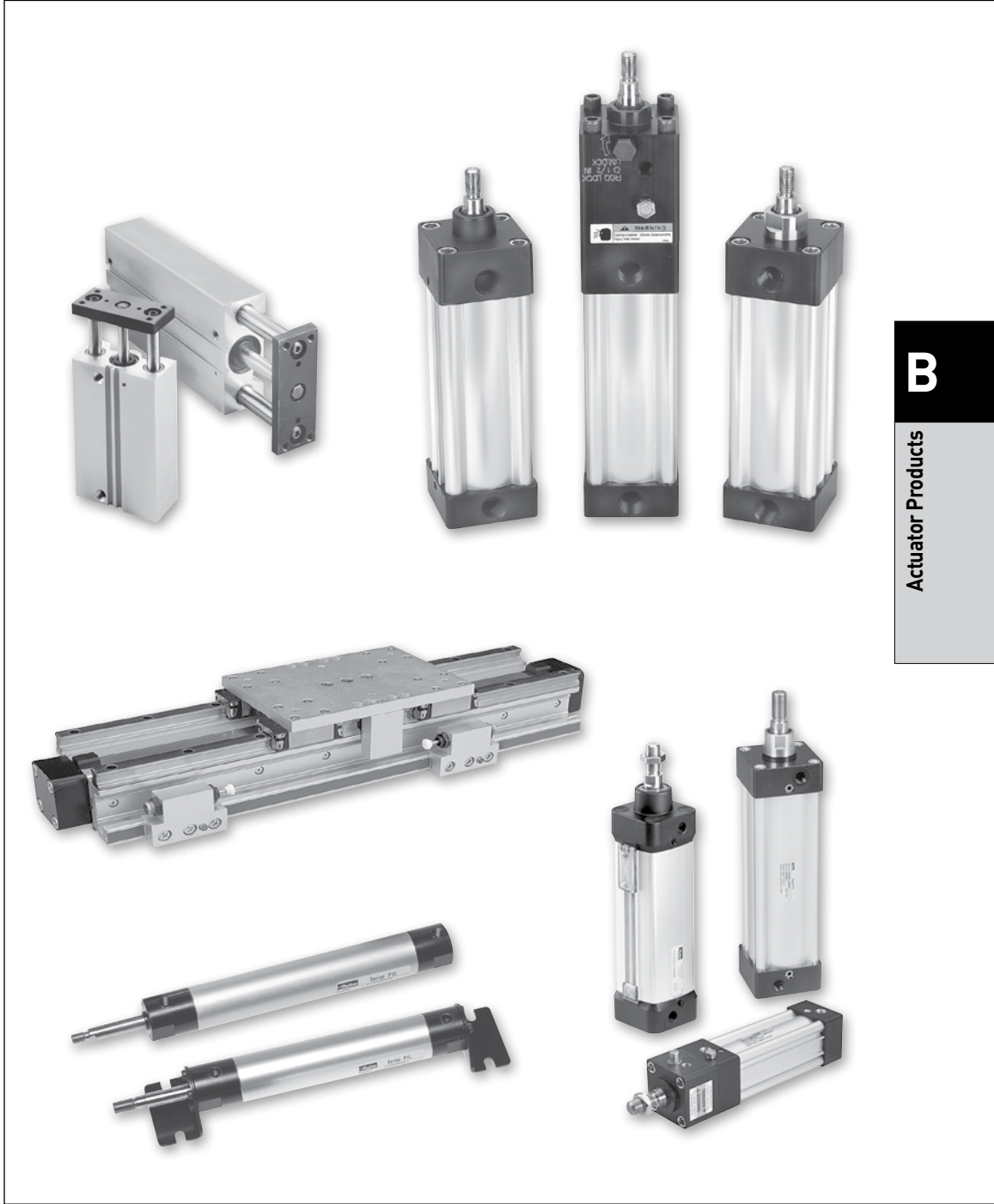
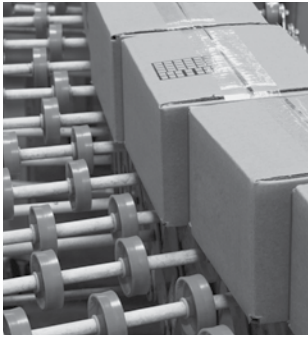
- **Safety Guide** – Actuator Products
- **Safety Guide** – Control Products
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J1

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**A**

Notes



**B**  
Actuator Products

# Actuator Products

## Tie Rod Cylinders

### 3MA Series - Economy NFPA Cylinder



B6

- Bore sizes 1-1/2 through 5 inch
- 18 standard mounting styles
- Pressures up to 250 PSIG
- Temperatures -10°F to 165°F
- Aluminum body construction

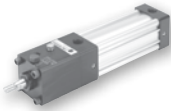
### 4MA Series - Flexible NFPA Cylinder



B16

- Bore sizes 1-1/2 through 8 inch
- 20 standard mounting styles
- Pressures up to 250 PSIG
- Temperatures -50°F to 250°F
- Aluminum body construction

### 3MAJ / 4MAJ - Rodlock Cylinder



B40

- Bore sizes 1-1/2 through 8 inch
- 17 standard mounting styles
- Pressures up to 100 PSIG
- Temperatures -10°F to 165°F
- Aluminum body construction

### 4MNR Series - Non-Rotating Cylinder



B58

- Bore sizes 1-1/8 through 4 inch
- 14 standard mounting styles
- Pressures up to 250 PSIG
- Temperatures -10°F to 165°F
- Aluminum body construction

### P1D Series - ISO 15552 / ISO 6431



B65

- 5 available for maximum flexibility
- Bore sizes 32mm through 200mm
- 10 standard mounting styles
- Pressures up to 145 PSIG
- Temperatures -10°F to 250°F
- Aluminum body construction

## Round Body Cylinders

### SR Series - Non-Repairable



B83

- Bore sizes 5/16 through 3 inch
- 28 mounting styles
- Pressures up to 250 PSIG
- Temperatures -10°F to 165°F
- Stainless steel body construction

### SRX Series - Position Feedback



B109

- Bore sizes 1-1/16 through 3 inch
- Continuous position feedback
- Pressures up to 150 PSIG
- Temperatures 40°F to 165°F
- Stainless steel body construction

### P1L Series - Repairable



B117

- Bore sizes 20mm through 100mm
- 9 mounting styles
- Pressures up to 145 PSIG
- Temperatures -10°F to 250°F
- Aluminum body construction

### P1A Series - ISO Non-Repairable



B132

- Bore sizes 10mm through 25mm
- 5 mounting styles
- Pressures up to 145 PSIG
- Temperatures -40°F to 302°F
- Stainless steel body construction

### P Series - Repairable



B136

- Bore sizes 1-1/8 through 4 inch
- 4 mounting styles
- Pressures up to 150 PSIG
- Temperatures -10°F to 250°F
- Aluminum body construction



## Compact Cylinders


**P1Q Series - Economy Compact Cylinder**



- Bore sizes 12mm through 100mm
- 4 flexible mounting options
- Pressures up to 10 PSIG
- Temperatures 23°F to 158°F
- Aluminum body construction

**B143**

**P1M Series - Compact Cylinder**



- Bore sizes 12mm through 100mm
- 6 mounting options
- Pressures up to 145 PSIG
- Temperatures -4°F to 250°F
- Aluminum body construction

**B151**

**LP / LPM Series - Compact Cylinder**




- Bore sizes 9/16 through 4 inch
- 6 mounting styles
- Pressures up to 150 PSIG
- Temperatures -10°F to 200°F
- Aluminum body construction

**B163**

## Guided Cylinders


**P5T Series - Compact Guided**



- Bore sizes 16mm through 100mm
- Pressures up to 145 PSIG
- Temperatures 0°F to 250°F
- Aluminum body construction
- Flexible porting: top, rear, side

**B169**


**P5T2 Series - Compact Guided**



- Bore sizes 12mm through 100mm
- Pressures up to 145 PSIG
- Temperatures 0°F to 250°F
- Aluminum body construction
- Through hole mounting

**B176**

**P5L Series - Guided**



- Bore sizes 20mm through 100mm
- Direct mounting
- Pressures up to 145 PSIG
- Temperatures 0°F to 250°F
- Extruded aluminum body construction

**B183**


**HB Series - Heavy Duty Guided**



- Bore sizes 1-1/2 through 2-1/2 inch
- Thrust, reach and compact versions available
- Air service pressure up to 250 PSIG, hydraulic service up to 750 PSIG
- Temperatures 0°F to 250°F
- Aluminum body construction
- Rod lock version available

**B209**

**P5E Series - P1D ISO Guided**



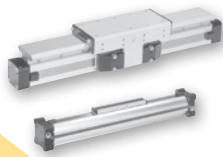
- Bore sizes 32mm through 100mm
- Pressures up to 145 PSIG
- Temperatures 14°F to 165°F
- Aluminum body construction
- Rod lock version available

**B217**

**B**  
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 Actuator Products

## Rodless Cylinders

### OSP-P Series - Band Type Rodless



- Bore sizes 10mm through 80mm
- Pressures to max. 8 bar
- Temperatures -10°F to 80°F
- Aluminum body construction

B223

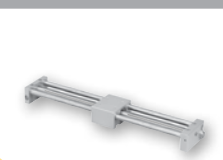
### P1X Series - Band Type Rodless



- 7 bore sizes 16mm through 63mm
- Integral sensor mounting rail
- Pressures 7 to 100 PSIG
- Temperatures 40°F to 140°F
- Aluminum body construction

B241

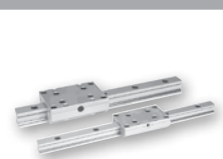
### P1Z Series - Magnetically Coupled Rodless



- 3 bore sizes 16mm, 20mm & 32mm
- Pressures 29 to 100 PSIG
- Temperatures 15°F to 140°F
- Stainless steel body construction

B253

### GDL Series - Rails & Cassettes



- 6 sizes available
- Speed up to 10m/s (33 ft/s)
- Temperatures -10°C to 80°C
- Aluminum alloy rail
- Aluminum body construction

B265

## Rotary Actuators

### PV Series - Vane Rotary



- 8 model sizes
- Single or double vane models
- Pressures to 150 PSIG
- Temperatures 30°F to 250°F
- 7 to 1800 lb-in output torque

B270

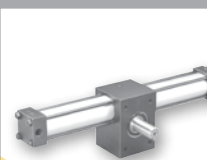
### PRN(A) Series - Vane Rotary



- 5 miniature and 4 standard models
- Temperatures -23°F to 176°F
- 1.33 to 2355 in-lb torque at 100 PSIG

B274

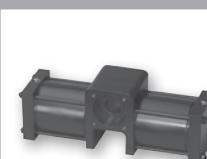
### PTR Series - Rack & Pinion Rotary



- Bore sizes 1 through 3-1/4 inch
- Pressures to 250 PSIG
- Temperatures 0°F to 250°F
- 39 to 2281 lb-in output torque

B279

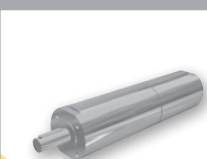
### HP Series - Large Rack & Pinion Rotary



- 2 large bore models
- 3 standard rotations
- Pressures to 100 PSIG
- Temperatures 0°F to 250°F
- 4500 and 10,000 lb-in output at 100 PSIG

B282

### P1V-S Series - Air Motors

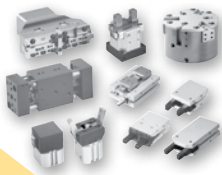


- Power from 20 through 1200 watts
- Speeds 5 to 24,000 RPM
- Pressures to max. 7 bar
- Temperatures -30°C to 100°C

B285

## Grippers

### Grippers



- Stroke ranges: 0.12 to 6.0 inches
- Grip forces: up to 2800 lbs
- Operating characteristics:
  - Single acting
  - Double acting
  - Spring assist and spring return

B288

## Electronic Sensors

### Sensors

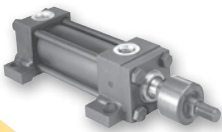


- Solid state
- Reed
- NAMUR
- Proximity

B294

## Actuator Accessories

### Linear Alignment Couplers



- 12 standard thread sizes
- Maximum reliability for trouble-free operation, long life and lower operating costs
- Increased cylinder life by reducing wear on piston and rod bearings
- Stainless steel versions available

B290

## Shock Absorbers

### Shock Absorbers



- Miniature - self-compensating
- Heavyweight - soft contact and self-compensating
- Miniature - soft contact and self-compensating
- Magnum series - adjustable
- Heavy - self-compensating
- Heavy - adjustable

B319

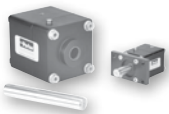
## 4TK Series - Air Oil Tanks



- 6 standard bore sizes
- Lightweight aluminum / fiberglass design
- 2 fluid flow baffles reduce agitation and aeration
- 8 standard mounting styles

B291

## PRL Series - Stand Alone Rodlock



- 5 different sizes
- Large holding forces
- 2 different mounting styles
- Case-hardened rod material available

B292

**B**

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 Actuator Products

- NFPA interchangeable economy series
- Bore sizes – 1-1/2", 2", 2-1/2", 3-1/4", 4" and 5"
- Available in any practical stroke length
- 18 standard modular mounting styles available
- Extruded-profile aluminum body with integrated switch grooves
- Single rod end or double rod end options available
- Cushions – standard and adjustable at both ends, optional non-cushioned
- NPT porting standard
- RoHS compliant



**Operating information**

Operating pressure: 250 PSIG (17 bar)  
 Temperature range: -10°F to 165°F (-23°C to 74°C)  
 Filtration requirements: 40 micron, dry filtered air  
 For technical information see CD

**Ordering information**

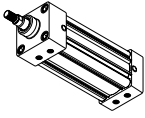
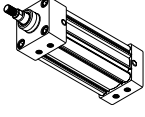
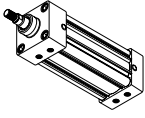
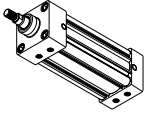
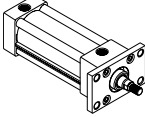
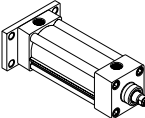
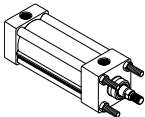
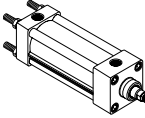
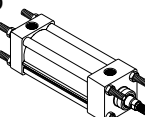
|   |   |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
|---|---|---|-------------------------------|---------------------------------|--|--|--------------------------|---------------|---|---|--|---|---|------------------------------|---|-----------------------|---|--|--------------------------------|----------|--------------------------------|----------|---|----------|---|-----------|--|----------|---|---|---|----------|--|----------|------------------|-----------|--------|---|--------------|----------|----------|-------------------------|----------|---------------------|----------|---------------------|
| <b>2.00</b>   | <b>C</b>  | <b>J</b>  | <b>3MA</b>                    | <b>U</b>                        | <b>1</b>   | <b>4</b>   | <b>A</b>                 | <b>C</b>      | <b>6.000</b>  |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>Bore size</b><br>1.50<br>2.00<br>2.50<br>3.25<br>4.00<br>5.00  | <b>Double rod cylinder</b> <sup>5</sup><br>Specify "K" only if double rod cylinder is required. | <b>Mounting style</b><br>Specify mounting style code (see table on following page). | <b>Series</b><br>3MA          | <b>Ports</b><br>Standard (NPTF) | <b>Seals</b><br><table border="1"><tr><td><b>Blank</b></td><td>Standard (nitrile seals)</td></tr><tr><td><b>E</b></td><td>Fluorocarbon rod wiper and rod seal only<sup>2</sup></td></tr></table> | <b>Blank</b>   | Standard (nitrile seals) | <b>E</b>      | Fluorocarbon rod wiper and rod seal only <sup>2</sup>     | <b>Piston rod number</b><br>Standard (rod code number 1) <sup>3</sup> | <b>Special modification</b><br>Specify "S" only for special modification other than rod end, and then describe modification in item notes. | <b>Cushion cap end</b><br><table border="1"><tr><td><b>C</b></td><td>Standard (cushioned cap end)</td></tr><tr><td><b>Blank</b></td><td>Non-cushioned cap end</td></tr></table> | <b>C</b>  | Standard (cushioned cap end) | <b>Blank</b>  | Non-cushioned cap end | <b>Stroke length</b><br>Specify stroke length required in inches. |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>Blank</b>  | Standard (nitrile seals)  |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>E</b>  | Fluorocarbon rod wiper and rod seal only <sup>2</sup>   |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>C</b>  | Standard (cushioned cap end)  |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>Blank</b>  | Non-cushioned cap end   |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>Cushion head end</b><br><table border="1"><tr><td><b>C</b></td><td>Standard (cushioned head end)</td></tr><tr><td><b>Blank</b></td><td>Non-cushioned head end</td></tr></table>  |   | <b>C</b>  | Standard (cushioned head end) | <b>Blank</b>                    | Non-cushioned head end   | <b>Cylinder construction</b><br><table border="1"><tr><td><b>Blank*</b></td><td>Standard (extruded body, standard round lobe orientation)</td></tr><tr><td><b>A*</b></td><td>Extruded body, round lobe orientation rotated 90 degrees from standard</td></tr><tr><td><b>N*</b></td><td>Extruded body, round lobe orientation rotated 180 degrees from standard</td></tr><tr><td><b>Z*</b></td><td>Extruded body, round lobe orientation rotated 270 degrees from standard</td></tr><tr><td><b>T</b></td><td>Aluminum round tube and carbon steel tie rods and nuts</td></tr></table> |                          | <b>Blank*</b> | Standard (extruded body, standard round lobe orientation) | <b>A*</b>   | Extruded body, round lobe orientation rotated 90 degrees from standard   | <b>N*</b>   | Extruded body, round lobe orientation rotated 180 degrees from standard | <b>Z*</b>                    | Extruded body, round lobe orientation rotated 270 degrees from standard | <b>T</b>              | Aluminum round tube and carbon steel tie rods and nuts            | <b>Piston rod thread style</b><br><table border="1"><tr><td><b>4</b></td><td>Small male</td></tr><tr><td><b>8</b></td><td>Intermediate male</td></tr><tr><td><b>9</b></td><td>Short female</td></tr><tr><td><b>55</b></td><td>For use with split coupler<sup>4</sup></td></tr><tr><td><b>3</b></td><td>Special (and specify all dimensions required)</td></tr></table> |                                | <b>4</b> | Small male                     | <b>8</b> | Intermediate male                                   | <b>9</b> | Short female                                      | <b>55</b> | For use with split coupler <sup>4</sup>          | <b>3</b> | Special (and specify all dimensions required)                         | <b>Piston rod thread type</b><br><table border="1"><tr><td><b>A</b></td><td>Standard (UNF unified thread)</td></tr><tr><td><b>W</b></td><td>BSF British fine</td></tr><tr><td><b>M*</b></td><td>Metric</td></tr></table><br><small>* Please reference catalog 0900P-E, page B106.</small> |   | <b>A</b> | Standard (UNF unified thread)                                      | <b>W</b> | BSF British fine | <b>M*</b> | Metric | <b>Rod material code</b><br><table border="1"><tr><td><b>Blank</b></td><td>Standard</td></tr><tr><td><b>Y</b></td><td>17-4 PH stainless steel</td></tr><tr><td><b>J</b></td><td>303 stainless steel</td></tr><tr><td><b>S</b></td><td>316 stainless steel</td></tr></table> | <b>Blank</b> | Standard | <b>Y</b> | 17-4 PH stainless steel | <b>J</b> | 303 stainless steel | <b>S</b> | 316 stainless steel |
| <b>C</b>  | Standard (cushioned head end)   |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>Blank</b>  | Non-cushioned head end  |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>Blank*</b>   | Standard (extruded body, standard round lobe orientation)                                       |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>A*</b>   | Extruded body, round lobe orientation rotated 90 degrees from standard                          |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>N*</b>   | Extruded body, round lobe orientation rotated 180 degrees from standard                         |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>Z*</b>   | Extruded body, round lobe orientation rotated 270 degrees from standard                         |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>T</b>  | Aluminum round tube and carbon steel tie rods and nuts  |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>4</b>  | Small male  |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>8</b>  | Intermediate male   |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>9</b>  | Short female  |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>55</b>   | For use with split coupler <sup>4</sup>   |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>3</b>  | Special (and specify all dimensions required)   |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>A</b>  | Standard (UNF unified thread)   |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>W</b>  | BSF British fine  |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>M*</b>   | Metric  |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>Blank</b>  | Standard  |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>Y</b>  | 17-4 PH stainless steel   |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>J</b>  | 303 stainless steel   |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>S</b>  | 316 stainless steel   |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <small>* Please reference catalog 0900P-E, table on page B10. Only applies to 1-1/2" to 4" bore size.</small>   |   |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>Piston type</b><br><table border="1"><tr><td><b>Blank</b></td><td>Standard (lipseals and magnetic ring)<sup>5</sup></td></tr><tr><td><b>1</b></td><td>Lipseals, no magnetic ring<sup>5</sup></td></tr><tr><td><b>2</b></td><td>Lipseals, no magnetic ring (aluminum piston)</td></tr><tr><td><b>3</b></td><td>Lipseals and magnetic ring (aluminum piston)</td></tr><tr><td><b>4</b></td><td>Bumper seals, no magnetic ring</td></tr><tr><td><b>6</b></td><td>Bumper seals and magnetic ring</td></tr><tr><td><b>B</b></td><td>Lipseals, 1/4" thick bumpers both ends<sup>1</sup></td></tr><tr><td><b>H</b></td><td>Lipseals, 1/4" thick bumper head end<sup>1</sup></td></tr><tr><td><b>C</b></td><td>Lipseals, 1/4" thick bumper cap end<sup>1</sup></td></tr><tr><td><b>D</b></td><td>Lipseals and magnetic ring, 1/4" thick bumpers both ends<sup>1</sup></td></tr><tr><td><b>F</b></td><td>Lipseals and magnetic ring, 1/4" thick bumper head end<sup>1</sup></td></tr><tr><td><b>R</b></td><td>Lipseals and magnetic ring, 1/4" thick bumper cap end<sup>1</sup></td></tr></table> |   |   |                               |                                 |  |  |                          |               |   | <b>Blank</b>  | Standard (lipseals and magnetic ring) <sup>5</sup>   | <b>1</b>  | Lipseals, no magnetic ring <sup>5</sup>                                 | <b>2</b>                     | Lipseals, no magnetic ring (aluminum piston)                            | <b>3</b>              | Lipseals and magnetic ring (aluminum piston)                      | <b>4</b>   | Bumper seals, no magnetic ring | <b>6</b> | Bumper seals and magnetic ring | <b>B</b> | Lipseals, 1/4" thick bumpers both ends <sup>1</sup> | <b>H</b> | Lipseals, 1/4" thick bumper head end <sup>1</sup> | <b>C</b>  | Lipseals, 1/4" thick bumper cap end <sup>1</sup> | <b>D</b> | Lipseals and magnetic ring, 1/4" thick bumpers both ends <sup>1</sup> | <b>F</b>  | Lipseals and magnetic ring, 1/4" thick bumper head end <sup>1</sup> | <b>R</b> | Lipseals and magnetic ring, 1/4" thick bumper cap end <sup>1</sup> |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>Blank</b>  | Standard (lipseals and magnetic ring) <sup>5</sup>  |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>1</b>  | Lipseals, no magnetic ring <sup>5</sup>   |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>2</b>  | Lipseals, no magnetic ring (aluminum piston)  |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>3</b>  | Lipseals and magnetic ring (aluminum piston)  |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>4</b>  | Bumper seals, no magnetic ring  |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>6</b>  | Bumper seals and magnetic ring  |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>B</b>  | Lipseals, 1/4" thick bumpers both ends <sup>1</sup>   |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>H</b>  | Lipseals, 1/4" thick bumper head end <sup>1</sup>   |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>C</b>  | Lipseals, 1/4" thick bumper cap end <sup>1</sup>  |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>D</b>  | Lipseals and magnetic ring, 1/4" thick bumpers both ends <sup>1</sup>                           |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>F</b>  | Lipseals and magnetic ring, 1/4" thick bumper head end <sup>1</sup>                             |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |
| <b>R</b>  | Lipseals and magnetic ring, 1/4" thick bumper cap end <sup>1</sup>                              |   |                               |                                 |  |  |                          |               |   |   |  |   |   |                              |   |                       |   |  |                                |          |                                |          |   |          |   |           |  |          |   |   |   |          |  |          |                  |           |        |   |              |          |          |                         |          |                     |          |                     |

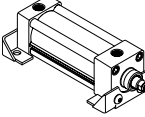
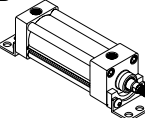
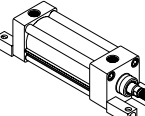
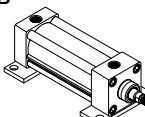
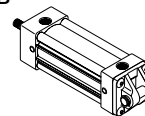
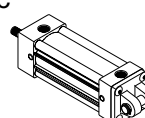
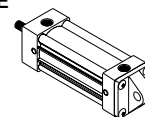
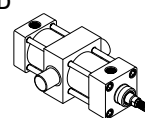
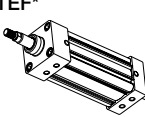
<sup>1</sup> Addition of 1/4" bumper results in a 1/4" stroke loss per bumper, per end. For example, a 6" stroke cylinder with 1/4" bumpers at both ends (option B) has an effective stroke of 5-1/2".  
<sup>2</sup> Used for external chemical compatibility applications, not high temperature.  
<sup>3</sup> Review Piston Rod Selection Chart, please reference catalog 0900P-E, page A14 to determine proper piston rod diameter. (Note: 3MA has only one rod diameter per bore size, so proper piston rod diameter from chart result may lead to bore size change). For oversize rod within the same bore size, please see 4MA section.  
<sup>4</sup> For additional information regarding this style, please reference catalog 0900P-E, page B105.  
 If non-standard Rod Material Code is required with this option, please place an "S" for special in Special Modification field and specify rod material in the item notes.  
<sup>5</sup> Double rod cylinders not available with composite piston type.

**B**  
 Tie Rod Cylinders  
 Actuator Products  
 3MA Series  
 4MA/4ML Series  
 3MAJ/4MAJ Series  
 4MNR Series  
 P1D Series



**3MA Mounting Styles for 1-1/2" to 5" Bore**

| Mounting style  | NFPA mounting | Description                               | Bore size |
|---|---------------|---|-----------|
| TEF<br>  | MX5/MS4       | Sleeve Nut with Side Tap (standard mount) | 1-1/2 - 5 |
| T<br>    | MX0           | No Mount (same construction as TEF)       | 1-1/2 - 5 |
| TE<br>   | MX5           | Sleeve Nut (same construction as TEF)     | 1-1/2 - 5 |
| F<br>    | MS4           | Side Tap (same construction as TEF)       | 1-1/2 - 5 |
| J<br>   | MF1           | Head Rectangular Flange                   | 1-1/2 - 5 |
| H<br>  | MF2           | Cap Rectangular Flange                    | 1-1/2 - 5 |
| TB<br> | MX3           | Tie Rods Extended Head End                | 1-1/2 - 5 |
| TC<br> | MX2           | Tie Rods Extended Cap End                 | 1-1/2 - 5 |
| TD<br> | MX1           | Tie Rods Extended Both Ends               | 1-1/2 - 5 |

| Mounting style   | NFPA mounting | Description               | Bore size |
|--|---------------|---------------------------|-----------|
| C<br>       | MS2           | Side Lug                  | 1-1/2 - 5 |
| CB<br>      | MS1           | Side End Angle            | 1-1/2 - 5 |
| G<br>       | MS7           | Side End Lug              | 1-1/2 - 4 |
| NB<br>      | N/A           | Base Bar                  | 1-1/2 - 4 |
| BB<br>     | MP1           | Cap Fixed Clevis          | 1-1/2 - 5 |
| BC<br>    | MP2           | Cap Detachable Clevis     | 1-1/2 - 5 |
| BE<br>    | MP4           | Cap Detachable Eye        | 1-1/2 - 4 |
| DD<br>    | MT4           | Intermediate Trunnion     | 1-1/2 - 5 |
| KTEF*<br> | MDX5/<br>MDS4 | Double Rod End, TEF Mount | 1-1/2 - 5 |

\* Double rod end cylinders can be ordered with head mountings, i.e. KJ.

**B**

Tie Rod Cylinders  
 Actuator Products

3MA  
 Series

4MA/4ML  
 Series

3MAJ/4MAJ  
 Series

4MNR  
 Series

P1D  
 Series

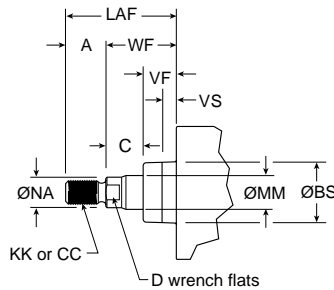
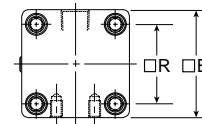
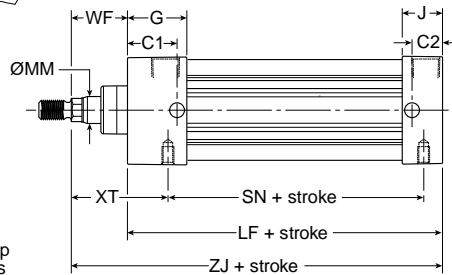
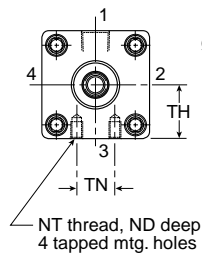
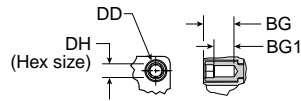
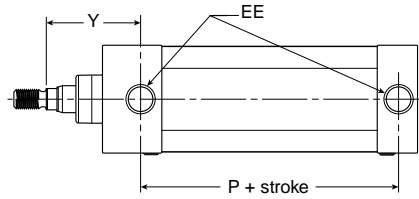
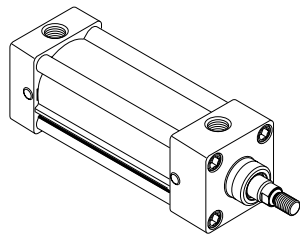
**Sensors**

For sensors see page B294.





**3MA Single Rod Dimensioned Drawings (Styles TEF, T, TE and F)**



For dimensions of all standard rod end styles, please see next page.  
 BS = pilot diameter  
 VS = length of pilot diameter

**Styles TEF, T, TE and F**

| Bore size | Rod size no. | Rod dia. MM | Thread     |                |       |       |       |       |       |       |       |       |     |         |      |       |     |       | EE (NPTF) |  |
|-----------|--------------|-------------|------------|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-----|---------|------|-------|-----|-------|-----------|--|
|           |              |             | Style 8 CC | Style 4 & 9 KK | A     | AA    | BG    | BG1   | BS    | C     | C1    | C2    | D   | DD      | DH   | E     | G   |       |           |  |
| 1-1/2     | 1            | 5/8         | 1/2-20     | 7/16-20        | 0.750 | 2.020 | 0.562 | 0.374 | 1.124 | 0.385 | 1.000 | 0.500 | 1/2 | 1/4-28  | 1/4  | 2.000 | 3/8 | 1.438 |           |  |
| 2         | 1            | 5/8         | 1/2-20     | 7/16-20        | 0.750 | 2.600 | 0.562 | 0.362 | 1.124 | 0.385 | 1.148 | 0.711 | 1/2 | 5/16-24 | 5/16 | 2.500 | 3/8 | 1.375 |           |  |
| 2-1/2     | 1            | 5/8         | 1/2-20     | 7/16-20        | 0.750 | 3.100 | 0.562 | 0.362 | 1.124 | 0.385 | 1.117 | 0.711 | 1/2 | 5/16-24 | 5/16 | 3.000 | 3/8 | 1.344 |           |  |
| 3-1/4     | 1            | 1           | 7/8-14     | 3/4-16         | 1.125 | 3.900 | 0.700 | 0.500 | 1.499 | 0.510 | 1.350 | 0.881 | 7/8 | 3/8-24  | 3/8  | 3.750 | 1/2 | 1.594 |           |  |
| 4         | 1            | 1           | 7/8-14     | 3/4-16         | 1.125 | 4.700 | 0.700 | 0.500 | 1.499 | 0.510 | 1.350 | 0.881 | 7/8 | 3/8-24  | 3/8  | 4.500 | 1/2 | 1.594 |           |  |
| 5         | 1            | 1           | 7/8-14     | 3/4-16         | 1.125 | 5.800 | 0.781 | 0.531 | 1.499 | 0.510 | 1.350 | 0.975 | 7/8 | 1/2-20  | 1/2  | 5.500 | 1/2 | 1.594 |           |  |

| Bore size | Rod size no. | Rod dia. MM |       |       |       |       |         |       |       |       |       |       |       |       |       |       | Add stroke |       |       |  |
|-----------|--------------|-------------|-------|-------|-------|-------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|-------|-------|--|
|           |              |             | J     | LAF   | NA    | ND    | NT      | R     | TH    | TN    | VF    | VS    | WF    | XT    | Y     | LF    | P          | SN    | ZJ    |  |
| 1-1/2     | 1            | 5/8         | 0.938 | 1.750 | 0.563 | 0.375 | 1/4-20  | 1.430 | 0.993 | 0.625 | 0.615 | -     | 1.000 | 1.938 | 1.875 | 3.625 | 2.313      | 2.250 | 4.625 |  |
| 2         | 1            | 5/8         | 0.938 | 1.750 | 0.563 | 0.438 | 5/16-18 | 1.840 | 1.243 | 0.875 | 0.615 | 0.250 | 1.000 | 1.938 | 1.875 | 3.625 | 2.313      | 2.250 | 4.625 |  |
| 2-1/2     | 1            | 5/8         | 0.938 | 1.750 | 0.563 | 0.625 | 3/8-16  | 2.190 | 1.493 | 1.250 | 0.615 | 0.250 | 1.000 | 1.938 | 1.938 | 3.750 | 2.375      | 2.375 | 4.750 |  |
| 3-1/4     | 1            | 1           | 1.125 | 2.500 | 0.938 | 0.750 | 1/2-13  | 2.760 | 1.868 | 1.500 | 0.865 | 0.250 | 1.375 | 2.438 | 2.438 | 4.250 | 2.625      | 2.625 | 5.625 |  |
| 4         | 1            | 1           | 1.125 | 2.500 | 0.938 | 0.750 | 1/2-13  | 3.320 | 2.243 | 2.063 | 0.865 | 0.250 | 1.375 | 2.438 | 2.438 | 4.250 | 2.625      | 2.625 | 5.625 |  |
| 5         | 1            | 1           | 1.219 | 2.500 | 0.938 | 0.938 | 5/8-11  | 4.100 | 2.743 | 2.688 | 0.865 | 0.250 | 1.375 | 2.438 | 2.438 | 4.500 | 2.875      | 2.875 | 5.875 |  |

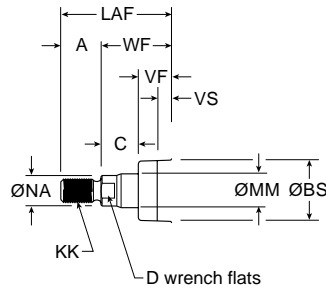
**B**  
 Tie Rod Cylinders  
 Actuator Products  
 3MA Series  
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 3MAJ/4MAJ Series  
 4MNR Series  
 P1D Series



**3MA Rod End Dimensions**

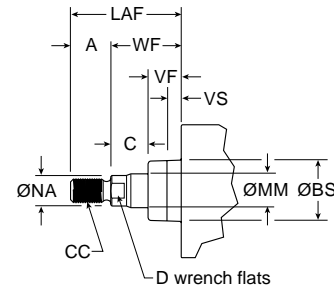
**Thread Style 4**

(NFPA Style SM)  
 Small Male



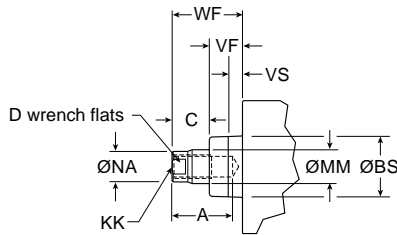
**Thread Style 8**

(NFPA Style IM)  
 Intermediate Male



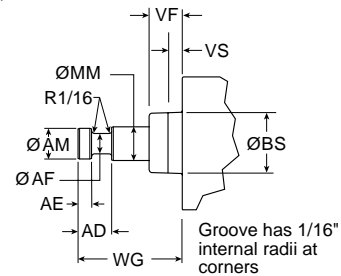
**Thread Style 9**

(NFPA Style SF)  
 Short Female



**Thread Style 55**

For use with Split Coupler  
 (please reference catalog 0900P-E, page B105 for more information)



**Thread Style 3 - “Special Thread”**

Special threads, rod extensions, rod eyes, blanks, etc. are also available.  
 To order, specify “Style 3” and give desired dimensions for KK or CC, A and W or WF.  
 If otherwise special, please supply dimensioned sketch.

**Applies to all rod ends:**  
 BS = pilot diameter  
 VS = length of pilot diameter

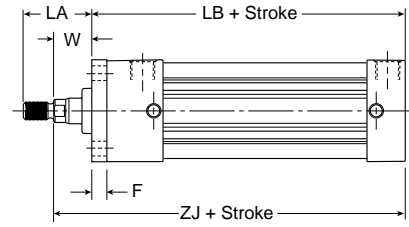
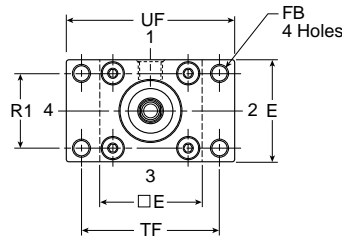
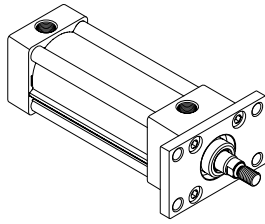
**Rod End Dimensions**

| Bore size | Rod no. | Rod dia. MM | Thread     |                | A     | AD    | AE    | AF    | AM    | BS    | C     | D   | LAF   | NA    | VF    | VS    | WF    | WG    |
|-----------|---------|-------------|------------|----------------|-------|-------|-------|-------|-------|-------|-------|-----|-------|-------|-------|-------|-------|-------|
|           |         |             | Style 8 CC | Style 4 & 9 KK |       |       |       |       |       |       |       |     |       |       |       |       |       |       |
| 1-1/2     | 1       | 5/8         | 1/2-20     | 7/16-20        | 0.750 | 0.625 | 0.250 | 0.375 | 0.570 | 1.124 | 0.385 | 1/2 | 1.750 | 0.563 | 0.615 | -     | 1.000 | 1.750 |
| 2         | 1       | 5/8         | 1/2-20     | 7/16-20        | 0.750 | 0.625 | 0.250 | 0.375 | 0.570 | 1.124 | 0.385 | 1/2 | 1.750 | 0.563 | 0.615 | 0.250 | 1.000 | 1.750 |
| 2-1/2     | 1       | 5/8         | 1/2-20     | 7/16-20        | 0.750 | 0.625 | 0.250 | 0.375 | 0.570 | 1.124 | 0.385 | 1/2 | 1.750 | 0.563 | 0.615 | 0.250 | 1.000 | 1.750 |
| 3-1/4     | 1       | 1           | 7/8-14     | 3/4-16         | 1.125 | 0.938 | 0.375 | 0.688 | 0.950 | 1.499 | 0.510 | 7/8 | 2.500 | 0.938 | 0.865 | 0.250 | 1.375 | 2.375 |
| 4         | 1       | 1           | 7/8-14     | 3/4-16         | 1.125 | 0.938 | 0.375 | 0.688 | 0.950 | 1.499 | 0.510 | 7/8 | 2.500 | 0.938 | 0.865 | 0.250 | 1.375 | 2.375 |
| 5         | 1       | 1           | 7/8-14     | 3/4-16         | 1.125 | 0.938 | 0.375 | 0.688 | 0.950 | 1.499 | 0.510 | 7/8 | 2.500 | 0.938 | 0.865 | 0.250 | 1.375 | 2.375 |

**B**  
 Tie Rod Cylinders  
 Actuator Products  
 3MA Series  
 4MA/4ML Series  
 3MAJ/4MAJ Series  
 4MNR Series  
 P1D Series

**Head Rectangular Flange**

Style J  
 (NFPA MF1)

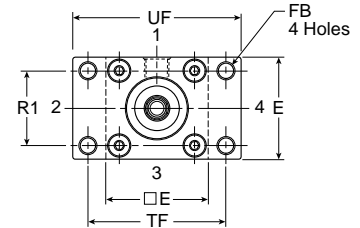
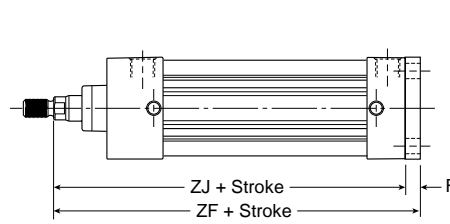
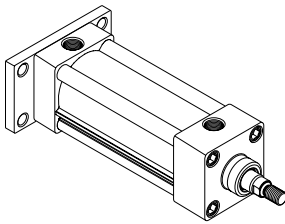


**Note:** Style J has a W dimension instead of WF and a LA dimension instead of LAF because of the flange installation. Please use dimensions W and LA regarding rod ends only for Style J.

For reference,  $WF = W + F$  and  $LA = W + A$ .

**Cap Rectangular Flange**

Style H  
 (NFPA MF2)



**Styles J and H**

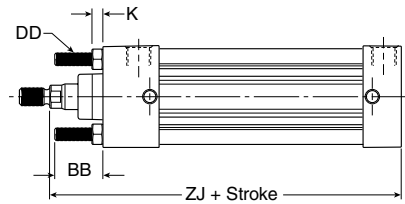
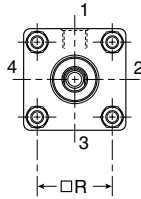
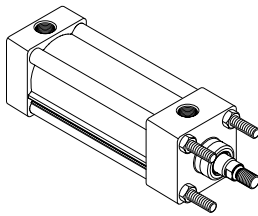
| Bore size | Rod no. | Rod dia. MM | A     | E     | F     | FB    | LA    | R1    | TF    | UF    | W     | Add stroke |       |       |
|-----------|---------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|-------|-------|
|           |         |             |       |       |       |       |       |       |       |       |       | LB         | ZF    | ZJ    |
| 1-1/2     | 1       | 5/8         | 0.750 | 2.000 | 0.375 | 0.313 | 1.375 | 1.430 | 2.750 | 3.375 | 0.625 | 4.000      | 5.000 | 4.625 |
| 2         | 1       | 5/8         | 0.750 | 2.500 | 0.375 | 0.375 | 1.375 | 1.840 | 3.375 | 4.125 | 0.625 | 4.000      | 5.000 | 4.625 |
| 2-1/2     | 1       | 5/8         | 0.750 | 3.000 | 0.375 | 0.375 | 1.375 | 2.190 | 3.875 | 4.625 | 0.625 | 4.125      | 5.125 | 4.750 |
| 3-1/4     | 1       | 1           | 1.125 | 3.750 | 0.625 | 0.438 | 1.875 | 2.760 | 4.688 | 5.500 | 0.750 | 4.875      | 6.250 | 5.625 |
| 4         | 1       | 1           | 1.125 | 4.500 | 0.625 | 0.438 | 1.875 | 3.320 | 5.438 | 6.250 | 0.750 | 4.875      | 6.250 | 5.625 |
| 5         | 1       | 1           | 1.125 | 5.500 | 0.625 | 0.563 | 1.875 | 4.100 | 6.625 | 7.625 | 0.750 | 5.125      | 6.500 | 5.875 |

**B**  
 Tie Rod Cylinders  
 Actuator Products  
 3MA Series  
 4MA/4ML Series  
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 4MNR Series  
 P1D Series



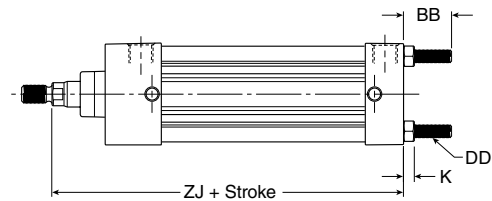
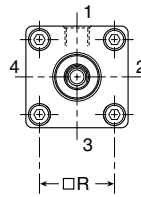
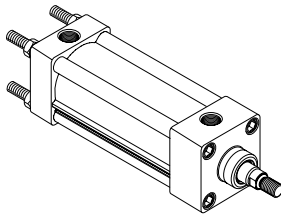
**Tie Rods Ext. Head End**

Style TB  
 (NFPA MX3)



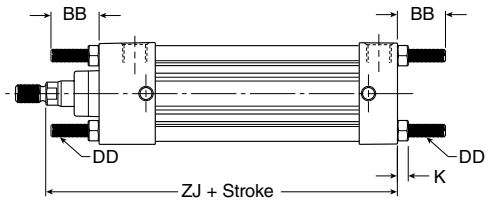
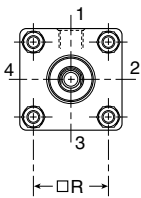
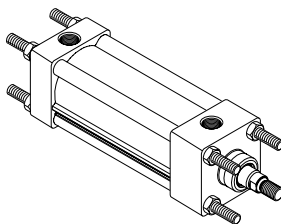
**Tie Rods Ext. Cap End**

Style TC  
 (NFPA MX2)



**Tie Rods Ext. Both Ends**

Style TD  
 (NFPA MX1)



**Styles TB, TC and TD**

| Bore size | Rod no. | Rod dia. MM | BB    | DD      | E     | K     | R     | Add stroke |  |
|-----------|---------|-------------|-------|---------|-------|-------|-------|------------|--|
|           |         |             |       |         |       |       |       | ZJ         |  |
| 1-1/2     | 1       | 5/8         | 1.000 | 1/4-28  | 2.000 | 0.250 | 1.430 | 4.625      |  |
| 2         | 1       | 5/8         | 1.125 | 5/16-24 | 2.500 | 0.313 | 1.840 | 4.625      |  |
| 2-1/2     | 1       | 5/8         | 1.125 | 5/16-24 | 3.000 | 0.313 | 2.190 | 4.750      |  |
| 3-1/4     | 1       | 1           | 1.375 | 3/8-24  | 3.750 | 0.375 | 2.760 | 5.625      |  |
| 4         | 1       | 1           | 1.375 | 3/8-24  | 4.500 | 0.375 | 3.320 | 5.625      |  |
| 5         | 1       | 1           | 1.813 | 1/2-20  | 5.500 | 0.438 | 4.100 | 5.875      |  |

**B**

Tie Rod Cylinders  
Actuator Products

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3MA Series

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4MA/4ML Series

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3MAJ/4MAJ Series

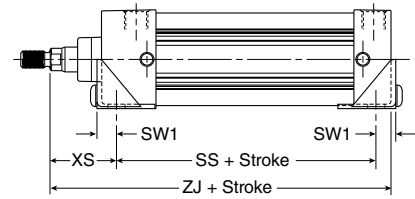
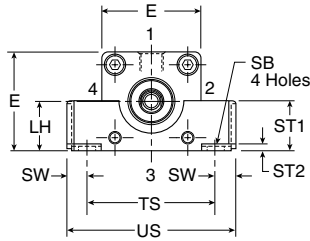
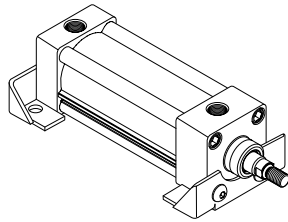
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4MNR Series

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P1D Series

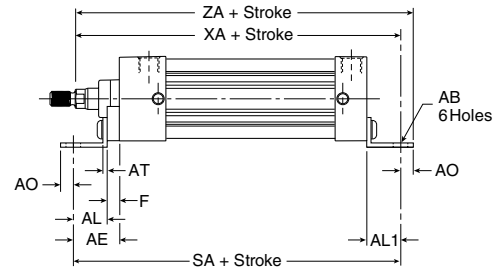
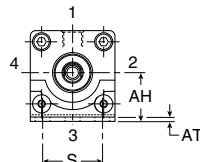
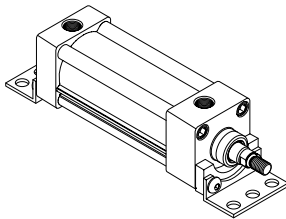
**Side Lug**  
 Style C  
 (NFPA MS2)



**Style C**

| Bore size | Rod no. | Rod dia. MM | E     | LH    | SB    | ST    | ST1   | ST2   | SW    | SW1   | TS    | US    | XS    | Add stroke |       |
|-----------|---------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|-------|
|           |         |             |       |       |       |       |       |       |       |       |       |       |       | SS         | ZJ    |
| 1-1/2     | 1       | 5/8         | 2.000 | 0.993 | 0.438 | 0.500 | 1.000 | 0.120 | 0.375 | 0.495 | 2.750 | 3.500 | 1.375 | 2.875      | 4.625 |
| 2         | 1       | 5/8         | 2.500 | 1.243 | 0.438 | 0.500 | 1.250 | 0.120 | 0.375 | 0.495 | 3.250 | 4.000 | 1.375 | 2.875      | 4.625 |
| 2-1/2     | 1       | 5/8         | 3.000 | 1.493 | 0.438 | 0.500 | 1.343 | 0.120 | 0.375 | 0.495 | 3.750 | 4.500 | 1.375 | 3.000      | 4.750 |
| 3-1/4     | 1       | 1           | 3.750 | 1.868 | 0.563 | 0.750 | 1.500 | 0.188 | 0.500 | 0.688 | 4.750 | 5.750 | 1.875 | 3.250      | 5.625 |
| 4         | 1       | 1           | 4.500 | 2.243 | 0.563 | 0.750 | 1.500 | 0.188 | 0.500 | 0.688 | 5.500 | 6.500 | 1.875 | 3.250      | 5.625 |
| 5         | 1       | 1           | 5.500 | 2.743 | 0.813 | 1.000 | 1.500 | 0.250 | 0.688 | 0.938 | 6.875 | 8.250 | 2.063 | 3.125      | 5.875 |

**Side End Angle\***  
 Style CB  
 (NFPA MS1)



Note: Dimension "S" is for the holes in the mount (not the screw to screw dimension)

\*Maximum recommended pressure for this mount is 150 PSIG

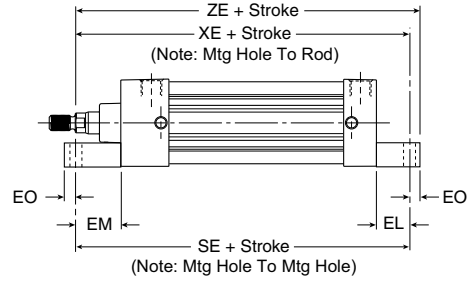
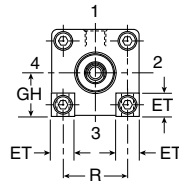
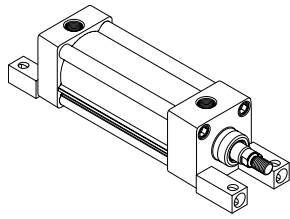
**Style CB**

| Bore size | Rod no. | Rod dia. MM | AB    | AE    | AH    | AL    | AL1   | AO    | AT    | E     | F     | S     | Add stroke |       |       |
|-----------|---------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|-------|-------|
|           |         |             |       |       |       |       |       |       |       |       |       |       | SA         | XA    | ZA    |
| 1-1/2     | 1       | 5/8         | 0.438 | 1.375 | 1.188 | 1.000 | 1.000 | 0.375 | 0.125 | 2.000 | 0.375 | 1.250 | 6.000      | 5.625 | 6.000 |
| 2         | 1       | 5/8         | 0.438 | 1.375 | 1.438 | 1.000 | 1.000 | 0.375 | 0.125 | 2.500 | 0.375 | 1.750 | 6.000      | 5.625 | 6.000 |
| 2-1/2     | 1       | 5/8         | 0.438 | 1.375 | 1.625 | 1.000 | 1.000 | 0.375 | 0.125 | 3.000 | 0.375 | 2.250 | 6.125      | 5.750 | 6.125 |
| 3-1/4     | 1       | 1           | 0.563 | 1.875 | 1.938 | 1.250 | 1.250 | 0.500 | 0.125 | 3.750 | 0.625 | 2.750 | 7.375      | 6.875 | 7.375 |
| 4         | 1       | 1           | 0.563 | -     | 2.250 | 1.875 | 1.250 | 0.500 | 0.125 | 4.500 | -     | 3.500 | 7.375      | 6.875 | 7.375 |
| 5         | 1       | 1           | 0.688 | 2.000 | 2.750 | 1.375 | 1.375 | 0.625 | 0.188 | 5.500 | 0.625 | 4.250 | 7.875      | 7.250 | 7.875 |



**Side End Lug**

Style G  
 (NFPA MS7)

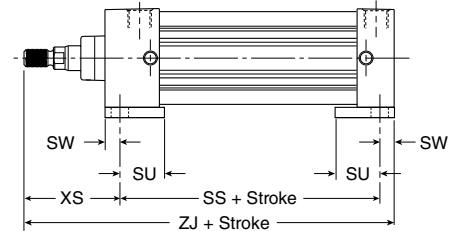
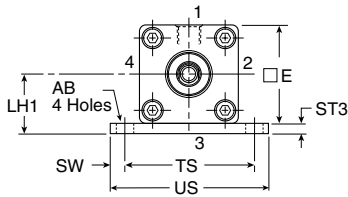
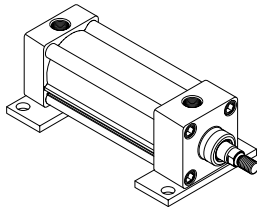


**Style G**

| Bore Size | Rod No. | Rod Dia. MM | E     | EB    | EL    | EM    | EO    | ET    | GH    | R     | Add stroke |       |       |
|-----------|---------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|------------|-------|-------|
|           |         |             |       |       |       |       |       |       |       |       | SE         | XE    | ZE    |
| 1-1/2     | 1       | 5/8         | 2.000 | 0.281 | 0.750 | 1.125 | 0.250 | 0.563 | 0.993 | 1.430 | 5.500      | 5.375 | 5.625 |
| 2         | 1       | 5/8         | 2.500 | 0.344 | 0.938 | 1.313 | 0.313 | 0.688 | 1.243 | 1.840 | 5.875      | 5.563 | 5.875 |
| 2-1/2     | 1       | 5/8         | 3.000 | 0.344 | 1.063 | 1.438 | 0.313 | 0.813 | 1.493 | 2.190 | 6.250      | 5.813 | 6.125 |
| 3-1/4     | 1       | 1           | 3.750 | 0.406 | 0.875 | 1.500 | 0.375 | 1.000 | 1.868 | 2.760 | 6.625      | 6.500 | 6.875 |
| 4         | 1       | 1           | 4.500 | 0.406 | 1.000 | 1.625 | 0.375 | 1.188 | 2.243 | 3.320 | 6.875      | 6.625 | 7.000 |

**Base Bar Mount**

Style NB



**Note:** Fasteners for NB base bar mount have been applied with removable threadlocking compound and torqued to bottom of endcaps.

**Style NB**

| Bore size | Rod no. | Rod dia. MM | AB    | E     | LH1   | ST3   | SU    | SW    | TS    | US    | XS    | Add stroke |       |
|-----------|---------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|-------|
|           |         |             |       |       |       |       |       |       |       |       |       | SS         | ZJ    |
| 1-1/2     | 1       | 5/8         | 0.438 | 2.000 | 1.243 | 0.250 | 1.125 | 0.375 | 2.750 | 3.500 | 1.375 | 2.875      | 4.625 |
| 2         | 1       | 5/8         | 0.438 | 2.500 | 1.493 | 0.250 | 1.125 | 0.375 | 3.250 | 4.000 | 1.375 | 2.875      | 4.625 |
| 2-1/2     | 1       | 5/8         | 0.438 | 3.000 | 1.868 | 0.375 | 1.125 | 0.375 | 3.750 | 4.500 | 1.375 | 3.000      | 4.750 |
| 3-1/4     | 1       | 1           | 0.563 | 3.750 | 2.368 | 0.500 | 1.250 | 0.500 | 4.750 | 5.750 | 1.875 | 3.250      | 5.625 |
| 4         | 1       | 1           | 0.563 | 4.500 | 2.743 | 0.500 | 1.250 | 0.500 | 5.500 | 6.500 | 1.875 | 3.250      | 5.625 |

**B**

Tie Rod Cylinders  
 Actuator Products

3MA  
 Series

4MA/4ML  
 Series

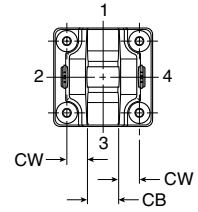
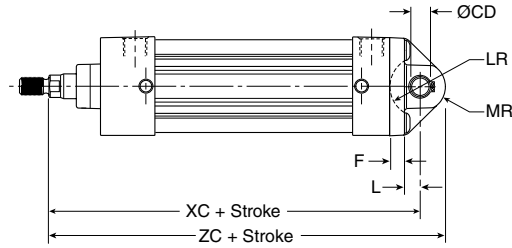
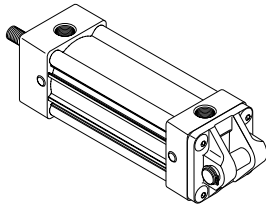
3MAJ/4MAJ  
 Series

4MNR  
 Series

P1D  
 Series

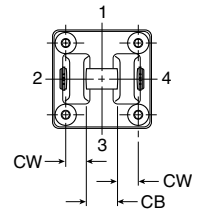
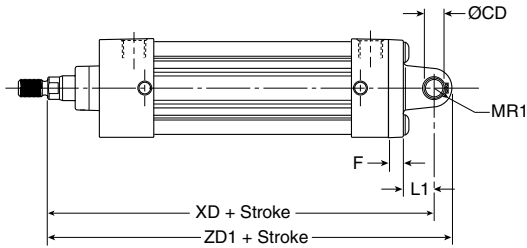
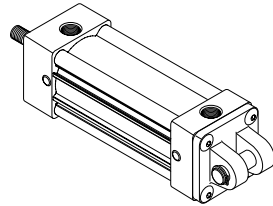
**Cap Fixed Clevis**

Style BB  
 (NFPA MP1)



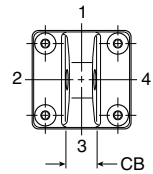
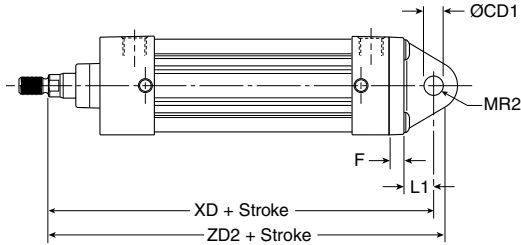
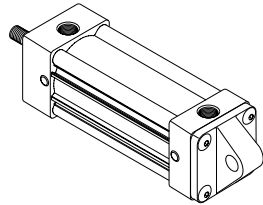
**Cap Detachable Clevis**

Style BC  
 (NFPA MP2)



**Cap Detachable Eye\***

Style BE  
 (NFPA MP4)



**Note:** 5 inch bore not available on BE mount, see 4MA series.

**Note:** For maximum swivel angle of BB mount with rear mounting plate, please reference Catalog 0900P-E, cylinder accessories on page B108.

**Styles BB, BC and BE**

| Bore size | Rod no. | Rod dia. MM | CB    | +0.002 |        | CW    | E     | F     | L     | LR    | L1    | MR    | MR1   | MR2   | Add stroke |       |       |       |       |
|-----------|---------|-------------|-------|--------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|-------|-------|-------|-------|
|           |         |             |       | -0.002 | +0.004 |       |       |       |       |       |       |       |       |       | XC         | XD    | ZC    | ZD1   | ZD2   |
| 1-1/2     | 1       | 5/8         | 0.750 | 0.501  | 0.500  | 0.500 | 2.000 | 0.375 | 0.375 | 0.750 | 0.750 | 0.625 | 0.500 | 0.625 | 5.375      | 5.750 | 6.000 | 6.250 | 6.375 |
| 2         | 1       | 5/8         | 0.750 | 0.501  | 0.500  | 0.500 | 2.500 | 0.375 | 0.375 | 0.750 | 0.750 | 0.625 | 0.500 | 0.625 | 5.375      | 5.750 | 6.000 | 6.250 | 6.375 |
| 2-1/2     | 1       | 5/8         | 0.750 | 0.501  | 0.500  | 0.500 | 3.000 | 0.375 | 0.375 | 0.750 | 0.750 | 0.625 | 0.500 | 0.688 | 5.500      | 5.875 | 6.125 | 6.375 | 6.563 |
| 3-1/4     | 1       | 1           | 1.250 | 0.751  | 0.750  | 0.625 | 3.750 | 0.625 | 0.625 | 1.000 | 1.250 | 0.938 | 0.750 | 0.875 | 6.875      | 7.500 | 7.813 | 8.250 | 8.375 |
| 4         | 1       | 1           | 1.250 | 0.751  | 0.750  | 0.625 | 4.500 | 0.625 | 0.625 | 1.000 | 1.250 | 0.938 | 0.750 | 0.875 | 6.875      | 7.500 | 7.813 | 8.250 | 8.375 |
| 5*        | 1       | 1           | 1.250 | 0.751  | 0.750  | 0.625 | 5.500 | 0.625 | 0.625 | 1.000 | 1.250 | 0.938 | 0.750 | 0.875 | 7.125      | 7.750 | 8.063 | 8.500 | 8.625 |

\* 5 inch bore not available on BE mount, see 4MA series

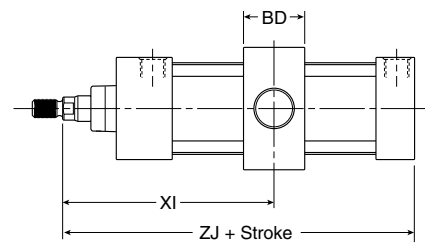
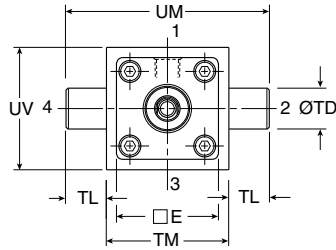
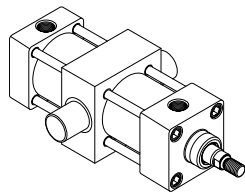
**B**  
 Tie Rod Cylinders  
 Actuator Products  
 Series  
 3MA  
 Series  
 4MA/4ML  
 Series  
 3MAJ/4MAJ  
 Series  
 4MNR  
 Series  
 P1D



**Intermediate Trunnion**

Style DD  
(NFPA MT4)

**Note:** Tie rod nuts for Style DD have a slot instead of internal hex.



**Style DD**

| Bore size | Rod no. | Rod dia. MM | E     | BD    | TD<br>+0.000<br>-0.001 | TL    | TM    | UM    | UT    | UV    | XG    | Min. XI | Add stroke |       |
|-----------|---------|-------------|-------|-------|------------------------|-------|-------|-------|-------|-------|-------|---------|------------|-------|
|           |         |             |       |       |                        |       |       |       |       |       |       |         | XJ         | ZJ    |
| 1-1/2     | 1       | 5/8         | 2.000 | 1.250 | 1.000                  | 1.000 | 2.500 | 4.500 | 4.000 | 2.500 | 1.750 | 3.036   | 4.125      | 4.625 |
| 2         | 1       | 5/8         | 2.500 | 1.500 | 1.000                  | 1.000 | 3.000 | 5.000 | 4.500 | 3.000 | 1.750 | 3.125   | 4.125      | 4.625 |
| 2-1/2     | 1       | 5/8         | 3.000 | 1.500 | 1.000                  | 1.000 | 3.500 | 5.500 | 5.000 | 3.500 | 1.750 | 3.094   | 4.250      | 4.750 |
| 3-1/4     | 1       | 1           | 3.750 | 2.000 | 1.000                  | 1.000 | 4.500 | 6.500 | 5.750 | 4.250 | 2.250 | 3.969   | 5.000      | 5.625 |
| 4         | 1       | 1           | 4.500 | 2.000 | 1.000                  | 1.000 | 5.250 | 7.250 | 6.500 | 5.000 | 2.250 | 3.969   | 5.000      | 5.625 |
| 5         | 1       | 1           | 5.500 | 2.000 | 1.000                  | 1.000 | 6.250 | 8.250 | 7.500 | 6.000 | 2.250 | 3.969   | 5.250      | 5.875 |

**Mounting Kits and Accessories**

Refer to page B37 for 3MA mounting kits and cylinder accessories.

**1-1/2" - 5" Bore 3MA Piston Seal Kits & Complete Cylinder Kits**

| Bore size | Rod no. | Rod dia. MM | PK - Piston Seal Kit, Standard Lipseals<br>Includes piston & end seals | SK - Complete Cylinder Kit. Includes wiper, rod seal, rod bearing, cylinder seals, and needle valve inserts | Torque units endcap fastener or tie rod |            |
|-----------|---------|-------------|--|---|---|------------|
|           |         |             | Nitrile seal kit number  | Nitrile seal kit number   | USA inch-lbs                            | Metric N-m |
| 1-1/2     | 1       | 5/8         | PK1503MA01   | SK15003MA1  | 32 - 36                                 | 3.6 - 4.1  |
| 2         | 1       | 5/8         | PK2003MA01   | SK20003MA1  | 72 - 82                                 | 8 - 9      |
| 2-1/2     | 1       | 5/8         | PK2503MA01   | SK25003MA1  | 72 - 82                                 | 8 - 9      |
| 3-1/4     | 1       | 1           | PK3253MA01   | SK32003MA1  | 216 - 228                               | 24 - 25.3  |
| 4         | 1       | 1           | PK4003MA01   | SK40003MA1  | 216 - 228                               | 24 - 25.3  |
| 5         | 1       | 1           | PK5003MA01   | SK50003MA1  | 360 - 372                               | 41 - 42    |

**B**

Tie Rod Cylinders  
Actuator Products

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3MA Series

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4MA/4ML Series

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3MAJ/4MAJ Series

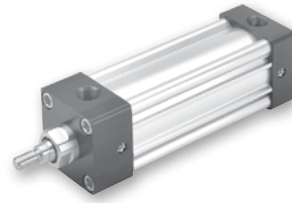
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4MNR Series

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P1D Series

- Industry leading aluminum NFPA interchangeable cylinder with flexible construction
- Bore sizes – 1-1/2", 2", 2-1/2", 3-1/4", 4" and 5"
- Removable bronze alloy gland/bearing for easy maintenance
- Available in any practical stroke length
- 20 standard mounting styles available
- Extruded-profile aluminum body with integrated switch grooves
- Single rod end or double rod ends
- Cushions – standard and adjustable at both ends, optional non-cushioned
- RoHS compliant



**Operating information**

|                                  | 4MA                                      | 4ML  |
|----------------------------------|--|--|
| Operating pressure:              | 250 PSIG (17 bar)<br>maximum air service | 400 PSIG (27 bar)<br>maximum hydraulic service |
| Temperature range –              |  |  |
| Standard seals                   | -10°F to 165°F (-23°C to 74°C)           |  |
| Fluorocarbon seals               | -10°F to 250°F (-23°C to 121°C)          |  |
| Low temperature seals            | -50°F to 150°F (-46°C to 66°C)           |  |
| Filtration requirements:         | 40 micron, dry filtered air              | Filtered hydraulic oil                         |
| For technical information see CD |  |  |

**Ordering information**

|   |   |  |  |  |  |   |   |
|---|---|--|--|--|--|---|---|
| <b>2.00</b>   | <b>J</b>  | <b>4MA</b>   | <b>U</b>   | <b>1</b>   | <b>4</b>   | <b>A</b>  | <b>6.000</b>  |
| <b>Bore size</b><br>1.50 <sup>1</sup><br>2.00<br>2.50<br>3.25<br>4.00<br>5.00   | <b>Double rod cylinder</b> <sup>12</sup><br>Specify "K" only if double rod cylinder is required.  | <b>Series</b><br>4MA Air service<br>4ML Hydraulic service <sup>2</sup> | <b>Ports</b><br>U NPTF<br>R BSPP<br>B BSPT<br>T SAE  | <b>Piston rod number</b><br>Specify rod code number for required diameter. <sup>8, 2</sup>   | <b>Cushion cap end</b><br>Blank Non-cushioned cap end<br>C Cushioned cap end (not available for 4ML) | <b>Piston rod thread type</b><br>A Standard (UNF unified thread)<br>W BSF British fine<br>M* Metric   | <b>Stroke length</b><br>Specify stroke length required in inches. <sup>11</sup> |
| <b>Mounting style</b><br>Specify mounting style code (see table on following page).   | <b>Special modification</b><br>Specify "S" only for special modification other than rod end, and then describe modification in item notes. (Includes 4MA with Linear Position Sensor Option) <sup>7</sup>   |  | <b>Seals</b><br>Blank Standard (nitrile seals)<br>V Fluorocarbon seals <sup>4</sup><br>E Fluorocarbon rod wiper and rod seal only <sup>5</sup><br>4 Low temperature seals <sup>4</sup><br>M Metallic rod wiper, nitrile seals <sup>6</sup> | <b>Piston rod thread style</b><br>4 Small male<br>8 Intermediate male<br>9 Short female<br>55 For use with split coupler <sup>9</sup><br>3 Special (and specify all dimensions required) |  | <b>Rod material and gland code</b><br>Blank Standard rod and gland<br>H Standard rod and HI LOAD gland<br>Y 17-4 PH stainless steel rod and standard gland<br>Z 17-4 PH stainless steel rod and HI LOAD gland<br>J 303 stainless steel rod and standard gland <sup>10</sup><br>K 303 stainless steel rod and HI LOAD gland <sup>10</sup><br>S 316 stainless steel rod and standard gland <sup>10</sup><br>T 316 stainless steel rod and HI LOAD gland <sup>10</sup> |   |
| <b>Cushion head end</b><br>Blank Non-cushioned head end<br>C Cushioned head end (not available for 1.50" bore with 1" rod or 4ML) | <b>Cylinder construction</b><br>Blank* Standard (extruded body, standard round lobe orientation)<br>A* Extruded body, round lobe orientation rotated 90 degrees from standard<br>N* Extruded body, round lobe orientation rotated 180 degrees from standard<br>Z* Extruded body, round lobe orientation rotated 270 degrees from standard<br>T Aluminum round tube and carbon steel tie rods & nuts |  | <b>* Please reference catalog 0900P-E, page B106.</b>  |  |  |   |   |
| <b>Piston type</b> <sup>2</sup>   |   |  |  |  |  |   |   |
| Blank   | Standard (lipseals and magnetic ring) <sup>12</sup>   |  |  |  |  |   |   |
| 1   | Lipseals, no magnetic ring <sup>12</sup>  |  |  |  |  |   |   |
| 2   | Lipseals, no magnetic ring (aluminum piston)  |  |  |  |  |   |   |
| 3   | Lipseals and magnetic ring (aluminum piston) (standard for 4ML)   |  |  |  |  |   |   |
| 4   | Bumper seals, no magnetic ring  |  |  |  |  |   |   |
| 6   | Bumper seals and magnetic ring  |  |  |  |  |   |   |
| B   | Lipseals, 1/4" thick bumpers both ends <sup>3</sup>   |  |  |  |  |   |   |
| H   | Lipseals, 1/4" thick bumper head end <sup>3</sup>   |  |  |  |  |   |   |
| C   | Lipseals, 1/4" thick bumper cap end <sup>3</sup>  |  |  |  |  |   |   |
| D   | Lipseals and magnetic ring, 1/4" thick bumpers both ends <sup>3</sup>   |  |  |  |  |   |   |
| F   | Lipseals and magnetic ring, 1/4" thick bumper head end <sup>3</sup>   |  |  |  |  |   |   |
| R   | Lipseals and magnetic ring, 1/4" thick bumper cap end <sup>3</sup>  |  |  |  |  |   |   |

**B**  
 Tie Rod Cylinders  
 Actuator Products  
 Series  
 3MA  
 4MA/4ML  
 3MAJ/4MAJ  
 4MNR  
 P1D

1 Not available with Linear Position Sensor Option (LPSO).  
 2 Piston Types (blank), 1, 4 and 6 not available for 4ML. Piston Types (blank) and 1 not available for oversize rod numbers 2 and 3. Seals option V only available with Piston Types 2 and 4. Seals option 4 only available with Piston Types 2 and 3.  
 3 Addition of 1/4" bumper results in a 1/4" stroke loss per bumper, per end. For example, a 6" stroke cylinder with 1/4" bumpers at both ends (option B) has an effective stroke of 5-1/2".  
 4 Reed and solid-state sensors only available with standard seals or options E and M. See footnote 2.  
 5 Used for external chemical compatibility applications, not high temperature.  
 6 If fluorocarbon seals are required with this option, please place an "S" for special in the Special Modification field and specify the "fluorocarbon seals and metallic rod wiper" in the item notes.  
 7 For Linear Position Sensor Option (LPSO), please include the following information for the Special Modification item notes:  
 a. Sensor part number (please reference catalog 0900P-E, pages B100-B104)  
 b. Sensor position  
 c. Port position (if other than position 1)  
 d. Length of stop tubing, gross stroke and net stroke (if required)  
 Also, Piston Type option (blank), 3, 6, D, F or R is required.  
 8 Review Piston Rod Selection Chart, please reference catalog 0900P-E, page A14 to determine proper piston rod diameter.  
 9 For additional information regarding this style, please reference catalog 0900P-E, page B105. If non-standard Rod Material and Gland Code is required with this option, please place an "S" for special in Special Modification field and specify Rod Material and Gland Code in the item notes.  
 10 Not available for 4ML.  
 11 If a stop tube is required, specify gross stroke (net stroke + stop tube) in the model number, then place an "S" for special in the Special Modification field and specify the stop tube length in the item notes. Not available with Piston Types (blank) and 1.  
 12 Double rod cylinders not available with composite piston type.



**4MA/4ML Mounting Styles for 1-1/2" to 5" Bore**

| Mounting style   | NFPA mounting | Description                               | Bore size  | Mounting style   | NFPA mounting | Description               | Bore size  |
|--|---------------|---|------------|--|---------------|---------------------------|------------|
| TEF   | MX5/MS4       | Sleeve Nut with Side Tap (standard mount) | 1-1/2 - 5* | CB        | MS1           | Side End Angle            | 1-1/2 - 5  |
| T     | MX0           | No Mount (same construction as TEF)       | 1-1/2 - 5  | G         | MS7           | Side End Lug              | 1-1/2 - 4* |
| TE    | MX5           | Sleeve Nut (same construction as TEF)     | 1-1/2 - 5  | NB        | N/A           | Base Bar                  | 1-1/2 - 4* |
| F     | MS4           | Side Tap (same construction as TEF)       | 1-1/2 - 5* | BB        | MP1           | Cap Fixed Clevis          | 1-1/2 - 5  |
| J     | MF1           | Head Rectangular Flange                   | 1-1/2 - 5  | BC        | MP2           | Cap Detachable Clevis     | 1-1/2 - 5  |
| H    | MF2           | Cap Rectangular Flange                    | 1-1/2 - 5  | BE       | MP4           | Cap Detachable Eye        | 1-1/2 - 5  |
| TB  | MX3           | Tie Rods Extended Head End                | 1-1/2 - 5  | D       | MT1           | Head Trunnion             | 1-1/2 - 5* |
| TC  | MX2           | Tie Rods Extended Cap End                 | 1-1/2 - 5  | DB      | MT2           | Cap Trunnion              | 1-1/2 - 5  |
| TD  | MX1           | Tie Rods Extended Both Ends               | 1-1/2 - 5  | DD      | MT4           | Intermediate Trunnion     | 1-1/2 - 5  |
| C   | MS2           | Side Lug                                  | 1-1/2 - 5  | KTEF †  | MDX5/MDS4     | Double Rod End, TEF Mount | 1-1/2 - 5  |

\* Not available for 1-1/2" bore with 1" rod.  
 † Double rod end cylinders can be ordered with head mountings, i.e. KJ.

**B**

**Tie Rod Cylinders  
 Actuator Products**

**3MA  
 Series**

**4MA/4ML  
 Series**

**3MAJ/4MAJ  
 Series**

**4MNR  
 Series**

**P1D  
 Series**

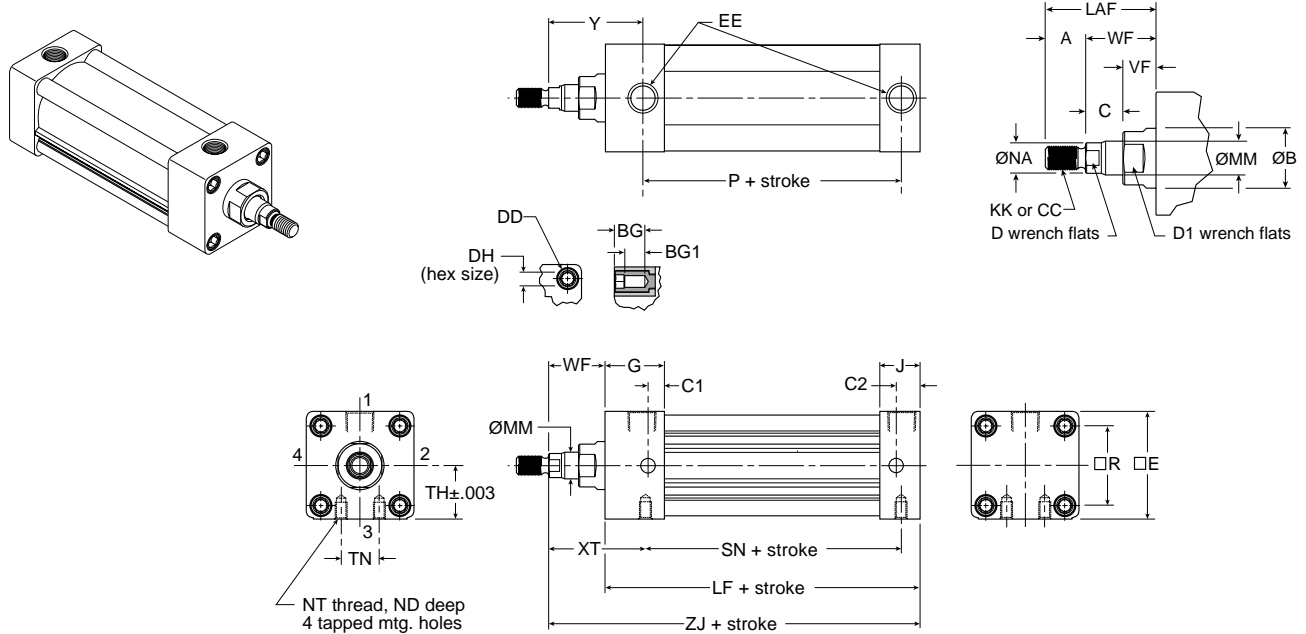
**Sensors**

For sensors see page B294.





Single Rod Dimensioned Drawings (Styles TEF, T, TE and F)



Styles TEF, T, TE and F

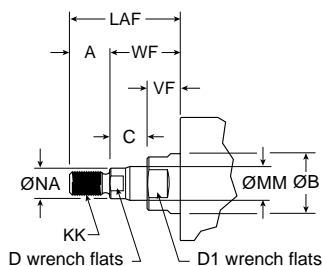
| Bore size | Rod no. | Rod dia. MM | Thread   |         | Style 8 |       | Style 4 & 9 |       | +0.000<br>-0.002 |       |       |       |       |       |         |       |       |       | EE (NPTF) |  | G  |  |    |  |   |  |    |  |   |  |    |  |    |  |
|-----------|---------|-------------|----------|---------|---------|-------|-------------|-------|------------------|-------|-------|-------|-------|-------|---------|-------|-------|-------|-----------|--|----|--|----|--|---|--|----|--|---|--|----|--|----|--|
|           |         |             | CC       | KK      | A       | AA    | B           | BG    | BG1              | C     | C1    | C2    | D     | D1    | DD      | DH    | E     |       |           |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
| 1-1/2     | 1*      | 5/8         | 1/2-20   | 7/16-20 | 0.750   | 2.020 | 1.124       | 0.562 | 0.374            | 0.385 | 1.000 | 0.500 | 1/2   | 1     | 1/4-28  | 1/4   | 2.000 | 3/8   | 1.438     |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
|           | 2       | 1           | 7/8-14   | 3/4-16  | 1.125   | 2.020 | 1.499       | 0.562 | 0.374            | 0.510 | -     | 0.500 | 7/8   | 1-3/8 | 1/4-28  | 1/4   | 2.000 | 3/8   | 1.438     |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
| 2         | 1       | 5/8         | 1/2-20   | 7/16-20 | 0.750   | 2.600 | 1.124       | 0.562 | 0.362            | 0.385 | 1.000 | 0.562 | 1/2   | 1     | 5/16-24 | 5/16  | 2.500 | 3/8   | 1.375     |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
|           | 3       | 1           | 7/8-14   | 3/4-16  | 1.125   | 2.600 | 1.499       | 0.562 | 0.362            | 0.510 | 1.000 | 0.562 | 7/8   | 1-3/8 | 5/16-24 | 5/16  | 2.500 | 3/8   | 1.375     |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
| 2-1/2     | 1       | 5/8         | 1/2-20   | 7/16-20 | 0.750   | 3.100 | 1.124       | 0.562 | 0.362            | 0.385 | 1.000 | 0.594 | 1/2   | 1     | 5/16-24 | 5/16  | 3.000 | 3/8   | 1.344     |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
|           | 3       | 1           | 7/8-14   | 3/4-16  | 1.125   | 3.100 | 1.499       | 0.562 | 0.362            | 0.510 | 1.000 | 0.594 | 7/8   | 1-3/8 | 5/16-24 | 5/16  | 3.000 | 3/8   | 1.344     |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
| 3-1/4     | 1       | 1           | 7/8-14   | 3/4-16  | 1.125   | 3.900 | 1.499       | 0.700 | 0.500            | 0.510 | 1.188 | 0.719 | 7/8   | 1-3/8 | 3/8-24  | 3/8   | 3.750 | 1/2   | 1.594     |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
|           | 3       | 1-3/8       | 1-1/4-12 | 1-14    | 1.625   | 3.900 | 1.999       | 0.700 | 0.500            | 0.635 | 1.188 | 0.719 | 1-1/8 | 1-7/8 | 3/8-24  | 3/8   | 3.750 | 1/2   | 1.594     |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
| 4         | 1       | 1           | 7/8-14   | 3/4-16  | 1.125   | 4.700 | 1.499       | 0.700 | 0.500            | 0.510 | 1.188 | 0.719 | 7/8   | 1-3/8 | 3/8-24  | 3/8   | 4.500 | 1/2   | 1.594     |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
|           | 3       | 1-3/8       | 1-1/4-12 | 1-14    | 1.625   | 4.700 | 1.999       | 0.700 | 0.500            | 0.635 | 1.188 | 0.719 | 1-1/8 | 1-7/8 | 3/8-24  | 3/8   | 4.500 | 1/2   | 1.594     |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
| 5         | 1       | 1           | 7/8-14   | 3/4-16  | 1.125   | 5.800 | 1.499       | 0.781 | 0.531            | 0.510 | 1.188 | 0.813 | 7/8   | 1-3/8 | 1/2-20  | 1/2   | 5.500 | 1/2   | 1.594     |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
|           | 3       | 1-3/8       | 1-1/4-12 | 1-14    | 1.625   | 5.800 | 1.999       | 0.781 | 0.531            | 0.635 | 1.188 | 0.813 | 1-1/8 | 1-7/8 | 1/2-20  | 1/2   | 5.500 | 1/2   | 1.594     |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
| Bore size | Rod no. | Rod dia. MM | J        |         | LAF     |       | NA          |       | ND               |       | NT    |       | R     |       | TH      |       | TN    |       | VF        |  | WF |  | XT |  | Y |  | LF |  | P |  | SN |  | ZJ |  |
|           |         |             | J        | LAF     | NA      | ND    | NT          | R     | TH               | TN    | VF    | WF    | XT    | Y     | LF      | P     | SN    | ZJ    |           |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
| 1-1/2     | 1*      | 5/8         | 0.938    | 1.750   | 0.563   | 0.375 | 1/4-20      | 1.430 | 0.993            | 0.625 | 0.615 | 1.000 | 1.938 | 1.875 | 3.625   | 2.313 | 2.250 | 4.625 |           |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
|           | 2       | 1           | 0.938    | 2.500   | 0.938   | -     | -           | 1.430 | 0.993            | -     | 0.865 | 1.375 | -     | 2.250 | 3.625   | 2.313 | -     | 5.000 |           |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
| 2         | 1       | 5/8         | 0.937    | 1.750   | 0.563   | 0.438 | 5/16-18     | 1.840 | 1.243            | 0.875 | 0.615 | 1.000 | 1.938 | 1.875 | 3.625   | 2.313 | 2.250 | 4.625 |           |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
|           | 3       | 1           | 0.937    | 2.500   | 0.938   | 0.375 | 5/16-18     | 1.840 | 1.243            | 0.875 | 0.865 | 1.375 | 2.313 | 2.250 | 3.625   | 2.313 | 2.250 | 5.000 |           |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
| 2-1/2     | 1       | 5/8         | 0.938    | 1.750   | 0.563   | 0.625 | 3/8-16      | 2.190 | 1.493            | 1.250 | 0.615 | 1.000 | 1.938 | 1.938 | 3.750   | 2.375 | 2.375 | 4.750 |           |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
|           | 3       | 1           | 0.938    | 2.500   | 0.938   | 0.625 | 3/8-16      | 2.190 | 1.493            | 1.250 | 0.865 | 1.375 | 2.313 | 2.313 | 3.750   | 2.375 | 2.375 | 5.125 |           |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
| 3-1/4     | 1       | 1           | 1.125    | 2.500   | 0.938   | 0.750 | 1/2-13      | 2.760 | 1.868            | 1.500 | 0.865 | 1.375 | 2.438 | 2.438 | 4.250   | 2.625 | 2.625 | 5.625 |           |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
|           | 3       | 1-3/8       | 1.125    | 3.250   | 1.313   | 0.750 | 1/2-13      | 2.760 | 1.868            | 1.500 | 0.990 | 1.625 | 2.688 | 2.688 | 4.250   | 2.625 | 2.625 | 5.875 |           |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
| 4         | 1       | 1           | 1.125    | 2.500   | 0.938   | 0.750 | 1/2-13      | 3.320 | 2.243            | 2.063 | 0.865 | 1.375 | 2.438 | 2.438 | 4.250   | 2.625 | 2.625 | 5.625 |           |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
|           | 3       | 1-3/8       | 1.125    | 3.250   | 1.313   | 0.750 | 1/2-13      | 3.320 | 2.243            | 2.063 | 0.990 | 1.625 | 2.688 | 2.688 | 4.250   | 2.625 | 2.625 | 5.875 |           |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
| 5         | 1       | 1           | 1.219    | 2.500   | 0.938   | 0.938 | 5/8-11      | 4.100 | 2.743            | 2.688 | 0.865 | 1.375 | 2.438 | 2.438 | 4.500   | 2.875 | 2.875 | 5.875 |           |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |
|           | 3       | 1-3/8       | 1.219    | 3.250   | 1.313   | 0.938 | 5/8-11      | 4.100 | 2.743            | 2.688 | 0.990 | 1.625 | 2.688 | 2.688 | 4.500   | 2.875 | 2.875 | 6.125 |           |  |    |  |    |  |   |  |    |  |   |  |    |  |    |  |

\* NOTE - 1-1/2" bore with 1" rod is TE mount, F mount not available.  
 1-1/2" bore with 1" rod cannot have a cushion at head end.

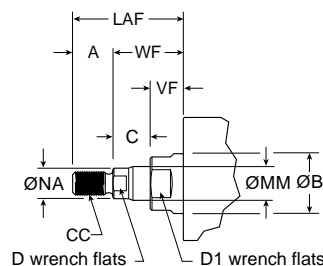


**4MA Rod End Dimensions**

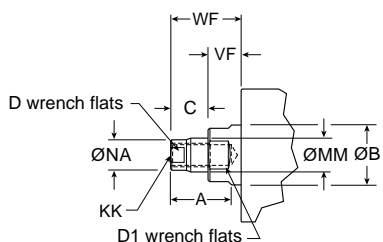
**Thread Style 4**  
 (NFPA Style SM)  
 Small Male



**Thread Style 8**  
 (NFPA Style IM)  
 Intermediate Male

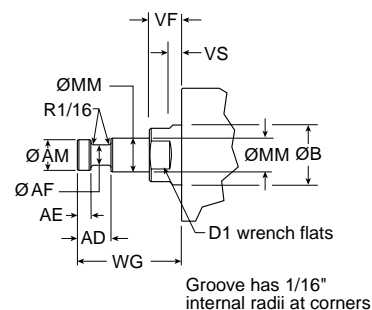


**Thread Style 9**  
 (NFPA Style SF)  
 Short Female



**Thread Style 55**

For use with Split Coupler  
 (please reference catalog 0900P-E, page B105 for more information)



**Thread Style 3 - "Special Thread"**

Special threads, rod extensions, rod eyes, blanks, etc. are also available.  
 To order, specify "Style 3" and give desired dimensions for KK or CC, A and W or WF.  
 If otherwise special, please supply dimensioned sketch.

**Rod End Dimensions**

| Bore size | Rod no. | Rod dia. MM | Thread     |                | +0.000<br>-0.002 |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-----------|---------|-------------|------------|----------------|------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|           |         |             | Style 8 CC | Style 4 & 9 KK | A                | AD    | AE    | AF    | AM    | B     | C     | D     | D1    | LAF   | NA    | VF    | WF    | WG    |
| 1-1/2     | 1       | 5/8         | 1/2-20     | 7/16-20        | 0.750            | 0.625 | 0.250 | 0.375 | 0.570 | 1.124 | 0.385 | 1/2   | 1     | 1.750 | 0.563 | 0.615 | 1.000 | 1.750 |
|           | 2       | 1           | 7/8-14     | 3/4-16         | 1.125            | 0.938 | 0.375 | 0.688 | 0.950 | 1.499 | 0.510 | 7/8   | 1-3/8 | 2.500 | 0.938 | 0.865 | 1.375 | 2.375 |
| 2         | 1       | 5/8         | 1/2-20     | 7/16-20        | 0.750            | 0.625 | 0.250 | 0.375 | 0.570 | 1.124 | 0.385 | 1/2   | 1     | 1.750 | 0.563 | 0.615 | 1.000 | 1.750 |
|           | 3       | 1           | 7/8-14     | 3/4-16         | 1.125            | 0.938 | 0.375 | 0.688 | 0.950 | 1.499 | 0.510 | 7/8   | 1-3/8 | 2.500 | 0.938 | 0.865 | 1.375 | 2.375 |
| 2-1/2     | 1       | 5/8         | 1/2-20     | 7/16-20        | 0.750            | 0.625 | 0.250 | 0.375 | 0.570 | 1.124 | 0.385 | 1/2   | 1     | 1.750 | 0.563 | 0.615 | 1.000 | 1.750 |
|           | 3       | 1           | 7/8-14     | 3/4-16         | 1.125            | 0.938 | 0.375 | 0.688 | 0.950 | 1.499 | 0.510 | 7/8   | 1-3/8 | 2.500 | 0.938 | 0.865 | 1.375 | 2.375 |
| 3-1/4     | 1       | 1           | 7/8-14     | 3/4-16         | 1.125            | 0.938 | 0.375 | 0.688 | 0.950 | 1.499 | 0.510 | 7/8   | 1-3/8 | 2.500 | 0.938 | 0.865 | 1.375 | 2.375 |
|           | 3       | 1-3/8       | 1-1/4-12   | 1-14           | 1.625            | 1.063 | 0.375 | 0.875 | 1.320 | 1.999 | 0.635 | 1-1/8 | 1-7/8 | 3.250 | 1.313 | 0.990 | 1.625 | 2.750 |
| 4         | 1       | 1           | 7/8-14     | 3/4-16         | 1.125            | 0.938 | 0.375 | 0.688 | 0.950 | 1.499 | 0.510 | 7/8   | 1-3/8 | 2.500 | 0.938 | 0.865 | 1.375 | 2.375 |
|           | 3       | 1-3/8       | 1-1/4-12   | 1-14           | 1.625            | 1.063 | 0.375 | 0.875 | 1.320 | 1.999 | 0.635 | 1-1/8 | 1-7/8 | 3.250 | 1.313 | 0.990 | 1.625 | 2.750 |
| 5         | 1       | 1           | 7/8-14     | 3/4-16         | 1.125            | 0.938 | 0.375 | 0.688 | 0.950 | 1.499 | 0.510 | 7/8   | 1-3/8 | 2.500 | 0.938 | 0.865 | 1.375 | 2.375 |
|           | 3       | 1-3/8       | 1-1/4-12   | 1-14           | 1.625            | 1.063 | 0.375 | 0.875 | 1.320 | 1.999 | 0.635 | 1-1/8 | 1-7/8 | 3.250 | 1.313 | 0.990 | 1.625 | 2.750 |

**B**

Tie Rod Cylinders  
Actuator Products

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3MA  
Series

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4MA/4ML  
Series

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3MAJ/4MAJ  
Series

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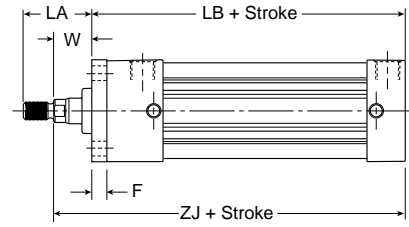
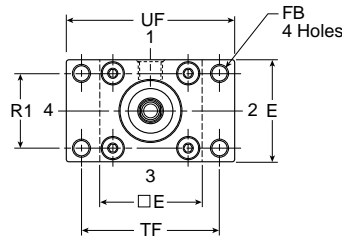
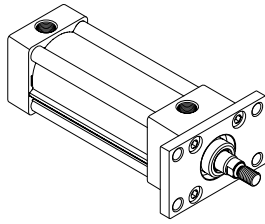
4MNR  
Series

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P1D  
Series

**Head Rectangular Flange**

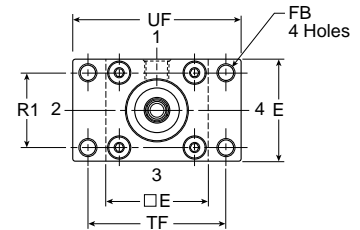
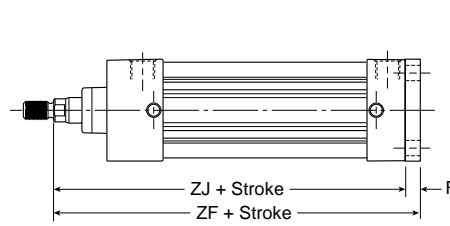
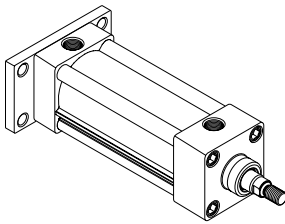
Style J  
 (NFPA MF1)



**Note:** Style J has a W dimension instead of WF and a LA dimension instead of LAF because of the flange installation. Please use dimensions W and LA regarding rod ends only for Style J.  
 For reference,  $WF = W + F$  and  $LA = W + A$ .

**Cap Rectangular Flange**

Style H  
 (NFPA MF2)



**Styles J and H**

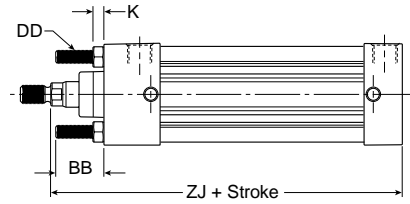
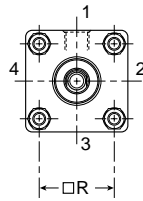
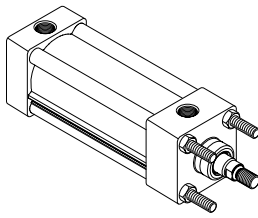
| Bore size | Rod no. | Rod dia. MM | A     | E     | F     | FB    | LA    | R1    | TF    | UF    | W     | Add stroke |       |       |
|-----------|---------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|-------|-------|
|           |         |             |       |       |       |       |       |       |       |       |       | LB         | ZF    | ZJ    |
| 1-1/2     | 1       | 5/8         | 0.750 | 2.000 | 0.375 | 0.313 | 1.375 | 1.430 | 2.750 | 3.375 | 0.625 | 4.000      | 5.000 | 4.625 |
|           | 2       | 1           | 1.125 | 2.000 | 0.375 | 0.313 | 2.125 | 1.430 | 2.750 | 3.375 | 1.000 | 4.000      | 5.375 | 5.000 |
| 2         | 1       | 5/8         | 0.750 | 2.500 | 0.375 | 0.375 | 1.375 | 1.840 | 3.375 | 4.125 | 0.625 | 4.000      | 5.000 | 4.625 |
|           | 3       | 1           | 1.125 | 2.500 | 0.375 | 0.375 | 2.125 | 1.840 | 3.375 | 4.125 | 1.000 | 4.000      | 5.375 | 5.000 |
| 2-1/2     | 1       | 5/8         | 0.750 | 3.000 | 0.375 | 0.375 | 1.375 | 2.190 | 3.875 | 4.625 | 0.625 | 4.125      | 5.125 | 4.750 |
|           | 3       | 1           | 1.125 | 3.000 | 0.375 | 0.375 | 2.125 | 2.190 | 3.875 | 4.625 | 1.000 | 4.125      | 5.500 | 5.125 |
| 3-1/4     | 1       | 1           | 1.125 | 3.750 | 0.625 | 0.438 | 1.875 | 2.760 | 4.688 | 5.500 | 0.750 | 4.875      | 6.250 | 5.625 |
|           | 3       | 1-3/8       | 1.625 | 3.750 | 0.625 | 0.438 | 2.625 | 2.760 | 4.688 | 5.500 | 1.000 | 4.875      | 6.500 | 5.875 |
| 4         | 1       | 1           | 1.125 | 4.500 | 0.625 | 0.438 | 1.875 | 3.320 | 5.438 | 6.250 | 0.750 | 4.875      | 6.250 | 5.625 |
|           | 3       | 1-3/8       | 1.625 | 4.500 | 0.625 | 0.438 | 2.625 | 3.320 | 5.438 | 6.250 | 1.000 | 4.875      | 6.500 | 5.875 |
| 5         | 1       | 1           | 1.125 | 5.500 | 0.625 | 0.563 | 1.875 | 4.100 | 6.625 | 7.625 | 0.750 | 5.125      | 6.500 | 5.875 |
|           | 3       | 1-3/8       | 1.625 | 5.500 | 0.625 | 0.563 | 2.625 | 4.100 | 6.625 | 7.625 | 1.000 | 5.125      | 6.750 | 6.125 |

**B**  
 Tie Rod Cylinders  
 Actuator Products  
 Series  
 3MA  
 Series  
 4MA/4ML  
 Series  
 3MAJ/4MAJ  
 Series  
 4MNR  
 Series  
 P1D



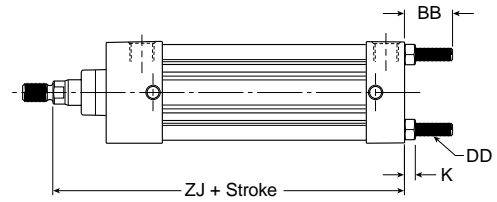
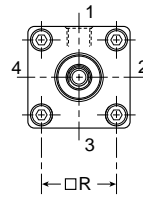
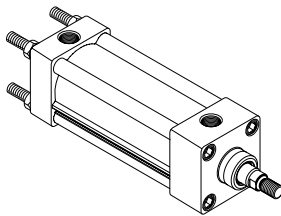
**Tie Rods Ext. Head End**

Style TB  
 (NFPA MX3)



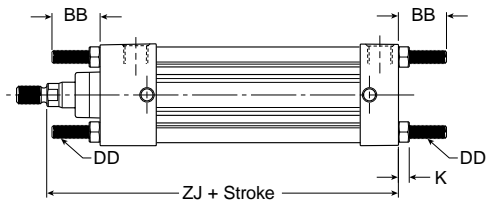
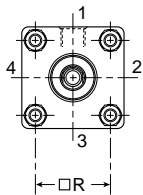
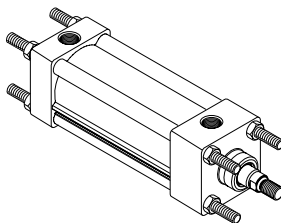
**Tie Rods Ext. Cap End**

Style TC  
 (NFPA MX2)



**Tie Rods Ext. Both Ends**

Style TD  
 (NFPA MX1)



**Styles TB, TC and TD**

| Bore size | Rod no. | Rod dia. MM | BB    | DD      | E     | K     | R     | Add stroke |  |
|-----------|---------|-------------|-------|---------|-------|-------|-------|------------|--|
|           |         |             |       |         |       |       |       | ZJ         |  |
| 1-1/2     | 1       | 5/8         | 1.000 | 1/4-28  | 2.000 | 0.250 | 1.430 | 4.625      |  |
|           | 2       | 1           | 1.000 | 1/4-28  | 2.000 | 0.250 | 1.430 | 5.000      |  |
| 2         | 1       | 5/8         | 1.125 | 5/16-24 | 2.500 | 0.313 | 1.840 | 4.625      |  |
|           | 3       | 1           | 1.125 | 5/16-24 | 2.500 | 0.313 | 1.840 | 5.000      |  |
| 2-1/2     | 1       | 5/8         | 1.125 | 5/16-24 | 3.000 | 0.313 | 2.190 | 4.750      |  |
|           | 3       | 1           | 1.125 | 5/16-24 | 3.000 | 0.313 | 2.190 | 5.125      |  |
| 3-1/4     | 1       | 1           | 1.375 | 3/8-24  | 3.750 | 0.375 | 2.760 | 5.625      |  |
|           | 3       | 1-3/8       | 1.375 | 3/8-24  | 3.750 | 0.375 | 2.760 | 5.875      |  |
| 4         | 1       | 1           | 1.375 | 3/8-24  | 4.500 | 0.375 | 3.320 | 5.625      |  |
|           | 3       | 1-3/8       | 1.375 | 3/8-24  | 4.500 | 0.375 | 3.320 | 5.875      |  |
| 5         | 1       | 1           | 1.813 | 1/2-20  | 5.500 | 0.438 | 4.100 | 5.875      |  |
|           | 3       | 1-3/8       | 1.813 | 1/2-20  | 5.500 | 0.438 | 4.100 | 6.125      |  |

**B**

Tie Rod Cylinders  
 Actuator Products

3MA  
 Series

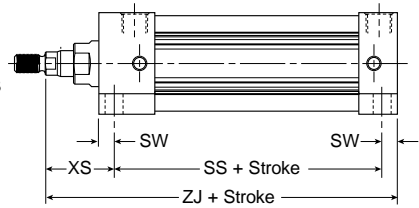
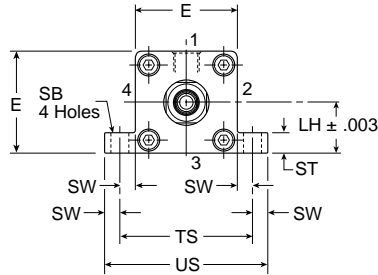
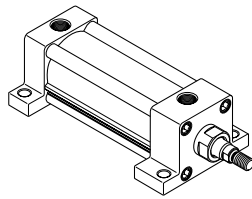
4MA/4ML  
 Series

3MAJ/4MAJ  
 Series

4MNR  
 Series

P1D  
 Series

**Side Lug**  
 Style C for  
 (NFPA MS2)

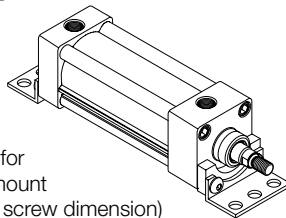


**Styles C**

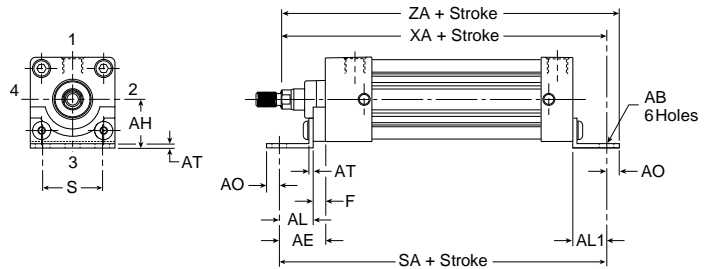
| Bore size | Rod no. | Rod dia. MM | E     | LH    | SB    | ST    | ST1   | ST2   | SW    | SW1   | TS    | US    | XS    | Add stroke |       |
|-----------|---------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|-------|
|           |         |             |       |       |       |       |       |       |       |       |       |       |       | SS         | ZJ    |
| 1-1/2     | 1       | 5/8         | 2.000 | 0.993 | 0.438 | 0.500 | 1.000 | 0.120 | 0.375 | 0.495 | 2.750 | 3.500 | 1.375 | 2.875      | 4.625 |
|           | 2       | 1           | 2.000 | 0.993 | 0.438 | 0.500 | 1.000 | 0.120 | 0.375 | 0.495 | 2.750 | 3.500 | 1.750 | 2.875      | 5.000 |
| 2         | 1       | 5/8         | 2.500 | 1.243 | 0.438 | 0.500 | 1.250 | 0.120 | 0.375 | 0.495 | 3.250 | 4.000 | 1.375 | 2.875      | 4.625 |
|           | 3       | 1           | 2.500 | 1.243 | 0.438 | 0.500 | 1.250 | 0.120 | 0.375 | 0.495 | 3.250 | 4.000 | 1.750 | 2.875      | 5.000 |
| 2-1/2     | 1       | 5/8         | 3.000 | 1.493 | 0.438 | 0.500 | 1.343 | 0.120 | 0.375 | 0.495 | 3.750 | 4.500 | 1.375 | 3.000      | 4.750 |
|           | 3       | 1           | 3.000 | 1.493 | 0.438 | 0.500 | 1.343 | 0.120 | 0.375 | 0.495 | 3.750 | 4.500 | 1.750 | 3.000      | 5.125 |
| 3-1/4     | 1       | 1           | 3.750 | 1.868 | 0.563 | 0.750 | 1.500 | 0.188 | 0.500 | 0.688 | 4.750 | 5.750 | 1.875 | 3.250      | 5.625 |
|           | 3       | 1-3/8       | 3.750 | 1.868 | 0.563 | 0.750 | 1.500 | 0.188 | 0.500 | 0.688 | 4.750 | 5.750 | 2.125 | 3.250      | 5.875 |
| 4         | 1       | 1           | 4.500 | 2.243 | 0.563 | 0.750 | 1.500 | 0.188 | 0.500 | 0.688 | 5.500 | 6.500 | 1.875 | 3.250      | 5.625 |
|           | 3       | 1-3/8       | 4.500 | 2.243 | 0.563 | 0.750 | 1.500 | 0.188 | 0.500 | 0.688 | 5.500 | 6.500 | 2.125 | 3.250      | 5.875 |
| 5         | 1       | 1           | 5.500 | 2.743 | 0.813 | 1.000 | 1.500 | 0.250 | 0.688 | 0.938 | 6.875 | 8.250 | 2.063 | 3.125      | 5.875 |
|           | 3       | 1-3/8       | 5.500 | 2.743 | 0.813 | 1.000 | 1.500 | 0.250 | 0.688 | 0.938 | 6.875 | 8.250 | 2.313 | 3.125      | 6.125 |

**Side End Angle\***

Style CB  
 (NFPA MS1)



**Note:**  
 Dimension "S" is for the holes in the mount (not the screw to screw dimension)



\*Maximum recommended pressure for this mount is 150 PSIG

**Style CB**

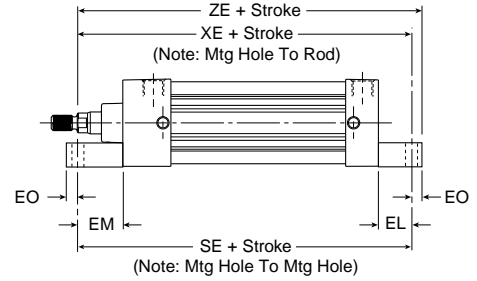
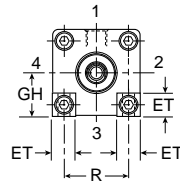
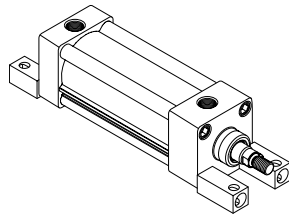
| Bore size | Rod no. | Rod dia. MM | AB    | AE    | AH    | AL    | AL1   | AO    | AT    | E     | F     | S     | Add stroke |       |       |
|-----------|---------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|-------|-------|
|           |         |             |       |       |       |       |       |       |       |       |       |       | SA         | XA    | ZA    |
| 1-1/2     | 1       | 5/8         | 0.438 | 1.375 | 1.188 | 1.000 | 1.000 | 0.375 | 0.125 | 2.000 | 0.375 | 1.250 | 6.000      | 5.625 | 6.000 |
|           | 2       | 1           | 0.438 | 1.375 | 1.188 | 1.000 | 1.000 | 0.375 | 0.125 | 2.000 | 0.375 | 1.250 | 6.000      | 6.000 | 6.375 |
| 2         | 1       | 5/8         | 0.438 | 1.375 | 1.438 | 1.000 | 1.000 | 0.375 | 0.125 | 2.500 | 0.375 | 1.750 | 6.000      | 5.625 | 6.000 |
|           | 3       | 1           | 0.438 | 1.375 | 1.438 | 1.000 | 1.000 | 0.375 | 0.125 | 2.500 | 0.375 | 1.750 | 6.000      | 6.000 | 6.375 |
| 2-1/2     | 1       | 5/8         | 0.438 | 1.375 | 1.625 | 1.000 | 1.000 | 0.375 | 0.125 | 3.000 | 0.375 | 2.250 | 6.125      | 5.750 | 6.125 |
|           | 3       | 1           | 0.438 | 1.375 | 1.625 | 1.000 | 1.000 | 0.375 | 0.125 | 3.000 | 0.375 | 2.250 | 6.125      | 6.125 | 6.500 |
| 3-1/4     | 1       | 1           | 0.563 | 1.875 | 1.938 | 1.250 | 1.250 | 0.500 | 0.125 | 3.750 | 0.625 | 2.750 | 7.375      | 6.875 | 7.375 |
|           | 3       | 1-3/8       | 0.563 | 1.875 | 1.938 | 1.250 | 1.250 | 0.500 | 0.125 | 3.750 | 0.625 | 2.750 | 7.375      | 7.125 | 7.625 |
| 4         | 1       | 1           | 0.563 | -     | 2.250 | 1.875 | 1.250 | 0.500 | 0.125 | 4.500 | -     | 3.500 | 7.375      | 6.875 | 7.375 |
|           | 3       | 1-3/8       | 0.563 | -     | 2.250 | 1.875 | 1.250 | 0.500 | 0.125 | 4.500 | -     | 3.500 | 7.375      | 7.125 | 7.625 |
| 5         | 1       | 1           | 0.688 | 2.000 | 2.750 | 1.375 | 1.375 | 0.625 | 0.188 | 5.500 | 0.625 | 4.250 | 7.875      | 7.250 | 7.875 |
|           | 3       | 1-3/8       | 0.688 | 2.000 | 2.750 | 1.375 | 1.375 | 0.625 | 0.188 | 5.500 | 0.625 | 4.250 | 7.875      | 7.500 | 8.125 |





**Side End Lug**

Style G  
 (NFPA MS7)



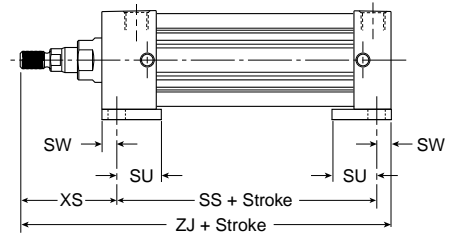
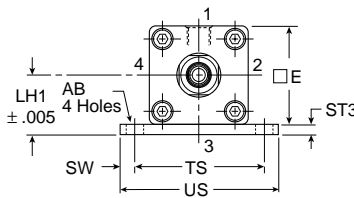
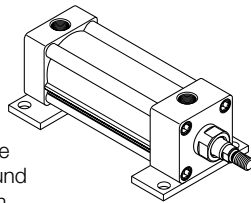
**Style G**

| Bore size | Rod no. | Rod dia. MM | E     | EB    | EL    | EM    | EO    | ET    | GH    | R     | Add Stroke |       |       |
|-----------|---------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|------------|-------|-------|
|           |         |             |       |       |       |       |       |       |       |       | SE         | XE    | ZE    |
| 1-1/2     | 1       | 5/8         | 2.000 | 0.281 | 0.750 | 1.125 | 0.250 | 0.563 | 0.993 | 1.430 | 5.500      | 5.375 | 5.625 |
|           | 2       | 1           | -     | -     | -     | -     | -     | -     | -     | -     | -          | -     | -     |
| 2         | 1       | 5/8         | 2.500 | 0.344 | 0.938 | 1.313 | 0.313 | 0.688 | 1.243 | 1.840 | 5.875      | 5.563 | 5.875 |
|           | 3       | 1           | 2.500 | 0.344 | 0.938 | 1.313 | 0.313 | 0.688 | 1.243 | 1.840 | 5.875      | 5.938 | 6.250 |
| 2-1/2     | 1       | 5/8         | 3.000 | 0.344 | 1.063 | 1.438 | 0.313 | 0.813 | 1.493 | 2.190 | 6.250      | 5.813 | 6.125 |
|           | 3       | 1           | 3.000 | 0.344 | 1.063 | 1.438 | 0.313 | 0.813 | 1.493 | 2.190 | 6.250      | 6.188 | 6.500 |
| 3-1/4     | 1       | 1           | 3.750 | 0.406 | 0.875 | 1.500 | 0.375 | 1.000 | 1.868 | 2.760 | 6.625      | 6.500 | 6.875 |
|           | 3       | 1-3/8       | 3.750 | 0.406 | 0.875 | 1.500 | 0.375 | 1.000 | 1.868 | 2.760 | 6.625      | 6.750 | 7.125 |
| 4         | 1       | 1           | 4.500 | 0.406 | 1.000 | 1.625 | 0.375 | 1.188 | 2.243 | 3.320 | 6.875      | 6.625 | 7.000 |
|           | 3       | 1-3/8       | 4.500 | 0.406 | 1.000 | 1.625 | 0.375 | 1.188 | 2.243 | 3.320 | 6.875      | 6.875 | 7.250 |

**Base Bar Mount**

Style NB for 4MA

**Note:** Fasteners for NB base bar mount have been applied with removable threadlocking compound and torqued to bottom of endcaps.



**Style NB**

| Bore size | Rod no. | Rod dia. MM | AB    | E     | LH1   | ST3   | SU    | SW    | TS    | US    | XS    | Add stroke |       |
|-----------|---------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|-------|
|           |         |             |       |       |       |       |       |       |       |       |       | SS         | ZJ    |
| 1-1/2     | 1       | 5/8         | 0.438 | 2.000 | 1.243 | 0.250 | 1.125 | 0.375 | 2.750 | 3.500 | 1.375 | 2.875      | 4.625 |
|           | 2       | 1           | -     | -     | -     | -     | -     | -     | -     | -     | -     | -          | -     |
| 2         | 1       | 5/8         | 0.438 | 2.500 | 1.493 | 0.250 | 1.125 | 0.375 | 3.250 | 4.000 | 1.375 | 2.875      | 4.625 |
|           | 3       | 1           | 0.438 | 2.500 | 1.493 | 0.250 | 1.125 | 0.375 | 3.250 | 4.000 | 1.750 | 2.875      | 5.000 |
| 2-1/2     | 1       | 5/8         | 0.438 | 3.000 | 1.868 | 0.375 | 1.125 | 0.375 | 3.750 | 4.500 | 1.375 | 3.000      | 4.750 |
|           | 3       | 1           | 0.438 | 3.000 | 1.868 | 0.375 | 1.125 | 0.375 | 3.750 | 4.500 | 1.750 | 3.000      | 5.125 |
| 3-1/4     | 1       | 1           | 0.563 | 3.750 | 2.368 | 0.500 | 1.250 | 0.500 | 4.750 | 5.750 | 1.875 | 3.250      | 5.625 |
|           | 3       | 1-3/8       | 0.563 | 3.750 | 2.368 | 0.500 | 1.250 | 0.500 | 4.750 | 5.750 | 2.125 | 3.250      | 5.875 |
| 4         | 1       | 1           | 0.563 | 4.500 | 2.743 | 0.500 | 1.250 | 0.500 | 5.500 | 6.500 | 1.875 | 3.250      | 5.625 |
|           | 3       | 1-3/8       | 0.563 | 4.500 | 2.743 | 0.500 | 1.250 | 0.500 | 5.500 | 6.500 | 2.125 | 3.250      | 5.875 |

**B**

Tie Rod Cylinders  
 Actuator Products

3MA  
 Series

4MA/4ML  
 Series

3MAJ/4MAJ  
 Series

4MNR  
 Series

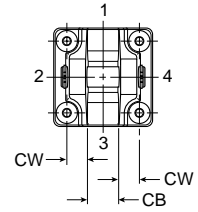
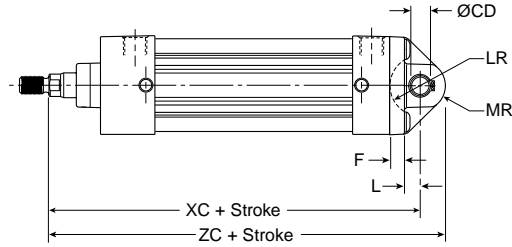
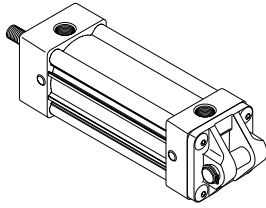
P1D  
 Series



**Cap Fixed Clevis**

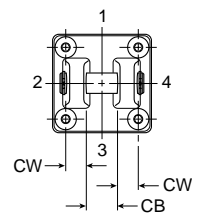
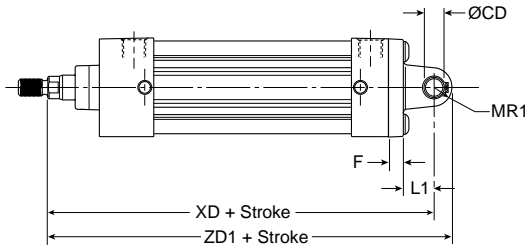
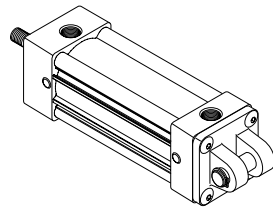
Style BB  
(NFPA MP1)

**Note:** For maximum swivel angle of BB mount with rear mounting plate, see cylinder accessories



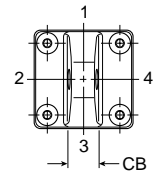
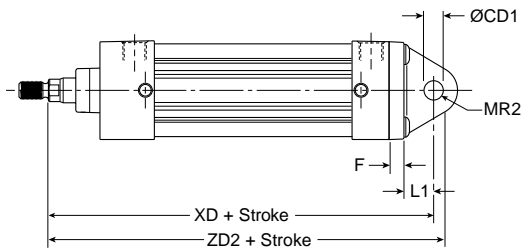
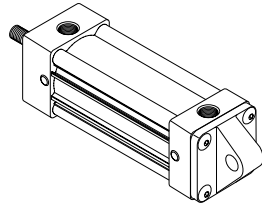
**Cap Detachable Clevis**

Style BC  
(NFPA MP2)



**Cap Detachable Eye**

Style BE  
(NFPA MP4)



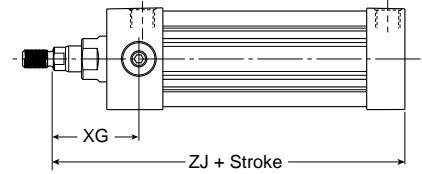
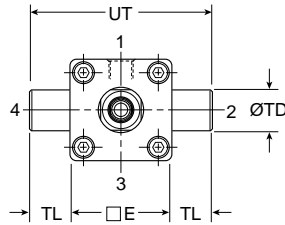
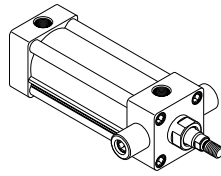
**Styles BB, BC and BE**

| Bore size | Rod no. | Rod dia. MM | CB    | Rod dia. |        | CW    | E     | F     | L     | LR    | L1    | MR    | MR1   | MR2   | Add stroke |        |       |       |       |
|-----------|---------|-------------|-------|----------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|--------|-------|-------|-------|
|           |         |             |       | +0.000   | +0.002 |       |       |       |       |       |       |       |       |       | -0.002     | +0.004 | XC    | XD    | ZC    |
| 1-1/2     | 1       | 5/8         | 0.750 | 0.501    | 0.500  | 0.500 | 2.000 | 0.375 | 0.375 | 0.750 | 0.750 | 0.625 | 0.500 | 0.625 | 5.375      | 5.750  | 6.000 | 6.250 | 6.375 |
|           | 2       | 1           | 0.750 | 0.501    | 0.500  | 0.500 | 2.000 | 0.375 | 0.375 | 0.750 | 0.750 | 0.625 | 0.500 | 0.625 | 5.750      | 6.125  | 6.375 | 6.625 | 6.750 |
| 2         | 1       | 5/8         | 0.750 | 0.501    | 0.500  | 0.500 | 2.500 | 0.375 | 0.375 | 0.750 | 0.750 | 0.625 | 0.500 | 0.625 | 5.375      | 5.750  | 6.000 | 6.250 | 6.375 |
|           | 3       | 1           | 0.750 | 0.501    | 0.500  | 0.500 | 2.500 | 0.375 | 0.375 | 0.750 | 0.750 | 0.625 | 0.500 | 0.625 | 5.750      | 6.125  | 6.375 | 6.625 | 6.750 |
| 2-1/2     | 1       | 5/8         | 0.750 | 0.501    | 0.500  | 0.500 | 3.000 | 0.375 | 0.375 | 0.750 | 0.750 | 0.625 | 0.500 | 0.688 | 5.500      | 5.875  | 6.125 | 6.375 | 6.563 |
|           | 3       | 1           | 0.750 | 0.501    | 0.500  | 0.500 | 3.000 | 0.375 | 0.375 | 0.750 | 0.750 | 0.625 | 0.500 | 0.688 | 5.875      | 6.250  | 6.500 | 6.750 | 6.313 |
| 3-1/4     | 1       | 1           | 1.250 | 0.751    | 0.750  | 0.625 | 3.750 | 0.625 | 0.625 | 1.000 | 1.250 | 0.938 | 0.750 | 0.875 | 6.875      | 7.500  | 7.813 | 8.250 | 8.375 |
|           | 3       | 1-3/8       | 1.250 | 0.751    | 0.750  | 0.625 | 3.750 | 0.625 | 0.625 | 1.000 | 1.250 | 0.938 | 0.750 | 0.875 | 7.125      | 7.750  | 8.063 | 8.500 | 8.625 |
| 4         | 1       | 1           | 1.250 | 0.751    | 0.750  | 0.625 | 4.500 | 0.625 | 0.625 | 1.000 | 1.250 | 0.938 | 0.750 | 0.875 | 6.875      | 7.500  | 7.813 | 8.250 | 8.375 |
|           | 3       | 1-3/8       | 1.250 | 0.751    | 0.750  | 0.625 | 4.500 | 0.625 | 0.625 | 1.000 | 1.250 | 0.938 | 0.750 | 0.875 | 7.125      | 7.750  | 8.063 | 8.500 | 8.625 |
| 5         | 1       | 1           | 1.250 | 0.751    | 0.750  | 0.625 | 5.500 | 0.625 | 0.625 | 1.000 | 1.250 | 0.938 | 0.750 | 0.875 | 7.125      | 7.750  | 8.063 | 8.500 | 8.625 |
|           | 3       | 1-3/8       | 1.250 | 0.751    | 0.750  | 0.625 | 5.500 | 0.625 | 0.625 | 1.000 | 1.250 | 0.938 | 0.750 | 0.875 | 7.375      | 8.000  | 8.313 | 8.750 | 8.875 |

**Head Trunnion\***

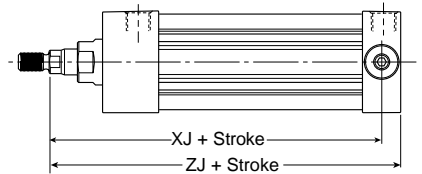
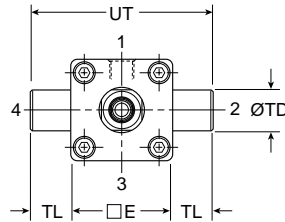
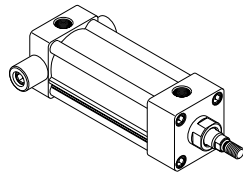
Style D  
(NFPA MT1)

**Note:** not available for 1-1/2" bore with 1" rod.



**Cap Trunnion**

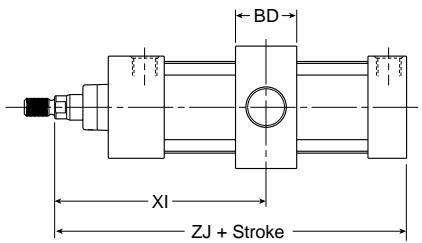
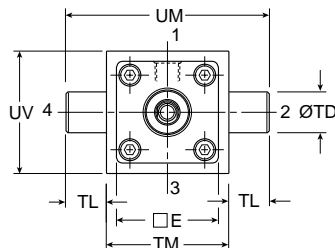
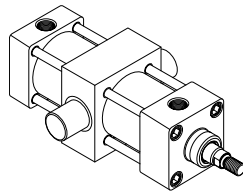
Style DB  
(NFPA MT2)



**Intermediate Trunnion**

Style DD  
(NFPA MT4)

**Note:** Tie rod nuts for Style DD have a slot instead of internal hex.



**Styles D, DB and DD**

| Bore size | Rod no. | Rod dia. MM | E     | BD    | +0.000<br>-0.001<br>TD | TL    | TM    | UM    | UT    | UV    | XG    | Min. XI | Add stroke |       |
|-----------|---------|-------------|-------|-------|------------------------|-------|-------|-------|-------|-------|-------|---------|------------|-------|
|           |         |             |       |       |                        |       |       |       |       |       |       |         | XJ         | ZJ    |
| 1-1/2     | 1 *     | 5/8         | 2.000 | 1.250 | 1.000                  | 1.000 | 2.500 | 4.500 | 4.000 | 2.500 | 1.750 | 3.036   | 4.125      | 4.625 |
|           | 2       | 1           | 2.000 | 1.250 | 1.000                  | 1.000 | 2.500 | 4.500 | 4.000 | 2.500 | -     | 3.437   | 4.250      | 5.000 |
| 2         | 1       | 5/8         | 2.500 | 1.500 | 1.000                  | 1.000 | 3.000 | 5.000 | 4.500 | 3.000 | 1.750 | 3.125   | 4.125      | 4.625 |
|           | 3       | 1           | 2.500 | 1.500 | 1.000                  | 1.000 | 3.000 | 5.000 | 4.500 | 3.000 | 2.125 | 3.500   | 4.500      | 5.000 |
| 2-1/2     | 1       | 5/8         | 3.000 | 1.500 | 1.000                  | 1.000 | 3.500 | 5.500 | 5.000 | 3.500 | 1.750 | 3.094   | 4.250      | 4.750 |
|           | 3       | 1           | 3.000 | 1.500 | 1.000                  | 1.000 | 3.500 | 5.500 | 5.000 | 3.500 | 2.125 | 3.469   | 4.625      | 5.125 |
| 3-1/4     | 1       | 1           | 3.750 | 2.000 | 1.000                  | 1.000 | 4.500 | 6.500 | 5.750 | 4.250 | 2.250 | 3.969   | 5.000      | 5.625 |
|           | 3       | 1-3/8       | 3.750 | 2.000 | 1.000                  | 1.000 | 4.500 | 6.500 | 5.750 | 4.250 | 2.500 | 4.219   | 5.250      | 5.875 |
| 4         | 1       | 1           | 4.500 | 2.000 | 1.000                  | 1.000 | 5.250 | 7.250 | 6.500 | 5.000 | 2.250 | 3.969   | 5.000      | 5.625 |
|           | 3       | 1-3/8       | 4.500 | 2.000 | 1.000                  | 1.000 | 5.250 | 7.250 | 6.500 | 5.000 | 2.500 | 4.219   | 5.250      | 5.875 |
| 5         | 1       | 1           | 5.500 | 2.000 | 1.000                  | 1.000 | 6.250 | 8.250 | 7.500 | 6.000 | 2.250 | 3.969   | 5.250      | 5.875 |
|           | 3       | 1-3/8       | 5.500 | 2.000 | 1.000                  | 1.000 | 6.250 | 8.250 | 7.500 | 6.000 | 2.500 | 4.219   | 5.500      | 6.125 |

\* Head trunnion style D not available for 1-1/2" bore with 1" rod

**B**

Tie Rod Cylinders  
Actuator Products

3MA Series

4MA/4ML Series

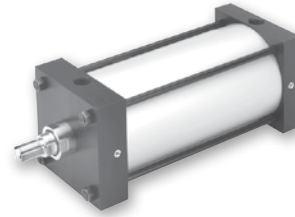
3MAJ/4MAJ Series

4MNR Series

P1D Series



- Industry leading NFPA interchangeable cylinder with flexible construction
- Bore sizes – 6" and 8"
- Removable bronze alloy gland/bearing for easy maintenance
- Available in any practical stroke length
- Tube and tie rod construction for heavy duty use
- Single rod end or double rod ends
- Cushions – optional and adjustable at either end or both ends (N/A for 4ML hydraulic version)
- 20 standard mounting styles available
- RoHS compliant



**Operating information**

|                                  | 4MA                                      | 4ML  |
|----------------------------------|--|--|
| Operating pressure:              | 250 PSIG (17 bar)<br>maximum air service | 400 PSIG (27 bar)<br>maximum hydraulic service |
| Temperature range –              |  |  |
| Standard seals                   | -10°F to 165°F (-23°C to 74°C)           |  |
| Fluorocarbon seals               | -10°F to 250°F (-23°C to 121°C)          |  |
| Low temperature seals            | -50°F to 150°F (-46°C to 66°C)           |  |
| Filtration requirements:         | 40 micron, dry filtered air              | Filtered hydraulic oil                         |
| For technical information see CD |  |  |

**Ordering information**

|                                  |  |   |   |   |  |  |  |  |   |          |  |  |   |   |
|----------------------------------|--|---|---|---|--|--|--|--|---|----------|--|--|---|---|
| <b>6.00</b>                      |  |   | <b>J</b>  | <b>4MA</b>  |  | <b>U</b>   |  |  | <b>1</b>  | <b>4</b> |  | <b>A</b>   |   | <b>12.000</b>   |
| <b>Bore size</b><br>6.00<br>8.00 |  | <b>Double rod cylinder</b><br>Specify "K" only if double rod cylinder is required.                      |   | <b>Series</b><br>4MA Air service<br>4ML Hydraulic service |  | <b>Ports</b><br>U NPTF<br>R BSPP<br>B BSPT<br>T SAE  |  |  | <b>Piston rod number</b><br>Specify rod code number for required diameter. 8, 2 |          |  |  |   | <b>Stroke length</b><br>Specify stroke length required in inches. 8 |
|                                  |  |   | <b>Mounting style</b><br>Specify mounting style code (see table on following page).               |   |  |  |  | <b>Special modification</b><br>Specify "S" only for special modification other than rod end, and then describe modification in item notes. (Includes 4MA with Linear Position Sensor Option) 7 |   |          |  | <b>Cushion cap end</b><br>Blank Non-cushioned cap end<br>C Cushioned cap end (not available for 4ML) |   |   |
|                                  |  | <b>Cushion head end</b><br>Blank Non-cushioned head end<br>C Cushioned head end (not available for 4ML) |   |   |  |  |  |  |   |          |  | <b>Piston rod thread type</b><br>A Standard (UNF unified thread)<br>W BSF British fine<br>M* Metric  |   |   |
|                                  |  |   | <b>Piston type</b><br>Blank Standard (lipseals and magnetic ring)<br>3 Lipseals and magnetic ring |   |  | <b>Seals</b><br>Blank Standard (nitrile seals)<br>V Fluorocarbon seals 1<br>E Fluorocarbon rod wiper and rod seal only 2<br>4 Low temperature seals 1<br>M Metallic rod wiper, nitrile seals 3 |  |  |   |          |  |  | <b>Rod material and gland code</b><br>Blank Standard rod and gland<br>H Standard rod and HI LOAD gland<br>Y 17-4 PH stainless steel rod and standard gland<br>Z 17-4 PH stainless steel rod and HI LOAD gland<br>J 303 stainless steel rod and standard gland 7<br>K 303 stainless steel rod and HI LOAD gland 7<br>S 316 stainless steel rod and standard gland 7<br>T 316 stainless steel rod and HI LOAD gland 7 |   |
|                                  |  |   |   |   |  |  |  | <b>Piston rod thread style</b><br>4 Small male<br>8 Intermediate male<br>9 Short female<br>55 For use with split coupler 6<br>3 Special (and specify all dimensions required)                  |   |          |  |  |   |   |

\* Please reference catalog 0900P-E, page B106.




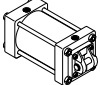

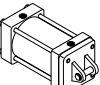

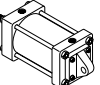

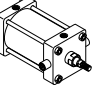

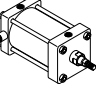

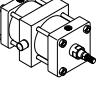

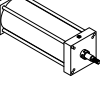

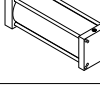


**Sensors**  
For sensors see page B294.

1 Reed and solid-state sensors only available with standard seals or options E and M.  
 2 Used for external chemical compatibility applications, not high temperature.  
 3 If fluorocarbon seals are required with this option, please place an "S" for special in the Special Modification field and specify the "fluorocarbon seals and metallic rod wiper" in the item notes.  
 4 For Linear Position Sensor Option (LPSO), please include the following information for the Special Modification item notes:  
 a. Sensor part number (please reference catalog 0900P-E, pages B100-B104)  
 b. Sensor position  
 c. Port position (if other than position 1)  
 d. Length of stop tubing, gross stroke and net stroke (if required) Also, Piston Type 3 is required.  
 5 Review Piston Rod Selection Chart, please reference catalog 0900P-E, page A14 to determine proper piston rod diameter.  
 6 For additional information regarding this style, please reference catalog 0900P-E, page B105. If non-standard Rod Material and Gland Code is required with this option, please place an "S" for special in Special Modification field and specify Rod Material and Gland Code in the item notes.  
 7 Not available for 4ML.  
 8 If a stop tube is required, specify gross stroke (net stroke + stop tube) in the model number, then place an "S" for special in the Special Modification field and specify the stop tube length in the item notes.

**B**  
 Tie Rod Cylinders  
 Actuator Products  
 3MA Series  
 4MA/4ML Series  
 3MAJ/4MAJ Series  
 4MNR Series  
 P1D Series



**4MA/4ML Mounting Styles for 6" to 8" Bore**

| Mounting style  | NFPA mounting | Description                 | Bore size | Mounting style   | NFPA mounting | Description              | Bore size |
|---|---------------|-----------------------------|-----------|--|---------------|--------------------------|-----------|
| <b>T</b><br>     | MX0           | No Mount                    | 6 - 8     | <b>CB</b><br>     | MS1           | Side End Angle           | 6 - 8     |
| <b>J</b><br>     | MF1           | Head Rectangular Flange     | 6         | <b>BB</b><br>     | MP1           | Cap Fixed Clevis         | 6 - 8     |
| <b>H</b><br>     | MF2           | Cap Rectangular Flange      | 6         | <b>BC</b><br>     | MP2           | Cap Detachable Clevis    | 6 - 8     |
| <b>TB</b><br>    | MX3           | Tie Rods Extended Head End  | 6 - 8     | <b>BE</b><br>     | MP4           | Cap Detachable Eye       | 6         |
| <b>TC</b><br>    | MX2           | Tie Rods Extended Cap End   | 6 - 8     | <b>D</b><br>      | MT1           | Head Trunnion            | 6 - 8     |
| <b>TD</b><br>   | MX1           | Tie Rods Extended Both Ends | 6 - 8     | <b>DB</b><br>    | MT2           | Cap Trunnion             | 6 - 8     |
| <b>TE</b><br>  | MX5           | Sleeve Nut                  | 6 - 8     | <b>DD</b><br>   | MT4           | Intermediate Trunnion    | 6 - 8     |
| <b>TEF</b><br> | MX5/MS4       | Sleeve Nut with Side Tap    | 6 - 8     | <b>JB</b><br>   | ME3           | Head Square              | 8         |
| <b>C</b><br>   | MS2           | Side Lug                    | 6 - 8     | <b>HB</b><br>   | ME4           | Cap Square               | 8         |
| <b>F</b><br>   | MS4           | Side Tap                    | 6 - 8     | <b>KT †</b><br> | MDX0          | Double Rod End, No Mount | 6 - 8     |

† Double rod end cylinders can be ordered with head mountings, i.e. KJ.

**B**

**Tie Rod Cylinders  
Actuator Products**

**3MA  
Series**

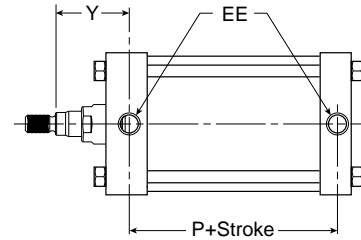
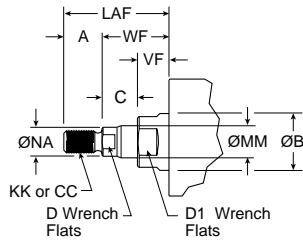
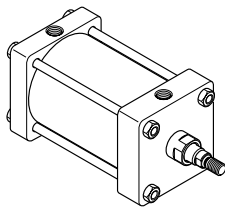
**4MA/4ML  
Series**

**3MAJ/4MAJ  
Series**

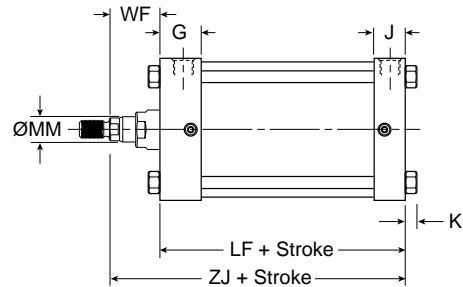
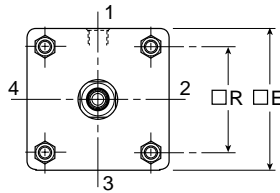
**4MNR  
Series**

**P1D  
Series**

**Single Rod Dimensioned Drawings – (Style T)**



For dimensions of all standard rod end styles, please see next page.



**Style T**

| Bore size | Rod no. | Rod dia. MM | Thread     |                | A     | AA    | +0.000<br>-0.002<br>B | C     | D     | D1     | E     | EE (NPTF) | G     |
|-----------|---------|-------------|------------|----------------|-------|-------|-----------------------|-------|-------|--------|-------|-----------|-------|
|           |         |             | Style 8 CC | Style 4 & 9 KK |       |       |                       |       |       |        |       |           |       |
| 6         | 1       | 1-3/8       | 1-1/4-12   | 1-14           | 1.625 | 6.900 | 1.999                 | 0.635 | 1-1/8 | 1-7/8  | 6.500 | 3/4       | 1.910 |
|           | 3       | 1-3/4       | 1-1/2-12   | 1-1/4-12       | 2.000 | 6.900 | 2.374                 | 0.760 | 1-1/2 | 2-3/16 | 6.500 | 3/4       | 1.910 |
| 8         | 1       | 1-3/8       | 1-1/4-12   | 1-14           | 1.625 | 9.100 | 1.999                 | 0.635 | 1-1/8 | 1-7/8  | 8.500 | 3/4       | 1.810 |
|           | 3       | 1-3/4       | 1-1/2-12   | 1-1/4-12       | 2.000 | 9.100 | 2.374                 | 0.760 | 1-1/2 | 2-3/16 | 8.500 | 3/4       | 1.810 |

| Bore size | Rod no. | Rod dia. MM | Add stroke |       |       |       |       |       |       |       |       |       |       |
|-----------|---------|-------------|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|           |         |             | J          | K     | LAF   | NA    | R     | VF    | WF    | Y     | LF    | P     | ZJ    |
| 6         | 1       | 1-3/8       | 1.410      | 0.438 | 3.250 | 1.313 | 4.880 | 0.990 | 1.625 | 2.813 | 5.000 | 3.125 | 6.625 |
|           | 3       | 1-3/4       | 1.410      | 0.438 | 3.875 | 1.688 | 4.880 | 1.115 | 1.875 | 3.063 | 5.000 | 3.125 | 6.875 |
| 8         | 1       | 1-3/8       | 1.440      | 0.563 | 3.250 | 1.313 | 6.440 | 0.990 | 1.625 | 2.750 | 5.125 | 3.250 | 6.750 |
|           | 3       | 1-3/4       | 1.440      | 0.563 | 3.875 | 1.688 | 6.440 | 1.115 | 1.875 | 3.000 | 5.125 | 3.250 | 7.000 |

**B**  
 Tie Rod Cylinders  
 Actuator Products

3MA Series

4MA/4ML Series

3MAJ/4MAJ Series

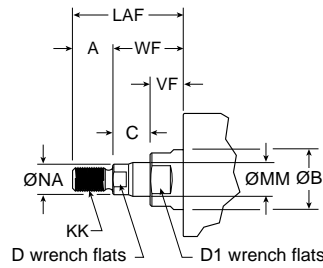
4MNR Series

P1D Series

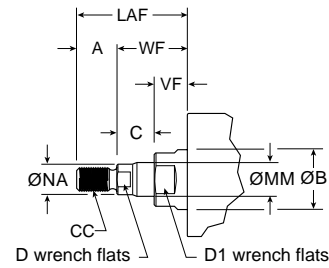


**4MA Rod End Dimensions**

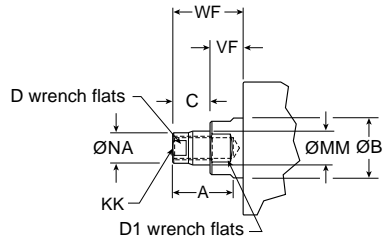
**Thread Style 4**  
 (NFPA Style SM)  
 Small Male



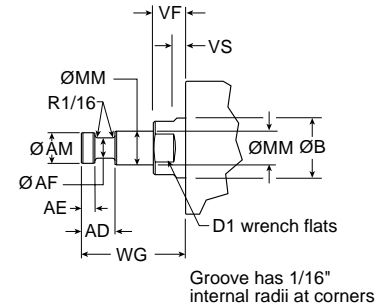
**Thread Style 8**  
 (NFPA Style IM)  
 Intermediate Male



**Thread Style 9**  
 (NFPA Style SF)  
 Short Female



**Thread Style 55**  
 For use with Split Coupler  
 (please reference catalog 0900P-E, page B105 for more information)



**Thread Style 3 - "Special Thread"**

Special threads, rod extensions, rod eyes, blanks, etc. are also available.  
 To order, specify "Style 3" and give desired dimensions for KK or CC, A and W or WF.  
 If otherwise special, please supply dimensioned sketch.

**Rod End Dimensions**

| Bore size | Rod no. | Rod dia. MM | Thread     |                | Tolerances: +.000 / -.002 |       |       |       |       |       |       |       |        |       |       |       |       |       |
|-----------|---------|-------------|------------|----------------|---------------------------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|-------|-------|
|           |         |             | Style 8 CC | Style 4 & 9 KK | A                         | AD    | AE    | AF    | AM    | B     | C     | D     | D1     | LAF   | NA    | VF    | WF    | WG    |
| 6         | 1       | 1-3/8       | 1-1/4-12   | 1-14           | 1.625                     | 1.063 | 0.375 | 0.875 | 1.320 | 1.999 | 0.635 | 1-1/8 | 1-7/8  | 3.250 | 1.313 | 0.990 | 1.625 | 2.750 |
|           | 3       | 1-3/4       | 1-1/2-12   | 1-1/4-12       | 2.000                     | 1.313 | 0.500 | 1.125 | 1.700 | 2.374 | 0.760 | 1-1/2 | 2-3/16 | 3.875 | 1.688 | 1.115 | 1.875 | 3.125 |
| 8         | 1       | 1-3/8       | 1-1/4-12   | 1-14           | 1.625                     | 1.063 | 0.375 | 0.875 | 1.320 | 1.999 | 0.635 | 1-1/8 | 1-7/8  | 3.250 | 1.313 | 0.990 | 1.625 | 2.750 |
|           | 3       | 1-3/4       | 1-1/2-12   | 1-1/4-12       | 2.000                     | 1.313 | 0.500 | 1.125 | 1.700 | 2.374 | 0.760 | 1-1/2 | 2-3/16 | 3.875 | 1.688 | 1.115 | 1.875 | 3.125 |

**B**

Tie Rod Cylinders  
 Actuator Products

3MA  
 Series

4MA/4ML  
 Series

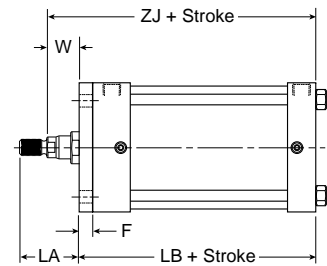
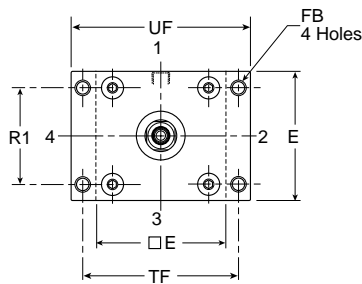
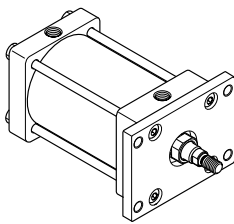
3MAJ/4MAJ  
 Series

4MNR  
 Series

P1D  
 Series

**Head Rectangular Flange**

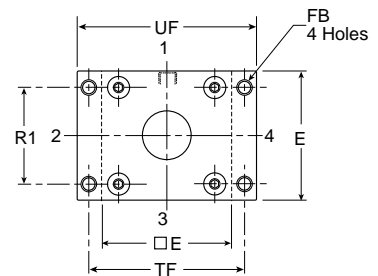
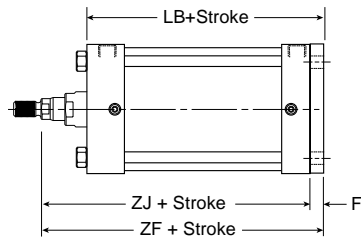
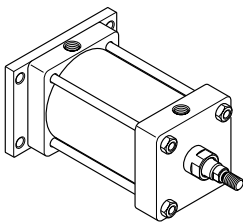
Style J  
 (NFPA MF1)  
 (only 6" Bore)



**Note:** Style J has a W dimension instead of WF and a LA dimension instead of LAF because of the flange installation. Please use dimensions W and LA regarding rod ends only for Style J. For reference,  $WF = W + F$  and  $LA = W + A$ .

**Cap Rectangular Flange**

Style H  
 (NFPA MF2)  
 (only 6" Bore)



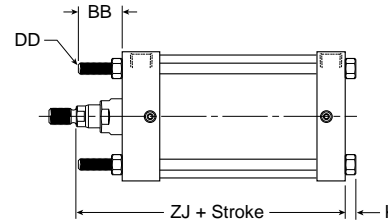
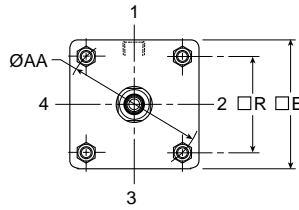
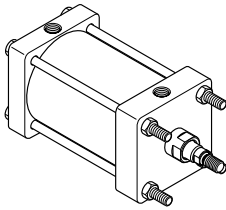
**Styles J and H**

| Bore size | Rod no. | Rod dia. MM | A     | E     | F     | FB    | LA    | R1    | TF    | UF    | W     | Add stroke |       |       |
|-----------|---------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|-------|-------|
|           |         |             |       |       |       |       |       |       |       |       |       | LB         | ZF    | ZJ    |
| 6         | 1       | 1-3/8       | 1.625 | 6.500 | 0.750 | 0.563 | 2.500 | 4.880 | 7.625 | 8.625 | 0.875 | 5.750      | 7.375 | 6.625 |
|           | 3       | 1-3/4       | 2.000 | 6.500 | 0.750 | 0.563 | 3.125 | 4.880 | 7.625 | 8.625 | 1.125 | 5.750      | 7.625 | 6.875 |

**B**  
 Tie Rod Cylinders  
 Actuator Products  
 Series  
 3MA  
 Series  
 4MA/4ML  
 Series  
 3MAJ/4MAJ  
 Series  
 4MNR  
 Series  
 P1D  
 Series

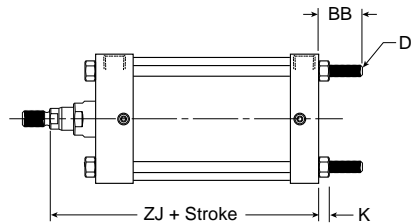
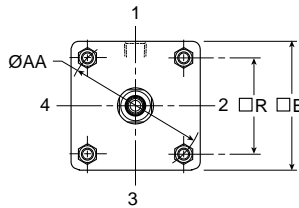
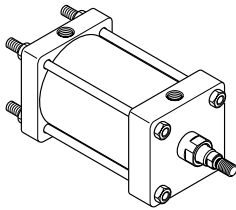
**Tie Rods Ext. Head End**

Style TB  
 (NFPA MX3)



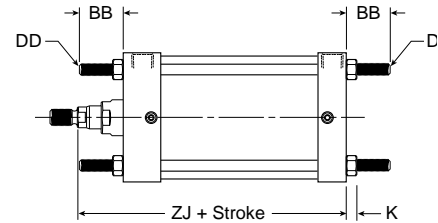
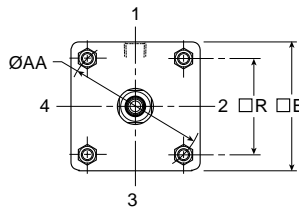
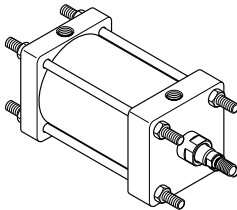
**Tie Rods Ext. Cap End**

Style TC  
 (NFPA MX2)



**Tie Rods Ext. Both Ends**

Style TD  
 (NFPA MX1)



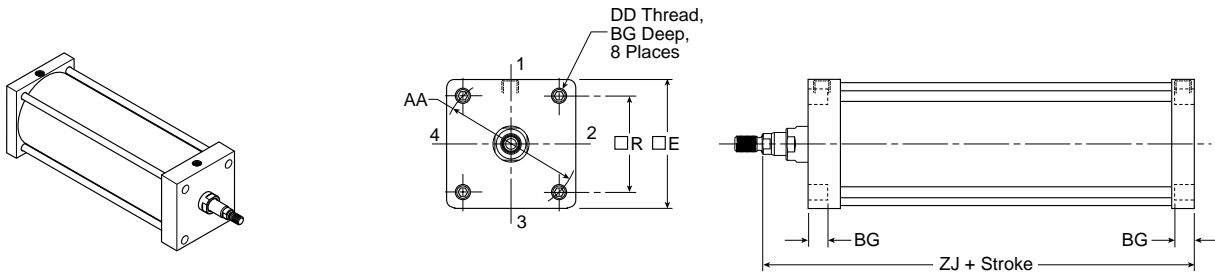
**Styles TB, TC and TD**

| Bore size | Rod no. | Rod dia. MM | AA    | BB    | DD     | E     | K     | R     | Add stroke |  |
|-----------|---------|-------------|-------|-------|--------|-------|-------|-------|------------|--|
|           |         |             |       |       |        |       |       |       | ZJ         |  |
| 6         | 1       | 1-3/8       | 6.900 | 1.813 | 1/2-20 | 6.500 | 0.438 | 4.880 | 6.625      |  |
|           | 3       | 1-3/4       | 6.900 | 1.813 | 1/2-20 | 6.500 | 0.438 | 4.880 | 6.875      |  |
| 8         | 1       | 1-3/8       | 9.100 | 2.313 | 5/8-18 | 8.500 | 0.563 | 6.440 | 6.750      |  |
|           | 3       | 1-3/4       | 9.100 | 2.313 | 5/8-18 | 8.500 | 0.563 | 6.440 | 7.000      |  |

|             |  |
|-------------|--|
| <b>B</b>    | Tie Rod Cylinders<br>Actuator Products |
|             | 3MA Series                             |
|             | 4MA/4ML Series                         |
|             | 3MAJ/4MAJ Series                       |
| 4MNR Series |  |
| P1D Series  |  |

**Sleeve Nut**

Style TE  
 (NFPA MX5)



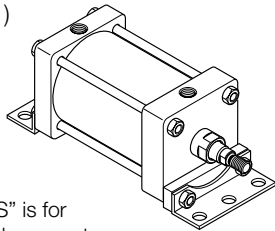
**Style TE**

| Bore size | Rod no. | Rod dia. MM | AA    | BG    | DD     | E     | R     | Add stroke |  |
|-----------|---------|-------------|-------|-------|--------|-------|-------|------------|--|
|           |         |             |       |       |        |       |       | ZJ         |  |
| 6         | 1       | 1-3/8       | 6.900 | 0.500 | 1/2-20 | 6.500 | 4.880 | 6.625      |  |
|           | 3       | 1-3/4       | 6.900 | 0.500 | 1/2-20 | 6.500 | 4.880 | 6.875      |  |
| 8         | 1       | 1-3/8       | 9.100 | 0.620 | 5/8-18 | 8.500 | 6.440 | 6.750      |  |
|           | 3       | 1-3/4       | 9.100 | 0.620 | 5/8-18 | 8.500 | 6.440 | 7.000      |  |

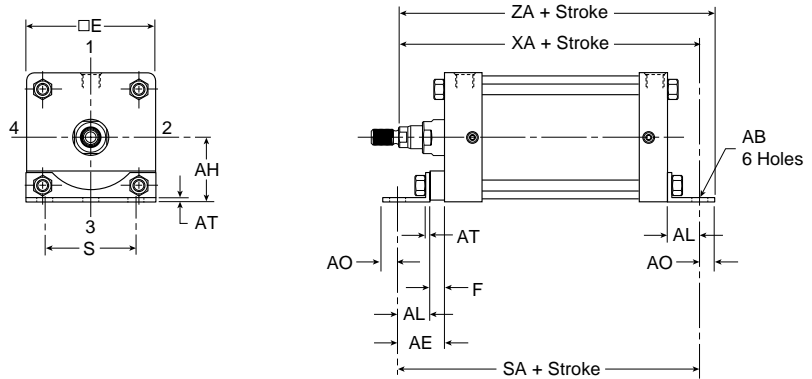
**B**  
 Tie Rod Cylinders  
 Actuator Products  
 3MA Series  
 4MA/4ML Series  
 3MAJ/4MAJ Series  
 4MNR Series  
 P1D Series

**Side End Angle\***

Style CB  
 (NFPA MS1)



**Note:**  
 Dimension "S" is for the holes in the mount (not the screw to screw dimension)



\*Maximum recommended pressure for this mount is 150 PSIG

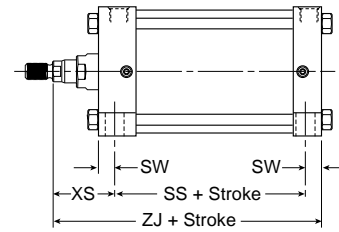
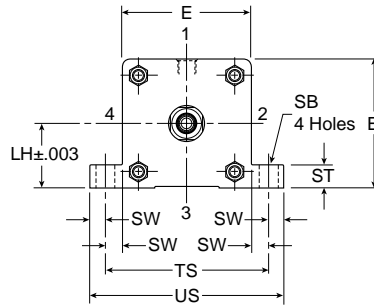
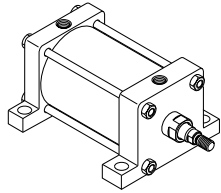
**Style CB**

| Bore size | Rod no. | Rod dia. MM | AB    | AE    | AH    | AL    | AO    | AT    | E     | F     | S     | Add stroke |       |       |
|-----------|---------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|-------|-------|
|           |         |             |       |       |       |       |       |       |       |       |       | SA         | XA    | ZA    |
| 6         | 1       | 1-3/8       | 0.813 | 2.125 | 3.250 | 1.375 | 0.625 | 0.188 | 6.500 | 0.750 | 5.250 | 8.500      | 8.000 | 6.625 |
|           | 3       | 1-3/4       | 0.813 | 2.125 | 3.250 | 1.375 | 0.625 | 0.188 | 6.500 | 0.750 | 5.250 | 8.500      | 8.250 | 6.875 |
| 8         | 1       | 1-3/8       | 0.813 | 1.813 | 4.250 | 1.813 | 0.688 | 0.250 | 8.500 | -     | 7.125 | 8.750      | 8.563 | 9.250 |
|           | 3       | 1-3/4       | 0.813 | 1.813 | 4.250 | 1.813 | 0.688 | 0.250 | 8.500 | -     | 7.125 | 8.750      | 8.813 | 9.500 |



**Side Lug**

Style C  
 (NFPA MS2)

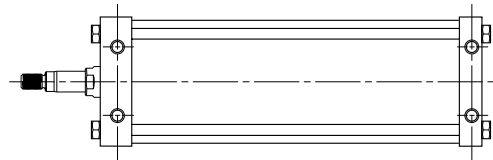
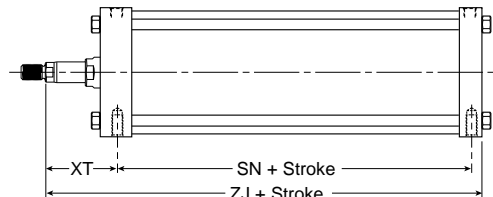
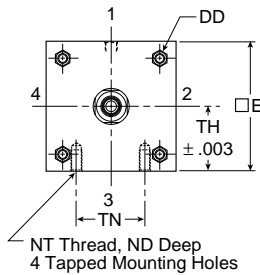
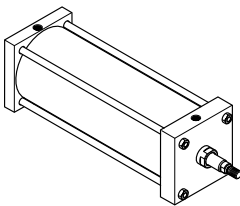


**Style C**

| Bore size | Rod no. | Rod dia. MM | E     | +/- .003 LH | SB    | ST    | SW    | TS    | US     | XS    | Add stroke |       |
|-----------|---------|-------------|-------|-------------|-------|-------|-------|-------|--------|-------|------------|-------|
|           |         |             |       |             |       |       |       |       |        |       | SS         | ZJ    |
| 6         | 1       | 1-3/8       | 6.500 | 3.243       | 0.813 | 1.000 | 0.688 | 7.875 | 9.250  | 2.313 | 3.625      | 6.625 |
|           | 3       | 1-3/4       | 6.500 | 3.243       | 0.813 | 1.000 | 0.688 | 7.875 | 9.250  | 2.563 | 3.625      | 6.875 |
| 8         | 1       | 1-3/8       | 8.500 | 4.243       | 0.813 | 1.000 | 0.688 | 9.875 | 11.250 | 2.313 | 3.750      | 6.750 |
|           | 3       | 1-3/4       | 8.500 | 4.243       | 0.813 | 1.000 | 0.688 | 9.875 | 11.250 | 2.563 | 3.750      | 7.000 |

**Side Tap**

Style F  
 (NFPA MS4)



**Style F**

| Bore size | Rod no. | Rod dia. MM | E     | ND    | NT     | +/- .003 TH | TN    | XT    | Add stroke |       |
|-----------|---------|-------------|-------|-------|--------|-------------|-------|-------|------------|-------|
|           |         |             |       |       |        |             |       |       | SN         | ZJ    |
| 6         | 1       | 1-3/8       | 6.500 | 1.125 | 3/4-10 | 3.243       | 3.250 | 2.813 | 3.125      | 6.625 |
|           | 3       | 1-3/4       | 6.500 | 1.125 | 3/4-10 | 3.243       | 3.250 | 3.063 | 3.125      | 6.875 |
| 8         | 1       | 1-3/8       | 8.500 | 1.125 | 3/4-10 | 4.243       | 4.500 | 2.813 | 3.250      | 6.750 |
|           | 3       | 1-3/4       | 8.500 | 1.125 | 3/4-10 | 4.243       | 4.500 | 3.063 | 3.250      | 7.000 |

**B**

Tie Rod Cylinders  
 Actuator Products

3MA  
 Series

4MA/4ML  
 Series

3MAJ/4MAJ  
 Series

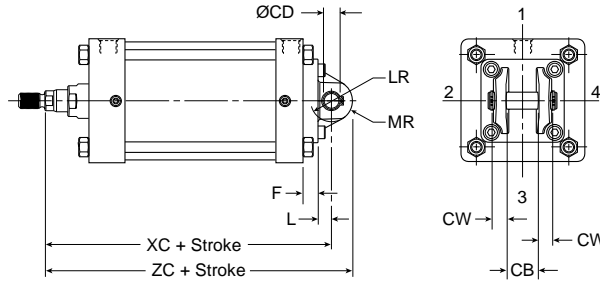
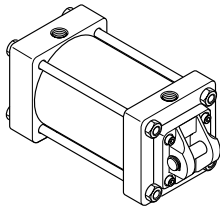
4MNR  
 Series

P1D  
 Series

**Cap Fixed Clevis**

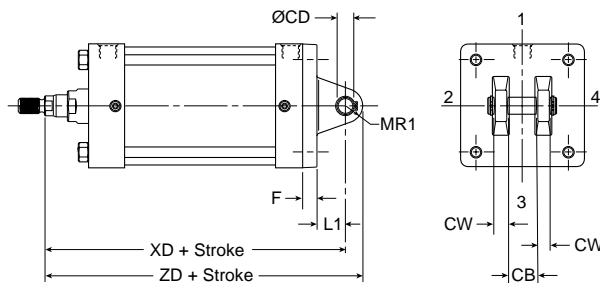
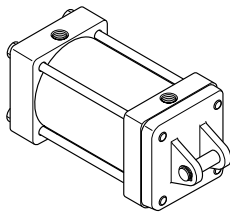
Style BB  
 (NFPA MP1)

**Note:** For maximum swivel angle of BB mount with rear mounting plate, please reference catalog 0900P-E, cylinder accessories on page B108.



**Cap Detachable Clevis**

Style BC  
 (NFPA MP2)

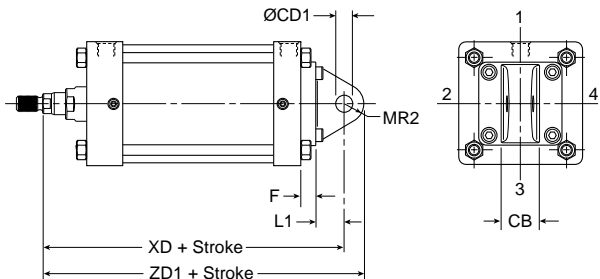
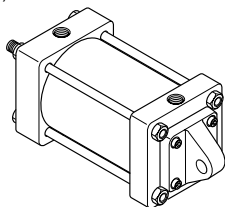


**Styles BB and BC**

| Bore size | Rod no. | Rod dia. MM | CB    | Rod dia. +.000 -0.002 | CD    | CW    | E     | F     | L     | LR    | L1    | MR    | MR1   | Add stroke |       |       |        |
|-----------|---------|-------------|-------|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|-------|-------|--------|
|           |         |             |       |                       |       |       |       |       |       |       |       |       |       | XC         | XD    | ZC    | ZD     |
| 6         | 1       | 1-3/8       | 1.500 | 1.001                 | 0.750 | 6.500 | 0.750 | 0.750 | 0.750 | 1.250 | 1.500 | 1.125 | 1.000 | 8.125      | 8.875 | 9.250 | 9.875  |
|           | 3       | 1-3/4       | 1.500 | 1.001                 | 0.750 | 6.500 | 0.750 | 0.750 | 0.750 | 1.250 | 1.500 | 1.125 | 1.000 | 8.375      | 9.125 | 9.500 | 10.125 |
| 8         | 1       | 1-3/8       | 1.500 | 1.001                 | 0.750 | 8.500 | 0.750 | 0.750 | 0.750 | 1.250 | 1.500 | 1.125 | 1.000 | 8.250      | 9.000 | 9.375 | 10.000 |
|           | 3       | 1-3/4       | 1.500 | 1.001                 | 0.750 | 8.500 | 0.750 | 0.750 | 0.750 | 1.250 | 1.500 | 1.125 | 1.000 | 8.500      | 9.250 | 9.625 | 10.250 |

**Cap Detachable Eye**

Style BE  
 (NFPA MP4)  
 (only 6" Bore)



**Style BE**

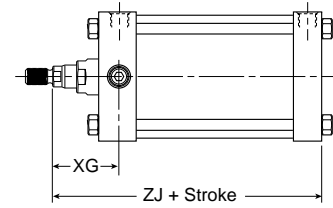
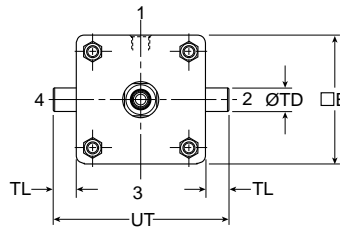
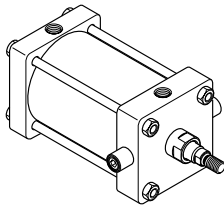
| Bore size | Rod no. | Rod dia. MM | CB    | Rod dia. +.002 +.004 | CD1   | E     | F     | L1    | MR2   | Add stroke |        |
|-----------|---------|-------------|-------|----------------------|-------|-------|-------|-------|-------|------------|--------|
|           |         |             |       |                      |       |       |       |       |       | XD         | ZD1    |
| 6         | 1       | 1-3/8       | 1.500 | 1.000                | 6.500 | 0.750 | 0.750 | 1.500 | 1.125 | 8.875      | 10.000 |
|           | 3       | 1-3/4       | 1.500 | 1.000                | 6.500 | 0.750 | 0.750 | 1.500 | 1.125 | 9.125      | 10.250 |

**B**  
 Tie Rod Cylinders  
 Actuator Products  
 Series  
 3MA  
 Series  
 4MA/4ML  
 Series  
 3MAJ/4MAJ  
 Series  
 4MNR  
 Series  
 P1D  
 Series



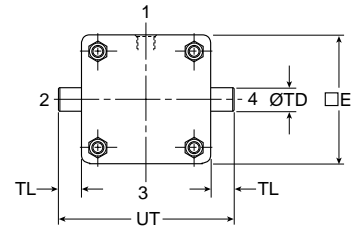
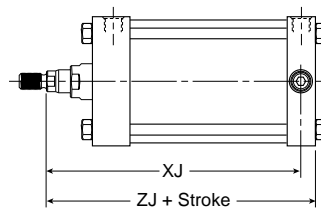
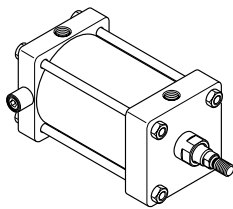
**Head Trunnion**

Style D  
 (NFPA MT1)



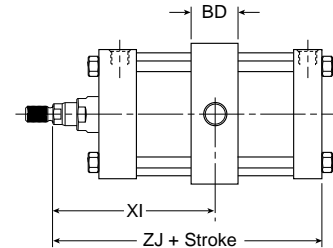
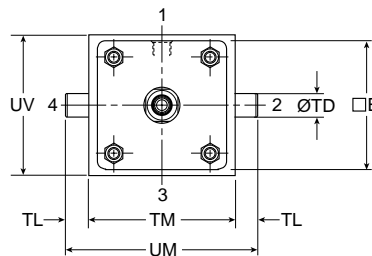
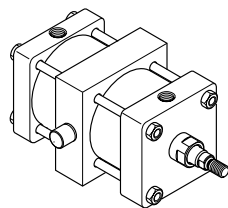
**Cap Trunnion**

Style DB  
 (NFPA MT2)



**Intermediate Trunnion**

Style DD  
 (NFPA MT4)



**Styles D, DB and DD**

| Bore size | Rod no. | Rod dia. MM | E     | BD    | +0.000<br>-0.001<br>TD | TL    | TM    | UM     | UT     | UV    | XG    | Min. XI | Add stroke |       |
|-----------|---------|-------------|-------|-------|------------------------|-------|-------|--------|--------|-------|-------|---------|------------|-------|
|           |         |             |       |       |                        |       |       |        |        |       |       |         | XJ         | ZJ    |
| 6         | 1       | 1-3/8       | 6.500 | 2.500 | 1.375                  | 1.375 | 7.625 | 10.375 | 9.250  | 7.000 | 2.625 | 4.813   | 5.875      | 6.625 |
|           | 3       | 1-3/4       | 6.500 | 2.500 | 1.375                  | 1.375 | 7.625 | 10.375 | 9.250  | 7.000 | 2.875 | 5.063   | 6.125      | 6.875 |
| 8         | 1       | 1-3/8       | 8.500 | 2.500 | 1.375                  | 1.375 | 9.750 | 12.500 | 11.250 | 9.500 | 2.625 | 4.750   | 6.000      | 6.750 |
|           | 3       | 1-3/4       | 8.500 | 2.500 | 1.375                  | 1.375 | 9.750 | 12.500 | 11.250 | 9.500 | 2.875 | 5.000   | 6.250      | 7.000 |

**B**

Tie Rod Cylinders  
 Actuator Products

3MA  
 Series

4MA/4ML  
 Series

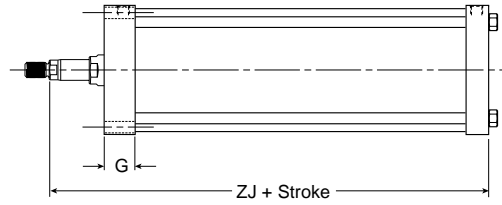
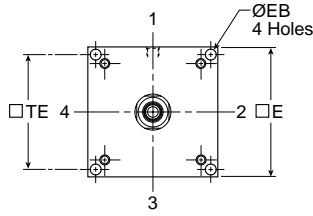
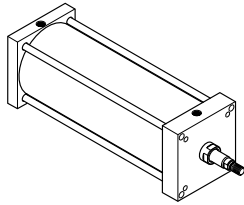
3MAJ/4MAJ  
 Series

4MNR  
 Series

P1D  
 Series

**Head Square**

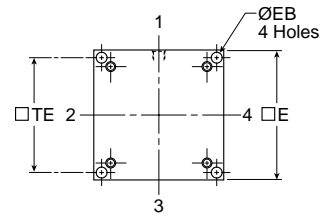
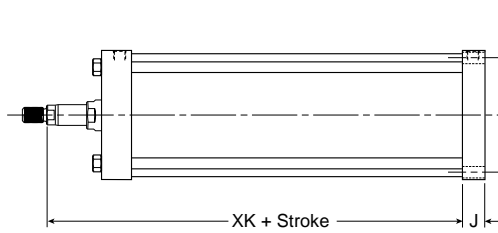
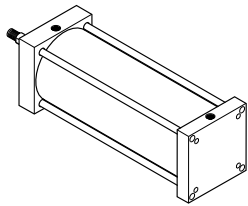
Style JB  
 (NFPA ME3)



**B**  
 Tie Rod Cylinders  
 Actuator Products  
 Series  
 3MA  
 Series  
 4MA/4ML  
 Series  
 3MAJ/4MAJ  
 Series  
 4MNR  
 Series  
 P1D  
 Series

**Cap Square**

Style HB  
 (NFPA ME4)



**Styles JB and HB**

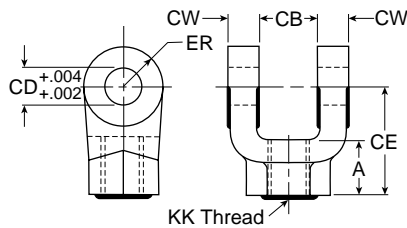
| Bore size | Rod no. | Rod dia. MM | E     | EB    | G     | J     | TE    | Add stroke |       |
|-----------|---------|-------------|-------|-------|-------|-------|-------|------------|-------|
|           |         |             |       |       |       |       |       | XK         | ZJ    |
| 8         | 1       | 1-3/8       | 8.500 | 0.688 | 1.810 | 1.440 | 7.570 | 5.313      | 6.750 |
|           | 3       | 1-3/4       | 8.500 | 0.688 | 1.810 | 1.440 | 7.570 | 5.563      | 7.000 |

**Mounting Kits and Accessories**

| Bore size | J (MF1)                 | H (MF2)                | BB (MP1)         | BC (MP2)              | BE (MP4)           | CB (MS1)        | C (MS2)             | G (MS7)      | Kit fastener torque units |         |
|-----------|-------------------------|------------------------|------------------|-----------------------|--------------------|-----------------|---------------------|--------------|---------------------------|---------|
|           | Head rectangular flange | Cap rectangular flange | Cap fixed clevis | Cap detachable clevis | Cap detachable eye | Side end angles | Side lug (3MA only) | Side end lug | inch-lbs                  | N-m     |
|           | Kit number              | Kit number             | Kit number       | Kit number            | Kit number         | Kit number      | Kit number          | Kit number   |                           |         |
| 1-1/2     | L079700150              | L079700150             | L079710150       | L079730150            | L079720150         | L079740150      | L079830150          | L079750150   | 32-36                     | 3.6-4.1 |
| 2         | L079700200              | L079700200             | L079710200       | L079730200            | L079720200         | L079740200      | L079830200          | L079750200   | 72-82                     | 8-9     |
| 2-1/2     | L079700250              | L079700250             | L079710250       | L079730250            | L079720250         | L079740250      | L079830250          | L079750250   | 72-82                     | 8-9     |
| 3-1/4     | L079700325              | L079700325             | L079710325       | L079730325            | L079720325         | L079740325      | L079830325          | L079750325   | 216-228                   | 24-25.3 |
| 4         | L079700400              | L079700400             | L079710400       | L079730400            | L079720400         | L079740400      | L079830400          | L079750400   | 216-228                   | 24-25.3 |
| 5         | L079700500              | L079700500             | L079710500       | L079730500            | N/A                | L079740500      | L079830500          | N/A          | 360-372                   | 41-42   |

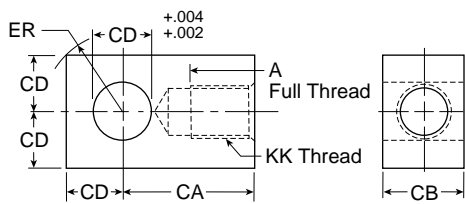
\*\* Spacer plate not used for 4" bore or double rod cylinders

**Female Rod Clevis**



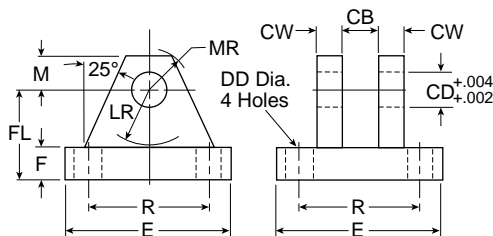
| Symbol              | 1458030044 | 1458030050 | 1458030075 | 1458030088 | 1458030100 | 1458030125 | 1458030150 |
|---------------------|------------|------------|------------|------------|------------|------------|------------|
| A                   | 3/4        | 3/4        | 1-1/8      | 1-5/8      | 1-5/8      | 2          | 2-1/4      |
| CB                  | 3/4        | 3/4        | 1-1/4      | 1-1/2      | 1-1/2      | 2          | 2-1/2      |
| CD                  | 1/2        | 1/2        | 3/4        | 1          | 1          | 1-3/8      | 1-3/4      |
| C E                 | 1-1/2      | 1-1/2      | 2-1/8      | 2-15/16    | 2-15/16    | 3-3/4      | 4-1/2      |
| CW                  | 1/2        | 1/2        | 5/8        | 3/4        | 3/4        | 1          | 1-1/4      |
| ER                  | 1/2        | 1/2        | 3/4        | 1          | 1          | 1-3/8      | 1-3/4      |
| KK                  | 7/16-20    | 1/2-20     | 3/4-16     | 7/8-14     | 1-14       | 1-1/4-12   | 1-1/2-12   |
| Load capacity (lbs) | 4250       | 4900       | 11200      | 18800      | 19500      | 33500      | 45600      |

**Rod Eye Knuckle**



| Symbol              | 1458040044 | 1458040050 | 1458040075 | 1458040088 | 1458040100 | 1458040125 | 1458040150 |
|---------------------|------------|------------|------------|------------|------------|------------|------------|
| A                   | 3/4        | 3/4        | 1-1/8      | 1-1/8      | 1-5/8      | 2          | 2-1/4      |
| CA                  | 1-1/2      | 1-1/2      | 2-1/16     | 2-3/8      | 2-13/16    | 3-7/16     | 4          |
| CB                  | 3/4        | 3/4        | 1-1/4      | 1-1/2      | 1-1/2      | 2          | 2-1/2      |
| CD                  | 1/2        | 1/2        | 3/4        | 1          | 1          | 1-3/8      | 1-3/4      |
| ER                  | 23/32      | 23/32      | 1-1/16     | 1-7/16     | 1-7/16     | 1-31/32    | 2-1/2      |
| KK                  | 7/16-20    | 1/2-20     | 3/4-16     | 7/8-14     | 1-14       | 1-1/4-12   | 1-1/2-12   |
| Load capacity (lbs) | 5000       | 5700       | 12100      | 13000      | 21700      | 33500      | 45000      |

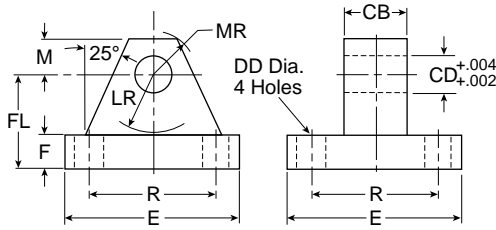
**Clevis Bracket**



| Symbol              | 1458050044 | 1458050050 | 1458050075 | 1458050100 | 1458050138 | 1458050175 |
|---------------------|------------|------------|------------|------------|------------|------------|
| CB                  | 15/32      | 3/4        | 1-1/4      | 1-1/2      | 2          | 2-1/2      |
| CD                  | 7/16       | 1/2        | 3/4        | 1          | 1-3/8      | 1-3/4      |
| CW                  | 3/8        | 1/2        | 5/8        | 3/4        | 1          | 1-1/4      |
| DD                  | 17/64      | 13/32      | 17/32      | 21/32      | 21/32      | 29/32      |
| E                   | 2-1/4      | 3-1/2      | 5          | 6-1/2      | 7-1/2      | 9-1/2      |
| F                   | 3/8        | 1/2        | 5/8        | 3/4        | 7/8        | 7/8        |
| FL                  | 1          | 1-1/2      | 1-7/8      | 2-1/4      | 3          | 3-5/8      |
| LR                  | 5/8        | 3/4        | 1-3/16     | 1-1/2      | 2          | 2-3/4      |
| M                   | 3/8        | 1/2        | 3/4        | 1          | 1-3/8      | 1-3/4      |
| MR                  | 1/2        | 5/8        | 29/32      | 1-1/4      | 1-21/32    | 2-7/32     |
| R                   | 1.75       | 2.55       | 3.82       | 4.95       | 5.73       | 7.50       |
| Load capacity (lbs) | 3600       | 7300       | 14000      | 19200      | 36900      | 34000      |



**Mounting Plate & Eye Bracket**



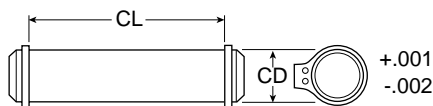
| Symbol                     | 1458060031 | 1458060050 | 1458060075 | 1458060100 | 1458060138 | 1458060175 |
|----------------------------|------------|------------|------------|------------|------------|------------|
| CB                         | 15/16      | 3/4        | 1-1/4      | 1-1/2      | 2          | 2-1/2      |
| CD                         | 15/16      | 1/2        | 3/4        | 1          | 1-3/8      | 1-3/4      |
| DD                         | 17/64      | 13/32      | 17/32      | 21/32      | 21/32      | 29/32      |
| E                          | 2-1/4      | 2-1/2      | 3-1/2      | 4-1/2      | 5          | 6-1/2      |
| F                          | 3/8        | 3/8        | 5/8        | 7/8        | 7/8        | 1-1/8      |
| FL                         | 1          | 1-1/8      | 17/8       | 2-3/8      | 3          | 3-3/8      |
| LR                         | 5/8        | 3/4        | 1-1/4      | 1-1/2      | 2-1/8      | 2-1/4      |
| M                          | 3/8        | 1/2        | 3/4        | 1          | 1-3/8      | 1-3/4      |
| MR                         | 1/2        | 9/16       | 7/8        | 1-1/4      | 1-5/8      | 2-1/8      |
| R                          | 1.75       | 1.63       | 2.55       | 3.25       | 3.82       | 4.95       |
| <b>Load Capacity (lbs)</b> | 1700       | 4100       | 10500      | 20400      | 21200      | 49480      |

**1-1/2" to 8" Bore Cylinder Accessories**

Rod end accessories can be selected by cylinder rod end thread size from Table A & B below. Mating parts for rod end accessories are listed just to the right of the knuckle or clevis selected. Mounting plates for style MP1 & MP4 cylinder mounts are selected by bore size from Table C.

| Rod end thread size | Table A<br>Mating parts |             |            | Table B<br>Mating parts |                |            | Table C<br>Mounting plates |                             |                             |
|---------------------|-------------------------|-------------|------------|-------------------------|----------------|------------|----------------------------|-----------------------------|-----------------------------|
|                     | Female rod clevis       | Eye bracket | Pivot pin  | Knuckle                 | Clevis bracket | Pivot pin  | Bore size                  | For mtg. style MP1 cylinder | For mtg. style MP4 cylinder |
| 7/16-20             | 1458030044              | 1458060050  | 0856640050 | 1458040044              | 1458050050     | 0856640050 | 1-1/2                      | 1458060050                  | 1458050050                  |
| 1/2-20              | 1458030050              | 1458060050  | 0856640050 | 1458040050              | 1458050050     | 0856640050 | 2                          | 1458060050                  | 1458050050                  |
| 3/4-16              | 1458030075              | 1458060075  | 0856640075 | 1458040075              | 1458050075     | 0856640075 | 2-1/2                      | 1458060050                  | 1458050050                  |
| 7/8-14              | 1458030088              | 1458060100  | 0856640100 | 1458040088              | 1458050100     | 0856640100 | 3-1/4                      | 1458060075                  | 1458050075                  |
| 1-14                | 1458030100              | 1458060100  | 0856640100 | 1458040100              | 1458050100     | 0856640100 | 4                          | 1458060075                  | 1458050075                  |
| 1-1/4-12            | 1458030125              | 1458060138  | 0856640138 | 1458040125              | 1458050138     | 0856640138 | 5                          | 1458060075                  | —                           |
| 1-1/2-12            | 1458030150              | 1458060175  | 0856640175 | 1458040150              | 1458050175     | 0856640175 | 6                          | 1458060100                  | —                           |
|                     |                         |             |            |                         |                |            | 8                          | 1458060100                  | —                           |

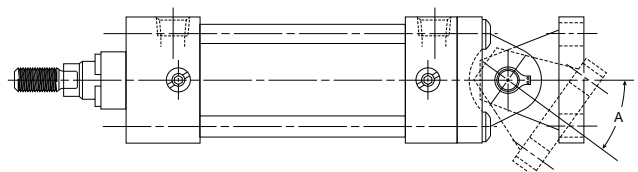
**Pivot Pin**



| Symbol                  | 0856640044 | 0856640050 | 0856640075 | 0856640100 | 0856640138 | 0856640175 |
|-------------------------|------------|------------|------------|------------|------------|------------|
| CD                      | 7/16       | 1/2        | 3/4        | 1          | 1-3/8      | 1-3/4      |
| CL                      | 1-5/16     | 1-7/8      | 2-5/8      | 3-1/8      | 4-1/8      | 5-3/16     |
| <b>Shear cap. (lbs)</b> | 6600       | 8600       | 19300      | 34300      | 65000      | 105200     |

**Note:** Pivot Pin must be ordered separately for single lug pivot mounting.

**Maximum pivot angle for rear clevis mounts (BB mounts) and accessories**



| Bore           | 1-1/2 | 2  | 2-1/2 | 3-1/4 | 4  | 5  | 6  | 8  |
|----------------|-------|----|-------|-------|----|----|----|----|
| <b>Angle A</b> | 52    | 43 | 29    | 50    | 49 | 45 | 42 | 42 |

**Service Kits**

| Bore size | Rod dia. | Rod no. | RG - Rod gland cartridge kit.<br>Includes gland and wiper, rod, and o-ring seals |                               | Gland to head torque units |         | PK - Piston seal kit,<br>standard lipseals.<br>Includes piston and o-ring seals |                              | SK - complete cylinder kit.<br>Includes rod gland kit, piston seal kit, and cushion kits |                              | Torque units endcap fastener or tie rod |         |
|-----------|----------|---------|--|-------------------------------|----------------------------|---------|---|------------------------------|--|------------------------------|---|---------|
|           |          |         | Nitrile seal kit number  | Fluorocarbon seals kit number | Ft-lbs                     | Nm      | Nitrile seal kit number   | Fluorocarbon seal kit number | Nitrile seal kit number  | Fluorocarbon seal kit number | inch-lbs                                | Nm      |
| 1-1/2     | 5/8      | 1       | RG04MA0061   | RG04MA0065                    | 40-45                      | 54-61   | PK1504MA01  | PK1504MA05                   | SK15104MA1   | SK15104MA5                   | 32-36                                   | 3.6-4.1 |
|           | 1        | 2       | RG04MA0101   | RG04MA0105                    | 45-50                      | 61-68   |   |                              | SK15304MA1   | SK15304MA5                   |   |         |
| 2         | 5/8      | 1       | RG04MA0061   | RG04MA0065                    | 40-45                      | 54-61   | PK2004MA01  | PK2004MA05                   | SK20104MA1   | SK20104MA5                   | 72-82                                   | 8-9     |
|           | 1        | 3       | RG04MA0101   | RG04MA0105                    | 45-50                      | 61-68   |   |                              | SK20304MA1   | SK20304MA5                   |   |         |
| 2-1/2     | 5/8      | 1       | RG04MA0061   | RG04MA0065                    | 40-45                      | 54-61   | PK2504MA01  | PK2504MA05                   | SK25104MA1   | SK25104MA5                   | 72-82                                   | 8-9     |
|           | 1        | 3       | RG04MA0101   | RG04MA0105                    | 45-50                      | 61-68   |   |                              | SK25304MA1   | SK25304MA5                   |   |         |
| 3-1/4     | 1        | 1       | RG04MA0101   | RG04MA0105                    | 45-50                      | 61-68   | PK3254MA01  | PK3254MA05                   | SK32104MA1   | SK32104MA5                   | 216-228                                 | 24-25.3 |
|           | 1-3/8    | 3       | RG04MA0131   | RG04MA0135                    | 75-80                      | 102-108 |   |                              | SK32304MA1   | SK32304MA5                   |   |         |
| 4         | 1        | 1       | RG04MA0101   | RG04MA0105                    | 45-50                      | 61-68   | PK4004MA01  | PK4004MA05                   | SK40104MA1   | SK40104MA5                   | 216-228                                 | 24-25.3 |
|           | 1-3/8    | 3       | RG04MA0131   | RG04MA0135                    | 75-80                      | 102-108 |   |                              | SK40304MA1   | SK40304MA5                   |   |         |
| 5         | 1        | 1       | RG04MA0101   | RG04MA0105                    | 45-50                      | 61-68   | PK5004MA01  | PK5004MA05                   | SK50104MA1   | SK50104MA5                   | 360-372                                 | 41-42   |
|           | 1-3/8    | 3       | RG04MA0131   | RG04MA0135                    | 75-80                      | 102-108 |   |                              | SK50304MA1   | SK50304MA5                   |   |         |
| 6         | 1-3/8    | 1       | RG04MA0131   | RG04MA0135                    | 75-80                      | 102-108 | PK6004MA01  | PK6004MA05                   | SK60104MA1   | SK60104MA5                   | 420-432                                 | 48-49   |
|           | 1-3/4    | 3       | RG04MA0171   | RG04MA0175                    | 90-95                      | 122-129 |   |                              | SK60304MA1   | SK60304MA5                   |   |         |
| 8         | 1-3/8    | 1       | RG04MA0131   | RG04MA0135                    | 75-80                      | 102-108 | PK8004MA01  | PK8004MA05                   | SK80104MA1   | SK80104MA5                   | 960-972                                 | 109-115 |
|           | 1-3/4    | 3       | RG04MA0171   | RG04MA0175                    | 90-95                      | 122-129 |   |                              | SK80304MA1   | SK80304MA5                   |   |         |

**B**

**Tie Rod Cylinders  
Actuator Products**

**3MA  
Series**

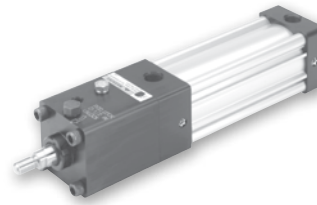
**4MA/4ML  
Series**

**3MAJ/4MAJ  
Series**

**4MNR  
Series**

**P1D  
Series**

- Industry leading NFPA interchangeable rod lock cylinder with flexible construction
- Rod lock holding force equivalent to cylinder output force at 100 PSIG
- Bore sizes – 1-1/2", 2", 2-1/2", 3-1/4", 4", 5", 6" and 8"
- 17 standard styles mounting styles available
- Available in any practical stroke length
- Rod diameters – 5/8", 1", 1-3/8" and 1-3/4"
- Single rod end or double rod ends
- Adjustable cushions are standard at both ends
- Manual override feature standard on all configurations



**Operating information**

Operating pressure: 100 PSIG (7 bar) maximum air pressure, except 2" bore with 1" rod rated at 80 PSIG)  
 60 PSIG (4.1 bar) minimum air pressure to release rod lock

Temperature range –  
 Standard seals -10°F to 165°F (-23°C to 74°C)  
 Fluorocarbon seals -10°F to 250°F (-23°C to 121°C)

Filtration requirements: 40 micron, dry filtered air

For technical information see CD

**Ordering information**

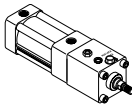
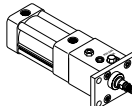
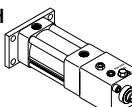
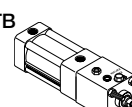
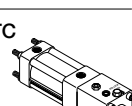
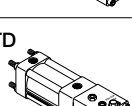
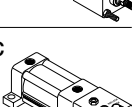
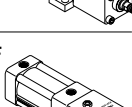
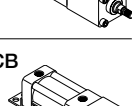
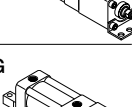
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|---|---|---|--|--|---|--|--|---|---|---|-------|--|---|--|-------|--|---|--|---|---|---|--------------------------------|---|---|---|---|---|--|----|---|---|---|--|--|--|-------|------------------------|---|--------------------------------|---|--|---|---|
| <b>2.00</b>   | <b>C</b>  | <b>J</b>  | <b>4MAJ</b>  | <b>U</b>   | <b>1</b>  | <b>4</b>   | <b>A</b>   | <b>C</b>  | <b>6.000</b>  |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| <b>Bore size</b><br>1.50 <sup>1</sup><br>2.00<br>2.50<br>3.25<br>4.00<br>5.00<br>6.00 <sup>2, 11</sup><br>8.00 <sup>2, 11</sup> | <b>Double Rod Cylinder</b> <sup>12</sup><br>Specify "K" only if double rod cylinder is required.  | <b>Mounting style</b><br>Specify mounting style code (see table on following page). | <b>Series</b><br>4MAJ 4MA rod lock cylinder<br>3MAJ 3MA rod lock cylinder  | <b>Ports</b> <sup>4</sup><br>U NPTF<br>R BSPP<br>B BSPT<br>T SAE | <b>Piston rod number</b><br>Specify rod code number for required diameter. <sup>8</sup> | <b>Special modification</b><br>Specify "S" only for special modification other than rod end, and then describe modification in item notes. (Includes 4MAJ with Linear Position Sensor Option) <sup>7</sup> | <b>Stroke length</b><br>Specify stroke length required in inches. <sup>8</sup> | <b>Cushion cap end</b><br>C Cushioned cap end "C" is required           | <b>Piston rod thread type</b><br>A Standard (UNF unified thread)<br>W BSF British fine<br>M* Metric |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| <b>Cushion head end</b><br>C Cushioned head end "C" is required   | <b>Cylinder construction</b>  |   | <b>Seals</b>   |  | <b>Piston rod thread style</b>  |  | <b>Rod material and gland code</b>   |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
|   | <table border="1"> <tr><td>Blank*</td><td>Standard (extruded body, standard round lobe orientation)</td></tr> <tr><td>A*</td><td>Extruded body, round lobe orientation rotated 90 degrees from standard</td></tr> <tr><td>N*</td><td>Extruded body, round lobe orientation rotated 180 degrees from standard</td></tr> <tr><td>Z*</td><td>Extruded body, round lobe orientation rotated 270 degrees from standard</td></tr> <tr><td>T</td><td>Aluminum round tube and carbon steel tie rods &amp; nuts</td></tr> </table> |   | Blank*   | Standard (extruded body, standard round lobe orientation)        | A*  | Extruded body, round lobe orientation rotated 90 degrees from standard   | N*   | Extruded body, round lobe orientation rotated 180 degrees from standard | Z*  | Extruded body, round lobe orientation rotated 270 degrees from standard | T     | Aluminum round tube and carbon steel tie rods & nuts | <table border="1"> <tr><td>Blank</td><td>Standard (nitrile seals)</td></tr> <tr><td>V</td><td>Fluorocarbon seals<sup>2, 5</sup></td></tr> <tr><td>E</td><td>Fluorocarbon rod wiper and rod seal only<sup>6</sup></td></tr> </table> |  | Blank | Standard (nitrile seals)                     | V | Fluorocarbon seals <sup>2, 5</sup>           | E | Fluorocarbon rod wiper and rod seal only <sup>6</sup> | <table border="1"> <tr><td>4</td><td>Small male</td></tr> <tr><td>8</td><td>Intermediate male</td></tr> <tr><td>9</td><td>Short female</td></tr> <tr><td>55</td><td>For use with split coupler<sup>9</sup></td></tr> <tr><td>3</td><td>Special (and specify all dimensions required)</td></tr> </table> |                                | 4 | Small male  | 8 | Intermediate male                                 | 9 | Short female                                     | 55 | For use with split coupler <sup>9</sup>                               | 3 | Special (and specify all dimensions required)                       | <table border="1"> <tr><td>Blank</td><td>Standard rod and gland</td></tr> <tr><td>H</td><td>Standard rod and HI LOAD gland</td></tr> <tr><td>Y</td><td>17-4 PH stainless steel rod and standard gland</td></tr> <tr><td>Z</td><td>17-4 PH stainless steel rod and HI LOAD gland</td></tr> </table> |  |  | Blank | Standard rod and gland | H | Standard rod and HI LOAD gland | Y | 17-4 PH stainless steel rod and standard gland | Z | 17-4 PH stainless steel rod and HI LOAD gland |
| Blank*  | Standard (extruded body, standard round lobe orientation)   |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| A*  | Extruded body, round lobe orientation rotated 90 degrees from standard  |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| N*  | Extruded body, round lobe orientation rotated 180 degrees from standard   |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| Z*  | Extruded body, round lobe orientation rotated 270 degrees from standard   |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| T   | Aluminum round tube and carbon steel tie rods & nuts  |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| Blank   | Standard (nitrile seals)  |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| V   | Fluorocarbon seals <sup>2, 5</sup>  |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| E   | Fluorocarbon rod wiper and rod seal only <sup>6</sup>   |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| 4   | Small male  |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| 8   | Intermediate male   |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| 9   | Short female  |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| 55  | For use with split coupler <sup>9</sup>   |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| 3   | Special (and specify all dimensions required)   |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| Blank   | Standard rod and gland  |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| H   | Standard rod and HI LOAD gland  |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| Y   | 17-4 PH stainless steel rod and standard gland  |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| Z   | 17-4 PH stainless steel rod and HI LOAD gland   |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
|   | <b>Piston type</b> <sup>11</sup>  |   | <p>* Please reference catalog 0900P-E, table on page B10. Only applies to 1-1/2" to 4" bore.</p> <table border="1"> <tr><td>Blank</td><td>Standard (lipseals and magnetic ring)<sup>12</sup></td></tr> <tr><td>1</td><td>Lipseals, no magnetic ring<sup>12</sup></td></tr> <tr><td>2</td><td>Lipseals, no magnetic ring (aluminum piston)</td></tr> <tr><td>3</td><td>Lipseals and magnetic ring (aluminum piston)</td></tr> <tr><td>4</td><td>Bumper seals, no magnetic ring</td></tr> <tr><td>6</td><td>Bumper seals and magnetic ring</td></tr> <tr><td>B</td><td>Lipseals, 1/4" thick bumpers both ends<sup>3</sup></td></tr> <tr><td>H</td><td>Lipseals, 1/4" thick bumper head end<sup>3</sup></td></tr> <tr><td>C</td><td>Lipseals, 1/4" thick bumper cap end<sup>3</sup></td></tr> <tr><td>D</td><td>Lipseals and magnetic ring, 1/4" thick bumpers both ends<sup>3</sup></td></tr> <tr><td>F</td><td>Lipseals and magnetic ring, 1/4" thick bumper head end<sup>3</sup></td></tr> <tr><td>R</td><td>Lipseals and magnetic ring, 1/4" thick bumper cap end<sup>3</sup></td></tr> </table>  |  |   |  |  |   |   |   | Blank | Standard (lipseals and magnetic ring) <sup>12</sup>  | 1   | Lipseals, no magnetic ring <sup>12</sup> | 2     | Lipseals, no magnetic ring (aluminum piston) | 3 | Lipseals and magnetic ring (aluminum piston) | 4 | Bumper seals, no magnetic ring                        | 6   | Bumper seals and magnetic ring | B | Lipseals, 1/4" thick bumpers both ends <sup>3</sup> | H | Lipseals, 1/4" thick bumper head end <sup>3</sup> | C | Lipseals, 1/4" thick bumper cap end <sup>3</sup> | D  | Lipseals and magnetic ring, 1/4" thick bumpers both ends <sup>3</sup> | F | Lipseals and magnetic ring, 1/4" thick bumper head end <sup>3</sup> | R  | Lipseals and magnetic ring, 1/4" thick bumper cap end <sup>3</sup> |  |       |                        |   |                                |   |  |   |   |
| Blank   | Standard (lipseals and magnetic ring) <sup>12</sup>   |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| 1   | Lipseals, no magnetic ring <sup>12</sup>  |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| 2   | Lipseals, no magnetic ring (aluminum piston)  |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| 3   | Lipseals and magnetic ring (aluminum piston)  |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| 4   | Bumper seals, no magnetic ring  |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| 6   | Bumper seals and magnetic ring  |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| B   | Lipseals, 1/4" thick bumpers both ends <sup>3</sup>   |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| H   | Lipseals, 1/4" thick bumper head end <sup>3</sup>   |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| C   | Lipseals, 1/4" thick bumper cap end <sup>3</sup>  |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| D   | Lipseals and magnetic ring, 1/4" thick bumpers both ends <sup>3</sup>   |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| F   | Lipseals and magnetic ring, 1/4" thick bumper head end <sup>3</sup>   |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
| R   | Lipseals and magnetic ring, 1/4" thick bumper cap end <sup>3</sup>  |   |  |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |
|   |   |   | <p><sup>1</sup> Not available with 1" rod diameter (rod number 2) for 1-1/2" bore. Not available with Linear Position Sensor Option (LPSO).</p> <p><sup>2</sup> Not available for 3MAJ, please specify 4MAJ.</p> <p><sup>3</sup> Addition of 1/4" bumper results in a 1/4" stroke loss per bumper, per end. For example, a 6" stroke cylinder with 1/4" bumpers at both ends (option B) has an effective stroke of 5-1/2".</p> <p><sup>4</sup> Port thread styles only for base cylinder. Rod lock port is always NPTF. If a different rod lock port thread style is required, place an "S" for special in the Special Modification field and indicate the desired rod lock port thread style in the item notes. NPTF cylinder ports are must be ordered for 3MAJ.</p> <p><sup>5</sup> Fluorocarbon seals for 4MAJ are only for external chemical compatibility applications, not high temperature.</p> <p><sup>6</sup> Used for external chemical compatibility applications, not high temperature.</p> <p><sup>7</sup> For Linear Position Sensor Option (LPSO), please include the following information for the Special Modification item notes:<br/> a. Sensor part number (please reference catalog 0900P-E, pages B100-B104)<br/> b. Sensor position<br/> c. Port position (if other than position 1)<br/> d. Length of stop tubing, gross stroke and net stroke (if required)<br/> LPSO not available for 3MAJ, please specify 4MAJ. Cylinder dimensions will</p> <p><sup>8</sup> Review Piston Rod Selection Chart, please reference catalog 0900P-E, on page A14 to determine proper piston rod diameter.</p> <p><sup>9</sup> For additional information regarding this style, please reference catalog 0900P-E, page B105. If non-standard Rod Material and Gland Code is required with this option, please place an "S" for special in Special Modification field and specify Rod Material and Gland Code in the item notes.</p> <p><sup>10</sup> If a stop tube is required, specify gross stroke (net stroke + stop tube) in the model number, then place an "S" for special in the Special Modification field and specify the stop tube length in the item notes. Not available with Piston Types (blank) and 1 for 1-1/2" - 5" bore cylinders. Stop tube not available for 3MAJ, please specify 4MAJ.</p> <p><sup>11</sup> 6"-8" bore 4MAJ can accept only Piston Types (blank) and 3. The (blank) piston for 6"-8" bores is aluminum, lipseals, no magnetic ring. Composite pistons not available with oversize rod number 3.</p> <p><sup>12</sup> Double rod cylinders not available with composite piston type.</p> |  |   |  |  |   |   |   |       |  |   |  |       |  |   |  |   |   |   |                                |   |   |   |   |   |  |    |   |   |   |  |  |  |       |                        |   |                                |   |  |   |   |

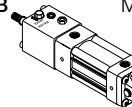
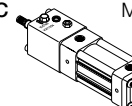
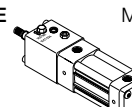
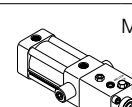
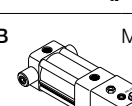
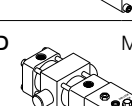
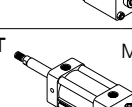
**B**  
 Tie Rod Cylinders  
 Actuator Products  
 Series  
 3MA  
 4MA/4ML  
 3MAJ/4MAJ  
 4MNR  
 P1D





**3MAJ\*/4MAJ Mounting Styles for 6" to 8" Bore**

| Mounting style   | NFPA mounting | Description                 | Bore size |
|--|---------------|-----------------------------|-----------|
| T     | MX0           | No Mount                    | 1-1/2 - 8 |
| J     | MF1           | Head Rectangular Flange     | 1-1/2 - 6 |
| H     | MF2           | Cap Rectangular Flange      | 1-1/2 - 6 |
| TB    | MX3           | Tie Rods Extended Head End  | 1-1/2 - 8 |
| TC    | MX2           | Tie Rods Extended Cap End   | 1-1/2 - 8 |
| TD   | MX1           | Tie Rods Extended Both Ends | 1-1/2 - 8 |
| C   | MS2           | Side Lug                    | 1-1/2 - 8 |
| F   | MS4           | Side Tap                    | 1-1/2 - 8 |
| CB  | MS1           | Side End Angle              | 1-1/2 - 8 |
| G   | MS7           | Side End Lug                | 1-1/2 - 4 |

| Mounting style   | NFPA mounting | Description              | Bore size |
|--|---------------|--------------------------|-----------|
| BB    | MP1           | Cap Fixed Clevis         | 1-1/2 - 8 |
| BC    | MP2           | Cap Detachable Clevis    | 1-1/2 - 8 |
| BE    | MP4           | Cap Detachable Eye       | 1-1/2 - 6 |
| D     | MT1           | Head Trunnion            | 1-1/2 - 8 |
| DB    | MT2           | Cap Trunnion             | 1-1/2 - 8 |
| DD   | MT4           | Intermediate Trunnion    | 1-1/2 - 8 |
| KT  | MDX0          | Double Rod End, No Mount | 1-1/2 - 8 |

\* 3MAJ utilizes base 3MA cylinder and is available in 1-1/2" to 5" bore sizes. Mounting style codes C, D and DB not available for 3MAJ

**B**

**Tie Rod Cylinders  
Actuator Products**

**3MA  
Series**

**4MA/4ML  
Series**

**3MAJ/4MAJ  
Series**

**4MNR  
Series**

**P1D  
Series**

**Sensors**

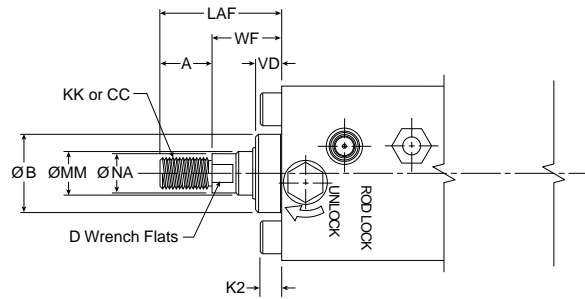
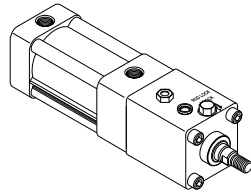
For sensors see page B294.



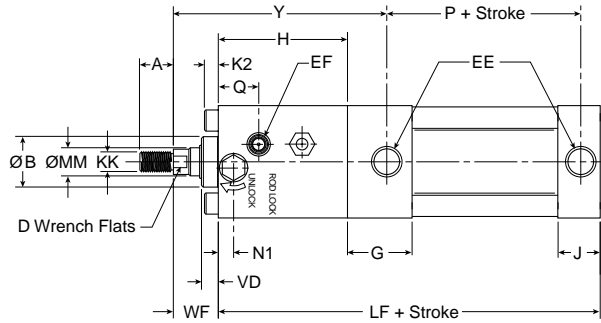
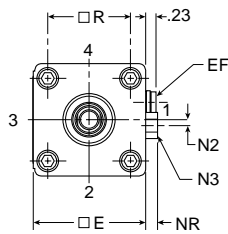
**3MAJ/4MAJ Series Single Rod Dimensions**

**No Mount Basic**

Style T  
 (NFPA MX0)



For dimensions of all standard rod end styles, see next page.



**Style T**

| Bore size | Rod no. | Rod dia. MM | Thread     |                | A     | AA    | +0.000<br>-0.002<br>B | D     | E     | EE (NPTF) | EF (NPTF) | G     | H     | J     |
|-----------|---------|-------------|------------|----------------|-------|-------|-----------------------|-------|-------|-----------|-----------|-------|-------|-------|
|           |         |             | Style 8 CC | Style 4 & 9 KK |       |       |                       |       |       |           |           |       |       |       |
| 1-1/2     | 1       | 5/8         | 1/2-20     | 7/16-20        | 0.750 | 2.020 | 1.124                 | 1/2   | 2.000 | 3/8       | 1/8       | 1.438 | 2.625 | 0.938 |
|           | 2       | 5/8         | 1/2-20     | 7/16-20        | 0.750 | 2.600 | 1.124                 | 1/2   | 2.500 | 3/8       | 1/8       | 1.375 | 2.875 | 0.937 |
| 2         | 3       | 1           | 7/8-14     | 3/4-16         | 1.125 | 2.600 | 1.499                 | 7/8   | 2.500 | 3/8       | 1/8       | 1.375 | 3.875 | 0.937 |
|           | 1       | 5/8         | 1/2-20     | 7/16-20        | 0.750 | 3.100 | 1.124                 | 1/2   | 3.000 | 3/8       | 1/8       | 1.344 | 2.875 | 0.938 |
| 2-1/2     | 3       | 1           | 7/8-14     | 3/4-16         | 1.125 | 3.100 | 1.499                 | 7/8   | 3.000 | 3/8       | 1/8       | 1.344 | 4.000 | 0.938 |
|           | 1       | 1           | 7/8-14     | 3/4-16         | 1.125 | 3.900 | 1.499                 | 7/8   | 3.750 | 1/2       | 1/4       | 1.594 | 4.500 | 1.125 |
| 3-1/4     | 3       | 1-3/8       | 1-1/4-12   | 1-14           | 1.625 | 3.900 | 1.999                 | 1-1/8 | 3.750 | 1/2       | 1/4       | 1.594 | 4.875 | 1.125 |
|           | 1       | 1           | 7/8-14     | 3/4-16         | 1.125 | 4.700 | 1.499                 | 7/8   | 4.500 | 1/2       | 1/4       | 1.594 | 4.875 | 1.125 |
| 4         | 3       | 1-3/8       | 1-1/4-12   | 1-14           | 1.625 | 4.700 | 1.999                 | 1-1/8 | 4.500 | 1/2       | 1/4       | 1.594 | 5.125 | 1.125 |
|           | 1       | 1           | 7/8-14     | 3/4-16         | 1.125 | 5.800 | 1.499                 | 7/8   | 5.500 | 1/2       | 1/4       | 1.594 | 5.375 | 1.219 |
| 5         | 3       | 1-3/8       | 1-1/4-12   | 1-14           | 1.625 | 5.800 | 1.999                 | 1-1/8 | 5.500 | 1/2       | 1/4       | 1.594 | 5.750 | 1.219 |

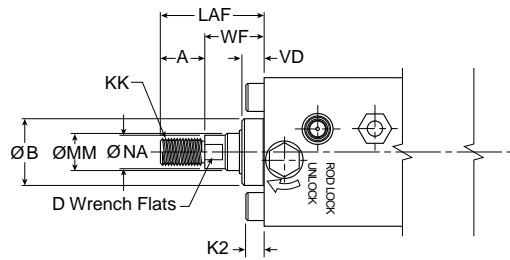
| Bore size | Rod no. | Rod dia. MM | K2    | LAF   | N1    | N2    | Hex N3 | NA    | NR    | Q     | R     | VD    | WF    | Y     | Add stroke |       |
|-----------|---------|-------------|-------|-------|-------|-------|--------|-------|-------|-------|-------|-------|-------|-------|------------|-------|
|           |         |             |       |       |       |       |        |       |       |       |       |       |       |       | LF         | P     |
| 1-1/2     | 1       | 5/8         | 0.250 | 1.750 | 0.220 | 0.140 | 5/16   | 0.563 | 0.190 | 0.715 | 1.430 | 0.375 | 1.000 | 4.500 | 6.250      | 2.313 |
|           | 1       | 5/8         | 0.313 | 1.750 | 0.340 | 0.130 | 1/2    | 0.563 | 0.265 | 0.895 | 1.840 | 0.375 | 1.000 | 4.750 | 6.500      | 2.313 |
| 2         | 3       | 1           | 0.313 | 2.500 | 0.338 | 0.146 | 1/2    | 0.938 | 0.275 | 1.065 | 1.840 | 0.500 | 1.375 | 6.125 | 7.500      | 2.313 |
|           | 1       | 5/8         | 0.313 | 1.750 | 0.346 | 0.150 | 1/2    | 0.563 | 0.265 | 0.755 | 2.190 | 0.500 | 1.000 | 4.813 | 6.625      | 2.375 |
| 2-1/2     | 3       | 1           | 0.313 | 2.500 | 0.346 | 0.148 | 1/2    | 0.938 | 0.265 | 1.120 | 2.190 | 0.500 | 1.375 | 6.313 | 7.750      | 2.375 |
|           | 1       | 1           | 0.375 | 2.500 | 0.631 | 0.180 | 5/8    | 0.938 | 0.340 | 1.510 | 2.760 | 0.500 | 1.375 | 6.938 | 8.750      | 2.625 |
| 3-1/4     | 3       | 1-3/8       | 0.375 | 3.250 | 0.813 | 0.247 | 5/8    | 1.313 | 0.350 | 1.645 | 2.760 | 0.625 | 1.625 | 7.563 | 9.125      | 2.625 |
|           | 1       | 1           | 0.375 | 2.500 | 0.625 | 0.240 | 7/8    | 0.938 | 0.500 | 1.725 | 3.320 | 0.500 | 1.375 | 7.313 | 9.125      | 2.625 |
| 4         | 3       | 1-3/8       | 0.375 | 3.250 | 0.771 | 0.276 | 7/8    | 1.313 | 0.490 | 1.679 | 3.320 | 0.750 | 1.625 | 7.813 | 9.375      | 2.625 |
|           | 1       | 1           | 0.500 | 2.500 | 0.720 | 0.220 | 7/8    | 0.938 | 0.500 | 1.995 | 4.100 | 0.500 | 1.375 | 7.813 | 9.875      | 2.875 |
| 5         | 3       | 1-3/8       | 0.500 | 3.250 | 0.720 | 0.220 | 7/8    | 1.313 | 0.490 | 2.330 | 4.100 | 0.750 | 1.625 | 8.438 | 10.250     | 2.875 |



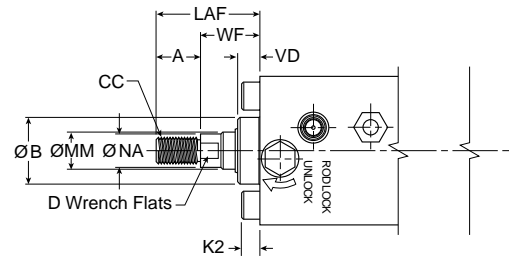
**B**  
 Tie Rod Cylinders  
 Actuator Products  
 Series  
 3MA  
 4MA/4ML  
 3MAJ/4MAJ  
 4MNR  
 P1D

**Rod End Dimensions**

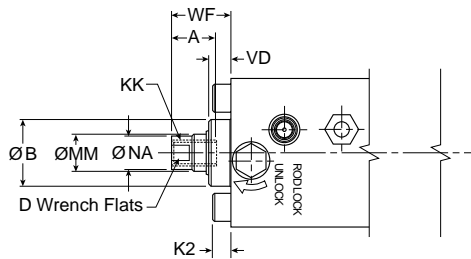
**Thread Style 4**  
 (NFPA Style SM)  
 Small Male



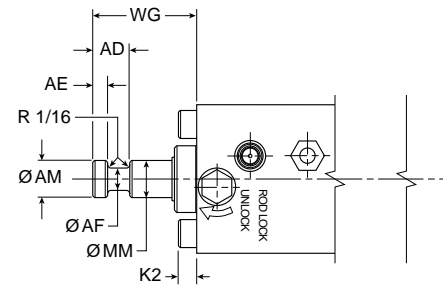
**Thread Style 8**  
 (NFPA Style IM)  
 Intermediate Male



**Thread Style 9**  
 (NFPA Style SF)  
 Short Female



**Thread Style 55**  
 For use with Split Coupler  
 (please reference catalog 0900P-E, page B105 for more information)



**Thread Style 3 - "Special Thread"**

Special threads, rod extensions, rod eyes, blanks, etc. are also available. To order, specify "Style 3" and give desired dimensions for KK or CC, A and W or WF. If otherwise special, please supply dimensioned sketch.

**Rod End Dimensions**

| Bore size | Rod no. | Rod dia. MM | Thread     |                | A       | AD    | AE    | AF    | AM    | B     | D     | K2    | LAF   | NA    | VD    | WF    | WG    |
|-----------|---------|-------------|------------|----------------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|           |         |             | Style 8 CC | Style 4 & 9 KK |         |       |       |       |       |       |       |       |       |       |       |       |       |
| 1-1/2     | 1       | 5/8         | 1/2-20     | 7/16-20        | 0.750   | 0.625 | 0.250 | 0.375 | 0.570 | 1.124 | 1/2   | 0.250 | 1.750 | 0.563 | 0.375 | 1.000 | 1.750 |
|           | 2       | 1           | 7/8-14     | 3/4-16         | 1.125   | 0.938 | 0.375 | 0.688 | 0.950 | 1.499 | 7/8   | 0.313 | 2.500 | 0.938 | 0.500 | 1.375 | 2.375 |
|           | 3       | 1           | 5/8        | 1/2-20         | 7/16-20 | 0.750 | 0.625 | 0.250 | 0.375 | 0.570 | 1.124 | 1/2   | 0.313 | 1.750 | 0.563 | 0.375 | 1.000 |
| 2-1/2     | 1       | 5/8         | 1/2-20     | 7/16-20        | 0.750   | 0.625 | 0.250 | 0.375 | 0.570 | 1.124 | 1/2   | 0.313 | 1.750 | 0.563 | 0.500 | 1.000 | 1.750 |
|           | 3       | 1           | 7/8-14     | 3/4-16         | 1.125   | 0.938 | 0.375 | 0.688 | 0.950 | 1.499 | 7/8   | 0.313 | 2.500 | 0.938 | 0.500 | 1.375 | 2.375 |
| 3-1/4     | 1       | 1           | 7/8-14     | 3/4-16         | 1.125   | 0.938 | 0.375 | 0.688 | 0.950 | 1.499 | 7/8   | 0.375 | 2.500 | 0.938 | 0.500 | 1.375 | 2.375 |
|           | 3       | 1-3/8       | 1-1/4-12   | 1-14           | 1.625   | 1.063 | 0.375 | 0.875 | 1.320 | 1.999 | 1-1/8 | 0.375 | 3.250 | 1.313 | 0.625 | 1.625 | 2.750 |
| 4         | 1       | 1           | 7/8-14     | 3/4-16         | 1.125   | 0.938 | 0.375 | 0.688 | 0.950 | 1.499 | 7/8   | 0.375 | 2.500 | 0.938 | 0.500 | 1.375 | 2.375 |
|           | 3       | 1-3/8       | 1-1/4-12   | 1-14           | 1.625   | 1.063 | 0.375 | 0.875 | 1.320 | 1.999 | 1-1/8 | 0.375 | 3.250 | 1.313 | 0.750 | 1.625 | 2.750 |
| 5         | 1       | 1           | 7/8-14     | 3/4-16         | 1.125   | 0.938 | 0.375 | 0.688 | 0.950 | 1.499 | 7/8   | 0.500 | 2.500 | 0.938 | 0.500 | 1.375 | 2.375 |
|           | 3       | 1-3/8       | 1-1/4-12   | 1-14           | 1.625   | 1.063 | 0.375 | 0.875 | 1.320 | 1.999 | 1-1/8 | 0.500 | 3.250 | 1.313 | 0.750 | 1.625 | 2.750 |

**B**

Tie Rod Cylinders  
Actuator Products

3MA Series

4MA/4ML Series

3MAJ/4MAJ Series

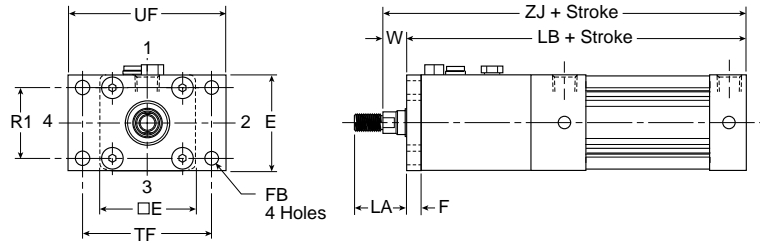
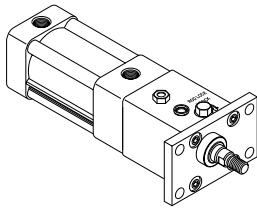
4MNR Series

P1D Series



**Head Rectangular Flange**

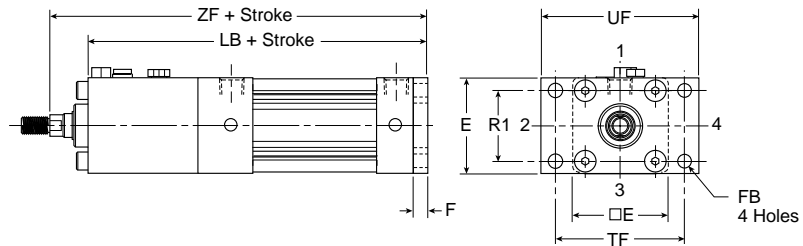
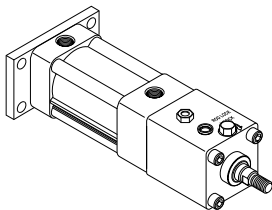
Style J  
(NFPA MF1)



**Note:** Style J has a W dimension instead of WF and a LA dimension instead of LAF because of the flange installation. Please use dimensions W and LA regarding rod ends only for Style J. For reference,  $WF = W + F$  and  $LA = W + A$ .

**Cap Rectangular Flange**

Style H  
(NFPA MF2)



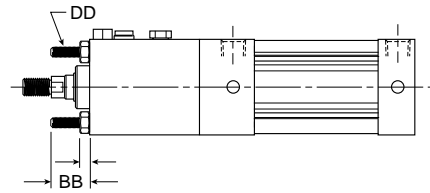
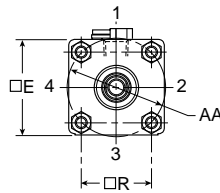
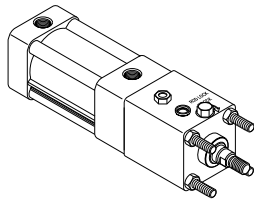
**Styles J and H**

| Bore size | Rod no. | Rod dia. MM | A     | E     | F     | FB    | LA    | R1    | TF    | UF    | W     | Add stroke |        |        |
|-----------|---------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|--------|--------|
|           |         |             |       |       |       |       |       |       |       |       |       | LB         | ZF     | ZJ     |
| 1-1/2     | 1       | 5/8         | 0.750 | 2.000 | 0.375 | 0.313 | 1.375 | 1.430 | 2.750 | 3.375 | 0.625 | 6.625      | 7.625  | 7.250  |
|           | 1       | 5/8         | 0.750 | 2.500 | 0.375 | 0.375 | 1.375 | 1.840 | 3.375 | 4.125 | 0.625 | 6.875      | 7.875  | 7.500  |
|           | 3       | 1           | 1.125 | 2.500 | 0.375 | 0.375 | 2.125 | 1.840 | 3.375 | 4.125 | 1.000 | 7.875      | 9.250  | 8.875  |
| 2-1/2     | 1       | 5/8         | 0.750 | 3.000 | 0.375 | 0.375 | 1.375 | 2.190 | 3.875 | 4.625 | 0.625 | 7.000      | 8.000  | 7.625  |
|           | 3       | 1           | 1.125 | 3.000 | 0.375 | 0.375 | 2.125 | 2.190 | 3.875 | 4.625 | 1.000 | 8.125      | 9.500  | 9.125  |
| 3-1/4     | 1       | 1           | 1.125 | 3.750 | 0.625 | 0.438 | 1.875 | 2.760 | 4.688 | 5.500 | 0.750 | 9.375      | 10.750 | 10.125 |
|           | 3       | 1-3/8       | 1.625 | 3.750 | 0.625 | 0.438 | 2.625 | 2.760 | 4.688 | 5.500 | 1.000 | 9.750      | 11.375 | 10.750 |
| 4         | 1       | 1           | 1.125 | 4.500 | 0.625 | 0.438 | 1.875 | 3.320 | 5.438 | 6.250 | 0.750 | 9.750      | 11.125 | 10.500 |
|           | 3       | 1-3/8       | 1.625 | 4.500 | 0.625 | 0.438 | 2.625 | 3.320 | 5.438 | 6.250 | 1.000 | 10.000     | 11.625 | 11.000 |
| 5         | 1       | 1           | 1.125 | 5.500 | 0.625 | 0.563 | 1.875 | 4.100 | 6.625 | 7.625 | 0.750 | 10.500     | 11.875 | 11.250 |
|           | 3       | 1-3/8       | 1.625 | 5.500 | 0.625 | 0.563 | 2.625 | 4.100 | 6.625 | 7.625 | 1.000 | 10.875     | 12.500 | 11.875 |

**B**  
Tie Rod Cylinders  
Actuator Products  
Series  
3MA  
Series  
4MA/4ML  
Series  
3MAJ/4MAJ  
Series  
4MNR  
Series  
P1D  
Series

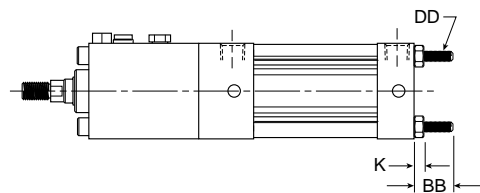
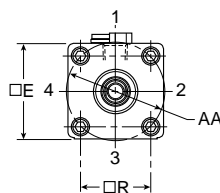
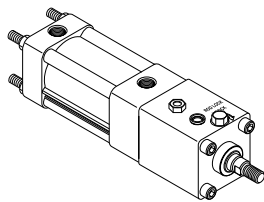
**Tie Rods Extended Head End Mount**

Style TB  
 (NFPA MX3)



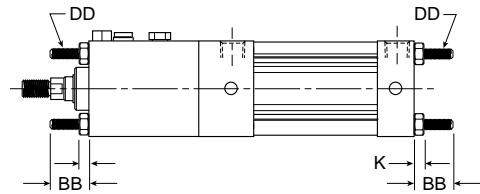
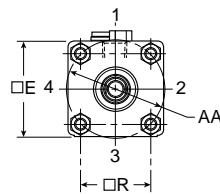
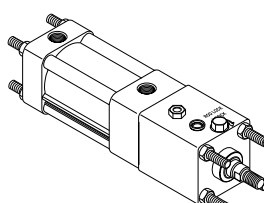
**Tie Rods Extended Cap End Mount**

Style TC  
 (NFPA MX2)



**Tie Rods Extended Both Ends Mount**

Style TD  
 (NFPA MX1)



**Styles TB, TC and TD**

| Bore size | Rod no. | Rod dia. MM | AA    | BB    | DD      | E     | K     | R     |
|-----------|---------|-------------|-------|-------|---------|-------|-------|-------|
| 1-1/2     | 1       | 5/8         | 2.020 | 1.000 | 1/4-28  | 2.000 | 0.250 | 1.430 |
| 2         | 1       | 5/8         | 2.600 | 1.125 | 5/16-24 | 2.500 | 0.313 | 1.840 |
|           | 3       | 1           | 2.600 | 1.125 | 5/16-24 | 2.500 | 0.313 | 1.840 |
| 2-1/2     | 1       | 5/8         | 3.100 | 1.125 | 5/16-24 | 3.000 | 0.313 | 2.190 |
|           | 3       | 1           | 3.100 | 1.125 | 5/16-24 | 3.000 | 0.313 | 2.190 |
| 3-1/4     | 1       | 1           | 3.900 | 1.375 | 3/8-24  | 3.750 | 0.375 | 2.760 |
|           | 3       | 1-3/8       | 3.900 | 1.375 | 3/8-24  | 3.750 | 0.375 | 2.760 |
| 4         | 1       | 1           | 4.700 | 1.375 | 3/8-24  | 4.500 | 0.375 | 3.320 |
|           | 3       | 1-3/8       | 4.700 | 1.375 | 3/8-24  | 4.500 | 0.375 | 3.320 |
| 5         | 1       | 1           | 5.800 | 1.813 | 1/2-20  | 5.500 | 0.438 | 4.100 |
|           | 3       | 1-3/8       | 5.800 | 1.813 | 1/2-20  | 5.500 | 0.438 | 4.100 |

**B**

Tie Rod Cylinders  
Actuator Products

3MA Series

4MA/4ML Series

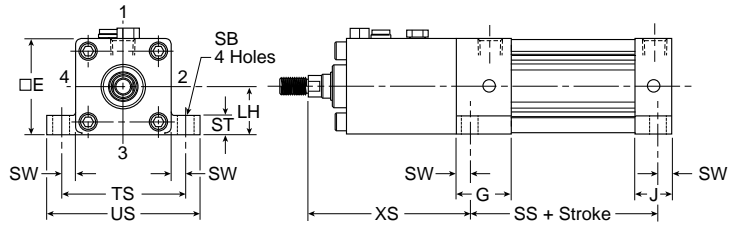
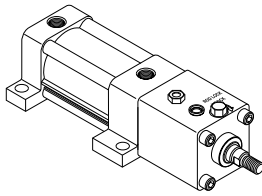
3MAJ/4MAJ Series

4MNR Series

P1D Series

**Side Lug Mount**

Style C (only 4MAJ)  
 (NFPA MS2)

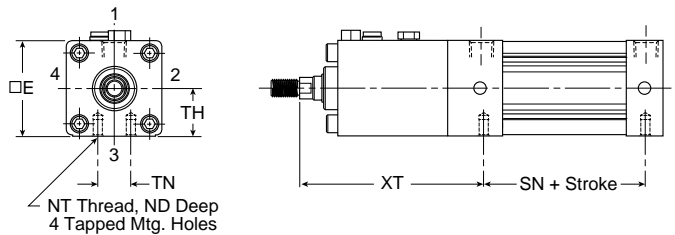
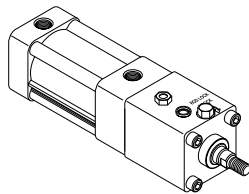


**Style C**

| Bore size | Rod no. | Rod dia. MM | E     | G     | J     | +/- .003 LH | SB    | ST    | SW    | TS    | US    | XS    | Add stroke SS |
|-----------|---------|-------------|-------|-------|-------|-------------|-------|-------|-------|-------|-------|-------|---------------|
| 1-1/2     | 1       | 5/8         | 2.000 | 1.438 | 0.938 | 0.993       | 0.438 | 0.500 | 0.375 | 2.750 | 3.500 | 4.000 | 2.875         |
|           | 2       | 5/8         | 2.500 | 1.375 | 0.937 | 1.243       | 0.438 | 0.500 | 0.375 | 3.250 | 4.000 | 4.250 | 2.875         |
| 2         | 3       | 1           | 2.500 | 1.375 | 0.937 | 1.243       | 0.438 | 0.500 | 0.375 | 3.250 | 4.000 | 5.625 | 2.875         |
|           | 1       | 5/8         | 3.000 | 1.344 | 0.938 | 1.493       | 0.438 | 0.500 | 0.375 | 3.750 | 4.500 | 4.250 | 3.000         |
| 2-1/2     | 3       | 1           | 3.000 | 1.344 | 0.938 | 1.493       | 0.438 | 0.500 | 0.375 | 3.750 | 4.500 | 5.750 | 3.000         |
|           | 1       | 5/8         | 3.750 | 1.594 | 1.125 | 1.868       | 0.563 | 0.750 | 0.500 | 4.750 | 5.750 | 6.375 | 3.250         |
| 3-1/4     | 3       | 1-3/8       | 3.750 | 1.594 | 1.125 | 1.868       | 0.563 | 0.750 | 0.500 | 4.750 | 5.750 | 7.000 | 3.250         |
|           | 1       | 1           | 4.500 | 1.594 | 1.125 | 2.243       | 0.563 | 0.750 | 0.500 | 5.500 | 6.500 | 6.750 | 3.250         |
| 4         | 3       | 1-3/8       | 4.500 | 1.594 | 1.125 | 2.243       | 0.563 | 0.750 | 0.500 | 5.500 | 6.500 | 7.250 | 3.250         |
|           | 1       | 1           | 5.500 | 1.594 | 1.219 | 2.743       | 0.813 | 1.000 | 0.688 | 6.875 | 8.250 | 7.438 | 3.125         |
| 5         | 3       | 1-3/8       | 5.500 | 1.594 | 1.219 | 2.743       | 0.813 | 1.000 | 0.688 | 6.875 | 8.250 | 8.063 | 3.125         |

**Side Tap Mount**

Style F  
 (NFPA MS4)



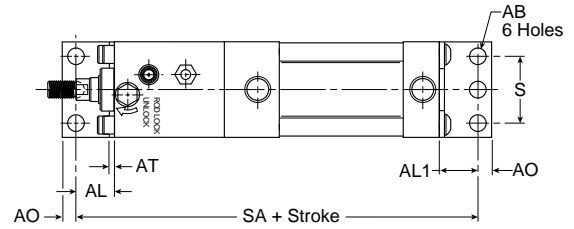
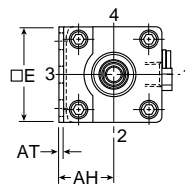
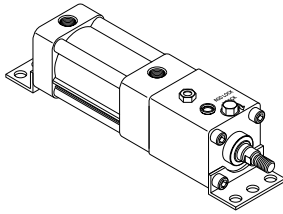
**Style F**

| Bore size | Rod no. | Rod dia. MM | E     | ND    | NT      | +/- .003 TH | TN    | XT    | Add stroke SN |
|-----------|---------|-------------|-------|-------|---------|-------------|-------|-------|---------------|
| 1-1/2     | 1       | 5/8         | 2.000 | 0.375 | 1/4-20  | 0.993       | 0.625 | 4.563 | 2.250         |
|           | 2       | 5/8         | 2.500 | 0.438 | 5/16-18 | 1.243       | 0.875 | 4.813 | 2.250         |
| 2         | 3       | 1           | 2.500 | 0.375 | 5/16-18 | 1.243       | 0.875 | 6.188 | 2.250         |
|           | 1       | 5/8         | 3.000 | 0.625 | 3/8-16  | 1.493       | 1.250 | 4.813 | 2.375         |
| 2-1/2     | 3       | 1           | 3.000 | 0.625 | 3/8-16  | 1.493       | 1.250 | 6.313 | 2.375         |
|           | 1       | 5/8         | 3.750 | 0.750 | 1/2-13  | 1.868       | 1.500 | 6.938 | 2.625         |
| 3-1/4     | 3       | 1-3/8       | 3.750 | 0.750 | 1/2-13  | 1.868       | 1.500 | 7.563 | 2.625         |
|           | 1       | 1           | 4.500 | 0.750 | 1/2-13  | 2.243       | 2.063 | 7.313 | 2.625         |
| 4         | 3       | 1-3/8       | 4.500 | 0.750 | 1/2-13  | 2.243       | 2.063 | 7.813 | 2.625         |
|           | 1       | 1           | 5.500 | 0.938 | 5/8-11  | 2.743       | 2.688 | 7.813 | 2.875         |
| 5         | 3       | 1-3/8       | 5.500 | 0.938 | 5/8-11  | 2.743       | 2.688 | 8.438 | 2.875         |



**Side End Angle Mount**

Style CB  
 (NFPA MS1)

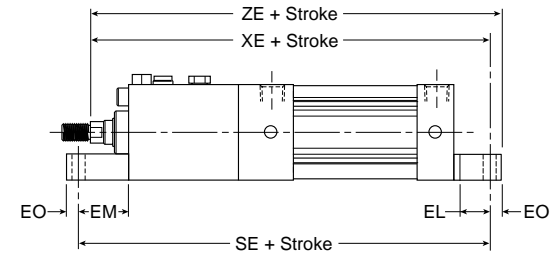
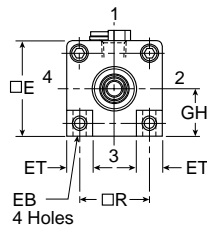
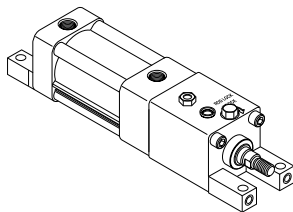


**Style CB**

| Bore size | Rod no. | Rod dia. MM | AB    | AH    | AL    | AL1   | AO    | AT    | E     | S     | Add stroke |
|-----------|---------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|------------|
|           |         |             |       |       |       |       |       |       |       |       | SA         |
| 1-1/2     | 1       | 5/8         | 0.438 | 1.188 | 1.000 | 1.000 | 0.375 | 0.125 | 2.000 | 1.250 | 8.250      |
|           | 3       | 1           | 0.438 | 1.438 | 1.000 | 1.000 | 0.375 | 0.125 | 2.500 | 1.750 | 8.500      |
| 2         | 1       | 5/8         | 0.438 | 1.438 | 1.000 | 1.000 | 0.375 | 0.125 | 2.500 | 1.750 | 9.500      |
|           | 3       | 1           | 0.438 | 1.438 | 1.000 | 1.000 | 0.375 | 0.125 | 2.500 | 1.750 | 9.500      |
| 2-1/2     | 1       | 5/8         | 0.438 | 1.625 | 1.000 | 1.000 | 0.375 | 0.125 | 3.000 | 2.250 | 8.625      |
|           | 3       | 1           | 0.438 | 1.625 | 1.000 | 1.000 | 0.375 | 0.125 | 3.000 | 2.250 | 9.750      |
| 3-1/4     | 1       | 1           | 0.563 | 1.938 | 1.250 | 1.250 | 0.500 | 0.125 | 3.750 | 2.750 | 11.250     |
|           | 3       | 1-3/8       | 0.563 | 1.938 | 1.250 | 1.250 | 0.500 | 0.125 | 3.750 | 2.750 | 11.625     |
| 4         | 1       | 1           | 0.563 | 2.250 | 1.875 | 1.250 | 0.500 | 0.125 | 4.500 | 3.500 | 12.250     |
|           | 3       | 1-3/8       | 0.563 | 2.250 | 1.875 | 1.250 | 0.500 | 0.125 | 4.500 | 3.500 | 12.500     |
| 5         | 1       | 1           | 0.688 | 2.750 | 1.375 | 1.375 | 0.625 | 0.188 | 5.500 | 4.250 | 12.625     |
|           | 3       | 1-3/8       | 0.688 | 2.750 | 1.375 | 1.375 | 0.625 | 0.188 | 5.500 | 4.250 | 13.000     |

**Side End Lug Mount**

Style G  
 (NFPA MS7)



**Style G**

| Bore size | Rod no. | Rod dia. MM | E     | EB    | EL    | EM    | EO    | ET    | +/- .003 GH | R     | Add stroke |        |        |
|-----------|---------|-------------|-------|-------|-------|-------|-------|-------|-------------|-------|------------|--------|--------|
|           |         |             |       |       |       |       |       |       |             |       | SE         | XE     | ZE     |
| 1-1/2     | 1       | 5/8         | 2.000 | 0.281 | 0.750 | 1.125 | 0.250 | 0.563 | 0.993       | 1.430 | 8.125      | 8.000  | 8.250  |
|           | 3       | 1           | 2.500 | 0.344 | 0.938 | 1.313 | 0.313 | 0.688 | 1.243       | 1.840 | 8.750      | 8.438  | 8.750  |
| 2         | 1       | 5/8         | 2.500 | 0.344 | 0.938 | 1.313 | 0.313 | 0.688 | 1.243       | 1.840 | 9.750      | 9.813  | 10.125 |
|           | 3       | 1           | 2.500 | 0.344 | 0.938 | 1.313 | 0.313 | 0.688 | 1.243       | 1.840 | 9.750      | 9.813  | 10.125 |
| 2-1/2     | 1       | 5/8         | 3.000 | 0.344 | 1.063 | 1.438 | 0.313 | 0.813 | 1.493       | 2.190 | 9.125      | 8.688  | 9.000  |
|           | 3       | 1           | 3.000 | 0.344 | 1.063 | 1.438 | 0.313 | 0.813 | 1.493       | 2.190 | 10.250     | 10.188 | 10.500 |
| 3-1/4     | 1       | 1           | 3.750 | 0.406 | 0.875 | 1.500 | 0.375 | 1.000 | 1.868       | 2.760 | 11.125     | 11.000 | 11.375 |
|           | 3       | 1-3/8       | 3.750 | 0.406 | 0.875 | 1.500 | 0.375 | 1.000 | 1.868       | 2.760 | 11.500     | 11.625 | 12.000 |
| 4         | 1       | 1           | 4.500 | 0.406 | 1.000 | 1.625 | 0.375 | 1.188 | 2.243       | 3.320 | 11.750     | 11.500 | 11.875 |
|           | 3       | 1-3/8       | 4.500 | 0.406 | 1.000 | 1.625 | 0.375 | 1.188 | 2.243       | 3.320 | 12.000     | 12.000 | 12.375 |

**B**

Tie Rod Cylinders  
 Actuator Products

3MA Series

4MA/4ML Series

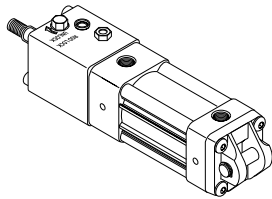
3MAJ/4MAJ Series

4MNR Series

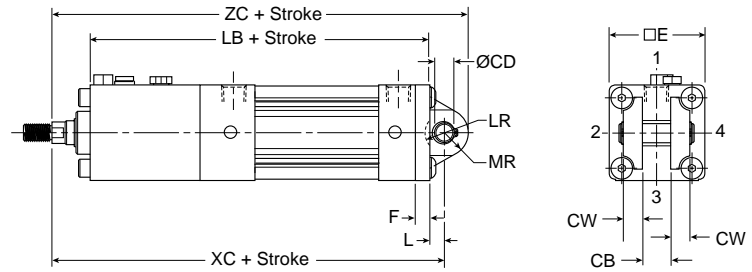
P1D Series

**Cap Fixed Clevis Mount**

Style BB  
 (NFPA MP1)

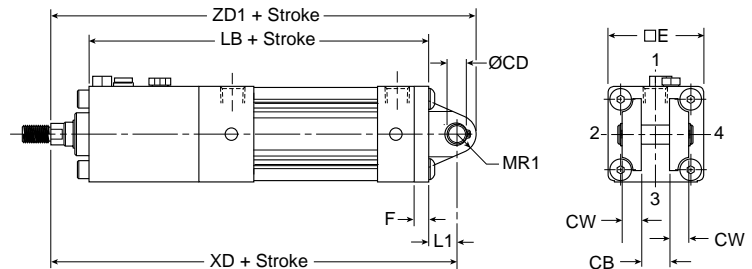
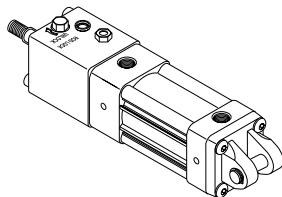


**NOTE:** For maximum swivel angle of BB mount with rear mounting plate, please reference catalog 0900P-E, cylinder accessories on page B108.



**Cap Detachable Clevis Mount**

Style BC  
 (NFPA MP2)



**Styles BB and BC**

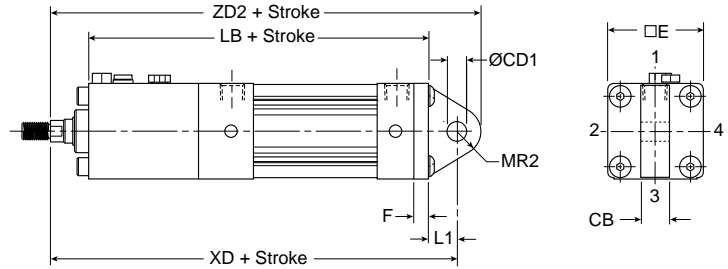
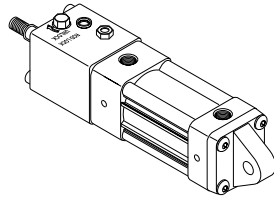
| Bore size | Rod no. | Rod dia. MM | CB    | +0.002<br>-0.002<br>CD | CW    | E     | F     | L     | L1    | LR    | MR    | MR1   | Add stroke |        |        |        |        |
|-----------|---------|-------------|-------|------------------------|-------|-------|-------|-------|-------|-------|-------|-------|------------|--------|--------|--------|--------|
|           |         |             |       |                        |       |       |       |       |       |       |       |       | LB         | XC     | XD     | ZC     | ZD1    |
| 1-1/2     | 1       | 5/8         | 0.750 | 0.501                  | 0.500 | 2.000 | 0.375 | 0.375 | 0.750 | 0.750 | 0.625 | 0.500 | 6.625      | 8.000  | 8.375  | 8.625  | 8.875  |
|           | 2       | 1           | 0.750 | 0.501                  | 0.500 | 2.500 | 0.375 | 0.375 | 0.750 | 0.750 | 0.625 | 0.500 | 6.875      | 8.250  | 8.625  | 8.875  | 9.125  |
| 2         | 3       | 1           | 0.750 | 0.501                  | 0.500 | 2.500 | 0.375 | 0.375 | 0.750 | 0.750 | 0.625 | 0.500 | 7.875      | 9.625  | 10.000 | 10.250 | 10.500 |
|           | 1       | 5/8         | 0.750 | 0.501                  | 0.500 | 3.000 | 0.375 | 0.375 | 0.750 | 0.750 | 0.625 | 0.500 | 7.000      | 8.375  | 8.750  | 9.000  | 9.250  |
| 2-1/2     | 3       | 1           | 0.750 | 0.501                  | 0.500 | 3.000 | 0.375 | 0.375 | 0.750 | 0.750 | 0.625 | 0.500 | 8.125      | 9.875  | 10.250 | 10.500 | 10.750 |
|           | 1       | 1           | 1.250 | 0.751                  | 0.625 | 3.750 | 0.625 | 0.625 | 1.250 | 1.000 | 0.938 | 0.750 | 9.375      | 11.375 | 12.000 | 12.313 | 12.750 |
| 3-1/4     | 3       | 1-3/8       | 1.250 | 0.751                  | 0.625 | 3.750 | 0.625 | 0.625 | 1.250 | 1.000 | 0.938 | 0.750 | 9.750      | 12.000 | 12.625 | 12.938 | 13.375 |
|           | 1       | 1           | 1.250 | 0.751                  | 0.625 | 4.500 | 0.625 | 0.625 | 1.250 | 1.000 | 0.938 | 0.750 | 9.750      | 11.750 | 12.375 | 12.688 | 13.125 |
| 4         | 3       | 1-3/8       | 1.250 | 0.751                  | 0.625 | 4.500 | 0.625 | 0.625 | 1.250 | 1.000 | 0.938 | 0.750 | 10.000     | 12.250 | 12.875 | 13.188 | 13.625 |
|           | 1       | 1           | 1.250 | 0.751                  | 0.625 | 5.500 | 0.625 | 0.625 | 1.250 | 1.000 | 0.938 | 0.750 | 10.500     | 12.500 | 13.125 | 13.438 | 13.875 |
| 5         | 3       | 1-3/8       | 1.250 | 0.751                  | 0.625 | 5.500 | 0.625 | 0.625 | 1.250 | 1.000 | 0.938 | 0.750 | 10.875     | 13.125 | 13.750 | 14.063 | 14.500 |

**B**  
 Tie Rod Cylinders  
 Actuator Products  
 Series  
 3MA  
 Series  
 4MA/4ML  
 Series  
 3MAJ/4MAJ  
 Series  
 4MNR  
 Series  
 P1D  
 Series

**Cap Detachable Eye Mount\***

Style BE  
 (NFPA MP4)

\* Not available for  
 5" bore 3MAJ,  
 please specify 4MAJ.



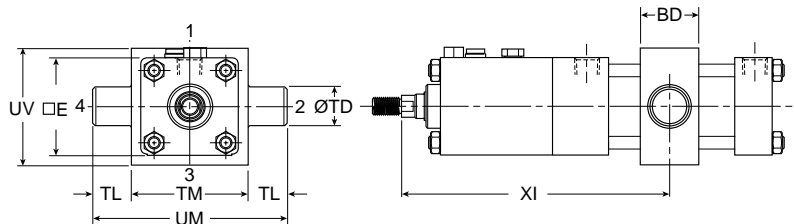
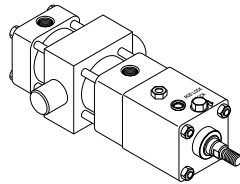
**Style BE**

| Bore size | Rod no. | Rod dia. MM | CB    | +0.02<br>+0.04<br>CD1 | E     | F     | L1    | MR2   | Add Stroke |        |        |
|-----------|---------|-------------|-------|-----------------------|-------|-------|-------|-------|------------|--------|--------|
|           |         |             |       |                       |       |       |       |       | LB         | XD     | ZD2    |
| 1-1/2     | 1       | 5/8         | 0.750 | 0.500                 | 2.000 | 0.375 | 0.750 | 0.625 | 6.625      | 8.375  | 9.000  |
|           | 3       | 1           | 0.750 | 0.500                 | 2.500 | 0.375 | 0.750 | 0.625 | 6.875      | 8.625  | 9.250  |
| 2         | 1       | 5/8         | 0.750 | 0.500                 | 2.500 | 0.375 | 0.750 | 0.625 | 7.875      | 10.000 | 10.625 |
|           | 3       | 1           | 0.750 | 0.500                 | 3.000 | 0.375 | 0.750 | 0.688 | 8.125      | 10.250 | 10.938 |
| 2-1/2     | 1       | 5/8         | 0.750 | 0.500                 | 3.000 | 0.375 | 0.750 | 0.688 | 9.375      | 12.000 | 12.875 |
|           | 3       | 1           | 0.750 | 0.500                 | 3.750 | 0.625 | 1.250 | 0.875 | 9.750      | 12.625 | 13.500 |
| 3-1/4     | 1       | 1           | 1.250 | 0.750                 | 4.500 | 0.625 | 1.250 | 0.875 | 9.750      | 12.375 | 13.250 |
|           | 3       | 1-3/8       | 1.250 | 0.750                 | 5.500 | 0.625 | 1.250 | 0.875 | 10.000     | 12.875 | 13.750 |
| 4         | 1       | 1           | 1.250 | 0.750                 | 5.500 | 0.625 | 1.250 | 0.875 | 10.500     | 13.125 | 14.000 |
|           | 3       | 1-3/8       | 1.250 | 0.750                 | 5.500 | 0.625 | 1.250 | 0.875 | 10.875     | 13.750 | 14.625 |
| 5*        | 1       | 1           | 1.250 | 0.750                 | 5.500 | 0.625 | 1.250 | 0.875 |            |        |        |
|           | 3       | 1-3/8       | 1.250 | 0.750                 | 5.500 | 0.625 | 1.250 | 0.875 |            |        |        |

**Intermediate Trunnion Mount**

Style DD  
 (NFPA MT4)

**Note:** Tie rod nuts for Style DD have a slot instead of external hex.



**Note:** Style DD requires minimum stroke per table.

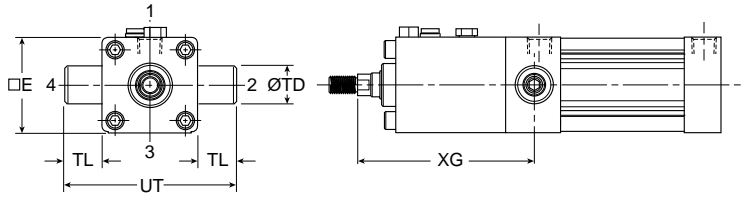
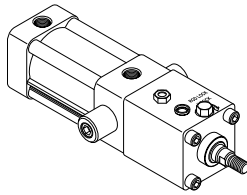
**Style DD**

| Bore size | Rod no. | Rod dia. MM | E     | BD    | +0.00<br>-0.01<br>TD | TL    | TM    | UM    | UV    | Min. XI | Min. stroke |
|-----------|---------|-------------|-------|-------|----------------------|-------|-------|-------|-------|---------|-------------|
|           |         |             |       |       |                      |       |       |       |       |         |             |
| 2         | 1       | 5/8         | 2.500 | 1.500 | 1.000                | 1.000 | 3.000 | 5.000 | 3.000 | 6.00    | 4.000       |
|           | 3       | 1           | 2.500 | 1.500 | 1.000                | 1.000 | 3.000 | 5.000 | 3.000 | 7.38    | 4.000       |
| 2-1/2     | 1       | 5/8         | 3.000 | 1.500 | 1.000                | 1.000 | 3.500 | 5.500 | 3.500 | 5.97    | 3.875       |
|           | 3       | 1           | 3.000 | 1.500 | 1.000                | 1.000 | 3.500 | 5.500 | 3.500 | 7.47    | 3.875       |
| 3-1/4     | 1       | 1           | 3.750 | 2.000 | 1.000                | 1.000 | 4.500 | 6.500 | 4.250 | 13.72   | 4.375       |
|           | 3       | 1-3/8       | 3.750 | 2.000 | 1.000                | 1.000 | 4.500 | 6.500 | 4.250 | 14.34   | 4.375       |
| 4         | 1       | 1           | 4.500 | 2.000 | 1.000                | 1.000 | 5.250 | 7.250 | 5.000 | 14.09   | 4.875       |
|           | 3       | 1-3/8       | 4.500 | 2.000 | 1.000                | 1.000 | 5.250 | 7.250 | 5.000 | 14.59   | 4.875       |
| 5         | 1       | 1           | 5.500 | 2.000 | 1.000                | 1.000 | 6.250 | 8.250 | 6.000 | 16.34   | 5.125       |
|           | 3       | 1-3/8       | 5.500 | 2.000 | 1.000                | 1.000 | 6.250 | 8.250 | 6.000 | 16.97   | 5.125       |



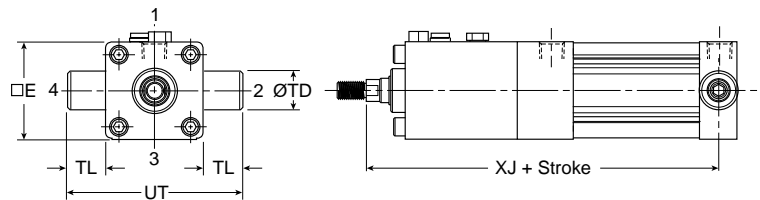
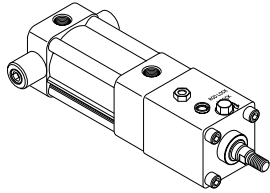
**Head Trunnion Mount**

Style D (only 4MAJ)  
 (NFPA MT1)



**Cap Trunnion Mount**

Style DB (only 4MAJ)  
 (NFPA MT2)



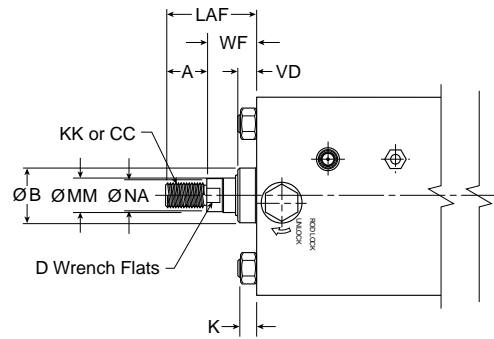
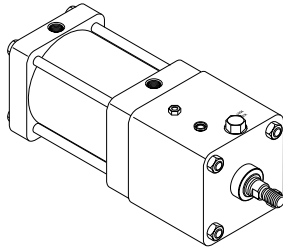
**Styles D and DB**

| Bore size | Rod no. | Rod dia. MM | E     | +0.000 -0.001 TD | TL    | UT    | XG    | XJ     |
|-----------|---------|-------------|-------|------------------|-------|-------|-------|--------|
| 1-1/2     | 1       | 5/8         | 2.000 | 1.000            | 1.000 | 4.000 | 4.375 | 6.750  |
|           | 3       | 1           | 2.500 | 1.000            | 1.000 | 4.500 | 4.625 | 7.000  |
| 2         | 1       | 5/8         | 2.500 | 1.000            | 1.000 | 4.500 | 4.625 | 7.000  |
|           | 3       | 1           | 2.500 | 1.000            | 1.000 | 4.500 | 6.000 | 8.375  |
| 2-1/2     | 1       | 5/8         | 3.000 | 1.000            | 1.000 | 5.000 | 4.625 | 7.125  |
|           | 3       | 1           | 3.000 | 1.000            | 1.000 | 5.000 | 6.125 | 8.625  |
| 3-1/4     | 1       | 1           | 3.750 | 1.000            | 1.000 | 5.750 | 6.750 | 9.500  |
|           | 3       | 1-3/8       | 3.750 | 1.000            | 1.000 | 5.750 | 7.375 | 10.125 |
| 4         | 1       | 1           | 4.500 | 1.000            | 1.000 | 6.500 | 7.125 | 9.875  |
|           | 3       | 1-3/8       | 4.500 | 1.000            | 1.000 | 6.500 | 7.625 | 10.375 |
| 5         | 1       | 1           | 5.500 | 1.000            | 1.000 | 7.500 | 7.625 | 10.625 |
|           | 3       | 1-3/8       | 5.500 | 1.000            | 1.000 | 7.500 | 8.250 | 11.250 |

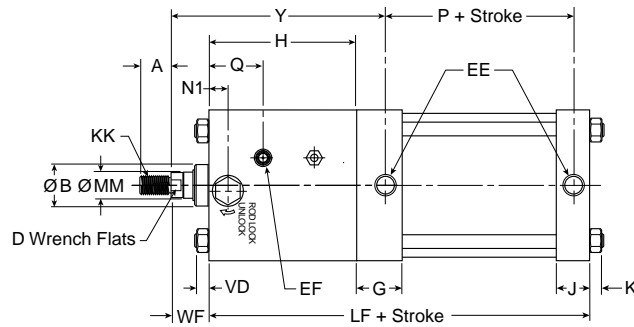
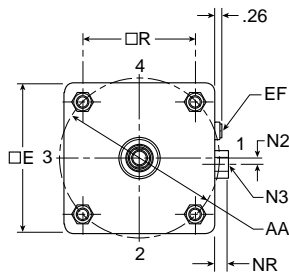
**B**  
Tie Rod Cylinders  
Actuator Products

Series  
3MA  
Series  
4MA/4ML  
Series  
3MAJ/4MAJ  
Series  
4MNR  
Series  
P1D

**No Mount**  
 Style T  
 (NFPA MX0)



For dimensions of all standard rod end styles, see next page.



**Style T**

| Bore size | Rod no. | Rod dia. MM | Thread     |                | A     | AA    | B     | D     | E     | EE (NPTF) | EF (NPTF) | G     | H     | J     |
|-----------|---------|-------------|------------|----------------|-------|-------|-------|-------|-------|-----------|-----------|-------|-------|-------|
|           |         |             | Style 8 CC | Style 4 & 9 KK |       |       |       |       |       |           |           |       |       |       |
| 6         | 1       | 1-3/8       | 1-1/4 - 12 | 1-14           | 1.625 | 6.900 | 1.999 | 1-1/8 | 6.500 | 3/4       | 1/4       | 1.910 | 6.375 | 1.410 |
|           | 3       | 1-3/4       | 1-1/2 - 12 | 1-1/4 - 12     | 2.000 | 6.900 | 2.374 | 1-1/2 | 6.500 | 3/4       | 1/4       | 1.910 | 6.875 | 1.410 |
| 8         | 1       | 1-3/8       | 1-1/4 - 12 | 1-14           | 1.625 | 9.100 | 1.999 | 1-1/8 | 8.500 | 3/4       | 1/4       | 1.810 | 6.625 | 1.440 |
|           | 3       | 1-3/4       | 1-1/2 - 12 | 1-1/4 - 12     | 2.000 | 9.100 | 2.374 | 1-1/2 | 8.500 | 3/4       | 1/4       | 1.810 | 7.125 | 1.440 |

| Bore size | Rod no. | Rod dia. MM | K     | LAF   | N1    | N2    | Hex N3 | NA    | NR    | Q     | R     | VD    | WF    | Y      | Add stroke |       |
|-----------|---------|-------------|-------|-------|-------|-------|--------|-------|-------|-------|-------|-------|-------|--------|------------|-------|
|           |         |             |       |       |       |       |        |       |       |       |       |       |       |        | LF         | P     |
| 6         | 1       | 1-3/8       | 0.438 | 3.250 | 1.165 | 0.177 | 1-5/16 | 1.313 | 0.750 | 2.705 | 4.880 | 0.755 | 1.625 | 9.188  | 11.375     | 3.125 |
|           | 3       | 1-3/4       | 0.438 | 3.875 | 1.495 | 0.177 | 1-5/16 | 1.688 | 0.740 | 3.055 | 4.880 | 0.875 | 1.875 | 9.938  | 11.875     | 3.125 |
| 8         | 1       | 1-3/8       | 0.563 | 3.250 | 1.305 | 0.177 | 1-5/16 | 1.313 | 0.740 | 2.885 | 6.440 | 0.755 | 1.625 | 9.375  | 11.750     | 3.250 |
|           | 3       | 1-3/4       | 0.563 | 3.875 | 1.570 | 0.177 | 1-5/16 | 1.688 | 0.740 | 3.145 | 6.440 | 0.875 | 1.875 | 10.125 | 12.250     | 3.250 |

**B**

Tie Rod Cylinders  
Actuator Products

3MA Series

4MA/4ML Series

3MAJ/4MAJ Series

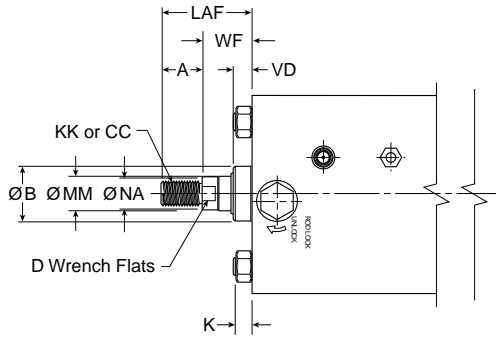
4MNR Series

P1D Series

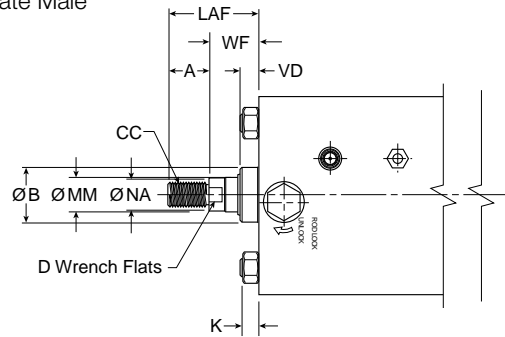


**Rod End Dimensions – 6" to 8" Bore Sizes**

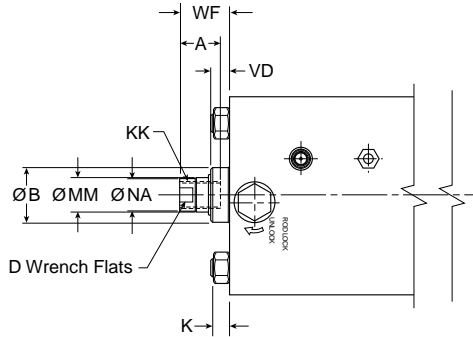
**Thread Style 4**  
 (NFPA Style SM)  
 Small Male



**Thread Style 8**  
 (NFPA Style IM)  
 Intermediate Male

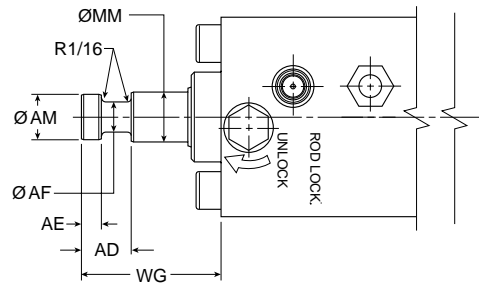


**Thread Style 9**  
 (NFPA Style SF)  
 Short Female



**Thread Style 55**

For use with Split Coupler  
 (please reference catalog 0900P-E, page B105 for more information)



**Thread Style 3 - "Special Thread"**

Special threads, rod extensions, rod eyes, blanks, etc. are also available.  
 To order, specify "Style 3" and give desired dimensions for KK or CC, A and W or WF.  
 If otherwise special, please supply dimensioned sketch.

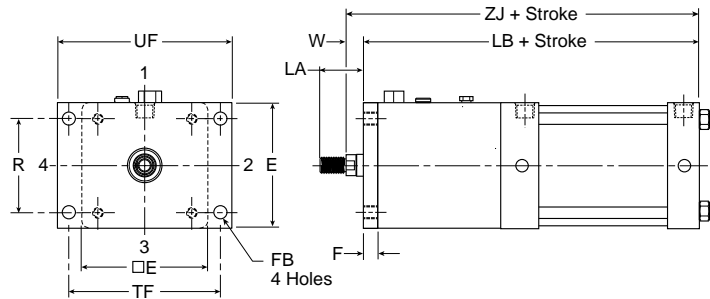
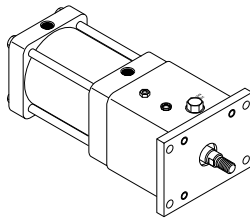
**Rod End Dimensions**

| Bore size | Rod no. | Rod dia. MM | Thread     |                |       |       |       |       |       |       |       |       |       |       |       |       |       |
|-----------|---------|-------------|------------|----------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|           |         |             | Style 8 CC | Style 4 & 9 KK | A     | AD    | AE    | AF    | AM    | B     | D     | K     | LAF   | NA    | VD    | WF    | WG    |
| 6         | 1       | 1-3/8       | 1-1/4-12   | 1-14           | 1.625 | 1.063 | 0.375 | 0.875 | 1.320 | 1.999 | 1-1/8 | 0.438 | 3.250 | 1.313 | 0.755 | 1.625 | 2.750 |
|           | 3       | 1-3/4       | 1-1/2-12   | 1-1/4-12       | 2.000 | 1.313 | 0.500 | 1.125 | 1.700 | 2.374 | 1-1/2 | 0.438 | 3.875 | 1.688 | 0.875 | 1.875 | 3.125 |
| 8         | 1       | 1-3/8       | 1-1/4-12   | 1-14           | 1.625 | 1.063 | 0.375 | 0.875 | 1.320 | 1.999 | 1-1/8 | 0.563 | 3.250 | 1.313 | 0.755 | 1.625 | 2.750 |
|           | 3       | 1-3/4       | 1-1/2-12   | 1-1/4-12       | 2.000 | 1.313 | 0.500 | 1.125 | 1.700 | 2.374 | 1-1/2 | 0.563 | 3.875 | 1.688 | 0.875 | 1.875 | 3.125 |

**B**  
 Tie Rod Cylinders  
 Actuator Products  
 Series  
 3MA  
 Series  
 4MA/4ML  
 Series  
 3MAJ/4MAJ  
 Series  
 4MNR  
 Series  
 P1D  
 Series

**Head Rectangular Flange Mount**

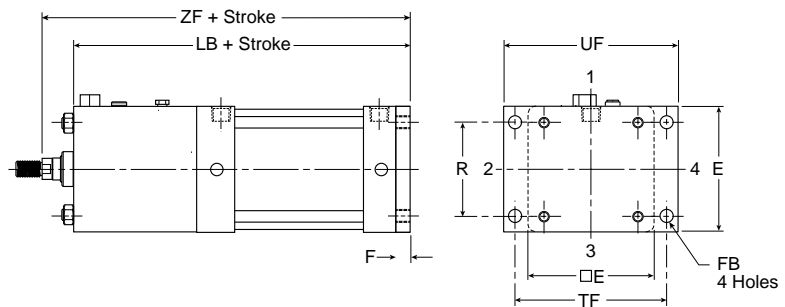
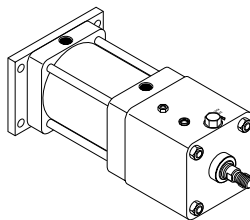
Style J  
 (NFPA MF1)  
 (only 6" Bore)



**Note:** Style J has a W dimension instead of WF and a LA dimension instead of LAF because of the flange installation. Please use dimensions W and LA regarding rod ends only for Style J.  
 For reference,  $WF = W + F$  and  $LA = W + A$ .

**Cap Rectangular Flange Mount**

Style H  
 (NFPA MF2)  
 (only 6" Bore)



**Styles J and H**

| Bore size | Rod no. | Rod dia. MM | A     | E     | F     | FB    | LA    | R     | TF    | UF    | W     | Add stroke |        |        |
|-----------|---------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|--------|--------|
|           |         |             |       |       |       |       |       |       |       |       |       | LB         | ZF     | ZJ     |
| 6         | 1       | 1-3/8       | 1.625 | 6.500 | 0.750 | 0.563 | 2.500 | 4.880 | 7.625 | 8.625 | 0.875 | 12.125     | 13.750 | 13.000 |
|           | 3       | 1-3/4       | 2.000 | 6.500 | 0.750 | 0.563 | 3.125 | 4.880 | 7.625 | 8.625 | 1.125 | 12.625     | 14.500 | 13.750 |

**B**

Tie Rod Cylinders  
 Actuator Products

3MA Series

4MA/4ML Series

3MAJ/4MAJ Series

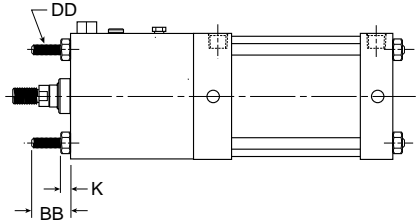
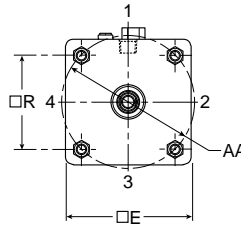
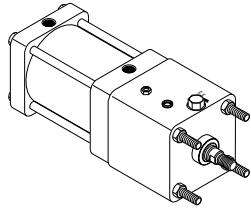
4MNR Series

P1D Series



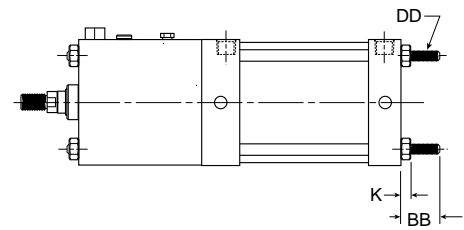
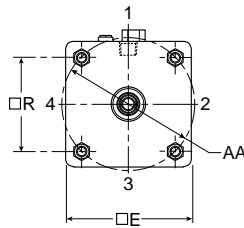
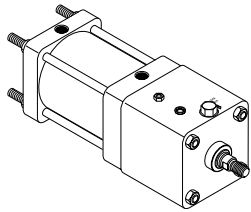
**Tie Rods Extended Head End Mount**

Style TB  
 (NFPA MX3)



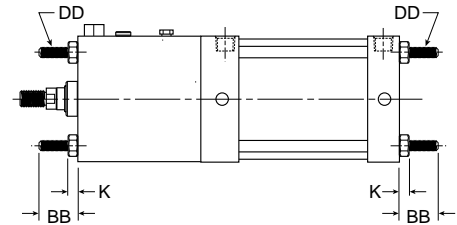
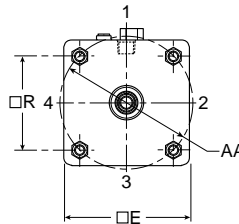
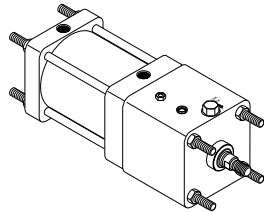
**Tie Rods Extended Cap End Mount**

Style TC  
 (NFPA MX2)



**Tie Rods Extended Both Ends Mount**

Style TD  
 (NFPA MX1)



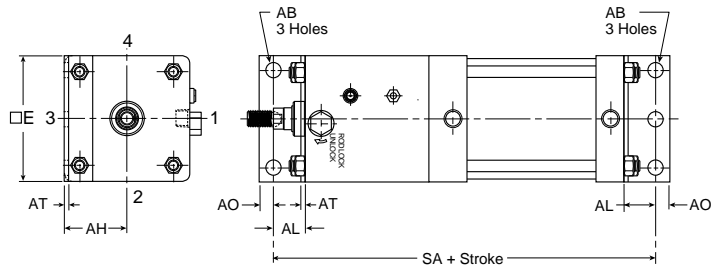
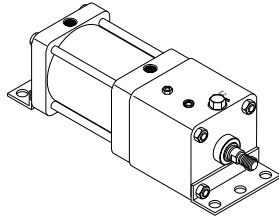
**Styles TB, TC and TD**

| Bore size | Rod no. | Rod dia. MM | AA    | BB    | DD     | E     | K     | R     |
|-----------|---------|-------------|-------|-------|--------|-------|-------|-------|
| 6         | 1       | 1-3/8       | 6.900 | 1.813 | 1/2-20 | 6.500 | 0.438 | 4.880 |
|           | 3       | 1-3/4       | 6.900 | 1.813 | 1/2-20 | 6.500 | 0.438 | 4.880 |
| 8         | 1       | 1-3/8       | 9.100 | 2.313 | 5/8-18 | 8.500 | 0.563 | 6.440 |
|           | 3       | 1-3/4       | 9.100 | 2.313 | 5/8-18 | 8.500 | 0.563 | 6.440 |

**B**  
 Tie Rod Cylinders  
 Actuator Products  
 Series  
 3MA  
 Series  
 4MA/4ML  
 Series  
 3MAJ/4MAJ  
 Series  
 4MNR  
 Series  
 P1D  
 Series

**Side End Angle Mount**

Style CB  
 (NFPA MS1)

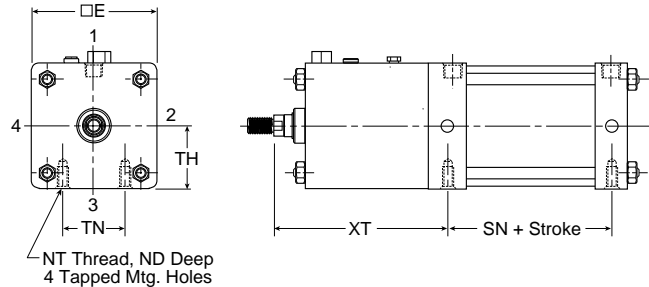
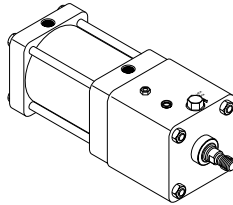


**Style CB**

| Bore size | Rod no. | Rod dia. MM | AB    | AH    | AL    | AO    | AT    | E     | S     | Add stroke SA |
|-----------|---------|-------------|-------|-------|-------|-------|-------|-------|-------|---------------|
| 6         | 1       | 1-3/8       | 0.813 | 3.250 | 1.375 | 0.625 | 0.188 | 6.500 | 5.250 | 14.125        |
|           | 3       | 1-3/4       | 0.813 | 3.250 | 1.375 | 0.625 | 0.188 | 6.500 | 5.250 | 14.625        |
| 8         | 1       | 1-3/8       | 0.813 | 4.250 | 1.813 | 0.688 | 0.250 | 8.500 | 7.125 | 15.375        |
|           | 3       | 1-3/4       | 0.813 | 4.250 | 1.813 | 0.688 | 0.250 | 8.500 | 7.125 | 15.875        |

**Side Tap Mount**

Style F  
 (NFPA MS4)

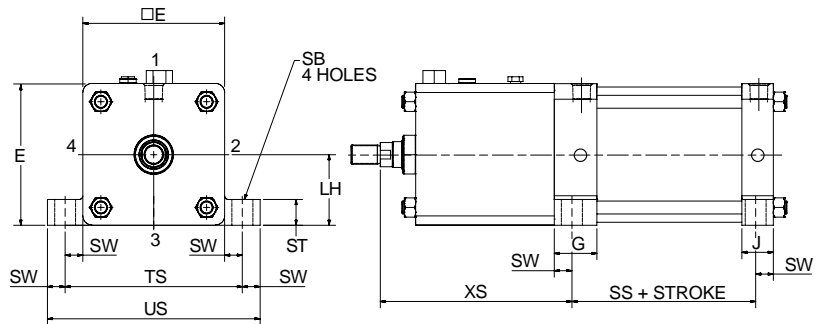
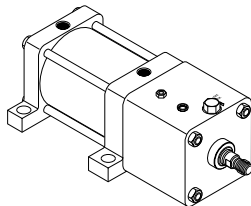


**Style F**

| Bore size | Rod no. | Rod dia. MM | E     | ND    | NT     | +/- .003 TH | TN    | XT     | Add stroke SN |
|-----------|---------|-------------|-------|-------|--------|-------------|-------|--------|---------------|
| 6         | 1       | 1-3/8       | 6.500 | 1.125 | 3/4-10 | 3.243       | 3.250 | 9.188  | 3.125         |
|           | 3       | 1-3/4       | 6.500 | 1.125 | 3/4-10 | 3.243       | 3.250 | 9.938  | 3.125         |
| 8         | 1       | 1-3/8       | 8.500 | 1.125 | 3/4-10 | 4.243       | 4.500 | 9.438  | 3.250         |
|           | 3       | 1-3/4       | 8.500 | 1.125 | 3/4-10 | 4.243       | 4.500 | 10.188 | 3.250         |

**Side Lug Mount**

Style C  
 (NFPA MS2)



**Style C**

| Bore size | Rod no. | Rod dia. MM | E     | G     | J     | +/- .003 LH | SB    | ST    | SW    | TS    | US     | XS    | Add stroke SS |
|-----------|---------|-------------|-------|-------|-------|-------------|-------|-------|-------|-------|--------|-------|---------------|
| 6         | 1       | 1-3/8       | 6.500 | 1.910 | 1.410 | 3.243       | 0.813 | 1.000 | 0.688 | 7.875 | 9.250  | 8.688 | 3.625         |
|           | 3       | 1-3/4       | 6.500 | 1.910 | 1.410 | 3.243       | 0.813 | 1.000 | 0.688 | 7.875 | 9.250  | 9.438 | 3.625         |
| 8         | 1       | 1-3/8       | 8.500 | 1.810 | 1.440 | 4.243       | 0.813 | 1.000 | 0.688 | 9.875 | 11.250 | 8.938 | 3.750         |
|           | 3       | 1-3/4       | 8.500 | 1.810 | 1.440 | 4.243       | 0.813 | 1.000 | 0.688 | 9.875 | 11.250 | 9.688 | 3.750         |

**B**

Tie Rod Cylinders  
 Actuator Products

3MA Series

4MA/4ML Series

3MAJ/4MAJ Series

4MNR Series

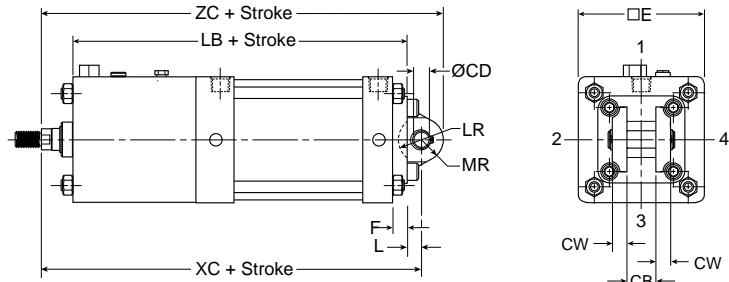
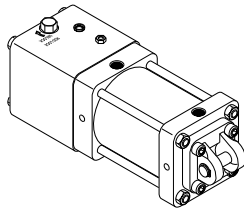
P1D Series



**Cap Fixed Clevis**

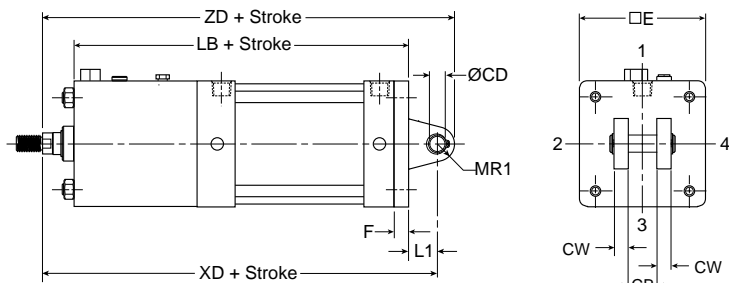
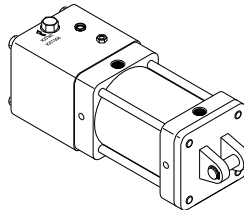
Style BB  
 (NFPA MP1)

**NOTE:** For maximum swivel angle of BB mount with rear mounting plate, please reference catalog 0900P-E, cylinder accessories on page B108.



**Cap Detachable Clevis**

Style BC  
 (NFPA MP2)

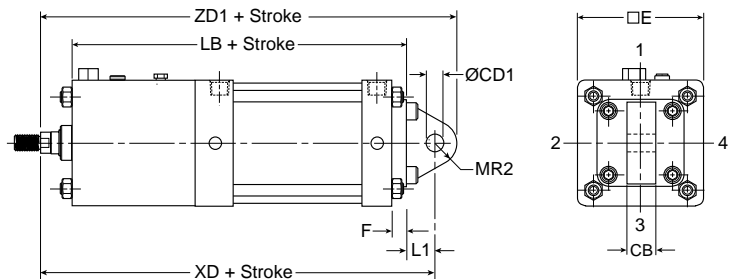
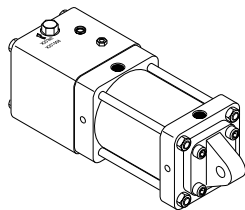


**Styles BB and BC**

| Bore size | Rod no. | Rod dia. MM | CB    | Rod dia. Tolerances |        | CW    | E     | F     | L     | L1    | LR    | MR    | MR1    | Add stroke |        |        |        |
|-----------|---------|-------------|-------|---------------------|--------|-------|-------|-------|-------|-------|-------|-------|--------|------------|--------|--------|--------|
|           |         |             |       | +0.002              | -0.002 |       |       |       |       |       |       |       |        | LB         | XC     | XD     | ZC     |
| 6         | 1       | 1-3/8       | 1.500 | 1.001               | 0.750  | 6.500 | 0.750 | 0.750 | 1.500 | 1.250 | 1.125 | 1.000 | 12.125 | 14.500     | 15.250 | 15.625 | 16.250 |
|           | 3       | 1-3/4       | 1.500 | 1.001               | 0.750  | 6.500 | 0.750 | 0.750 | 1.500 | 1.250 | 1.125 | 1.000 | 12.625 | 15.250     | 16.000 | 16.375 | 17.000 |
| 8         | 1       | 1-3/8       | 1.500 | 1.001               | 0.750  | 8.500 | 0.750 | 0.750 | 1.500 | 1.250 | 1.125 | 1.000 | 12.500 | 14.875     | 15.625 | 16.000 | 16.625 |
|           | 3       | 1-3/4       | 1.500 | 1.001               | 0.750  | 8.500 | 0.750 | 0.750 | 1.500 | 1.250 | 1.125 | 1.000 | 13.000 | 15.625     | 16.375 | 16.750 | 17.375 |

**Cap Detachable Eye Mount**

Style BE  
 (NFPA MP4)  
 (only 6" Bore)

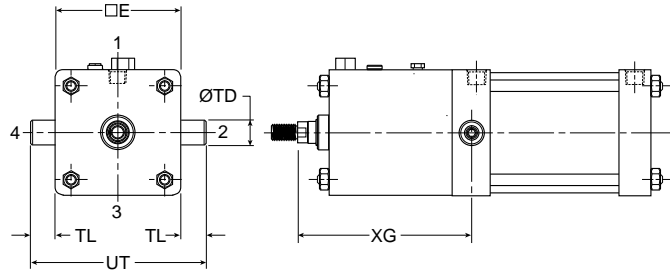
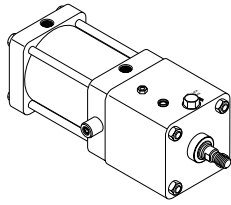


**Style BE**

| Bore size | Rod no. | Rod dia. MM | CB    | Rod dia. Tolerances |        | E     | F     | L1    | MR2   | Add stroke |        |        |
|-----------|---------|-------------|-------|---------------------|--------|-------|-------|-------|-------|------------|--------|--------|
|           |         |             |       | +0.002              | +0.004 |       |       |       |       | LB         | XD     | ZD1    |
| 6         | 1       | 1-3/8       | 1.500 | 1.000               | 1.000  | 6.500 | 0.750 | 1.500 | 1.125 | 12.125     | 15.250 | 16.375 |
|           | 3       | 1-3/4       | 1.500 | 1.000               | 1.000  | 6.500 | 0.750 | 1.500 | 1.125 | 12.625     | 16.000 | 17.125 |

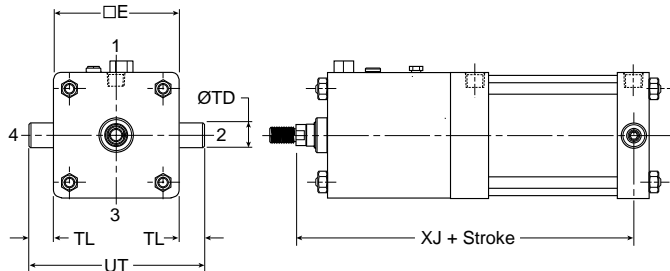
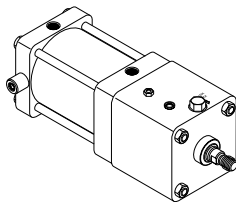
**Head Trunnion Mount**

Style D  
 (NFPA MT1)



**Cap Trunnion Mount**

Style DB  
 (NFPA MT2)

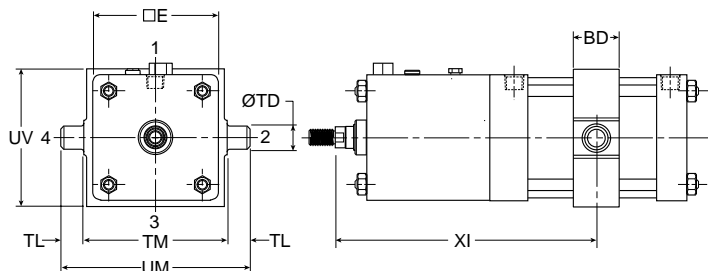
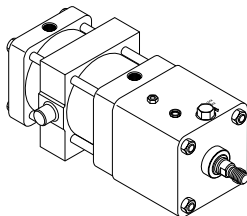


**Styles D and DB**

| Bore size | Rod no. | Rod dia. MM | E     | +0.000<br>-0.001<br>TD | TL    | UT     | XG     | XJ     |
|-----------|---------|-------------|-------|------------------------|-------|--------|--------|--------|
| 6         | 1       | 1-3/8       | 6.500 | 1.375                  | 1.375 | 9.250  | 9.000  | 12.250 |
|           | 3       | 1-3/4       | 6.500 | 1.375                  | 1.375 | 9.250  | 9.750  | 13.000 |
| 8         | 1       | 1-3/8       | 8.500 | 1.375                  | 1.375 | 11.250 | 9.250  | 12.625 |
|           | 3       | 1-3/4       | 8.500 | 1.375                  | 1.375 | 11.250 | 10.000 | 13.375 |

**Intermediate Trunnion Mount**

Style DD  
 (NFPA MT4)



**Note:** Style DD requires minimum stroke per table.

**Style DD**

| Bore size | Rod no. | Rod dia. MM | E     | BD    | +0.000<br>-0.001<br>TD | TL    | TM    | UM     | UV    | Min. XI | Min. stroke |
|-----------|---------|-------------|-------|-------|------------------------|-------|-------|--------|-------|---------|-------------|
| 6         | 1       | 1-3/8       | 6.500 | 2.500 | 1.375                  | 1.375 | 7.625 | 10.375 | 7.000 | 20.16   | 6.125       |
|           | 3       | 1-3/4       | 6.500 | 2.500 | 1.375                  | 1.375 | 7.625 | 10.375 | 7.000 | 20.19   | 6.125       |
| 8         | 1       | 1-3/8       | 8.500 | 2.500 | 1.375                  | 1.375 | 9.750 | 12.500 | 9.500 | 26.31   | 6.500       |
|           | 3       | 1-3/4       | 8.500 | 2.500 | 1.375                  | 1.375 | 9.750 | 12.500 | 9.500 | 27.06   | 6.500       |

**B**

Tie Rod Cylinders  
Actuator Products

3MA Series

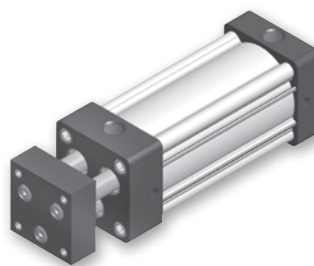
4MA/4ML Series

3MAJ/4MAJ Series

4MNR Series

P1D Series

- Bore sizes – 1-1/8", 1-1/2", 2", 2-1/2", 3-1/4", and 4"
- Non-rotating cylinder, multiple piston rods
- Strokes available in any practical stroke length
- Steel tooling plate standard, specials available
- Single rod end or double rod ends
- Optional adjustable cushions available
- Mounting styles – 14 standard styles
- RoHS compliant



**Operating information**

Operating pressure: 250 PSIG (17 bar)  
 Temperature range –  
     Standard seals -10°F to 165°F (-23°C to 74°C)  
     Fluorocarbon seals -10°F to 250°F (-23°C to 121°C)  
 Filtration requirements: 40 micron, dry filtered air  
 For technical information see CD

**Ordering information**

|   |   |                       |  |  |   |   |  |   |
|---|---|-----------------------|--|--|---|---|--|---|
| <b>2.00</b>   | <b>J</b>  | <b>4MNR</b>           | <b>2</b>   | <b>U</b>   | <b>T</b>  | <b>9</b>  | <b>A</b>   | <b>6.000</b>  |
| <b>Bore size</b><br>1.12 <sup>1</sup><br>1.50 <sup>1</sup><br>2.00<br>2.50<br>3.25<br>4.00  | <b>Double rod cylinder</b><br>Specify "K" only if double rod cylinder is required.  | <b>Series</b><br>4MNR | <b>Ports</b><br>U NPTF<br>R BSPP   | <b>Seals</b><br>Blank Standard (nitrile seals)<br>V Fluorocarbon seals <sup>3</sup><br>E Fluorocarbon rod wiper and rod seal only <sup>4</sup>   | <b>Tooling plate</b><br>T Standard plate<br>M Special plate (please specify details)            | <b>Stroke length</b><br>Specify stroke length required in inches. | <b>Cushion cap end</b><br>Blank Non-cushioned cap end<br>C Cushioned cap end   | <b>Stroke length</b><br>Specify stroke length required in inches. |
| <b>Cushion head end</b><br>Blank Non-cushioned head end<br>C Cushioned head end   | <b>Mounting style</b><br>Specify mounting style code (see table on following page). |                       |  |  |   |   | <b>Piston rod thread type</b><br>A Standard (UNF unified thread)   |   |
| <b>Cylinder construction</b><br>Blank* Standard (extruded body, standard round lobe orientation)<br>A* Extruded body, round lobe orientation rotated 90 degrees from standard<br>N* Extruded body, round lobe orientation rotated 180 degrees from standard<br>Z* Extruded body, round lobe orientation rotated 270 degrees from standard<br>T Aluminum round tube and carbon steel tie rods & nuts |   |                       |  | <b>Special modification</b><br>Specify "S" only for special modification other than rod end, and then describe modification in item notes. (Includes 4MNR with Linear Position Sensor Option) <sup>5</sup> |   |   | <b>Rod material and gland code</b><br>Blank Standard rod and gland<br>H Standard rod and HI LOAD gland<br>Y 17-4 PH stainless steel rod and standard gland |   |
|   |   |                       |  |  | <b>Piston rod thread style</b><br>9 Standard<br>3 Special (and specify all dimensions required) |   |  |   |
|   |   |                       | <b>Piston type<sup>2</sup></b><br>2 Lipseals, no magnetic ring (aluminum piston)<br>3 Lipseals and magnetic ring (aluminum piston) |  |   |   |  |   |

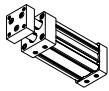
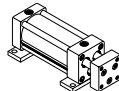
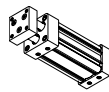
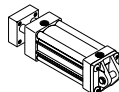
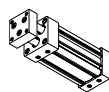
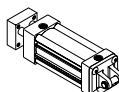
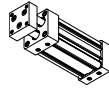
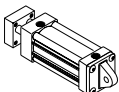
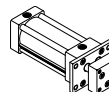
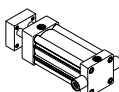
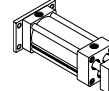
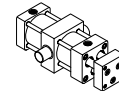
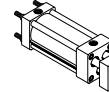
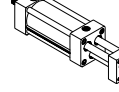
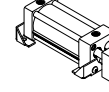
\* Please reference table in catalog 0900P-E, page B10

**Sensors**  
For sensors see page B294.

<sup>1</sup> Not available with Linear Position Sensor Option (LPSO).  
<sup>2</sup> Seals option V only available with Piston Type 2.  
<sup>3</sup> Reed and solid-state sensors only available with standard seals or options E. See footnote 2.  
<sup>4</sup> Used for external chemical compatibility applications, not high temperature.

**B**  
 Tie Rod Cylinders  
 Actuator Products  
 Series  
 3MA  
 4MA/4ML  
 3MAJ/4MAJ  
 4MNR  
 P1D

**4MNR Mounting Styles**

| Mounting style   | NFPA mounting | Description                               | Bore size | Mounting style   | NFPA mounting      | Description           | Bore size |
|--|---------------|---|-----------|--|--------------------|-----------------------|-----------|
| <b>TEF</b><br>  | MX5/MS4       | Sleeve Nut with Side Tap (standard mount) | 1-1/2 - 4 | <b>NB</b><br>                       | N/A                | Base Bar              | 1-1/8 - 4 |
| <b>T</b><br>    | MX0           | No Mount (same construction as TEF)       | 1-1/8 - 4 | <b>BB</b><br>                       | MP1                | Cap Fixed Clevis      | 1-1/2 - 4 |
| <b>TE</b><br>   | MX5           | Sleeve Nut (same construction as TEF)     | 1-1/2 - 4 | <b>BC</b><br>                       | MP2                | Cap Detachable Clevis | 1-1/8 - 4 |
| <b>F</b><br>    | MS4           | Side Tap (same construction as TEF)       | 1-1/8 - 4 | <b>BE</b><br>                       | MP4                | Cap Detachable Eye    | 1-1/8 - 4 |
| <b>J</b><br>    | MF1           | Head Rectangular Flange                   | 1-1/8 - 4 | <b>DB</b><br>                       | MT2                | Cap Trunnion          | 1-1/2 - 4 |
| <b>H</b><br>   | MF2           | Cap Rectangular Flange                    | 1-1/2 - 4 | <b>DD</b><br>                      | MT4                | Intermediate Trunnion | 1-1/2 - 4 |
| <b>TC</b><br> | MX2           | Tie Rods Extended Cap End                 | 1-1/2 - 5 | <b>KTEF / KT / KTE / KF *</b><br> | MDX0 / MDX5 / MDS4 | Double Rod End        | 1-1/2 - 4 |
| <b>C</b><br>  | MS2           | Side Lug                                  | 1-1/2 - 4 |  |                    |                       |           |

\* Double rod end cylinders can be ordered with head mountings i.e. KJ.

**B**

**Tie Rod Cylinders  
Actuator Products**

**3MA  
Series**

**4MA/4ML  
Series**

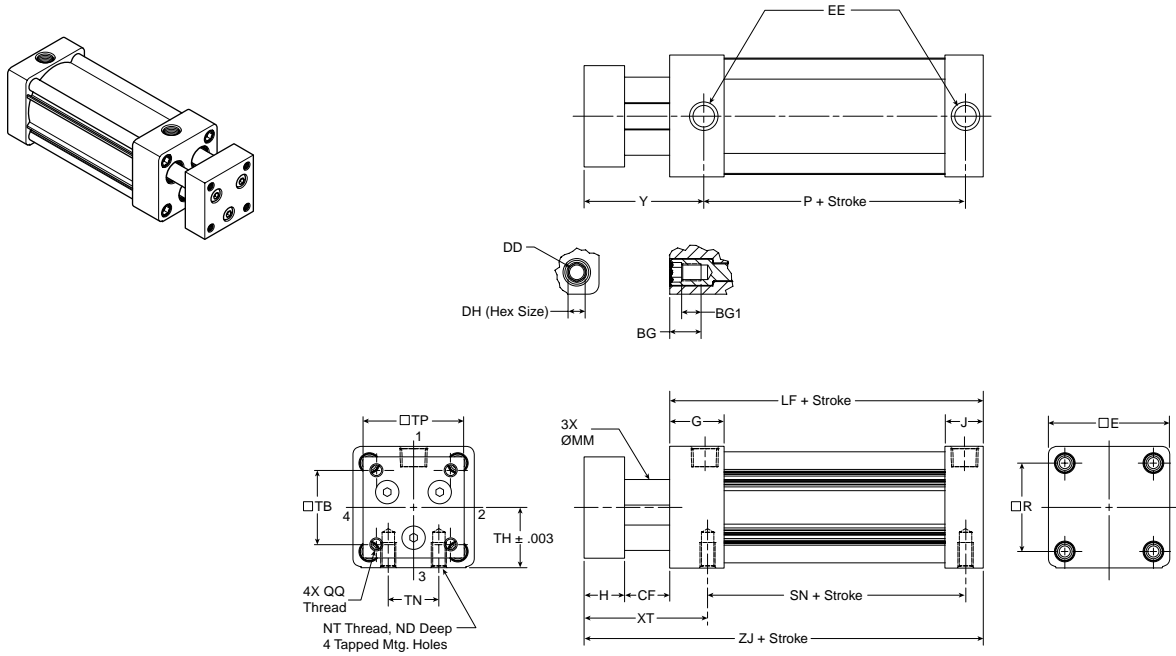
**3MAJ/4MAJ  
Series**

**4MNR  
Series**

**P1D  
Series**

**4MNR Single Rod Dimensioned Drawings (Styles TEF, T, TE and F)**

(NFPA MX0, MX5, MS4)



**Thread Style 3 - "Special Thread"**

Special threads, rod extensions, rod eyes, blanks, etc. are also available. To order, specify "Style 3" and give desired dimensions for KK (thread size), A (thread length) and W or WF. If otherwise special, please supply dimensioned sketch.

**Styles TEF, T, TE and F**

| Bore size | Rod dia. MM | BG    | BG1   | CF    | DD      | DH   | E     | EE (NPTF) | G     | H     | J     | ND    | NT      |
|-----------|-------------|-------|-------|-------|---------|------|-------|-----------|-------|-------|-------|-------|---------|
| 1-1/8 *   | 5/16        | -     | -     | 0.875 | 10-32   | -    | 1.500 | 1/8       | 1.000 | 0.625 | 0.625 | 0.250 | 10-32   |
| 1-1/2     | 8mm         | 0.056 | 0.375 | 1.125 | 1/4-28  | 1/4  | 2.000 | 3/8       | 1.438 | 0.750 | 0.938 | 0.375 | 1/4-20  |
| 2         | 12mm        | 0.056 | 0.362 | 1.125 | 5/16-24 | 5/16 | 2.500 | 3/8       | 1.375 | 0.750 | 0.938 | 0.438 | 5/16-18 |
| 2-1/2     | 16mm        | 0.056 | 0.362 | 1.125 | 5/16-24 | 5/16 | 3.000 | 3/8       | 1.344 | 1.000 | 0.938 | 0.625 | 3/8-16  |
| 3-1/4     | 16mm        | 0.700 | 0.500 | 1.375 | 3/8-24  | 3/8  | 3.750 | 1/2       | 1.594 | 1.000 | 1.125 | 0.750 | 1/2-13  |
| 4         | 16mm        | 0.700 | 0.500 | 1.375 | 3/8-24  | 3/8  | 4.500 | 1/2       | 1.594 | 1.000 | 1.125 | 0.750 | 1/2-13  |

| Bore size | Rod dia. MM | Add stroke |       |       |       |       |       |       |       |       |       |       |       |
|-----------|-------------|------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|           |             | QQ         | R     | TB    | TH    | TP    | TN    | XT    | Y     | LF    | P     | SN    | ZJ    |
| 1-1/8 *   | 5/16        | 6-32       | 1.125 | 0.750 | 0.750 | 1.250 | 0.500 | 2.000 | 2.031 | 2.500 | 1.468 | 1.500 | 3.750 |
| 1-1/2     | 8mm         | 10-32      | 1.430 | 1.120 | 0.993 | 1.500 | 0.625 | 2.812 | 2.750 | 3.625 | 2.313 | 2.250 | 5.375 |
| 2         | 12mm        | 1/4-28     | 1.840 | 1.430 | 1.243 | 2.000 | 0.875 | 2.812 | 2.750 | 3.625 | 2.313 | 2.250 | 5.375 |
| 2-1/2     | 16mm        | 5/16-24    | 2.190 | 1.840 | 1.493 | 2.500 | 1.250 | 3.062 | 3.062 | 3.750 | 2.375 | 2.375 | 5.875 |
| 3-1/4     | 16mm        | 3/8-24     | 2.760 | 2.190 | 1.680 | 3.250 | 1.500 | 3.437 | 3.437 | 4.250 | 2.625 | 2.625 | 6.500 |
| 4         | 16mm        | 3/8-24     | 3.320 | 2.760 | 2.243 | 4.000 | 2.063 | 3.437 | 3.437 | 4.250 | 2.625 | 2.625 | 6.500 |

\* Twin rod with flange construction (not shown)

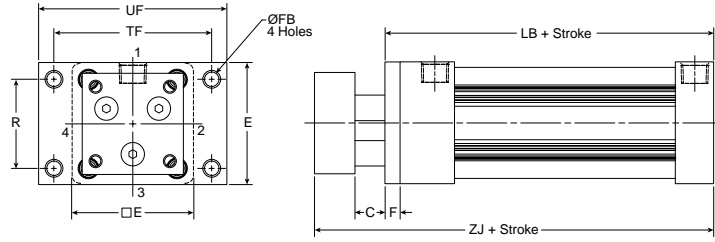
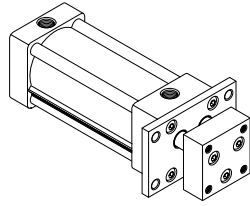
**B**  
 Tie Rod Cylinders  
 Actuator Products  
 Series  
 3MA  
 4MA/4ML  
 3MAJ/4MAJ  
 4MNR  
 P1D





**Head Rectangular Flange**

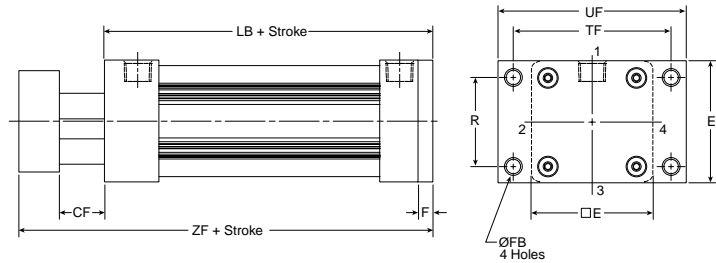
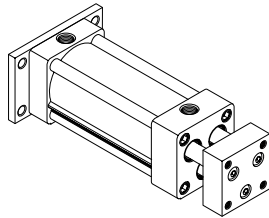
Style J  
 (NFPA MF1)



**Note:** Style J has a “C” dimension instead of “CF” because of the flange installation. For reference, CF = C + F

**Cap Rectangular Flange**

Style H  
 (NFPA MF2)



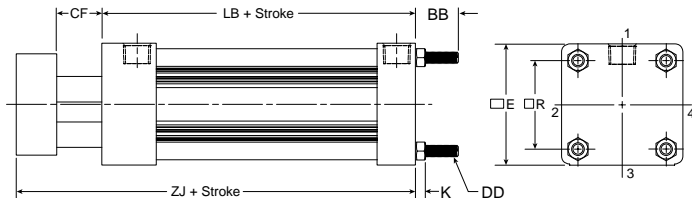
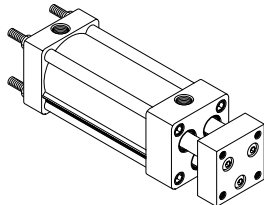
**Styles J and H**

| Bore size | Rod dia. MM | C     | CF    | E     | F     | FB    | H     | R     | TF    | UF    | Add stroke |       |       |
|-----------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|-------|-------|
|           |             |       |       |       |       |       |       |       |       |       | LB         | ZF    | ZJ    |
| 1-1/8 *   | 5/16        | 0.625 | 0.875 | 1.500 | 0.250 | 0.219 | 0.625 | 1.000 | 2.000 | 2.500 | 2.750      | 4.250 | 4.000 |
| 1-1/2     | 8mm         | 0.750 | 1.125 | 2.000 | 0.375 | 0.313 | 0.750 | 1.430 | 2.750 | 3.375 | 4.000      | 5.875 | 5.500 |
| 2         | 12mm        | 0.750 | 1.125 | 2.500 | 0.375 | 0.375 | 0.750 | 1.840 | 3.375 | 4.125 | 4.000      | 5.875 | 5.500 |
| 2-1/2     | 16mm        | 0.750 | 1.125 | 3.000 | 0.375 | 0.375 | 1.000 | 2.190 | 3.875 | 4.625 | 4.125      | 6.250 | 5.875 |
| 3-1/4     | 16mm        | 0.750 | 1.375 | 3.750 | 0.625 | 0.438 | 1.000 | 2.760 | 4.688 | 5.500 | 4.875      | 7.250 | 6.625 |
| 4         | 16mm        | 0.750 | 1.375 | 4.500 | 0.625 | 0.438 | 1.000 | 3.320 | 5.438 | 6.250 | 4.875      | 7.250 | 6.625 |

\* Twin rod with flange construction (not shown)

**Tie Rods Ext. Cap End**

Style TC  
 (NFPA MX2)



**Style TC**

| Bore size | Rod dia. MM | BB    | DD      | CF    | E     | K     | R     | Add stroke |       |
|-----------|-------------|-------|---------|-------|-------|-------|-------|------------|-------|
|           |             |       |         |       |       |       |       | LB         | ZJ    |
| 1-1/2     | 8mm         | 1.000 | 1/4-28  | 1.125 | 2.000 | 0.250 | 1.430 | 4.000      | 5.500 |
| 2         | 12mm        | 1.125 | 5/16-24 | 1.125 | 2.500 | 0.313 | 1.840 | 4.000      | 5.500 |
| 2-1/2     | 16mm        | 1.125 | 5/16-24 | 1.125 | 3.000 | 0.313 | 2.190 | 4.125      | 5.875 |
| 3-1/4     | 16mm        | 1.375 | 3/8-24  | 1.375 | 3.750 | 0.375 | 2.760 | 4.875      | 6.625 |
| 4         | 16mm        | 1.375 | 3/8-24  | 1.375 | 4.500 | 0.375 | 3.320 | 4.875      | 6.625 |

**B**

Tie Rod Cylinders  
 Actuator Products

3MA  
 Series

4MA/4ML  
 Series

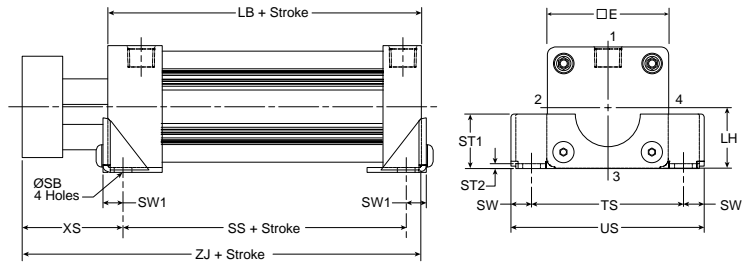
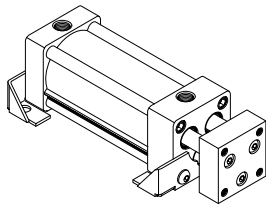
3MAJ/4MAJ  
 Series

4MNR  
 Series

P1D  
 Series

**Side Lug**

Style C  
 (NFPA MS2)

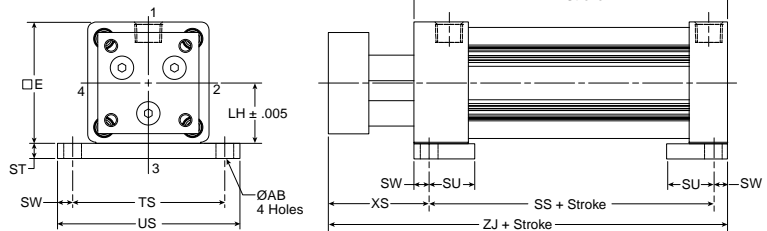
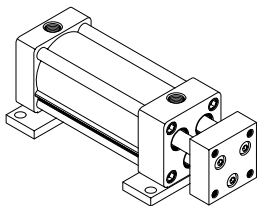


**Style C**

| Bore size | Rod dia. MM | E     | LH    | SB    | ST1   | ST2   | SW    | SW1   | TS    | US    | XS    | Add stroke |       |       |
|-----------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|-------|-------|
|           |             |       |       |       |       |       |       |       |       |       |       | LB         | SS    | ZJ    |
| 1-1/2     | 8mm         | 2.000 | 0.993 | 0.438 | 1.000 | 0.120 | 0.375 | 0.495 | 2.750 | 3.500 | 2.250 | 4.000      | 2.875 | 5.500 |
| 2         | 12mm        | 2.500 | 1.243 | 0.438 | 1.250 | 0.120 | 0.375 | 0.495 | 3.250 | 4.000 | 2.250 | 4.000      | 2.875 | 5.500 |
| 2-1/2     | 16mm        | 3.000 | 1.493 | 0.438 | 1.343 | 0.120 | 0.375 | 0.495 | 3.750 | 4.500 | 2.500 | 4.125      | 3.000 | 5.875 |
| 3-1/4     | 16mm        | 3.750 | 1.868 | 0.563 | 1.500 | 0.188 | 0.500 | 0.688 | 4.750 | 5.750 | 2.875 | 4.875      | 3.250 | 6.625 |
| 4         | 16mm        | 4.500 | 2.243 | 0.563 | 1.500 | 0.188 | 0.500 | 0.688 | 5.500 | 6.500 | 2.875 | 4.875      | 3.250 | 6.625 |

**Base Bar Mount**

Style NB



**Note:** Fasteners for NB base bar mount have been applied with removable threadlocking compound and torqued to bottom of endcaps.

**Style NB**

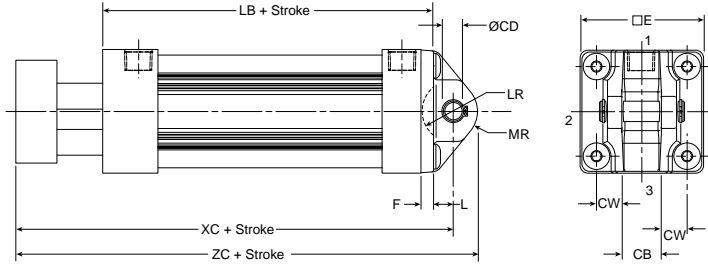
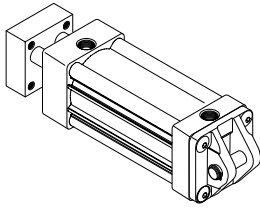
| Bore size | Rod dia. MM | AB    | E     | LH    | ST    | SU    | SW    | TS    | US    | XS    | Add stroke |       |       |
|-----------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|-------|-------|
|           |             |       |       |       |       |       |       |       |       |       | LB         | SS    | ZJ    |
| 1-1/8 *   | 5/16        | 0.203 | 1.500 | 1.000 | 0.250 | 0.750 | 0.250 | 1.875 | 2.375 | 1.750 | 2.750      | 1.750 | 3.750 |
| 1-1/2     | 8mm         | 0.438 | 2.000 | 1.243 | 0.250 | 1.125 | 0.375 | 2.750 | 3.500 | 2.250 | 4.000      | 2.875 | 5.500 |
| 2         | 12mm        | 0.438 | 2.500 | 1.493 | 0.250 | 1.125 | 0.375 | 3.250 | 4.000 | 2.250 | 4.000      | 2.875 | 5.500 |
| 2-1/2     | 16mm        | 0.438 | 3.000 | 1.868 | 0.375 | 1.125 | 0.375 | 3.750 | 4.500 | 2.500 | 4.125      | 3.000 | 5.875 |
| 3-1/4     | 16mm        | 0.563 | 3.750 | 2.368 | 0.500 | 1.250 | 0.500 | 4.750 | 5.750 | 2.875 | 4.875      | 3.250 | 6.625 |
| 4         | 16mm        | 0.563 | 4.500 | 2.743 | 0.500 | 1.250 | 0.500 | 5.500 | 6.500 | 2.875 | 4.875      | 3.250 | 6.625 |

\* Twin rod with flange construction (not shown)

**Cap Fixed Clevis**

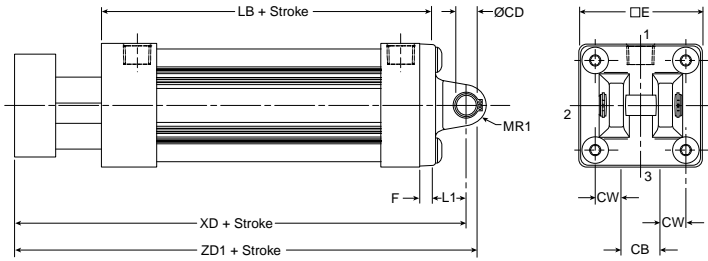
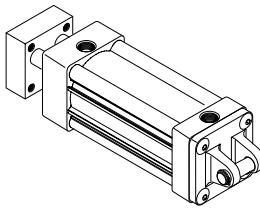
Style BB (NFPA MP1)

**Note:** For maximum swivel angle of BB mount with rear mounting plate, please reference catalog 0900P-E, accessories page B141.



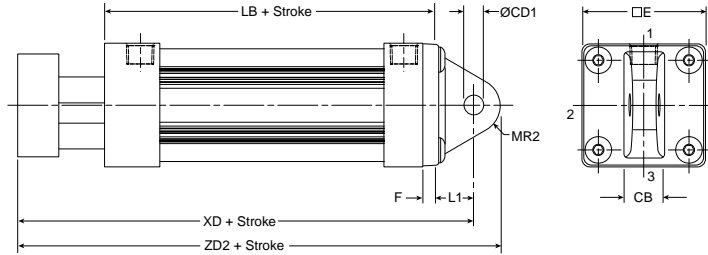
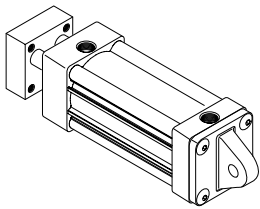
**Cap Detachable Clevis**

Style BC (NFPA MP2)



**Cap Detachable Eye**

Style BE (NFPA MP4)



**Styles BB, BC and BE**

| Bore size | Rod dia. MM | CB    | CD    | CD1   | CW    | E     | F     | L     | LR    | L1    |
|-----------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1-1/2     | 8mm         | 0.750 | 0.501 | 0.500 | 0.500 | 2.000 | 0.375 | 0.375 | 0.750 | 0.750 |
| 2         | 12mm        | 0.750 | 0.501 | 0.500 | 0.500 | 2.500 | 0.375 | 0.375 | 0.750 | 0.750 |
| 2-1/2     | 16mm        | 0.750 | 0.501 | 0.500 | 0.500 | 3.000 | 0.375 | 0.375 | 0.750 | 0.750 |
| 3-1/4     | 16mm        | 1.250 | 0.751 | 0.750 | 0.625 | 3.750 | 0.625 | 0.625 | 1.000 | 1.250 |
| 4         | 16mm        | 1.250 | 0.751 | 0.750 | 0.625 | 4.500 | 0.625 | 0.625 | 1.000 | 1.250 |

| Bore size | Rod dia. MM | MR    | MR1   | MR2   | Add stroke |       |       |       |       |       |
|-----------|-------------|-------|-------|-------|------------|-------|-------|-------|-------|-------|
|           |             |       |       |       | LB         | XC    | XD    | ZC    | ZD1   | ZD2   |
| 1-1/2     | 8mm         | 0.625 | 0.500 | 0.625 | 4.000      | 6.250 | 6.625 | 6.875 | 7.125 | 7.250 |
| 2         | 12mm        | 0.625 | 0.500 | 0.625 | 4.000      | 6.250 | 6.625 | 6.875 | 7.125 | 7.250 |
| 2-1/2     | 16mm        | 0.625 | 0.500 | 0.688 | 4.125      | 6.625 | 7.000 | 7.250 | 7.500 | 7.688 |
| 3-1/4     | 16mm        | 0.938 | 0.750 | 0.875 | 4.875      | 7.875 | 8.500 | 8.813 | 9.250 | 9.375 |
| 4         | 16mm        | 0.938 | 0.750 | 0.875 | 4.875      | 7.875 | 8.500 | 8.813 | 9.250 | 9.375 |

**B**

Tie Rod Cylinders  
Actuator Products

3MA Series

4MA/4ML Series

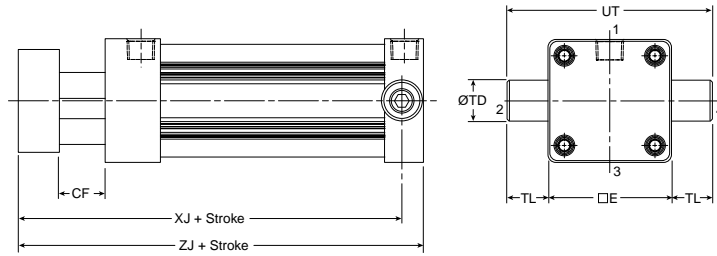
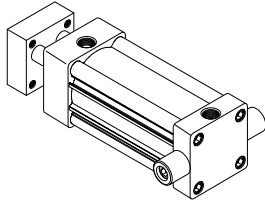
3MAJ/4MAJ Series

4MNR Series

P1D Series

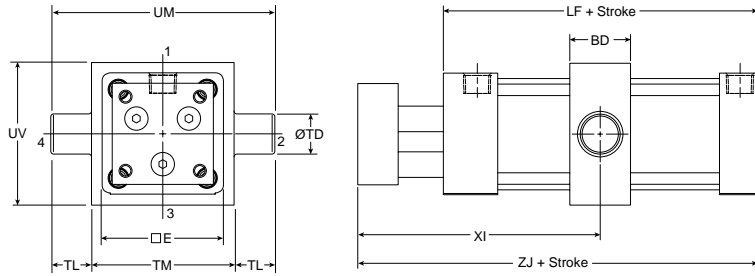
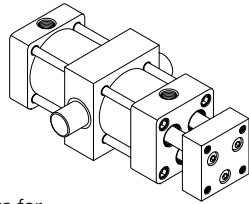
**Cap Trunnion**

Style DB  
 (NFPA MT2)



**Intermediate Trunnion**

Style DD  
 (NFPA MT4)



**Note:** Tie rod nuts for Style DD have a slot instead of internal hex.

**B**  
 Tie Rod Cylinders  
 Actuator Products

Series  
 3MA

Series  
 4MA/4ML

Series  
 3MAJ/4MAJ

Series  
 4MNR

Series  
 P1D

**Styles DD and DD**

| Bore size | Rod dia. MM | E     | BD    | CF    | TD    | TL    | TM    | UM    | UT    | UV    | Min. XI | Add stroke |       |       |
|-----------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|------------|-------|-------|
|           |             |       |       |       |       |       |       |       |       |       |         | LF         | XJ    | ZJ    |
| 1-1/2     | 8mm         | 2.000 | 1.250 | 1.125 | 1.000 | 1.000 | 2.500 | 4.500 | 4.000 | 2.500 | 4.000   | 4.000      | 5.000 | 5.875 |
| 2         | 12mm        | 2.500 | 1.500 | 1.125 | 1.000 | 1.000 | 3.000 | 5.000 | 4.500 | 3.000 | 4.125   | 4.000      | 5.000 | 5.875 |
| 2-1/2     | 16mm        | 3.000 | 1.500 | 1.125 | 1.000 | 1.000 | 3.500 | 5.500 | 5.000 | 3.500 | 4.375   | 4.125      | 5.375 | 6.250 |
| 3-1/4     | 16mm        | 3.750 | 2.000 | 1.375 | 1.000 | 1.000 | 4.500 | 6.500 | 5.750 | 4.250 | 5.125   | 4.875      | 6.000 | 7.250 |
| 4         | 16mm        | 4.500 | 2.000 | 1.375 | 1.000 | 1.000 | 5.250 | 7.250 | 6.500 | 5.000 | 5.125   | 4.875      | 6.000 | 7.250 |

The innovative P1D is a future-proof generation of ISO/VDMA cylinders. The cylinders are double acting, with a new design of air cushioning.

The P1D complies with the current ISO 6431, ISO 15552, VDMA 24562 and AFNOR installation dimension standards

- Available in 32 to 200mm bores
- PUR seals for long service life
- Drop-in sensors
- Corrosion resistant design
- Magnetic piston as standard
- Lubricated with food grade grease



### Operating information

|   |   |
|---|---|
| Operating pressure:                             | 145 PSIG (10 bar) maximum   |
| Temperature range:                              | Standard: -4°F to 176°F (-20°C to 80°C)<br>High temperature: 14°F to 250°F (-10°C to 121°C) |
| Cylinders for low pressure hydraulic operation: | Ø32 - 125mm   |
| ATEX approval:                                  | CE Ex II GD c T4 248°F (120°C)  |
| Filtration requirements:                        | 40 micron, dry filtered air   |
| For technical information see CD                |   |

### P1D Standard - Double acting

#### Ø32mm - (G<sup>1</sup>/<sub>8</sub>)

| Stroke (mm) | Order Code           |
|-------------|----------------------|
| 25          | P1D-S032MC-0025NNNNN |
| 40          | P1D-S032MC-0040NNNNN |
| 50          | P1D-S032MC-0050NNNNN |
| 80          | P1D-S032MC-0080NNNNN |
| 100         | P1D-S032MC-0100NNNNN |
| 125         | P1D-S032MC-0125NNNNN |
| 160         | P1D-S032MC-0160NNNNN |
| 200         | P1D-S032MC-0200NNNNN |
| 250         | P1D-S032MC-0250NNNNN |
| 320         | P1D-S032MC-0320NNNNN |
| 400         | P1D-S032MC-0400NNNNN |
| 500         | P1D-S032MC-0500NNNNN |

#### Ø40mm - (G<sup>1</sup>/<sub>4</sub>)

|     |                      |
|-----|----------------------|
| 25  | P1D-S040MC-0025NNNNN |
| 40  | P1D-S040MC-0040NNNNN |
| 50  | P1D-S040MC-0050NNNNN |
| 80  | P1D-S040MC-0080NNNNN |
| 100 | P1D-S040MC-0100NNNNN |
| 125 | P1D-S040MC-0125NNNNN |
| 160 | P1D-S040MC-0160NNNNN |
| 200 | P1D-S040MC-0200NNNNN |
| 250 | P1D-S040MC-0250NNNNN |
| 320 | P1D-S040MC-0320NNNNN |
| 400 | P1D-S040MC-0400NNNNN |
| 500 | P1D-S040MC-0500NNNNN |

#### Ø50mm - (G<sup>1</sup>/<sub>4</sub>)

|     |                      |
|-----|----------------------|
| 25  | P1D-S050MC-0025NNNNN |
| 40  | P1D-S050MC-0040NNNNN |
| 50  | P1D-S050MC-0050NNNNN |
| 80  | P1D-S050MC-0080NNNNN |
| 100 | P1D-S050MC-0100NNNNN |
| 125 | P1D-S050MC-0125NNNNN |
| 160 | P1D-S050MC-0160NNNNN |
| 200 | P1D-S050MC-0200NNNNN |
| 250 | P1D-S050MC-0250NNNNN |
| 320 | P1D-S050MC-0320NNNNN |
| 400 | P1D-S050MC-0400NNNNN |
| 500 | P1D-S050MC-0500NNNNN |

#### Ø63mm - (G<sup>3</sup>/<sub>8</sub>)

| Stroke (mm) | Order Code           |
|-------------|----------------------|
| 25          | P1D-S063MC-0025NNNNN |
| 40          | P1D-S063MC-0040NNNNN |
| 50          | P1D-S063MC-0050NNNNN |
| 80          | P1D-S063MC-0080NNNNN |
| 100         | P1D-S063MC-0100NNNNN |
| 125         | P1D-S063MC-0125NNNNN |
| 160         | P1D-S063MC-0160NNNNN |
| 200         | P1D-S063MC-0200NNNNN |
| 250         | P1D-S063MC-0250NNNNN |
| 320         | P1D-S063MC-0320NNNNN |
| 400         | P1D-S063MC-0400NNNNN |
| 500         | P1D-S063MC-0500NNNNN |

#### Ø80mm - (G<sup>3</sup>/<sub>8</sub>)

|     |                      |
|-----|----------------------|
| 25  | P1D-S080MC-0025NNNNN |
| 40  | P1D-S080MC-0040NNNNN |
| 50  | P1D-S080MC-0050NNNNN |
| 80  | P1D-S080MC-0080NNNNN |
| 100 | P1D-S080MC-0100NNNNN |
| 125 | P1D-S080MC-0125NNNNN |
| 160 | P1D-S080MC-0160NNNNN |
| 200 | P1D-S080MC-0200NNNNN |
| 250 | P1D-S080MC-0250NNNNN |
| 320 | P1D-S080MC-0320NNNNN |
| 400 | P1D-S080MC-0400NNNNN |
| 500 | P1D-S080MC-0500NNNNN |

#### Ø100mm - (G<sup>1</sup>/<sub>2</sub>)

| Stroke (mm) | Order Code           |
|-------------|----------------------|
| 25          | P1D-S100MC-0025NNNNN |
| 40          | P1D-S100MC-0040NNNNN |
| 50          | P1D-S100MC-0050NNNNN |
| 80          | P1D-S100MC-0080NNNNN |
| 100         | P1D-S100MC-0100NNNNN |
| 125         | P1D-S100MC-0125NNNNN |
| 160         | P1D-S100MC-0160NNNNN |
| 200         | P1D-S100MC-0200NNNNN |
| 250         | P1D-S100MC-0250NNNNN |
| 320         | P1D-S100MC-0320NNNNN |
| 400         | P1D-S100MC-0400NNNNN |
| 500         | P1D-S100MC-0500NNNNN |

#### Ø125mm - (G<sup>1</sup>/<sub>2</sub>)

|     |                      |
|-----|----------------------|
| 25  | P1D-S125MC-0025NNNNN |
| 40  | P1D-S125MC-0040NNNNN |
| 50  | P1D-S125MC-0050NNNNN |
| 80  | P1D-S125MC-0080NNNNN |
| 100 | P1D-S125MC-0100NNNNN |
| 125 | P1D-S125MC-0125NNNNN |
| 160 | P1D-S125MC-0160NNNNN |
| 200 | P1D-S125MC-0200NNNNN |
| 250 | P1D-S125MC-0250NNNNN |
| 320 | P1D-S125MC-0320NNNNN |
| 400 | P1D-S125MC-0400NNNNN |
| 500 | P1D-S125MC-0500NNNNN |

The cylinders are supplied complete with a zinc plated steel piston rod nut.

#### Sensors

For sensors see page B294.



Most popular.

**Design Versions**

**P1D Standard Version**

P1D Standard Version cylinders are available in 32-125mm bores and utilize internal composite technology to save weight, while assuring the high performance and functionality expected of ISO cylinders. Cushions and bumpers at both ends and a magnetic piston are included as standard. The Standard Version serves all markets where performance at an affordable price is desired.



**P1D Removable Gland Version**

P1D Removable Gland Version cylinders are available in 32-200mm bores and utilize bar stock endcaps and a removable high-strength bronze bearing for traditional and custom applications. The bronze bearing assembly is externally removable for quick and easy maintenance. No other ISO cylinder manufacturer in the world produces a Removable Gland Version and meets these demands. This version covers all applications which require performance and customization at all bore sizes.



**P1D Series Rod Lock Cylinder**

The P1D Series Rod Lock Cylinder incorporates a powerful piston rod locking device, which clamps the piston rod and locks it in position. The locking device is a spring lock with an air pressure release and is integrated into the front (head) cover of the cylinder.



**P1D Clean Version**

The P1D Clean Version is completely designed for the food industry. The stringent requirements for hygiene regarding choice of material and corrosion resistance have guided the development of this cylinder version. Available with BSPP ports (ISO 1179-1 with ISO 228-1 threads).



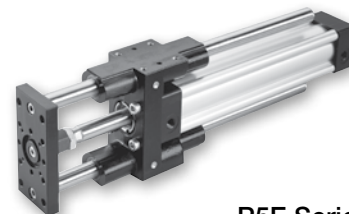
**P1D Tie-Rod Version**

The P1D Tie-Rod Version cylinders are based on the same high level technology as the Standard Version. They accept either Standard Version or Removable Gland Version heads and caps. This cylinder is the perfect choice wherever a true tie-rod cylinder is needed.



**Guided Cylinders**

For guided versions of the P1D, see the P5E Series and HB Series.



**P5E Series**

|               |                          |
|---------------|--------------------------|
| <b>B</b>      | <b>Tie Rod Cylinders</b> |
|               | <b>Actuator Products</b> |
| <b>Series</b> | <b>3MA</b>               |
| <b>Series</b> | <b>4MA/4ML</b>           |
| <b>Series</b> | <b>3MAJ/4MAJ</b>         |
| <b>Series</b> | <b>4MNR</b>              |
| <b>Series</b> | <b>P1D</b>               |

**Ordering information**

P1D
-
S
032
M
C
-
0500
N
N
N
N
N

| Piston Style |                        |                       |
|--------------|------------------------|-----------------------|
| Cushions     | Piston material        |                       |
|              | Composite <sup>1</sup> | Aluminum <sup>2</sup> |
| None         | M                      | Y                     |
| Cush B/E     | - <sup>3</sup>         | 4                     |
| Cush head    | J                      | 5                     |
| Cush cap     | K                      | 6                     |

| Bore size |                    |
|-----------|--------------------|
| 032       | 32mm               |
| 040       | 40mm               |
| 050       | 50mm               |
| 063       | 63mm               |
| 080       | 80mm               |
| 100       | 100mm              |
| 125       | 125mm              |
| 160       | 160mm <sup>8</sup> |
| 200       | 200mm <sup>8</sup> |

| Stroke <sup>14</sup>                       |  |
|--|--|
| Specify whole mm using 4 digits, i.e. 0500 |  |

| Rod end |               |
|---------|---------------|
| N       | Metric male   |
| 6       | Metric female |
| 3       | Special*      |

\* Please provide desired dimensions for KK, AM and WH or W. If otherwise, please provide dimensioned sketch.

| Version  |                       |          |  |   |
|--|-----------------------|----------|--|---|
|  | Cylinder body profile | Rod lock |  |   |
|  |                       | None     | Fitted w/ standard rod lock <sup>7</sup> | Fitted w/ manual override rod lock <sup>7</sup> |
| Die cast end caps <sup>4</sup>                   | Standard              | S        | L  | N/A   |
|  | Tie Rod <sup>13</sup> | T        | M  | N/A   |
|  | Clean                 | C        | D  | N/A   |
| Removable gland <sup>5</sup> (machined end caps) | Standard              | G        | R  | J   |
|  | Tie Rod <sup>13</sup> | E        | 7 <sup>4</sup>                           | Consult Factory                                 |
| Special <sup>6</sup>                             | Any Special           | /        |  |   |

| Function                                      |                 |               |            |                      |
|---|-----------------|---------------|------------|----------------------|
| Fastener type                                 | Rod wiper style | Double acting | Double rod | Tandem <sup>13</sup> |
| Standard end cover screws                     | Std scraper     | M             | F          | C                    |
|   | Metal scraper   | Q             | R          | J                    |
| Stainless steel end cover screws <sup>9</sup> | Std scraper     | A             | G          | N/A                  |
|   | Metal scraper   | S             | T          | N/A                  |

| Piston rod & seal material                     |               |                            |                         |
|--|---------------|----------------------------|-------------------------|
| Piston rod material                            | Seal material |                            |                         |
|  | Standard      | Fluorocarbon <sup>10</sup> | Hydraulic <sup>11</sup> |
| Chrome plated carbon steel <sup>2</sup>        | C             | G                          | J                       |
| Chrome plated stainless steel <sup>2, 19</sup> | R             | D                          | Z                       |
| 316 Stainless steel <sup>13</sup>              | S             | N/A                        | N/A                     |
| Acid-resistant stainless steel                 | M             | N <sup>2</sup>             | N/A                     |

| Cylinder ports front & rear |                           |  |
|-----------------------------|---------------------------|--|
| -                           | BSPG Ports (G Threads)**  |  |
| E                           | NPTF Ports*               |  |
| Q                           | BSPT Ports (RC Threads)*† |  |

\* Not available on clean version.  
† Not available on die cast version.  
\*\*ISO 1179-1 with ISO 228-1 threads.

| Rod mountings & plugs <sup>15</sup>                 |                        |                         |
|---|------------------------|-------------------------|
| Rod mounting  | No plugs <sup>16</sup> | With plugs <sup>1</sup> |
| Swivel rod eye                                      | S                      | A                       |
| Swivel rod eye SS                                   | T                      | 1                       |
| Swivel rod eye with clevis bracket GA <sup>19</sup> | V                      | E                       |
| Swivel rod eye SS with clevis bracket GA            | W                      | 2                       |
| Clevis  | C                      | B                       |
| Clevis SS   | D                      | 3                       |
| Flexco coupling                                     | F                      | G                       |
| One additional piston rod nut                       | X                      | P                       |
| Stainless steel piston rod nut                      | Y                      | 4                       |
| Acid-resistant nut                                  | Z                      | 5                       |
| None (piston rod nut only)                          | N                      | R                       |

| Sensors <sup>17</sup>   |                |               |              |
|---|----------------|---------------|--------------|
| Prepared for factory-fitted sensors   | Cable location |               |              |
|   | Front or left  | Rear or right | Front & rear |
| P1D clean version   | 6              | 7             | 8            |
| P1D all versions (except Clean) prepared for sensors or clean version without sensor capability <sup>18</sup> | N              |               |              |

| Mounting style                                    |          |             |
|---|----------|-------------|
|   | Standard | Rotated 90° |
| Flange MF1 at head (front) end                    | 1        | 3           |
| Flange MF2 at cap (rear) end                      | B        | 4           |
| Flanges MF1 and MF2 at both ends                  | 2        | K           |
| Foot brackets MS1                                 | F        | R           |
| Clevis bracket GA aluminum                        | C        | U           |
| Rear eye MP4 aluminum                             | E        | V           |
| Rear swivel eye MP6 aluminum                      | S        | W           |
| Clevis bracket MP2 aluminum                       | T        | Y           |
| Rear eye + clevis (MP4 + MP2) aluminum            | L        | Z           |
| Clevis bracket MP2 + pivot hinge aluminum         | X        | 5           |
| Clevis bracket GA aluminum + steel swivel hinge   | Q        | 0           |
| Rear swivel eye + clevis bracket GA aluminum      | M        | A           |
| Intermediate trunnion MT4 (requires XV dimension) | G        | 7           |
| Trunnion flange at head (front) end <sup>4</sup>  | H        | P           |
| Trunnion flange at cap (rear) end <sup>4</sup>    | J        | 8           |
| None (MX0)  | N        | 9           |

**Notes:**

- 1 Not available for 160-200mm bores.
- 2 Not available on Clean Version.
- 3 Must be placed in model code.
- 4 Not available for 160-200mm bores or with fluorocarbon seals.
- 5 When Removable Gland Version is fitted with rod lock, gland cannot be replaced without disassembling cylinder.
- 6 If special cylinder is ordered (other than rod end), End Cap Style, Cylinder Body Profile and Rod Lock option must be given in addition to the special request.
- 7 Cylinders fitted with rod locks must be cushioned on both ends.
- 8 Tie Rod Version E must be specified for these bores.
- 9 Applies only to end cover screws for 32-125mm bores. For stainless steel tie rods and nuts (all bore sizes), change Version to special and request stainless steel tie rods and nuts.
- 10 If used for temperature above 80°C (176°F), aluminum piston required. Not available with die cast end caps.
- 11 Hydraulic seal option valid for Removable Gland Version only. Adjustable cushion options and Rod Lock Versions not available.
- 12 Only available on Clean Version.
- 13 Tie Rod Version is required for Tandem Function.
- 14 When specifying a stop tube, place a "/" in the version field. Then specify the version, amount of stop tube and amount of net stroke. The stroke used in the model code should be gross stroke (net stroke plus stop tube).
- 15 Please review Piston Rod Selection Chart in the Engineering Section to check for a rod buckling condition.
- 16 Clean Version comes standard with plugs. Use this column when ordering Clean Version.
- 17 For sensor part numbers and specifications, please refer to Electronic Sensors section.
- 18 P1D Clean Version ordered without sensors cannot be retrofitted with sensor capability.
- 19 Consult factory for this option.

**Double Rod Cylinders**  
Double rod option is available with Mounting Styles MX0, MS1, MF1, MF2 and MT4.  
For double rod cylinders, it is assumed that the rod number and rod end are the same for both piston rods. On a double rod cylinder where the two rod ends are different, use a rod end of '3' and be sure to clearly state which rod end is to be assembled at which end.

B

Tie Rod Cylinders  
Actuator Products

3MA Series

4MA/4ML Series

3MAJ/4MAJ Series

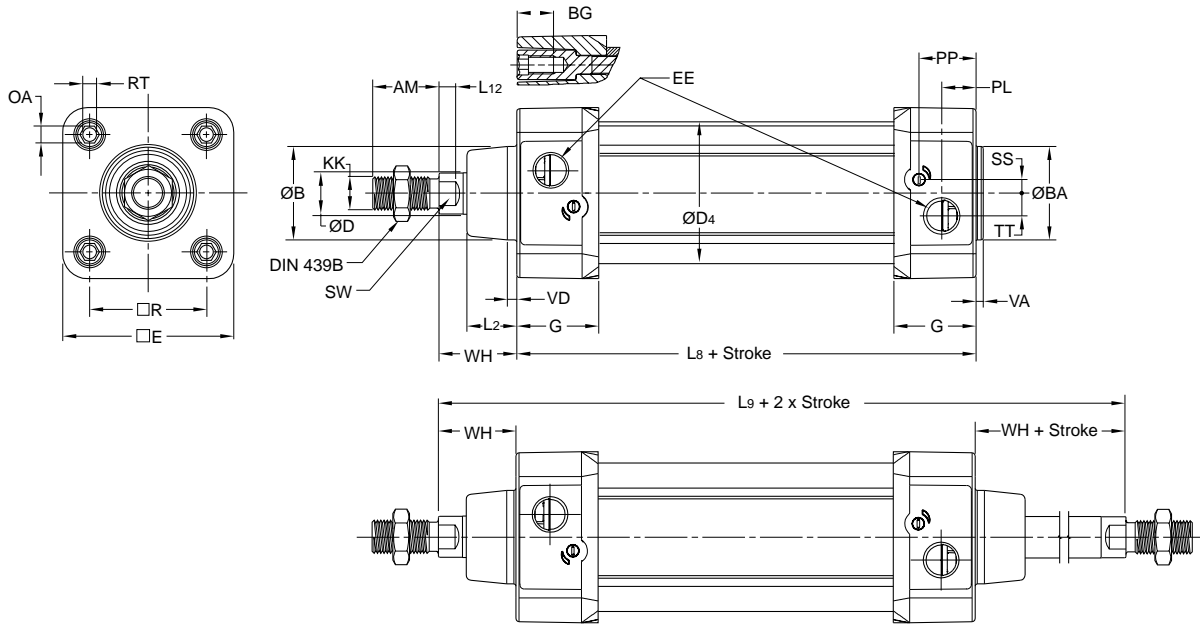
4MNR Series

P1D Series





**P1D Standard Version**



**B**  
 Tie Rod Cylinders  
 Actuator Products

Series  
 3MA  
 4MA/4ML  
 3MAJ/4MAJ  
 4MNR  
 P1D

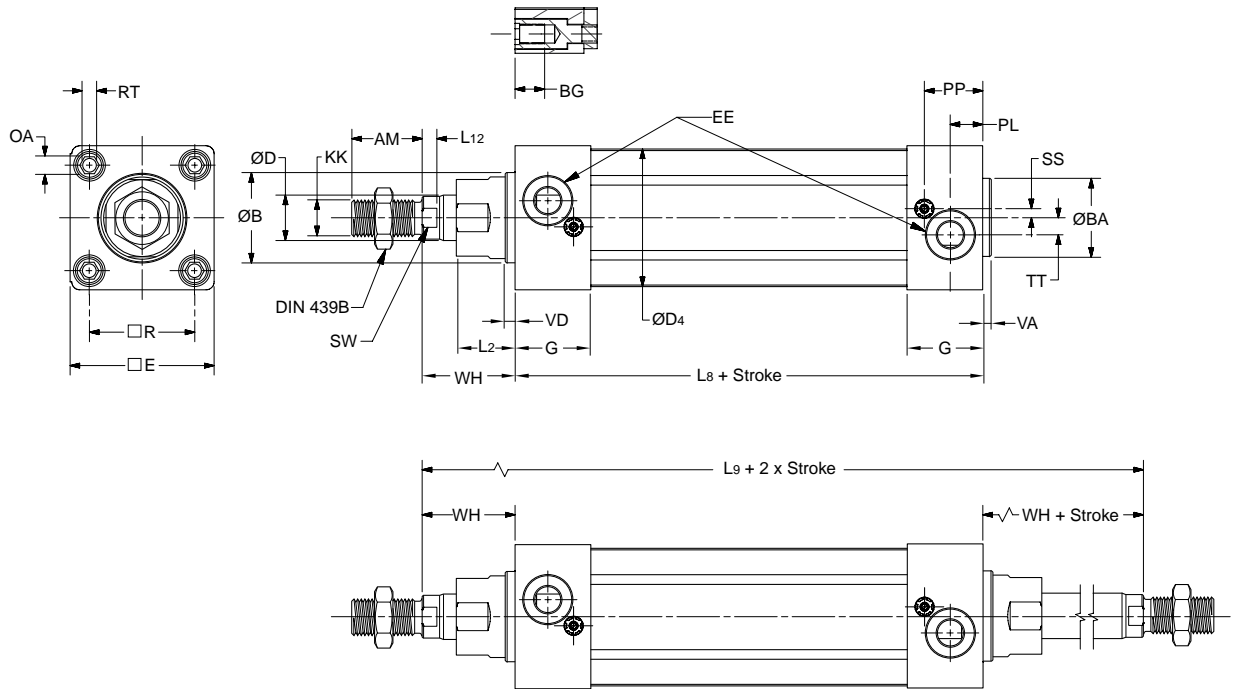
| Bore size | EE    |      |       |       |      |       |       |       |           |      |          |       |       |       |        |  |
|-----------|-------|------|-------|-------|------|-------|-------|-------|-----------|------|----------|-------|-------|-------|--------|--|
|           | AM mm | B mm | BA mm | BG mm | D mm | D4 mm | E     | BSPP* | NPTF/BSPT | G mm | KK       | L2 mm | L8 mm | L9 mm | L12 mm |  |
| 32        | 22    | 30   | 30    | 16    | 12   | 45.0  | 50.0  | G1/8  | 1/8       | 28.5 | M10x1.25 | 16.0  | 94    | 146   | 6.0    |  |
| 40        | 24    | 35   | 35    | 16    | 16   | 52.0  | 57.4  | G1/4  | 1/4       | 33.0 | M12x1.25 | 19.0  | 105   | 165   | 6.5    |  |
| 50        | 32    | 40   | 40    | 16    | 20   | 60.7  | 69.4  | G1/4  | 1/4       | 33.5 | M16x1.5  | 24.0  | 106   | 180   | 8.0    |  |
| 63        | 32    | 45   | 45    | 16    | 20   | 71.5  | 82.4  | G3/8  | 3/8       | 39.5 | M16x1.5  | 24.0  | 121   | 195   | 8.0    |  |
| 80        | 40    | 45   | 45    | 17    | 25   | 86.7  | 99.4  | G3/8  | 3/8       | 39.5 | M20x1.5  | 30.0  | 128   | 220   | 10.0   |  |
| 100       | 40    | 55   | 55    | 17    | 25   | 106.7 | 116.0 | G1/2  | 1/2       | 44.5 | M20x1.5  | 32.4  | 138   | 240   | 10.0   |  |
| 125       | 54    | 60   | 60    | 20    | 32   | 134.0 | 139.0 | G1/2  | 1/2       | 51.0 | M27x2    | 45.0  | 160   | 290   | 13.0   |  |

| Bore size | OA mm | PL mm | PP mm | R mm  | RT  | SS mm | SW mm | TT mm | VA mm | VD mm | WH mm |
|-----------|-------|-------|-------|-------|-----|-------|-------|-------|-------|-------|-------|
| 32        | 6     | 13    | 21.8  | 32.5  | M6  | 4.0   | 10    | 4.5   | 3.5   | 4.5   | 26    |
| 40        | 6     | 14    | 21.9  | 38.0  | M6  | 8.0   | 13    | 5.5   | 3.5   | 4.5   | 30    |
| 50        | 8     | 14    | 25.9  | 46.5  | M8  | 4.0   | 17    | 7.5   | 3.5   | 4.5   | 37    |
| 63        | 8     | 16    | 27.4  | 56.5  | M8  | 6.5   | 17    | 11.0  | 3.5   | 4.5   | 37    |
| 80        | 6     | 16    | 30.5  | 72.0  | M10 | 0     | 22    | 15.0  | 3.5   | 4.5   | 46    |
| 100       | 6     | 18    | 35.8  | 89.0  | M10 | 0     | 22    | 20.0  | 3.5   | 4.5   | 51    |
| 125       | 8     | 23    | 40.5  | 110.0 | M12 | 0     | 27    | 17.5  | 3.5   | 6.5   | 65    |

\* ISO 1179-1 with ISO 228-1 threads

**P1D Removable Gland Version**



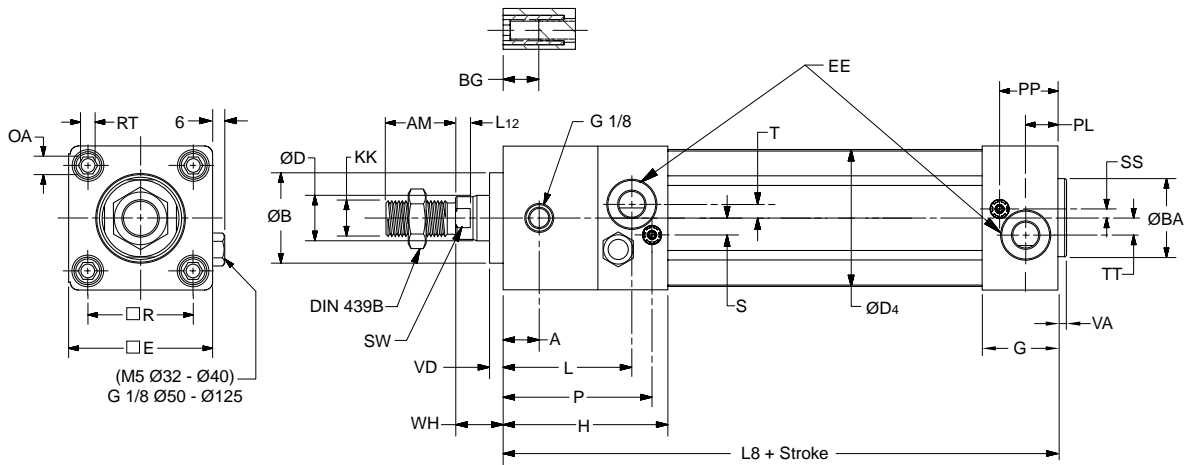
| Bore size | AM mm | B mm | BA mm | BG mm | D mm | D4 mm | E mm  | EE     |           | G mm | KK       | L2 mm | L8 mm | L9 mm | L12 mm |
|-----------|-------|------|-------|-------|------|-------|-------|--------|-----------|------|----------|-------|-------|-------|--------|
|           |       |      |       |       |      |       |       | BSPP * | NPTF/BSPT |      |          |       |       |       |        |
| 32        | 22    | 30   | 30    | 16    | 12   | 45.0  | 46.5  | G1/8   | 1/8       | 28.5 | M10x1.25 | 18    | 94    | 146   | 6.0    |
| 40        | 24    | 35   | 35    | 16    | 16   | 52.0  | 52.0  | G1/4   | 1/4       | 33.0 | M12x1.25 | 20    | 105   | 165   | 6.5    |
| 50        | 32    | 40   | 40    | 16    | 20   | 60.7  | 63.5  | G1/4   | 1/4       | 33.5 | M16x1.5  | 26    | 106   | 180   | 6.5    |
| 63        | 32    | 45   | 45    | 16    | 20   | 71.5  | 76.0  | G3/8   | 3/8       | 39.5 | M16x1.5  | 26    | 121   | 195   | 6.5    |
| 80        | 40    | 45   | 45    | 17    | 25   | 86.7  | 95.5  | G3/8   | 3/8       | 39.5 | M20x1.5  | 33    | 128   | 220   | 10.0   |
| 100       | 40    | 55   | 55    | 17    | 25   | 106.7 | 114.5 | G1/2   | 1/2       | 44.5 | M20x1.5  | 33    | 138   | 240   | 10.0   |
| 125       | 54    | 60   | 60    | 20    | 32   | 134.0 | 140.0 | G1/2   | 1/2       | 51.0 | M27x2    | 41    | 160   | 290   | 13.0   |

| Bore size | OA mm | PL mm | PP mm | R mm  | RT  | SS mm | SW mm | TT mm | VA mm | VD mm | WH mm |
|-----------|-------|-------|-------|-------|-----|-------|-------|-------|-------|-------|-------|
| 32        | 6     | 13    | 21.8  | 32.5  | M6  | 6.5   | 10    | 4.5   | 3.5   | 4.5   | 26    |
| 40        | 6     | 14    | 21.9  | 38.0  | M6  | 8.0   | 13    | 5.5   | 3.5   | 4.5   | 30    |
| 50        | 8     | 14    | 25.9  | 46.5  | M8  | 4.0   | 17    | 7.5   | 3.5   | 4.5   | 37    |
| 63        | 8     | 16    | 27.4  | 56.5  | M8  | 6.5   | 17    | 11.0  | 3.5   | 4.5   | 37    |
| 80        | 6     | 16    | 30.5  | 72.0  | M10 | 0     | 22    | 15.0  | 3.5   | 4.5   | 46    |
| 100       | 6     | 18    | 35.8  | 89.0  | M10 | 0     | 22    | 20.0  | 3.5   | 4.5   | 51    |
| 125       | 8     | 23    | 40.5  | 110.0 | M12 | 0     | 27    | 17.5  | 5.5   | 6.5   | 65    |

\* ISO 1179-1 with ISO 228-1 threads

**B**  
Tie Rod Cylinders  
Actuator Products  
3MA Series  
4MA/4ML Series  
3MAJ/4MAJ Series  
4MNR Series  
P1D Series

**P1D Rod Lock Version (Version R or L)**



| Bore size | A mm | AM mm | B mm | BA mm | BG mm | D mm | D4 mm | E mm  | EE * | G mm | H mm  | KK       | L mm  | L8 mm | L12 mm |
|-----------|------|-------|------|-------|-------|------|-------|-------|------|------|-------|----------|-------|-------|--------|
| 32        | 16   | 22    | 30   | 30    | 16    | 12   | 45.0  | 46.5  | G1/8 | 28.5 | 71.5  | M10x1.25 | 56.0  | 137   | 6.0    |
| 40        | 16   | 24    | 35   | 35    | 16    | 16   | 52.0  | 52.0  | G1/4 | 33.0 | 77.0  | M12x1.25 | 56.0  | 149   | 6.5    |
| 50        | 18   | 32    | 40   | 40    | 16    | 20   | 60.7  | 63.5  | G1/4 | 33.5 | 80.5  | M16x1.5  | 62.5  | 153   | 6.5    |
| 63        | 26   | 32    | 45   | 45    | 16    | 20   | 71.5  | 76.0  | G3/8 | 39.5 | 96.5  | M16x1.5  | 74.5  | 178   | 6.5    |
| 80        | 35   | 40    | 45   | 45    | 17    | 25   | 86.7  | 95.5  | G3/8 | 39.5 | 110.5 | M20x1.5  | 87.0  | 199   | 10.0   |
| 100       | 50   | 40    | 55   | 55    | 17    | 25   | 106.7 | 114.5 | G1/2 | 44.5 | 132.5 | M20x1.5  | 106.0 | 226   | 10.0   |
| 125       | 60   | 54    | 60   | 60    | 20    | 32   | 134.0 | 140.0 | G1/2 | 51.0 | 145.0 | M27x2    | 117.0 | 254   | 13.0   |

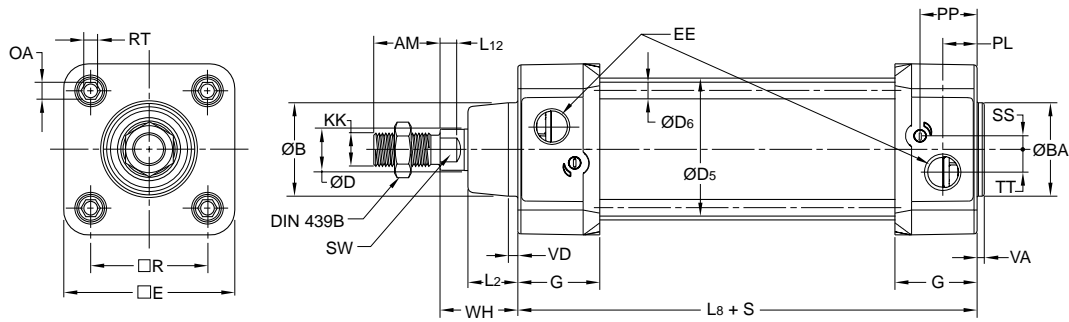
  

| Bore size | OA mm | P mm  | PL mm | PP mm | R mm  | RT mm | S mm | SS mm | SW mm | T mm | TT mm | VA mm | VD mm | WH mm |
|-----------|-------|-------|-------|-------|-------|-------|------|-------|-------|------|-------|-------|-------|-------|
| 32        | 6     | 64.8  | 13    | 21.8  | 32.5  | M6    | 7    | 6.5   | 10    | 2.5  | 4.5   | 3.5   | 4.5   | 15    |
| 40        | 6     | 68.0  | 14    | 21.9  | 38.0  | M6    | 9    | 8.0   | 13    | 2.0  | 5.5   | 3.5   | 4.5   | 16    |
| 50        | 8     | 73.5  | 14    | 25.9  | 46.5  | M8    | 8    | 4.0   | 17    | 4.0  | 7.5   | 3.5   | 5.0   | 17    |
| 63        | 8     | 89.5  | 16    | 27.4  | 56.5  | M8    | 8    | 6.5   | 17    | 2.0  | 11.0  | 3.5   | 5.0   | 17    |
| 80        | 6     | 101.5 | 16    | 30.5  | 72.0  | M10   | 9    | 0     | 22    | 5.0  | 15.0  | 3.5   | 4.0   | 20    |
| 100       | 6     | 123.5 | 18    | 35.8  | 89.0  | M10   | 12   | 0     | 22    | 6.0  | 20.0  | 3.5   | 4.0   | 20    |
| 125       | 8     | 136.0 | 23    | 40.5  | 110.0 | M12   | 12   | 0     | 27    | 6.0  | 17.5  | 5.5   | 6.0   | 27    |

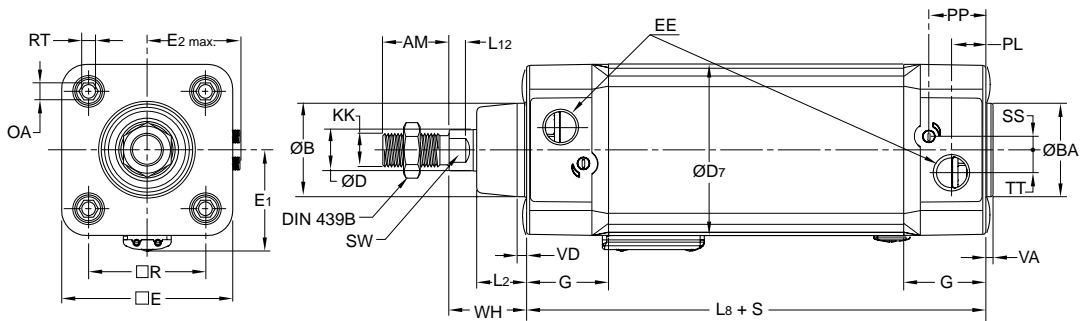
\* ISO 1179-1 with ISO 228-1 threads

**B**  
 Tie Rod Cylinders  
 Actuator Products  
 Series  
 3MA  
 4MA/4ML  
 Series  
 3MAJ/4MAJ  
 Series  
 4MNR  
 Series  
 P1D  
 Series

**P1D Tie-Rod Version (32-125mm)**



**P1D Clean Version**



| Bore size | D5 mm | D6 mm | D7 mm | E1 mm | E2 max mm |
|-----------|-------|-------|-------|-------|-----------|
| 32        | 36    | 5.3   | 49.6  | 32    | 5         |
| 40        | 45    | 5.3   | 57.3  | 36    | 6         |
| 50        | 55    | 7.1   | 69.3  | 42    | 6         |
| 63        | 68    | 7.1   | 82.3  | 49    | 5         |
| 80        | 85    | 8.9   | 99.3  | 57    | 5         |
| 100       | 105   | 8.9   | 117.6 | 68    | 6         |
| 125       | 132   | 10.7  | 142.8 | 81    | 6         |

Other dimensions, see P1D removable gland version.

**B**

**Tie Rod Cylinders  
 Actuator Products**

**3MA  
 Series**

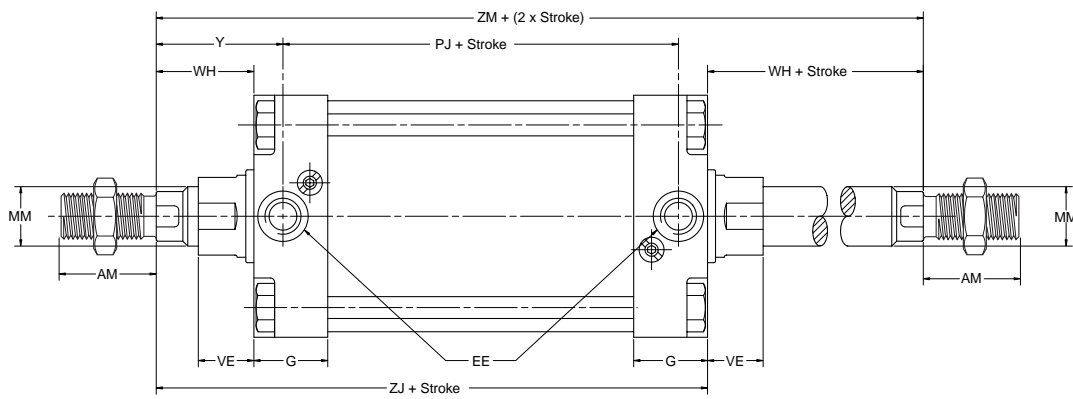
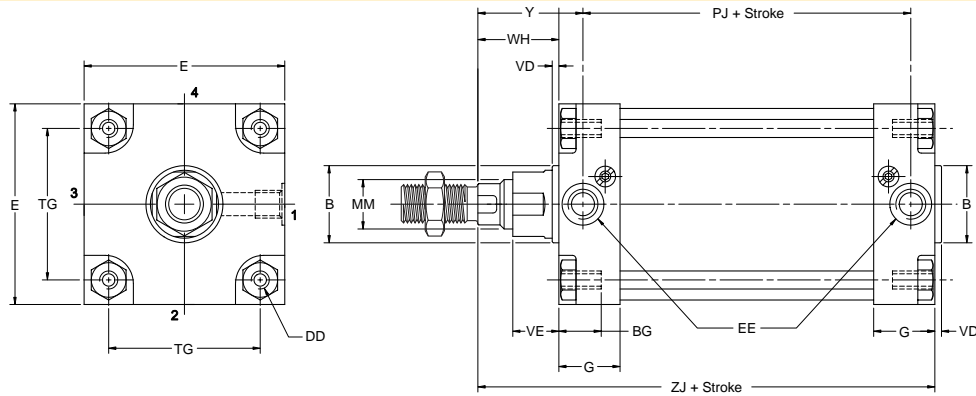
**4MA/4ML  
 Series**

**3MAJ/4MAJ  
 Series**

**4MNR  
 Series**

**P1D  
 Series**

**P1D Tie-Rod Version (160-200mm)**



Rod End #1

Rod End #2

| Bore size | AM mm | B d11 mm | BG mm | DD  | E mm | EE                |           | G mm | MM mm | TG mm | VD mm | VE mm | WH mm | Y mm | PJ1 mm | ZJ1 mm | ZM2 mm |
|-----------|-------|----------|-------|-----|------|-------------------|-----------|------|-------|-------|-------|-------|-------|------|--------|--------|--------|
|           |       |          |       |     |      | BSPP <sup>3</sup> | NPTF/BSPT |      |       |       |       |       |       |      |        |        |        |
| 160       | 72    | 65       | 24    | M16 | 177  | G3/4              | 3/4       | 54   | 40    | 140   | 6     | 56    | 80    | 105  | 130    | 260    | 340    |
| 200       | 72    | 75       | 24    | M16 | 214  | G3/4              | 3/4       | 54   | 40    | 175   | 6     | 56    | 95    | 120  | 130    | 275    | 370    |

1 Add stroke  
 2 Add 2x stroke  
 3 ISO 1179-1 with ISO 228-1 threads

**Double Rod Cylinders**

Double rod option is available on Mounting Styles MX0, MS1, MF1, MF2 and MT4.

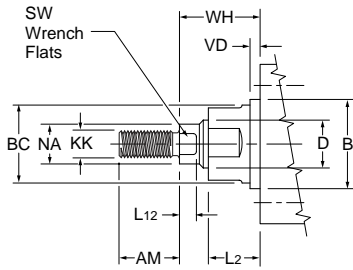
For double rod cylinders, it is assumed that the rod number and rod end are the same for both piston rods. On a double rod cylinder where the two rod ends are different, use a rod end of '3' and be sure to clearly state which rod end is to be assembled at which end.

**B**  
 Tie Rod Cylinders  
 Actuator Products  
 Series  
 3MA  
 Series  
 4MA/4ML  
 Series  
 3MAJ/4MAJ  
 Series  
 4MNR  
 Series  
 P1D

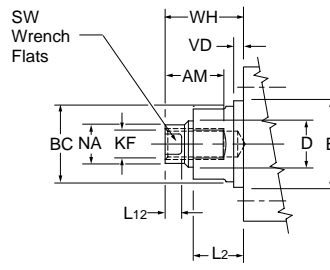


**All Mountings Except MF1**

**Thread Style N**



**Thread Style 6**



**Thread Style 3 -  
 “Special Thread”**

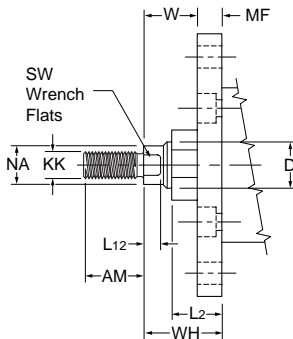
Special thread, extension, rod eye, blank, etc are also available. To order, specify “Style 3” and provide desired dimensions for KF or KK, AM and WH. If otherwise special, furnish dimensioned sketch.

| Bore size | D  | KK       | KF       | AM | B d11 | BC | SW across flats | L12 | NA | VD  | L2 | WH* |
|-----------|----|----------|----------|----|-------|----|-----------------|-----|----|-----|----|-----|
| 32        | 12 | M10x1.25 | M8x1     | 22 | 30    | 27 | 10              | 6   | 11 | 4.5 | 18 | 26  |
| 40        | 16 | M12x1.25 | M10x1.25 | 24 | 35    | 32 | 13              | 6.5 | 15 | 4.5 | 20 | 30  |
| 50        | 20 | M16x1.5  | M14x1.5  | 32 | 40    | 36 | 17              | 6.5 | 19 | 4.5 | 26 | 37  |
| 63        | 20 | M16x1.5  | M14x1.5  | 32 | 45    | 36 | 17              | 6.5 | 19 | 4.5 | 26 | 37  |
| 80        | 25 | M20x1.5  | M18x1.5  | 40 | 45    | 41 | 22              | 10  | 24 | 4.5 | 33 | 46  |
| 100       | 25 | M20x1.5  | M18x1.5  | 40 | 55    | 41 | 22              | 10  | 24 | 4.5 | 33 | 51  |
| 125       | 32 | M27x2    | M24x2    | 54 | 60    | 50 | 27              | 13  | 31 | 6.5 | 41 | 65  |
| 160       | 40 | M36x2    | M30x2    | 72 | 65    | 60 | 36              | 16  | 39 | 6   | 56 | 80  |
| 200       | 40 | M36x2    | M30x2    | 72 | 75    | 60 | 36              | 16  | 39 | 6   | 56 | 95  |

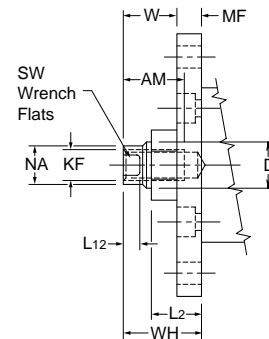
\*NOTE: Dimensions do not apply to Rod Lock Versions.

**With MF1 Mounting**

**Thread Style N**



**Thread Style 6**



**“Special Thread”  
 Style 3**

Special thread, extension, rod eye, blank, etc are also available. To order, specify “Style 3” and provide desired dimensions for KF or KK, AM and WH. If otherwise special, furnish dimensioned sketch.

| Bore size | D  | KK       | KF       | AM | SW across flats | L12 | MF | NA | L2 | W† | WH† |
|-----------|----|----------|----------|----|-----------------|-----|----|----|----|----|-----|
| 32        | 12 | M10x1.25 | M8x1     | 22 | 10              | 6   | 10 | 11 | 18 | 16 | 26  |
| 40        | 16 | M12x1.25 | M10x1.25 | 24 | 13              | 6.5 | 10 | 15 | 20 | 20 | 30  |
| 50        | 20 | M16x1.5  | M14x1.5  | 32 | 17              | 6.5 | 12 | 19 | 26 | 25 | 37  |
| 63        | 20 | M16x1.5  | M14x1.5  | 32 | 17              | 6.5 | 12 | 19 | 26 | 25 | 37  |
| 80        | 25 | M20x1.5  | M18x1.5  | 40 | 22              | 10  | 16 | 24 | 33 | 30 | 46  |
| 100       | 25 | M20x1.5  | M18x1.5  | 40 | 22              | 10  | 16 | 24 | 33 | 35 | 51  |
| 125       | 32 | M27x2    | M24x2    | 54 | 27              | 13  | 20 | 31 | 41 | 45 | 65  |
| 160       | 40 | M36x2    | M30x2    | 72 | 36              | 16  | 20 | 39 | 56 | 60 | 80  |
| 200       | 40 | M36x2    | M30x2    | 72 | 36              | 16  | 25 | 39 | 56 | 70 | 95  |

†NOTE: Dimensions do not apply to Rod Lock Versions.



**Flange – MF1, MF2**

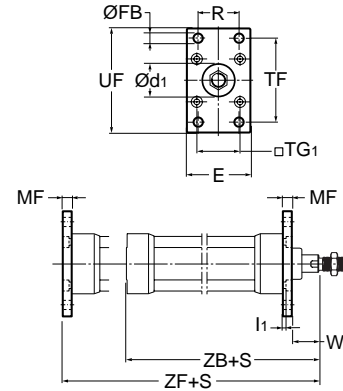


Intended for fixed mounting of cylinder. Flange can be fitted to front or rear end cover of cylinder.

**Materials:**

32-100mm bore flange: Surface-treated aluminum, black  
 125-200mm bore flange: Steel, black  
 Mounting screws acc. to DIN 6912: Zinc-plated steel 8.8

Supplied complete with mounting screws for attachment to cylinder.



According to ISO MF1/MF2, VDMA 24 562, AFNOR

| Bore size mm | d1 H11 mm | FB H13 mm | TG1 mm | E mm | R JS14 mm | MF JS14 mm | TF JS14 mm | UF  | l1 -0.5 mm | W mm | ZF mm | ZB mm | Weight kg | Part number       |
|--------------|-----------|-----------|--------|------|-----------|------------|------------|-----|------------|------|-------|-------|-----------|-------------------|
| 32           | 30        | 7         | 32.5   | 45   | 32        | 10         | 64         | 80  | 5.0        | 16   | 130   | 123.5 | 0.23      | <b>P1C-4KMBA</b>  |
| 40           | 35        | 9         | 38.0   | 52   | 36        | 10         | 72         | 90  | 5.0        | 20   | 145   | 138.5 | 0.28      | <b>P1C-4LMBA</b>  |
| 50           | 40        | 9         | 46.5   | 65   | 45        | 12         | 90         | 110 | 6.5        | 25   | 155   | 146.5 | 0.53      | <b>P1C-4MMBA</b>  |
| 63           | 45        | 9         | 56.5   | 75   | 50        | 12         | 100        | 120 | 6.5        | 25   | 170   | 161.5 | 0.71      | <b>P1C-4NMBA</b>  |
| 80           | 45        | 12        | 72.0   | 95   | 63        | 16         | 126        | 150 | 8.0        | 30   | 190   | 177.5 | 1.59      | <b>P1C-4PMBA</b>  |
| 100          | 55        | 14        | 89.0   | 112  | 75        | 16         | 150        | 185 | 8.0        | 35   | 205   | 192.5 | 2.19      | <b>P1C-4QMBA</b>  |
| 125          | 60        | 16        | 110.0  | 140  | 90        | 20         | 180        | 220 | 10.5       | 45   | 245   | 230.5 | 3.78      | <b>P1C-4RMB</b>   |
| 160          | 65        | 18        | 140.0  | 180  | 115       | 20         | 230        | 260 | 9.5        | 60   | 280   | 266   | C.F.      | <b>L075370160</b> |
| 200          | 75        | 22        | 175.0  | 220  | 135       | 25         | 270        | 300 | 12.5       | 70   | 300   | 281   | C.F.      | <b>L075370200</b> |

S = Stroke length C.F. = Consult Factory

**Foot Bracket – MS1**

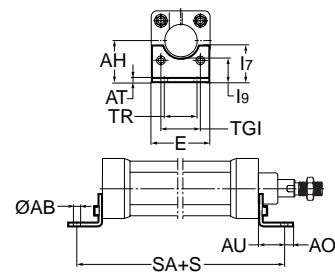


Intended for fixed mounting of cylinder. Foot bracket can be fitted to front and rear end covers of cylinder.

**Materials:**

Foot bracket: Surface-treated steel, black  
 Mounting screws acc. to DIN 912: Zinc-plated steel 8.8

Supplied in pairs with mounting screws for attachment to cylinder.



According to ISO MS1, VDMA 24 562, AFNOR

| Bore size mm | AB H14 mm | TG1 mm | E mm | TR JS14 mm | AO mm | AU mm | AH JS15 mm | l7 mm | AT mm | l9 JS14 mm | SA mm | Weight* kg | Part number       |
|--------------|-----------|--------|------|------------|-------|-------|------------|-------|-------|------------|-------|------------|-------------------|
| 32           | 7         | 32.5   | 45   | 32         | 10    | 24    | 32         | 30    | 4.5   | 17.0       | 142   | 0.06       | <b>P1C-4KMF</b>   |
| 40           | 9         | 38.0   | 52   | 36         | 8     | 28    | 36         | 30    | 4.5   | 18.5       | 161   | 0.08       | <b>P1C-4LMF</b>   |
| 50           | 9         | 46.5   | 65   | 45         | 13    | 32    | 45         | 36    | 5.5   | 25.0       | 170   | 0.16       | <b>P1C-4MMF</b>   |
| 63           | 9         | 56.5   | 75   | 50         | 13    | 32    | 50         | 35    | 5.5   | 27.5       | 185   | 0.25       | <b>P1C-4NMF</b>   |
| 80           | 12        | 72.0   | 95   | 63         | 14    | 41    | 63         | 49    | 6.5   | 40.5       | 210   | 0.50       | <b>P1C-4PMF</b>   |
| 100          | 14        | 89.0   | 115  | 75         | 15    | 41    | 71         | 54    | 6.5   | 43.5       | 220   | 0.85       | <b>P1C-4QMF</b>   |
| 125          | 16        | 110.0  | 140  | 90         | 22    | 45    | 90         | 71    | 8.0   | 60.0       | 250   | 1.48       | <b>P1C-4RMF</b>   |
| 160          | 18        | 140.0  | 180  | 115        | 15    | 60    | 115        | 100   | 9.0   | 63.5       | 300   | C.F.       | <b>L075380160</b> |
| 200          | 22        | 175.0  | 220  | 135        | 30    | 70    | 135        | 100   | 12.0  | 65.0       | 320   | C.F.       | <b>L075380200</b> |

S = Stroke length C.F. = Consult Factory

\*Weight per item





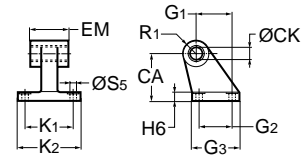
**Pivot Bracket with Rigid Bearing**



Intended for flexible mounting of cylinder. The pivot bracket can be combined with clevis bracket MP2.

**Materials:**

Pivot bracket: Surface-treated aluminium, black  
 Bearing: Sintered oil-bronze bushing



According to CETOP RP 107 P, VDMA 24 562, AFNOR

| Bore size mm | CK H9 mm | S5 H13 mm | K1 JS14 mm | K2  | G1 JS14 mm | G2 JS14 mm | EM mm | G3 mm | CA JS15 mm | H6 mm | R1 mm | Weight kg | Part number       |
|--------------|----------|-----------|------------|-----|------------|------------|-------|-------|------------|-------|-------|-----------|-------------------|
| 32           | 10       | 6.6       | 38         | 51  | 21         | 18         | 25.5  | 31    | 32         | 8     | 10.0  | 0.06      | <b>P1C-4KMD</b>   |
| 40           | 12       | 6.6       | 41         | 54  | 24         | 22         | 27.0  | 35    | 36         | 10    | 11.0  | 0.08      | <b>P1C-4LMD</b>   |
| 50           | 12       | 9.0       | 50         | 65  | 33         | 30         | 31.0  | 45    | 45         | 12    | 13.0  | 0.15      | <b>P1C-4MMD</b>   |
| 63           | 16       | 9.0       | 52         | 67  | 37         | 35         | 39.0  | 50    | 50         | 12    | 15.0  | 0.20      | <b>P1C-4NMD</b>   |
| 80           | 16       | 11.0      | 66         | 86  | 47         | 40         | 49.0  | 60    | 63         | 14    | 15.0  | 0.33      | <b>P1C-4PMD</b>   |
| 100          | 20       | 11.0      | 76         | 96  | 55         | 50         | 59.0  | 70    | 71         | 15    | 19.0  | 0.49      | <b>P1C-4QMD</b>   |
| 125          | 25       | 14.0      | 94         | 124 | 70         | 60         | 69.0  | 90    | 90         | 20    | 22.5  | 1.02      | <b>P1C-4RMD</b>   |
| 160          | 30       | 14.0      | 118        | 156 | 97         | 89         | 88.5  | 126   | 115        | 25    | 31.0  | C.F.      | <b>L075480160</b> |
| 200          | 30       | 16.0      | 122        | 162 | 105        | 89         | 88.5  | 130   | 135        | 30    | 31.0  | C.F.      | <b>L075480200</b> |

C.F. = Consult Factory

**Swivel Eye Bracket – MP6**

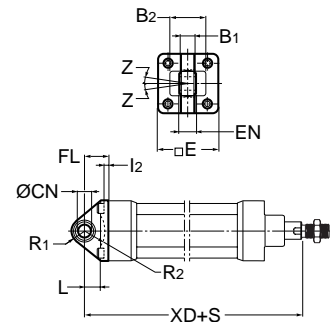


Intended for use together with clevis bracket GA

**Materials:**

Bracket: Surface-treated aluminium, black  
 (Cast iron for 160-200mm bores)  
 Swivel bearing acc. to DIN 648K: Hardened steel

Supplied complete with mounting screws for attachment to cylinder.



According to VDMA 24 562, AFNOR

| Bore size mm | E mm | B1 mm | B2 mm | EN mm | R1 mm | R2 mm | FL mm | l2 mm | L mm | CN H7 mm | XD mm | Z   | Weight kg | Part number       |
|--------------|------|-------|-------|-------|-------|-------|-------|-------|------|----------|-------|-----|-----------|-------------------|
| 32           | 45   | 10.5  | –     | 14    | 16    | –     | 22    | 5.5   | 12   | 10       | 142   | 4°  | 0.08      | <b>P1C-4KMSA</b>  |
| 40           | 52   | 12.0  | –     | 16    | 18    | –     | 25    | 5.5   | 15   | 12       | 160   | 4°  | 0.11      | <b>P1C-4LMSA</b>  |
| 50           | 65   | 15.0  | 51    | 21    | 21    | 19    | 27    | 6.5   | 15   | 16       | 170   | 4°  | 0.20      | <b>P1C-4MMSA</b>  |
| 63           | 75   | 15.0  | –     | 21    | 23    | –     | 32    | 6.5   | 20   | 16       | 190   | 4°  | 0.27      | <b>P1C-4NMSA</b>  |
| 80           | 95   | 18.0  | –     | 25    | 29    | –     | 36    | 10.0  | 20   | 20       | 210   | 4°  | 0.52      | <b>P1C-4PMSA</b>  |
| 100          | 115  | 18.0  | –     | 25    | 31    | –     | 41    | 10.0  | 25   | 20       | 230   | 4°  | 0.72      | <b>P1C-4QMSA</b>  |
| 125          | 140  | 25.0  | –     | 37    | 40    | –     | 50    | 10.0  | 30   | 30       | 275   | 4°  | 1.53      | <b>P1C-4RMSA</b>  |
| 160          | 177  | 30.0  | –     | 43    | 44    | 41    | 55    | 4.0   | 41   | 35       | 315   | 16° | C.F.      | <b>L075420160</b> |
| 200          | 214  | 30.0  | –     | 43    | 48    | 42    | 60    | 8.0   | 42   | 35       | 335   | 16° | C.F.      | <b>L075420200</b> |

S = Stroke length C.F. = Consult Factory

**B**  
 Tie Rod Cylinders  
 Actuator Products

3MA Series

4MA/4ML Series

3MAJ/4MAJ Series

4MNR Series

P1D Series



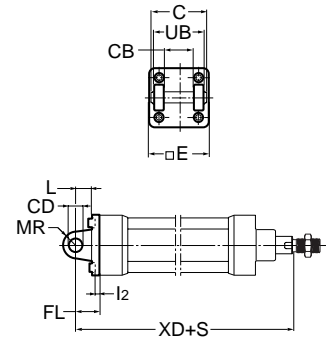
**Clevis Bracket – MP2**



Intended for flexible mounting of cylinder. Clevis bracket MP2 can be combined with clevis bracket MP4.

**Materials:**

Clevis bracket: Surface-treated aluminium, black for 32-160mm bores; Cast iron for 200mm bore  
 Pin: Surface hardened steel  
 Circlips according to DIN 471: Spring steel  
 Mounting screws acc. to DIN 912: Zinc-plated steel 8.8  
 Supplied complete with mounting screws for attachment to cylinder.



According to ISO MP2, VDMA 24 562, AFNOR

| Bore size mm | C mm | E mm | UB h14 mm | CB H14 mm | FL ±0.2 mm | L mm | l2 mm | CD H9 mm | MR mm | XD mm | Weight kg | Part number       |
|--------------|------|------|-----------|-----------|------------|------|-------|----------|-------|-------|-----------|-------------------|
| 32           | 53   | 45   | 45        | 26        | 22         | 13   | 5.5   | 10       | 10    | 142   | 0.08      | <b>P1C-4KMT</b>   |
| 40           | 60   | 52   | 52        | 28        | 25         | 16   | 5.5   | 12       | 12    | 160   | 0.11      | <b>P1C-4LMT</b>   |
| 50           | 68   | 65   | 60        | 32        | 27         | 16   | 6.5   | 12       | 12    | 170   | 0.14      | <b>P1C-4MMT</b>   |
| 63           | 78   | 75   | 70        | 40        | 32         | 21   | 6.5   | 16       | 16    | 190   | 0.29      | <b>P1C-4NMT</b>   |
| 80           | 98   | 95   | 90        | 50        | 36         | 22   | 10.0  | 16       | 16    | 210   | 0.36      | <b>P1C-4PMT</b>   |
| 100          | 118  | 115  | 110       | 60        | 41         | 27   | 10.0  | 20       | 20    | 230   | 0.64      | <b>P1C-4QMT</b>   |
| 125          | 139  | 140  | 130       | 70        | 50         | 30   | 10.0  | 25       | 25    | 275   | 1.17      | <b>P1C-4RMT</b>   |
| 160          | 178  | 180  | 170       | 90        | 55         | 35   | 10.0  | 30       | 25    | 315   | C.F.      | <b>L075390160</b> |
| 200          | 178  | 200  | 170       | 90        | 60         | 35   | 14.0  | 30       | 25    | 335   | C.F.      | <b>L075390200</b> |

S = Stroke length C.F. = Consult Factory

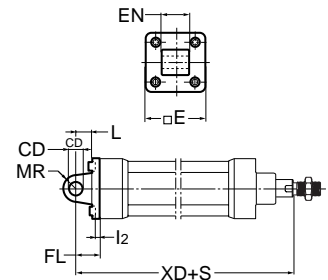
**Clevis Bracket – MP4**



Intended for flexible mounting of cylinder. Clevis bracket MP4 can be combined with clevis bracket MP2.

**Materials:**

Clevis bracket: Surface-treated aluminium, black for 32-125mm bores; Cast iron for 160-200mm bores  
 Mounting screws acc. to DIN 912: Zinc-plated steel 8.8  
 Supplied complete with mounting screws for attachment to cylinder.



According to ISO MP4, VDMA 24 562, AFNOR

| Bore size mm | E mm | EW mm | FL mm | L ±0.2 mm | l2 mm | CD mm | MR H9 mm | XD mm | Weight kg | Part number       |
|--------------|------|-------|-------|-----------|-------|-------|----------|-------|-----------|-------------------|
| 32           | 45   | 26    | 22    | 13        | 5.5   | 10    | 10       | 142   | 0.09      | <b>P1C-4KME</b>   |
| 40           | 52   | 28    | 25    | 16        | 5.5   | 12    | 12       | 160   | 0.13      | <b>P1C-4LME</b>   |
| 50           | 65   | 32    | 27    | 16        | 6.5   | 12    | 12       | 170   | 0.17      | <b>P1C-4MME</b>   |
| 63           | 75   | 40    | 32    | 21        | 6.5   | 16    | 16       | 190   | 0.36      | <b>P1C-4NME</b>   |
| 80           | 95   | 50    | 36    | 22        | 10.0  | 16    | 16       | 210   | 0.46      | <b>P1C-4PME</b>   |
| 100          | 115  | 60    | 41    | 27        | 10.0  | 20    | 20       | 230   | 0.83      | <b>P1C-4QME</b>   |
| 125          | 140  | 70    | 50    | 30        | 10.0  | 25    | 25       | 275   | 1.53      | <b>P1C-4RME</b>   |
| 160          | 180  | 90    | 55    | 35        | 10.0  | 30    | 25       | 315   | C.F.      | <b>L075410160</b> |
| 200          | 220  | 90    | 60    | 35        | 14.0  | 30    | 25       | 335   | C.F.      | <b>L075410200</b> |

S = Stroke length C.F. = Consult Factory

**B**  
 Tie Rod Cylinders  
 Actuator Products  
 3MA Series  
 4MA/4ML Series  
 3MAJ/4MAJ Series  
 4MNR Series  
 P1D Series



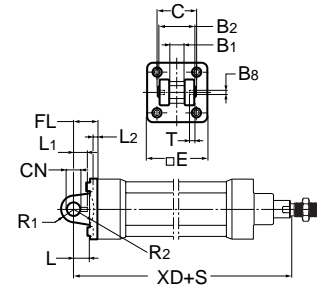
**Clevis Bracket – GA**



Intended for flexible mounting of cylinder. Clevis bracket GA can be combined with pivot bracket with swivel bearing, swivel eye bracket and swivel rod eye.

**Materials:**

- Clevis bracket: Surface-treated aluminium
  - Pin: Surface hardened steel
  - Locking pin: Spring steel
  - Circlips according to DIN 471: Spring steel
  - Mounting screws acc. to DIN 912: Zinc-plated steel 8.8
- Supplied complete with mounting screws for attachment to cylinder.

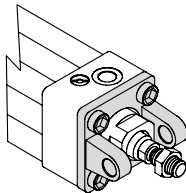


According to VDMA 24 562, AFNOR

| Bore size mm | C mm | E mm | B2 d12 mm | B1 H14 mm | T mm | B3 mm | R2 mm | L1 mm | FL ±0.2 mm | I2 mm | L mm | CN F7 mm | R1 mm | XD mm | Weight kg | Part number       |
|--------------|------|------|-----------|-----------|------|-------|-------|-------|------------|-------|------|----------|-------|-------|-----------|-------------------|
| 32           | 41   | 45   | 34        | 14        | 3    | 3.3   | 17    | 11.5  | 22         | 5.5   | 12   | 10       | 11    | 142   | 0.09      | <b>P1C-4KMCA</b>  |
| 40           | 48   | 52   | 40        | 16        | 4    | 4.3   | 20    | 12.0  | 25         | 5.5   | 15   | 12       | 13    | 160   | 0.13      | <b>P1C-4LMCA</b>  |
| 50           | 54   | 65   | 45        | 21        | 4    | 4.3   | 22    | 14.0  | 27         | 6.5   | 17   | 16       | 18    | 170   | 0.17      | <b>P1C-4MMCA</b>  |
| 63           | 60   | 75   | 51        | 21        | 4    | 4.3   | 25    | 14.0  | 32         | 6.5   | 20   | 16       | 18    | 190   | 0.36      | <b>P1C-4NMCA</b>  |
| 80           | 75   | 95   | 65        | 25        | 4    | 4.3   | 30    | 16.0  | 36         | 10.0  | 20   | 20       | 22    | 210   | 0.58      | <b>P1C-4PMCA</b>  |
| 100          | 85   | 115  | 75        | 25        | 4    | 4.3   | 32    | 16.0  | 41         | 10.0  | 25   | 20       | 22    | 230   | 0.89      | <b>P1C-4QMCA</b>  |
| 125          | 110  | 140  | 97        | 37        | 6    | 6.3   | 42    | 24.0  | 50         | 10.0  | 30   | 30       | 30    | 275   | 1.75      | <b>P1C-4RMCA</b>  |
| 160          | 140  | 178  | 122       | 43        | 6    | 6.3   | 46    | 26.5  | 55         | 10.0  | 37   | 35 h9    | 36    | C.F.  | C.F.      | <b>L075510160</b> |
| 200          | 175  | 218  | 122       | 43        | 6    | 6.3   | 49    | 26.5  | 60         | 11.5  | 40   | 35 h9    | 38    | C.F.  | C.F.      | <b>L075510200</b> |

S = Stroke length C.F. = Consult Factory

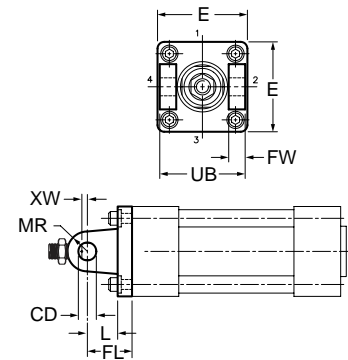
**Head Detachable Clevis – MP7**



Intended for flexible mounting of cylinder

**Materials:**

- Clevis bracket: Cast iron for 32-63mm bores;
  - Surface treated aluminum, black for 80-200mm bores
  - Mounting screws acc. to DIN 912: Zinc-plated steel 8.8
- Supplied complete with mounting screws for attachment to cylinder.



According to ISO MP7, VDMA 24 562, AFNOR

| Bore size mm | CD mm | E mm  | FL mm | FW mm | L mm | MR mm | UB mm | XW mm | Part number       |
|--------------|-------|-------|-------|-------|------|-------|-------|-------|-------------------|
| 32           | 10    | 46.5  | 22    | 8     | 12   | 10    | 45    | 4     | <b>L075400032</b> |
| 40           | 12    | 52    | 25    | 9     | 15   | 12    | 52    | 5     | <b>L075400040</b> |
| 50           | 12    | 63.5  | 27    | 10    | 15   | 13    | 60    | 10    | <b>L075400050</b> |
| 63           | 16    | 76    | 32    | 15    | 20   | 16    | 70    | 5     | <b>L075400063</b> |
| 80           | 16    | 95.5  | 36    | 20    | 20   | 17    | 90    | 10    | <b>L075400080</b> |
| 100          | 20    | 114.5 | 41    | 25    | 25   | 21    | 110   | 10    | <b>L075400100</b> |
| 125          | 25    | 140   | 50    | 30    | 35   | 25    | 130   | 15    | <b>L075400125</b> |
| 160          | 30    | 177   | 55    | 40    | 36   | 30    | 170   | 25    | <b>L075400160</b> |
| 200          | 30    | 214   | 60    | 40    | 41   | 30    | 170   | 35    | <b>L075400200</b> |

B

Tie Rod Cylinders  
Actuator Products

3MA Series

4MA/4ML Series

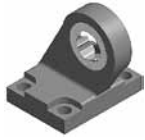
3MAJ/4MAJ Series

4MNR Series

P1D Series



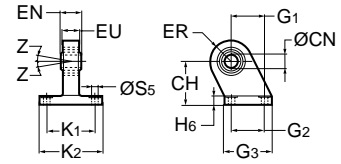
**Pivot Bracket with Swivel Bearing**



Intended for use together with clevis bracket GA.

**Materials:**

Pivot bracket: Surface-treated steel, black  
 Swivel bearing acc. to DIN 648K: Hardened steel



According to VDMA 24 562, AFNOR

| Bore size mm | CN H7 mm | S5 H13 mm | K1 JS14 mm | K2 mm | EU mm | G1 JS14 mm | G2 JS14 mm | EN mm | G3 mm | CH JS15 mm | H6 mm | ER mm | Z  | Weight kg | Part number     |
|--------------|----------|-----------|------------|-------|-------|------------|------------|-------|-------|------------|-------|-------|----|-----------|-----------------|
| 32           | 10       | 6.6       | 38         | 51    | 10.5  | 21         | 18         | 14    | 31    | 32         | 10    | 16    | 4° | 0.18      | <b>P1C-4KMA</b> |
| 40           | 12       | 6.6       | 41         | 54    | 12.0  | 24         | 22         | 16    | 35    | 36         | 10    | 18    | 4° | 0.25      | <b>P1C-4LMA</b> |
| 50           | 16       | 9.0       | 50         | 65    | 15.0  | 33         | 30         | 21    | 45    | 45         | 12    | 21    | 4° | 0.47      | <b>P1C-4MMA</b> |
| 63           | 16       | 9.0       | 52         | 67    | 15.0  | 37         | 35         | 21    | 50    | 50         | 12    | 23    | 4° | 0.57      | <b>P1C-4NMA</b> |
| 80           | 20       | 11.0      | 66         | 86    | 18.0  | 47         | 40         | 25    | 60    | 63         | 14    | 28    | 4° | 1.05      | <b>P1C-4PMA</b> |
| 100          | 20       | 11.0      | 76         | 96    | 18.0  | 55         | 50         | 25    | 70    | 71         | 15    | 30    | 4° | 1.42      | <b>P1C-4QMA</b> |
| 125          | 30       | 14.0      | 94         | 124   | 25.0  | 70         | 60         | 37    | 90    | 90         | 20    | 40    | 4° | 3.10      | <b>P1C-4RMA</b> |

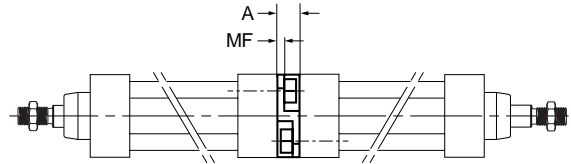
**Mounting kit**



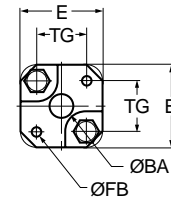
Mounting kit for back to back mounted cylinders, 3 and 4 position duplex cylinders.

**Materials:**

Mounting: Aluminium  
 Mounting screws: Zinc-plated steel 8.8



| Bore size mm | E mm | TG mm | ØFB mm | MF mm | A mm | ØBA mm | Weight kg | Part number     |
|--------------|------|-------|--------|-------|------|--------|-----------|-----------------|
| 32           | 50   | 32.5  | 6.5    | 5     | 16   | 30     | 0.060     | <b>P1E-6KB0</b> |
| 40           | 60   | 38.0  | 6.5    | 5     | 16   | 35     | 0.078     | <b>P1E-6LB0</b> |
| 50           | 66   | 46.5  | 8.5    | 6     | 20   | 40     | 0.162     | <b>P1E-6MB0</b> |
| 63           | 80   | 56.5  | 8.5    | 6     | 20   | 45     | 0.194     | <b>P1E-6NB0</b> |
| 80           | 100  | 72.0  | 10.5   | 8     | 25   | 45     | 0.450     | <b>P1E-6PB0</b> |
| 100          | 118  | 89.0  | 10.5   | 8     | 25   | 55     | 0.672     | <b>P1E-6QB0</b> |



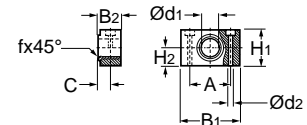
**Pivot Bracket – MT4**



Intended for use together with central trunnion MT4.

**Materials:**

Pivot bracket: Surface-treated aluminium  
 Bearing acc. to DIN 1850 C: Sintered oil-bronze bushing  
 Supplied in pairs.



According to ISO, VDMA 24 562, AFNOR

| Bore size mm | B1 mm | B2 mm | A mm | C mm | d1 mm | d2 H13 mm | H1 mm | H2 mm | fx45° min mm | Weight* kg | Part number       |
|--------------|-------|-------|------|------|-------|-----------|-------|-------|--------------|------------|-------------------|
| 32           | 46    | 18.0  | 32   | 10.5 | 12    | 6.6       | 30    | 15    | 1.0          | 0.04       | <b>9301054261</b> |
| 40           | 55    | 21.0  | 36   | 12.0 | 16    | 9.0       | 36    | 18    | 1.6          | 0.07       | <b>9301054262</b> |
| 50           | 55    | 21.0  | 36   | 12.0 | 16    | 9.0       | 36    | 18    | 1.6          | 0.07       | <b>9301054262</b> |
| 63           | 65    | 23.0  | 42   | 13.0 | 20    | 11.0      | 40    | 20    | 1.6          | 0.12       | <b>9301054264</b> |
| 80           | 65    | 23.0  | 42   | 13.0 | 20    | 11.0      | 40    | 20    | 1.6          | 0.12       | <b>9301054264</b> |
| 100          | 75    | 28.5  | 50   | 16.0 | 25    | 14.0      | 50    | 25    | 2.0          | 0.21       | <b>9301054266</b> |
| 125          | 75    | 28.5  | 50   | 16.0 | 25    | 14.0      | 50    | 25    | 2.0          | 0.21       | <b>9301054266</b> |

\* Weight per item

**B**  
 Tie Rod Cylinders  
 Actuator Products  
 Series  
 3MA  
 Series  
 4MA/4ML  
 Series  
 3MAJ/4MAJ  
 Series  
 4MNR  
 Series  
 P1D

**Intermediate Trunnion – MT4**



Standard\*



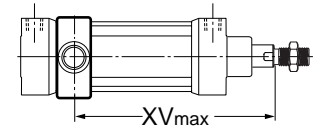
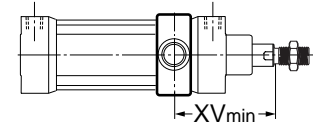
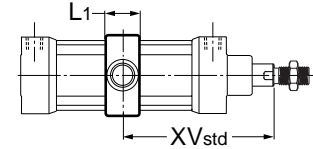
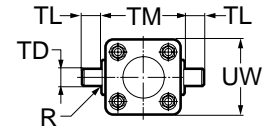
Tie Rod Version

Intended for articulated mounting of cylinder. The trunnion is factory-fitted at an optional location. Order by specifying Mounting Style G or 7 and providing the desired XV dimension (3-digit measure in mm). See page B67 for ordering information. Combined with pivot bracket for MT4 for 32-125mm bores.

**Materials:**

Trunnion: Zinc plated steel  
 (Cast iron for 160-200mm bores)

\* Standard mounting is for the Standard cylinder body and is permanently affixed by the factory.



**According to ISO MT4, VDMA 24 562, AFNOR**

| Bore size mm | TM h14 mm | TL h14 mm | TD e9 mm | R mm | UW mm | L1 mm | X1 mm | XVmin mm | X2 mm | Weight kg |
|--------------|-----------|-----------|----------|------|-------|-------|-------|----------|-------|-----------|
| 32           | 50        | 12        | 12       | 1.0  | 46    | 15    | 73.0  | 62.0     | 84.0  | 0.13      |
| 40           | 63        | 16        | 16       | 1.6  | 59    | 20    | 82.5  | 73.0     | 92.0  | 0.31      |
| 50           | 75        | 16        | 16       | 1.6  | 69    | 20    | 90.0  | 80.5     | 99.5  | 0.37      |
| 63           | 90        | 20        | 20       | 1.6  | 84    | 25    | 97.5  | 89.5     | 106.0 | 0.69      |
| 80           | 110       | 20        | 20       | 1.6  | 102   | 25    | 110.0 | 98.0     | 122.0 | 0.89      |
| 100          | 132       | 25        | 25       | 2.0  | 125   | 30    | 120.0 | 110.5    | 129.5 | 1.58      |
| 125          | 160       | 25        | 25       | 2.0  | 155   | 32    | 145.0 | 132.0    | 158.0 | 2.60      |
| 160          | 200       | 32        | 32       | 2.5  | 190   | 70    | C.F.  | 169      | C.F.  | C.F.      |
| 200          | 250       | 32        | 32       | 2.5  | 242   | 70    | C.F.  | 184      | C.F.  | C.F.      |

$XV_{std} = X1 + \text{Stroke length}/2$

$XV_{max} = X2 + \text{Stroke length}$

C.F. = Consult Factory

**Flange Mounted Trunnion**

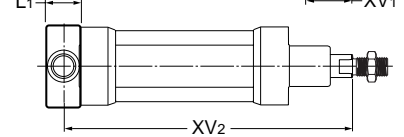
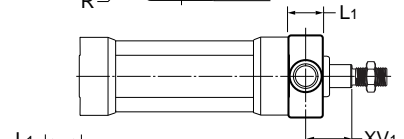
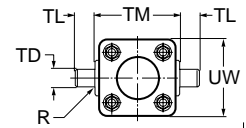


Intended for articulated mounting of cylinder. This trunnion can be flange mounted on the front or rear end cover of all P1D cylinders. If you choose, you can order a complete cylinder with factory-fitted flange mounted trunnion – see the ordering information on page B67 Individual trunnions have part numbers as shown below.

**Materials:**

Trunnion: zinc plated steel  
 Screws: zinc plated steel, 8.8

Delivered complete with mounting screws for attachment to the cylinder



**According to ISO MT4, VDMA 24 562, AFNOR**

| Bore size mm | TM h14 mm | TL h14 mm | TD e9 mm | R mm | UW mm | L1 mm | XV1 mm | X mm  | Weight kg | Part number      |
|--------------|-----------|-----------|----------|------|-------|-------|--------|-------|-----------|------------------|
| 32           | 50        | 12        | 12       | 1.0  | 46    | 14    | 19.0   | 127.0 | 0.17      | <b>P1D-4KMYF</b> |
| 40           | 63        | 16        | 16       | 1.6  | 59    | 19    | 20.5   | 144.5 | 0.43      | <b>P1D-4LMYF</b> |
| 50           | 75        | 16        | 16       | 1.6  | 69    | 19    | 27.5   | 152.5 | 0.55      | <b>P1D-4MMYF</b> |
| 63           | 90        | 20        | 20       | 1.6  | 84    | 24    | 25.0   | 170.0 | 1.10      | <b>P1D-4NMYF</b> |
| 80           | 110       | 20        | 20       | 1.6  | 102   | 24    | 34.0   | 186.0 | 1.66      | <b>P1D-4PMYF</b> |
| 100          | 132       | 25        | 25       | 2.0  | 155   | 29    | 36.5   | 203.5 | 3.00      | <b>P1D-4QMYF</b> |

$XV2 = X + \text{Stroke length}$

|                  |                   |
|------------------|-------------------|
| <b>B</b>         | Tie Rod Cylinders |
|                  | Actuator Products |
| 3MA Series       |                   |
| 4MA/4ML Series   |                   |
| 3MAJ/4MAJ Series |                   |
| 4MNR Series      |                   |
| P1D Series       |                   |



**Swivel Rod Eye**



Stainless Steel  
 Swivel Rod Eye

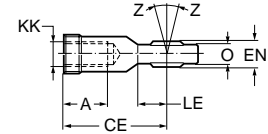
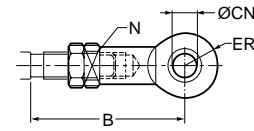
Swivel rod eye for articulated mounting of cylinder.  
 Swivel rod eye can be combined with clevis bracket GA.  
 Maintenance-free.

**Materials:**

Swivel rod eye: Zinc-plated steel  
 Swivel bearing according to DIN 648K: Hardened steel

Swivel rod eye: Stainless steel  
 Swivel bearing according to DIN 648K: Stainless steel

Use stainless steel nut (see next page) with stainless steel swivel rod eye.



**According to ISO 8139**

| Bore size mm | A mm | B min mm | B max mm | CE mm | CN H9 mm | EN h12 mm | ER mm | KK       | LE min mm | N mm | O mm | Z   | Weight kg | Part number       | Stainless steel part number |
|--------------|------|----------|----------|-------|----------|-----------|-------|----------|-----------|------|------|-----|-----------|-------------------|-----------------------------|
| 32           | 20   | 48.0     | 55       | 3     | 10       | 14        | 14    | M10x1.25 | 15        | 17   | 10.5 | 12° | 0.08      | <b>P1C-4KRS</b>   | <b>P1S-4JRT</b>             |
| 40           | 22   | 56.0     | 62       | 50    | 12       | 16        | 16    | M12x1.25 | 17        | 19   | 12.0 | 12° | 0.12      | <b>P1C-4LRS</b>   | <b>P1S-4LRT</b>             |
| 50           | 28   | 72.0     | 80       | 64    | 16       | 21        | 21    | M16x1.5  | 22        | 22   | 15.0 | 15° | 0.25      | <b>P1C-4MRS</b>   | <b>P1S-4MRT</b>             |
| 63           | 28   | 72.0     | 80       | 64    | 16       | 21        | 21    | M16x1.5  | 22        | 22   | 15.0 | 15° | 0.25      | <b>P1C-4PRS</b>   | <b>P1S-4PRT</b>             |
| 80           | 33   | 87.0     | 97       | 77    | 20       | 25        | 25    | M20x1.5  | 26        | 32   | 18.0 | 15° | 0.46      | <b>P1C-4RRS</b>   | <b>P1S-4RRT</b>             |
| 100          | 33   | 87.0     | 97       | 77    | 20       | 25        | 25    | M20x1.5  | 26        | 32   | 18.0 | 15° | 0.46      | <b>P1C-4RRS</b>   | <b>P1S-4RRT</b>             |
| 125          | 51   | 123.5    | 137      | 110   | 30       | 37        | 35    | M27x2    | 36        | 41   | 25.0 | 15° | 1.28      | <b>P1C-4RRS</b>   | <b>P1S-4RRT</b>             |
| 160/200      | 56   | C.F.     | C.F.     | 125   | 35*      | 43        | 40    | M36x2    | 40        | 50   | 28.0 | 15° | C.F.      | <b>L075470036</b> | <b>C.F.</b>                 |

\*H7 C.F. = Consult Factory

**Clevis**



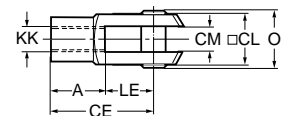
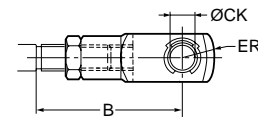
Stainless Steel  
 Clevis

Clevis for articulated mounting of cylinder.

**Materials:**

Clevis, clip: Galvanized steel  
 Pin: Hardened steel

Clevis: Stainless steel  
 Pin: Stainless steel  
 Circlips according to DIN 471: Stainless steel



**According to ISO 8140**

| Bore size mm | A mm | B min mm | B max mm | CE mm | CK h11/E9 mm | CL mm | CM mm | ER mm | KK       | LE mm | O mm | Weight kg | Part number       | Stainless steel part number |
|--------------|------|----------|----------|-------|--------------|-------|-------|-------|----------|-------|------|-----------|-------------------|-----------------------------|
| 32           | 20   | 45.0     | 52       | 40    | 10           | 20    | 10    | 16    | M10x1.25 | 20    | 28.0 | 0.09      | <b>P1C-4KRC</b>   | <b>P1S-4JRD</b>             |
| 40           | 24   | 54.0     | 60       | 48    | 12           | 24    | 12    | 19    | M12x1.25 | 24    | 32.0 | 0.15      | <b>P1C-4LRC</b>   | <b>P1S-4LRD</b>             |
| 50           | 32   | 72.0     | 80       | 64    | 16           | 32    | 16    | 25    | M16x1.5  | 32    | 41.5 | 0.35      | <b>P1C-4MRC</b>   | <b>P1S-4MRD</b>             |
| 63           | 32   | 72.0     | 80       | 64    | 16           | 32    | 16    | 25    | M16x1.5  | 32    | 41.5 | 0.35      | <b>P1C-4MRC</b>   | <b>P1S-4MRD</b>             |
| 80           | 40   | 90.0     | 100      | 80    | 20           | 40    | 20    | 32    | M20x1.5  | 40    | 50.0 | 0.75      | <b>P1C-4PRC</b>   | <b>P1S-4PRD</b>             |
| 100          | 40   | 90.0     | 100      | 80    | 20           | 40    | 20    | 32    | M20x1.5  | 40    | 50.0 | 0.75      | <b>P1C-4PRC</b>   | <b>P1S-4PRD</b>             |
| 125          | 56   | 123.5    | 137      | 110   | 30           | 55    | 30    | 45    | M27x2    | 54    | 72.0 | 2.10      | <b>P1C-4RRC</b>   | <b>P1S-4RRD</b>             |
| 160/200      | 71   | C.F.     | C.F.     | 144   | 35           | 70    | 35    | 57    | M36x2    | 72    | 95   | C.F.      | <b>L075490036</b> | <b>C.F.</b>                 |

C.F. = Consult Factory



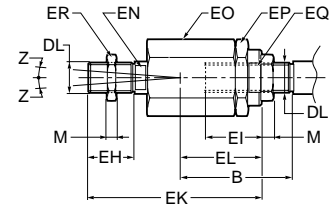
**Flexo Coupling**



Flexo coupling for articulated mounting of piston rod. Flexo fitting is intended to take up axial angle errors within a range of  $\pm 4^\circ$ .

**Materials:**

Flexo coupling, nut: Zinc-plated steel  
 Socket: Hardened steel  
 Supplied complete with galvanized adjustment nut.



| Bore size mm | B min mm | B max mm | DL       | EH mm | EI mm | EK mm | EL mm | EN mm | EO mm | EP mm | EQ mm | ER mm | M mm | Z  | Weight kg | Part number       |
|--------------|----------|----------|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|----|-----------|-------------------|
| 32           | 36.0     | 43       | M10x1.25 | 20    | 23    | 70    | 31    | 12    | 30    | 30    | 19    | 30    | 5.0  | 4° | 0.21      | <b>P1C-4KRF</b>   |
| 40           | 37.0     | 43       | M12x1.25 | 23    | 23    | 67    | 31    | 12    | 30    | 30    | 19    | 30    | 6.0  | 4° | 0.22      | <b>P1C-4LRF</b>   |
| 50           | 53.0     | 61       | M16x1.5  | 40    | 32    | 112   | 45    | 19    | 41    | 41    | 30    | 41    | 8.0  | 4° | 0.67      | <b>P1C-4MRF</b>   |
| 63           | 53.0     | 61       | M16x1.5  | 40    | 32    | 112   | 45    | 19    | 41    | 41    | 30    | 41    | 8.0  | 4° | 0.67      | <b>P1C-4PRF</b>   |
| 80           | 57.0     | 67       | M20x1.5  | 39    | 42    | 122   | 56    | 19    | 41    | 41    | 30    | 41    | 10.0 | 4° | 0.72      | <b>P1C-4RRF</b>   |
| 100          | 57.0     | 67       | M20x1.5  | 39    | 42    | 122   | 56    | 19    | 41    | 41    | 30    | 41    | 10.0 | 4° | 0.72      | <b>P1C-4RRF</b>   |
| 125          | 75.5     | 89       | M27x2    | 48    | 48    | 145   | 60    | 24    | 55    | 55    | 32    | 55    | 13.5 | 4° | 1.80      | <b>P1C-4RRF</b>   |
| 160/200      | C.F.     | C.F.     | M36x2    | 72    | 78    | 251   | C.F.  | 36    | 75    | 75    | 50    | 55    | 18.0 | 4° | C.F.      | <b>L075530036</b> |

C.F. = Consult Factory

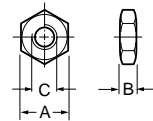
**Nuts**



Intended for fixed mounting of accessories to the piston rod.

**Material:** Zinc-plated steel

All P1D cylinders are delivered with a zinc-plated steel piston rod nut, except P1D Clean, which is delivered with a stainless steel piston rod nut instead.



**Stainless Steel Nut**

**Material:** Stainless steel A2

All P1D cylinders are delivered with a zinc-plated steel piston rod nut, except P1D Clean, which is delivered with a stainless steel piston rod nut instead.

**Acid-proof nut**

**Material:** Acid-proof steel A4

Cylinders with acid-proof piston rod are supplied with nut of acid-proof steel.

**According to DIN 439 B**

| Bore size mm | A mm | B mm | C        | Weight kg | Part numbers      |                   |                   |
|--------------|------|------|----------|-----------|-------------------|-------------------|-------------------|
|              |      |      |          |           | Steel             | Stainless steel   | Acid-proof        |
| 32           | 17   | 5.0  | M10x1.25 | 0.007     | <b>9128985601</b> | <b>9126725404</b> | <b>0261109919</b> |
| 40           | 19   | 6.0  | M12x1.25 | 0.010     | <b>0261109910</b> | <b>9126725405</b> | <b>0261109920</b> |
| 50           | 24   | 8.0  | M16x1.5  | 0.021     | <b>9128985603</b> | <b>9126725406</b> | <b>0261109917</b> |
| 63           | 24   | 8.0  | M16x1.5  | 0.021     |                   |                   |                   |
| 80           | 30   | 10.0 | M20x1.5  | 0.040     | <b>0261109911</b> | <b>0261109921</b> | <b>0261109916</b> |
| 100          | 30   | 10.0 | M20x1.5  | 0.040     |                   |                   |                   |
| 125          | 41   | 13.5 | M27x2    | 0.100     | <b>0261109912</b> | <b>0261109922</b> | <b>0261109918</b> |
| 160/200      | 55   | 18.0 | M36x2    | C.F.      | <b>L075540036</b> | <b>C.F.</b>       | <b>C.F.</b>       |

C.F. = Consult Factory

**B**

Tie Rod Cylinders  
Actuator Products

3MA Series

4MA/4ML Series

3MAJ/4MAJ Series

4MNR Series

P1D Series





**Service Kits: P1D-S, P1D-T, P1D-C,  
and P1D-F Versions**

| Cylinder bore<br>mm | P1D cylinder version<br>Consisting of: piston, rod and o-ring seals |
|---------------------|---|
| 32                  | SK032P1D01  |
| 40                  | SK040P1D01  |
| 50                  | SK050P1D01  |
| 63                  | SK063P1D01  |
| 80                  | SK080P1D01  |
| 100                 | SK100P1D01  |
| 125                 | SK125P1D01  |

**Gland Service Kits: P1D-G and P1D-E Versions**

| Bore size<br>mm | Rod<br>dia.<br>mm | Rod<br>no. | RG-rod gland cartridge kit<br>Consisting of: rod gland, seals, and wiper |                                   | RK-rod seal kit<br>Consisting of: gland seals, and wiper |                                   |
|-----------------|-------------------|------------|--|-----------------------------------|--|-----------------------------------|
|                 |                   |            | Nitrile seals<br>part number   | Fluorocarbon seals<br>part number | Nitrile seals<br>part number                             | Fluorocarbon seals<br>Part number |
| 32              | 12                | 1          | RG0P1D0121   | RG0P1D0125                        | RK0P1D0121   | RK0P1D0125                        |
| 40              | 16                | 1          | RG0P1D0161   | RG0P1D0165                        | RK0P1D0161   | RK0P1D0165                        |
| 50 & 63         | 20                | 1          | RG0P1D0201   | RG0P1D0205                        | RK0P1D0201   | RK0P1D0205                        |
| 80 & 100        | 25                | 1          | RG0P1D0251   | RG0P1D0255                        | RK0P1D0251   | RK0P1D0255                        |
| 125             | 32                | 1          | RG0P1D0321   | RG0P1D0325                        | RK0P1D0321   | RK0P1D0325                        |

**Piston and End Seal Service Kits: P1D-G and P1D-E Versions**

| Bore size<br>mm | PK – piston seal kit<br>Consisting of: piston seals, wear ring,<br>and magnetic strip (nitrile only) |                                   | CB – cylinder body end seal kit<br>Consisting of: end seal o-rings |                                   |
|-----------------|--|-----------------------------------|--|-----------------------------------|
|                 | Nitrile seals<br>part number   | Fluorocarbon seals<br>part number | Nitrile seals<br>part number                                       | Fluorocarbon seals<br>part number |
| 32              | PK032P1D01   | PK032P1D05                        | CB032P1D01   | CB032P1D05                        |
| 40              | PK040P1D01   | PK040P1D05                        | CB040P1D01   | CB040P1D05                        |
| 50              | PK050P1D01   | PK050P1D05                        | CB050P1D01   | CB050P1D05                        |
| 63              | PK063P1D01   | PK063P1D05                        | CB063P1D01   | CB063P1D05                        |
| 80              | PK080P1D01   | PK080P1D05                        | CB080P1D01   | CB080P1D05                        |
| 100             | PK100P1D01   | PK100P1D05                        | CB100P1D01   | CB100P1D05                        |
| 125             | PK125P1D01   | PK125P1D05                        | CB125P1D01   | CB125P1D05                        |

**B**  
Tie Rod Cylinders  
Actuator Products

3MA  
Series

4MA/4ML  
Series

3MAJ/4MAJ  
Series

4MNR  
Series

P1D  
Series



- 304 stainless steel cylinder body, non repairable construction
- Aluminum heads and caps, Delrin heads and caps are optional
- 12 bore sizes — 5/16" through 3"  
(see dimensional tables for SRM and SRD/SRDM exclusions).
- Stainless steel piston rods are standard up to 1.50" bore
- 28 standard mounting styles (not all available on SRM and SRD/SRDM – see table on following page)
- Single and double acting
- Adjustable cushions optional on both ends



**Operating information**

|                                  |  |
|----------------------------------|--|
| Operating pressure:              | 250 PSIG for SR and SRM<br>100 PSIG for SRD/SRDM                             |
| Temperature range:               | -10°F to 165°F for SR<br>14°F to 140°F for SRM<br>32°F to 160°F for SRD/SRDM |
| Filtration requirements:         | 40 micron, dry filtered air  |
| For technical information see CD |  |

**Ordering information**

| Bore Size 1 |         |
|-------------|---------|
| .31         | 5/16"   |
| .44         | 7/16"   |
| .56         | 9/16"   |
| .75         | 3/4"    |
| .88         | 7/8"    |
| 1.06        | 1-1/16" |
| 1.25        | 1-1/4"  |
| 1.50        | 1-1/2"  |
| 1.75        | 1-3/4"  |
| 2.00        | 2"      |
| 2.50        | 2-1/2"  |
| 3.00        | 3"      |

| Series |                                      |
|--------|--------------------------------------|
| SR     | Standard cylinder                    |
| SRM    | With magnetic piston                 |
| SRD    | With delrin caps                     |
| SRDM   | With delrin caps and magnetic piston |

| Piston |                |
|--------|----------------|
| Blank  | No bumpers     |
| B      | With bumpers 3 |

| Seals |                      |
|-------|----------------------|
| Blank | Standard seals       |
| V     | Fluorocarbon seals 4 |
| W     | Rod wiper            |

| Stroke             |  |
|--------------------|--|
| Specify in inches. |  |

| Cushion Cap 2                              |  |
|--|--|
| Use "C" only when cushion cap is required. |  |

| Non-Standard Piston Rod  |  |
|--|--|
| Use "3" only when special piston rod end is required. Specify CC, LE and A Dimensions (See next page.) |  |

| Non-Standard Rod  |  |
|---|--|
| Specify Y for stainless steel piston rod. Stainless steel is standard on all bore sizes up to and including 1.50" Bore. |  |

| Special  |  |
|--|--|
| Use "S" only if special modifications are required, except piston rod end. |  |

| Sensors                    |  |
|----------------------------|--|
| For sensors see page B294. |  |

|             |          |  |          |           |          |          |  |  |  |          |             |
|-------------|----------|--|----------|-----------|----------|----------|--|--|--|----------|-------------|
| <b>1.06</b> | <b>C</b> |  | <b>D</b> | <b>SR</b> | <b>B</b> | <b>V</b> |  |  |  | <b>C</b> | <b>2.00</b> |
|-------------|----------|--|----------|-----------|----------|----------|--|--|--|----------|-------------|

**Cushion Head 2**  
Use "C" only when cushion head is required.

**Double Rod**  
Use "K" only when double rod is required. Available on DX and DXH mounting only.

**Mounting 1**  
N, NR, NRP, P, R, RP, D, DP, DXP, DX, DXH, A, RA, AP, AR, BRN, BRR, BFD, BRD, BFN, BFR, TRN, TRR, TFD, TRD, TFN or TFR.

<sup>1</sup> Bore sizes and mounting styles are limited by series. See table on next page for availability.

<sup>2</sup> Cushions not available on SRD/SRDM series.

<sup>3</sup> Bumpers may increase cylinder length. Please reference catalog 0900P-E, page D37 for adders.

<sup>4</sup> Fluorocarbon seals not available on SRM or SRDM series.

B

Round Body Cylinders  
Actuator Products

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SR/SM/SRD/SRDM  
Series

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SRX  
Series

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P1L  
Series

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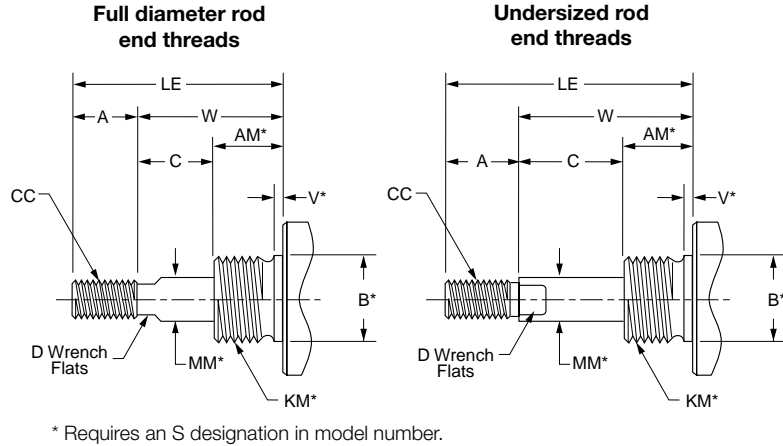
P1A  
Series

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P  
Series

**Non-Standard Rods**

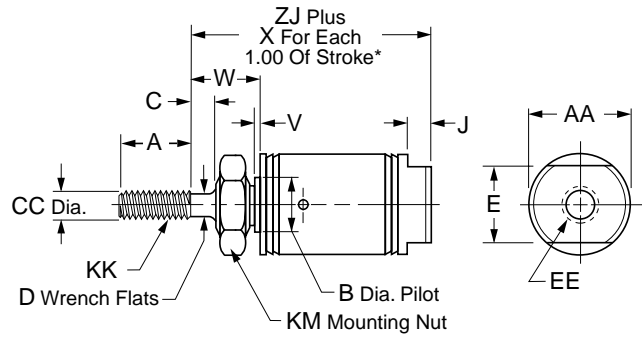
For non-standard rod dimensions, or undersized rod end threads, put a “3” in model number and describe the rod using the letters shown in the drawing. Specify CC, LE and A dimensions. LE is measured in retracted position.



**Mounting Style N**

Nose mount, spring return

| Bore size | SR | SRM | Std. strokes (in)             | Max. stroke (in) | SS rod std |
|-----------|----|-----|-------------------------------|------------------|------------|
| 5/16"     | •  |     | 1/2, 1, 1-1/2, 2, 2-1/2, 3, 4 | 4                | ✓          |
| 7/16"     | •  |     | 1/2, 1, 1-1/2, 2, 2-1/2, 3, 4 | 6                | ✓          |
| 9/16"     | •  | •   | 1/2, 1, 1-1/2, 2, 3, 4        | 6                | ✓          |
| 3/4"      | •  | •   | 1/2, 1, 1-1/2, 2, 3, 4        | 6                | ✓          |
| 7/8"      | •  | •   | 1/2, 1, 1-1/2, 2, 3, 4        | 6                | ✓          |
| 1-1/16"   | •  | •   | 1/2, 1, 1-1/2, 2, 3, 4        | 6                | ✓          |
| 1-1/4"    | •  | •   | 1/2, 1, 2, 3, 4               | 6                | ✓          |
| 1-1/2"    | •  | •   | 1/2, 1, 2, 3, 4               | 6                | ✓          |
| 1-3/4"    | •  | •   | 1/2, 1, 1-1/2, 2, 2-1/2, 3, 4 | 6                |            |
| 2"        | •  | •   | -                             | 4                |            |



| Bore size |      |      |       |      |       |      |      |          |      |             |              |      |      |        |      | ZJ   |  |
|-----------|------|------|-------|------|-------|------|------|----------|------|-------------|--------------|------|------|--------|------|------|--|
|           | A    | AA   | B     | C    | CC    | D    | E    | EE       | J    | KK          | KM           | V    | W    | X      | SR   | SRM  |  |
| 5/16"     | 0.38 | 0.36 | -     | -    | 0.125 | -    | 0.36 | #10-32   | -    | #5-40 UNC   | 1/4-28       | 0    | 0.25 | 0.75** | 1.12 | -    |  |
| 7/16"     | 0.50 | 0.50 | 0.374 | -    | 0.188 | -    | 0.38 | #10-32   | 0.19 | #10-32 UNF  | 3/8-24       | 0.05 | 0.31 | 0.94** | 1.31 | -    |  |
| 9/16"     | 0.50 | 0.62 | 0.437 | -    | 0.188 | -    | 0.50 | #10-32   | 0.19 | #10-32 UNF  | 7/16-20      | 0.06 | 0.38 | 1.62   | 1.53 | 1.76 |  |
| 3/4"      | 0.50 | 0.81 | 0.499 | -    | 0.250 | -    | 0.62 | 1/8 NPTF | 0.19 | 1/4-28 UNF  | 1/2-20       | 0.09 | 0.44 | 1.69   | 1.50 | 1.75 |  |
| 7/8"      | 0.50 | 0.93 | 0.624 | -    | 0.250 | -    | 0.62 | 1/8 NPTF | 0.19 | 1/4-28 UNF  | 5/8-18       | 0.09 | 0.50 | 1.56   | 1.84 | -    |  |
| 1-1/16"   | 0.50 | 1.12 | 0.624 | 0.12 | 0.312 | 0.25 | 0.88 | 1/8 NPTF | 0.19 | 5/16-24 UNF | 5/8-18       | 0.09 | 0.62 | 1.56   | 2.06 | 2.31 |  |
| 1-1/4"    | 0.75 | 1.34 | 0.749 | 0.25 | 0.437 | 0.38 | 0.88 | 1/8 NPTF | 0.25 | 7/16-20 UNF | 3/4-16       | 0.09 | 0.88 | 1.81   | 2.66 | 2.78 |  |
| 1-1/2"    | 0.75 | 1.56 | 0.749 | 0.25 | 0.437 | 0.38 | 0.88 | 1/8 NPTF | 0.25 | 7/16-20 UNF | 3/4-16       | 0.09 | 0.88 | 1.69   | 2.44 | 2.69 |  |
| 1-3/4"    | 0.88 | 1.84 | 1.031 | 0.38 | 0.500 | 7/16 | 1.25 | 1/4 NPTF | 0.25 | 1/2-20 UNF  | 1-14         | 0.09 | 0.75 | 2.0    | 2.97 | 3.09 |  |
| 2"        | 0.88 | 2.08 | 1.374 | 0.38 | 0.625 | 0.50 | 1.25 | 1/4 NPTF | 0.31 | 1/2-20 UNF  | 1-1/4-120.12 | 1.19 | -    | ▲      | ▲    |      |  |

▲ SR: 5.41" for 1" stroke, 7.41" for 2" stroke, 8.66" for 3" stroke, 11.59" for 4" stroke.  
 SRM: 5.66" for 1" stroke, 7.66" for 2" stroke, 8.91" for 3" stroke, 11.84" for 4" stroke.

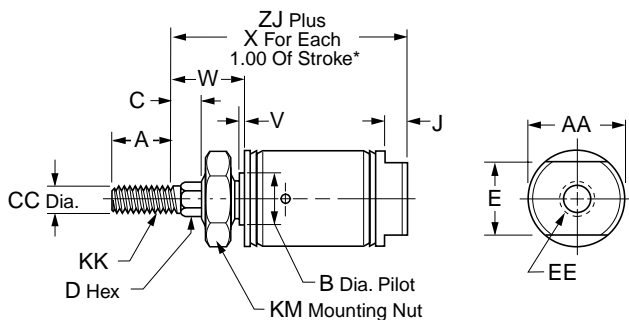
\* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract a half inch.

\*\* For each 0.50" of stroke

**B**  
 Round Body Cylinders  
 Actuator Products  
**SR/SW/SRD/SRDM**  
 Series  
**SRX**  
 Series  
**P1L**  
 Series  
**P1A**  
 Series  
**P**  
 Series

**Mounting Style NR**

Nose mount, spring return, hex rod



| Bore size | SR | SRM | Std. stroke (in)              | Max.. stroke (in) | SS rod std |
|-----------|----|-----|-------------------------------|-------------------|------------|
| 7/16"     | •  |     | 1/2, 1, 1-1/2, 2, 3, 4        | 6                 | ✓          |
| 9/16"     | •  | •   | 1/2, 1, 1-1/2, 2, 3, 4        | 6                 | ✓          |
| 3/4"      | •  | •   | 1/2, 1, 1-1/2, 2, 3, 4        | 6                 | ✓          |
| 7/8"      | •  |     | 1/2, 1, 1-1/2, 2, 3, 4        | 6                 | ✓          |
| 1-1/16"   | •  | •   | 1/2, 1, 1-1/2, 2, 3, 4        | 6                 | ✓          |
| 1-1/4"    | •  | •   | 1, 2, 3, 4                    | 6                 | ✓          |
| 1-1/2"    | •  | •   | 1/2, 1, 2, 3, 4               | 6                 | ✓          |
| 1-3/4"    | •  | •   | 1/2, 1, 1-1/2, 2, 2-1/2, 3, 4 | 6                 |            |

| Bore size | A    | AA   | B     | C    | CC    | D    | E    | EE       | J    | KK          | KM      | V    | W    | X    | ZJ   |      |
|-----------|------|------|-------|------|-------|------|------|----------|------|-------------|---------|------|------|------|------|------|
|           |      |      |       |      |       |      |      |          |      |             |         |      |      |      | SR   | SRM  |
| 7/16"     | 0.50 | -    | 0.374 | 0.25 | 0.188 | 3/16 | -    | #10-32   | 0.19 | #10-32 UNF  | 3/8-24  | 0.05 | 0.56 | 0.94 | 1.56 | -    |
| 9/16"     | 0.50 | -    | 0.437 | 0.25 | 0.188 | 3/16 | -    | #10-32   | 0.19 | #10-32 UNF  | 7/16-20 | 0.06 | 0.62 | 1.62 | 1.78 | 2.03 |
| 3/4"      | 0.50 | -    | 0.499 | 0.25 | 0.250 | 1/4  | -    | 1/8 NPTF | 0.19 | 1/4-28 UNF  | 1/2-20  | 0.09 | 0.69 | 1.69 | 1.75 | 2.00 |
| 7/8"      | 0.50 | -    | 0.624 | 0.25 | 0.250 | 1/4  | -    | 1/8 NPTF | 0.19 | 1/4-28 UNF  | 5/8-18  | 0.09 | 0.75 | 1.56 | 2.09 | -    |
| 1-1/16"   | 0.50 | 1.12 | 0.624 | 0.25 | 0.312 | 3/8  | 0.88 | 1/8 NPTF | 0.19 | 5/16-24 UNF | 5/8-18  | 0.09 | 0.75 | 1.56 | 2.19 | 2.44 |
| 1-1/4"    | 0.88 | 1.34 | 0.749 | 0.25 | 0.437 | 7/16 | 0.88 | 1/8 NPTF | 0.25 | 7/16-20 UNF | 3/4-16  | 0.09 | 0.88 | 1.81 | 2.66 | 2.78 |
| 1-1/2"    | 0.88 | 1.56 | 0.749 | 0.38 | 0.437 | 7/16 | 0.88 | 1/8 NPTF | 0.25 | 7/16-20 UNF | 3/4-16  | 0.09 | 1.00 | 1.69 | 2.56 | 2.81 |
| 1-3/4"    | 0.88 | 1.84 | 1.031 | 0.38 | 0.500 | 1/2  | 1.25 | 1/4 NPTF | 0.25 | 1/2-20 UNF  | 1-14    | 0.09 | 1.12 | 2.0  | 3.03 | 3.15 |

\* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

**B**

Round Body Cylinders  
Actuator Products

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SR/SM/SRD/SRDM  
Series

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SRX  
Series

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P1L  
Series

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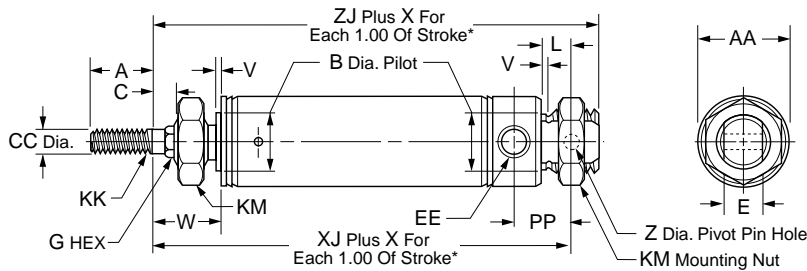
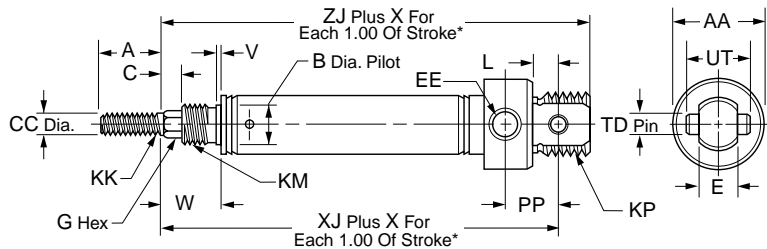
P1A  
Series

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P  
Series

**Mounting Style NRP**

Pivot & nose mount, spring return, hex rod



**Bore sizes**

|         |
|---------|
| 7/16" * |
| 3/4"    |

\* No mounting nuts

**Bore sizes**

|           |
|-----------|
| 9/16" *   |
| 7/8" *    |
| 1-1/16" * |
| 1-1/4"    |
| 1-1/2" *  |
| 1-3/4"    |

\* No mounting nuts

**B**  
 Round Body Cylinders  
 Actuator Products  
 SR/SW/SRD/SRDM  
 Series  
 SRX  
 Series  
 P1L  
 Series  
 P1A  
 Series  
 P  
 Series

| Bore size | Std. stroke (in) |                               | Max. stroke (in) | SS rod std | A    | AA   | B     | C    | CC    | E    | EE       |
|-----------|------------------|-------------------------------|------------------|------------|------|------|-------|------|-------|------|----------|
|           | SR               | SRM                           |                  |            |      |      |       |      |       |      |          |
| 7/16"     | •                | 1/2, 1, 1-1/2, 2, 3, 4        | 6                | ✓          | 0.50 | 0.74 | 0.374 | 0.25 | 0.188 | 0.31 | #10-32   |
| 9/16"     | •                | 1/2, 1, 1-1/2, 2, 3, 4        | 6                | ✓          | 0.50 | 0.62 | 0.437 | 0.25 | 0.188 | 0.31 | #10-32   |
| 3/4"      | •                | 1, 2, 3, 4                    | 6                | ✓          | 0.50 | 0.86 | 0.499 | 0.25 | 0.250 | 0.38 | 1/8 NPTF |
| 7/8"      | •                | 1, 2, 3, 4                    | 6                | ✓          | 0.50 | 0.93 | 0.624 | 0.25 | 0.250 | 0.38 | 1/8 NPTF |
| 1-1/16"   | •                | 1, 2, 3, 4                    | 6                | ✓          | 0.50 | 1.12 | 0.624 | 0.25 | 0.312 | 0.38 | 1/8 NPTF |
| 1-1/4"    | •                | 1, 2, 3, 4                    | 6                | ✓          | 0.88 | 1.34 | 0.749 | 0.25 | 0.437 | 0.50 | 1/8 NPTF |
| 1-1/2"    | •                | 1, 2, 3, 4                    | 6                | ✓          | 0.88 | 1.56 | 0.749 | 0.38 | 0.437 | 0.62 | 1/8 NPTF |
| 1-3/4"    | •                | 1/2, 1, 1-1/2, 2, 2-1/2, 3, 4 | 6                | ✓          | 0.88 | 1.84 | 1.031 | 0.38 | 0.500 | 0.62 | 1/4 NPTF |

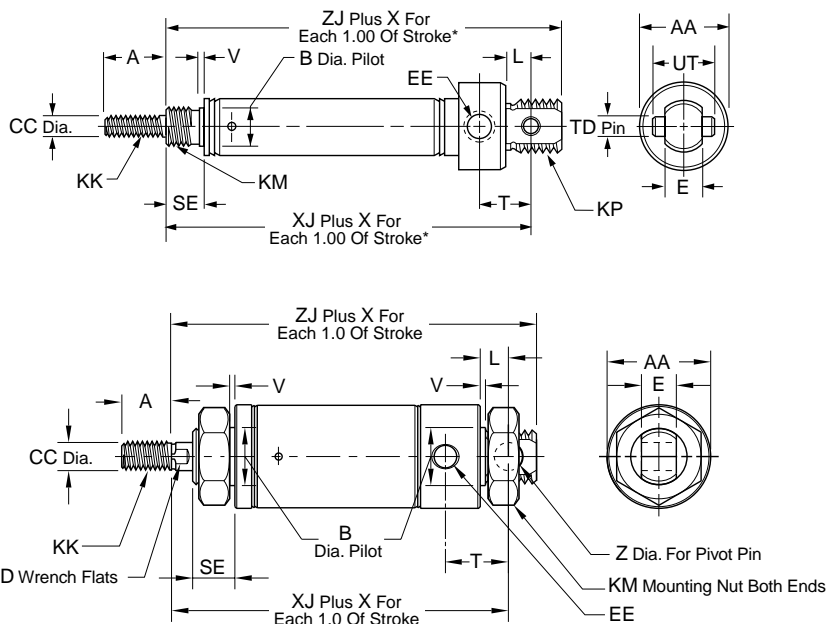
| Bore size | XJ    |             |         |             |      |      |       |      |      |      |      |      | ZJ   |       |      |      |
|-----------|-------|-------------|---------|-------------|------|------|-------|------|------|------|------|------|------|-------|------|------|
|           | G HEX | KK          | KM      | KP          | L    | PP   | TD    | UT   | V    | W    | X    | SR   | SRM  | Z     | SR   | SRM  |
| 7/16"     | 3/16  | #10-32 UNF  | 3/8-24  | 7/16-20 UNF | 0.25 | 0.44 | 0.156 | 0.50 | 0.05 | 0.56 | 0.94 | 2.00 | -    | -     | 2.25 | -    |
| 9/16"     | 3/16  | #10-32 UNF  | 7/16-20 | 7/16-20 UNF | 0.25 | 0.38 | -     | -    | 0.06 | 0.62 | 1.62 | 2.06 | 2.31 | 0.157 | 2.25 | 2.50 |
| 3/4"      | 1/4   | 1/4-28 UNF  | 1/2-20  | 5/8-18 UNF  | 0.34 | 0.62 | 0.250 | 0.75 | 0.09 | 0.69 | 1.69 | 2.53 | 2.78 | -     | 2.81 | 3.06 |
| 7/8"      | 1/4   | 1/4-28 UNF  | 5/8-18  | 5/8-18 UNF  | 0.34 | 0.62 | 0.250 | 0.75 | 0.09 | 0.75 | 1.56 | 2.72 | -    | -     | 3.00 | -    |
| 1-1/16"   | 3/8   | 5/16-24 UNF | 5/8-18  | 5/8-18 UNF  | 0.34 | 0.62 | 0.250 | 0.75 | 0.09 | 0.75 | 1.56 | 2.78 | 3.03 | -     | 3.06 | 3.31 |
| 1-1/4"    | 7/16  | 7/16-20 UNF | 3/4-16  | -           | 0.41 | 0.78 | 0.251 | -    | 0.09 | 0.88 | 1.81 | 3.38 | 3.50 | 0.251 | 3.78 | 3.91 |
| 1-1/2"    | 7/16  | 7/16-20 UNF | 3/4-16  | -           | 0.50 | 0.81 | 0.375 | 1.00 | 0.09 | 1.00 | 1.69 | 3.25 | 3.50 | -     | 3.62 | 3.87 |
| 1-3/4"    | 1/2   | 1/2-20 UNF  | 1-14    | -           | 0.50 | 1.12 | 0.376 | 0.62 | 0.09 | 1.12 | 2.0  | 4.09 | 4.21 | 0.376 | 4.59 | 4.71 |

\* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.



**Mounting Style P**

Pivot mount, spring return



**Bore sizes**

|         |
|---------|
| 5/16" * |
| 7/16"   |
| 3/4"    |

\* No mounting nuts

**Bore sizes**

|           |
|-----------|
| 9/16" *   |
| 7/8" *    |
| 1-1/16" * |
| 1-1/4"    |
| 1-1/2" *  |
| 1-3/4"    |
| 2" *      |

\* No mounting nuts

| Bore size | SR | SRM | Std. stroke (in)              | Max. stroke (in) | SS rod std | A    | AA   | B     | CC    | D    | E    | EE       |
|-----------|----|-----|-------------------------------|------------------|------------|------|------|-------|-------|------|------|----------|
| 5/16"     | •  |     | 1/2, 1, 1-1/2, 2, 3, 4        | 4                | ✓          | 0.38 | 0.39 | -     | 0.125 | -    | 0.25 | #10-32   |
| 7/16"     | •  |     | 1/2, 1, 1-1/2, 2, 3, 4        | 6                | ✓          | 0.50 | 0.74 | 0.374 | 0.188 | -    | 0.31 | #10-32   |
| 9/16"     | •  | •   | 1/2, 1, 1-1/2, 2, 3, 4        | 6                | ✓          | 0.50 | 0.62 | 0.437 | 0.188 | -    | 0.31 | #10-32   |
| 3/4"      | •  | •   | 1/2, 1, 1-1/2, 2, 3, 4        | 6                | ✓          | 0.50 | 0.86 | 0.499 | 0.250 | -    | 0.38 | 1/8 NPTF |
| 7/8"      | •  |     | 1/2, 1, 1-1/2, 2, 3, 4        | 6                | ✓          | 0.50 | 0.93 | 0.624 | 0.250 | -    | 0.38 | 1/8 NPTF |
| 1-1/16"   | •  | •   | 1/2, 1, 1-1/2, 2, 3, 4        | 6                | ✓          | 0.50 | 1.12 | 0.624 | 0.312 | 0.25 | 0.38 | 1/8 NPTF |
| 1-1/4"    | •  | •   | 1, 2, 3, 4                    | 6                | ✓          | 0.75 | 1.34 | 0.749 | 0.437 | 0.38 | 0.50 | 1/8 NPTF |
| 1-1/2"    | •  | •   | 1, 2, 3, 4                    | 6                | ✓          | 0.75 | 1.56 | 0.749 | 0.437 | 0.38 | 0.62 | 1/8 NPTF |
| 1-3/4"    | •  | •   | 1/2, 1, 1-1/2, 2, 2-1/2, 3, 4 | 6                |            | 0.88 | 1.84 | 1.031 | 0.500 | 7/16 | 0.62 | 1/4 NPTF |
| 2"        | •  | •   | -                             | 4                |            | 0.88 | 2.08 | 1.374 | 0.625 | 0.50 | 0.75 | 1/4 NPTF |

| Bore size | KK          | KM       | KP          | L    | SE   | T    | TD    | UT   | V    | X    | XJ   |      | ZJ    |      |      |
|-----------|-------------|----------|-------------|------|------|------|-------|------|------|------|------|------|-------|------|------|
|           |             |          |             |      |      |      |       |      |      |      | SR   | SRM  | Z     | SR   | SRM  |
| 5/16"     | #5-40 UNC   | 3/8-24   | -           | 0.34 | 0.25 | 0.34 | -     | -    | -    | 0.75 | 1.52 | -    | 0.125 | 1.68 | -    |
| 7/16"     | #10-32 UNF  | 3/8-24   | 7/16-20 UNF | 0.25 | 0.31 | 0.44 | 0.156 | 0.50 | 0.05 | 0.94 | 1.75 | -    | -     | 2.00 | -    |
| 9/16"     | #10-32 UNF  | 7/16-20  | 7/16-20 UNF | 0.25 | 0.38 | 0.38 | -     | -    | 0.06 | 1.62 | 1.81 | 2.06 | 0.157 | 2.00 | 2.25 |
| 3/4"      | 1/4-28 UNF  | 1/2-20   | 5/8-18 UNF  | 0.34 | 0.44 | 0.62 | 0.250 | 0.75 | 0.09 | 1.69 | 2.28 | 2.53 | -     | 2.56 | 2.81 |
| 7/8"      | 1/4-28 UNF  | 5/8-18   | 5/8-18 UNF  | 0.34 | 0.50 | 0.62 | 0.250 | 0.75 | 0.09 | 1.56 | 2.47 | -    | -     | 2.75 | -    |
| 1-1/16"   | 5/16-24 UNF | 5/8-18   | 5/8-18 UNF  | 0.34 | 0.50 | 0.62 | 0.250 | 0.75 | 0.09 | 1.56 | 2.66 | 2.91 | -     | 2.94 | 3.19 |
| 1-1/4"    | 7/16-20 UNF | 3/4-16   | -           | 0.41 | 0.63 | 0.78 | -     | -    | 0.09 | 1.81 | 3.38 | 3.91 | 0.251 | 3.78 | 3.50 |
| 1-1/2"    | 7/16-20 UNF | 3/4-16   | -           | 0.50 | 0.63 | 0.81 | 0.375 | 1.00 | 0.09 | 1.81 | 3.12 | 3.37 | -     | 3.50 | 3.75 |
| 1-3/4"    | 1/2-20 UNF  | 1-14     | -           | 0.50 | 0.75 | 1.12 | -     | -    | 0.09 | 2.0  | 4.03 | 4.15 | 0.376 | 4.53 | 4.65 |
| 2"        | 1/2-20 UNF  | 1-1/4-12 | -           | 0.56 | 0.81 | 1.03 | -     | -    | 0.12 | -    | ■    | *    | -     | ▲    | ◆    |

■ 6.34" for 1" stroke, 8.34" for 2" stroke, 9.59" for 3" stroke, 12.53" for 4" stroke\*  
 ▲ 6.78" for 1" stroke, 8.78" for 2" stroke, 10.03" for 3" stroke, 12.97" for 4" stroke\*  
 \* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract a half inch.

**B**

Round Body Cylinders  
Actuator Products

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SR/SM/SRD/SRDM  
Series

---

SRX  
Series

---

P1L  
Series

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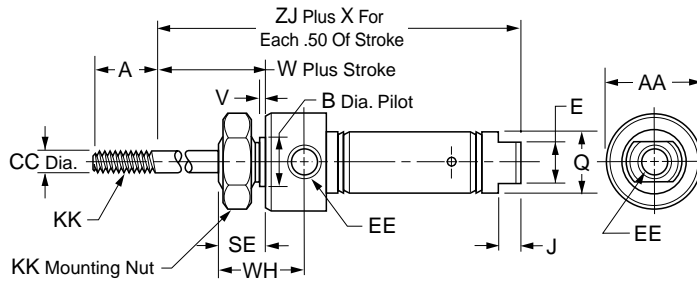
P1A  
Series

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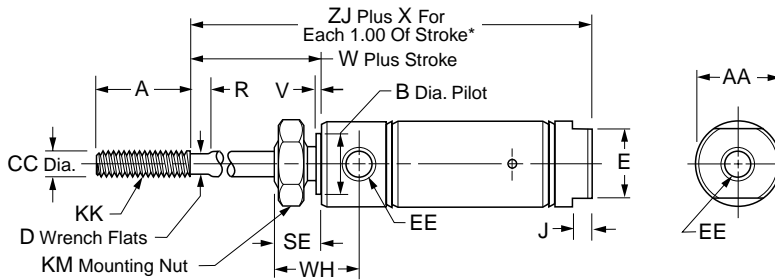
P  
Series

**Mounting Style R**

Nose mount, spring extended



| Bore sizes |
|------------|
| 5/16"      |
| 7/16"      |
| 3/4"       |



| Bore sizes |
|------------|
| 9/16"      |
| 7/8"       |
| 1-1/16"    |
| 1-1/4"     |
| 1-1/2"     |
| 1-3/4"     |
| 2" *       |

\* No mounting nuts

| Bore size | SR | SRM | Std. stroke (in)              | Max. stroke (in) | SS rod std | A    | AA       | B     | CC    | D    | E    |
|-----------|----|-----|-------------------------------|------------------|------------|------|----------|-------|-------|------|------|
| 5/16"     | •  |     | 1/2, 1, 1-1/2, 2, 2-1/2, 3    | 4                | ✓          | 0.38 | 0.50 SQ. | –     | 0.125 | –    | –    |
| 7/16"     | •  |     | 1/2, 1, 1-1/2, 2, 3           | 6                | ✓          | 0.50 | 0.74     | 0.437 | 0.188 | –    | 0.38 |
| 9/16"     | •  | •   | 1/2, 1, 1-1/2, 2, 3           | 6                | ✓          | 0.50 | 0.62     | 0.437 | 0.188 | –    | 0.50 |
| 3/4"      | •  | •   | 1/2, 1, 2, 3, 4               | 6                | ✓          | 0.50 | 0.86     | 0.624 | 0.250 | –    | –    |
| 7/8"      | •  |     | 1/2, 1, 2, 3, 4               | 6                | ✓          | 0.50 | 0.93     | 0.624 | 0.250 | –    | –    |
| 1-1/16"   | •  | •   | 1/2, 1, 1-1/2, 2, 3, 4        | 6                | ✓          | 0.50 | 1.12     | 0.624 | 0.312 | 0.25 | –    |
| 1-1/4"    | •  | •   | 1, 2, 3, 4                    | 6                | ✓          | 0.75 | 1.34     | 0.749 | 0.437 | 0.38 | –    |
| 1-1/2"    | •  | •   | 1, 2, 3, 4                    | 6                | ✓          | 1.25 | 1.56     | 0.749 | 0.437 | 0.38 | 0.88 |
| 1-3/4"    | •  | •   | 1/2, 1, 1-1/2, 2, 2-1/2, 3, 4 | 6                |            | 0.88 | 1.84     | 1.031 | 0.500 | 7/16 | –    |
| 2"        | •  | •   | –                             | 4                |            | 0.88 | 2.08     | 1.374 | 0.625 | 0.50 | –    |

| Bore size | EE       | J    | KK          | KM       | Q    | R    | SE   | V    | W    | WH   | X      | ZJ SR | SM   |
|-----------|----------|------|-------------|----------|------|------|------|------|------|------|--------|-------|------|
| 5/16"     | #10-32   | –    | #5-40 UNC   | 3/8-24   | 0.36 | –    | 0.31 | –    | 0.31 | 0.47 | 1.25   | 1.49  | –    |
| 7/16"     | #10-32   | 0.19 | #10-32 UNF  | 7/16-20  | 0.50 | –    | 0.38 | 0.05 | 0.38 | 0.72 | 1.44   | 1.94  | –    |
| 9/16"     | #10-32   | 0.19 | #10-32 UNF  | 7/16-20  | 0.62 | –    | 0.38 | 0.05 | 0.38 | 0.78 | 2.62   | 2.00  | 2.25 |
| 3/4"      | 1/8 NPTF | –    | 1/4-28 UNF  | 5/8-18   | 0.81 | –    | 0.50 | 0.09 | 0.50 | 0.97 | 2.69** | 2.31  | 2.56 |
| 7/8"      | 1/8 NPTF | –    | 1/4-28 UNF  | 5/8-18   | –    | –    | 0.50 | 0.09 | 0.50 | 0.97 | 2.56   | 2.31  | –    |
| 1-1/16"   | 1/8 NPTF | –    | 5/16-24 UNF | 5/8-18   | –    | 0.12 | 0.50 | 0.09 | 0.62 | 1.06 | 2.81   | 2.62  | 2.87 |
| 1-1/4"    | 1/8 NPTF | –    | 7/16-20 UNF | 3/4-16   | –    | 0.25 | 0.62 | 0.09 | 0.88 | 1.38 | 2.81   | 3.47  | 3.60 |
| 1-1/2"    | 1/8 NPTF | 0.25 | 7/16-20 UNF | 3/4-16   | –    | 0.25 | 0.62 | 0.09 | 0.88 | 1.25 | 3.00   | 3.19  | 3.44 |
| 1-3/4"    | 1/4 NPTF | –    | 1/2-20 UNF  | 1-14     | –    | –    | 0.75 | 0.09 | 1.06 | 1.63 | 3.0    | 4.03  | 4.15 |
| 2"        | 1/4 NPTF | –    | 1/2-20 UNF  | 1-1/4-12 | –    | 0.38 | 0.81 | 0.12 | 1.19 | 1.47 | –      | ▲     | ◆    |

▲ 7.11" for 1" stroke, 10.11" for 2" stroke, 12.34" for 3" stroke, 16.34" for 4" stroke.\*

\* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

\*\* For each 1.00" of stroke.

**B**  
 Round Body Cylinders  
 Actuator Products

SR/SM/SRD/SRDM  
 Series

SRX  
 Series

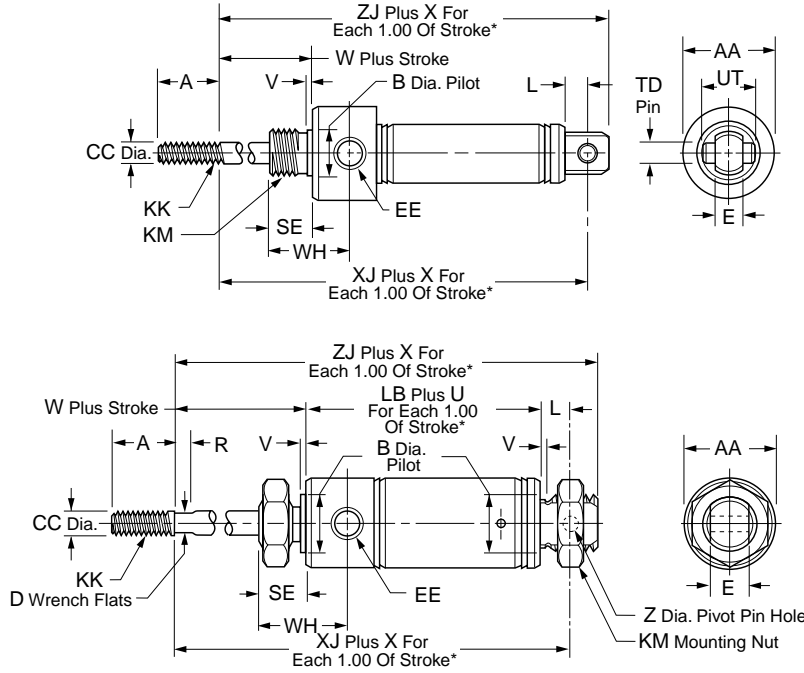
P1L  
 Series

P1A  
 Series

P  
 Series

**Mounting Style RP**

Pivot and nose mount, spring extended



| Bore sizes |
|------------|
| 5/16" *    |
| 7/16"      |
| 3/4"       |

\* No mounting nuts

| Bore sizes |
|------------|
| 9/16" *    |
| 7/8" *     |
| 1-1/16" *  |
| 1-1/4"     |
| 1-1/2" *   |
| 1-3/4"     |
| 2" *       |

\* No mounting nuts

| Bore size | SR | SRM | Std. stroke (in)           | Max. stroke (in) | SS rod std | A    | AA       | B     | CC    | D    | E    | EE       | KK          |
|-----------|----|-----|----------------------------|------------------|------------|------|----------|-------|-------|------|------|----------|-------------|
| 5/16"     | •  |     | 1/2, 1, 1-1/2, 2, 2-1/2, 3 | 4                | ✓          | 0.38 | 0.50 SQ. | –     | 0.125 | –    | 0.25 | #10-32   | #5-40 UNC   |
| 7/16"     | •  |     | 1/2, 1, 1-1/2, 2, 3        | 6                | ✓          | 0.50 | 0.74     | 0.437 | 0.188 | –    | 0.31 | #10-32   | #10-32 UNF  |
| 9/16"     | •  | •   | 1/2, 1, 1-1/2, 2, 3        | 6                | ✓          | 0.50 | 0.62     | 0.437 | 0.188 | –    | 0.31 | #10-32   | #10-32 UNF  |
| 3/4"      | •  | •   | 1/2, 1, 2, 3, 4            | 6                | ✓          | 0.50 | 0.86     | 0.624 | 0.250 | –    | 0.38 | 1/8 NPTF | 1/4-28 UNF  |
| 7/8"      | •  |     | 1/2, 1, 2, 3, 4            | 6                | ✓          | 0.50 | 0.93     | 0.624 | 0.250 | –    | 0.38 | 1/8 NPTF | 1/4-28 UNF  |
| 1-1/16"   | •  | •   | 1/2, 1, 1-1/2, 2, 3, 4     | 6                | ✓          | 0.50 | 1.12     | 0.624 | 0.312 | 0.25 | 0.38 | 1/8 NPTF | 5/16-24 UNF |
| 1-1/4"    | •  | •   | 1, 2, 3, 4                 | 6                | ✓          | 0.75 | 1.34     | 0.749 | 0.437 | 0.38 | 0.50 | 1/8 NPTF | 7/16-20 UNF |
| 1-1/2"    | •  | •   | 1, 2, 3, 4                 | 6                | ✓          | 1.25 | 1.56     | 0.749 | 0.437 | 0.38 | 0.62 | 1/8 NPTF | 7/16-20 UNF |
| 2"        | •  | •   | –                          | 4                |            | .88  | 2.08     | 1.374 | 0.625 | 0.50 | 0.75 | 1/4 NPTF | 1/2-20 UNF  |

| Bore size | KM        | L    | LB   | R    | SE   | TD    | U    | UT   | V    | W    | WH   | X    | XJ   |      |       | ZJ   |      |
|-----------|-----------|------|------|------|------|-------|------|------|------|------|------|------|------|------|-------|------|------|
|           |           |      |      |      |      |       |      |      |      |      |      |      | SR   | SRM  | Z     | SR   | SRM  |
| 5/16"     | 3/8-24    | 0.19 | –    | –    | 0.31 | –     | –    | –    | –    | 0.31 | 0.47 | 1.25 | 1.88 | –    | –     | 2.04 | –    |
| 7/16"     | 7/16-20   | 0.25 | –    | –    | 0.38 | 0.156 | –    | 0.50 | 0.05 | 0.38 | 0.72 | 1.44 | 2.38 | –    | –     | 2.62 | –    |
| 9/16"     | 7/16-20   | 0.25 | –    | –    | 0.38 | –     | –    | –    | 0.06 | 0.38 | 0.78 | 2.62 | 2.28 | 2.53 | 0.157 | 2.47 | 2.72 |
| 3/4"      | 5/8-18    | 0.34 | –    | –    | 0.50 | 0.250 | –    | 0.75 | 0.09 | 0.50 | 0.97 | 2.69 | 2.44 | 2.69 | –     | 2.72 | 2.97 |
| 7/8"      | 5/8-18    | 0.34 | –    | –    | 0.50 | 0.250 | –    | 0.75 | 0.09 | 0.50 | 0.97 | 2.56 | 2.63 | –    | –     | 2.91 | –    |
| 1-1/16"   | 5/8-18    | 0.34 | –    | 0.12 | 0.50 | 0.250 | –    | 0.75 | 0.09 | 0.62 | 1.06 | 2.81 | 2.78 | 3.03 | –     | 3.06 | 3.31 |
| 1-1/4"    | 3/4-16    | 0.41 | 2.47 | 0.25 | 0.62 | –     | 1.81 | –    | 0.09 | 0.88 | 1.38 | 2.81 | 3.78 | 3.91 | 0.251 | 4.16 | 4.28 |
| 1-1/2"    | 3/4-16    | 0.50 | –    | 0.25 | 0.62 | 0.375 | –    | 1.00 | 0.09 | 0.88 | 1.25 | 3.00 | 3.88 | 4.13 | –     | 4.25 | 4.50 |
| 2"        | 1-1/4 -12 | 0.56 | –    | 0.38 | 0.81 | –     | –    | –    | 0.12 | 1.19 | 1.47 | –    | ■    | ★    | 0.376 | ▲    | ◆    |

■ 8.05" for 1" stroke, 11.05" for 2" stroke, 13.28" for 3" stroke, 17.28" for 4" stroke\*

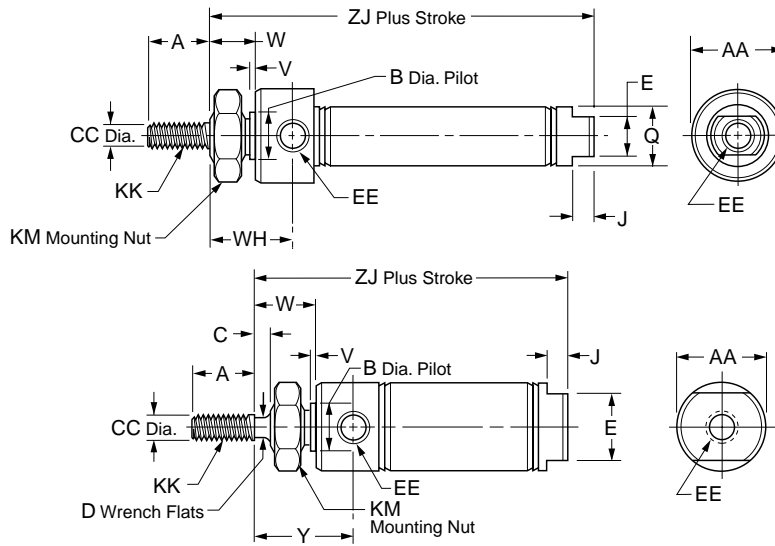
▲ 8.50" for 1" stroke, 11.50" for 2" stroke, 13.72" for 3" stroke, 17.72" for 4" stroke\*

\* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.



**Mounting Style D**

Nose mount, double acting



**Bore sizes**

- 5/16"
- 7/16"
- 3/4"

**Bore sizes**

- 9/16"
- 7/8"
- 1-1/16"
- 1-1/4"
- 1-1/2"
- 1-3/4"
- 2" \*
- 2-1/2" \*
- 3" \*

\* No mounting nuts

| Bore size | Series |     |          | Std. stroke (in)                               | Max. stroke (in) | SS rod std | A    | AA       | B     | C    | CC    |
|-----------|--------|-----|----------|--|------------------|------------|------|----------|-------|------|-------|
|           | SR     | SRM | SRD SRDM |  |                  |            |      |          |       |      |       |
| 5/16"     | •      |     |          | 1/2, 1, 1-1/2, 2, 2-1/2, 3, 4                  | 4                | ✓          | 0.38 | 0.50 SQ. | –     | –    | 0.125 |
| 7/16"     | •      |     |          | 1/2, 1, 1-1/2, 2, 3, 4                         | 12               | ✓          | 0.50 | 0.74     | 0.437 | –    | 0.188 |
| 9/16"     | •      | •   | •        | 1/2, 1, 1-1/2, 2, 3, 4                         | 12               | ✓          | 0.50 | 0.62     | 0.437 | –    | 0.188 |
| 3/4"      | •      | •   | •        | 1/2, 1, 2, 2-1/2, 3, 4, 5, 6, 8, 10            | 12               | ✓          | 0.50 | 0.86     | 0.624 | –    | 0.250 |
| 7/8"      | •      |     |          | 1/2, 1, 2, 3, 4, 5, 6                          | 12               | ✓          | 0.50 | 0.93     | 0.624 | –    | 0.250 |
| 1-1/16"   | •      | •   | •        | 1/2, 1, 1-1/2, 2, 2-1/2, 3, 4, 5, 6, 8, 10, 12 | 12               | ✓          | 0.50 | 1.12     | 0.624 | 0.12 | 0.312 |
| 1-1/4"    | •      | •   |          | 1, 2, 3, 4, 5, 6                               | 12               | ✓          | 0.75 | 1.34     | 0.749 | 0.25 | 0.437 |
| 1-1/2"    | •      | •   | •        | 1/2, 1, 2, 3, 4, 5, 6, 8, 10, 12               | 12               | ✓          | 0.75 | 1.56     | 0.749 | 0.25 | 0.437 |
| 1-3/4"    | •      | •   |          | 1/2, 1, 1-1/2, 2, 2-1/2, 3, 4, 5, 6            | 12               |            | 0.88 | 1.84     | 1.031 | 0.31 | 0.500 |
| 2"        | •      | •   | •        | –  | 12               |            | 0.88 | 2.08     | 1.374 | 0.38 | 0.625 |
| 2-1/2"    | •      | •   |          | –  | 12               |            | 0.88 | 2.62     | 1.500 | 0.38 | 0.625 |
| 3"        | •      |     |          | –  | 12               |            | 1.25 | 3.16     | 1.630 | 0.38 | 0.750 |

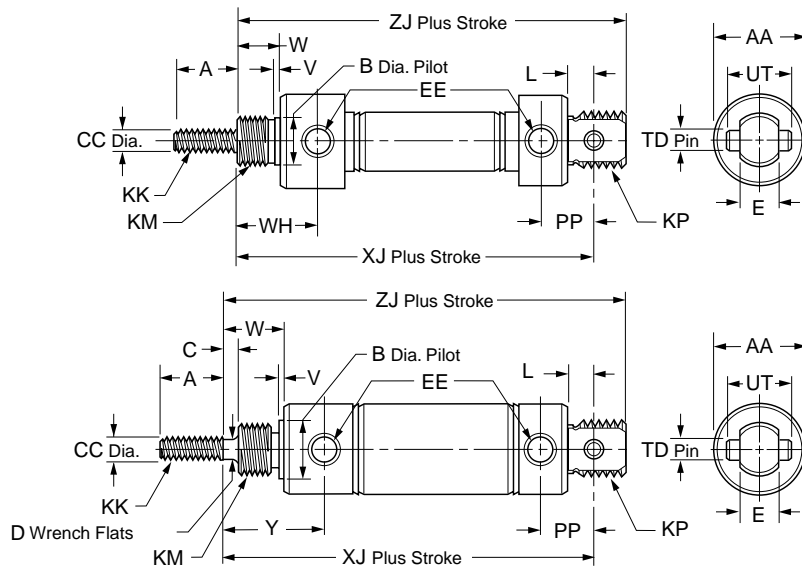
| Bore size | Series |      |          |      |             |          |      |      |      |      |      | ZJ   |      |
|-----------|--------|------|----------|------|-------------|----------|------|------|------|------|------|------|------|
|           | D      | E    | EE       | J    | KK          | KM       | Q    | V    | W    | WH   | Y    | SR   | SRM  |
| 5/16"     | –      | –    | #10-32   | –    | #5-40 UNC   | 3/8-24   | 0.36 | –    | 0.31 | 0.47 | –    | 1.64 | –    |
| 7/16"     | –      | 0.38 | #10-32   | 0.19 | #10-32 UNF  | 7/16-20  | 0.50 | 0.05 | 0.38 | 0.72 | –    | 2.12 | –    |
| 9/16"     | –      | 0.50 | #10-32   | 0.19 | #10-32 UNF  | 7/16-20  | –    | 0.06 | 0.38 | 0.78 | –    | 2.28 | 2.53 |
| 3/4"      | –      | 0.62 | 1/8 NPTF | 0.19 | 1/4-28 UNF  | 5/8-18   | 0.81 | 0.09 | 0.50 | 0.97 | –    | 2.97 | 2.97 |
| 7/8"      | –      | 0.62 | 1/8 NPTF | 0.19 | 1/4-28 UNF  | 5/8-18   | –    | 0.09 | 0.50 | 0.97 | –    | 2.94 | –    |
| 1-1/16"   | 0.25   | 0.88 | 1/8 NPTF | 0.19 | 5/16-24 UNF | 5/8-18   | –    | 0.09 | 0.62 | –    | 1.19 | 3.25 | 3.41 |
| 1-1/4"    | 0.38   | 0.88 | 1/8 NPTF | 0.25 | 7/16-20 UNF | 3/4-16   | –    | 0.09 | 0.88 | –    | 1.62 | 4.00 | 4.03 |
| 1-1/2"    | 0.38   | 0.88 | 1/8 NPTF | 0.25 | 7/16-20 UNF | 3/4-16   | –    | 0.09 | 0.88 | –    | 1.50 | 3.69 | 3.94 |
| 1-3/4"    | 7/16   | 1.25 | 1/4 NPTF | 0.25 | 1/2-20 UNF  | 1-14     | –    | 0.09 | 1.06 | 1.63 | –    | 4.69 | 4.69 |
| 2"        | 0.50   | 1.25 | 1/4 NPTF | 0.31 | 1/2-20 UNF  | 1-1/4-12 | –    | 0.12 | 1.19 | –    | 1.84 | 4.69 | 4.97 |
| 2-1/2"    | 1/2    | 1.75 | 1/4 NPTF | 0.31 | 1/2-20 UNF  | 1-3/8-12 | –    | 0.13 | 1.19 | –    | 1.84 | 4.69 | 4.69 |
| 3"        | 5/8    | 2.00 | 3/8 NPTF | 0.31 | 5/8-18 UNF  | 1-1/2-12 | –    | 0.19 | 1.38 | –    | 2.09 | 5.25 | –    |





**Mounting Style DP**

Pivot and nose mount, double acting, pivot pin



| Bore sizes |
|------------|
| 5/16"      |
| 7/16"      |
| 3/4"       |

| Bore sizes |
|------------|
| 1-1/16"    |
| 1-1/2"     |

| Bore size | SR | SRM | Std. stroke (in)                               | Max. stroke (in) | SS rod | A    | AA   | B     | CC    | D    | E    |
|-----------|----|-----|--|------------------|--------|------|------|-------|-------|------|------|
| 7/16"     | •  |     | 1/2, 1, 1-1/2, 2, 3, 4                         | 12               | ✓      | 0.50 | 0.74 | 0.437 | 0.188 | -    | 0.31 |
| 3/4"      | •  | •   | 1/2, 1, 2, 2-1/2, 3, 4, 5, 6, 8, 10            | 12               | ✓      | 0.50 | 0.86 | 0.624 | 0.250 | -    | 0.38 |
| 1-1/16"   | •  | •   | 1/2, 1, 1-1/2, 2, 2-1/2, 3, 4, 5, 6, 8, 10, 12 | 12               | ✓      | 0.50 | 1.12 | 0.624 | 0.312 | 0.25 | 0.38 |
| 1-1/2"    | •  | •   | 1, 2, 3, 4, 5, 6, 8, 10, 12                    | 12               | ✓      | 0.75 | 1.56 | 0.749 | 0.437 | 0.38 | 0.62 |

| Bore size | EE       | KK          | KM      | KP          | L    | PP   | TD    | UT   | V    | W    | WH   | XJ   |      | ZJ   |      |      |
|-----------|----------|-------------|---------|-------------|------|------|-------|------|------|------|------|------|------|------|------|------|
|           |          |             |         |             |      |      |       |      |      |      |      | SR   | SRM  | Y    | SR   | SRM  |
| 7/16"     | #10-32   | #10-32 UNF  | 7/16-20 | 7/16-20 UNF | 0.25 | 0.44 | 0.156 | 0.50 | 0.05 | 0.38 | 0.72 | 2.56 | -    | -    | 2.81 | -    |
| 3/4"      | 1/8 NPTF | 1/4-28 UNF  | 5/8-18  | 5/8-18 UNF  | 0.34 | 0.62 | 0.250 | 0.75 | 0.09 | 0.50 | 0.97 | 3.75 | 3.75 | -    | 4.03 | 4.03 |
| 1-1/16"   | 1/8 NPTF | 5/16-24 UNF | 5/8-18  | 5/8-18 UNF  | 0.34 | 0.62 | 0.250 | 0.75 | 0.09 | 0.62 | -    | 3.84 | 4.00 | 1.19 | 4.12 | 4.28 |
| 1-1/2"    | 1/8 NPTF | 7/16-20 UNF | 3/4-16  | -           | 0.50 | 0.81 | 0.375 | 1.00 | 0.09 | 0.87 | -    | 4.38 | 4.63 | 1.50 | 4.75 | 5.00 |

**B**  
 Round Body Cylinders  
 Actuator Products

SR/SM/SRD/SRDM  
 Series

SRX  
 Series

P1L  
 Series

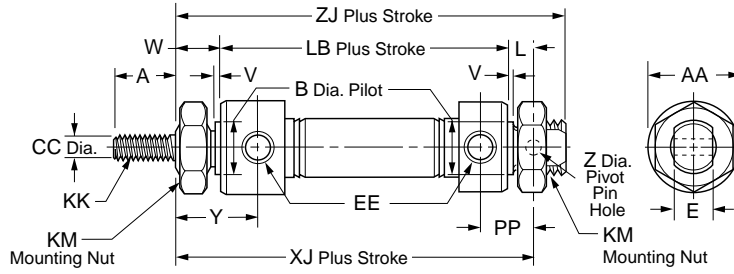
P1A  
 Series

P  
 Series

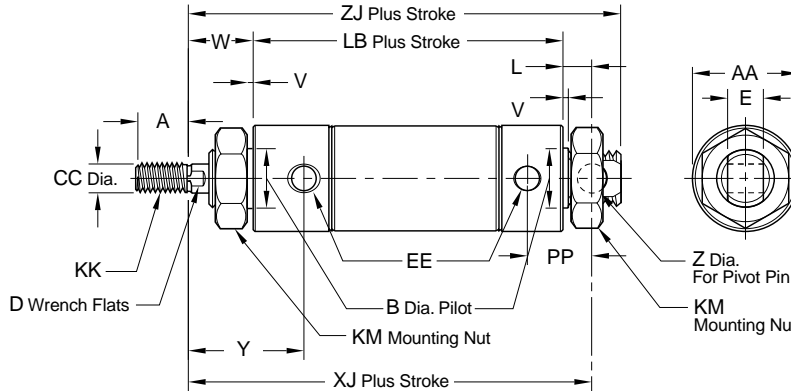


**Mounting Style DXP**

Pivot & nose mount, double acting, no pivot pin



| Bore sizes |
|------------|
| 5/16"      |
| 7/16"      |
| 3/4"       |



| Bore sizes |
|------------|
| 9/16" *    |
| 7/8"       |
| 1-1/16"    |
| 1-1/4"     |
| 1-1/2"     |
| 1-3/4"     |
| 2" *       |
| 2-1/2" *   |
| 3" *       |

\* No mounting nuts

**B**  
 Round Body Cylinders  
 Actuator Products

SR/SW/SRD/SRDM  
 Series

SRX  
 Series

P1L  
 Series

P1A  
 Series

P  
 Series

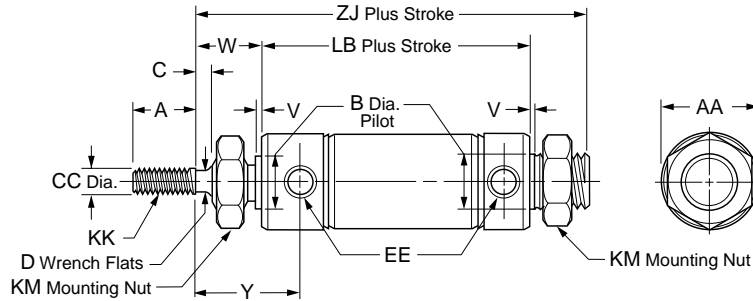
| Bore size | SR | SRM | SRD<br>SRDM | Std. stroke<br>(in)                            | Max.<br>stroke<br>(in) | SS<br>rod<br>std | A    | AA       | B     | CC    | D    | E    |
|-----------|----|-----|-------------|--|------------------------|------------------|------|----------|-------|-------|------|------|
| 5/16"     | •  |     |             | 1/2, 1, 1-1/2, 2, 2-1/2, 3, 4                  | 4                      | ✓                | 0.38 | 0.50 SQ. | -     | 0.125 | -    | 0.25 |
| 7/16"     | •  |     |             | 1/2, 1, 1-1/2, 2, 3, 4                         | 12                     | ✓                | 0.50 | 0.74     | 0.437 | 0.188 | -    | 0.31 |
| 9/16"     | •  | •   | •           | 1/2, 1, 1-1/2, 2, 3, 4                         | 12                     | ✓                | 0.50 | 0.62     | 0.437 | 0.188 | -    | 0.31 |
| 3/4"      | •  | •   | •           | 1, 2, 3, 4, 5, 6, 8, 10                        | 32                     | ✓                | 0.50 | 0.86     | 0.624 | 0.250 | -    | 0.38 |
| 7/8"      | •  |     |             | 1, 2, 3, 4, 5, 6, 8, 10                        | 32                     | ✓                | 0.50 | 0.93     | 0.624 | 0.250 | -    | 0.38 |
| 1-1/16"   | •  | •   | •           | 1/2, 1, 1-1/2, 2, 2-1/2, 3, 4, 5, 6, 8, 10, 12 | 32                     | ✓                | 0.50 | 1.12     | 0.624 | 0.312 | 0.25 | 0.38 |
| 1-1/4"    | •  | •   |             | 1, 2, 3, 4, 5, 6, 7, 8, 10, 12                 | 32                     | ✓                | 0.75 | 1.34     | 0.749 | 0.437 | 0.38 | 0.50 |
| 1-1/2"    | •  | •   | •           | -  | 32                     | ✓                | 0.75 | 1.56     | 0.749 | 0.437 | 0.38 | 0.62 |
| 1-3/4"    | •  | •   |             | 1, 2, 3, 4, 5, 6, 8, 10, 12                    | 32                     |                  | 0.88 | 1.84     | 1.031 | 0.500 | 7/16 | 0.62 |
| 2"        | •  | •   | •           | -  | 32                     |                  | 0.88 | 2.08     | 1.374 | 0.625 | 0.50 | 0.75 |
| 2-1/2"    | •  | •   |             | -  | 32                     |                  | 0.88 | 2.62     | 1.500 | 0.625 | 1/2  | 0.75 |
| 3"        | •  |     |             | -  | 32                     |                  | 1.25 | 3.16     | 1.630 | 0.750 | 5/8  | 0.88 |

| Bore size | XJ       |             |          |      |      |      |      |      | ZJ   |      |      |       |      |      |
|-----------|----------|-------------|----------|------|------|------|------|------|------|------|------|-------|------|------|
|           | EE       | KK          | KM       | L    | LB   | PP   | V    | W    | SR   | SRM  | Y    | Z     | SR   | SRM  |
| 5/16"     | #10-32   | #5-40 UNC   | 3/8-24   | 0.19 | -    | 0.34 | -    | 0.31 | 2.03 | -    | -    | 0.125 | 2.19 | -    |
| 7/16"     | #10-32   | #10-32 UNF  | 7/16-20  | 0.25 | 1.94 | 0.44 | 0.05 | 0.38 | 2.56 | -    | 0.72 | 0.157 | 2.81 | -    |
| 9/16"     | #10-32   | #10-32 UNF  | 7/16-20  | 0.25 | -    | 0.38 | 0.06 | 0.38 | 2.56 | 2.81 | 0.78 | 0.157 | 2.75 | 3.00 |
| 3/4"      | 1/8 NPTF | 1/4-28 UNF  | 5/8-18   | 0.34 | 2.91 | 0.62 | 0.09 | 0.50 | 3.75 | 3.75 | 0.97 | 0.251 | 4.03 | 4.03 |
| 7/8"      | 1/8 NPTF | 1/4-28 UNF  | 5/8-18   | 0.34 | -    | 0.62 | 0.09 | 0.50 | 3.56 | -    | 0.97 | 0.251 | 3.84 | -    |
| 1-1/16"   | 1/8 NPTF | 5/16-24 UNF | 5/8-18   | 0.34 | -    | 0.62 | 0.09 | 0.62 | 3.84 | -    | 1.19 | 0.251 | 4.12 | 4.28 |
| 1-1/4"    | 1/8 NPTF | 7/16-20 UNF | 3/4-16   | 0.41 | -    | 0.78 | 0.09 | 0.88 | 4.72 | 4.75 | 1.62 | 0.251 | 5.12 | 5.16 |
| 1-1/2"    | 1/8 NPTF | 7/16-20 UNF | 3/4-16   | 0.50 | -    | 0.81 | 0.09 | 0.88 | 4.38 | 4.63 | 1.50 | 0.376 | 4.75 | 5.00 |
| 1-3/4"    | 1/4 NPTF | 1/2-20 UNF  | 1-14     | 0.50 | 4.19 | 1.12 | 0.09 | 1.06 | 5.75 | 5.75 | 1.94 | 0.376 | 6.25 | 6.25 |
| 2"        | 1/4 NPTF | 1/2-20 UNF  | 1-1/4-12 | 0.56 | -    | 1.03 | 0.12 | 1.19 | 5.62 | 5.91 | -    | 0.376 | 6.06 | 6.34 |
| 2-1/2"    | 1/4 NPTF | 1/2-20 UNF  | 1-3/8-12 | 0.56 | -    | 1.03 | 0.13 | 1.19 | 5.62 | 5.62 | 1.84 | 0.376 | 6.06 | 6.06 |
| 3"        | 3/8 NPTF | 5/8-18 UNF  | 1-1/2-12 | 0.81 | -    | 1.34 | 0.19 | 1.38 | 6.50 | -    | 2.09 | 0.500 | 7.12 | -    |



**Mounting Style DX**

Threaded both ends, double acting



| Bore size | SR | SRM | Std. stroke (in)                               | Max. stroke (in) | SS rod std |
|-----------|----|-----|--|------------------|------------|
| 7/16" *   | •  |     | 1/2, 1, 1-1/2, 2, 3, 4                         | 12               | ✓          |
| 9/16" *   | •  | •   | 1/2, 1, 1-1/2, 2, 3, 4                         | 12               | ✓          |
| 3/4" *    | •  | •   | 1, 2, 3, 4, 5, 6, 8, 10                        | 32               | ✓          |
| 7/8" *    | •  | •   | 1, 2, 3, 4, 5, 6, 8, 10                        | 32               | ✓          |
| 1-1/16" * | •  | •   | 1/2, 1, 1-1/2, 2, 2-1/2, 3, 4, 5, 6, 8, 10, 12 | 32               | ✓          |
| 1-1/4" *  | •  | •   | 1, 2, 3, 4, 5, 6, 7, 8, 10, 12                 | 32               | ✓          |
| 1-1/2"    | •  | •   | 1, 2, 3, 4, 5, 6, 8, 10, 12                    | 32               | ✓          |
| 2" *      | •  | •   | –  | 32               |            |

| Bore size | A    | AA   | B     | C    | CC    | D    | EE       | KK          | KM       | LB   |     |      | ZJ   |      |      |
|-----------|------|------|-------|------|-------|------|----------|-------------|----------|------|-----|------|------|------|------|
|           |      |      |       |      |       |      |          |             |          | SR   | SRM | V    | W    | Y    | SR   |
| 7/16" *   | 0.50 | 0.74 | 0.437 | –    | 0.188 | –    | #10-32   | #10-32 UNF  | 7/16-20  | 1.94 |     | 0.05 | 0.38 | 0.72 | 2.81 |
| 9/16" *   | 0.50 | 0.62 | 0.437 | –    | 0.188 | –    | #10-32   | #10-32 UNF  | 7/16-20  | –    |     | 0.06 | 0.38 | 0.78 | 2.75 |
| 3/4" *    | 0.50 | 0.86 | 0.624 | –    | 0.250 | –    | 1/8 NPTF | 1/4-28 UNF  | 5/8-18   | 2.91 |     | 0.09 | 0.50 | 0.97 | 4.03 |
| 7/8" *    | 0.50 | 0.93 | 0.624 | –    | 0.250 | –    | 1/8 NPTF | 1/4-28 UNF  | 5/8-18   | –    |     | 0.09 | 0.50 | 0.97 | 3.84 |
| 1-1/16" * | 0.50 | 1.12 | 0.624 | 0.12 | 0.312 | 0.25 | 1/8 NPTF | 5/16-24 UNF | 5/8-18   | –    |     | 0.09 | 0.62 | 1.19 | 4.12 |
| 1-1/4" *  | 0.75 | 0.34 | 0.749 | 0.25 | 0.437 | 0.38 | 1/8 NPTF | 7/16-20 UNF | 3/4-16   | –    |     | 0.09 | 0.88 | 1.62 | 5.12 |
| 1-1/2"    | 0.75 | 1.56 | 0.749 | 0.25 | 0.437 | 0.38 | 1/8 NPTF | 7/16-20 UNF | 3/4-16   | 3.00 |     | 0.09 | 0.88 | 1.50 | 4.50 |
| 2" *      | 0.88 | 2.08 | 1.374 | 0.38 | 0.625 | 0.50 | 1/4 NPTF | 1/2-20 UNF  | 1-1/4-12 | –    |     | 0.12 | 1.19 | –    | 6.06 |

\* Available upon request. Please consult factory.

**B**

Round Body Cylinders  
 Actuator Products

SR/SM/SRD/SRDM  
 Series

SRX  
 Series

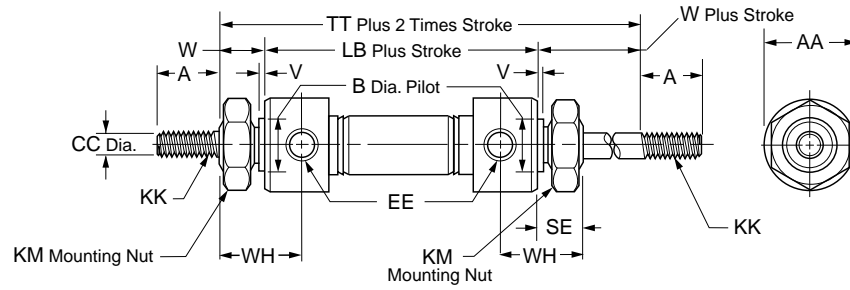
P1L  
 Series

P1A  
 Series

P  
 Series

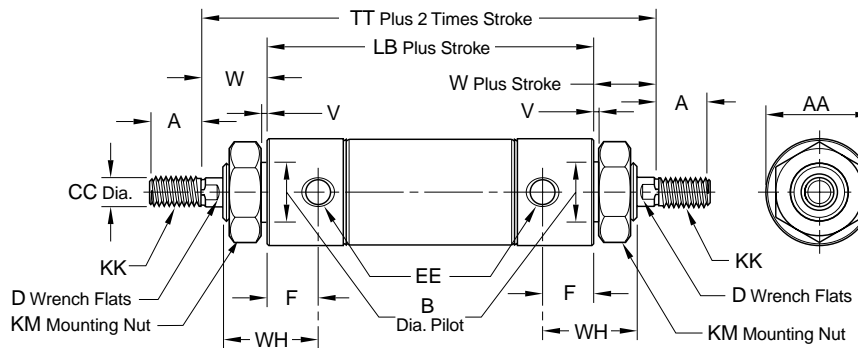
**Mounting Style KDX**

Threaded both ends, double acting, double rod



**Bore sizes**

- 7/16"
- 3/4"



**Bore sizes**

- 9/16" \*
- 7/8"
- 1-1/16"
- 1-1/4"
- 1-1/2"
- 1-3/4"
- 2" \*
- 2-1/2" \*
- 3" \*

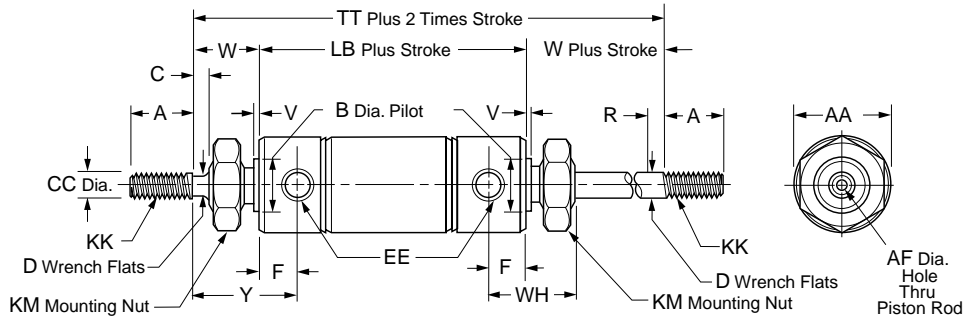
\* No mounting nuts

| Bore size | SR | SRM | SRD<br>SRDM | Std. stroke<br>(in)    | Max. stroke<br>(in) | SS<br>rod | A    | AA   | B     | CC    |
|-----------|----|-----|-------------|------------------------|---------------------|-----------|------|------|-------|-------|
| 7/16"     | •  |     |             | 1/2, 1, 1-1/2, 2, 3, 4 | 6                   | ✓         | 0.50 | 0.74 | 0.437 | 0.188 |
| 9/16"     | •  | •   | •           | 1/2, 1, 1-1/2, 2, 3, 4 | 6                   | ✓         | 0.50 | 0.62 | 0.437 | 0.188 |
| 3/4"      | •  | •   | •           | 1, 2, 3, 4, 5, 6       | 12                  | ✓         | 0.50 | 0.86 | 0.624 | 0.250 |
| 7/8"      | •  |     |             | 1, 2, 3, 4, 6          | 12                  | ✓         | 0.50 | 0.93 | 0.624 | 0.250 |
| 1-1/16"   | •  | •   | •           | 1, 2, 3, 4, 5, 6       | 12                  | ✓         | 0.50 | 1.12 | 0.624 | 0.312 |
| 1-1/4"    | •  | •   | •           | 1, 2, 3, 4, 5, 6       | 12                  | ✓         | 0.75 | 1.34 | 0.749 | 0.437 |
| 1-1/2"    | •  | •   | •           | 1, 2, 3, 4, 5, 6       | 12                  | ✓         | 0.75 | 1.56 | 0.749 | 0.437 |
| 1-3/4"    | •  | •   | •           | 1, 2, 3, 4, 5, 6       | 12                  | ✓         | 0.88 | 1.84 | 1.031 | 0.500 |
| 2"        | •  | •   | •           | –                      | 12                  | ✓         | 0.88 | 2.08 | 1.374 | 0.625 |
| 2-1/2"    | •  | •   | •           | –                      | 18                  | ✓         | 0.88 | 2.62 | 1.500 | 0.625 |
| 3"        | •  | •   | •           | –                      | 12                  | ✓         | 1.25 | 3.16 | 1.630 | 0.750 |

| Bore size | D    | EE       | F    | KK          | KM       | LB   |      |      | TT   |      |      | V    | W    | WH |
|-----------|------|----------|------|-------------|----------|------|------|------|------|------|------|------|------|----|
|           |      |          |      |             |          | SR   | SRM  | SE   | SR   | SRM  | SE   |      |      |    |
| 7/16"     | –    | #10-32   | 0.34 | #10-32 UNF  | 7/16-20  | 2.06 | –    | 0.38 | 2.81 | –    | 0.05 | 0.38 | 0.72 |    |
| 9/16"     | –    | #10-32   | 0.40 | #10-32 UNF  | 7/16-20  | 2.19 | 2.44 | 0.38 | 2.94 | 3.19 | 0.06 | 0.38 | 0.78 |    |
| 3/4"      | –    | 1/8 NPTF | 0.47 | 1/4-28 UNF  | 5/8-18   | 3.00 | 3.00 | 0.50 | 4.00 | 4.00 | 0.09 | 0.50 | 0.97 |    |
| 7/8"      | –    | 1/8 NPTF | 0.47 | 1/4-28 UNF  | 5/8-18   | 2.91 | –    | 0.50 | 3.91 | –    | 0.09 | 0.50 | 0.97 |    |
| 1-1/16"   | 0.25 | 1/8 NPTF | 0.56 | 5/16-24 UNF | 5/8-18   | 2.75 | 3.28 | 0.50 | 4.00 | 4.53 | 0.09 | 0.62 | 1.19 |    |
| 1-1/4"    | 0.38 | 1/8 NPTF | 0.75 | 7/16-20 UNF | 3/4-16   | 3.81 | 3.84 | 0.63 | 5.56 | 5.59 | 0.09 | 0.88 | 1.62 |    |
| 1-1/2"    | 0.38 | 1/8 NPTF | 0.62 | 7/16-20 UNF | 3/4-16   | 3.38 | 3.63 | 0.63 | 5.12 | 5.38 | 0.09 | 0.88 | 1.50 |    |
| 1-3/4"    | 7/16 | 1/4 NPTF | 0.88 | 1/2-20 UNF  | 1-14     | 4.44 | 4.44 | 0.75 | 6.56 | 6.56 | 0.09 | 1.06 | 1.63 |    |
| 2"        | 0.50 | 1/4 NPTF | 0.65 | 1/2-20 UNF  | 1-1/4-12 | 4.19 | 4.47 | –    | 6.56 | 6.84 | 0.12 | 1.19 | 1.84 |    |
| 2-1/2"    | 1/2  | 1/4 NPTF | 0.65 | 1/2-20 UNF  | 1-3/8-12 | 4.19 | 4.19 | –    | 6.56 | 6.56 | 0.13 | 1.19 | 1.84 |    |
| 3"        | 5/8  | 3/8 NPTF | 0.71 | 5/8-18 UNF  | 1-1/2-12 | 4.56 | –    | –    | 7.31 | –    | 0.19 | 1.38 | 1.72 |    |

**Mounting Style KDXH**

Threaded both ends, double rod, hollow rod

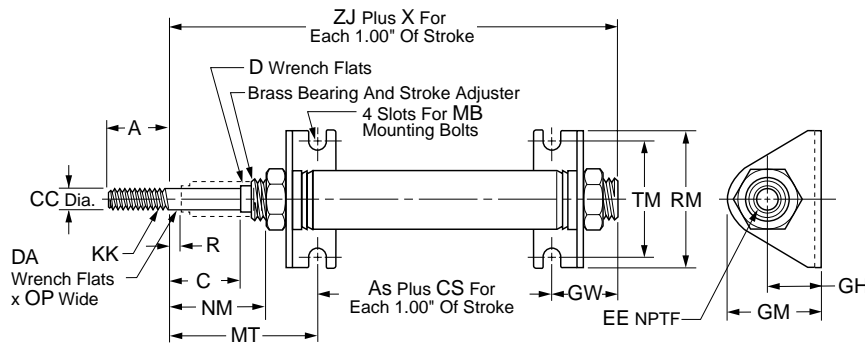


| Bore size | SR | SRM | Std. stroke (in) | Max. stroke (in) | SS rod | A    | AA   | AF    | B     | C    | CC    |
|-----------|----|-----|------------------|------------------|--------|------|------|-------|-------|------|-------|
| 1-1/16"   | •  | •   | 1, 2, 3, 4, 5, 6 | 12               | N/A    | 0.50 | 1.12 | 0.187 | 0.624 | 0.12 | 0.312 |
| 1-1/4"    | •  | •   | 1, 2, 3, 4, 5, 6 | 12               | N/A    | 0.75 | 1.34 | 0.250 | 0.749 | 0.25 | 0.437 |
| 1-1/2"    | •  | •   | 1, 2, 3, 4, 5, 6 | 12               | N/A    | 0.75 | 1.56 | 0.250 | 0.749 | 0.25 | 0.437 |
| 1-3/4"    | •  | •   | 1, 2, 3, 4, 5, 6 | 12               | N/A    | 0.88 | 1.84 | 0.328 | 1.031 | 0.38 | 0.500 |

| Bore size | D    | EE       | F    | KK          | KM     | LB   |      | R    | TT   |      | V    | W    | WH   | Y    |
|-----------|------|----------|------|-------------|--------|------|------|------|------|------|------|------|------|------|
|           |      |          |      |             |        | SR   | SRM  |      | SR   | SRM  |      |      |      |      |
| 1-1/16"   | 0.25 | 1/8 NPTF | 0.56 | 5/16-24 UNF | 5/8-18 | 2.75 | 3.28 | 0.12 | 4.00 | 4.53 | 0.09 | 0.62 | 1.06 | 1.19 |
| 1-1/4"    | 0.38 | 1/8 NPTF | 0.75 | 7/16-20 UNF | 3/4-16 | 3.81 | 3.84 | 0.25 | 5.56 | 5.59 | 0.09 | 0.88 | 1.38 | 1.62 |
| 1-1/2"    | 0.38 | 1/8 NPTF | 0.62 | 7/16-20 UNF | 3/4-16 | 3.38 | 3.63 | 0.25 | 5.12 | 5.38 | 0.09 | 0.88 | 1.25 | 1.50 |
| 1-3/4"    | 7/16 | 1/4 NPTF | 0.88 | 1/2-20 UNF  | 1-14   | 4.44 | 4.44 | –    | 6.56 | 6.56 | 0.09 | 1.06 | 1.63 | 1.63 |

**Mounting Style A**

Nose mount, spring return, head adjustable stroke



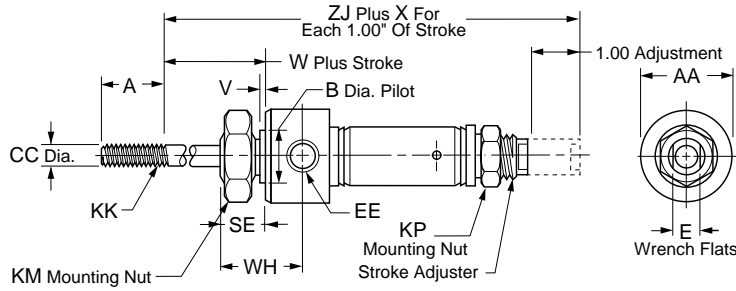
| Bore size | SR | SRM | Std. stroke   | Max. stroke (in) | SS rod std | A    | AS   | C    | CC    | CS   | D    |
|-----------|----|-----|---|------------------|------------|------|------|------|-------|------|------|
| 3/4"      | •  |     | Stroke adjustment in 1" increments to 3":<br>1" stroke adjusts 0-1" | 6                | ✓          | 0.50 | –    | 1.19 | 0.250 | 1.69 | –    |
| 1-1/16"   | •  |     | 2" stroke adjusts 1-2"  | 6                | ✓          | 0.50 | 0.32 | 1.25 | 0.312 | 1.56 | 0.25 |
| 1-1/2"    | •  |     | 3" stroke adjusts 2-3"  | 6                | ✓          | 0.75 | 0.19 | 1.25 | 0.437 | 2.00 | 0.62 |

| Bore size | EE       | GH   | GM   | GW   | KK          | MB    | MT   | NM   | OP   | R    | RM   | TM   | X    | ZJ   |
|-----------|----------|------|------|------|-------------|-------|------|------|------|------|------|------|------|------|
| 3/4"      | 1/8 NPTF | 0.81 | 1.38 | 0.88 | 1/4-28 UNF  | 0.250 | 2.38 | 1.44 | –    | 0.19 | 1.88 | 1.50 | 1.69 | 3.12 |
| 1-1/16"   | 1/8 NPTF | 0.81 | 1.38 | 0.93 | 5/16-24 UNF | 0.250 | 2.38 | 1.44 | 0.12 | 0.25 | 1.88 | 1.50 | 1.56 | 3.63 |
| 1-1/2"    | 1/8 NPTF | 1.00 | 1.78 | 1.25 | 7/16-20 UNF | 0.250 | 2.56 | 1.50 | –    | 0.25 | 2.50 | 1.88 | 2.00 | 4.00 |

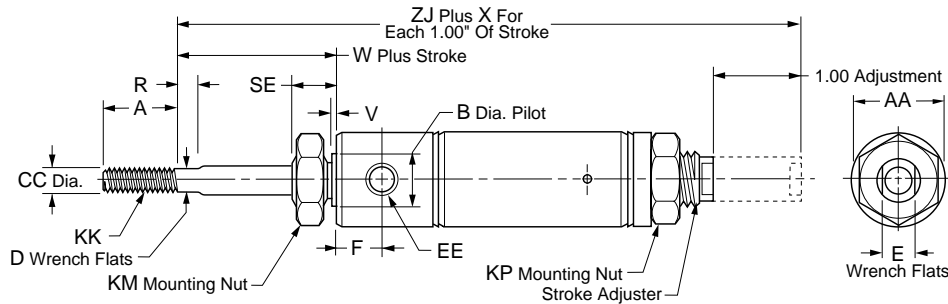


**Mounting Style RA**

Nose mount, spring return, cap adjustable stroke



**Bore sizes**  
 3/4"



**Bore sizes**  
 1-1/16"  
 1-1/2"

**B**  
 Round Body Cylinders  
 Actuator Products  
 SR/SM/SRD/SRDM  
 Series  
 SRX  
 Series  
 P1L  
 Series  
 P1A  
 Series  
 P  
 Series

| Bore size | SR | SRM | Std. stroke                               | Max. stroke (in) | SS rod std |
|-----------|----|-----|---|------------------|------------|
| 3/4"      | •  |     | Stroke adjustment in 1" increments to 3": | 6                | ✓          |
| 1-1/16"   | •  |     | 1" stroke adjusts 0-1"                    | 6                | ✓          |
| 1-1/2"    | •  |     | 2" stroke adjusts 1-2"                    | 6                | ✓          |
|           |    |     | 3" stroke adjusts 2-3"                    | 6                | ✓          |

| Bore size | A    | AS   | AA   | B     | CC    | D    | E    | EE       | F    |
|-----------|------|------|------|-------|-------|------|------|----------|------|
| 3/4"      | 0.50 | 1.69 | 0.86 | 0.624 | 0.250 | -    | 0.34 | 1/8 NPTF | -    |
| 1-1/16"   | 0.50 | 0.32 | 1.12 | 0.624 | 0.312 | 0.25 | 0.50 | 1/8 NPTF | 0.56 |
| 1-1/2"    | 1.25 | 0.19 | 1.56 | 0.749 | 0.437 | 0.38 | 0.62 | 1/8 NPTF | 0.62 |

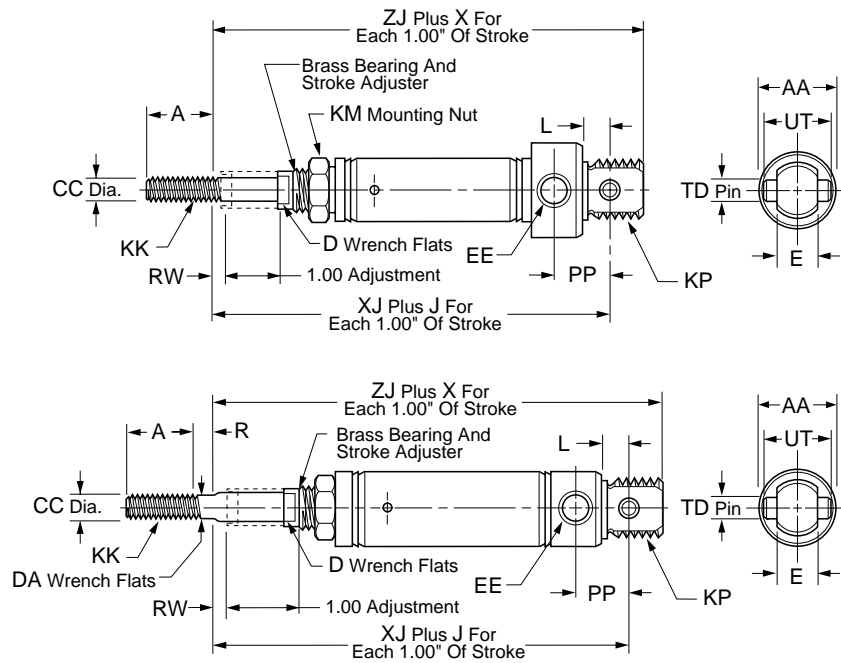
  

| 3/4"    | KK          | KM     | SE   | R    | V    | W    | WH   | X    | ZJ   |
|---------|-------------|--------|------|------|------|------|------|------|------|
| 1-1/16" | 1/4-28 UNF  | 5/8-18 | 0.50 | -    | 0.09 | 0.53 | 0.97 | 2.69 | 3.78 |
| 1-1/2"  | 5/16-24 UNF | 5/8-18 | 0.50 | 0.12 | 0.09 | 0.50 | -    | 2.56 | 4.03 |
| 1-1/2"  | 7/16-20 UNF | 3/4-16 | 0.62 | 0.25 | 0.09 | 0.88 | -    | 2.00 | 5.81 |



**Mounting Style AP**

Pivot mount, spring return, head adjustable stroke



Bore sizes  
 3/4"

Bore sizes  
 1-1/16"  
 1-1/2"

| Bore size | SR | SRM | Std. stroke                                      | Max. stroke (in) | SS rod std |
|-----------|----|-----|--|------------------|------------|
| 3/4"      | •  |     | Stroke adjustment in 1" increments to 3":        | 6                | ✓          |
| 1-1/16"   | •  |     | 1" stroke adjusts 0-1"<br>2" stroke adjusts 1-2" | 6                | ✓          |
| 1-1/2"    | •  |     | 3" stroke adjusts 2-3"                           | 6                | ✓          |

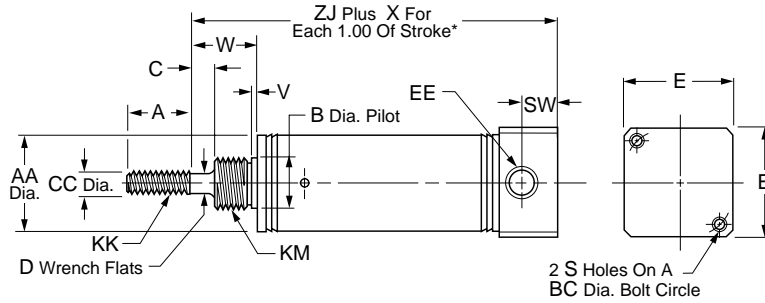
| Bore size | A    | AA   | CC    | D    | DA   | E    | EE       | J    | KK          |
|-----------|------|------|-------|------|------|------|----------|------|-------------|
| 3/4"      | 0.50 | 0.86 | 0.250 | 0.34 | –    | 0.38 | 1/8 NPTF | 1.69 | 1/4-28 UNF  |
| 1-1/16"   | 0.50 | 1.12 | 0.312 | 0.50 | 0.25 | 0.38 | 1/8 NPTF | 1.56 | 5/16-24 UNF |
| 1-1/2"    | 0.75 | 1.56 | 0.437 | 0.62 | 0.38 | 0.62 | 1/8 NPTF | 2.00 | 7/16-20 UNF |

| Bore size | KM      | KP         | L    | OP   | PP   | R    | RW   | TD    | UT   | X    | XJ   | ZJ   |
|-----------|---------|------------|------|------|------|------|------|-------|------|------|------|------|
| 3/4"      | 7/16-20 | 5/8-18 UNF | 0.34 | –    | 0.62 | 0.19 | 0.19 | 0.250 | 0.75 | 1.69 | 3.65 | 3.93 |
| 1-1/16"   | –       | 5/8-18 UNF | 0.34 | 0.25 | 0.62 | 0.12 | 0.25 | 0.250 | 0.75 | 1.56 | 3.97 | 4.25 |
| 1-1/2"    | 3/4-16  | –          | 0.50 | –    | 0.81 | 0.25 | 0.25 | 0.375 | 1.00 | 2.00 | 4.31 | 4.69 |

**B**  
 Round Body Cylinders  
 Actuator Products  
 SR/SM/SRD/SRDM  
 Series  
 SRX  
 Series  
 P1L  
 Series  
 P1A  
 Series  
 P  
 Series

**Mounting Style BRN**

Rear block mount, single acting, spring return



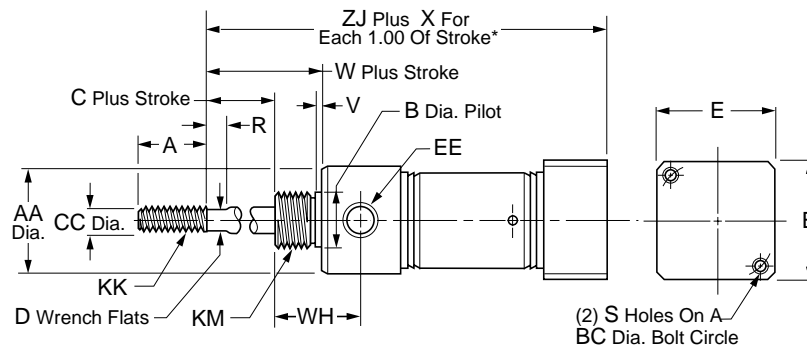
| Bore size | SR | SRM | Std. stroke (in) | Max. stroke (in) | SS rod std | A    | AA   | B     | C    | CC    | D    |
|-----------|----|-----|------------------|------------------|------------|------|------|-------|------|-------|------|
| 7/16"     | •  |     | 1/2, 1, 2, 3, 4  | 6                | ✓          | 0.50 | 0.5  | 0.374 | –    | 0.188 | –    |
| 3/4"      | •  | •   | 1, 2, 3, 4       | 6                | ✓          | 0.75 | 0.81 | 0.499 | 0.25 | 0.250 | 0.22 |
| 1-1/16"   | •  | •   | 1, 2, 3, 4       | 6                | ✓          | 0.75 | 1.12 | 0.624 | 0.38 | 0.312 | 0.25 |
| 1-1/2"    | •  | •   | 1, 2, 3, 4       | 6                | ✓          | 1.25 | 1.56 | 0.749 | 0.25 | 0.437 | 0.38 |

| Bore size | E    | EE       | KK          | KM     | SW   | V    | W    | X    | ZJ   |      |
|-----------|------|----------|-------------|--------|------|------|------|------|------|------|
|           |      |          |             |        |      |      |      |      | SR   | SRM  |
| 7/16"     | 0.75 | #10-32   | #10-32 UNF  | 3/8-24 | 0.38 | 0.05 | 0.31 | 0.94 | 1.62 | –    |
| 3/4"      | 1.00 | 1/8 NPTF | 1/4-28 UNF  | 1/2-20 | 0.44 | 0.09 | 0.62 | 1.69 | 2.31 | 2.56 |
| 1-1/16"   | 1.25 | 1/8 NPTF | 5/16-24 UNF | 5/8-18 | 0.44 | 0.09 | 0.88 | 1.81 | 2.81 | 3.06 |
| 1-1/2"    | 1.75 | 1/4 NPTF | 7/16-20 UNF | 3/4-16 | 0.62 | 0.09 | 0.88 | 2.00 | 3.06 | 3.31 |

\* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

**Mounting Style BRR**

Rear block mount, single acting, spring extend



| Bore size | SR | SRM | Std. stroke (in) | Max. stroke (in) | SS rod std | A    | AA   | B     | BC   | C    | CC    | D    |
|-----------|----|-----|------------------|------------------|------------|------|------|-------|------|------|-------|------|
| 3/4"      | •  | •   | 1, 2, 3, 4       | 6                | ✓          | 0.75 | 0.86 | 0.624 | 1.00 | 0.25 | 0.250 | 0.22 |
| 1-1/16"   | •  | •   | 1, 2, 3, 4       | 6                | ✓          | 0.75 | 1.12 | 0.624 | 1.25 | 0.38 | 0.312 | 0.25 |
| 1-1/2"    | •  | •   | 1, 2, 3, 4       | 6                | ✓          | 1.25 | 1.56 | 0.749 | 1.75 | 0.25 | 0.437 | 0.38 |

| Bore size | E    | EE       | KK          | KM     | R    | S          | V    | W    | WH   | X    | ZJ   |      |
|-----------|------|----------|-------------|--------|------|------------|------|------|------|------|------|------|
|           |      |          |             |        |      |            |      |      |      |      | SR   | SRM  |
| 3/4"      | 1.00 | 1/8 NPTF | 1/4-28 UNF  | 5/8-18 | 0.25 | #10-32 UNF | 0.09 | 0.75 | 0.97 | 2.69 | 3.22 | 3.47 |
| 1-1/16"   | 1.25 | 1/8 NPTF | 5/16-24 UNF | 5/8-18 | 0.25 | #10-32 UNF | 0.09 | 0.88 | 1.06 | 2.81 | 3.53 | 3.78 |
| 1-1/2"    | 1.75 | 1/4 NPTF | 7/16-20 UNF | 3/4-16 | 0.25 | 1/4-20 UNC | 0.09 | 0.88 | 1.25 | 3.00 | 3.88 | 4.13 |

\* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

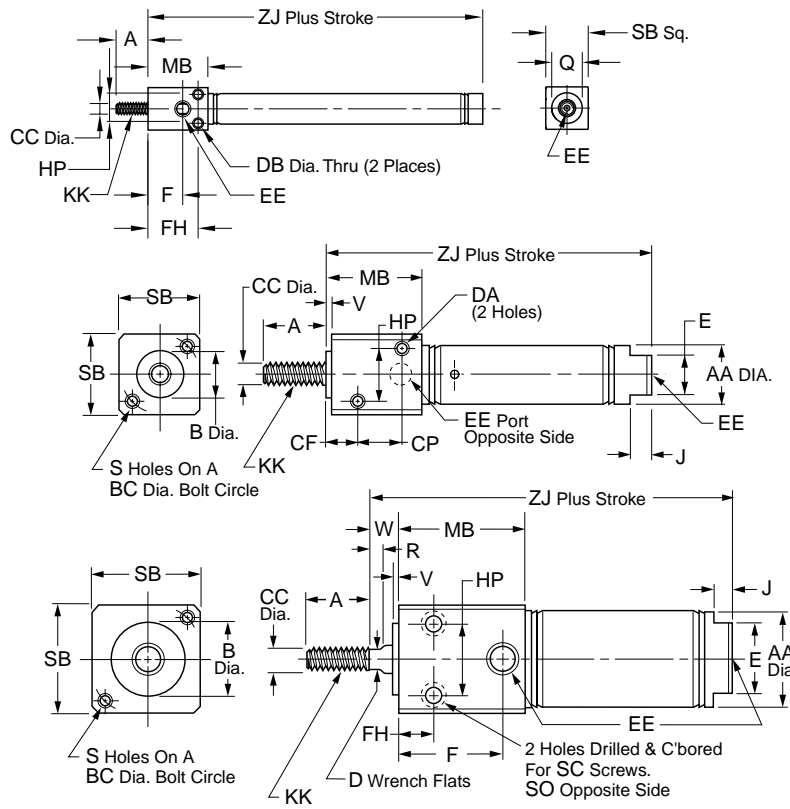
**B**  
 Round Body Cylinders  
 Actuator Products  
**SR/SM/SRD/SRD/SDM**  
 Series  
 SRX  
 Series  
 P1L  
 Series  
 P1A  
 Series  
 P  
 Series





**Mounting Style BFD**

Front block mount, double acting



| Bore sizes |
|------------|
| 5/16"      |

| Bore sizes |
|------------|
| 7/16"      |

| Bore sizes |
|------------|
| 3/4"       |
| 1-1/16"    |
| 1-1/2"     |

| Bore size | SR | SRM | Std. stroke (in)              | Max. stroke (in) | SS rod std | A    | AA   | B     | BC   | CC    |
|-----------|----|-----|-------------------------------|------------------|------------|------|------|-------|------|-------|
| 5/16"     | •  |     | 1/2, 1, 1-1/2, 2, 2-1/2, 3, 4 | 4                | ✓          | 0.38 | -    | -     | -    | 0.125 |
| 7/16"     | •  |     | 1/2, 1, 1-1/2, 2, 3, 4        | 12               | ✓          | 0.50 | 0.50 | 0.437 | 0.75 | 0.188 |
| 3/4"      | •  | •   | 1/2, 1, 2, 3, 4, 5, 6         | 12               | ✓          | 0.75 | 0.81 | 0.624 | 1.00 | 0.250 |
| 1-1/16"   | •  | •   | 1, 2, 3, 4, 5, 6              | 12               | ✓          | 0.75 | 1.12 | 0.750 | 1.25 | 0.312 |
| 1-1/2"    | •  | •   | 1, 2, 3, 4, 5, 6              | 12               | ✓          | 1.25 | 1.56 | 1.00  | 1.75 | 0.437 |

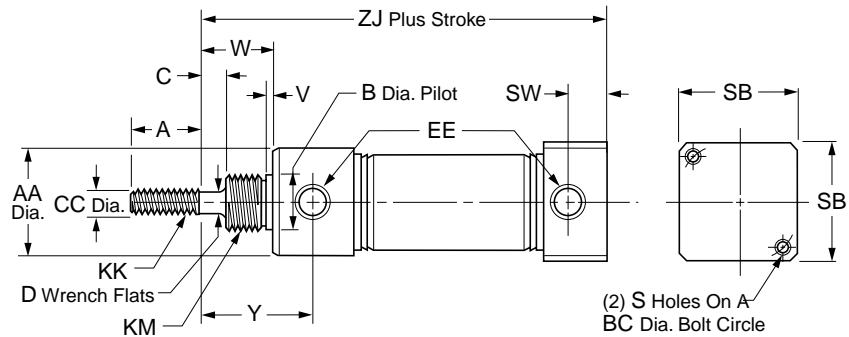
| Bore size | CF   | CP   | D    | DA    | DB   | E    | EE       | F    | FH   | HP   | J    |
|-----------|------|------|------|-------|------|------|----------|------|------|------|------|
| 5/16"     | -    | -    | -    | -     | 0.11 | -    | #10-32   | 0.41 | 0.59 | 0.34 | -    |
| 7/16"     | 0.31 | 0.44 | -    | #8-32 | -    | 0.38 | #10-32   | -    | 0.31 | 0.44 | 0.19 |
| 3/4"      | -    | -    | 0.22 | -     | -    | 0.62 | 1/8 NPTF | 0.88 | 0.38 | 0.62 | 0.19 |
| 1-1/16"   | -    | -    | 0.25 | -     | -    | 0.88 | 1/8 NPTF | 1.16 | 0.62 | 0.81 | 0.19 |
| 1-1/2"    | -    | -    | 0.38 | -     | -    | 0.88 | 1/4 NPTF | 1.53 | 0.88 | 1.12 | 0.25 |

| Bore size | ZJ          |      |      |      |            |         |        |             |       |      |      |      |
|-----------|-------------|------|------|------|------------|---------|--------|-------------|-------|------|------|------|
|           | KK          | MB   | Q    | R    | S          | SB      | SC     | SO          | V     | W    | SR   | SRM  |
| 5/16"     | #5-40 UNC   | 0.71 | 0.36 | -    | -          | 0.50 SQ | -      | -           | -     | -    | 1.72 | -    |
| 7/16"     | #10-32 UNF  | 0.88 | -    | -    | #8-32 UNC  | 0.75    | -      | -           | 0.062 | -    | 2.12 | -    |
| 3/4"      | 1/4-28 UNF  | 1.12 | -    | -    | #10-32 UNF | 1.00    | #10-32 | 1/4-20 UNC  | 0.093 | 0.34 | 3.22 | 3.22 |
| 1-1/16"   | 5/16-24 UNF | 1.41 | -    | 0.25 | #10-32 UNF | 1.25    | #10-32 | 1/4-20 UNC  | 0.093 | 0.47 | 3.75 | 3.91 |
| 1-1/2"    | 7/16-20 UNF | 1.88 | -    | -    | 1/4-20 UNC | 1.75    | 1/4-20 | 5/16-18 UNC | 0.125 | 0.38 | 4.19 | 4.44 |



**Mounting Style BRD**

Rear block mount, double acting



**B**  
 Round Body Cylinders  
 Actuator Products  
 SR/SM/SRD/SRDM  
 Series  
 SRX  
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 P1L  
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 Series  
 P  
 Series

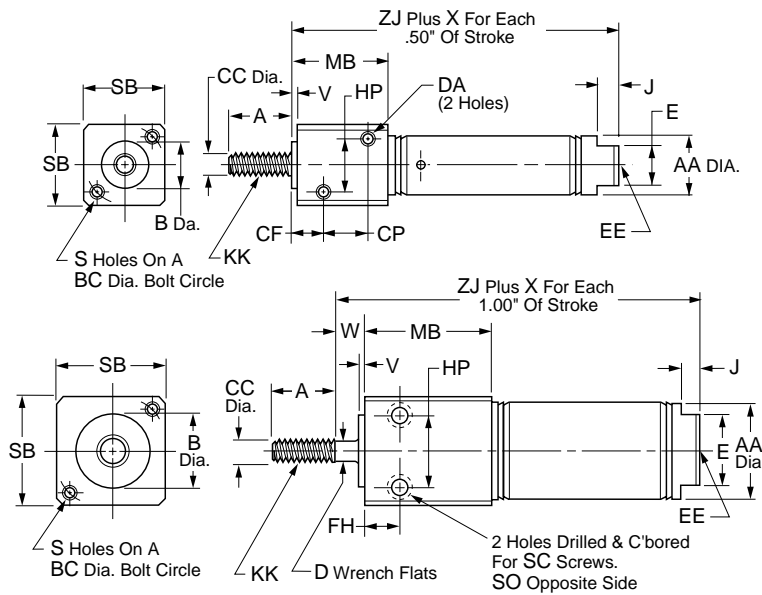
| Bore size | SR | SRM | Std. stroke (in) | Max. stroke (in) | SS rod std |
|-----------|----|-----|------------------|------------------|------------|
| 7/16"     | •  |     | 1/2, 1, 2, 3, 4  | 12               | ✓          |
| 3/4"      | •  | •   | 1, 2, 3, 4, 5, 6 | 12               | ✓          |
| 1-1/16"   | •  | •   | 1, 2, 3, 4       | 12               | ✓          |
| 1-1/2"    | •  | •   | 1, 2, 3, 4, 5, 6 | 12               | ✓          |

| Bore size | A    | AA   | B     | BC   | C    | CC    | D    | EE       | KK          |
|-----------|------|------|-------|------|------|-------|------|----------|-------------|
| 7/16"     | 0.50 | 0.74 | 0.437 | 0.75 | –    | 0.188 | –    | #10-32   | #10-32 UNF  |
| 3/4"      | 0.75 | 0.86 | 0.624 | 1.00 | 0.25 | 0.250 | 0.22 | 1/8 NPTF | 1/4-28 UNF  |
| 1-1/16"   | 0.75 | 1.12 | 0.624 | 1.25 | 0.38 | 0.312 | 0.25 | 1/8 NPTF | 5/16-24 UNF |
| 1-1/2"    | 1.25 | 1.56 | 0.749 | 1.75 | 0.25 | 0.437 | 0.38 | 1/4 NPTF | 7/16-20 UNF |

| Bore size | KM          | S          | SB   | SW   | V    | W    | Y    | ZJ   |      |
|-----------|-------------|------------|------|------|------|------|------|------|------|
|           |             |            |      |      |      |      |      | SR   | SRM  |
| 7/16"     | 7/16-20 UNF | #8-32 UNC  | 0.75 | 0.38 | 0.05 | 0.43 | 0.72 | 2.44 | –    |
| 3/4"      | 5/8-18 UNF  | #10-32 UNF | 1.00 | 0.44 | 0.09 | 0.75 | 1.22 | 3.78 | 3.78 |
| 1-1/16"   | 5/8-18 UNF  | #10-32 UNF | 1.25 | 0.44 | 0.09 | 0.88 | 1.44 | 4.00 | 4.16 |
| 1-1/2"    | 3/4-16 UNF  | 1/4-20 UNC | 1.75 | 0.62 | 0.09 | 0.88 | 1.47 | 4.38 | 4.63 |

**Mounting Style BFN**

Front block mount, single acting, spring return



| Bore sizes |
|------------|
| 7/16"      |

| Bore sizes |
|------------|
| 3/4"       |
| 1-1/16"    |
| 1-1/2"     |

| Bore size | SR | SRM | Std. stroke (in)    | Max stroke (in) | SS rod std |
|-----------|----|-----|---------------------|-----------------|------------|
| 7/16"     | •  |     | 1/2, 1, 1-1/2, 2, 3 | 6               | ✓          |
| 3/4"      | •  | •   | 1/2, 1, 2, 3, 4     | 6               | ✓          |
| 1-1/16"   | •  | •   | 1, 2, 3, 4          | 6               | ✓          |
| 1-1/2"    | •  | •   | 1, 2, 3, 4          | 6               | ✓          |

| Bore size | A    | AA   | B     | BC   | CC    | CF   | CP   | D    | DA        | E    | EE       | FH   |
|-----------|------|------|-------|------|-------|------|------|------|-----------|------|----------|------|
| 7/16"     | 0.50 | 0.50 | 0.437 | 0.75 | 0.188 | 0.31 | 0.44 | -    | #8-32 UNC | 0.38 | #10-32   | 0.31 |
| 3/4"      | 0.75 | 0.81 | 0.624 | 1.00 | 0.250 | -    | -    | 0.22 | -         | 0.62 | 1/8 NPTF | 0.38 |
| 1-1/16"   | 0.75 | 1.12 | 0.750 | 1.25 | 0.312 | -    | -    | 0.25 | -         | 0.88 | 1/8 NPTF | 0.62 |
| 1-1/2"    | 1.25 | 1.56 | 1.00  | 1.75 | 0.437 | -    | -    | 0.38 | -         | 0.88 | 1/4 NPTF | 0.88 |

| Bore size | HP   | J    | KK          | MB   | S          | SB   | SC     | SO          | V     | W    | X    | ZJ   |      |
|-----------|------|------|-------------|------|------------|------|--------|-------------|-------|------|------|------|------|
|           |      |      |             |      |            |      |        |             |       |      |      | SR   | SRM  |
| 7/16"     | 0.44 | 0.19 | #10-32 UNF  | 0.88 | #8-32 UNC  | 0.75 | -      | -           | 0.062 | -    | 0.94 | 1.94 | -    |
| 3/4"      | 0.62 | 0.19 | 1/4-28 UNF  | 1.12 | #10-32 UNF | 1.00 | #10-32 | 1/4-20 UNC  | 0.093 | 0.34 | 1.69 | 2.66 | 2.91 |
| 1-1/16"   | 0.81 | 0.19 | 5/16-24 UNF | 1.41 | #10-32 UNF | 1.25 | #10-32 | 1/4-20 UNC  | 0.093 | 0.47 | 1.81 | 3.38 | 3.63 |
| 1-1/2"    | 1.12 | 0.25 | 7/16-20 UNF | 1.88 | 1/4 UNC    | 1.75 | 1/4-20 | 5/16-18 UNC | 0.125 | 0.38 | 2.00 | 3.69 | 3.94 |

\* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

**B**  
 Round Body Cylinders  
 Actuator Products

SR/SM/SRD/SRDM  
 Series

SRX  
 Series

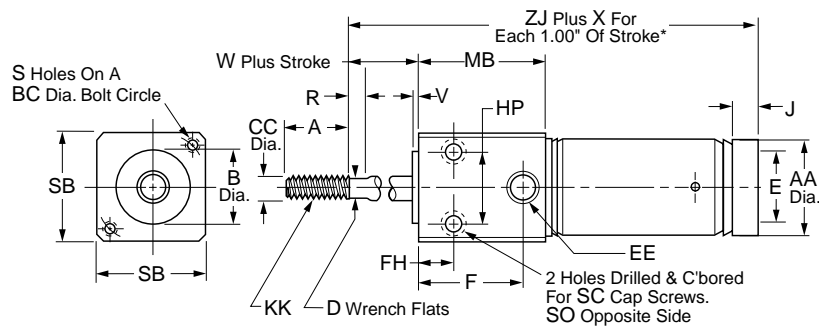
P1L  
 Series

P1A  
 Series

P  
 Series

**Mounting Style BFR**

Front block mount, single acting, spring extend



| Bore size | SR | SRM | Std. stroke (in) | Max stroke (in) | SS rod std |
|-----------|----|-----|------------------|-----------------|------------|
| 3/4"      | •  | •   | 1, 2, 3, 4       | 6               | ✓          |
| 1-1/16"   | •  | •   | 1, 2, 3, 4       | 6               | ✓          |
| 1-1/2"    | •  | •   | 1, 2, 3, 4       | 6               | ✓          |

| Bore size | A    | AA   | B     | BC   | CC    | D    | E    | EE       | F    | FH   | HP   | J    |
|-----------|------|------|-------|------|-------|------|------|----------|------|------|------|------|
| 3/4"      | 0.75 | 0.81 | 0.624 | 1.00 | 0.250 | 0.22 | -    | 1/8 NPTF | 0.88 | 0.38 | 0.62 | 0.19 |
| 1-1/16"   | 0.75 | 1.12 | 0.750 | 1.25 | 0.312 | 0.25 | -    | 1/8 NPTF | 1.16 | 0.62 | 0.81 | -    |
| 1-1/2"    | 1.25 | 1.56 | 1.00  | 1.75 | 0.437 | 0.38 | 0.88 | 1/4 NPTF | 1.53 | 0.88 | 1.12 | 0.25 |

| Bore size | KK          | MB   | R    | S          | SB   | SC     | SO          | V     | W    | X    | ZJ   |      |
|-----------|-------------|------|------|------------|------|--------|-------------|-------|------|------|------|------|
|           |             |      |      |            |      |        |             |       |      |      | SR   | SRM  |
| 3/4"      | 1/4-28 UNF  | 1.12 | 0.25 | #10-32 UNF | 1.00 | #10-32 | 1/4-20 UNC  | 0.093 | 0.34 | 2.69 | 2.56 | 2.81 |
| 1-1/16"   | 5/16-24 UNF | 1.41 | 0.25 | #10-32 UNF | 1.25 | #10-32 | 1/4-20 UNC  | 0.093 | 0.47 | 2.81 | 3.12 | 3.37 |
| 1-1/2"    | 7/16-20 UNF | 1.88 | 0.25 | 1/4-20 UNC | 1.75 | 1/4-20 | 5/16-18 UNC | 0.125 | 0.38 | 3.00 | 3.69 | 3.94 |

\* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

**B**  
 Round Body Cylinders  
 Actuator Products

**SR/SW/SRD/SRDM**  
 Series

**SRX**  
 Series

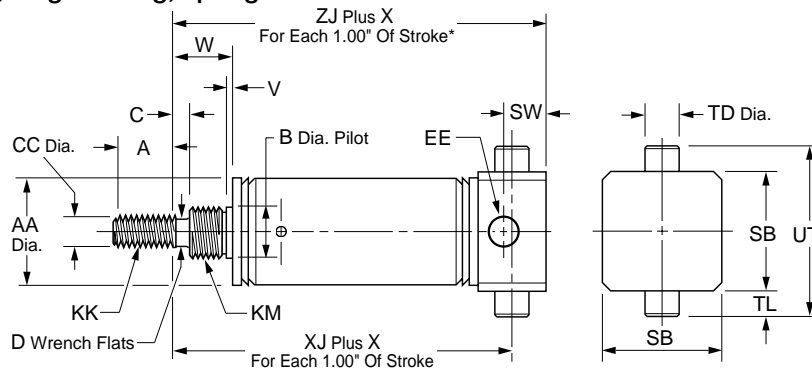
**P1L**  
 Series

**P1A**  
 Series

**P**  
 Series

**Mounting Style TRN**

Rear trunnion mount, single acting, spring return



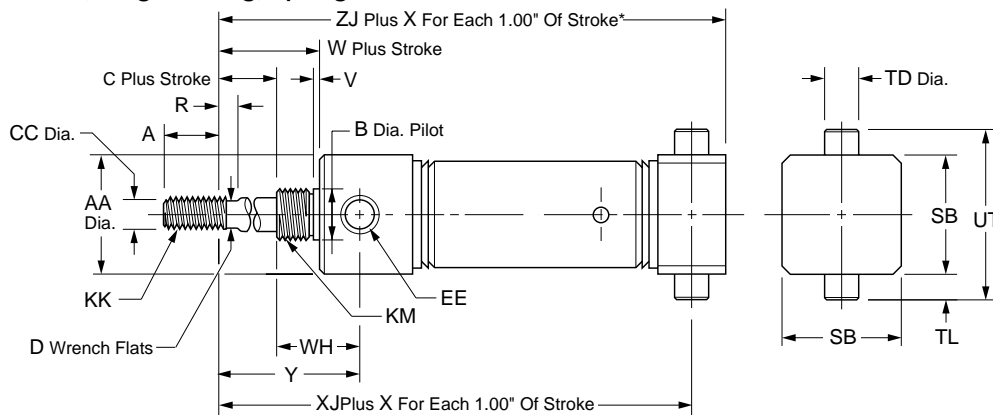
| Bore size | SR | SRM | Std. stroke (in) | Max. stroke (in) | SS rod std | A     | AA   | B     | C               | CC    | D    | EE       |
|-----------|----|-----|------------------|------------------|------------|-------|------|-------|-----------------|-------|------|----------|
|           |    |     |                  |                  |            | 7/16" | •    |       | 1/2, 1, 2, 3, 4 | 6     | ✓    | 0.50     |
| 3/4"      | •  | •   | 1, 2, 3, 4       | 6                | ✓          | 0.75  | 0.81 | 0.499 | 0.25            | 0.250 | 0.22 | 1/8 NPTF |
| 1-1/16"   | •  | •   | 1, 2, 3, 4       | 6                | ✓          | 0.75  | 1.12 | 0.624 | 0.38            | 0.312 | 0.25 | 1/8 NPTF |
| 1-1/2"    | •  | •   | 1, 2, 3, 4       | 6                | ✓          | 1.25  | 1.56 | 0.749 | 0.25            | 0.437 | 0.38 | 1/4 NPTF |

| Bore size | KK          | KM         | SB   | SW   | TD    | TL   | UT   | V    | W    | X      | XJ   |      | ZJ   |      |
|-----------|-------------|------------|------|------|-------|------|------|------|------|--------|------|------|------|------|
|           |             |            |      |      |       |      |      |      |      |        | SR   | SRM  | SR   | SRM  |
| 7/16"     | #10-32 UNF  | 3/8-24 UNF | 0.75 | 0.38 | 0.374 | 0.50 | 1.25 | 0.05 | 0.32 | 0.94** | 1.38 | –    | 1.62 | –    |
| 3/4"      | 1/4-28 UNF  | 1/2-20 UNF | 1.00 | 0.44 | 0.500 | 0.38 | 1.75 | 0.09 | 0.62 | 1.69   | 1.94 | 2.19 | 2.31 | 2.56 |
| 1-1/16"   | 5/16-24 UNF | 5/8-18 UNF | 1.25 | 0.44 | 0.500 | 0.38 | 2.00 | 0.09 | 0.88 | 1.81   | 2.44 | 2.69 | 2.81 | 3.06 |
| 1-1/2"    | 7/16-20 UNF | 3/4-16 UNF | 1.75 | 0.62 | 0.500 | 0.38 | 2.50 | 0.09 | 0.88 | 2.00   | 2.56 | 2.81 | 3.06 | 3.31 |

\* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.  
 \*\* For each 0.50" of stroke.

**Mounting Style TRR**

Rear trunnion mount, single acting, spring extend



| Bore size | SR | SRM | Std. stroke (in) | Max. stroke (in) | SS rod std | A    | AA   | B     | C          | CC    | D    | EE       |
|-----------|----|-----|------------------|------------------|------------|------|------|-------|------------|-------|------|----------|
|           |    |     |                  |                  |            | 3/4" |      |       | 1, 2, 3, 4 | 6     | 3    | 0.75     |
| 1-1/16"   |    |     | 1, 2, 3, 4       | 6                | 3          | 0.75 | 1.12 | 0.624 | 0.38       | 0.312 | 0.25 | 1/8 NPTF |
| 1-1/2"    |    |     | 1, 2, 3, 4       | 6                | 3          | 1.25 | 1.56 | 0.749 | 0.25       | 0.437 | 0.38 | 1/4 NPTF |

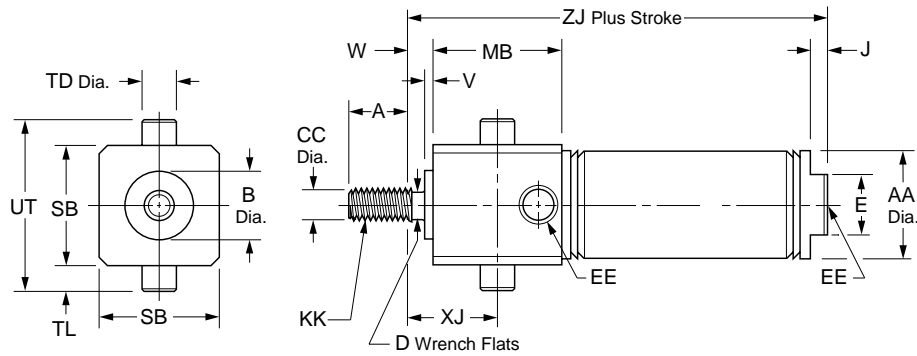
| Bore size | KK          | KM         | R    | SB   | TD    | TL   | UT   | V    | W    | WH   | X    | XJ   |      | ZJ   |      |
|-----------|-------------|------------|------|------|-------|------|------|------|------|------|------|------|------|------|------|
|           |             |            |      |      |       |      |      |      |      |      |      | SR   | SRM  | SR   | SRM  |
| 3/4"      | 1/4-28 UNF  | 1/2-20 UNF | 0.25 | 1.00 | 0.500 | 0.38 | 1.75 | 0.09 | 0.75 | 0.72 | 2.69 | 2.85 | 3.10 | 3.22 | 3.47 |
| 1-1/16"   | 5/16-24 UNF | 5/8-18 UNF | 0.25 | 1.25 | 0.500 | 0.38 | 2.00 | 0.09 | 0.88 | 0.68 | 2.81 | 3.15 | 3.40 | 3.53 | 3.78 |
| 1-1/2"    | 7/16-20 UNF | 3/4-16 UNF | 0.25 | 1.75 | 0.500 | 0.38 | 2.50 | 0.09 | 0.88 | 1.25 | 3.00 | 3.38 | 3.63 | 3.88 | 4.13 |

\* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.



**Mounting Style TFD**

Front trunnion mount, double acting

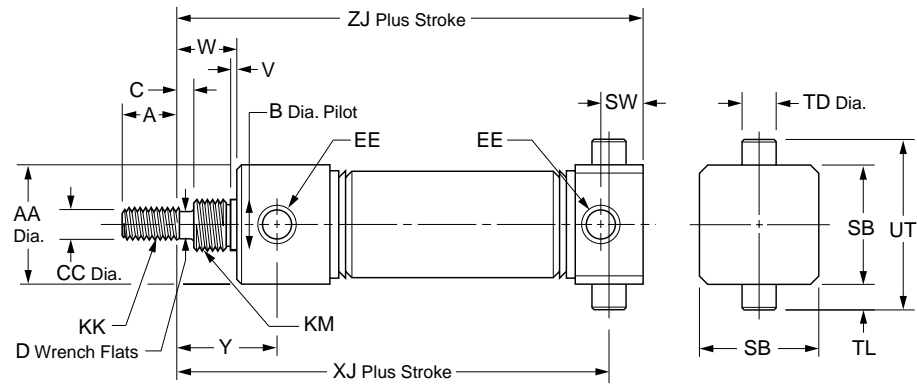


| Bore size | SR | SRM | Std. stroke (in)       | Max. stroke (in) | SS rod std | A    | AA   | B     | CC    | D    | E    | EE       |
|-----------|----|-----|------------------------|------------------|------------|------|------|-------|-------|------|------|----------|
| 7/16"     | •  |     | 1/2, 1, 1-1/2, 2, 3, 4 | 12               | ✓          | 0.50 | 0.50 | 0.437 | 0.188 | –    | 0.38 | #10-32   |
| 3/4"      | •  | •   | 1, 2, 3, 4, 5, 6       | 12               | ✓          | 0.75 | 0.81 | 0.624 | 0.250 | 0.22 | 0.62 | 1/8 NPTF |
| 1-1/16"   | •  | •   | 1, 2, 3, 4, 5, 6       | 12               | ✓          | 0.75 | 1.12 | 0.750 | 0.312 | 0.25 | 0.88 | 1/8 NPTF |
| 1-1/2"    | •  | •   | 1, 2, 3, 4, 5, 6       | 12               | ✓          | 1.25 | 1.56 | 1.000 | 0.437 | 0.38 | 0.88 | 1/4 NPTF |

| Bore size | J    | KK          |      | MB   | SB    | TD    | TL   | UT    | V    | W    | XJ   | ZJ   |  |
|-----------|------|-------------|------|------|-------|-------|------|-------|------|------|------|------|--|
|           | 0.19 | #10-32 UNF  | SR   |      |       |       |      |       |      |      |      | SRM  |  |
| 7/16"     | 0.19 | 1/4-28 UNF  | 0.88 | 0.75 | 0.374 | 0.250 | 1.25 | 0.062 | –    | 0.31 | 2.12 | –    |  |
| 3/4"      | 0.19 | 5/16-24 UNF | 1.12 | 1.00 | 0.500 | 0.38  | 1.75 | 0.093 | 0.34 | 0.69 | 3.22 | 3.22 |  |
| 1-1/16"   | 0.25 | 7/16-20 UNF | 1.41 | 1.25 | 0.500 | 0.38  | 2.00 | 0.093 | 0.47 | 1.09 | 3.75 | 3.91 |  |
| 1-1/2"    |      |             | 1.88 | 1.75 | 0.500 | 0.38  | 2.50 | 0.125 | 0.38 | 1.31 | 4.19 | 4.44 |  |

**Mounting Style TRD**

Rear trunnion mount, double acting



| Bore size | SR | SRM | Std. stroke (in)       | Max. stroke (in) | SS rod std | A    | AA   | B     | C    | CC    | D    | EE       |
|-----------|----|-----|------------------------|------------------|------------|------|------|-------|------|-------|------|----------|
| 7/16"     | •  |     | 1/2, 1, 1-1/2, 2, 3, 4 | 12               | ✓          | 0.50 | 0.74 | 0.437 | –    | 0.188 | –    | #10-32   |
| 3/4"      | •  | •   | 1, 2, 3, 4, 5, 6       | 12               | ✓          | 0.75 | 0.86 | 0.624 | 0.25 | 0.250 | 0.22 | 1/8 NPTF |
| 1-1/16"   | •  | •   | 1, 2, 3, 4             | 12               | ✓          | 0.75 | 1.12 | 0.624 | 0.38 | 0.312 | 0.25 | 1/8 NPTF |
| 1-1/2"    | •  | •   | 1, 2, 3, 4, 5, 6       | 12               | ✓          | 1.25 | 1.56 | 0.749 | 0.25 | 0.437 | 0.38 | 1/4 NPTF |

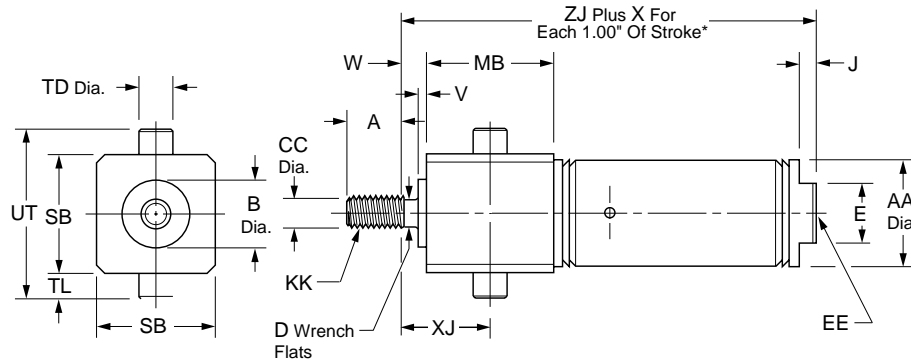
| Bore size | KK          |             | KM   |      | SB    | SW   | TD   | TL   | UT   | V    | W    | XJ   |      | ZJ   |  |
|-----------|-------------|-------------|------|------|-------|------|------|------|------|------|------|------|------|------|--|
|           | #10-32 UNF  | 7/16-20 UNF | SR   | SRM  |       |      |      |      |      |      |      | Y    | SR   | SRM  |  |
| 7/16"     | 1/4-28 UNF  | 5/8-18 UNF  | 0.75 | 0.38 | 0.374 | 0.25 | 1.25 | 0.05 | 0.38 | 2.19 | –    | 0.72 | 2.44 | –    |  |
| 3/4"      | 5/16-24 UNF | 5/8-18 UNF  | 1.00 | 0.44 | 0.500 | 0.38 | 1.75 | 0.09 | 0.75 | 3.41 | 3.41 | 1.22 | 3.78 | 3.78 |  |
| 1-1/16"   | 7/16-20 UNF | 3/4-16 UNF  | 1.25 | 0.44 | 0.500 | 0.38 | 2.00 | 0.09 | 0.88 | 3.62 | 3.62 | 1.44 | 4.00 | 4.16 |  |
| 1-1/2"    |             |             | 1.75 | 0.62 | 0.500 | 0.38 | 2.50 | 0.09 | 0.88 | 3.88 | 4.13 | 1.47 | 4.38 | 4.63 |  |

**B**  
 Round Body Cylinders  
 Actuator Products  
 SR/SW/SRD/SRDM  
 Series  
 SRX  
 Series  
 P1L  
 Series  
 P1A  
 Series  
 P  
 Series



**Mounting Style TFN**

Front trunnion mount, single acting, spring return



| Bore size | SR | SRM | Std. stroke (in)    | Max. stroke (in) | SS rod std | A    | AA   | B     | CC    | D    | E    | EE       |
|-----------|----|-----|---------------------|------------------|------------|------|------|-------|-------|------|------|----------|
| 7/16"     | •  |     | 1/2, 1, 1-1/2, 2, 3 | 6                | ✓          | 0.50 | 0.50 | 0.437 | 0.188 | –    | 0.38 | #10-32   |
| 3/4"      | •  | •   | 1/2, 1, 2, 3, 4     | 6                | ✓          | 0.75 | 0.81 | 0.624 | 0.250 | 0.22 | 0.62 | 1/8 NPTF |
| 1-1/16"   | •  | •   | 1, 2, 3, 4          | 6                | ✓          | 0.75 | 1.12 | 0.750 | 0.312 | 0.25 | 0.88 | 1/8 NPTF |
| 1-1/2"    | •  | •   | 1, 2, 3, 4          | 6                | ✓          | 1.25 | 1.56 | 1.000 | 0.437 | 0.38 | 0.88 | 1/4 NPTF |

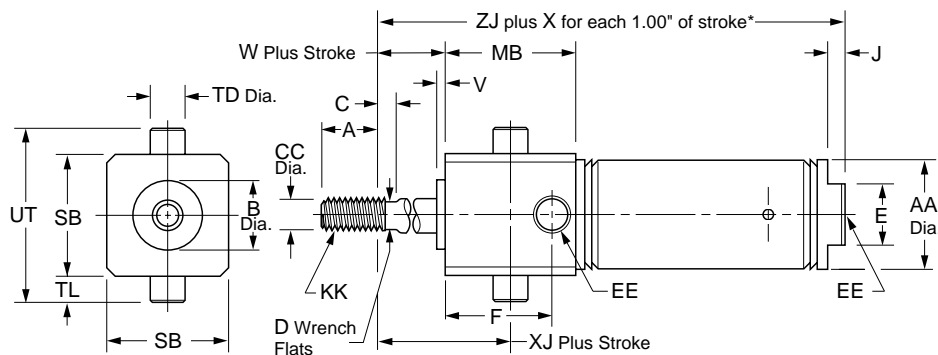
| Bore size | J    | KK          | MB   | SB   | TD    | TL   | UT   | V     | W    | X      | XJ   | ZJ SR | ZJ SRM |
|-----------|------|-------------|------|------|-------|------|------|-------|------|--------|------|-------|--------|
| 7/16"     | 0.19 | #10-32 UNF  | 0.88 | 0.75 | 0.374 | 0.25 | 1.25 | 0.062 | 0    | 0.94** | 0.31 | 1.94  | –      |
| 3/4"      | 0.19 | 5/16-24 UNF | 1.12 | 1.00 | 0.500 | 0.38 | 1.75 | 0.093 | 0.34 | 1.69   | 0.69 | 2.66  | 2.91   |
| 1-1/16"   | 0.25 | 7/16-20 UNF | 1.41 | 1.25 | 0.500 | 0.38 | 2.00 | 0.093 | 0.47 | 1.81   | 1.09 | 3.38  | 3.63   |
| 1-1/2"    |      |             | 1.88 | 1.75 | 0.500 | 0.38 | 2.50 | 0.125 | 0.38 | 2.00   | 1.31 | 3.69  | 3.94   |

\* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.

\*\* For each 0.50" of stroke

**Mounting Style TFR**

Front trunnion mount, single acting, spring extend



| Bore size | SR | SRM | Std. stroke (in) | Max. stroke (in) | SS rod std | A    | AA   | B     | C    | CC    | D    | E    |
|-----------|----|-----|------------------|------------------|------------|------|------|-------|------|-------|------|------|
| 3/4"      | •  | •   | 1, 2, 3, 4       | 6                | ✓          | 0.75 | 0.81 | 0.624 | 0.25 | 0.250 | 0.22 | 0    |
| 1-1/16"   | •  | •   | 1, 2, 3, 4       | 6                | ✓          | 0.75 | 1.12 | 0.750 | 0.25 | 0.312 | 0.25 | 0    |
| 1-1/2"    | •  | •   | 1, 2, 3, 4       | 6                | ✓          | 1.25 | 1.56 | 1.000 | 0.25 | 0.437 | 0.38 | 0.88 |

| Bore size | F    | EE       | J    | KK          | MB   | SB   | TD    | TL   | UT   | V     | W    | X    | XJ   | ZJ SR | ZJ SRM |
|-----------|------|----------|------|-------------|------|------|-------|------|------|-------|------|------|------|-------|--------|
| 3/4"      | 0.88 | 1/8 NPTF | –    | 1/4-28 UNF  | 1.12 | 1.00 | 0.500 | 0.38 | 1.75 | 0.093 | 0.34 | 2.69 | 0.69 | 2.56  | 2.81   |
| 1-1/16"   | 1.16 | 1/8 NPTF | –    | 5/16-24 UNF | 1.41 | 1.25 | 0.500 | 0.38 | 2.00 | 0.093 | 0.47 | 2.81 | 1.09 | 3.12  | 3.37   |
| 1-1/2"    | –    | 1/4 NPTF | 0.25 | 7/16-20 UNF | 1.88 | 1.75 | 0.500 | 0.38 | 2.50 | 0.125 | 0.38 | 3.00 | 1.31 | 3.69  | 3.94   |

\* To determine lengths for half inch stroke increments, determine length for next highest whole number stroke and subtract one half inch.



**Air Reservoirs**

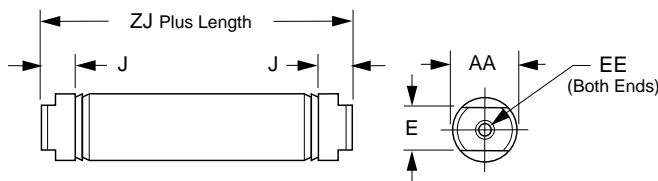
Air Reservoirs installed can significantly reduce the pulsation of a system. In addition air reservoirs can be used as a means to store energy. Caution should always be used when storing energy. Air reservoirs if installed in the correct location and sized correctly can temporarily increase the flow of an actuator or cylinder.

As always never exceed the rated pressure of the cylinder.

**Ordering information**

| <b>.75</b>   | <b>AR</b>     | <b>SR</b> | <b>2.00</b> |      |      |         |      |        |      |    |      |        |      |    |   |          |  |    |               |  |  |        |                                     |
|--|---------------|-----------|-------------|------|------|---------|------|--------|------|----|------|--------|------|----|---|----------|--|----|---------------|--|--|--------|-------------------------------------|
| <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Bore Size*</th></tr> <tr><td>.75</td><td>3/4"</td></tr> <tr><td>1.06</td><td>1-1/16"</td></tr> <tr><td>1.50</td><td>1-1/2"</td></tr> <tr><td>2.00</td><td>2"</td></tr> <tr><td>2.50</td><td>2-1/2"</td></tr> <tr><td>3.00</td><td>3"</td></tr> </table> | Bore Size*    |           | .75         | 3/4" | 1.06 | 1-1/16" | 1.50 | 1-1/2" | 2.00 | 2" | 2.50 | 2-1/2" | 3.00 | 3" | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Mounting</th></tr> <tr><td>AR</td><td>Air Reservoir</td></tr> </table> | Mounting |  | AR | Air Reservoir |  | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th>Length</th></tr> <tr><td>Specify in inches. See table below.</td></tr> </table> | Length | Specify in inches. See table below. |
| Bore Size*   |               |           |             |      |      |         |      |        |      |    |      |        |      |    |   |          |  |    |               |  |  |        |                                     |
| .75  | 3/4"          |           |             |      |      |         |      |        |      |    |      |        |      |    |   |          |  |    |               |  |  |        |                                     |
| 1.06   | 1-1/16"       |           |             |      |      |         |      |        |      |    |      |        |      |    |   |          |  |    |               |  |  |        |                                     |
| 1.50   | 1-1/2"        |           |             |      |      |         |      |        |      |    |      |        |      |    |   |          |  |    |               |  |  |        |                                     |
| 2.00   | 2"            |           |             |      |      |         |      |        |      |    |      |        |      |    |   |          |  |    |               |  |  |        |                                     |
| 2.50   | 2-1/2"        |           |             |      |      |         |      |        |      |    |      |        |      |    |   |          |  |    |               |  |  |        |                                     |
| 3.00   | 3"            |           |             |      |      |         |      |        |      |    |      |        |      |    |   |          |  |    |               |  |  |        |                                     |
| Mounting   |               |           |             |      |      |         |      |        |      |    |      |        |      |    |   |          |  |    |               |  |  |        |                                     |
| AR   | Air Reservoir |           |             |      |      |         |      |        |      |    |      |        |      |    |   |          |  |    |               |  |  |        |                                     |
| Length   |               |           |             |      |      |         |      |        |      |    |      |        |      |    |   |          |  |    |               |  |  |        |                                     |
| Specify in inches. See table below.  |               |           |             |      |      |         |      |        |      |    |      |        |      |    |   |          |  |    |               |  |  |        |                                     |

| Bore size | Standard lengths     | Max. length | Volume (in3)                   |
|-----------|----------------------|-------------|--------------------------------|
| 3/4"      | 1" increments to 4"  | 32"         | 0.39 plus 0.44 per inch length |
| 1-1/16"   | 1" increments to 8"  | 32"         | 0.99 plus 0.89 per inch length |
| 1-1/2"    | 1" increments to 16" | 32"         | 1.91 plus 1.77 per inch length |
| 2"        | 1" increments to 16" | 32"         | 4.22 plus 3.14 per inch length |
| 2-1/2"    | 1" increments to 16" | 32"         | 7.04 plus 4.91 per inch length |
| 3"        | 1" increments to 16" | 32"         | 9.90 plus 7.07 per inch length |

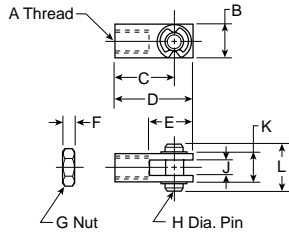


| Bore size | AA    | E     | EE        | J     | ZJ    |
|-----------|-------|-------|-----------|-------|-------|
| 3/4"      | 0.813 | 0.625 | 1/8" NPTF | 0.19  | 1.938 |
| 1-1/16"   | 1.125 | 0.88  | 1/8" NPTF | 0.19  | 2.375 |
| 1-1/2"    | 1.56  | 0.88  | 1/8" NPTF | 0.250 | 2.250 |
| 2"        | 2.08  | 1.25  | 1/4" NPTF | 0.312 | 2.875 |
| 2-1/2"    | 2.62  | 1.75  | 1/4" NPTF | 0.312 | 2.875 |
| 3"        | 3.16  | 2.00  | 3/8" NPTF | 0.312 | 3.190 |



**Piston Rod Clevis**

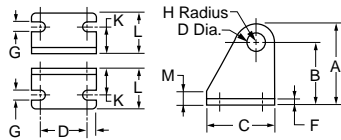
Assembly includes pin and (2) retainer rings and (1) jam nut.



| Bore size       | A       | B    | C    | D    | E    | F   | G       | H   | J   | K    | L    | Part number               |
|-----------------|---------|------|------|------|------|-----|---------|-----|-----|------|------|---------------------------|
| 5/16            | #5-40   | .31  | .44  | .56  | .38  | .11 | #5-40   | .12 | .13 | .31  | .50  | L071300025                |
| 7/16, 9/16      | #10-32  | .38  | .75  | .94  | .56  | .12 | #10-32  | .19 | .19 | .38  | .56  | L071300100<br>L077130100* |
| 3/4, 7/8        | 1/4-28  | .50  | .94  | 1.19 | .68  | .16 | 1/4-28  | .25 | .25 | .50  | .69  | L071300200<br>L077130200* |
| 1-1/16          | 5/16-24 | .50  | .94  | 1.19 | .68  | .19 | 5/16-24 | .25 | .25 | .50  | .69  | L071300300<br>L077130300* |
| 1-1/4, 1-1/2    | 7/16-20 | .75  | 1.31 | 1.69 | .94  | .25 | 7/16-20 | .38 | .38 | .75  | 1.03 | L071300400<br>L077130400* |
| 1-3/4, 2, 2-1/2 | 1/2-20  | .75  | 1.31 | 1.69 | .94  | .31 | 1/2-20  | .38 | .38 | .75  | 1.03 | L071300500<br>L077130500* |
| 3               | 5/8-18  | 1.00 | 2.25 | 2.75 | 1.50 | .38 | 5/8-18  | .50 | .50 | 1.00 | 1.38 | L071300600                |

\* Stainless Steel for use with SRD/SRDM cylinders.

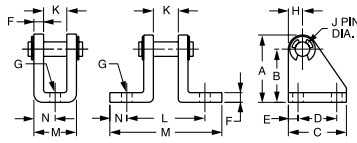
**Pivot Brackets**



| Bore size        | A    | B    | C    | D    | E   | F   | G   | H   | J    | K   | L    | M   | Part number |
|------------------|------|------|------|------|-----|-----|-----|-----|------|-----|------|-----|-------------|
| 7/16             | .76  | .56  | .75  | .50  | .12 | .06 | .19 | .20 | .160 | .28 | .50  | .12 | L071310100  |
| 3/4, 7/8, 1-1/16 | 1.19 | .88  | 1.12 | .75  | .19 | .12 | .27 | .31 | .255 | .44 | .81  | .25 | L071310200  |
| 1-1/2            | 1.75 | 1.38 | 1.50 | 1.00 | .25 | .12 | .27 | .38 | .380 | .62 | 1.00 | .25 | L071310300  |

**Pivot Bracket Assembly**

Assembly includes pin and (2) retainer rings.



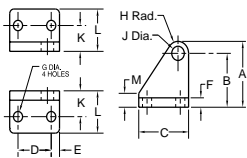
5/16" bore only

| Bore size        | A    | B    | C    | D    | E   | F   | G   | H   | J    | K   | L    | M    | N   | Part number               |
|------------------|------|------|------|------|-----|-----|-----|-----|------|-----|------|------|-----|---------------------------|
| 5/16             | .53  | .40  | .62  | .38  | .12 | .04 | .16 | .12 | .12  | .26 | -    | .36  | .18 | L071320025                |
| 7/16, 9/16       | .76  | .56  | .75  | .50  | .12 | .06 | .19 | .19 | .156 | .34 | .91  | 1.34 | .22 | L071320100<br>L077150100* |
| 3/4, 7/8, 1-1/16 | 1.18 | .88  | 1.12 | .75  | .19 | .12 | .27 | .30 | .250 | .38 | 1.25 | 2.00 | .38 | L071320200<br>L077150200* |
| 1-1/4            | 1.18 | .88  | 1.12 | .75  | .19 | .12 | .27 | .30 | .250 | .50 | 1.38 | 2.14 | .38 | L071320300                |
| 1-1/2, 1-3/4     | 1.75 | 1.38 | 1.50 | 1.00 | .25 | .25 | .27 | .37 | .375 | .62 | 2.00 | 2.88 | .44 | L071320400<br>L077150400* |
| 2, 2-1/2         | 1.75 | 1.38 | 1.50 | 1.00 | .25 | .25 | .27 | .37 | .375 | .75 | 2.12 | 3.00 | .44 | L071320500<br>L077150500* |
| 3                | 2.25 | 1.75 | 1.75 | 1.25 | .25 | .25 | .27 | .50 | .50  | .88 | 2.62 | 3.88 | .62 | L071320600                |

\* Stainless steel for use with SRD/SRDM cylinders.

**SR Series Trunnion Brackets**

Select brackets for SR series trunnion mount cylinders from the table below. (Note: trunnion brackets are ordered as a separate item from the cylinder.)

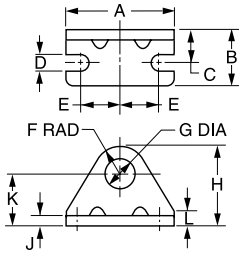


| Bore size         | A    | B    | C    | D | E   | F   | G   | H   | J    | K   | L    | M   | Part number |
|-------------------|------|------|------|---|-----|-----|-----|-----|------|-----|------|-----|-------------|
| 7/16              | 1.75 | 1.38 | 1.50 | 1 | .25 | .25 | .27 | .38 | .375 | .69 | 1.12 | .37 | L076600100  |
| 3/4, 11/16, 1-1/2 | 1.75 | 1.38 | 1.50 | 1 | .25 | .25 | .27 | .38 | .500 | .69 | 1.12 | .37 | L076600200  |

Most popular.



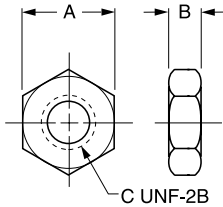
**Foot Brackets**



| Bore size        | A    | B    | C    | D   | E    | F    | G    | H    | J   | K    | L   | Part number               |
|------------------|------|------|------|-----|------|------|------|------|-----|------|-----|---------------------------|
| 5/16             | 1.00 | .37  | .25  | .13 | .37  | .31  | .25  | .75  | .06 | .44  | .12 | L073790016                |
| 5/16             | 1.00 | .37  | .25  | .13 | .37  | .31  | .38  | .75  | .06 | .44  | .12 | L073790023                |
| 7/16             | 1.38 | .62  | .31  | .19 | .50  | .31  | .38  | .88  | .07 | .56  | .12 | L073790024                |
| 7/16, 9/16       | 1.38 | .62  | .38  | .19 | .50  | .38  | .44  | .94  | .09 | .56  | .12 | L073790028<br>L077160028* |
| 3/4              | 1.62 | .75  | .44  | .19 | .62  | .41  | .50  | 1.09 | .10 | .69  | .19 | L073790032                |
| 3/4, 7/8, 1-1/16 | 1.88 | 1.00 | .56  | .27 | .75  | .56  | .63  | 1.38 | .12 | .81  | .25 | L073790040<br>L077160040* |
| 1-1/4, 1-1/2     | 2.50 | 1.50 | .75  | .27 | .94  | .75  | .75  | 1.75 | .12 | 1.00 | .38 | L073790048<br>L077160048* |
| 1-3/4            | 3.00 | 1.50 | .87  | .35 | 1.12 | .91  | 1.03 | 2.16 | .19 | 1.25 | .50 | L073790102                |
| 2                | 3.12 | 1.62 | 1.00 | .34 | 1.12 | 1.00 | 1.38 | 2.50 | .25 | 1.50 | .62 | L073790124<br>L077160124* |
| 2-1/2            | 3.75 | 1.62 | 1.00 | .35 | 1.44 | 1.25 | 1.51 | 3.00 | .25 | 1.75 | .75 | L073790132                |
| 3                | 4.37 | 1.62 | 1.00 | .35 | 1.75 | 1.25 | 1.64 | 3.14 | .25 | 1.89 | .89 | L073790140                |

\* Stainless Steel for use with SRD/SRDM cylinders.

**Mounting Nut**



| Bore size        | A    | B   | C        | Part number               |
|------------------|------|-----|----------|---------------------------|
| 5/16             | .44  | .16 | 1/4-28   | L073800200                |
| 5/16, 7/16       | .56  | .22 | 3/8-24   | L073800400                |
| 7/16, 9/16       | .69  | .25 | 7/16-20  | L073800500<br>L077170500* |
| 3/4              | .75  | .31 | 1/2-20   | L073800600                |
| 3/4, 7/8, 1-1/16 | .94  | .38 | 5/8-18   | L073800800<br>L077170800* |
| 1-1/4, 1-1/2     | 1.12 | .42 | 3/4-16   | L073800900                |
| 1-1/4, 1-1/2     | 1.12 | .72 | 3/4-16   | L077170900*               |
| 1-3/4            | 1.50 | .55 | 1-14     | L073801100                |
| 2                | 1.88 | .50 | 1-1/4-12 | L073801200<br>L077171200* |
| 2-1/2            | 2.06 | .78 | 1-3/8-12 | L073801400                |
| 3                | 2.25 | .84 | 1-1/2-12 | L073801500                |

\* Stainless Steel for use with SRD/SRDM cylinders.

Most popular.



**B**  
 Round Body Cylinders  
 Actuator Products

SR/SW/SRD/SRDM  
 Series

SRX  
 Series

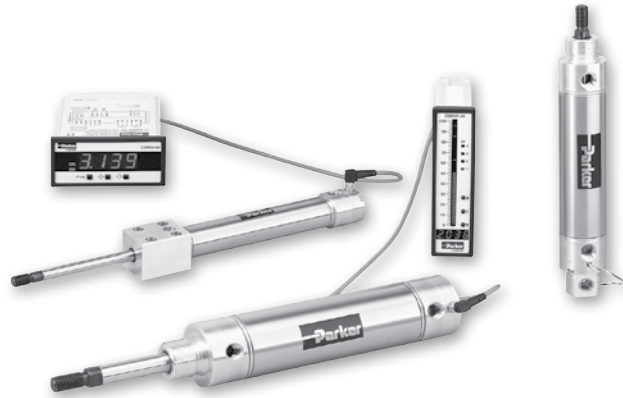
P1L  
 Series

P1A  
 Series

P  
 Series

- Continuous position feedback
- Bore sizes: 1-1/16" to 3"
- Signal input: 5 to 24 VDC
- Signal output (w/o controls): DC ratiometric voltage\*
- Signal output (w/controls): 0 to 10 VDC or 4 to 20 mA
- Strokes: Available in any practical stroke length up to 24"

\* Mega Ohm impedance interface device suggested for limiting sensor current if controller is not used.



**Operating information**

|                                  |                               |
|----------------------------------|-------------------------------|
| Operating pressure:              | 150 PSIG air                  |
| Temperature range:               | 40°F to 160°F (4.4°C to 71°C) |
| Filtration requirements:         | 40 micron, dry filtered air   |
| For technical information see CD |                               |

**Ordering information**

|                  |                              |                                 |                              |                              |   |                                 |   |              |
|------------------|------------------------------|---------------------------------|------------------------------|------------------------------|---|---------------------------------|---|--------------|
| <b>1.50"</b>     | <b>DXP</b>                   | <b>P</b>                        | <b>SRX</b>                   | <b>B</b>                     | <b>F</b>  | <b>S</b>                        | <b>3</b>  | <b>6.00"</b> |
| <b>Bore size</b> | <b>Connector style</b>       |                                 | <b>Piston</b>                |                              | <b>Special</b>  |                                 | <b>Stroke</b>   |              |
| 1.06"            | <b>P</b> Plug                | <b>F</b> Flying leads           | <b>B</b> Bumper*             | Leave blank if not required. |   | <b>S</b> Special                | Stroke in inches  |              |
| 1.50"            | <b>Mounting style</b>        |                                 | Leave blank if not required. |                              | Leave blank if special modification is not required.      |                                 | Leave blank if special rod end dimension is not required. |              |
| 2.00"            | <b>D</b> Nose mount          | <b>DXP</b> Nose and pivot mount | <b>Seals</b>                 |                              | <b>Non-standard rod dimension</b>                         |                                 |   |              |
| 2.50"            | <b>BFD</b> Front block mount |                                 | <b>F</b> Low friction        | Leave blank if not required. |   | <b>3</b> Non-standard dimension |   |              |
| 3.00"            |                              |                                 | Leave blank if not required. |                              | Leave blank if special rod end dimension is not required. |                                 |   |              |

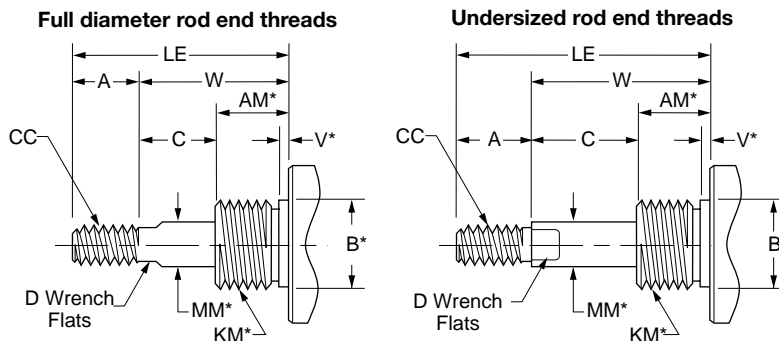
\* Incorporating bumpers adds 1/4" of overall length to the cylinder.

**Sensors**  
 For sensors see page B294.

**NOTE:** For non-standard / special rod ends, see below.

**Non-standard rods**

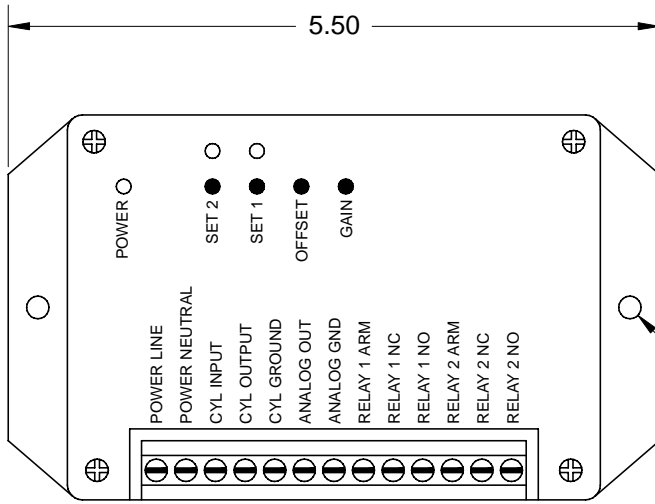
For non-standard rod dimensions, or undersized rod end threads, put a "3" in model number and describe the rod using the letters shown in the drawing. It is necessary to specify only those dimensions that are non-standard. LE is measured in retracted position.



\* Requires an "S" designation in model number.

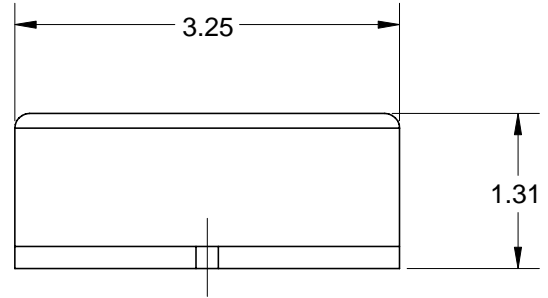
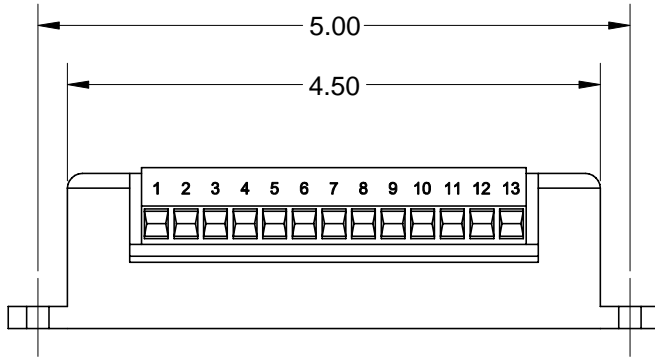
|   |
|---|
| <b>B</b>                                  |
| Round Body Cylinders<br>Actuator Products |
| SR/SM/SRD/SRDM<br>Series                  |
| SRX<br>Series                             |
| P1L<br>Series                             |
| P1A<br>Series                             |
| P<br>Series                               |

**Dual Set Point Controller, Part #149344000**



**Ordering Information**

| Model number      | Input specifications | Output specifications |
|-------------------|----------------------|-----------------------|
| <b>1493440002</b> | 120 VAC              | 0-10 V                |
| <b>1493440003</b> | 120 VAC              | 4-20 mA               |
| <b>1493440004</b> | 12-24 VDC            | 0-10 V                |
| <b>1493440005</b> | 12-24 VDC            | 4-20 mA               |



**Dual Set Point Controller Specifications, Part #149344000**

- Power Input Requirements..... 12 to 24 VDC, 0.1 amps, or 120 VAC, 60 Hz, 0.1 amps
- Output specifications – Set Point .....Relay (2) 2 amps @ 24 VDC or 120 VAC
- Output Specifications – Scaleable .....0 to 10 V, 1 mA max. output current (10K ohm impedance min.) 4 to 20mA, into 500-ohm max. impedance
- Maximum Zero Offset.....50% of cylinder stroke
- Minimum Span Range.....50% of cylinder stroke
- Enclosure Dimensions..... 1.31" h x 5.50" w x 3.25" d
- Electronics Temperature Operating Range .... +40°F to +160°F

*Please reference Parker Bulletin #0971-G-B2 for information regarding programming and operation of this controller.*

**B**  
 Round Body Cylinders  
 Actuator Products

SR/SW/SRD/SRDM  
 Series

SRX  
 Series

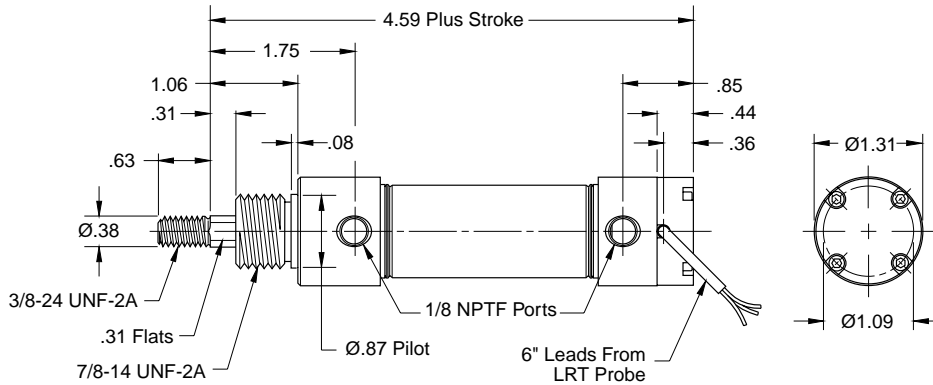
P1L  
 Series

P1A  
 Series

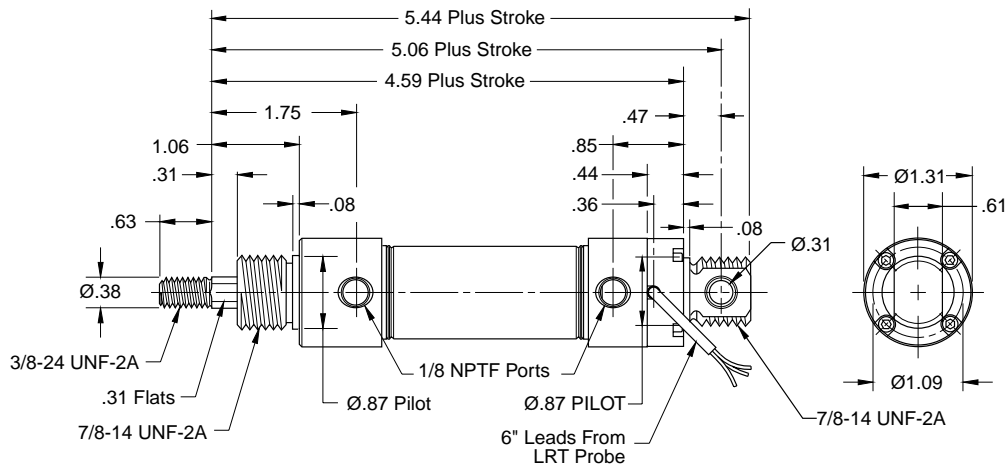
P  
 Series

**1-1/16" Bore Cylinders**

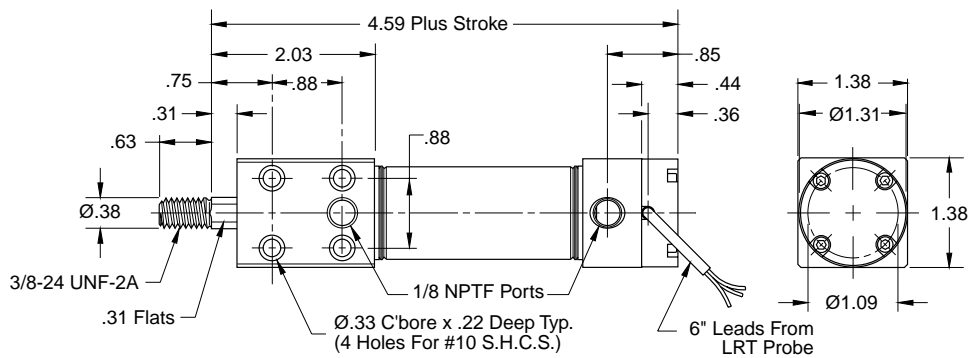
**Style D**



**Style DXP**



**Style BFD**



**B**

Round Body Cylinders  
 Actuator Products

SR/SM/SRD/SRDM  
 Series

SRX  
 Series

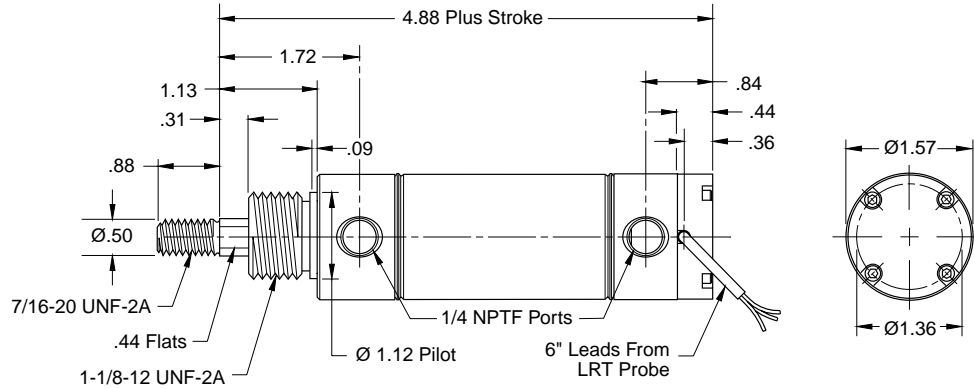
P1L  
 Series

P1A  
 Series

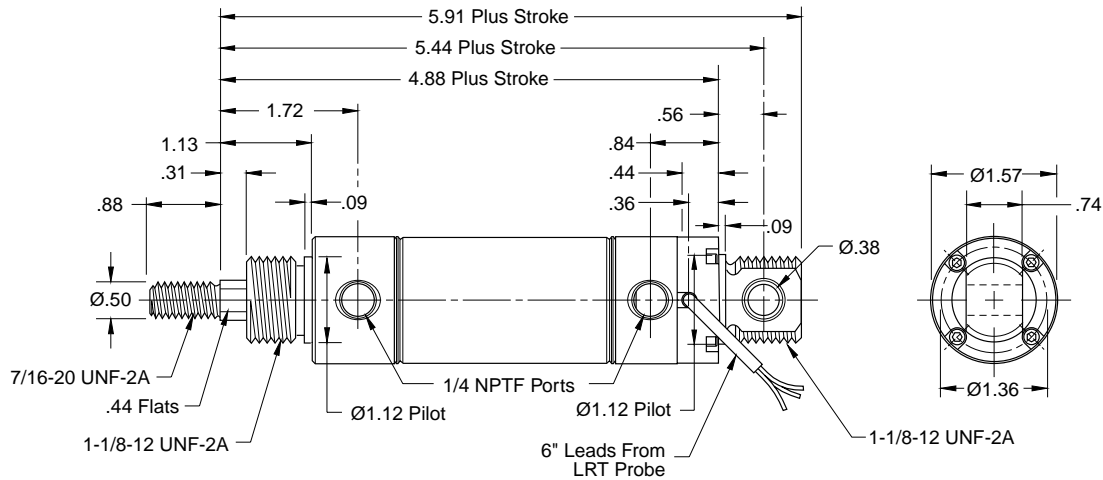
P  
 Series

**1-1/2" Bore Cylinders**

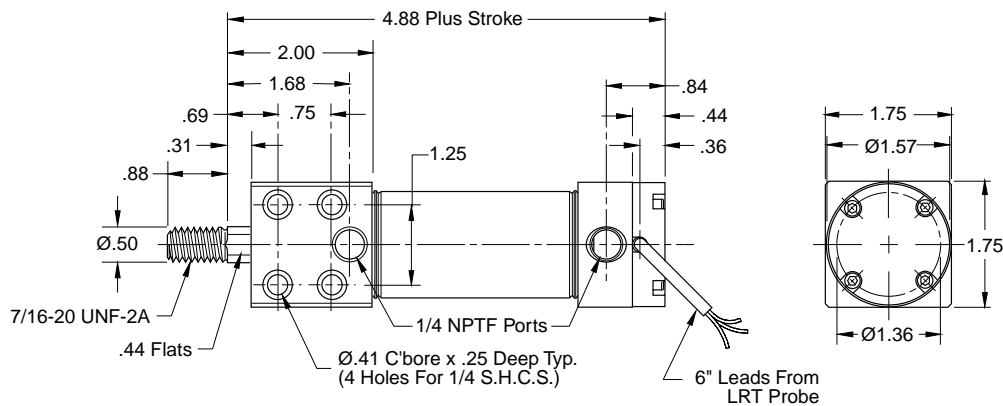
**Style D**



**Style DXP**



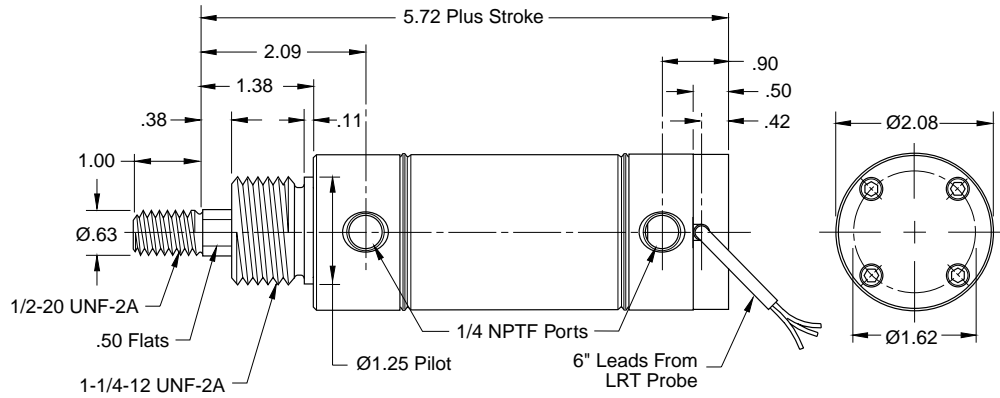
**Style BFD**



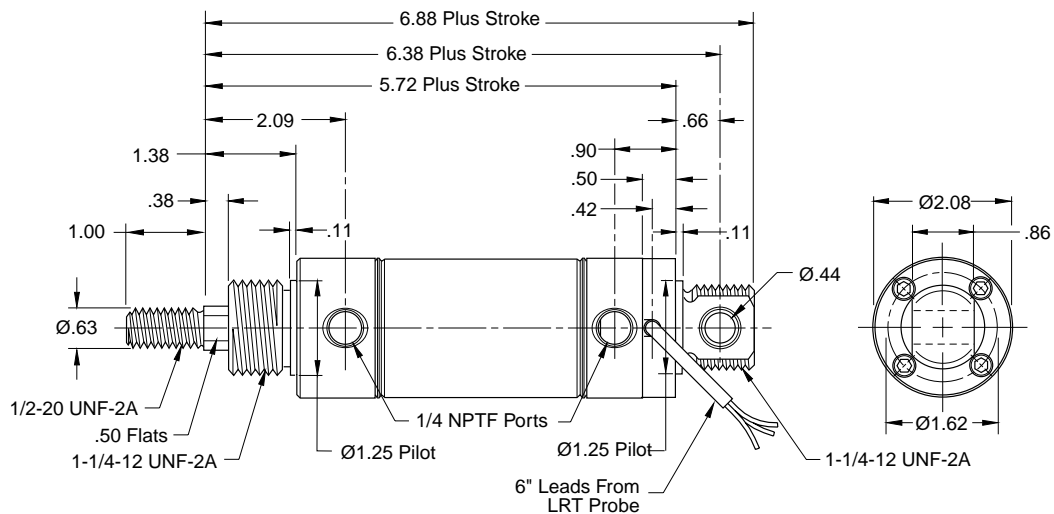
|            |                      |
|------------|----------------------|
| <b>B</b>   | Round Body Cylinders |
|            | Actuator Products    |
| <b>SR</b>  | SR/SM/SRD/SRD/SRD    |
|            | Series               |
| <b>SRX</b> | Series               |
| <b>P1L</b> | Series               |
| <b>P1A</b> | Series               |
| <b>P</b>   | Series               |

**2" Bore Cylinders**

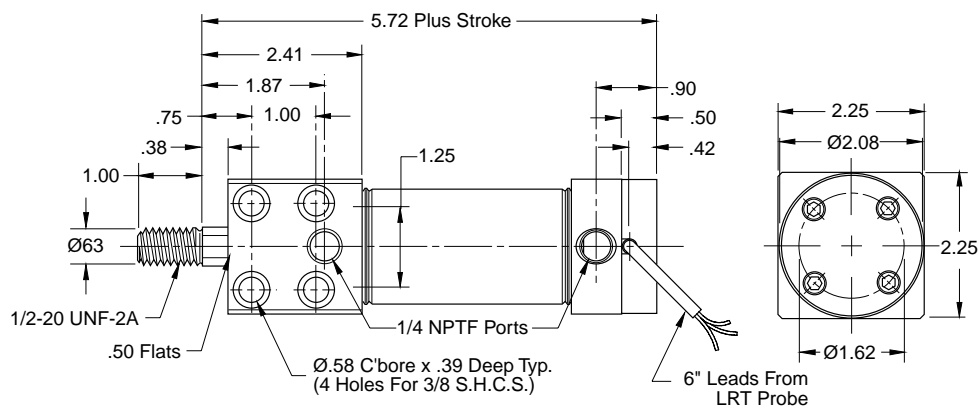
**Style D**



**Style DXP**



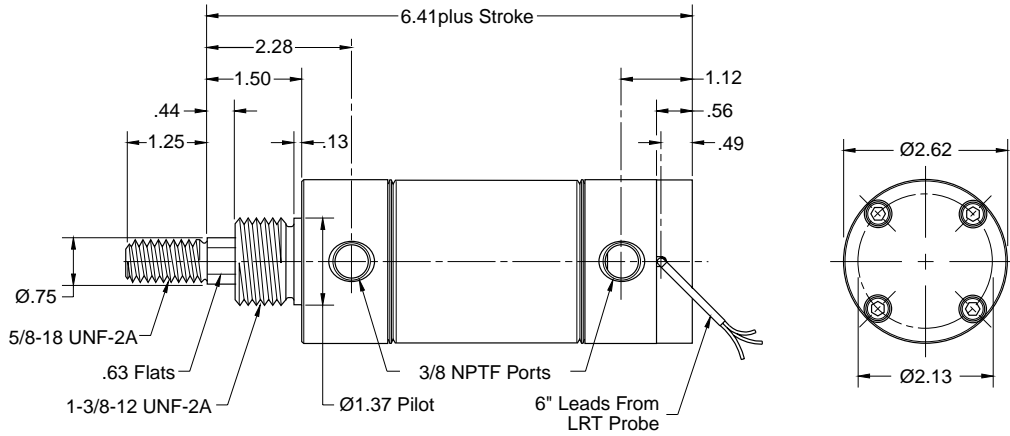
**Style BFD**



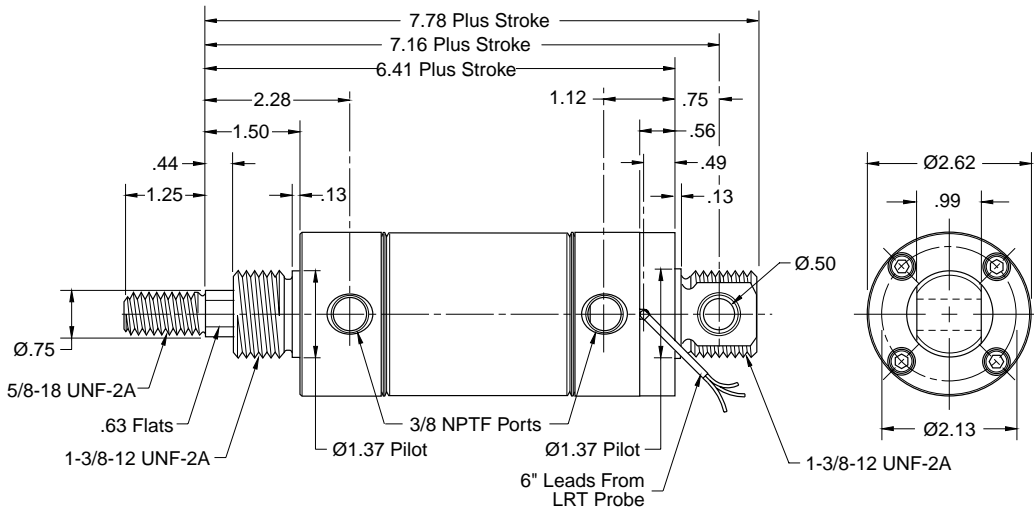
|               |   |
|---------------|---|
| <b>B</b>      | Round Body Cylinders<br>Actuator Products |
|               | SR/SM/SRD/SRDM<br>Series                  |
| SRX<br>Series |   |
| P1L<br>Series |   |
| P1A<br>Series |   |
| P<br>Series   |   |

**2-1/2" Bore Cylinders**

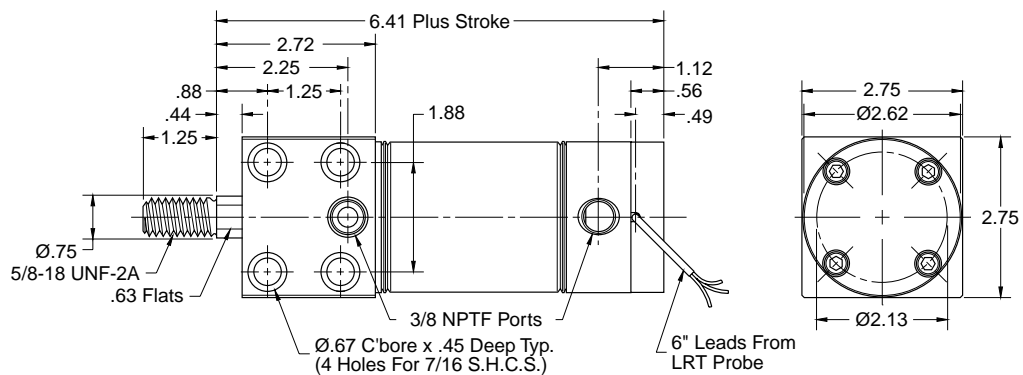
**Style D**



**Style DXP**



**Style BFD**

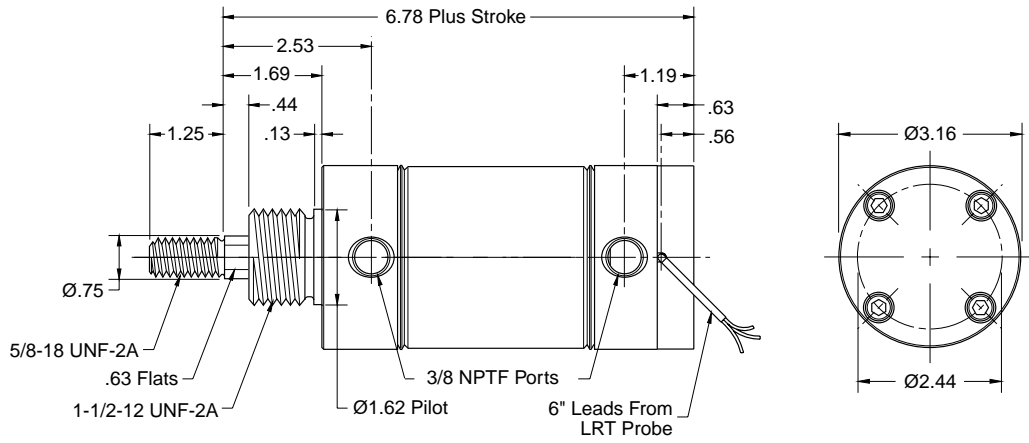


|                |                      |
|----------------|----------------------|
| <b>B</b>       | Round Body Cylinders |
|                | Actuator Products    |
| SR/SM/SRD/SRDM | Series               |
|                | SRX                  |
| P1L            | Series               |
|                | P1A                  |
| P              | Series               |
|                | P                    |

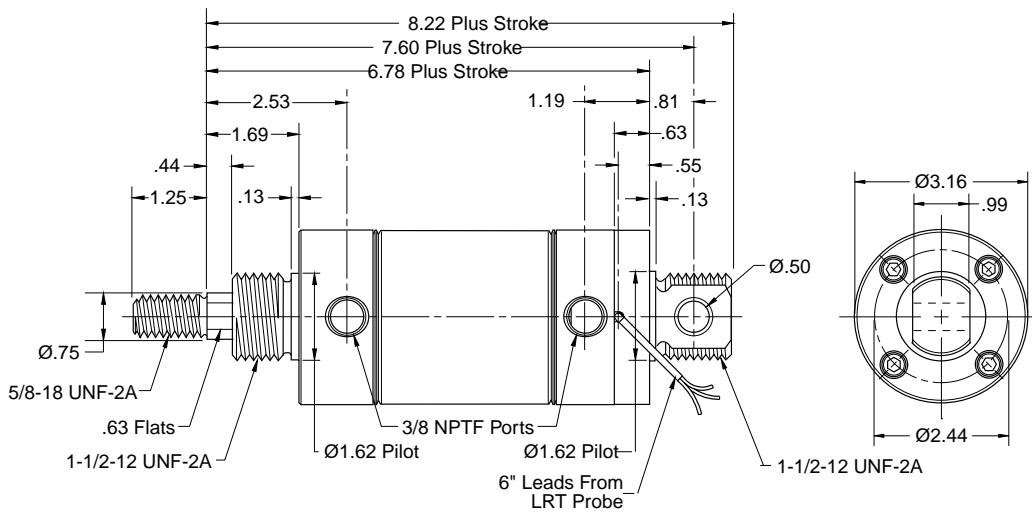


**3" Bore Cylinders**

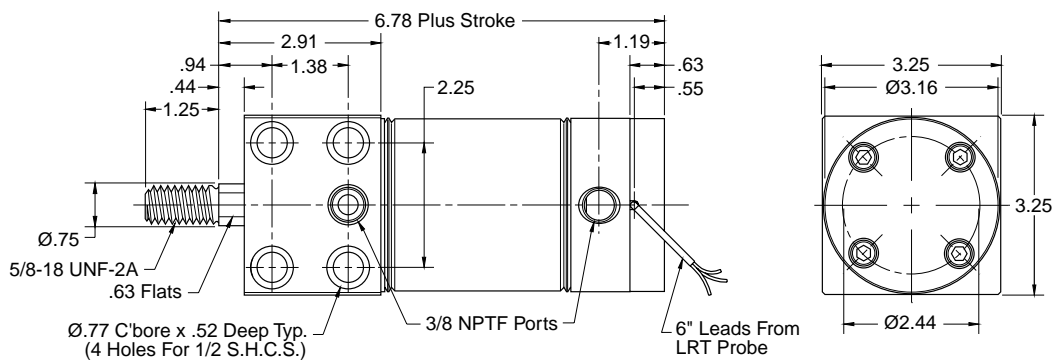
**Style D**



**Style DXP**

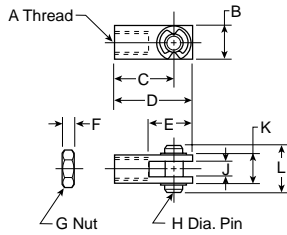


**Style BFD**



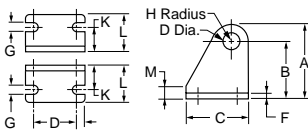
|          |   |
|----------|---|
| <b>B</b> | Round Body Cylinders<br>Actuator Products |
|          | SR/SM/SRD/SRDM<br>Series                  |
|          | SRX<br>Series                             |
|          | P1L<br>Series                             |
|          | P1A<br>Series                             |
|          | P<br>Series                               |

**Piston Rod Clevis**



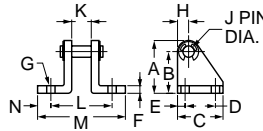
| Bore size | A       | B    | C    | D    | E    | F   | G       | H   | J   | K    | L    | Part number |
|-----------|---------|------|------|------|------|-----|---------|-----|-----|------|------|-------------|
| 1-1/16    | 3/8-24  | .63  | 1.38 | 1.69 | .94  | .22 | 3/8-24  | .31 | .32 | .63  | .88  | L071300350  |
| 1-1/2     | 7/16-20 | .75  | 1.31 | 1.69 | .94  | .25 | 7/16-20 | .38 | .38 | .75  | 1.03 | L071300400  |
| 2         | 1/2-20  | .88  | 1.88 | 2.31 | 1.31 | .31 | 1/2-20  | .44 | .45 | .88  | 1.14 | L071300550  |
| 2-1/2, 3  | 5/8-18  | 1.00 | 2.25 | 2.75 | 1.50 | .38 | 5/8-18  | .50 | .51 | 1.00 | 1.38 | L071300600  |

**Pivot Brackets**



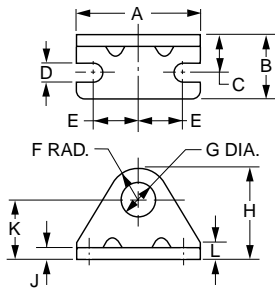
| Bore size | A    | B    | C    | D    | E   | F   | G   | H   | J    | K   | L    | M   | Part number |
|-----------|------|------|------|------|-----|-----|-----|-----|------|-----|------|-----|-------------|
| 1-1/16    | 1.31 | 1.00 | 1.31 | .81  | .25 | .16 | .28 | .31 | .315 | .56 | .88  | .28 | L071310400  |
| 1-1/2     | 1.63 | 1.25 | 1.63 | 1.00 | .31 | .19 | .34 | .38 | .378 | .69 | 1.13 | .31 | L071310500  |
| 2         | 1.81 | 1.38 | 1.81 | 1.19 | .31 | .25 | .34 | .44 | .440 | .75 | 1.19 | .38 | L071310600  |
| 2-1/2, 3  | 2.13 | 1.63 | 2.13 | 1.38 | .38 | .25 | .41 | .50 | .503 | .88 | 1.38 | .38 | L071310700  |

**Pivot Brackets**



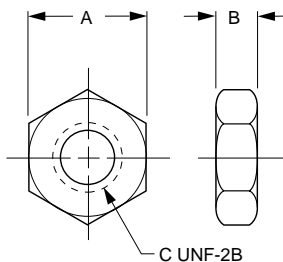
| Bore size | A    | B    | C    | D    | E   | F   | G   | H   | J    | K    | L    | M    | N   | Part number |
|-----------|------|------|------|------|-----|-----|-----|-----|------|------|------|------|-----|-------------|
| 1-1/16    | 1.31 | 1.00 | 1.31 | .81  | .25 | .16 | .28 | .31 | .312 | .62  | 1.75 | 2.38 | .31 | L071320250  |
| 1-1/2     | 1.63 | 1.25 | 1.63 | 1.00 | .31 | .19 | .34 | .38 | .375 | .75  | 2.13 | 3.00 | .44 | L071320350  |
| 2         | 1.81 | 1.38 | 1.81 | 1.19 | .31 | .25 | .34 | .44 | .437 | .88  | 2.38 | 3.25 | .44 | L071320450  |
| 2-1/2, 3  | 2.13 | 1.63 | 2.13 | 1.38 | .38 | .25 | .41 | .50 | .500 | 1.00 | 2.75 | 3.75 | .50 | L071320550  |

**Foot Brackets**



| Bore size | A    | B    | C    | D   | E    | F    | G    | H    | J   | K    | L   | Part number |
|-----------|------|------|------|-----|------|------|------|------|-----|------|-----|-------------|
| 1-1/16    | 2.13 | 1.16 | .66  | .28 | .75  | .75  | .88  | 1.75 | .16 | 1.00 | .38 | L073790056  |
| 1-1/2     | 2.75 | 1.44 | .81  | .35 | 1.00 | .94  | 1.13 | 2.19 | .19 | 1.25 | .38 | L073790108  |
| 2         | 3.00 | 1.59 | .91  | .35 | 1.19 | 1.06 | 1.26 | 2.44 | .22 | 1.38 | .44 | L073790116  |
| 2-1/2     | 3.75 | 1.88 | 1.06 | .41 | 1.50 | 1.19 | 1.38 | 2.81 | .25 | 1.63 | .50 | L073790125  |
| 3         | 4.38 | 1.62 | 1.00 | .35 | 1.75 | 1.25 | 1.64 | 3.14 | .25 | 1.89 | .89 | L073790140  |

**Mounting Nut**



| Bore size | A    | B   | C        | Part number |
|-----------|------|-----|----------|-------------|
| 1-1/16    | 1.31 | .48 | 7/8-14   | L073801000  |
| 1-1/2     | 1.69 | .61 | 1-1/8-12 | L073801300  |
| 2         | 1.88 | .50 | 1-1/4-12 | L073801200  |
| 2-1/2     | 2.06 | .78 | 1-3/8-12 | L073801400  |
| 3         | 2.25 | .84 | 1-1/2-12 | L073801500  |

Most popular.

**B**  
 Round Body Cylinders  
 Actuator Products  
 SR/SM/SRD/SRD/SDM Series  
 SRX Series  
 P1L Series  
 P1A Series  
 P Series



- Repairable aluminum cylinder, anodized body and end caps
- 8 bore sizes: 20mm to 100mm (3/4" to 4")
- 4 Standard rod ends: inch, metric, male, female
- Bumpers standard on both ends
- Adjustable cushions optional at both ends
- Mounting styles: 9 standard
- Strokes available in any practical length
- Available in metric or inch mounting threads



**Operating information**

Operating pressure: 10 bar (145 PSIG)  
 Temperature range:  
     Standard -23°C to 74°C (-10°F to 250°F)  
     High temperature version\* -23°C to 121°C (-10°F to 250°F)

\* Option intended for limited exposure to temperatures over 80°C or 176°F. This option is primarily for applications which subject the cylinder to fluids that have an adverse effect on external seals.

Filtration requirements: 40 micron, dry filtered air

For technical information see CD

**Ordering information**

**P1L N 032 D M N 0200 W B N N N**

|                           |               |                  |  |
|---------------------------|---------------|------------------|--|
| <b>Construction 1</b>     | <b>Stroke</b> | <b>Version 3</b> | <b>Rod material</b>                    |
| N Inch mounting threads   | Specify in mm | B Basic          | N Carbon steel (std on 32-100mm bores) |
| M Metric mounting threads |               | W With options   | S Stainless (std on 20-25mm bores)     |
|                           |               | / Special        |  |

|                   |                      |                        |
|-------------------|----------------------|------------------------|
| <b>Bores (mm)</b> | <b>Seal material</b> | <b>Rod end style 1</b> |
| 020 032 050 080   | N Standard seals     | N Inch male 4          |
| 025 040 063 100   | T Fluorocarbon       | 6 Metric female        |
|                   |                      | 5 Metric male 5        |
|                   |                      | 9 Inch female          |
|                   |                      | 3 Special              |

|                             |                              |                    |
|-----------------------------|------------------------------|--------------------|
| <b>Function</b>             | <b>Mounting style</b>        | <b>Port type 1</b> |
| D Double acting, single rod | N No mountings fitted (std.) | N NPT threads 4    |
| K Double acting, double rod | J Front flange               | B BSPT threads 5   |
|                             | H Rear flange                |                    |
|                             | B Single rear clevis         |                    |
|                             | A Double rear clevis         |                    |
|                             | F Foot, front & rear         |                    |
|                             | G Nose mount                 |                    |
|                             | E Front trunnion             |                    |
|                             | D Rear trunnion              |                    |

|   |   |                           |
|---|---|---------------------------|
| <b>Cushions/magnetic piston</b>           | <b>Stroke length for standard cylinders</b> |                           |
| N No cushion, no magnetic piston          | <b>Bore</b>                                 | <b>Min. stroke (mm)</b>   |
| M No cushion, magnetic piston 2           | 20  | 2                         |
| F Cushioned both ends, no magnetic piston | 25  | 2                         |
| Y Cushioned both ends, magnetic piston 2  | 32  | 2                         |
|   | 40  | 4                         |
|   | 50  | 5                         |
|   | 63  | 7                         |
|   | 80  | 4                         |
|   | 100   | 4                         |
|   |   | <b>Max. stroke (mm) 6</b> |
|   |   | 1000                      |
|   |   | 1000                      |
|   |   | 1000                      |
|   |   | 1000                      |
|   |   | 1000                      |
|   |   | 1000                      |

**Notes:**

- When selecting inch or metric construction, be advised that the piston rod end and porting thread will coincide with the mounting thread selected as the standard for the basic cylinder. For example, selecting "M" in the construction field will automatically provide a metric male piston rod end and BSPT ports as standard.
- Not available with fluorocarbon seal option.
- If cylinder contains no options, then use "B" as the last digit in the model code. The last 4 boxes are used only when "W" or "/" appears in this field.
- Standard with Inch Construction
- Standard with Metric Construction
- Please consult factory for availability of stroke lengths longer than those listed.

**Sensors**  
 For sensors see page B294.

B

Round Body Cylinders  
Actuator Products

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SR/SM/SRD/SRDM  
Series

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SRX  
Series

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P1L  
Series

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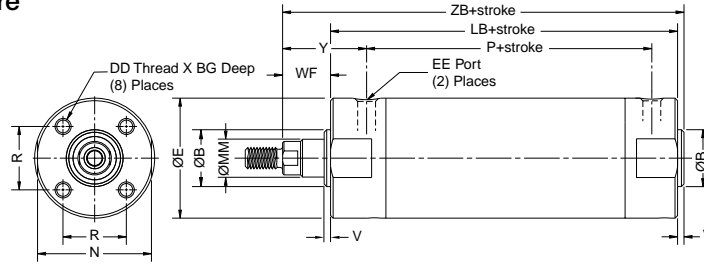
P1A  
Series

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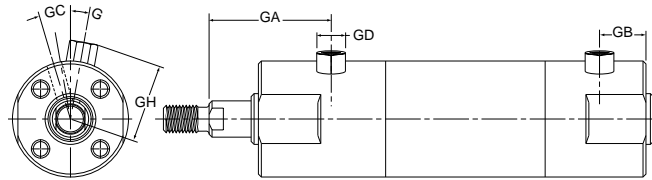
P  
Series

**Style N - Basic No Mount**

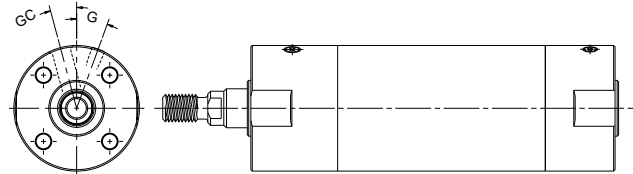
Typical 20 to 100 mm Bore  
 without air cushion



With adjustable air cushion - 20 to 25 mm bores



With adjustable air cushion - 32 to 100 mm bores  
 (feature a flush-fit cushion adjustment screw)



**Style N, envelope and mounting dimensions – mm (inch)**

| Bore size | ØB<br>+0 -0.02<br>(+0 -0.001) | DD<br>(UNF)          | BG<br>depth   | ØE             | EE<br>(NPTF)    | Ø MM<br>rod dia. | N             | NA           | R              | V           | WF           | Y            |
|-----------|-------------------------------|----------------------|---------------|----------------|-----------------|------------------|---------------|--------------|----------------|-------------|--------------|--------------|
| 20        | 12<br>(0.472)                 | M4x0.7<br>(8-32)     | 7<br>(0.28)   | 27<br>(1.06)   | 1/8*<br>(1/8 †) | 8<br>(0.315)     | 24<br>(0.94)  | -            | 14<br>(0.55)   | 2<br>(0.08) | 13<br>(0.50) | 28<br>(1.10) |
| 25        | 14<br>(0.551)                 | M5x0.8<br>(10-32)    | 7.6<br>(0.30) | 32<br>(1.26)   | 1/8*<br>(1/8 †) | 10<br>(0.394)    | 29<br>(1.14)  | -            | 16.5<br>(0.65) | 2<br>(0.08) | 16<br>(0.62) | 30<br>(1.18) |
| 32        | 18<br>(0.709)                 | M5x0.8<br>(10-32)    | 7.6<br>(0.30) | 39<br>(1.53)   | 1/8<br>(1/8)    | 12<br>(0.472)    | 36<br>(1.42)  | 11<br>(0.43) | 20<br>(0.79)   | 2<br>(0.08) | 22<br>(0.88) | 40<br>(1.57) |
| 40        | 25<br>(0.984)                 | M6x1<br>(1/4-28)     | 12<br>(0.47)  | 48.5<br>(1.91) | 1/8<br>(1/8)    | 16<br>(0.630)    | 44<br>(1.73)  | 14<br>(0.55) | 26<br>(1.02)   | 2<br>(0.08) | 22<br>(0.88) | 42<br>(1.65) |
| 50        | 30<br>(1.181)                 | M8x1.25<br>(5/16-24) | 16<br>(0.63)  | 59<br>(2.32)   | 1/4<br>(1/4)    | 20<br>(0.787)    | 55<br>(2.17)  | 18<br>(0.71) | 32<br>(1.26)   | 2<br>(0.08) | 30<br>(1.19) | 53<br>(2.09) |
| 63        | 32<br>(1.260)                 | M10x1.5<br>(3/8-24)  | 16<br>(0.63)  | 72<br>(2.83)   | 1/4<br>(1/4)    | 20<br>(0.787)    | 69<br>(2.72)  | 18<br>(0.71) | 38<br>(1.50)   | 2<br>(0.08) | 30<br>(1.19) | 53<br>(2.09) |
| 80        | 40<br>(1.575)                 | M10x1.5<br>(3/8-24)  | 22<br>(0.88)  | 90<br>(3.54)   | 3/8<br>(3/8)    | 25<br>(0.984)    | 86<br>(3.39)  | 23<br>(0.91) | 50<br>(1.97)   | 3<br>(0.12) | 31<br>(1.22) | 59<br>(2.32) |
| 100       | 50<br>(1.968)                 | M12x1.75<br>(1/2-20) | 22<br>(0.88)  | 110<br>(4.33)  | 1/2<br>(1/2)    | 32<br>(1.260)    | 106<br>(4.17) | 30<br>(1.18) | 60<br>(2.36)   | 3<br>(0.12) | 31<br>(1.22) | 57<br>(2.24) |

**Add stroke**

| Bore size | LB            | P            | ZB            |
|-----------|---------------|--------------|---------------|
| 20        | 69<br>(2.70)  | 45<br>(1.77) | 83<br>(3.28)  |
| 25        | 69<br>(2.70)  | 46<br>(1.81) | 86<br>(3.40)  |
| 32        | 71<br>(2.78)  | 43<br>(1.69) | 95<br>(3.74)  |
| 40        | 78<br>(3.06)  | 49<br>(1.93) | 102<br>(4.02) |
| 50        | 90<br>(3.53)  | 53<br>(2.09) | 122<br>(4.80) |
| 63        | 90<br>(3.53)  | 52<br>(2.05) | 122<br>(4.80) |
| 80        | 108<br>(4.25) | 64<br>(2.52) | 142<br>(5.59) |
| 100       | 108<br>(4.25) | 66<br>(2.60) | 142<br>(5.59) |

**Adjustable air cushion**

| Bore size | GA           | GB           | GD<br>Hex   | GC°    | G°     | GH             | EE                      | Cushion<br>length |
|-----------|--------------|--------------|-------------|--------|--------|----------------|-------------------------|-------------------|
| 20        | 33<br>(1.30) | 14<br>(0.55) | 8<br>(0.31) | 13-1/2 | 25-1/2 | 20.5<br>(0.81) | M5 x 0.8<br>(10-32 UNF) | 9<br>(0.35)       |
| 25        | 35<br>(1.38) | 14<br>(0.55) | 8<br>(0.31) | 15-1/2 | 20-1/2 | 23<br>(0.91)   | M5 x 0.8<br>(10-32 UNF) | 9<br>(0.35)       |
| 32        | -            | -            | -           | 10-1/2 | 30-1/2 | -              | 1/8<br>(1/8 NPTF)       | 10<br>(0.39)      |
| 40        | -            | -            | -           | 10-1/2 | 22-1/2 | -              | 1/8<br>(1/8 NPTF)       | 12<br>(0.47)      |
| 50        | -            | -            | -           | 10-1/2 | 23-1/2 | -              | 1/4<br>(1/4 NPTF)       | 15<br>(0.59)      |
| 63        | -            | -            | -           | 15-1/2 | 20-1/2 | -              | 1/4<br>(1/4 NPTF)       | 15<br>(0.59)      |
| 80        | -            | -            | -           | 15-1/2 | 25-1/2 | -              | 3/8<br>(3/8 NPTF)       | 15<br>(0.59)      |
| 100       | -            | -            | -           | 15-1/2 | 25-1/2 | -              | 1/2<br>(1/2 NPTF)       | 15<br>(0.59)      |

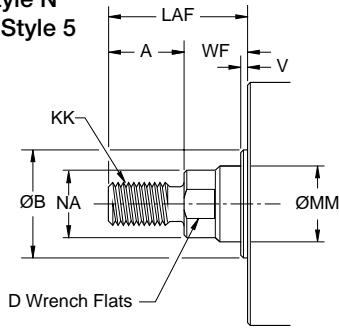
\* Ports are M5 for cushioned versions, metric  
 † Ports are 10-32 for cushioned versions, inch



**Rod End Details**

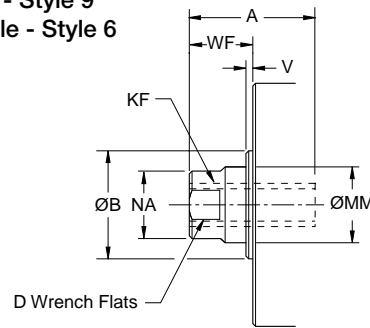
**Male threads**

Inch male - Style N  
 Metric male - Style 5



**Female threads**

Inch female - Style 9  
 Metric female - Style 6



**Special rod end threads**

**Thread Style 3**

Special Metric or Inch threads, extension, blank, etc., are also available.

To order, specify "Style 3" and give desired dimensions for KK or KF, A and LAF or WF (length dimensions in millimeters).  
 If otherwise special, supply a dimensioned sketch.

**Rod ends – mm (inch)**

| Bore size | Thread       |                               |              |                            |                            |              |                  |              |             |              |
|-----------|--------------|-------------------------------|--------------|----------------------------|----------------------------|--------------|------------------|--------------|-------------|--------------|
|           | A            | ØB<br>+0 -0.02<br>(+0 -0.001) | D            | KK<br>Style 5<br>(Style N) | KF<br>Style 6<br>(Style 9) | LAF          | Ø MM<br>rod dia. | NA           | V           | WF           |
| 20        | 13<br>(0.50) | 12<br>(0.472)                 | 6<br>(0.24)  | M8 x 1.25<br>(1/4-28)      | M5 x 0.80<br>(#10-32)      | 26<br>(1.00) | 8<br>(0.315)     | -            | 2<br>(0.08) | 13<br>(0.50) |
| 25        | 13<br>(0.50) | 14<br>(0.551)                 | 8<br>(0.31)  | M10 x 1.25<br>(5/16-24)    | M6 x 1.00<br>(1/4-28)      | 29<br>(1.12) | 10<br>(0.394)    | -            | 2<br>(0.08) | 16<br>(0.62) |
| 32        | 19<br>(0.75) | 18<br>(0.709)                 | 10<br>(0.39) | M10 x 1.25<br>(7/16-20)    | M8 x 1.25<br>(5/16-24)     | 41<br>(1.63) | 12<br>(0.472)    | 11<br>(0.43) | 2<br>(0.08) | 22<br>(0.88) |
| 40        | 19<br>(0.75) | 25<br>(0.984)                 | 12<br>(0.47) | M14 x 1.5<br>(7/16-20)     | M8 x 1.25<br>(3/8-24)      | 41<br>(1.63) | 16<br>(0.630)    | 14<br>(0.55) | 2<br>(0.08) | 22<br>(0.88) |
| 50        | 22<br>(0.88) | 30<br>(1.181)                 | 16<br>(0.63) | M18 x 1.5<br>(1/2-20)      | M10 x 1.25<br>(1/2-20)     | 52<br>(2.07) | 20<br>(0.787)    | 18<br>(0.71) | 2<br>(0.08) | 30<br>(1.19) |
| 63        | 22<br>(0.88) | 32<br>(1.260)                 | 16<br>(0.63) | M18 x 1.5<br>(1/2-20)      | M10 x 1.25<br>(1/2-20)     | 52<br>(2.07) | 20<br>(0.787)    | 18<br>(0.71) | 2<br>(0.08) | 30<br>(1.19) |
| 80        | 38<br>(1.50) | 40<br>(1.575)                 | 20<br>(0.79) | M22 x 1.5<br>(3/4-16)      | M16 x 1.5<br>(5/8-18)      | 69<br>(2.72) | 25<br>(0.984)    | 23<br>(0.91) | 3<br>(0.12) | 31<br>(1.22) |
| 100       | 48<br>(1.88) | 50<br>(1.968)                 | 26<br>(1.02) | M26 x 1.5<br>(1-14)        | M20 x 1.5<br>(3/4-16)      | 79<br>(3.11) | 32<br>(1.260)    | 30<br>(1.18) | 3<br>(0.12) | 31<br>(1.22) |

**B**

Round Body Cylinders  
 Actuator Products

SR/SM/SRD/SRDM  
 Series

SRX  
 Series

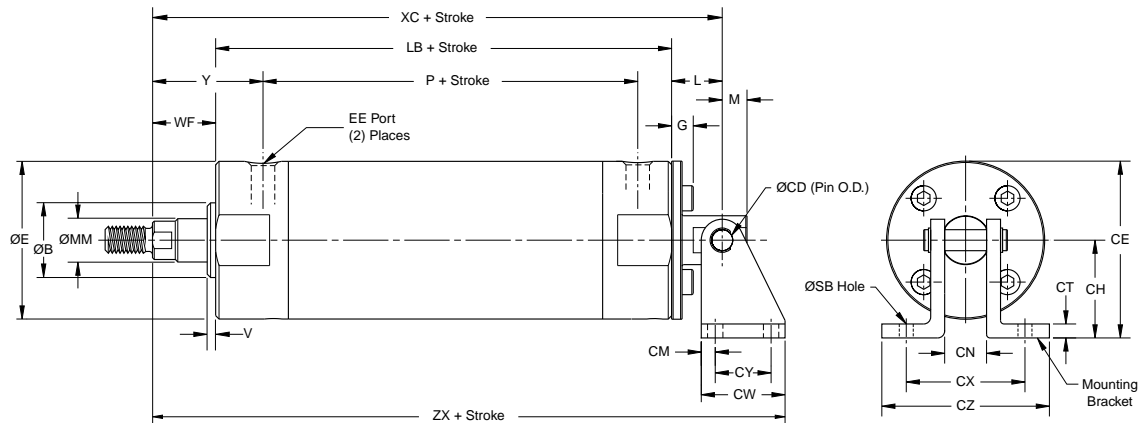
P1L  
 Series

P1A  
 Series

P  
 Series

**Style B - Single Rear Clevis**

Typical 20 to 100 mm Bore



Note: Mating Mounting Bracket and Pin must be ordered as separate items

**Style B, envelope and mounting dimensions – mm (inch)**

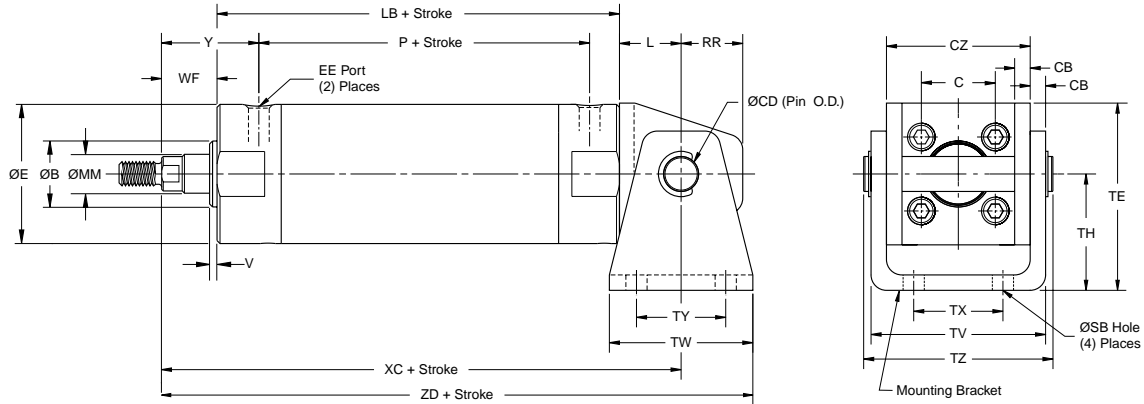
| Bore size | ØB                        | ØCD                | ØE             | EE              | G              | L            | M            | ØMM           | V           | WF           | Y            |
|-----------|---------------------------|--------------------|----------------|-----------------|----------------|--------------|--------------|---------------|-------------|--------------|--------------|
|           | +0 - 0.02<br>(+0 - 0.001) | h9<br>(+0 - 0.002) |                | BSPT<br>(NTPF)  |                |              |              | rod dia.      |             |              |              |
| 20        | 12<br>(0.472)             | 6.35<br>(0.250)    | 27<br>(1.06)   | 1/8*<br>(1/8 †) | 7<br>(0.26)    | 18<br>(0.70) | 7<br>(0.28)  | 8<br>(0.315)  | 2<br>(0.08) | 13<br>(0.50) | 28<br>(1.10) |
| 25        | 14<br>(0.551)             | 6.35<br>(0.250)    | 32<br>(1.26)   | 1/8*<br>(1/8 †) | 8<br>(0.27)    | 17<br>(0.68) | 7<br>(0.28)  | 10<br>(0.394) | 2<br>(0.08) | 16<br>(0.62) | 30<br>(1.18) |
| 32        | 18<br>(0.709)             | 6.35<br>(0.250)    | 39<br>(1.53)   | 1/8<br>(1/8)    | 15.5<br>(0.57) | 27<br>(1.07) | 10<br>(0.39) | 12<br>(0.472) | 2<br>(0.08) | 22<br>(0.88) | 40<br>(1.57) |
| 40        | 25<br>(0.984)             | 9.52<br>(0.375)    | 48.5<br>(1.91) | 1/8<br>(1/8)    | 10<br>(0.36)   | 22<br>(0.88) | 10<br>(0.39) | 16<br>(0.630) | 2<br>(0.08) | 22<br>(0.88) | 42<br>(1.65) |
| 50        | 30<br>(1.181)             | 9.52<br>(0.375)    | 59<br>(2.32)   | 1/4<br>(1/4)    | 12<br>(0.43)   | 23<br>(0.91) | 11<br>(0.44) | 20<br>(0.787) | 2<br>(0.08) | 30<br>(1.19) | 53<br>(2.09) |
| 63        | 32<br>(1.260)             | 9.52<br>(0.375)    | 72<br>(2.83)   | 1/4<br>(1/4)    | 13<br>(0.46)   | 23<br>(0.91) | 11<br>(0.44) | 20<br>(0.787) | 2<br>(0.08) | 30<br>(1.19) | 53<br>(2.09) |
| 80        | 40<br>(1.575)             | 19.07<br>(0.751)   | 90<br>(3.54)   | 3/8<br>(3/8)    | 15<br>(0.54)   | 35<br>(1.38) | 19<br>(0.75) | 25<br>(0.984) | 3<br>(0.12) | 31<br>(1.22) | 59<br>(2.32) |
| 100       | 50<br>(1.968)             | 19.07<br>(0.751)   | 110<br>(4.33)  | 1/2<br>(1/2)    | 17<br>(0.64)   | 43<br>(1.69) | 19<br>(0.75) | 32<br>(1.260) | 3<br>(0.12) | 31<br>(1.22) | 57<br>(2.24) |

| Bore size |                |              |              |              |             |              |              |              |               |              | Add stroke    |              |               |               |
|-----------|----------------|--------------|--------------|--------------|-------------|--------------|--------------|--------------|---------------|--------------|---------------|--------------|---------------|---------------|
|           | CE             | CH           | CM           | CN           | CT          | CW           | CX           | CY           | CZ            | ØSB          | LB            | P            | XC            | ZX            |
| 20        | 35.5<br>(1.39) | 22<br>(0.87) | 5<br>(0.19)  | 10<br>(0.38) | 3<br>(0.12) | 29<br>(1.13) | 32<br>(1.25) | 19<br>(0.75) | 51<br>(2.00)  | 7<br>(0.27)  | 69<br>(2.70)  | 45<br>(1.77) | 99<br>(3.91)  | 120<br>(4.74) |
| 25        | 38<br>(1.49)   | 22<br>(0.87) | 5<br>(0.19)  | 10<br>(0.38) | 3<br>(0.12) | 29<br>(1.13) | 32<br>(1.25) | 19<br>(0.75) | 51<br>(2.00)  | 7<br>(0.27)  | 69<br>(2.70)  | 46<br>(1.81) | 102<br>(4.00) | 123<br>(4.83) |
| 32        | 41.5<br>(1.63) | 22<br>(0.87) | 5<br>(0.19)  | 13<br>(0.50) | 3<br>(0.12) | 29<br>(1.13) | 35<br>(1.38) | 19<br>(0.75) | 54<br>(2.12)  | 7<br>(0.27)  | 71<br>(2.78)  | 43<br>(1.69) | 120<br>(4.72) | 141<br>(5.55) |
| 40        | 59<br>(2.31)   | 35<br>(1.38) | 6<br>(0.25)  | 16<br>(0.62) | 3<br>(0.12) | 38<br>(1.50) | 47<br>(1.86) | 25<br>(1.00) | 67<br>(2.62)  | 7<br>(0.27)  | 78<br>(3.06)  | 49<br>(1.93) | 122<br>(4.81) | 151<br>(5.94) |
| 50        | 64.5<br>(2.52) | 35<br>(1.38) | 6<br>(0.25)  | 19<br>(0.75) | 6<br>(0.25) | 38<br>(1.50) | 54<br>(2.12) | 25<br>(1.00) | 76<br>(3.00)  | 7<br>(0.27)  | 90<br>(3.53)  | 53<br>(2.09) | 143<br>(5.63) | 172<br>(6.76) |
| 63        | 80<br>(3.17)   | 44<br>(1.75) | 6<br>(0.25)  | 19<br>(0.75) | 6<br>(0.25) | 38<br>(1.50) | 54<br>(2.12) | 25<br>(1.00) | 76<br>(3.00)  | 7<br>(0.27)  | 90<br>(3.53)  | 52<br>(2.05) | 143<br>(5.63) | 172<br>(6.76) |
| 80        | 96<br>(3.77)   | 51<br>(2.00) | 13<br>(0.50) | 28<br>(1.09) | 6<br>(0.25) | 64<br>(2.50) | 72<br>(2.84) | 38<br>(1.50) | 104<br>(4.09) | 11<br>(0.42) | 108<br>(4.25) | 64<br>(2.52) | 173<br>(6.82) | 218<br>(8.57) |
| 100       | 115<br>(4.54)  | 60<br>(2.37) | 13<br>(0.50) | 32<br>(1.25) | 6<br>(0.25) | 70<br>(2.75) | 76<br>(3.00) | 44<br>(1.75) | 108<br>(4.25) | 14<br>(0.55) | 108<br>(4.25) | 66<br>(2.60) | 189<br>(7.44) | 240<br>(9.44) |

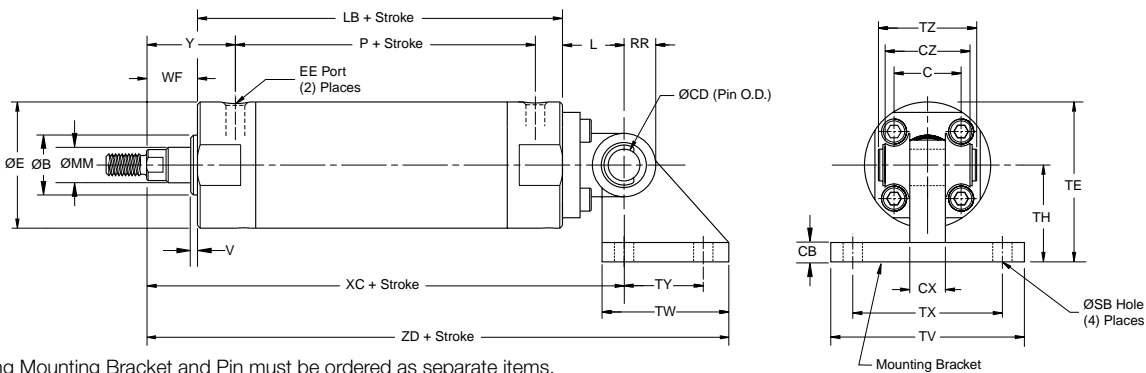
\* Ports are M5 for cushioned versions, metric  
 † Ports are 10-32 for cushioned versions, inch

**Style A - Double Rear Clevis**

Typical 20 to 63 mm bore



Typical 80 to 100 mm bore



Note: Mating Mounting Bracket and Pin must be ordered as separate items.

**Style A, envelope and mounting dimensions – mm (inch)**

| Bore size | ØB                   | C           | CB         | ØCD                 | CZ        | CX        | ØE          | EE          | L         | ØMM        | RR        | V        | WF        |
|-----------|----------------------|-------------|------------|---------------------|-----------|-----------|-------------|-------------|-----------|------------|-----------|----------|-----------|
|           | +0 -0.02 (+0 -0.001) |             |            | d 9 (-0.001 -0.003) |           |           |             | BSPT (NPTF) |           | rod dia.   |           |          |           |
| 20        | 12 (0.472)           | 14 (0.55)   | 3 (0.12)   | 8 (0.315)           | 29 (1.14) | –         | 27 (1.06)   | 1/8* (1/8†) | 14 (0.55) | 8 (0.315)  | 11 (0.43) | 2 (0.08) | 13 (0.50) |
| 25        | 14 (0.551)           | 16.5 (0.65) | 3 (0.12)   | 10 (0.394)          | 33 (1.30) | –         | 32 (1.26)   | 1/8* (1/8†) | 16 (0.63) | 10 (0.394) | 13 (0.51) | 2 (0.08) | 16 (0.62) |
| 32        | 18 (0.709)           | 20 (0.79)   | 4.5 (0.18) | 12 (0.472)          | 40 (1.57) | –         | 39 (1.53)   | 1/8 (1/8)   | 20 (0.79) | 12 (0.472) | 15 (0.59) | 2 (0.08) | 22 (0.88) |
| 40        | 25 (0.984)           | 26 (1.02)   | 4.5 (0.18) | 14 (0.551)          | 49 (1.93) | –         | 48.5 (1.91) | 1/8 (1/8)   | 22 (0.87) | 16 (0.630) | 18 (0.71) | 2 (0.08) | 22 (0.88) |
| 50        | 30 (1.181)           | 32 (1.26)   | 6 (0.25)   | 16 (0.630)          | 60 (2.36) | –         | 59 (2.32)   | 1/4 (1/4)   | 25 (0.98) | 20 (0.787) | 20 (0.79) | 2 (0.08) | 30 (1.19) |
| 63        | 32 (1.260)           | 38 (1.50)   | 8 (0.31)   | 18 (0.709)          | 74 (2.91) | –         | 72 (2.83)   | 1/4 (1/4)   | 30 (1.18) | 20 (0.787) | 22 (0.87) | 2 (0.08) | 30 (1.19) |
| 80        | 40 (1.575)           | 50 (1.97)   | 11 (0.43)  | 18 (0.709)          | 56 (2.20) | 28 (1.10) | 90 (3.54)   | 3/8 (3/8)   | 35 (1.38) | 25 (0.984) | 18 (0.71) | 3 (0.12) | 31 (1.22) |
| 100       | 50 (1.968)           | 60 (2.36)   | 12 (0.47)  | 22 (0.866)          | 64 (2.52) | 32 (1.26) | 110 (4.33)  | 1/2 (1/2)   | 43 (1.69) | 32 (1.260) | 22 (0.87) | 3 (0.12) | 31 (1.22) |

| Bore size | ØSB         | TY        | TV         | TE          | TH        | TX         | TW        | TZ           | Y         | Add Stroke |           |            |               |
|-----------|-------------|-----------|------------|-------------|-----------|------------|-----------|--------------|-----------|------------|-----------|------------|---------------|
|           |             |           |            |             |           |            |           |              |           | LB         | P         | XC         | ZD            |
| 20        | 5.5 (0.22)  | 28 (1.10) | 35 (1.39)  | 38 (1.50)   | 25 (0.98) | 16 (0.63)  | 42 (1.66) | 43.4 (1.71)  | 28 (1.10) | 69 (2.70)  | 45 (1.77) | 95 (3.75)  | 116 (4.58)    |
| 25        | 5.5 (0.22)  | 28 (1.10) | 39 (1.55)  | 45.5 (1.79) | 30 (1.18) | 20 (0.79)  | 42 (1.66) | 48 (1.89)    | 30 (1.18) | 69 (2.70)  | 46 (1.81) | 100 (3.95) | 121 (4.78)    |
| 32        | 7 (0.28)    | 28 (1.10) | 49 (1.93)  | 54 (2.13)   | 35 (1.38) | 22 (0.87)  | 48 (1.88) | 59.4 (2.34)  | 40 (1.57) | 71 (2.78)  | 43 (1.69) | 113 (4.45) | 137 (5.39)    |
| 40        | 7 (0.28)    | 30 (1.18) | 58 (2.28)  | 63.5 (2.50) | 40 (1.57) | 30 (1.18)  | 56 (2.20) | 71.4 (2.81)  | 42 (1.65) | 78 (3.06)  | 49 (1.93) | 122 (4.81) | 150 (5.91)    |
| 50        | 9 (0.35)    | 36 (1.42) | 72 (2.83)  | 79 (3.11)   | 50 (1.97) | 36 (1.42)  | 64 (2.52) | 86 (3.38)    | 53 (2.09) | 90 (3.53)  | 53 (2.09) | 145 (5.70) | 177 (6.96)    |
| 63        | 11 (0.43)   | 46 (1.81) | 90 (3.54)  | 96 (3.78)   | 60 (2.36) | 46 (1.81)  | 74 (2.91) | 105.4 (4.15) | 53 (2.09) | 90 (3.53)  | 52 (2.05) | 150 (5.90) | 187 (7.36)    |
| 80        | 11 (0.43)   | 45 (1.77) | 110 (4.33) | 100 (3.94)  | 55 (2.17) | 85 (3.35)  | 72 (2.83) | 64 (2.52)    | 59 (2.32) | 108 (4.25) | 64 (2.52) | 174 (6.85) | 232.5 (9.15)  |
| 100       | 13.5 (0.53) | 60 (2.36) | 130 (5.12) | 120 (4.72)  | 65 (2.56) | 100 (3.94) | 93 (3.66) | 72 (2.83)    | 57 (2.24) | 108 (4.25) | 66 (2.60) | 182 (7.17) | 258.5 (10.18) |

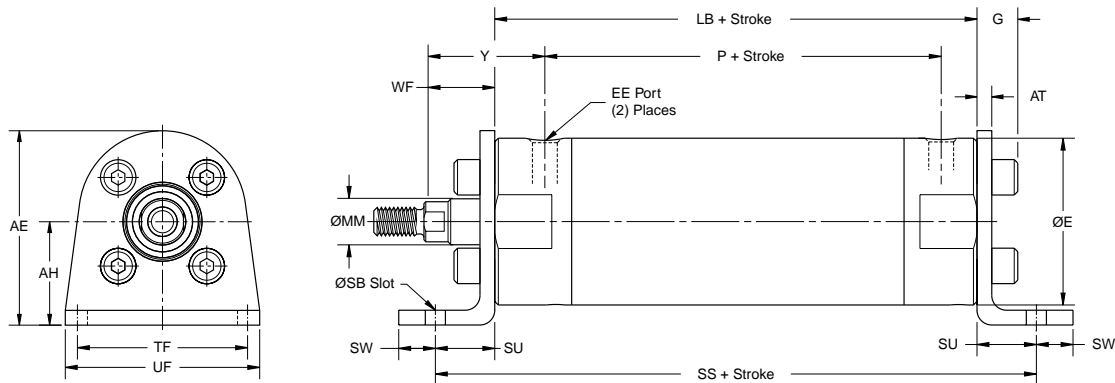
\* Ports are M5 for cushioned versions, metric

† Ports are 10-32 for cushioned versions, inch



**Style F - Foot Mount**

Typical 20 to 100 mm bore



**Style F, envelope and mounting dimensions – mm (inch)**

| Bore size | AE             | AH             | AT          | ØE             | EE (BSPT)      | G             | ØMM rod dia.  | ØSB          |
|-----------|----------------|----------------|-------------|----------------|----------------|---------------|---------------|--------------|
| 20        | 36.5<br>(1.44) | 20.6<br>(0.81) | 3<br>(0.12) | 27<br>(1.06)   | 1/8*<br>(1/8†) | 6<br>(0.20)   | 8<br>(0.315)  | 7<br>(0.27)  |
| 25        | 38.5<br>(1.52) | 20.6<br>(0.81) | 3<br>(0.12) | 32<br>(1.26)   | 1/8*<br>(1/8†) | 6.5<br>(0.22) | 10<br>(0.394) | 7<br>(0.27)  |
| 32        | 46.5<br>(1.83) | 25.4<br>(1.00) | 3<br>(0.12) | 39<br>(1.53)   | 1/8<br>(1/8)   | 6.5<br>(0.22) | 12<br>(0.472) | 7<br>(0.28)  |
| 40        | 51<br>(2.02)   | 25.4<br>(1.00) | 3<br>(0.12) | 48.5<br>(1.91) | 1/8<br>(1/8)   | 7<br>(0.25)   | 16<br>(0.630) | 7<br>(0.28)  |
| 50        | 72<br>(2.84)   | 38.1<br>(1.50) | 6<br>(0.25) | 59<br>(2.32)   | 1/4<br>(1/4)   | 11<br>(0.41)  | 20<br>(0.787) | 9<br>(0.34)  |
| 63        | 83.5<br>(3.29) | 44.5<br>(1.75) | 6<br>(0.25) | 72<br>(2.83)   | 1/4<br>(1/4)   | 12<br>(0.44)  | 20<br>(0.787) | 9<br>(0.34)  |
| 80        | 101<br>(3.98)  | 55<br>(2.17)   | 6<br>(0.25) | 90<br>(3.54)   | 3/8<br>(3/8)   | 12<br>(0.44)  | 25<br>(0.984) | 11<br>(0.43) |
| 100       | 121<br>(4.76)  | 65<br>(2.56)   | 6<br>(0.25) | 110<br>(4.33)  | 1/2<br>(1/2)   | 13<br>(0.50)  | 32<br>(1.260) | 14<br>(0.55) |

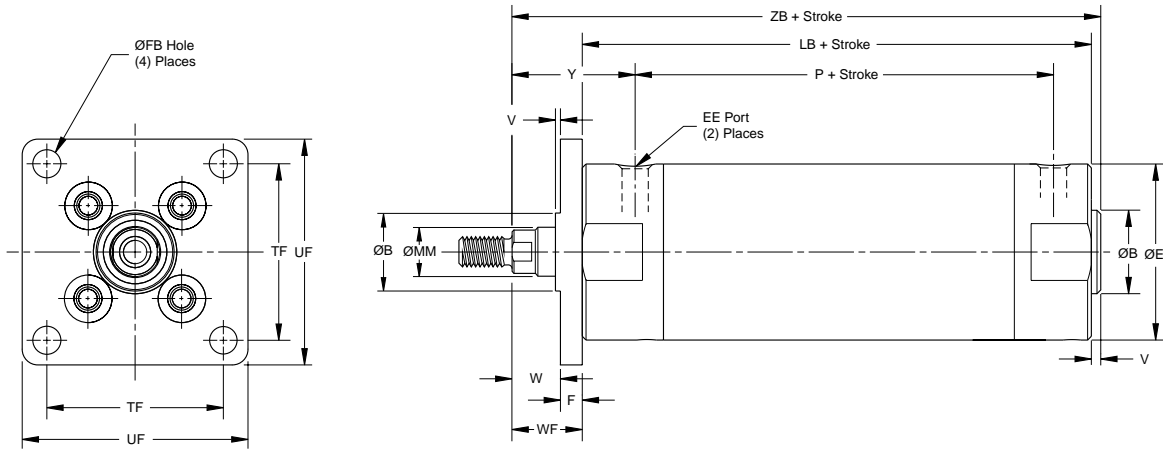
| Bore size | SU             | SW           | TF            | UF             | WF           | Y            | Add stroke    |              |               |
|-----------|----------------|--------------|---------------|----------------|--------------|--------------|---------------|--------------|---------------|
|           |                |              |               |                |              |              | LB            | P            | SS            |
| 20        | 14<br>(0.56)   | 11<br>(0.44) | 38<br>(1.50)  | 48<br>(1.88)   | 13<br>(0.50) | 28<br>(1.10) | 69<br>(2.70)  | 45<br>(1.77) | 97<br>(3.82)  |
| 25        | 14<br>(0.56)   | 11<br>(0.44) | 38<br>(1.50)  | 48<br>(1.88)   | 16<br>(0.62) | 30<br>(1.18) | 69<br>(2.70)  | 46<br>(1.81) | 97<br>(3.82)  |
| 32        | 19<br>(0.75)   | 19<br>(0.75) | 48<br>(1.88)  | 63.5<br>(2.50) | 22<br>(0.88) | 40<br>(1.57) | 71<br>(2.78)  | 43<br>(1.69) | 109<br>(4.28) |
| 40        | 18<br>(0.72)   | 20<br>(0.78) | 48<br>(1.88)  | 63.5<br>(2.50) | 22<br>(0.88) | 42<br>(1.65) | 78<br>(3.06)  | 49<br>(1.93) | 114<br>(4.50) |
| 50        | 25<br>(1.00)   | 16<br>(0.62) | 57<br>(2.24)  | 79<br>(3.12)   | 30<br>(1.19) | 53<br>(2.09) | 90<br>(3.53)  | 53<br>(2.09) | 140<br>(5.53) |
| 63        | 25<br>(1.00)   | 16<br>(0.62) | 73<br>(2.88)  | 95<br>(3.75)   | 30<br>(1.19) | 53<br>(2.09) | 90<br>(3.53)  | 52<br>(2.05) | 140<br>(5.53) |
| 80        | 28.5<br>(1.12) | 14<br>(0.55) | 100<br>(3.94) | 125<br>(4.92)  | 31<br>(1.22) | 59<br>(2.32) | 108<br>(4.25) | 64<br>(2.52) | 165<br>(6.49) |
| 100       | 30<br>(1.18)   | 16<br>(0.63) | 120<br>(4.72) | 150<br>(5.91)  | 31<br>(1.22) | 57<br>(2.24) | 108<br>(4.25) | 66<br>(2.60) | 168<br>(6.61) |

\* Ports are M5 for cushioned versions, metric  
 † Ports are 10-32 for cushioned versions, inch



**Style J - Front Flange**

Typical 20 to 100 mm bore



**Style J, envelope and mounting dimensions – mm (inch)**

| Bore size | ØB |         | EE (BSPT) | F           | ØFB | ØMM rod dia. | TF | UF  | V | WF | W  | Y  |
|-----------|----|---------|-----------|-------------|-----|--------------|----|-----|---|----|----|----|
|           | +0 | -0.02   |           |             |     |              |    |     |   |    |    |    |
| 20        | 12 | (0.472) | 27        | 1/8* (1/8†) | 6   | 5.5          | 8  | 28  | 2 | 13 | 7  | 28 |
| 25        | 14 | (0.551) | 32        | 1/8* (1/8†) | 7   | 5.5          | 10 | 32  | 2 | 16 | 9  | 30 |
| 32        | 18 | (0.709) | 39        | 1/8 (1/8)   | 7   | 7            | 12 | 38  | 2 | 22 | 15 | 40 |
| 40        | 25 | (0.984) | 48.5      | 1/8 (1/8)   | 8   | 7            | 16 | 46  | 2 | 22 | 14 | 42 |
| 50        | 30 | (1.181) | 59        | 1/4 (1/4)   | 9   | 9            | 20 | 58  | 2 | 30 | 21 | 53 |
| 63        | 32 | (1.260) | 72        | 1/4 (1/4)   | 9   | 11           | 20 | 70  | 2 | 30 | 21 | 53 |
| 80        | 40 | (1.575) | 90        | 3/8 (3/8)   | 11  | 11           | 25 | 82  | 3 | 31 | 20 | 59 |
| 100       | 50 | (1.968) | 110       | 1/2 (1/2)   | 14  | 14           | 32 | 100 | 3 | 31 | 17 | 57 |

| Bore size | Add stroke |           |            |
|-----------|------------|-----------|------------|
|           | LB         | P         | ZB         |
| 20        | 69 (2.70)  | 45 (1.77) | 83 (3.28)  |
| 25        | 69 (2.70)  | 46 (1.81) | 86 (3.40)  |
| 32        | 71 (2.78)  | 43 (1.69) | 95 (3.74)  |
| 40        | 78 (3.06)  | 49 (1.93) | 102 (4.02) |
| 50        | 90 (3.53)  | 53 (2.09) | 122 (4.80) |
| 63        | 90 (3.53)  | 52 (2.05) | 122 (4.80) |
| 80        | 108 (4.25) | 64 (2.52) | 142 (5.59) |
| 100       | 108 (4.25) | 66 (2.60) | 142 (5.59) |

\* Ports are M5 for cushioned versions, metric  
 † Ports are 10-32 for cushioned versions, inch

**B**

Round Body Cylinders  
Actuator Products

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SR/SM/SRD/SRDM  
Series

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SRX  
Series

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P1L  
Series

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P1A  
Series

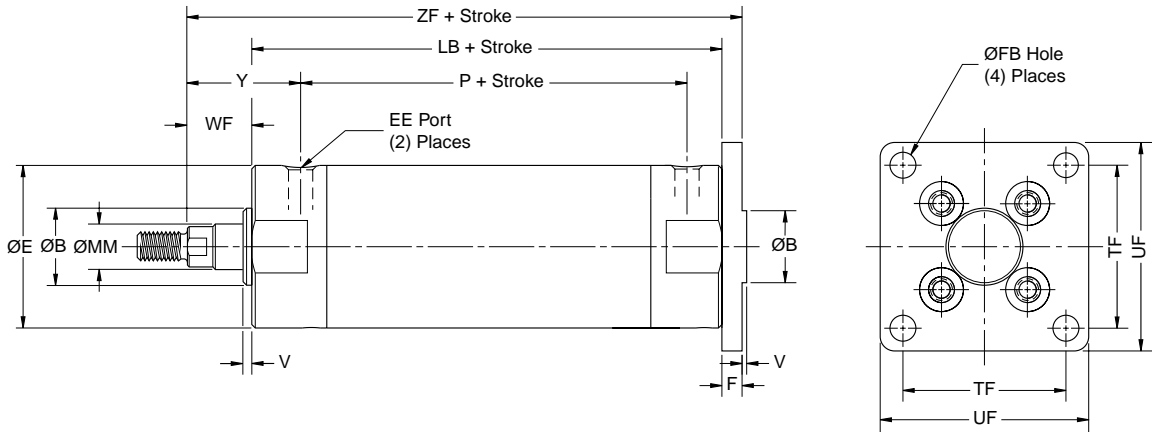
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P  
Series



**Style H - Rear Flange**

Typical 20 to 100 mm bore



**Style H, envelope and mounting dimensions – mm (inch)**

| Bore size | ØB<br>+0<br>-0.02 | ØE             | EE<br>(BSPT)   | F            | ØFB           | ØMM<br>rod<br>dia. | TF            | UF            | V           | WF           | Y            |
|-----------|-------------------|----------------|----------------|--------------|---------------|--------------------|---------------|---------------|-------------|--------------|--------------|
| 20        | 12<br>(0.472)     | 27<br>(1.06)   | 1/8*<br>(1/8†) | 6<br>(0.24)  | 5.5<br>(0.22) | 8<br>(0.315)       | 28<br>(1.10)  | 40<br>(1.57)  | 2<br>(0.08) | 13<br>(0.50) | 28<br>(1.10) |
| 25        | 14<br>(0.551)     | 32<br>(1.26)   | 1/8*<br>(1/8†) | 7<br>(0.28)  | 5.5<br>(0.22) | 10<br>(0.394)      | 32<br>(1.26)  | 44<br>(1.73)  | 2<br>(0.08) | 16<br>(0.62) | 30<br>(1.18) |
| 32        | 18<br>(0.709)     | 39<br>(1.53)   | 1/8<br>(1/8)   | 7<br>(0.28)  | 7<br>(0.28)   | 12<br>(0.472)      | 38<br>(1.50)  | 53<br>(2.09)  | 2<br>(0.08) | 22<br>(0.88) | 40<br>(1.57) |
| 40        | 25<br>(0.984)     | 48.5<br>(1.91) | 1/8<br>(1/8)   | 8<br>(0.31)  | 7<br>(0.28)   | 16<br>(0.630)      | 46<br>(1.81)  | 61<br>(2.40)  | 2<br>(0.08) | 22<br>(0.88) | 42<br>(1.65) |
| 50        | 30<br>(1.181)     | 59<br>(2.32)   | 1/4<br>(1/4)   | 9<br>(0.35)  | 9<br>(0.35)   | 20<br>(0.787)      | 58<br>(2.28)  | 76<br>(3.00)  | 2<br>(0.08) | 30<br>(1.19) | 53<br>(2.09) |
| 63        | 32<br>(1.260)     | 72<br>(2.83)   | 1/4<br>(1/4)   | 9<br>(0.35)  | 11<br>(0.43)  | 20<br>(0.787)      | 70<br>(2.76)  | 92<br>(3.62)  | 2<br>(0.08) | 30<br>(1.19) | 53<br>(2.09) |
| 80        | 40<br>(1.575)     | 90<br>(3.54)   | 3/8<br>(3/8)   | 11<br>(0.43) | 11<br>(0.43)  | 25<br>(0.984)      | 82<br>(3.23)  | 104<br>(4.09) | 3<br>(0.12) | 31<br>(1.22) | 59<br>(2.32) |
| 100       | 50<br>(1.968)     | 110<br>(4.33)  | 1/2<br>(1/2)   | 14<br>(0.55) | 14<br>(0.55)  | 32<br>(1.260)      | 100<br>(3.94) | 128<br>(5.04) | 3<br>(0.12) | 31<br>(1.22) | 57<br>(2.24) |

| Bore size | Add stroke    |              |               |
|-----------|---------------|--------------|---------------|
|           | LB            | P            | ZF            |
| 20        | 69<br>(2.70)  | 45<br>(1.77) | 87<br>(3.44)  |
| 25        | 69<br>(2.70)  | 46<br>(1.81) | 91<br>(3.60)  |
| 32        | 71<br>(2.78)  | 43<br>(1.69) | 100<br>(3.94) |
| 40        | 78<br>(3.06)  | 49<br>(1.93) | 108<br>(4.25) |
| 50        | 90<br>(3.53)  | 53<br>(2.09) | 129<br>(5.07) |
| 63        | 90<br>(3.53)  | 52<br>(2.05) | 129<br>(5.07) |
| 80        | 108<br>(4.25) | 64<br>(2.52) | 150<br>(5.91) |
| 100       | 108<br>(4.25) | 66<br>(2.60) | 153<br>(6.02) |

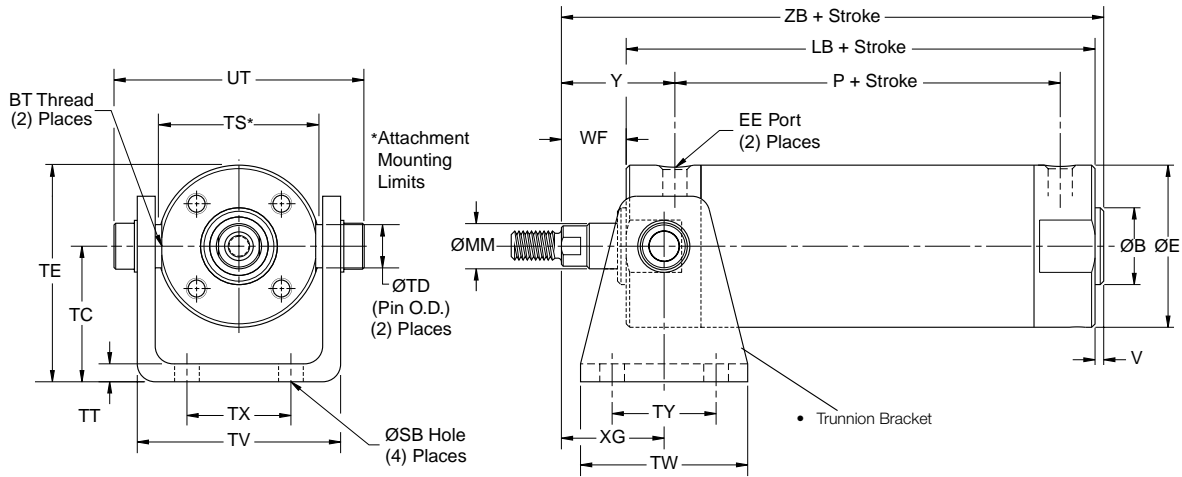
\* Ports are M5 for cushioned versions, metric  
 † Ports are 10-32 for cushioned versions, inch

**B**  
 Round Body Cylinders  
 Actuator Products  
 SR/SW/SRD/SRDM  
 Series  
 SRX  
 Series  
 P1L  
 Series  
 P1A  
 Series  
 P  
 Series



**Style E - Front Trunnion**

Typical 20 to 63 mm bore



Note: Trunnion Bracket must be ordered as separate item

**Style E, envelope and mounting dimensions – mm (inch)**

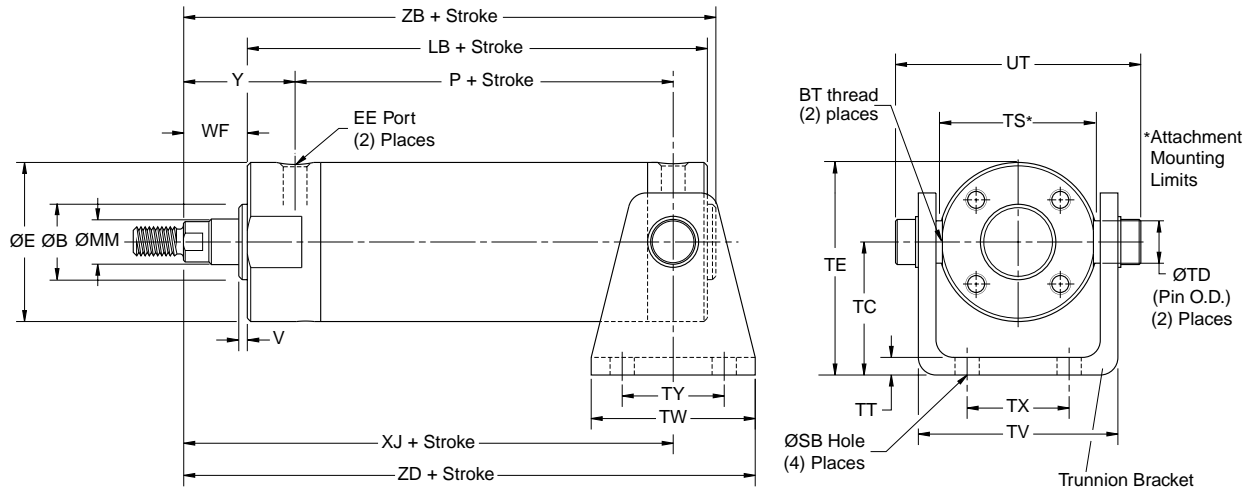
| Bore size | ØB |         | BT       | D  | ØE     | EE (BSPT)      | ØMM rod dia. | V       | WF | XG     | Y  | ØSB    | TC |        |    |        |     |        |    |        |
|-----------|----|---------|----------|----|--------|----------------|--------------|---------|----|--------|----|--------|----|--------|----|--------|-----|--------|----|--------|
|           | +0 | -0.02   |          |    |        |                |              |         |    |        |    |        |    |        |    |        |     |        |    |        |
| 20        | 12 | (0.472) | M5x0.80  | 6  | (0.24) | 1/8*<br>(1/8†) | 8            | (0.315) | 2  | (0.08) | 13 | (0.50) | 24 | (0.93) | 28 | (1.10) | 5.5 | (0.22) | 25 | (0.98) |
| 25        | 14 | (0.551) | M6x0.75  | 8  | (0.31) | 1/8*<br>(1/8†) | 10           | (0.394) | 2  | (0.08) | 16 | (0.62) | 27 | (1.05) | 30 | (1.18) | 5.5 | (0.22) | 30 | (1.18) |
| 32        | 18 | (0.709) | M8x1.00  | 10 | (0.39) | 1/8<br>(1/8)   | 12           | (0.472) | 2  | (0.08) | 22 | (0.88) | 33 | (1.31) | 40 | (1.57) | 7   | (0.28) | 35 | (1.38) |
| 40        | 25 | (0.984) | M10x1.25 | 12 | (0.47) | 1/8<br>(1/8)   | 16           | (0.630) | 2  | (0.08) | 22 | (0.88) | 34 | (1.35) | 42 | (1.65) | 7   | (0.28) | 40 | (1.57) |
| 50        | 30 | (1.181) | M12x1.25 | 16 | (0.63) | 1/4<br>(1/4)   | 20           | (0.787) | 2  | (0.08) | 30 | (1.19) | 43 | (1.70) | 53 | (2.09) | 9   | (0.35) | 50 | (1.97) |
| 63        | 32 | (1.260) | M14x1.50 | 16 | (0.63) | 1/4<br>(1/4)   | 20           | (0.787) | 2  | (0.08) | 30 | (1.19) | 43 | (1.70) | 53 | (2.09) | 11  | (0.43) | 60 | (2.36) |

| Bore size | ØTD e8 | TE      | TS   | TT     | TV | TW     | TX  | TY     | UT | Add stroke |    |        |    |        |    |        |      |        |    |        |    |        |     |        |
|-----------|--------|---------|------|--------|----|--------|-----|--------|----|------------|----|--------|----|--------|----|--------|------|--------|----|--------|----|--------|-----|--------|
|           |        |         |      |        |    |        |     |        |    | LB         | P  | ZB     |    |        |    |        |      |        |    |        |    |        |     |        |
| 20        | 8      | (0.315) | 38.5 | (1.51) | 28 | (1.10) | 3   | (0.12) | 35 | (1.39)     | 42 | (1.66) | 16 | (0.63) | 28 | (1.10) | 47.5 | (1.87) | 69 | (2.70) | 45 | (1.77) | 83  | (3.28) |
| 25        | 10     | (0.394) | 46   | (1.81) | 33 | (1.30) | 3   | (0.12) | 39 | (1.55)     | 42 | (1.66) | 20 | (0.79) | 28 | (1.10) | 53   | (2.09) | 69 | (2.70) | 46 | (1.81) | 86  | (3.40) |
| 32        | 12     | (0.472) | 54.5 | (2.15) | 40 | (1.58) | 4.5 | (0.18) | 49 | (1.93)     | 48 | (1.88) | 22 | (0.87) | 28 | (1.10) | 68   | (2.67) | 71 | (2.78) | 43 | (1.69) | 95  | (3.74) |
| 40        | 14     | (0.551) | 64   | (2.53) | 49 | (1.93) | 4.5 | (0.18) | 58 | (2.28)     | 56 | (2.20) | 30 | (1.18) | 30 | (1.18) | 79   | (3.10) | 78 | (3.06) | 49 | (1.93) | 102 | (4.02) |
| 50        | 16     | (0.630) | 79.5 | (3.13) | 60 | (2.36) | 6   | (0.25) | 72 | (2.83)     | 64 | (2.52) | 36 | (1.42) | 36 | (1.42) | 99   | (3.88) | 90 | (3.53) | 53 | (2.09) | 122 | (4.80) |
| 63        | 18     | (0.709) | 96   | (3.78) | 74 | (2.91) | 8   | (0.31) | 90 | (3.54)     | 74 | (2.91) | 46 | (1.81) | 46 | (1.81) | 119  | (4.69) | 90 | (3.53) | 52 | (2.05) | 122 | (4.80) |

\* Ports are M5 for cushioned versions, metric  
 † Ports are 10-32 for cushioned versions, inch

**Style D - Rear Trunnion**

Typical 20 to 63 mm bore



Note: Trunnion Bracket must be ordered as separate item

**Style D, envelope and mounting dimensions – mm (inch)**

| Bore size | ØB<br>+0<br>-0.02 | BT       | ØE             | EE<br>(BSPT)   | ØMM<br>rod<br>dia. | V           | WF           | Y            | ØSB           | TC           | ØTD<br>e8     | TE             |
|-----------|-------------------|----------|----------------|----------------|--------------------|-------------|--------------|--------------|---------------|--------------|---------------|----------------|
|           | BT                |          |                |                |                    |             |              |              |               |              |               |                |
| 20        | 12<br>(0.472)     | M5x0.80  | 27<br>(1.06)   | 1/8*<br>(1/8†) | 8<br>(0.315)       | 2<br>(0.08) | 13<br>(0.50) | 28<br>(1.10) | 5.5<br>(0.22) | 25<br>(0.98) | 8<br>(0.315)  | 38.5<br>(1.51) |
| 25        | 14<br>(0.551)     | M6x0.75  | 32<br>(1.26)   | 1/8*<br>(1/8†) | 10<br>(0.394)      | 2<br>(0.08) | 16<br>(0.62) | 30<br>(1.18) | 5.5<br>(0.22) | 30<br>(1.18) | 10<br>(0.394) | 46<br>(1.81)   |
| 32        | 18<br>(0.709)     | M8x1.00  | 39<br>(1.53)   | 1/8<br>(1/8)   | 12<br>(0.472)      | 2<br>(0.08) | 22<br>(0.88) | 40<br>(1.57) | 7<br>(0.28)   | 35<br>(1.38) | 12<br>(0.472) | 54.5<br>(2.15) |
| 40        | 25<br>(0.984)     | M10x1.25 | 48.5<br>(1.91) | 1/8<br>(1/8)   | 16<br>(0.630)      | 2<br>(0.08) | 22<br>(0.88) | 42<br>(1.65) | 7<br>(0.28)   | 40<br>(1.57) | 14<br>(0.551) | 64<br>(2.53)   |
| 50        | 30<br>(1.181)     | M12x1.25 | 59<br>(2.32)   | 1/4<br>(1/4)   | 20<br>(0.787)      | 2<br>(0.08) | 30<br>(1.19) | 53<br>(2.09) | 9<br>(0.35)   | 50<br>(1.97) | 16<br>(0.630) | 79.5<br>(3.13) |
| 63        | 32<br>(1.260)     | M14x1.50 | 72<br>(2.83)   | 1/4<br>(1/4)   | 20<br>(0.787)      | 2<br>(0.08) | 30<br>(1.19) | 53<br>(2.09) | 11<br>(0.43)  | 60<br>(2.36) | 18<br>(0.709) | 96<br>(3.78)   |

| Bore size | Add stroke   |               |              |              |              |              |                |              |              |               |               |               |
|-----------|--------------|---------------|--------------|--------------|--------------|--------------|----------------|--------------|--------------|---------------|---------------|---------------|
|           | TS           | TT            | TV           | TW           | TX           | TY           | UT             | LB           | P            | XJ            | ZB            | ZD            |
| 20        | 28<br>(1.10) | 3<br>(0.12)   | 35<br>(1.39) | 42<br>(1.66) | 16<br>(0.63) | 28<br>(1.10) | 47.5<br>(1.87) | 69<br>(2.70) | 45<br>(1.77) | 70<br>(2.77)  | 83<br>(3.28)  | 91<br>(3.60)  |
| 25        | 33<br>(1.30) | 3<br>(0.12)   | 39<br>(1.55) | 42<br>(1.66) | 20<br>(0.79) | 28<br>(1.10) | 53<br>(2.09)   | 69<br>(2.70) | 46<br>(1.81) | 73<br>(2.89)  | 86<br>(3.40)  | 94<br>(3.72)  |
| 32        | 40<br>(1.58) | 4.5<br>(0.18) | 49<br>(1.93) | 48<br>(1.88) | 22<br>(0.87) | 28<br>(1.10) | 68<br>(2.67)   | 71<br>(2.78) | 43<br>(1.69) | 83<br>(3.27)  | 95<br>(3.74)  | 107<br>(4.21) |
| 40        | 49<br>(1.93) | 4.5<br>(0.18) | 58<br>(2.28) | 56<br>(2.20) | 30<br>(1.18) | 30<br>(1.18) | 79<br>(3.10)   | 78<br>(3.06) | 49<br>(1.93) | 90<br>(3.54)  | 102<br>(4.02) | 118<br>(4.64) |
| 50        | 60<br>(2.36) | 6<br>(0.25)   | 72<br>(2.83) | 64<br>(2.52) | 36<br>(1.42) | 36<br>(1.42) | 99<br>(3.88)   | 90<br>(3.53) | 53<br>(2.09) | 108<br>(4.25) | 122<br>(4.80) | 140<br>(5.51) |
| 63        | 74<br>(2.91) | 8<br>(0.31)   | 90<br>(3.54) | 74<br>(2.91) | 46<br>(1.81) | 46<br>(1.81) | 119<br>(4.69)  | 90<br>(3.53) | 52<br>(2.05) | 108<br>(4.25) | 122<br>(4.80) | 145<br>(5.71) |

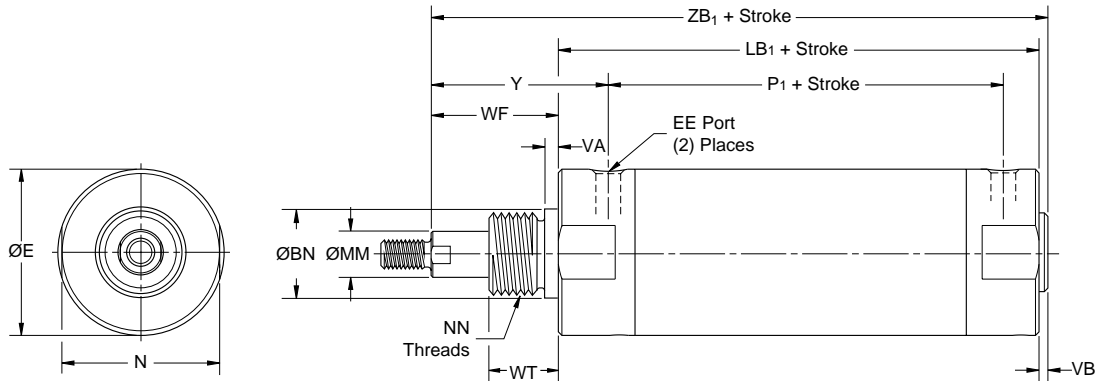
\* Ports are M5 for cushioned versions, metric  
 † Ports are 10-32 for cushioned versions, inch

**B**  
 Round Body Cylinders  
 Actuator Products  
 SR/SM/SRD/SRD/SDM  
 Series  
 SRX  
 Series  
 P1L  
 Series  
 P1A  
 Series  
 P  
 Series



**Style G - Nose Mount**

Typical 20 to 25 mm bore



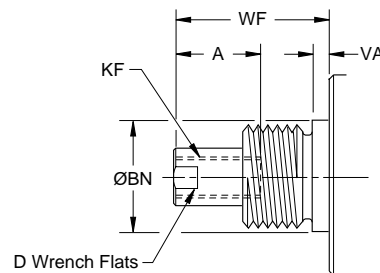
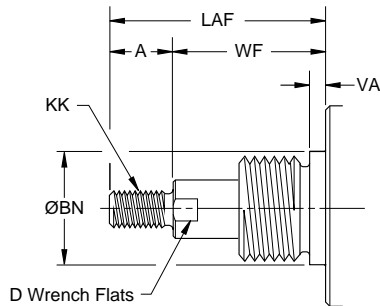
**Rod end details – 20 and 25 mm bore**

**Male threads**

Inch male - Style N  
 Metric male - Style 5

**Female threads**

Inch female - Style 9  
 Metric female - Style 6



**Special rod end threads**

**Thread style 3**

Special metric or inch threads, extension, blank, etc., are also available. To order, specify "Style 3" and give desired dimensions for KK or KF, A and LAF or WF (length dimensions in millimeters). If otherwise special, supply a dimensioned sketch.

**Style G, envelope and mounting dimensions – mm (inch)**

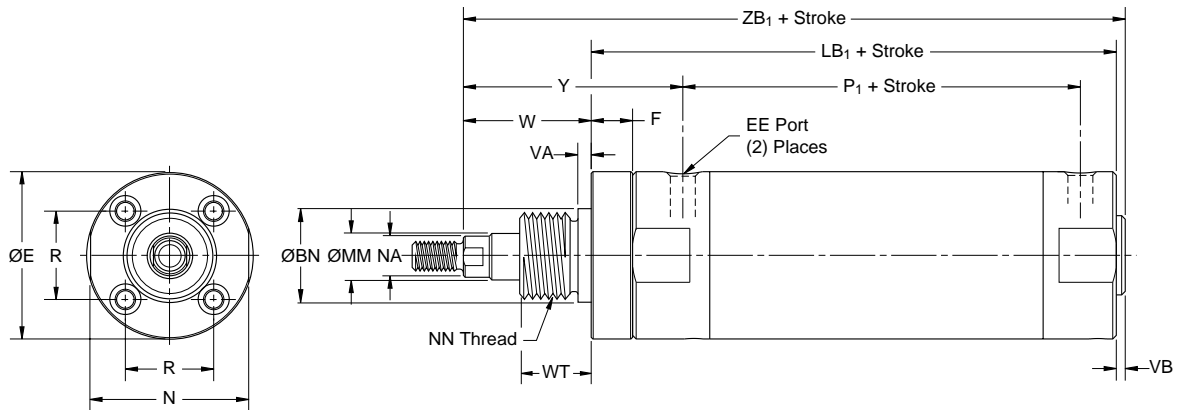
| Bore size | A            | BN +0 -0.08      | D           | ØE           | EE (BSPT)      | Thread KK Style 5     | Thread KF Style 6   | ØMM rod dia. | LAF           | NN                 | N            | VA          | VB          | WF           | WT           | Y            | Add stroke      |                |                 |
|-----------|--------------|------------------|-------------|--------------|----------------|-----------------------|---------------------|--------------|---------------|--------------------|--------------|-------------|-------------|--------------|--------------|--------------|-----------------|----------------|-----------------|
|           |              |                  |             |              |                |                       |                     |              |               |                    |              |             |             |              |              |              | LB <sup>1</sup> | P <sup>1</sup> | ZB <sup>1</sup> |
| 20        | 13<br>(0.50) | 19.02<br>(0.749) | 6<br>(0.24) | 27<br>(1.06) | 1/8*<br>(1/8†) | M8x1.25<br>(1/4-28)   | M5x0.80<br>(#10-32) | 35<br>(1.38) | 8<br>(0.315)  | 3/4-16<br>(3/4-16) | 24<br>(0.94) | 3<br>(0.12) | 2<br>(0.08) | 22<br>(0.88) | 16<br>(0.63) | 32<br>(1.25) | 66<br>(2.60)    | 47<br>(1.85)   | 90<br>(3.56)    |
| 25        | 13<br>(0.50) | 19.02<br>(0.749) | 8<br>(0.31) | 32<br>(1.26) | 1/8*<br>(1/8†) | M10x1.25<br>(5/16-24) | M6x1.00<br>(1/4-28) | 35<br>(1.38) | 10<br>(0.394) | 3/4-16<br>(3/4-16) | 29<br>(1.14) | 3<br>(0.12) | 2<br>(0.08) | 22<br>(0.88) | 16<br>(0.63) | 32<br>(1.25) | 66<br>(2.60)    | 47<br>(1.85)   | 90<br>(3.56)    |

\* Ports are M5 for cushioned versions, metric

† Ports are 10-32 for cushioned versions, inch

**Style G - Nose Mount**

Typical 32 to 63mm bore



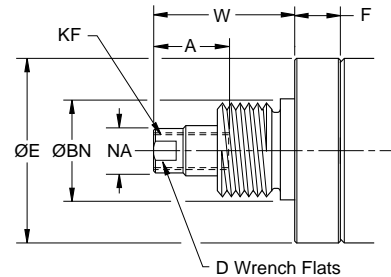
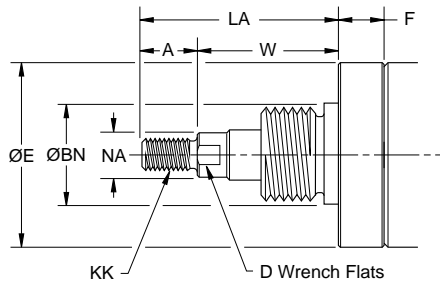
**Rod end details – 32 to 63mm bore**

**Male threads**

Inch male - Style N  
 Metric male - Style 5

**Female threads**

Inch female - Style 9  
 Metric female - Style 6



**Special rod end threads**

**Thread style 3**

Special metric or inch threads, extension, blank, etc., are also available. To order, specify "Style 3" and give desired dimensions for KK or KF, A and LAF or WF (Note: LAF = LA+F and WF = W+F), (length dimensions in millimeters). If otherwise special, supply a dimensioned sketch.

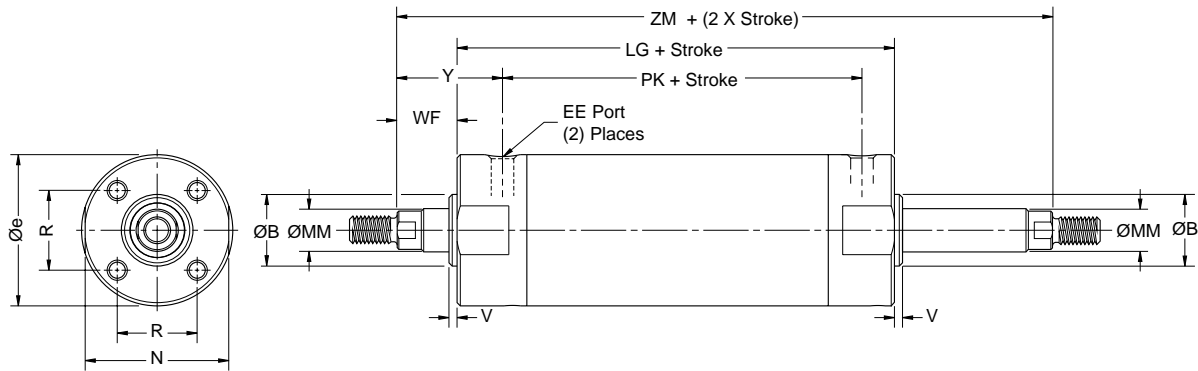
**Style G, envelope and mounting dimensions – mm (inch)**

| Bore size | A            | BN<br>+0<br>-0.8 | D            | ØE             | EE*<br>(BSPT) | F            | Thread<br>KK<br>Style 5 | Thread<br>KF<br>Style 6 | LA           | ØMM<br>rod<br>dia. | NN                     | N            | NA           | R            | VA          | VB          | W            | WT             | Y            | Add stroke      |                |                 |
|-----------|--------------|------------------|--------------|----------------|---------------|--------------|-------------------------|-------------------------|--------------|--------------------|------------------------|--------------|--------------|--------------|-------------|-------------|--------------|----------------|--------------|-----------------|----------------|-----------------|
|           |              |                  |              |                |               |              |                         |                         |              |                    |                        |              |              |              |             |             |              |                |              | LB <sup>1</sup> | P <sup>1</sup> | ZB <sup>1</sup> |
| 32        | 19<br>(0.75) | 19.02<br>(0.749) | 10<br>(0.39) | 39<br>(1.53)   | 1/8<br>(1/8)  | 9<br>(0.37)  | M10x1.25<br>(7/16-20)   | M8x1.25<br>(5/16-24)    | 41<br>(1.63) | 12<br>(0.472)      | 3/4-16<br>(3/4-16)     | 36<br>(1.42) | 11<br>(0.43) | 20<br>(0.79) | 3<br>(0.12) | 2<br>(0.08) | 22<br>(0.88) | 16<br>(0.63)   | 49<br>(1.93) | 80<br>(3.15)    | 43<br>(1.69)   | 104<br>(4.11)   |
| 40        | 19<br>(0.75) | 26.87<br>(1.058) | 12<br>(0.47) | 48.5<br>(1.91) | 1/8<br>(1/8)  | 14<br>(0.56) | M14x1.5<br>(7/16-20)    | M8x1.25<br>(3/8-24)     | 51<br>(2.00) | 16<br>(0.630)      | 1-14<br>(1-14)         | 44<br>(1.73) | 14<br>(0.55) | 26<br>(1.02) | 5<br>(0.19) | 2<br>(0.08) | 32<br>(1.25) | 22<br>(0.88)   | 66<br>(2.60) | 92<br>(3.62)    | 49<br>(1.93)   | 126<br>(4.95)   |
| 50        | 22<br>(0.88) | 34.90<br>(1.374) | 16<br>(0.63) | 59<br>(2.32)   | 1/4<br>(1/4)  | 15<br>(0.59) | M18x1.5<br>(1/2-20)     | M10x1.25<br>(1/2-20)    | 52<br>(2.07) | 20<br>(0.787)      | 1-1/4-12<br>(1-1/4-12) | 55<br>(2.17) | 18<br>(0.71) | 32<br>(1.26) | 3<br>(0.12) | 2<br>(0.08) | 30<br>(1.19) | 20.5<br>(0.81) | 68<br>(2.68) | 105<br>(4.12)   | 53<br>(2.09)   | 137<br>(5.39)   |
| 63        | 22<br>(0.88) | 38.10<br>(1.500) | 16<br>(0.63) | 72<br>(2.83)   | 1/4<br>(1/4)  | 16<br>(0.63) | M18x1.5<br>(1/2-20)     | M10x1.25<br>(1/2-20)    | 52<br>(2.07) | 20<br>(0.787)      | 1-3/8-12<br>(1-3/8-12) | 69<br>(2.72) | 18<br>(0.71) | 38<br>(1.50) | 3<br>(0.12) | 2<br>(0.08) | 30<br>(1.19) | 20.5<br>(0.81) | 70<br>(2.76) | 106<br>(4.19)   | 52<br>(2.05)   | 139<br>(5.46)   |

\* See Metric Dimensions for BSPT Port Size.  
 See Inch Dimensions for NPTF Port Size.

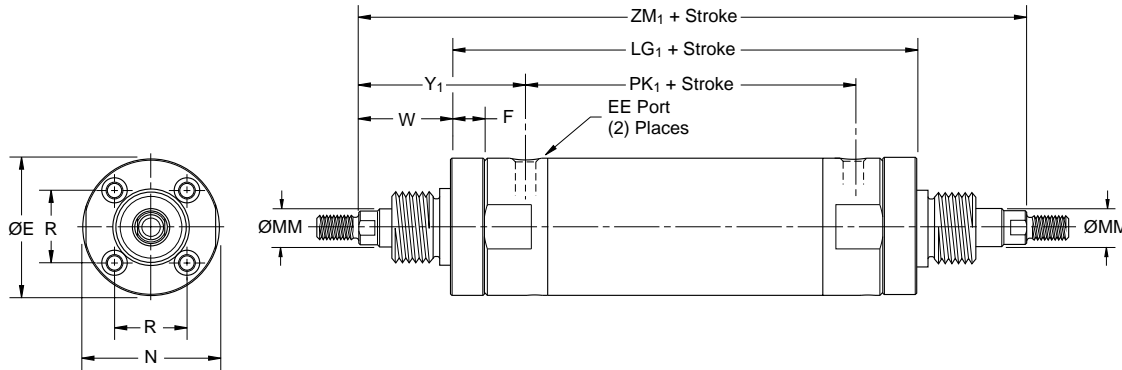
**Double-Rod**

Typical 20 to 100mm bore



**Double-Rod**

Nose Mount (32 to 63mm bore)



For detailed dimensions for the nose mount from 20 to 63 mm bore, please reference previous pages.

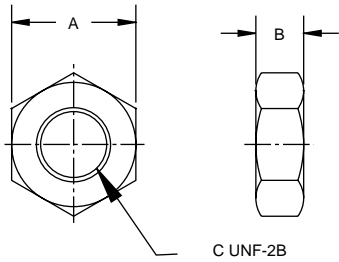
**Double rod, envelope and mounting dimensions – mm (inch)**

| Bore size | ØB      |        | F      | EE (BSPT)      | ØMM rod dia. |        | Add stroke |        |        |        |        |        |        |        |        |        |        |        |
|-----------|---------|--------|--------|----------------|--------------|--------|------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|           | +0      | -0.02  |        |                | ØE           | N      | R          | V      | W      | WF     | Y      | Y1     | LG     | LG1    | PK     | PK1    | ZM     | ZM1    |
| 20        | 12      | 27     | -      | 1/8*<br>(1/8†) | 8            | 24     | 14         | 2      | -      | 13     | 28     | 32     | 75     | 70     | 45     | 50     | 101    | 95     |
|           | (0.472) | (1.06) |        |                | (0.315)      | (0.94) | (0.55)     | (0.08) |        | (0.50) | (1.10) | (1.25) | (2.97) | (2.74) | (1.77) | (1.97) | (3.97) | (3.74) |
| 25        | 14      | 32     | -      | 1/8*<br>(1/8†) | 10           | 29     | 16.5       | 2      | -      | 16     | 30     | 32     | 75     | 70     | 47     | 50     | 107    | 101    |
|           | (0.551) | (1.26) |        |                | (0.394)      | (1.14) | (0.65)     | (0.08) |        | (0.62) | (1.18) | (1.25) | (2.97) | (2.74) | (1.85) | (1.97) | (4.21) | (3.98) |
| 32        | 18      | 39     | 9      | 1/8<br>(1/8)   | 12           | 36     | 20         | 2      | 22     | 22     | 40     | 49     | 78     | 97     | 42     | 42     | 122    | 141    |
|           | (0.709) | (1.53) | (0.37) |                | (0.472)      | (1.42) | (0.79)     | (0.08) | (0.88) | (0.88) | (1.57) | (1.93) | (3.06) | (3.80) | (1.65) | (1.65) | (4.82) | (5.56) |
| 40        | 25      | 48.5   | 14     | 1/8<br>(1/8)   | 16           | 44     | 26         | 2      | 32     | 22     | 42     | 66     | 87     | 115    | 47     | 47     | 131    | 179    |
|           | (0.984) | (1.91) | (0.56) |                | (0.630)      | (1.73) | (1.02)     | (0.08) | (1.25) | (0.88) | (1.65) | (2.60) | (3.41) | (4.53) | (1.85) | (1.85) | (5.17) | (7.03) |
| 50        | 30      | 59     | 15     | 1/4<br>(1/4)   | 20           | 55     | 32         | 2      | 30     | 30     | 53     | 68     | 100    | 130    | 54     | 54     | 160    | 190    |
|           | (1.181) | (2.32) | (0.59) |                | (0.787)      | (2.17) | (1.26)     | (0.08) | (1.19) | (1.19) | (2.09) | (2.68) | (3.93) | (5.11) | (2.13) | (2.13) | (6.31) | (7.49) |
| 63        | 32      | 72     | 17     | 1/4<br>(1/4)   | 20           | 69     | 38         | 2      | 30     | 30     | 53     | 70     | 100    | 133    | 54     | 54     | 160    | 194    |
|           | (1.260) | (2.83) | (0.66) |                | (0.787)      | (2.72) | (1.50)     | (0.08) | (1.19) | (1.19) | (2.09) | (2.76) | (3.93) | (5.25) | (2.13) | (2.13) | (6.31) | (7.63) |
| 80        | 40      | 90     | -      | 3/8<br>(3/8)   | 25           | 86     | 50         | 3      | -      | 31     | 59     | -      | 119    | -      | 61     | -      | 181    | -      |
|           | (1.575) | (3.54) |        |                | (0.984)      | (3.39) | (1.97)     | (0.12) |        | (1.22) | (2.32) |        | (4.70) |        | (2.40) |        | (7.14) |        |
| 100       | 50      | 110    | -      | 1/2<br>(1/2)   | 32           | 106    | 60         | 3      | -      | 31     | 57     | -      | 119    | -      | 65     | -      | 181    | -      |
|           | (1.968) | (4.33) |        |                | (1.260)      | (4.17) | (2.36)     | (0.12) |        | (1.22) | (2.24) |        | (4.70) |        | (2.56) |        | (7.14) |        |

\* Ports are M5 for cushioned versions, metric  
 † Ports are 10-32 for cushioned versions, inch



**Rod Jam Nut**



Rod jam nut should be ordered separately on all mounting styles.

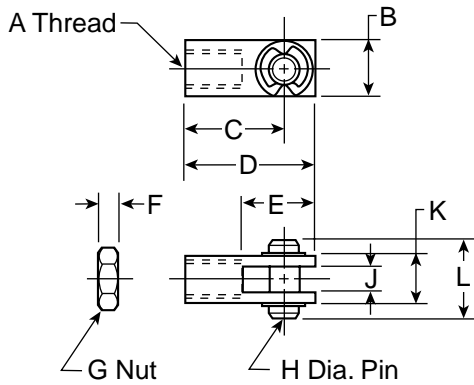
**Rod Jam Nut Dimensions – mm**

| Bore size | A  | B  | C          | Part number       |
|-----------|----|----|------------|-------------------|
| 20        | 13 | 4  | M8 x 1.25  | <b>L075540008</b> |
| 25-32     | 17 | 5  | M10 x 1.25 | <b>L075540010</b> |
| 40        | 22 | 7  | M14 x 1.5  | <b>L075540014</b> |
| 50-63     | 27 | 8  | M18 x 1.5  | <b>L075540018</b> |
| 80        | 32 | 11 | M22 x 1.5  | <b>L075540022</b> |
| 100       | 41 | 16 | M26 x 1.5  | <b>L075540026</b> |

**Rod Jam Nut Dimensions – inch**

| Bore size | A    | B    | C       | Part number       |
|-----------|------|------|---------|-------------------|
| 20        | 0.44 | 0.16 | 1/4-28  | <b>L077970025</b> |
| 25        | 0.50 | 0.19 | 5/16-24 | <b>L077970031</b> |
| 32-40     | 0.69 | 0.25 | 7/16-20 | <b>L077970044</b> |
| 50-63     | 0.75 | 0.31 | 1/2-20  | <b>L077970050</b> |
| 80        | 1.12 | 0.42 | 3/4 -16 | <b>L077970075</b> |
| 100       | 1.50 | 0.55 | 1-14    | <b>L077970100</b> |

**Piston Rod Clevis**



**Piston Rod Clevis Dimensions – mm**

| Bore size | A        | B  | C  | D  | E  | F  | H h9 | J   | K    | L    | Part number       |
|-----------|----------|----|----|----|----|----|------|-----|------|------|-------------------|
| 20        | M8x1.25  | 13 | 24 | 30 | 18 | 4  | 6.35 | 6.5 | 13   | 17.5 | <b>L077590020</b> |
| 25        | M10x1.25 | 19 | 24 | 30 | 18 | 5  | 6.35 | 6.5 | 19   | 24.5 | <b>L077590025</b> |
| 32        | M10x1.25 | 19 | 34 | 43 | 24 | 5  | 9.52 | 10  | 19   | 26   | <b>L077590032</b> |
| 40        | M14x1.5  | 19 | 34 | 43 | 24 | 7  | 9.52 | 10  | 19   | 26   | <b>L077590040</b> |
| 50        | M18x1.5  | 28 | 34 | 43 | 24 | 8  | 9.52 | 10  | 28   | 36   | <b>L077590050</b> |
| 63        | M18x1.5  | 28 | 34 | 43 | 24 | 8  | 9.52 | 10  | 28   | 36   | <b>L077590050</b> |
| 80        | M22x1.5  | 38 | 50 | 71 | 48 | 11 | 18   | 28  | 56   | 64   | <b>PIM-4PRC</b>   |
| 100       | M26x1.5  | 44 | 55 | 79 | 55 | 16 | 22   | 32  | 63.5 | 72   | <b>L077590100</b> |

**Piston Rod Clevis Dimensions – inch**

| Bore size | A       | B    | C    | D    | E    | F    | H     | J    | K +0<br>-0.02 | L    | Part number       |
|-----------|---------|------|------|------|------|------|-------|------|---------------|------|-------------------|
| 20        | 1/4-28  | 0.50 | 0.94 | 1.19 | 0.69 | 0.16 | 0.250 | 0.26 | 0.50          | 0.69 | <b>L077960025</b> |
| 25        | 5/16-24 | 0.50 | 0.94 | 1.19 | 0.69 | 0.19 | 0.250 | 0.26 | 0.50          | 0.69 | <b>L077960031</b> |
| 32        | 7/16-20 | 0.75 | 1.32 | 1.69 | 0.94 | 0.25 | 0.375 | 0.38 | 0.75          | 1.03 | <b>L077960044</b> |
| 40        | 7/16-20 | 0.75 | 1.32 | 1.69 | 0.94 | 0.25 | 0.375 | 0.38 | 0.75          | 1.03 | <b>L077960044</b> |
| 50        | 1/2-20  | 0.75 | 1.32 | 1.69 | 0.94 | 0.31 | 0.375 | 0.38 | 0.75          | 1.03 | <b>L077960050</b> |
| 63        | 1/2-20  | 0.75 | 1.32 | 1.69 | 0.94 | 0.31 | 0.375 | 0.38 | 0.75          | 1.03 | <b>L077960050</b> |
| 80        | 3/4-16  | 1.25 | 1.81 | 2.38 | 1.31 | 0.42 | 0.437 | 0.52 | 1.25          | 1.66 | <b>L077960075</b> |
| 100       | 1-14    | 1.50 | 2.63 | 3.38 | 1.81 | 0.55 | 0.500 | 0.64 | 1.50          | 1.91 | <b>L077960100</b> |

**B**  
Round Body Cylinders  
Actuator Products  
SRX  
Series  
SR/SM/SRD/SRDM  
Series  
P1L  
Series  
P1A  
Series  
P  
Series





**Mounting Kits & Accessories**

**How to order P1L mounting kits as a separate item**

| Bore size | Foot mounting |            | Flange     |            | Trunnion / double clevis bracket | Single clevis bracket |
|-----------|---------------|------------|------------|------------|----------------------------------|-----------------------|
|           | Inch          | Metric     | Inch       | Metric     |                                  |                       |
| 20        | L077440075    | L077550020 | L077450075 | L077560020 | L077510020                       | L077520075            |
| 25        | L077440100    | L077550025 | L077450100 | L077560025 | L077510025                       | L077520075            |
| 32        | L077440125    | L077550032 | L077450125 | L077560032 | L077510032                       | L077520125            |
| 40        | L077440150    | L077550040 | L077450150 | L077560040 | L077510040                       | L077520150            |
| 50        | L077440200    | L077550050 | L077450200 | L077560050 | L077510050                       | L077520200            |
| 63        | L077440250    | L077550063 | L077450250 | L077560063 | L077510063                       | L077520250            |
| 80        | L077440312    | L077550080 | L077450312 | L077560080 | L077510080                       | L077520312            |
| 100       | L077440400    | L077550100 | L077450400 | L077560100 | L077510100                       | L077520400            |

| Bore size | Single clevis |            | Double clevis |            | Single clevis pin | Double clevis pin |
|-----------|---------------|------------|---------------|------------|-------------------|-------------------|
|           | Inch          | Metric     | Inch          | Metric     |                   |                   |
| 20        | L077470075    | L077570020 | L077480075    | L077580020 | L077490075        | L077500020        |
| 25        | L077470100    | L077570025 | L077480100    | L077580025 | L077490075        | L077500025        |
| 32        | L077470125    | L077570032 | L077480125    | L077580032 | L077490125        | L077500032        |
| 40        | L077470150    | L077570040 | L077480150    | L077580040 | L077490150        | L077500040        |
| 50        | L077470200    | L077570050 | L077480200    | L077580050 | L077490200        | L077500050        |
| 63        | L077470250    | L077570063 | L077480250    | L077580063 | L077490200        | L077500063        |
| 80        | L077470312    | L077570080 | L077480312    | L077580080 | L077490312        | L077500080        |
| 100       | L077470400    | L077570100 | L077480400    | L077580100 | L077490400        | L077500100        |

**Notes:**

- “Inch” mounting kits include inch threaded bolts, while “Metric” mounting kits include metric threaded bolts. Please verify that the kit style matches the cylinder Construction type (code “N” or “M”) for which it is intended.
- Clevis pins may be used for either Inch or Metric mounting kits.

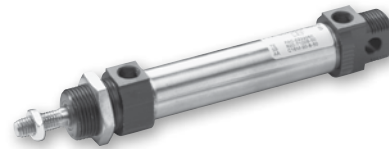
**Service kits**

| Bore size | Single rod cylinder repair kits<br>Consisting of: 1 ea. Symbol #5, 7, 12, & 2 ea. Symbol #1, 8 11, 14 |                           | Double rod cylinder repair kits<br>Consisting of: 1 ea. Symbol #5, 7, & 2 ea. Symbol #1, 8 11, 12, 14 |                           |
|-----------|---|---------------------------|---|---------------------------|
|           | Class 1 seals, std. service   | Class 5 seals, high temp. | Class 1 seals, std. service   | Class 5 seals, high temp. |
| mm        | Part number   | Part number               | Part number   | Part number               |
| 20        | P1L020D001  | P1L020D005                | P1L020K001  | P1L020K005                |
| 25        | P1L025D001  | P1L025D005                | P1L025K001  | P1L025K005                |
| 32        | P1L032D001  | P1L032D005                | P1L032K001  | P1L032K005                |
| 40        | P1L040D001  | P1L040D005                | P1L040K001  | P1L040K005                |
| 50        | P1L050D001  | P1L050D005                | P1L050K001  | P1L050K005                |
| 63        | P1L063D001  | P1L063D005                | P1L063K001  | P1L063K005                |
| 80        | P1L080D001  | P1L080D005                | P1L080K001  | P1L080K005                |
| 100       | P1L100D001  | P1L100D005                | P1L100K001  | P1L100K005                |

**B**  
 Round Body Cylinders  
 Actuator Products  
 SR/SM/SRD/SRDM  
 Series  
 SRX  
 Series  
 P1L  
 Series  
 P1A  
 Series  
 P  
 Series



- Conforms to ISO 6432 and CETOP RP52P standards
- 5 bore sizes, 10mm to 25mm
- Stainless steel body with black anodized aluminum end caps
- Stainless steel piston rod
- Magnetic piston and bumpers standard



**Operating information**

Operating pressure: 10 bar (145 PSIG), air  
 Temperature range:  
 Working -20°C to 80°C (4°F to 176°F)  
 High temperature version  
 20mm, 25mm -10°C to 150°C (14°F to 302°F)  
 10mm, 12mm, 16mm -10°C to 120°C (14°F to 248°F)  
 Low temperature version -40°C to 60°C (-40°F to 140°F)  
 Filtration requirements: 40 micron, dry filtered air  
 For technical information see CD



**B**

Round Body Cylinders  
 Actuator Products

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 Series

**Ordering information**

**P1A - S**      **016**      **M**      **S**      -      **0025**

| Bore size |      |
|-----------|------|
| 010       | 10mm |
| 012       | 12mm |
| 016       | 16mm |
| 020       | 20mm |
| 025       | 25mm |

| Cylinder type / function |   |
|--------------------------|---|
| <b>M</b>                 | Double-acting, adjustable cushioning, Ø16-25 mm. Not for sealing material type F.             |
| <b>D</b>                 | Double-acting, bumpers, Ø10 - Ø25   |
| <b>F</b>                 | Double-acting, adjustable cushioning, double rod, Ø16-25 mm. Not for sealing material type F. |
| <b>K</b>                 | Double-acting, bumpers, double rod, Ø10 - Ø25   |
| <b>S</b>                 | Single-acting, bumpers, spring return for retract stroke, Ø10-25 mm                           |
| <b>T</b>                 | Single-acting, bumpers, spring extend for advance stroke, Ø16-25 mm                           |

| Sealing material |  |
|------------------|--|
| <b>S</b>         | Standard<br>-20°C to +80°C (-4°F to +176°F)<br>Magnetic piston   |
| <b>F</b>         | High temperature:<br>Ø12 mm, 16 mm, 20 mm and 25 mm<br>-10°C to +150°C. (14°F to 302°F)<br>Non magnetic piston |
| <b>V</b>         | External seals of fluorinated rubber<br>-20°C to +80°C (-4°F to +176°F)<br>Magnetic piston                     |

**Stroke length, mm**  
 E.g. 0025 = 25 mm  
 For standard stroke length and max length see table below.

| Stroke Lengths                                       |           | Stroke Length (* = standard, ° = non-standard, blank = N/A) |    |    |     |    |    |     |     |      |      |      |      |      |      |      |      |   |
|--|-----------|---|----|----|-----|----|----|-----|-----|------|------|------|------|------|------|------|------|---|
| Cylinder model                                       | Bore size | 10  | 15 | 20 | 25* | 30 | 40 | 50* | 80* | 100* | 125* | 160* | 200* | 250* | 320* | 400* | 500* |   |
|  |           | <b>Double acting with fixed end-cushioning:</b>             |    |    |     |    |    |     |     |      |      |      |      |      |      |      |      |   |
| P1A-S 010 D  | 10        | •   | •  | •  | •   | •  | •  | •   | •   | •    | •    | •    | •    | •    | •    | •    | •    | • |
| P1A-S 012 D  | 12        | •   | •  | •  | •   | •  | •  | •   | •   | •    | •    | •    | •    | •    | •    | •    | •    | • |
| P1A-S 016 D  | 16        | •   | •  | •  | •   | •  | •  | •   | •   | •    | •    | •    | •    | •    | •    | •    | •    | • |
| P1A-S 020 D  | 20        | •   | •  | •  | •   | •  | •  | •   | •   | •    | •    | •    | •    | •    | •    | •    | •    | • |
| P1A-S 025 D  | 25        | •   | •  | •  | •   | •  | •  | •   | •   | •    | •    | •    | •    | •    | •    | •    | •    | • |
| <b>Double acting with adjustable end-cushioning:</b> |           |   |    |    |     |    |    |     |     |      |      |      |      |      |      |      |      |   |
| P1A-S 016 M  | 16        |   |    | •  | •   | •  | •  | •   | •   | •    | •    | •    | •    | •    | •    | •    | •    | • |
| P1A-S 020 M  | 20        |   |    | •  | •   | •  | •  | •   | •   | •    | •    | •    | •    | •    | •    | •    | •    | • |
| P1A-S 025 M  | 25        |   |    | •  | •   | •  | •  | •   | •   | •    | •    | •    | •    | •    | •    | •    | •    | • |
| <b>Single acting:</b>                                |           |   |    |    |     |    |    |     |     |      |      |      |      |      |      |      |      |   |
| P1A-S 010 SS   | 10        | •   | •  | •  | •   | •  | •  | •   | •   |      |      |      |      |      |      |      |      |   |
| P1A-S 012 SS   | 12        | •   | •  | •  | •   | •  | •  | •   | •   |      |      |      |      |      |      |      |      |   |
| P1A-S 016 SS(TS)                                     | 16        | •   | •  | •  | •   | •  | •  | •   | •** |      |      |      |      |      |      |      |      |   |
| P1A-S 020 SS(TS)                                     | 20        | •   | •  | •  | •   | •  | •  | •   | •   |      |      |      |      |      |      |      |      |   |
| P1A-S 025 SS(TS)                                     | 25        | •   | •  | •  | •   | •  | •  | •   | •   |      |      |      |      |      |      |      |      |   |

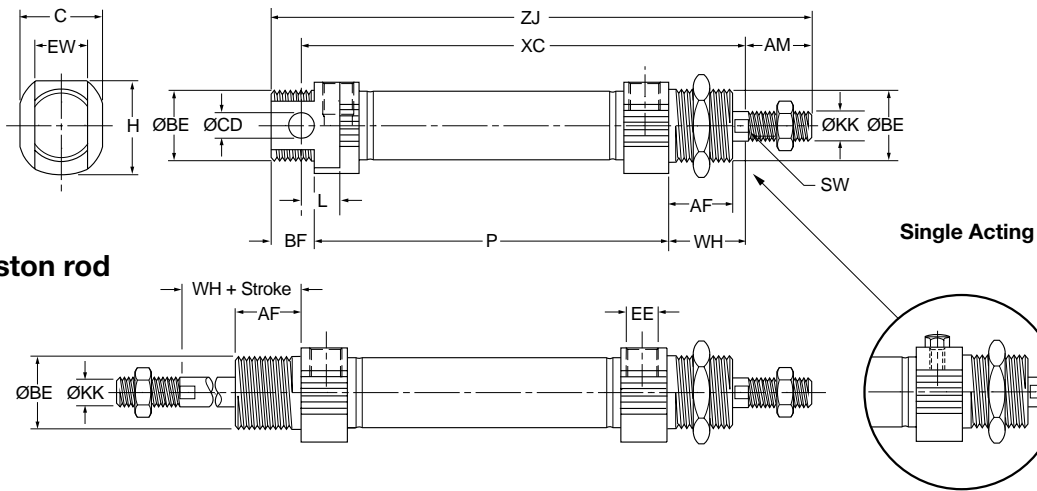
\* Standard stroke lengths in mm according to ISO 4393  
 \*\* Not for the TS version

**Sensors**

For sensors see page B294.



**Double acting cylinders**



**Double piston rod**

| Bore size mm     | AM <sup>0/-2</sup> mm | BE       | AF mm | BF mm | C mm | CD <sup>h9</sup> mm | EE   | EW mm | H mm | KK       | L mm | SW mm | WH $\pm$ 1.2 mm |
|------------------|-----------------------|----------|-------|-------|------|---------------------|------|-------|------|----------|------|-------|-----------------|
| 10               | 12                    | M12x1.25 | 12    | 10    | 14.0 | 4                   | M5   | 8     | 16.7 | M4       | 6    | –     | 16              |
| 12               | 16                    | M16x1.5  | 18    | 13    | 18.0 | 6                   | M5   | 12    | 19.1 | M6       | 9    | 5     | 22              |
| 16 <sup>1)</sup> | 16                    | M16x1.5  | 18    | 13    | 18.0 | 6                   | M5   | 12    | 19.1 | M6       | 9    | 5     | 22              |
| 16 <sup>2)</sup> | 16                    | M16x1.5  | 18    | 13    | 25.0 | 6                   | M5   | 12    | 24.0 | M6       | 9    | 5     | 22              |
| 20               | 20                    | M22x1.5  | 20    | 14    | 24.0 | 8                   | G1/8 | 16    | 27.0 | M8       | 12   | 7     | 24              |
| 25               | 22                    | M22x1.5  | 22    | 14    | 27.5 | 8                   | G1/8 | 16    | 29.0 | M10x1.25 | 12   | 9     | 28              |

1) P1A-S016DS/SS/TS      2) P1A-S016MS

**Double acting cylinders**

| Bore size mm | XC mm        | ZJ mm        | P mm        |
|--------------|--------------|--------------|-------------|
| 10           | 64 + stroke  | 84 + stroke  | 46 + stroke |
| 12           | 75 + stroke  | 99 + stroke  | 48 + stroke |
| 16           | 82 + stroke  | 104 + stroke | 53 + stroke |
| 20           | 95 + stroke  | 125 + stroke | 67 + stroke |
| 25           | 104 + stroke | 132 + stroke | 68 + stroke |

**Single-acting, spring return, type SS**

| Bore size mm | XC (mm) at various strokes |     |     |     |     |     | ZJ (mm) at various strokes |     |     |     |     |     | P (mm) at various strokes |    |    |     |     |     |
|--------------|----------------------------|-----|-----|-----|-----|-----|----------------------------|-----|-----|-----|-----|-----|---------------------------|----|----|-----|-----|-----|
|              | 10                         | 15  | 25  | 40  | 50  | 80  | 10                         | 15  | 25  | 40  | 50  | 80  | 10                        | 15 | 25 | 40  | 50  | 80  |
| 10           | 74                         | 79  | 89  | 126 | 136 | 174 | 94                         | 99  | 109 | 146 | 156 | 194 | 56                        | 61 | 71 | 108 | 118 | 156 |
| 12           | 85                         | 90  | 100 | 132 | 142 | 185 | 109                        | 114 | 124 | 156 | 166 | 209 | 58                        | 63 | 73 | 105 | 115 | 158 |
| 16           | 92                         | 97  | 107 | 122 | 132 | 184 | 114                        | 119 | 129 | 144 | 154 | 206 | 63                        | 68 | 78 | 93  | 103 | 155 |
| 20           | 105                        | 110 | 120 | 135 | 145 | 191 | 135                        | 140 | 150 | 165 | 175 | 221 | 77                        | 82 | 92 | 107 | 117 | 163 |
| 25           | 114                        | 119 | 129 | 144 | 154 | 201 | 142                        | 147 | 157 | 172 | 182 | 229 | 78                        | 83 | 93 | 108 | 118 | 165 |

**Single-acting, spring-extended, type TS**

| Bore size mm | ZC <sup>3)</sup> (mm) at various strokes |     |     |     |     | ZJ <sup>3)</sup> (mm) at various strokes |     |     |     |     | P (mm) at various strokes |     |    |    |     |     |     |     |
|--------------|--|-----|-----|-----|-----|--|-----|-----|-----|-----|---------------------------|-----|----|----|-----|-----|-----|-----|
|              | 10                                       | 15  | 25  | 40  | 80  | 10                                       | 15  | 25  | 40  | 80  | 10                        | 15  | 25 | 40 | 80  |     |     |     |
| 16           | 107                                      | 112 | 122 | 137 | 147 | –  | 134 | 139 | 149 | 164 | 174                       | –   | 78 | 83 | 93  | 108 | 118 | –   |
| 20           | 120                                      | 125 | 135 | 150 | 160 | 195                                      | 156 | 161 | 171 | 186 | 196                       | 231 | 92 | 97 | 107 | 122 | 132 | 167 |
| 25           | 129                                      | 134 | 144 | 159 | 169 | 205                                      | 165 | 170 | 180 | 195 | 205                       | 241 | 93 | 98 | 108 | 123 | 133 | 169 |

3) With piston rod retracted, as shown in the dimension drawing  
 Length tolerances  $\pm$ 1 mm    Stroke length tolerance +1.5/0 mm

**B**  
 Round Body Cylinders  
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SR/SM/SRD/SRDM  
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SRX  
 Series

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P1L  
 Series

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P1A  
 Series

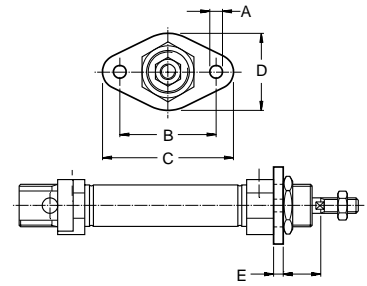
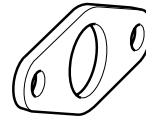
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P  
 Series



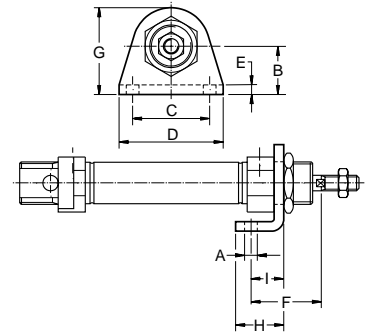
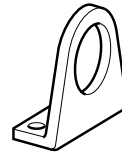
**Flange - MF8**

| Cylinder<br>Ø mm | A   | B  | C  | D  | E | F  | Weight<br>lbs | Part<br>number  |
|------------------|-----|----|----|----|---|----|---------------|-----------------|
| 10               | 4.5 | 30 | 40 | 22 | 3 | 13 | 0.025         | <b>P1A-4CMB</b> |
| 12-16            | 5.5 | 40 | 52 | 30 | 4 | 18 | 0.055         | <b>P1A-4DMB</b> |
| 20               | 6.6 | 50 | 66 | 40 | 5 | 19 | 0.100         | <b>P1A-4HMB</b> |
| 25               | 6.6 | 50 | 66 | 40 | 5 | 23 | 0.100         |                 |



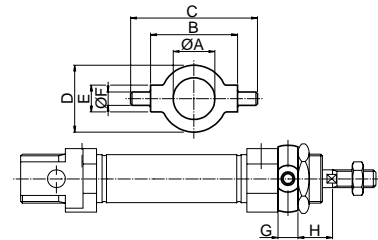
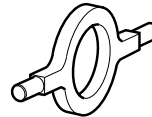
**Foot - MS3**

| Cylinder<br>Ø mm | A   | B  | C  | D  | E | F  | G    | H  | I  | Weight<br>lbs | Part<br>number  |
|------------------|-----|----|----|----|---|----|------|----|----|---------------|-----------------|
| 10               | 4.5 | 16 | 25 | 35 | 3 | 24 | 26.0 | 16 | 11 | 0.045         | <b>P1A-4CMF</b> |
| 12-16            | 5.5 | 20 | 32 | 42 | 4 | 32 | 32.5 | 20 | 14 | 0.08          | <b>P1A-4DMF</b> |
| 20               | 6.5 | 25 | 40 | 54 | 5 | 36 | 45.0 | 25 | 17 | 0.18          | <b>P1A-4HMF</b> |
| 25               | 6.5 | 25 | 40 | 54 | 5 | 40 | 45.0 | 25 | 17 | 0.18          |                 |



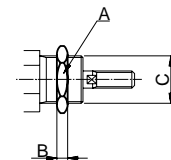
**Cover Trunnion**

| Cylinder<br>Ø mm | A    | B h14 | C  | D  | E e9 | F | G | H  | Weight<br>lbs | Part<br>number  |
|------------------|------|-------|----|----|------|---|---|----|---------------|-----------------|
| 10               | 12.5 | 26    | 38 | 20 | 8    | 4 | 6 | 10 | 0.03          | <b>P1A-4CMJ</b> |
| 12-16            | 16.5 | 38    | 58 | 25 | 10   | 6 | 8 | 14 | 0.07          | <b>P1A-4DMJ</b> |
| 20               | 22.5 | 46    | 66 | 30 | 10   | 6 | 8 | 16 | 0.08          | <b>P1A-4HMJ</b> |
| 25               | 22.5 | 46    | 66 | 30 | 10   | 6 | 8 | 20 | 0.08          |                 |



**Mounting Nut**

| Cylinder<br>Ø mm | A  | B  | C        | Weight<br>lbs | Part<br>number    |
|------------------|----|----|----------|---------------|-------------------|
| 10               | 19 | 6  | M12x1.25 | 0.02          | <b>9127385101</b> |
| 12-16            | 24 | 8  | M16x1.50 | 0.04          | <b>9127385102</b> |
| 20-25            | 32 | 11 | M22x1.50 | 0.09          | <b>9127385103</b> |

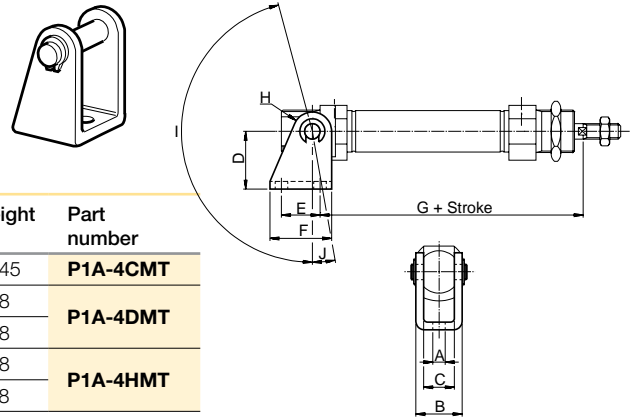


Most popular.



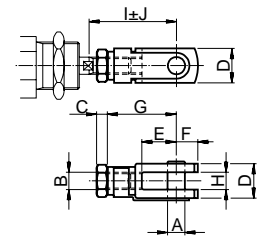
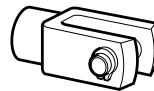
**B**  
 Round Body Cylinders  
 Actuator Products  
 SR/SM/SRD/SRDM  
 Series  
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 P1A  
 Series  
 P  
 Series

**Clevis Bracket**



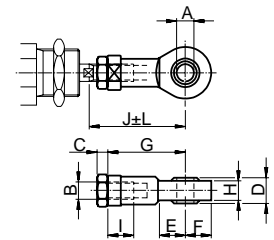
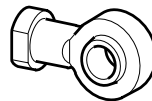
| Cylinder<br>Ø mm | A<br>mm | B<br>mm | C<br>mm | D<br>mm | E<br>mm | F<br>mm | G<br>mm | H<br>mm | I<br>° | J<br>° | Weight<br>lbs | Part<br>number  |
|------------------|---------|---------|---------|---------|---------|---------|---------|---------|--------|--------|---------------|-----------------|
| 10               | 4.5     | 13      | 8       | 24      | 12.5    | 20      | 65.3    | 5       | 160    | 17     | 0.045         | <b>P1A-4CMT</b> |
| 12               | 5.5     | 18      | 12      | 27      | 15.0    | 25      | 73.0    | 7       | 170    | 15     | 0.08          | <b>P1A-4DMT</b> |
| 16               | 5.5     | 18      | 12      | 27      | 15.0    | 25      | 80.0    | 7       | 170    | 15     | 0.08          | <b>P1A-4DMT</b> |
| 20               | 6.5     | 24      | 16      | 30      | 20.0    | 32      | 91.0    | 10      | 165    | 10     | 0.18          | <b>P1A-4HMT</b> |
| 25               | 6.5     | 24      | 16      | 30      | 20.0    | 32      | 100.0   | 10      | 165    | 10     | 0.18          | <b>P1A-4HMT</b> |

**Rod clevis**



| Cylinder<br>Ø mm | A<br>mm | B             | C<br>mm | D<br>mm | E<br>mm | F<br>mm | G<br>mm | H<br>mm | I<br>mm | J<br>mm | Weight<br>lbs | Part<br>number  |
|------------------|---------|---------------|---------|---------|---------|---------|---------|---------|---------|---------|---------------|-----------------|
| 10               | 4       | M4            | 2.2     | 8       | 8       | 5       | 16      | 4       | 22.0    | 2.0     | 0.015         | <b>P1A-4CRC</b> |
| 12-16            | 6       | M6            | 3.2     | 12      | 12      | 7       | 24      | 6       | 31.0    | 3.0     | 0.05          | <b>P1A-4DRC</b> |
| 20               | 8       | M8            | 4.0     | 16      | 16      | 10      | 32      | 8       | 40.5    | 3.5     | 0.10          | <b>P1A-4HRC</b> |
| 25               | 10      | M10 x<br>1.25 | 5.0     | 20      | 20      | 12      | 40      | 10      | 49.0    | 3.0     | 0.21          | <b>P1A-4JRC</b> |

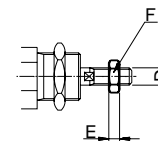
**Swivel Rod Eye**



| Cylinder<br>Ø mm | A<br>mm | B             | C<br>mm | D<br>mm | E<br>mm | F<br>mm | G<br>mm | H<br>mm | I<br>mm | J<br>mm | K<br>mm | L<br>mm | Weight<br>lbs | Part<br>number  |
|------------------|---------|---------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------------|-----------------|
| 10               | 5       | M4            | 2.2     | 8       | 10      | 9       | 27      | 6.0     | 8       | 33.0    | 9       | 2.0     | 0.04          | <b>P1A-4CRS</b> |
| 12-16            | 6       | M6            | 3.2     | 9       | 10      | 10      | 30      | 6.8     | 9       | 38.5    | 11      | 1.5     | 0.06          | <b>P1A-4DRS</b> |
| 20               | 8       | M8            | 4.0     | 12      | 12      | 12      | 36      | 9.0     | 12      | 46.0    | 14      | 2.0     | 0.10          | <b>P1A-4HRS</b> |
| 25               | 10      | M10 x<br>1.25 | 5.0     | 14      | 14      | 14      | 43      | 10.5    | 15      | 52.5    | 17      | 2.5     | 0.19          | <b>P1A-4JRS</b> |

**Rod Nut**

| Cylinder<br>Ø mm | D<br>mm  | F<br>mm | E<br>mm | Weight<br>lbs | Part number       |
|------------------|----------|---------|---------|---------------|-------------------|
| 10               | M4       | 7       | 2.2     | 0.002         | <b>0261110600</b> |
| 12-16            | M6       | 10      | 3.2     | 0.004         | <b>0261210800</b> |
| 20               | M8       | 13      | 4.0     | 0.010         | <b>0261211000</b> |
| 25               | M10x1.25 | 17      | 5.0     | 0.015         | <b>9128985601</b> |



Most popular.

**B**

Round Body Cylinders  
 Actuator Products

SR/SM/SRD/SRDM  
 Series

SRX  
 Series

P1L  
 Series

P1A  
 Series

P  
 Series

- Repairable design, aluminum construction
- 6 bore sizes: 1-1/8" to 4"
- Double-acting, spring-return and spring-extend models
- Cushions optional at either or both ends
- Universal nose and tang mounts
- Standard stroke lengths to 20 inches in one inch increments, plus 1-1/2", 2-1/2" and 3-1/2" strokes. Fraction strokes and strokes over 20 inches are available upon request.



**Operating information**

Operating pressure: 150 PSIG  
 Temperature range:  
     Standard seals -10°F to 165°F  
     Fluorocarbon seals -10°F to 250°F  
 Filtration requirements: 40 micron, dry filtered air  
 For technical information see CD

**Ordering information**

|   |          |          |               |  |          |  |  |  |          |          |  |   |  |
|---|----------|----------|---------------|--|----------|--|--|--|----------|----------|--|---|--|
| <b>2-1/2"</b>   | <b>C</b> | <b>K</b> | <b>P</b>      | <b>L</b>   | <b>U</b> |  |  |  | <b>1</b> | <b>6</b> |  | <b>C</b>  | <b>X6"</b>   |
| <b>Bore size</b><br>1-1/8"<br>1-1/2"<br>2"<br>2-1/2"<br>3"<br>4"    |          |          | <b>Series</b> | <b>Piston</b><br>Blank O-ring piston<br>L Lipseal piston<br>Sensors available on lipseal pistons only. |          |  |  |  |          |          |  |   | <b>Stroke</b><br>Specify in inches. Show times symbol "X" just ahead of stroke length. |
| <b>Cushion head end</b><br>Blank No cushion<br>C Cushion head end   |          |          |               | <b>Ports</b><br>U N.P.T.F.   |          |  |  |  |          |          |  | <b>Cushion cap end</b><br>Blank No cushion<br>C Cushion cap end   |  |
| <b>Double rod</b><br>Blank Single rod<br>K Double rod               |          |          |               | <b>Seals / options</b><br>Blank Buna-N<br>V Fluorocarbon<br>M Magnet with Buna-N seals <sup>1</sup>    |          |  |  |  |          |          |  | <b>Rod material</b><br>Blank Standard rod<br>D 416 Stainless steel <sup>2</sup>   |  |
| <b>Mounting style</b><br>Blank Standard<br>N No tang<br>A Dual tang |          |          |               | <b>Spring</b><br>E Spring extend<br>R Spring return  |          |  |  |  |          |          |  | <b>Rod thread</b><br>6 Standard<br>3 Special<br>(For special rod end specify "CC" thread Dia. A and LE or LE1 or Dim. or submit sketch.)        |  |
|   |          |          |               |  |          |  |  |  |          |          |  | <b>Special number</b><br>Use "S" symbol only if special feature is required (specify).<br>NOTE: Do not use symbol "S" for rod end modification. |  |
|   |          |          |               |  |          |  |  |  |          |          |  | <b>Rod diameter style</b><br>1 Standard<br>For double rod cylinders specify rod code twice.   |  |

**Safety Cushion Adjustment Location**

With port in position 1, cushion location will be position 4.

**Notes:**  
<sup>1</sup> Must specify lipseal piston with magnet option.  
<sup>2</sup> Standard on 1-1/8" bore. {D} not required.

**Sensors**  
 For sensors see page B294.

**B**

Round Body Cylinders

Actuator Products

---

SR/SW/SRD/SRD

Series

---

SRX

Series

---

P1L

Series

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P1A

Series

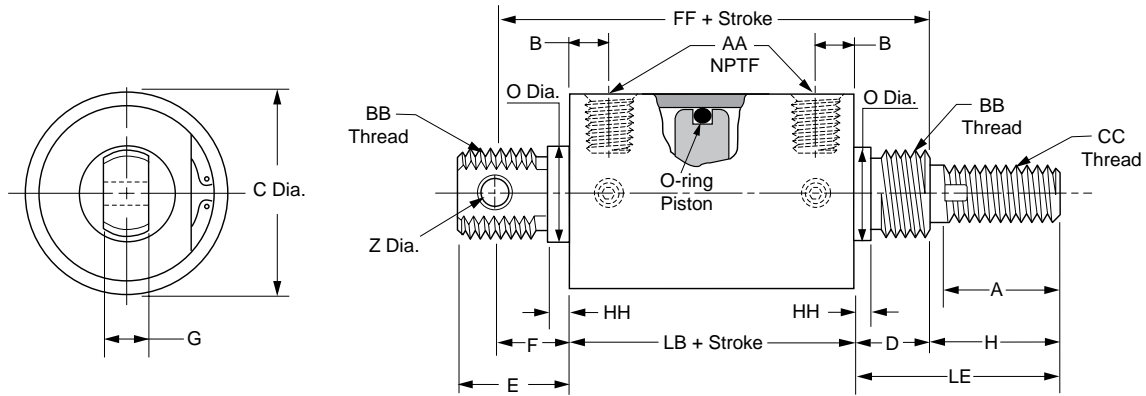
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P

Series

**Model P**

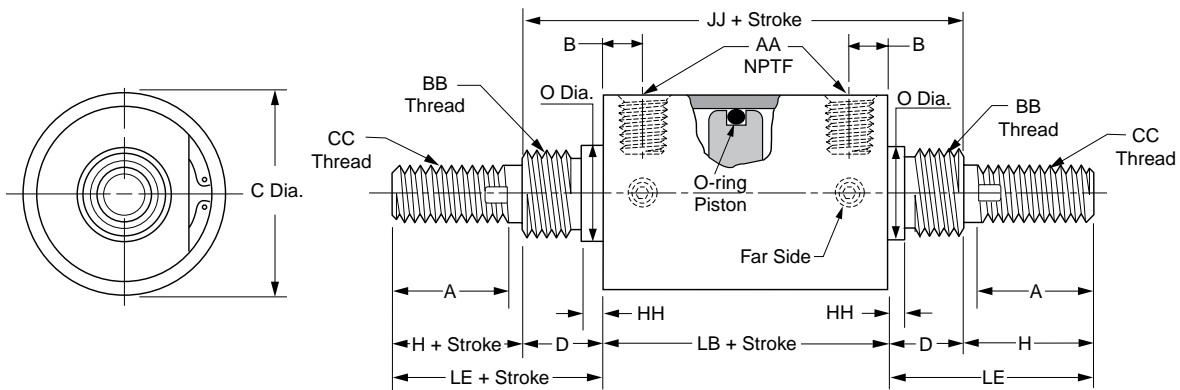
O-ring piston – single rod



Model P cylinders are available without tang covered by dimension E minus HH at no extra charge. To order specify Model NP.

**Model KP**

O-ring piston – double rod



Mounting nuts not supplied with cylinder.

**Model P and KP single and double rod cylinders**

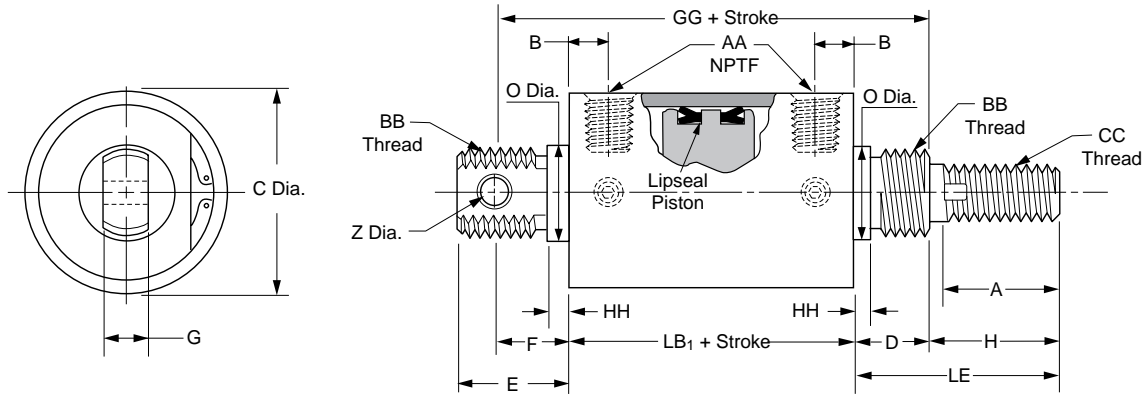
| Bore Size | Rod Dia. | LB     | B     | C     | D   | E     | F     | G   | H       | A     | O      | Z    | AA  | BB       | CC     | FF    | HH   | JJ     | LE      |
|-----------|----------|--------|-------|-------|-----|-------|-------|-----|---------|-------|--------|------|-----|----------|--------|-------|------|--------|---------|
| 1-1/8     | 3/8      | 2-1/16 | 13/32 | 1-3/8 | 5/8 | 1     | 11/16 | 3/8 | 1       | 7/8   | 3/4    | 1/4  | 1/8 | 3/4-16   | 3/8-16 | 3-3/8 | 3/32 | 3-5/16 | 1-5/8   |
| 1-1/2     | 1/2      | 2-5/8  | 1/2   | 1-3/4 | 7/8 | 1-1/4 | 7/8   | 1/2 | 1-7/16  | 1-1/4 | 1-1/16 | 5/16 | 1/4 | 1-14     | 1/2-13 | 4-3/8 | 1/8  | 4-3/8  | 2-5/16  |
| 2         | 5/8      | 2-5/8  | 1/2   | 2-1/4 | 7/8 | 1-1/4 | 7/8   | 1/2 | 1-7/16  | 1-1/4 | 1-1/16 | 5/16 | 1/4 | 1-14     | 5/8-11 | 4-3/8 | 1/8  | 4-3/8  | 2-5/16  |
| 2-1/2     | 3/4      | 3      | 5/8   | 2-3/4 | 1   | 2     | 1-3/8 | 5/8 | 1-11/16 | 1-1/2 | 1-3/8  | 7/16 | 3/8 | 1-3/8-12 | 3/4-10 | 5-3/8 | 3/16 | 5      | 2-11/16 |
| 3         | 3/4      | 3      | 5/8   | 3-1/4 | 1   | 2     | 1-3/8 | 5/8 | 1-11/16 | 1-1/2 | 1-3/8  | 7/16 | 3/8 | 1-3/8-12 | 3/4-10 | 5-3/8 | 3/16 | 5      | 2-11/16 |

Note: 4" bore size offered only with Lipseal Piston.  
 FLUOROCARBON SEALS for operation to 250°F are available at extra cost. Specify model PV or KPV.



**Model PL**

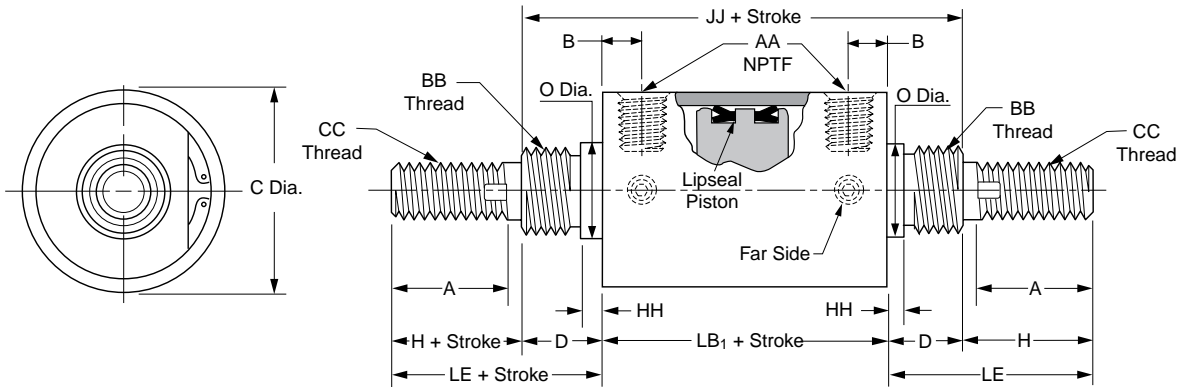
Lipseal piston – single rod



Model PL cylinders are available without tang covered by dimension E minus HH at no extra charge. To order specify Model NPL.

**Model KPL**

Lipseal piston – double rod



Mounting nuts not supplied with cylinder.

**Model PL and KPL single and double rod cylinders**

| Bore Size | Rod Dia. | LB <sub>1</sub> | B     | C     | D     | E      | F      | G   | H       | A     | O      | Z    | AA  | BB       | CC     | GG     | HH   | KK     | LE      |
|-----------|----------|-----------------|-------|-------|-------|--------|--------|-----|---------|-------|--------|------|-----|----------|--------|--------|------|--------|---------|
| 1-1/8     | 3/8      | 3-1/16          | 13/32 | 1-3/8 | 5/8   | 1      | 11/16  | 3/8 | 1       | 7/8   | 3/4    | 1/4  | 1/8 | 3/4-16   | 3/8-16 | 4-3/8  | 3/32 | 4-5/16 | 1-5/8   |
| 1-1/2     | 1/2      | 3-5/8           | 1/2   | 1-3/4 | 7/8   | 1-1/4  | 7/8    | 1/2 | 1-7/16  | 1-1/4 | 1-1/16 | 5/16 | 1/4 | 1-14     | 1/2-13 | 5-3/8  | 1/8  | 5-3/8  | 2-5/16  |
| 2         | 5/8      | 3-5/8           | 1/2   | 2-1/4 | 7/8   | 1-1/4  | 7/8    | 1/2 | 1-7/16  | 1-1/4 | 1-1/16 | 5/16 | 1/4 | 1-14     | 5/8-11 | 5-3/8  | 1/8  | 4-3/8  | 2-5/16  |
| 2-1/2     | 3/4      | 4               | 5/8   | 2-3/4 | 1     | 2      | 1-3/8  | 5/8 | 1-11/16 | 1-1/2 | 1-3/8  | 7/16 | 3/8 | 1-3/8-12 | 3/4-10 | 6-3/8  | 3/16 | 6      | 2-11/16 |
| 3         | 3/4      | 4               | 5/8   | 3-1/4 | 1     | 2      | 1-3/8  | 5/8 | 1-11/16 | 1-1/2 | 1-3/8  | 7/16 | 3/8 | 1-3/8-12 | 3/4-10 | 6-3/8  | 3/16 | 6      | 2-11/16 |
| 4         | 1        | 5-1/2           | 15/16 | 4-3/8 | 1-1/8 | 2-3/16 | 1-7/16 | 3/4 | 2-1/4   | 1-7/8 | 1-3/4  | 1/2  | 1/2 | 1-3/4-12 | 1-14   | 8-1/16 | 3/16 | 7-1/4  | 3-3/8   |

FLUOROCARBON SEALS for operation to 250°F are available at extra cost. Specify model PLV or KPLV.

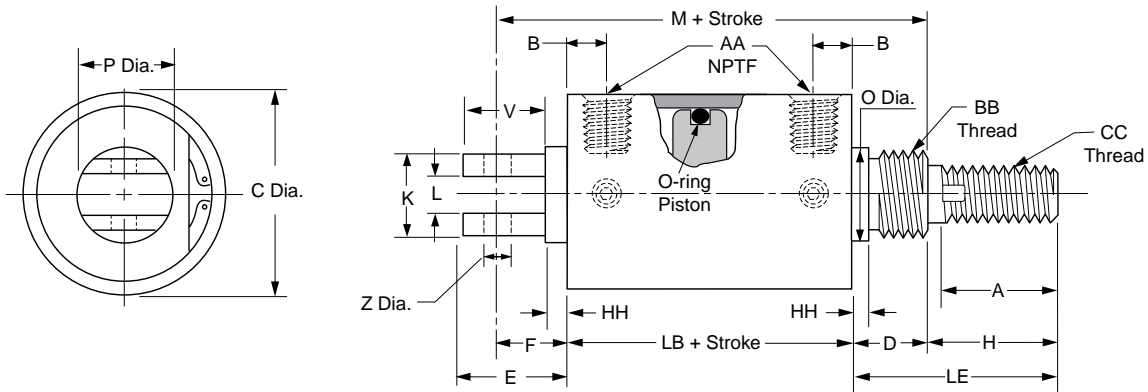
**B**  
 Round Body Cylinders  
 Actuator Products  
 SR/SM/SRD/SRDM  
 Series  
 SRX  
 Series  
 P1L  
 Series  
 P1A  
 Series  
 P  
 Series





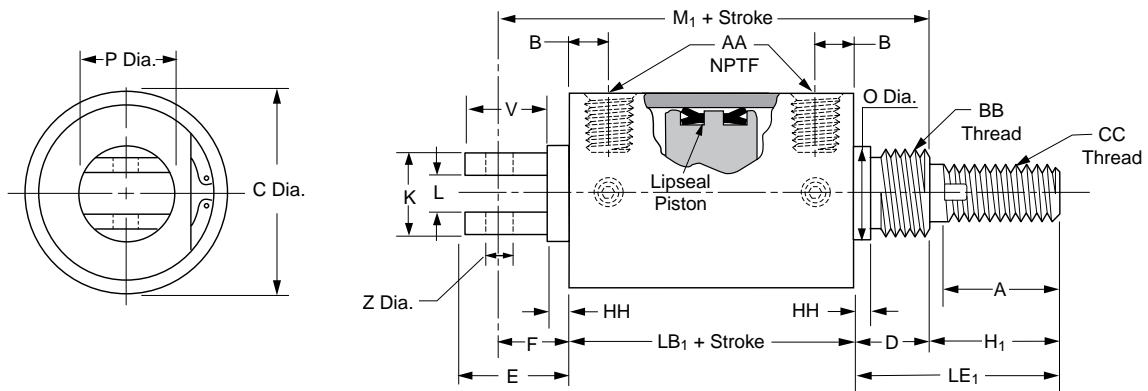
**Model AP**

O-ring piston – single rod  
 1-1/8" bore thru 3" bore



**Model APL**

Lipseal piston – single rod  
 1-1/8" bore thru 4" bore



Mounting nuts not supplied with cylinder.

**Models AP and APL only**

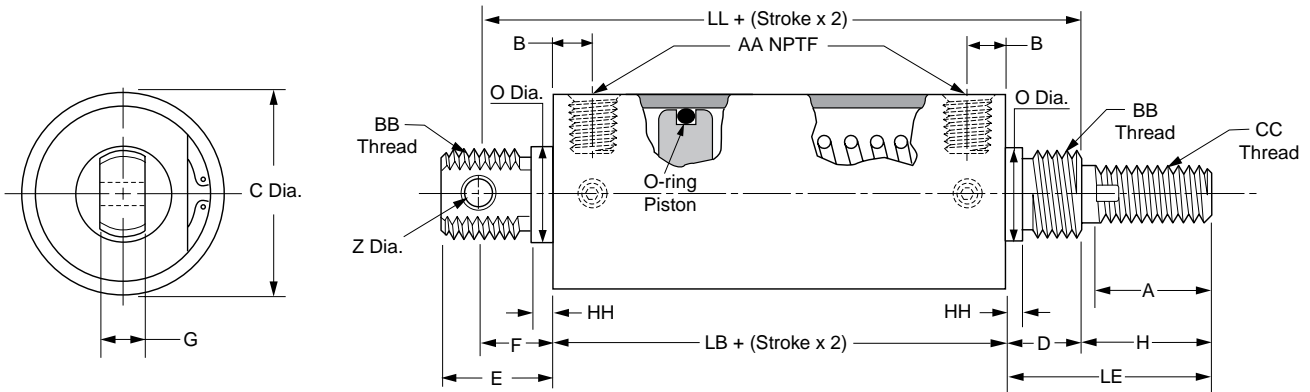
| Bore Size | Rod Dia. | LB     | LB <sub>1</sub> | B     | C     | D     | E       | F      | H       | H <sub>1</sub> | A     | K     | L   | M       | M <sub>1</sub> | O      | P       | V       | Z   | AA  | BB       | CC     | HH   | LE      | LE <sub>1</sub> |
|-----------|----------|--------|-----------------|-------|-------|-------|---------|--------|---------|----------------|-------|-------|-----|---------|----------------|--------|---------|---------|-----|-----|----------|--------|------|---------|-----------------|
| 1-1/8     | 3/8      | 2-1/16 | 3-1/16          | 13/32 | 1-3/8 | 5/8   | 1       | 11/16  | 1       | 1              | 7/8   | 15/16 | 3/8 | 4-3/8   | 5-3/8          | 3/4    | 15/16   | 7/8     | 3/8 | 1/8 | 3/4-16   | 3/8-16 | 3/32 | 1-5/8   | 1-5/8           |
| 1-1/2     | 1/2      | 2-5/8  | 3-5/8           | 1/2   | 1-3/4 | 7/8   | 1-5/8   | 15/16  | 2-7/16  | 1-7/16         | 1-1/4 | 1-1/4 | 1/2 | 6-7/8   | 6-7/8          | 1-1/16 | 1-1/4   | 1-1/2   | 3/8 | 1/4 | 1-14     | 1/2-13 | 1/8  | 3-5/16  | 2-5/16          |
| 2         | 5/8      | 2-5/8  | 3-5/8           | 1/2   | 2-1/4 | 7/8   | 2-1/4   | 1-9/16 | 2-7/16  | 1-7/16         | 1-1/4 | 1-1/2 | 1/2 | 7-1/2   | 7-1/2          | 1-1/16 | 1-11/16 | 1-3/4   | 1/2 | 1/4 | 1-14     | 5/8-11 | 1/8  | 3-5/16  | 2-5/16          |
| 2-1/2     | 3/4      | 3      | 4               | 5/8   | 2-3/4 | 1     | 1-13/16 | 1-1/8  | 3-11/16 | 2-11/16        | 1-1/2 | 1-1/2 | 1/2 | 8-13/16 | 8-13/16        | 1-3/8  | 2-1/4   | 1-11/16 | 1/2 | 3/8 | 1-3/8-12 | 3/4-10 | 3/16 | 4-11/16 | 3-11/16         |
| 3         | 3/4      | 3      | 4               | 5/8   | 3-1/4 | 1     | 2-5/16  | 1-5/8  | 3-11/16 | 2-11/16        | 1-1/2 | 1-1/2 | 1/2 | 9-5/16  | 9-5/16         | 1-3/8  | 2-1/4   | 1-3/4   | 1/2 | 3/8 | 1-3/8-12 | 3/4-10 | 3/16 | 4-11/16 | 3-11/16         |
| 4         | 1        | -      | 5-1/2           | 15/16 | 4-3/8 | 1-1/8 | 2-7/8   | 1-7/8  | -       | 2-1/4          | 1-7/8 | 2-1/4 | 3/4 | -       | 10-3/4         | 1-3/4  | 3       | 2-1/2   | 3/4 | 1/2 | 1-3/4-12 | 1-14   | 3/16 | -       | 3-3/8           |

FLUOROCARBON Seals for operation to 250°F are available at extra cost. Specify model ASPV or ASPLV.



**Model PR – Spring return**  
**Model PE – Spring extend**

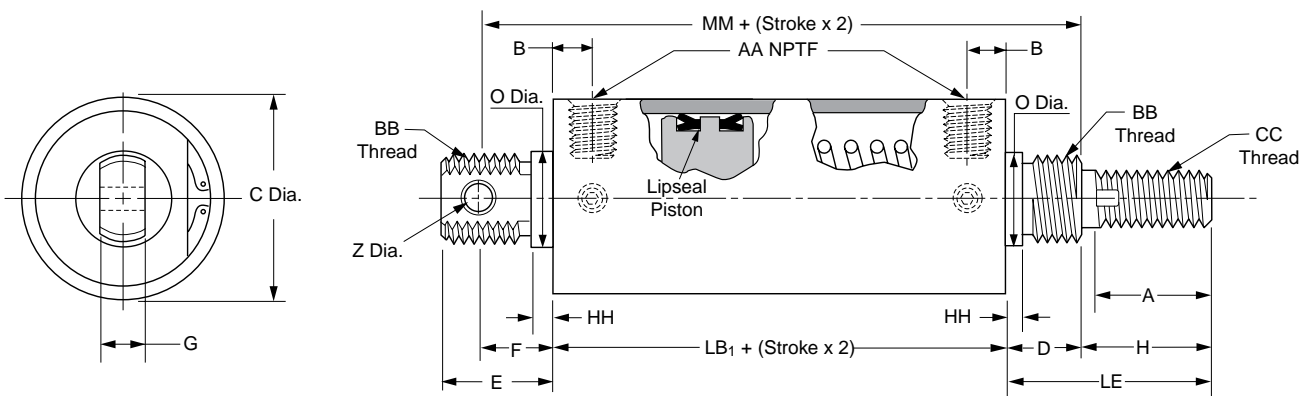
O-ring piston



Spring return cylinders are available without tail section covered by dimension E minus HH at no extra charge. To order, add letter "N" to model number.

**Model PLR – Spring return**  
**Model PLE – Spring extend**

Lipseal piston



Mounting nuts not supplied with cylinder.

**For single rod spring return cylinders up to 6" stroke (no load spring)**

| Bore Size | Rod Dia. | LB     | LB <sub>1</sub> | B     | C     | D     | E      | F      | G   | H       | A     | O      | Z    | AA  | BB       | CC     | HH   | LL    | MM     | LE      | Spring force    |                  |
|-----------|----------|--------|-----------------|-------|-------|-------|--------|--------|-----|---------|-------|--------|------|-----|----------|--------|------|-------|--------|---------|-----------------|------------------|
|           |          |        |                 |       |       |       |        |        |     |         |       |        |      |     |          |        |      |       |        |         | Pre-load (lbs.) | Max. load (lbs.) |
| 1-1/8     | 3/8      | 2-1/16 | 3-1/16          | 13/32 | 1-3/8 | 5/8   | 1      | 11/16  | 3/8 | 1       | 7/8   | 3/4    | 1/4  | 1/8 | 3/4-16   | 3/8-16 | 3/32 | 3-3/8 | 4-3/8  | 1-5/8   | 12              | 36               |
| 1-1/2     | 1/2      | 2-5/8  | 3-5/8           | 1/2   | 1-3/4 | 7/8   | 1-1/4  | 7/8    | 1/2 | 1-7/16  | 1-1/4 | 1-1/16 | 5/16 | 1/4 | 1-14     | 1/2-13 | 1/8  | 4-3/8 | 5-3/8  | 2-5/16  | 14              | 45               |
| 2         | 5/8      | 2-5/8  | 3-5/8           | 1/2   | 2-1/4 | 7-8   | 1-1/4  | 7/8    | 1/2 | 1-7/16  | 1-1/4 | 1-1/16 | 5/16 | 1/4 | 1-14     | 5/8-11 | 1/8  | 4-3/8 | 5-3/8  | 2-5/16  | 18              | 48               |
| 2-1/2     | 3/4      | 3      | 4               | 5/8   | 2-3/4 | 1     | 2      | 1-3/8  | 5/8 | 1-11/16 | 1-1/2 | 1-3/8  | 7/16 | 3/8 | 1-3/8-12 | 3/4-10 | 3/16 | 5-3/8 | 6-3/8  | 2-11/16 | 30              | 64               |
| 3         | 3/4      | 3      | 4               | 5/8   | 3-1/4 | 1     | 2      | 1-3/8  | 5/8 | 1-11/16 | 1-1/2 | 1-3/8  | 7/16 | 3/8 | 1-3/8-12 | 3/4-10 | 3/16 | 5-3/8 | 6-3/8  | 2-11/16 | 30              | 64               |
| 4         | 1        | ▲      | 5-1/2           | 15/16 | 4-3/8 | 1-1/8 | 2-3/16 | 1-7/16 | 3/4 | 2-1/4   | 1-7/8 | 1-3/4  | 1/2  | 1/2 | 1-3/4-12 | 1-14   | 3/16 | ▲     | 8-1/16 | 3-3/8   | 50              | 148              |

▲ 4" bore spring return cylinders, available only with lipseal type piston.

\*\* Net stroke plus stop tube = gross stroke.

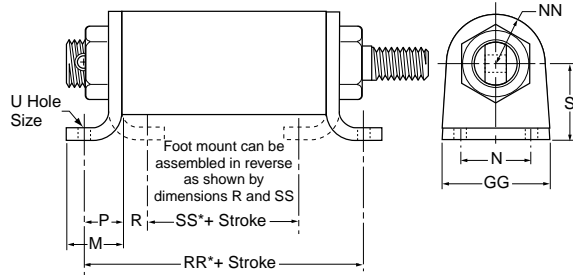
FLUOROCARBON SEALS for operation to 250°F are available at extra cost. Specify model PVR, PVE, PLVR or PLVE.

\* Dimensions shown are for cylinder with no load spring. For heavier springs or double rod spring return cylinders, consult factory.

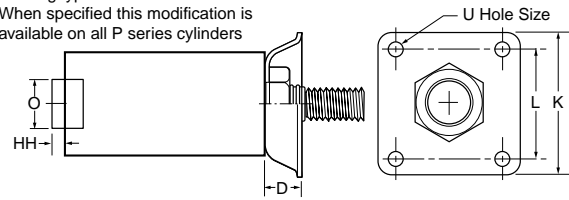
**B**  
 Round Body Cylinders  
 Actuator Products  
 SR/SM/SRD/SRDM  
 Series  
 SRX  
 Series  
 P1L  
 Series  
 P1A  
 Series  
 P  
 Series



**Foot and Flange Mounts**



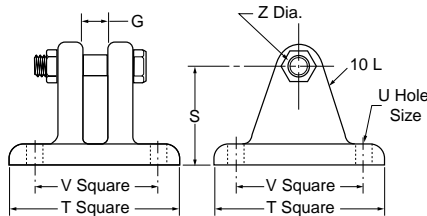
No tang type shown.  
 When specified this modification is available on all P series cylinders



| Bore size | D     | K     | L     | M       | N       | O      | P     | R      | S      | U     | GG      | HH   | NN     | RR      | SS     | Foot mount* | Flange mount** |
|-----------|-------|-------|-------|---------|---------|--------|-------|--------|--------|-------|---------|------|--------|---------|--------|-------------|----------------|
| 1-1/8     | 5/8   | 2-1/2 | 2     | 1-3/8   | 1-11/16 | 3/4    | 7/8   | 5/8    | 1-9/32 | 9/32  | 2-11/16 | 3/32 | 11/16  | 3-13/16 | 13/16  | L069190000  | L069230000     |
| 1-1/2     | 7/8   | 3-1/4 | 2-1/2 | 1-9/32  | 1-5/8   | 1-1/16 | 7/8   | 9/16   | 1-3/4  | 9/32  | 2-7/16  | 1/8  | 1-1/8  | 4-3/8   | 1-1/2  | L069200000  | L069240000     |
| 2         | 7/8   | 3-1/4 | 2-1/2 | 1-9/32  | 1-5/8   | 1-1/16 | 7/8   | 9/16   | 1-3/4  | 9/32  | 2-7/16  | 1/8  | 1-1/8  | 4-3/8   | 1-1/2  | L069200000  | L069240000     |
| 2-1/2     | 1     | 4-1/2 | 3-3/8 | 1-29/32 | 2-1/4   | 1-3/8  | 1-1/4 | 7/8    | 2-3/8  | 13/32 | 3-9/16  | 3/16 | 1-5/8  | 5-1/2   | 1-1/4  | L069210000  | L069250000     |
| 3         | 1     | 4-1/2 | 3-3/8 | 1-29/32 | 2-1/4   | 1-3/8  | 1-1/4 | 7/8    | 2-3/8  | 13/32 | 3-9/16  | 3/16 | 1-5/8  | 5-1/2   | 1-1/4  | L069210000  | L069250000     |
| 4         | 1-1/8 | 5-1/4 | 4     | 2-17/32 | 3-1/4   | 1-3/4  | 1-3/4 | 1-5/16 | 3-3/16 | 15/32 | 4-13/16 | 3/16 | 2-3/16 | 9▲      | 2-7/8▲ | L069220000  | L069260000     |

▲ Dimension shown is for lipseal piston type.  
 \* Part number includes one foot mounting and one mounting nut.  
 \*\* Includes mounting nut.

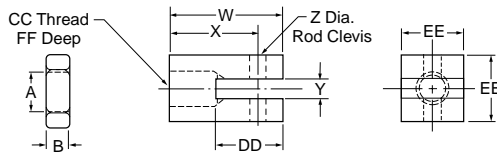
**Clevis Bracket**



| Bore size | G   | S      | T     | U     | V     | Z    | Part number |
|-----------|-----|--------|-------|-------|-------|------|-------------|
| 1-1/8     | 3/8 | 1-9/32 | 2-1/4 | 9/32  | 1-3/4 | 1/4  | L06730 0000 |
| 1-1/2     | 1/2 | 1-3/4  | 3     | 9/32  | 2-1/4 | 5/16 | L06731 0000 |
| 2         | 1/2 | 1-3/4  | 3     | 9/32  | 2-1/4 | 5/16 | L06731 0000 |
| 2-1/2     | 5/8 | 2-3/8  | 4     | 13/32 | 3     | 7/16 | L06732 0000 |
| 3         | 5/8 | 2-3/8  | 4     | 13/32 | 3     | 7/16 | L06732 0000 |
| 4         | 3/4 | 3-3/16 | 5     | 15/32 | 3-3/4 | 1/2  | L06733 0000 |

Connecting pin and locknut furnished with clevis bracket.

**Rod Clevis**

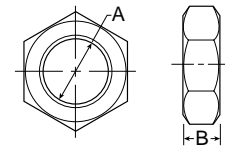


| Cyl. bore | Rod dia. | A      | B     | CC     | DD      | EE    | FF     | W     | X       | Y    | Z    | Part number |
|-----------|----------|--------|-------|--------|---------|-------|--------|-------|---------|------|------|-------------|
| 1-1/8     | 3/8      | 3/8-16 | 7/32  | 3/8-16 | 1-1/8   | 3/4   | 5/8    | 1-3/4 | 1-3/8   | 5/16 | 1/4  | L06734 0000 |
| 1-1/2     | 1/2      | 1/2-13 | 5/16  | 1/2-13 | 1-5/16  | 1     | 15/16  | 2-1/4 | 1-3/4   | 3/8  | 5/16 | L06735 0000 |
| 2         | 5/8      | 5/8-11 | 3/8   | 5/8-11 | 1-5/16  | 1     | 15/16  | 2-1/4 | 1-3/4   | 3/8  | 5/16 | L06736 0000 |
| 2-1/2     | 3/4      | 3/4-10 | 27/64 | 3/4-10 | 1-5/16  | 1-1/4 | 1-1/16 | 2-3/8 | 1-13/16 | 1/2  | 7/16 | L06737 0000 |
| 3         | 3/4      | 3/4-10 | 27/64 | 3/4-10 | 1-5/16  | 1-1/4 | 1-1/16 | 2-3/8 | 1-13/16 | 1/2  | 7/16 | L06737 0000 |
| 4         | 1        | 1-14   | 35/64 | 1-14   | 1-13/16 | 1-1/2 | 1-9/16 | 3-3/8 | 2-5/8   | 5/8  | 1/2  | L06738 0000 |

Note: Rod end jam nut furnished with rod clevis.

Most popular.

**Mounting Nut for Cylinders\*\***



| Bore size | A        | B     | Part number |
|-----------|----------|-------|-------------|
| 1-1/8     | 3/4-16   | 27/64 | 083301 0048 |
| 1-1/2 & 2 | 1-14     | 35/64 | 083301 0100 |
| 2-1/2 & 3 | 1-3/8-12 | 25/32 | 083301 0124 |
| 4         | 1-3/4-12 | 15/16 | 083183 0000 |

**Sensors**

For sensors see page B294.



**Table A**

**Seal kit for series “P” cylinders with o-ring piston**

Contains: 2 each symbol #15 & 1 each symbol #16, 24 & 25

| Bore size | Standard seal kit part number | Hi-temp seal kit part number |
|-----------|-------------------------------|------------------------------|
| 1-1/8"    | L067680000                    | L067730000                   |
| 1-1/2"    | L067690000                    | L067740000                   |
| 2"        | L067700000                    | L067750000                   |
| 2-1/2"    | L067710000                    | L067760000                   |
| 3"        | L067720000                    | L067770000                   |

**Table B**

**Seal kit for series “P” cylinders with lipseal piston**

Contains: 2 each symbol #15 & 23 & 1 each symbol #24 & 25

| Bore size | Standard seal kit part number | Hi-temp seal kit part number |
|-----------|-------------------------------|------------------------------|
| 1-1/8"    | L067780000                    | L067840000                   |
| 1-1/2"    | L067790000                    | L067850000                   |
| 2"        | L067800000                    | L067860000                   |
| 2-1/2"    | L067810000                    | L067870000                   |
| 3"        | L067820000                    | L067880000                   |
| 4"        | L067830000                    | L067890000                   |

**Table C**

**Cushion seal kit for series “P” cylinders**

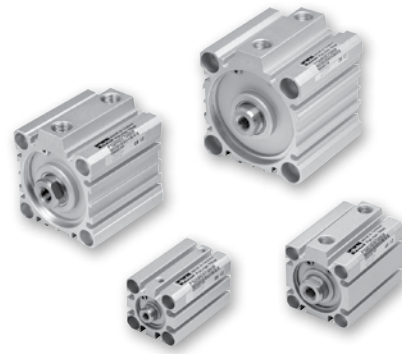
Contains: 2 each symbol #19 & 21 (Symbol #21 not required or supplied for 1-1/8" & 1-1/2" bore size cylinders)

| Bore size | Standard seal kit part number | Hi-temp seal kit part number |
|-----------|-------------------------------|------------------------------|
| 1-1/8"    | L067900000                    | L067950000                   |
| 1-1/2"    | L067910000                    | L067960000                   |
| 2"        | L067920000                    | L067970000                   |
| 2-1/2"    | L067930000                    | L067980000                   |
| 3"        | L067930000                    | L067980000                   |
| 4"        | L067940000                    | L067990000                   |

**B**  
 Round Body Cylinders  
 Actuator Products  
 SR/SW/SRD/SRDM  
 Series  
 SRX  
 Series  
 P1L  
 Series  
 P1A  
 Series  
 P  
 Series



- Economical square body compact cylinder
- 10 bore sizes available 12mm - 100mm
- 4 flexible mounting options
- Female and male rod ends available
- Bumpers standard on all models
- Magnetic and non-magnetic construction available



**Operating information**

Operating pressure: 10 bar (145 PSIG) maximum  
 Temperature range: -5°C to 60°C (23°F to 140°F)  
 Filtration requirements: 40 micron, dry filtered air  
 For technical information see CD

**Metric Double Acting / Magnetic - Female Threaded Piston Rod**

**12mm**

| Stroke (mm) | Order Code      |
|-------------|-----------------|
| 5           | P1QS012DC7G0005 |
| 10          | P1QS012DC7G0010 |
| 15          | P1QS012DC7G0015 |
| 25          | P1QS012DC7G0025 |
| 30          | P1QS012DC7G0030 |

**16mm**

|    |                 |
|----|-----------------|
| 5  | P1QS016DC7G0005 |
| 10 | P1QS016DC7G0010 |
| 15 | P1QS016DC7G0015 |
| 25 | P1QS016DC7G0025 |
| 30 | P1QS016DC7G0030 |

**20mm**

|    |                 |
|----|-----------------|
| 10 | P1QS020DC7G0010 |
| 15 | P1QS020DC7G0015 |
| 25 | P1QS020DC7G0025 |
| 30 | P1QS020DC7G0030 |
| 40 | P1QS020DC7G0040 |
| 50 | P1QS020DC7G0050 |

**25mm**

|    |                 |
|----|-----------------|
| 10 | P1QS025DC7G0010 |
| 15 | P1QS025DC7G0015 |
| 25 | P1QS025DC7G0025 |
| 30 | P1QS025DC7G0030 |
| 40 | P1QS025DC7G0040 |
| 50 | P1QS025DC7G0050 |

**32mm**

| Stroke (mm) | Order Code      |
|-------------|-----------------|
| 10          | P1QS032DC7N0010 |
| 15          | P1QS032DC7N0015 |
| 25          | P1QS032DC7N0025 |
| 30          | P1QS032DC7N0030 |
| 40          | P1QS032DC7N0040 |
| 50          | P1QS032DC7N0050 |
| 75          | P1QS032DC7N0075 |
| 100         | P1QS032DC7N0100 |

**40mm**

|     |                 |
|-----|-----------------|
| 15  | P1QS040DC7N0015 |
| 25  | P1QS040DC7N0025 |
| 30  | P1QS040DC7N0030 |
| 40  | P1QS040DC7N0040 |
| 50  | P1QS040DC7N0050 |
| 75  | P1QS040DC7N0075 |
| 100 | P1QS040DC7N0100 |

**50mm**

|     |                 |
|-----|-----------------|
| 15  | P1QS050DC7N0015 |
| 25  | P1QS050DC7N0025 |
| 30  | P1QS050DC7N0030 |
| 40  | P1QS050DC7N0040 |
| 50  | P1QS050DC7N0050 |
| 75  | P1QS050DC7N0075 |
| 100 | P1QS050DC7N0100 |

**63mm**

|    |                 |
|----|-----------------|
| 15 | P1QS063DC7N0015 |
| 25 | P1QS063DC7N0025 |
| 30 | P1QS063DC7N0030 |
| 40 | P1QS063DC7N0040 |
| 50 | P1QS063DC7N0050 |
| 75 | P1QS063DC7N0075 |

**80mm**

|    |                 |
|----|-----------------|
| 15 | P1QS080DC7N0015 |
| 25 | P1QS080DC7N0025 |
| 30 | P1QS080DC7N0030 |
| 40 | P1QS080DC7N0040 |
| 50 | P1QS080DC7N0050 |
| 75 | P1QS080DC7N0075 |

**100mm**

|    |                 |
|----|-----------------|
| 15 | P1QS100DC7N0015 |
| 25 | P1QS100DC7N0025 |
| 30 | P1QS100DC7N0030 |
| 40 | P1QS100DC7N0040 |
| 50 | P1QS100DC7N0050 |
| 75 | P1QS100DC7N0075 |

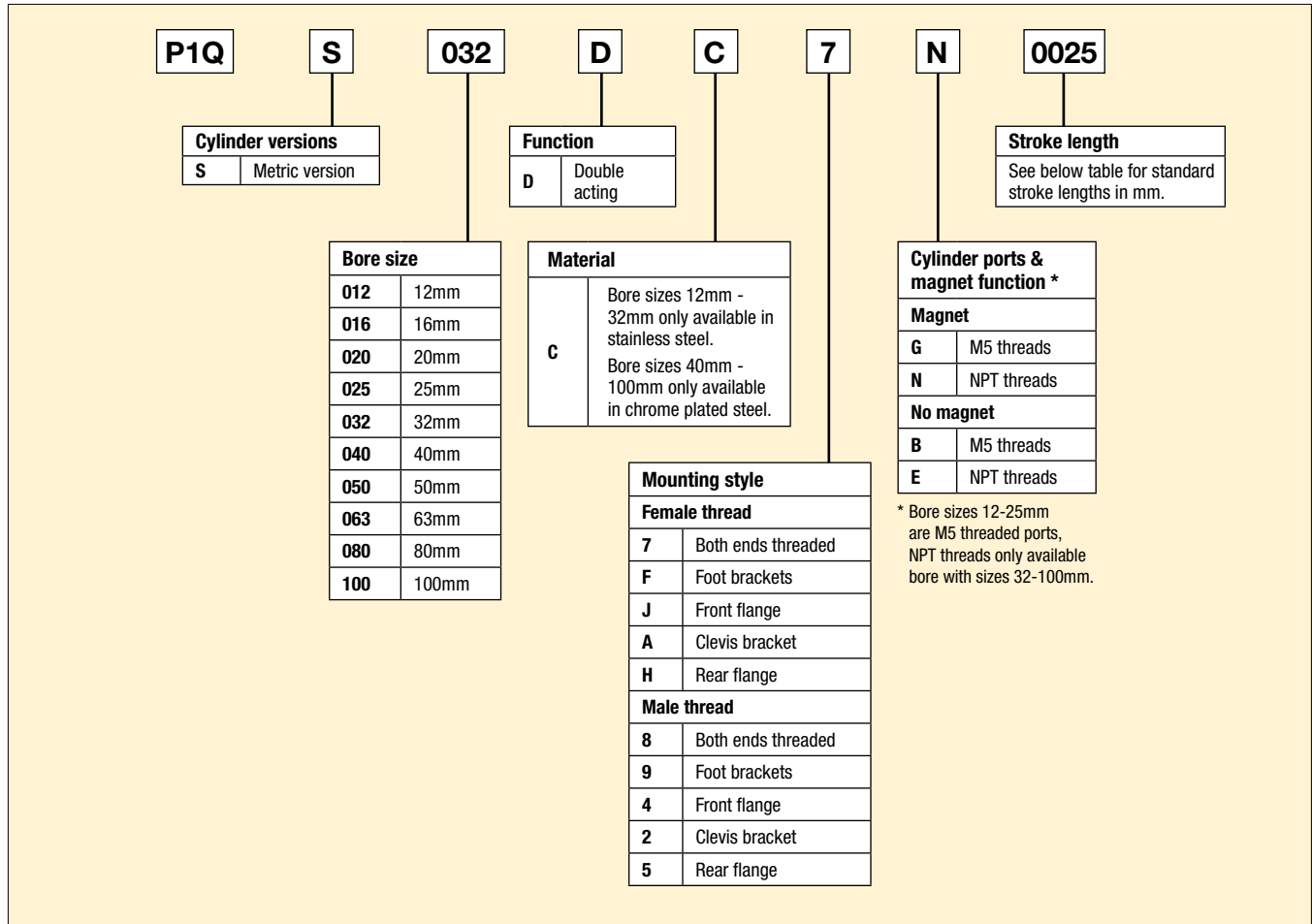
Most popular.

**Sensors**

For sensors see page B294.



**Ordering information**



**B**  
 Compact Cylinders  
 Actuator Products  
 P1Q Series  
 P1M Series  
 LP/LPM Series

**Standard strokes**

| Bore size | 5 | 10 | 15 | 25 | 30 | 40 | 50 | 75 | 100 |
|-----------|---|----|----|----|----|----|----|----|-----|
| 12 - 16   | • | •  | •  | •  | •  |    |    |    |     |
| 20 - 25   |   | •  | •  | •  | •  | •  | •  |    |     |
| 32        |   | •  | •  | •  | •  | •  | •  | •  | •   |
| 40 - 50   |   |    | •  | •  | •  | •  | •  | •  | •   |
| 63 - 100  |   |    | •  | •  | •  | •  | •  | •  | •   |

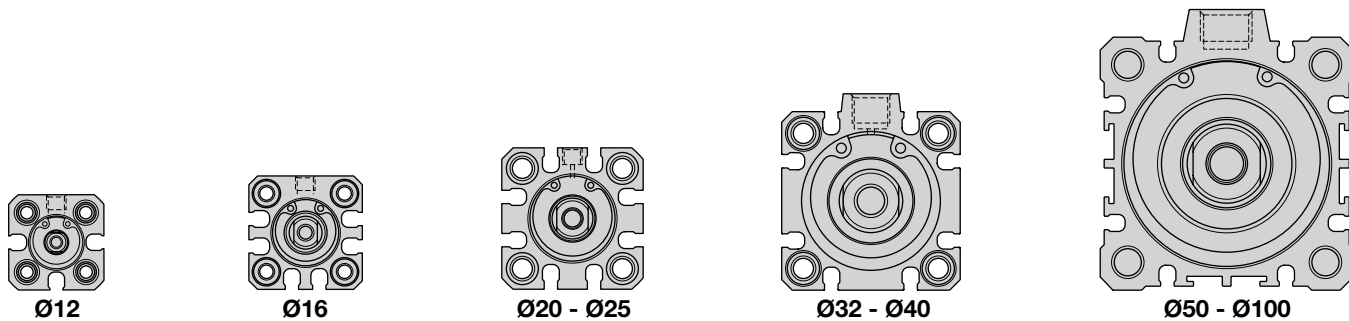
**Cylinder forces, double acting variants**

| Cyl. bore/ pist. rod mm | Stroke piston area | cm <sup>2</sup> | Max theoretical force in N (bar) |      |      |      |      |             |      |      |      |
|-------------------------|--------------------|-----------------|----------------------------------|------|------|------|------|-------------|------|------|------|
|                         |                    |                 | 1.0                              | 2.0  | 3.0  | 4.0  | 5.0  | 6.0         | 7.0  | 8.0  | 9.0  |
| 12/6                    | +                  | 1.1             | 11                               | 23   | 34   | 45   | 57   | <b>68</b>   | 79   | 90   | 102  |
|                         | -                  | 0.8             | 8                                | 17   | 25   | 34   | 42   | <b>51</b>   | 59   | 68   | 76   |
| 16/8                    | +                  | 2.0             | 20                               | 40   | 60   | 80   | 101  | <b>121</b>  | 141  | 161  | 181  |
|                         | -                  | 1.5             | 15                               | 30   | 45   | 60   | 75   | <b>90</b>   | 106  | 121  | 136  |
| 20/10                   | +                  | 3.1             | 31                               | 63   | 94   | 126  | 157  | <b>188</b>  | 220  | 251  | 283  |
|                         | -                  | 2.4             | 24                               | 47   | 71   | 94   | 118  | <b>141</b>  | 165  | 188  | 212  |
| 25/12                   | +                  | 4.9             | 49                               | 98   | 147  | 196  | 245  | <b>295</b>  | 344  | 393  | 442  |
|                         | -                  | 3.8             | 38                               | 76   | 113  | 151  | 189  | <b>227</b>  | 264  | 302  | 340  |
| 32/16                   | +                  | 8.0             | 80                               | 161  | 241  | 322  | 402  | <b>483</b>  | 563  | 643  | 724  |
|                         | -                  | 6.0             | 60                               | 121  | 181  | 241  | 302  | <b>362</b>  | 422  | 483  | 543  |
| 40/16                   | +                  | 12.6            | 126                              | 251  | 377  | 503  | 628  | <b>754</b>  | 880  | 1005 | 1131 |
|                         | -                  | 10.6            | 106                              | 211  | 317  | 422  | 528  | <b>633</b>  | 739  | 844  | 950  |
| 50/20                   | +                  | 19.6            | 196                              | 393  | 589  | 785  | 982  | <b>1178</b> | 1374 | 1571 | 1767 |
|                         | -                  | 16.5            | 165                              | 330  | 495  | 660  | 825  | <b>990</b>  | 1155 | 1319 | 1484 |
| 63/20                   | +                  | 31.2            | 312                              | 623  | 935  | 1247 | 1559 | <b>1870</b> | 2182 | 2494 | 2806 |
|                         | -                  | 28.0            | 280                              | 561  | 841  | 1121 | 1402 | <b>1682</b> | 1962 | 2242 | 2523 |
| 80/25                   | +                  | 50.3            | 503                              | 1005 | 1508 | 2011 | 2513 | <b>3016</b> | 3519 | 4021 | 4524 |
|                         | -                  | 45.4            | 454                              | 907  | 1361 | 1814 | 2268 | <b>2721</b> | 3175 | 3629 | 4082 |
| 100/32                  | +                  | 78.5            | 785                              | 1571 | 2356 | 3142 | 3927 | <b>4712</b> | 5498 | 6283 | 7069 |
|                         | -                  | 70.5            | 705                              | 1410 | 2115 | 2820 | 3525 | <b>4230</b> | 4936 | 5640 | 6345 |

+ = Outward stroke  
 - = Return stroke

**Note:**  
 Select a theoretical force 50-100% larger than the force required

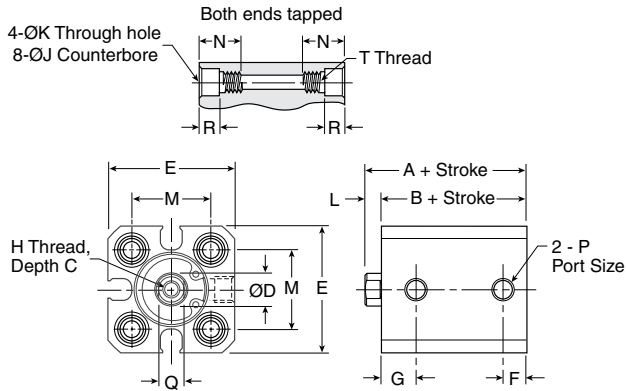
**Front profiles by bore size**



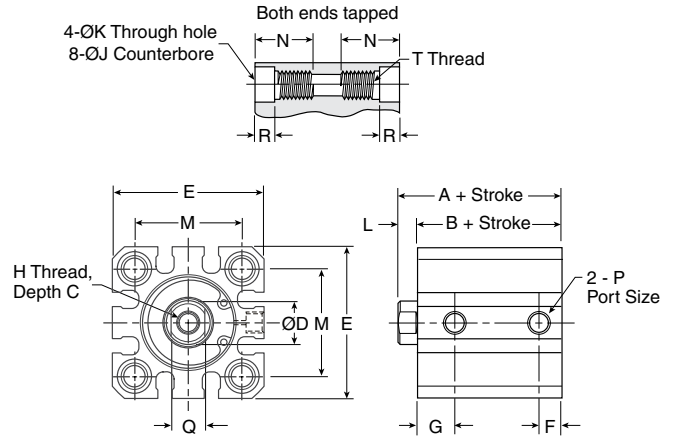
**B**  
 Compact Cylinders  
 Actuator Products  
 P1Q Series  
 P1M Series  
 LP/LPM Series

**Magnet Dimensions**

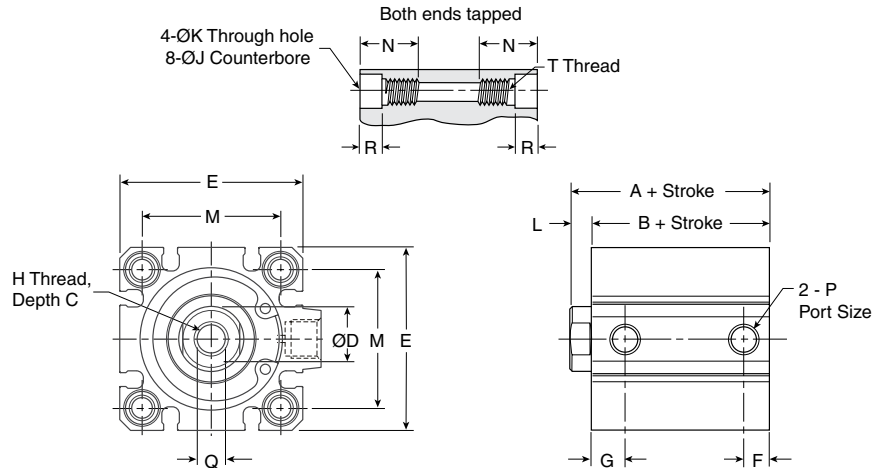
**Ø12 - Ø16**



**Ø20 - Ø25**



**Ø32 - Ø100**



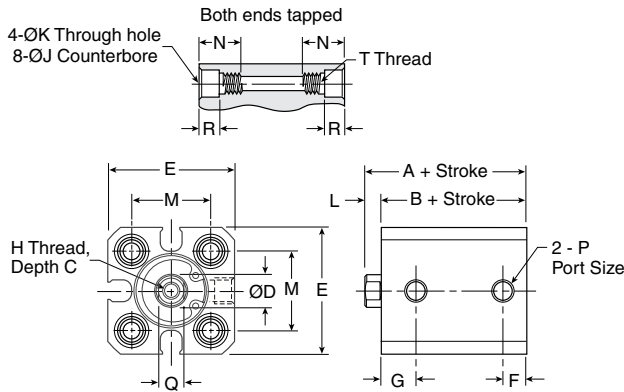
| Bore size | A mm | B mm | C mm | D mm | E mm | F mm | G mm | H       | J mm | K mm | L mm | M mm | N mm | P      | Q mm | R mm | T        |
|-----------|------|------|------|------|------|------|------|---------|------|------|------|------|------|--------|------|------|----------|
| 12        | 25.5 | 22   | 6    | 6    | 25   | 5    | 7.5  | M3x0.5  | 6.5  | 3.5  | 3.5  | 15.5 | 11   | M5x0.8 | 5    | 4    | M4x0.7   |
| 16        | 25.5 | 22   | 8    | 8    | 29   | 5    | 7.5  | M4x0.7  | 6.5  | 3.5  | 3.5  | 20   | 11   | M5x0.8 | 6    | 4    | M4x0.7   |
| 20        | 34   | 29.5 | 7    | 10   | 36   | 5.5  | 9    | M5x0.8  | 9    | 5.4  | 4.5  | 25.5 | 17   | M5x0.8 | 8    | 7    | M6x1.0   |
| 25        | 37.5 | 32.5 | 12   | 12   | 40   | 5.5  | 11   | M6x1.0  | 9    | 5.4  | 5    | 28   | 17   | M5x0.8 | 10   | 7    | M6x1.0   |
| 32        | 40   | 33   | 13   | 16   | 45   | 7.5  | 10.5 | M8x1.25 | 9    | 5.5  | 7    | 34   | 17   | 1/8"   | 14   | 7    | M6x1.0   |
| 40        | 46.5 | 39.5 | 13   | 16   | 52   | 8    | 11   | M8x1.25 | 9    | 5.5  | 7    | 40   | 17   | 1/8"   | 14   | 7    | M6x1.0   |
| 50        | 48.5 | 40.5 | 15   | 20   | 64   | 10.5 | 10.5 | M10x1.5 | 11   | 6.6  | 8    | 50   | 22   | 1/4"   | 17   | 8    | M8x1.25  |
| 63        | 54   | 46   | 15   | 20   | 77   | 10.5 | 15   | M10x1.5 | 14   | 9    | 8    | 60   | 28.5 | 1/4"   | 17   | 10.5 | M10x1.5  |
| 80        | 63.5 | 53.5 | 21   | 25   | 98   | 12.5 | 16   | M16x2.0 | 17.5 | 11   | 10   | 77   | 35.5 | 3/8"   | 22   | 13.5 | M12x1.75 |
| 100       | 75   | 63   | 27   | 30   | 117  | 13   | 23   | M20x2.5 | 17.5 | 11   | 12   | 94   | 35.5 | 3/8"   | 27   | 13.5 | M12x1.75 |

**B**  
 Compact Cylinders  
 Actuator Products  
 P1Q Series  
 P1M Series  
 LP/LPM Series

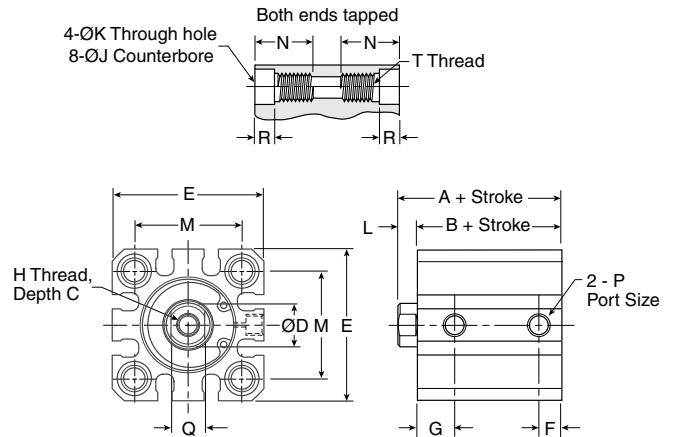


**Non-magnet Dimensions**

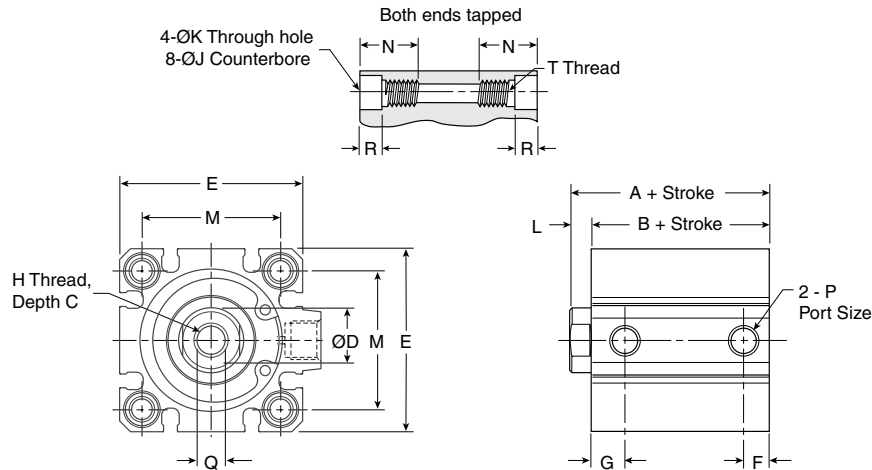
**Ø12 - Ø16**



**Ø20 - Ø25**



**Ø32 - Ø100**



| Bore size | A         |             | B         |             | C  | D  | E   | F    | G    | H       | J    | K   | L   | M    | N    | P      | Q  | R    | T        |
|-----------|-----------|-------------|-----------|-------------|----|----|-----|------|------|---------|------|-----|-----|------|------|--------|----|------|----------|
|           | 5 to 50mm | 75 to 100mm | 5 to 50mm | 75 to 100mm |    |    |     |      |      |         |      |     |     |      |      |        |    |      |          |
| 12        | 20.5      | -           | 17        | -           | 6  | 6  | 25  | 5    | 7.5  | M3x0.5  | 6.5  | 3.5 | 3.5 | 15.5 | 11   | M5x0.8 | 5  | 4    | M4x0.7   |
| 16        | 20.5      | -           | 17        | -           | 8  | 8  | 29  | 5    | 7.5  | M4x0.7  | 6.5  | 3.5 | 3.5 | 20   | 11   | M5x0.8 | 6  | 4    | M4x0.7   |
| 20        | 24        | -           | 19.5      | -           | 7  | 10 | 36  | 5.5  | 9    | M5x0.8  | 9    | 5.4 | 4.5 | 25.5 | 17   | M5x0.8 | 8  | 7    | M6x1.0   |
| 25        | 27.5      | -           | 22.5      | -           | 12 | 12 | 40  | 5.5  | 11   | M6x1.0  | 9    | 5.4 | 5   | 28   | 17   | M5x0.8 | 10 | 7    | M6x1.0   |
| 32        | 30        | 40          | 23        | 33          | 13 | 16 | 45  | 7.5  | 10.5 | M8x1.25 | 9    | 5.5 | 7   | 34   | 17   | 1/8"   | 14 | 7    | M6x1.0   |
| 40        | 36.5      | 46.5        | 29.5      | 39.5        | 13 | 16 | 52  | 8    | 11   | M8x1.25 | 9    | 5.5 | 7   | 40   | 17   | 1/8"   | 14 | 7    | M6x1.0   |
| 50        | 38.5      | 48.5        | 30.5      | 40.5        | 15 | 20 | 64  | 10.5 | 10.5 | M10x1.5 | 11   | 6.6 | 8   | 50   | 22   | 1/4"   | 17 | 8    | M8x1.25  |
| 63        | 44        | 54          | 36        | 46          | 15 | 20 | 77  | 10.5 | 15   | M10x1.5 | 14   | 9   | 8   | 60   | 28.5 | 1/4"   | 17 | 10.5 | M10x1.5  |
| 80        | 53.5      | 63.5        | 43.5      | 53.5        | 21 | 25 | 98  | 12.5 | 16   | M16x2.0 | 17.5 | 11  | 10  | 77   | 35.5 | 3/8"   | 22 | 13.5 | M12x1.75 |
| 100       | 65        | 75          | 53        | 63          | 27 | 30 | 117 | 13   | 23   | M20x2.5 | 17.5 | 11  | 12  | 94   | 35.5 | 3/8"   | 27 | 13.5 | M12x1.75 |

**B**  
 Compact Cylinders  
 Actuator Products  
 P1Q Series  
 P1M Series  
 LP/LPM Series

**Flange Mounting – Style J, H, 4, 5**

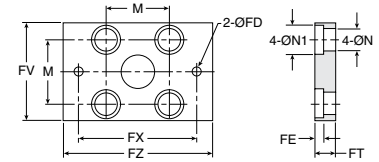


Intended for fixed mounting of cylinder. Flange can be fitted to front or rear of cylinder.

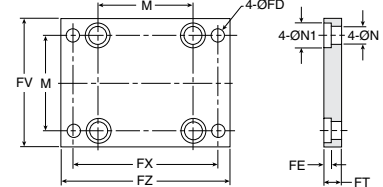
**Material**

Flange: surface treated steel, black  
 Supplied complete with mounting screws for attachment to cylinder.

**Ø12 - Ø25**



**Ø32 - Ø100**



| Bore size | FD mm | FT mm | FV mm | FX mm | FZ mm | M mm | N mm | N1 mm | Mass kg | Part number     |
|-----------|-------|-------|-------|-------|-------|------|------|-------|---------|-----------------|
| 12        | 4.5   | 5.5   | 25    | 45    | 55    | 15.5 | 4.5  | 7.5   | 0.08    | <b>P1Q-4DMB</b> |
| 16        | 4.5   | 5.5   | 30    | 45    | 55    | 20   | 4.5  | 7.5   | 0.10    | <b>P1Q-4FMB</b> |
| 20        | 6.5   | 8     | 39    | 48    | 60    | 25.5 | 6.5  | 10.5  | 0.16    | <b>P1Q-4HMB</b> |
| 25        | 6.5   | 8     | 42    | 52    | 64    | 28   | 6.5  | 10.5  | 0.20    | <b>P1Q-4JMB</b> |
| 32        | 5.5   | 8     | 48    | 56    | 65    | 34   | 6.5  | 10.5  | 0.23    | <b>P1Q-4KMB</b> |
| 40        | 5.5   | 8     | 54    | 62    | 72    | 40   | 6.5  | 10.5  | 0.28    | <b>P1Q-4LMB</b> |
| 50        | 6.5   | 9     | 67    | 76    | 89    | 50   | 8.5  | 13.5  | 0.53    | <b>P1Q-4MMB</b> |
| 63        | 9     | 9     | 80    | 92    | 108   | 60   | 10.5 | 16.5  | 0.71    | <b>P1Q-4NMB</b> |
| 80        | 11    | 11    | 99    | 116   | 134   | 77   | 12.5 | 18.5  | 1.59    | <b>P1Q-4PMB</b> |
| 100       | 11    | 11    | 117   | 136   | 154   | 94   | 12.5 | 18.5  | 2.19    | <b>P1Q-4QMB</b> |

**Foot Mounting – Style F, 9**



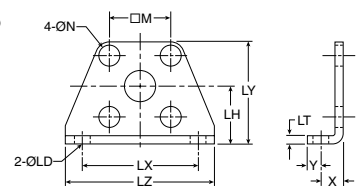
Intended for fixed mounting of cylinder. Angle bracket can be fitted to front and rear of cylinder.

**Material**

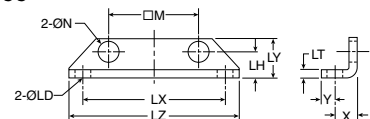
Angle bracket: surface treated steel, black  
 Supplied in pairs with mounting screws for attachment to cylinder.

\* Weight per item

**Ø12 - Ø25**



**Ø32 - Ø100**



| Bore size | LD mm | LH mm | LT mm | LX mm | LY mm | LZ mm | X mm | Y mm | M mm | N mm | Mass kg | Part number     |
|-----------|-------|-------|-------|-------|-------|-------|------|------|------|------|---------|-----------------|
| 12        | 4.5   | 17    | 2     | 34    | 29.5  | 44    | 8    | 4.5  | 15.5 | 4.5  | 0.02*   | <b>P1Q-4DMF</b> |
| 16        | 4.5   | 19    | 2     | 38    | 33.5  | 48    | 8    | 5    | 20   | 4.5  | 0.02*   | <b>P1Q-4FMF</b> |
| 20        | 6.5   | 24    | 3.2   | 48    | 42    | 62    | 9.2  | 5.8  | 25.5 | 6.5  | 0.04*   | <b>P1Q-4HMF</b> |
| 25        | 6.5   | 26    | 3.2   | 52    | 46    | 66    | 10.7 | 5.8  | 28   | 6.5  | 0.05*   | <b>P1Q-4JMF</b> |
| 32        | 6.5   | 13    | 3.2   | 57    | 20    | 71    | 11.2 | 5.8  | 34   | 6.5  | 0.06*   | <b>P1Q-4KMF</b> |
| 40        | 6.5   | 13    | 3.2   | 64    | 20    | 78    | 11.2 | 7    | 40   | 6.5  | 0.08*   | <b>P1Q-4LMF</b> |
| 50        | 8.5   | 14    | 3.2   | 79    | 22    | 95    | 12.2 | 8    | 50   | 8.5  | 0.16*   | <b>P1Q-4MMF</b> |
| 63        | 10.5  | 16    | 3.2   | 95    | 26    | 113   | 13.7 | 9    | 60   | 10.5 | 0.25*   | <b>P1Q-4NMF</b> |
| 80        | 13    | 20.5  | 4.5   | 118   | 32    | 140   | 16.5 | 11   | 77   | 13   | 0.50*   | <b>P1Q-4PMF</b> |
| 100       | 13    | 24    | 6     | 137   | 36    | 162   | 23   | 11.5 | 94   | 13   | 0.85*   | <b>P1Q-4QMF</b> |

**B**  
 Compact Cylinders  
 Actuator Products  
 P1Q Series  
 P1M Series  
 LP/LPM Series

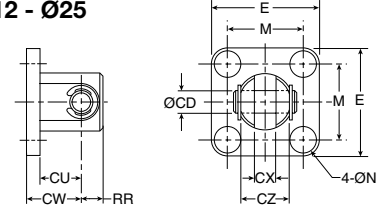
**Clevis Mounting – Style A, 2**



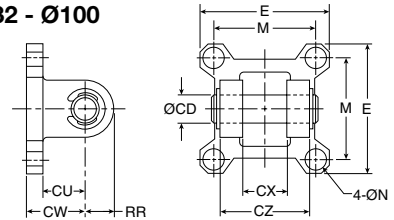
Intended for flexible mounting of cylinder. Clevis bracket can be fitted to the rear of cylinder.

**Material**  
 Clevis bracket: surface treated steel, black  
 Supplied complete with mounting screws for attachment to cylinder.

**Ø12 - Ø25**



**Ø32 - Ø100**



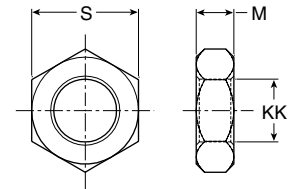
| Bore size | CD mm | CU mm | CW mm | CX mm | CZ mm | N mm | RR mm | M mm | E mm  | Mass kg | Part number     |
|-----------|-------|-------|-------|-------|-------|------|-------|------|-------|---------|-----------------|
| 12        | 5     | 9.5   | 14    | 5.3   | 9.8   | 4.5  | 6     | 15.5 | 25    | 0.02    | <b>P1Q-4DMT</b> |
| 16        | 5     | 10.5  | 15    | 6.8   | 11.8  | 4.5  | 6     | 20   | 29    | 0.03    | <b>P1Q-4FMT</b> |
| 20        | 8     | 12.5  | 18    | 8.3   | 15.8  | 6.5  | 9     | 25.5 | 36    | 0.05    | <b>P1Q-4HMT</b> |
| 25        | 10    | 14.5  | 20    | 10.3  | 19.8  | 6.5  | 10    | 28   | 40    | 0.06    | <b>P1Q-4JMT</b> |
| 32        | 10    | 14.5  | 20    | 18.3  | 35.8  | 6.5  | 10    | 34   | 45.5  | 0.08    | <b>P1Q-4KMT</b> |
| 40        | 10    | 15    | 22    | 18.3  | 35.8  | 6.5  | 10    | 40   | 53.5  | 0.11    | <b>P1Q-4LMT</b> |
| 50        | 14    | 20    | 28    | 22.3  | 43.8  | 8.5  | 14    | 50   | 64.5  | 0.14    | <b>P1Q-4MMT</b> |
| 63        | 14    | 21    | 30    | 22.3  | 43.8  | 10.5 | 14    | 60   | 77.5  | 0.29    | <b>P1Q-4NMT</b> |
| 80        | 18    | 28    | 38    | 28.3  | 55.8  | 12.5 | 18    | 77   | 98.5  | 0.36    | <b>P1Q-4PMT</b> |
| 100       | 22    | 32    | 45    | 32.3  | 63.8  | 12.5 | 22    | 94   | 117.5 | 0.64    | <b>P1Q-4QMT</b> |

**Jam Nut**



Intended for fixed mounting of accessories to the piston rod.

**Materials**  
 Galvanized steel  
 Cylinders supplied with galvanized nut.



| Bore size | KK       | M   | S  | Mass kg | Part number       |
|-----------|----------|-----|----|---------|-------------------|
| 12        | M5x0.8   | 2.7 | 18 | 0.002   | <b>L075540005</b> |
| 16        | M6x1.0   | 3.2 | 10 | 0.002   | <b>L075540006</b> |
| 20        | M8x1.25  | 4   | 13 | 0.005   | <b>L075540008</b> |
| 25        | M10x1.25 | 5   | 17 | 0.007   | <b>L075540010</b> |
| 32        | M14x1.5  | 7   | 22 | 0.010   | <b>L075540014</b> |
| 40        | M14x1.5  | 7   | 22 | 0.010   | <b>L075540014</b> |
| 50        | M18x1.5  | 8   | 27 | 0.021   | <b>L075540018</b> |
| 63        | M18x1.5  | 8   | 27 | 0.021   | <b>L075540018</b> |
| 80        | M22x1.5  | 11  | 32 | 0.040   | <b>L075540022</b> |
| 100       | M26x1.5  | 16  | 41 | 0.040   | <b>L075540026</b> |

**B**

Compact Cylinders  
Actuator Products

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P1Q  
Series

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P1M  
Series

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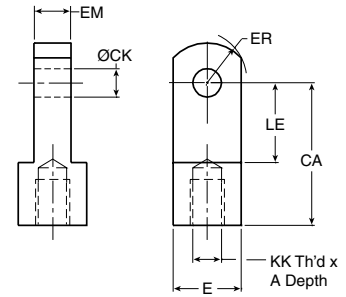
LP/LPM  
Series

**Rod Eye**



Rod eye for articulated mounting of cylinder.  
 Rod eye can be combined with clevis bracket.  
 Maintenance-free.

**Material**  
 Rod eye, nut: galvanized steel



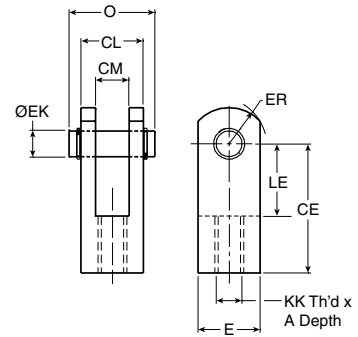
| Bore size | A    | E       | CA | KK       | ER   | LE   | CK | EM  | Mass kg | Part number     |
|-----------|------|---------|----|----------|------|------|----|-----|---------|-----------------|
| 12        | 7    | 9.5 Sq. | 16 | M5x0.8   | 6.5  | 7    | 5  | 5   | 0.03    | <b>P1M-4DRE</b> |
| 16        | 8    | 11 Sq.  | 25 | M6x1.0   | 8    | 14   | 5  | 6.5 | 0.03    | <b>P1M-4FRE</b> |
| 20        | 8.5  | 16 Sq.  | 25 | M8x1.25  | 10.5 | 11.5 | 8  | 8   | 0.05    | <b>P1M-4HRE</b> |
| 25        | 10.5 | 19 Sq.  | 30 | M10x1.25 | 13   | 14   | 10 | 10  | 0.07    | <b>P1M-4JRE</b> |
| 32        | 14   | 22 Dia. | 30 | M14x1.5  | 12   | 14   | 10 | 18  | 0.08    | <b>P1M-4LRE</b> |
| 40        | 14   | 22 Dia. | 30 | M14x1.5  | 12   | 14   | 10 | 18  | 0.12    | <b>P1M-4LRE</b> |
| 50        | 18.5 | 28 Dia. | 40 | M18x1.5  | 16   | 20   | 14 | 22  | 0.25    | <b>P1M-4MRE</b> |
| 63        | 18.5 | 28 Dia. | 40 | M18x1.5  | 16   | 20   | 14 | 22  | 0.25    | <b>P1M-4MRE</b> |
| 80        | 22   | 38 Dia. | 50 | M22x1.5  | 21   | 27   | 18 | 28  | 0.25    | <b>P1M-4PRE</b> |

**Rod Clevis**



Clevis for articulated mounting of cylinder.

**Material**  
 Clevis, clip, nut: galvanized steel  
 Pin: hardened steel



| Bore size | A    | E       | CE | KK       | ER   | LE   | EK (h9) | CM  | CL  | O    | Mass kg | Part number     |
|-----------|------|---------|----|----------|------|------|---------|-----|-----|------|---------|-----------------|
| 12        | 7    | 9.5     | 16 | M5x0.8   | 6.5  | 7    | 5       | 5   | 9.5 | 14.5 | 0.02    | <b>P1M-4DRC</b> |
| 16        | 11   | 11      | 21 | M6x1.0   | 8    | 10   | 5       | 6.5 | 11  | 16.5 | 0.02    | <b>P1M-4FRC</b> |
| 20        | 8.5  | 16      | 25 | M8x1.25  | 10.5 | 11.5 | 8       | 8   | 16  | 21   | 0.05    | <b>P1M-4HRC</b> |
| 25        | 10.5 | 19      | 30 | M10x1.25 | 13   | 14   | 10      | 10  | 19  | 25.5 | 0.09    | <b>P1M-4JRC</b> |
| 32        | 16   | 22 Dia. | 30 | M14x1.25 | 12   | 14   | 10      | 18  | 36  | 41.5 | 0.09    | <b>P1M-4LRC</b> |
| 40        | 16   | 22 Dia. | 30 | M14x1.25 | 12   | 14   | 10      | 18  | 36  | 41.5 | 0.15    | <b>P1M-4LRC</b> |
| 50        | 20   | 28 Dia. | 40 | M18x1.5  | 16   | 20   | 14      | 22  | 44  | 50.5 | 0.35    | <b>P1M-4MRC</b> |
| 63        | 20   | 28 Dia. | 40 | M18x1.5  | 16   | 20   | 14      | 22  | 44  | 50.5 | 0.35    | <b>P1M-4MRC</b> |
| 80        | 23   | 38 Dia. | 50 | M22x1.5  | 21   | 27   | 18      | 28  | 56  | 64   | 0.75    | <b>P1M-4PRC</b> |

**B**  
 Compact Cylinders  
 Actuator Products  
 P1Q Series  
 P1M Series  
 LP/LPM Series

- Versatile range of square body style compact cylinder
- Available in Low Profile Version or Long Bearing Version for enhanced rod bearing support
- 10 bore sizes: 12mm through 100mm
- Single and double acting versions available
- Four flexible port configurations available
- Recessed, flush position piston sensing available



**Operating information**

Operating pressure: 145 PSIG (10 bar) maximum air  
 Temperature range: Standard: -4°F to 176°F (-20°C to 80°C)  
 High: 14°F to 250°F (-10°C to 121°C)  
 Filtration requirements: 40 micron, dry filtered air  
 For technical information see CD

**Ordering information**

|            |            |          |          |          |          |          |          |          |            |
|------------|------------|----------|----------|----------|----------|----------|----------|----------|------------|
| <b>P1M</b> | <b>032</b> | <b>C</b> | <b>/</b> | <b>D</b> | <b>C</b> | <b>P</b> | <b>6</b> | <b>G</b> | <b>012</b> |
|------------|------------|----------|----------|----------|----------|----------|----------|----------|------------|

**Bore size**

|     |       |
|-----|-------|
| 012 | 12mm  |
| 016 | 16mm  |
| 020 | 20mm  |
| 025 | 25mm  |
| 032 | 32mm  |
| 040 | 40mm  |
| 050 | 50mm  |
| 063 | 63mm  |
| 080 | 80mm  |
| 100 | 100mm |

**Cylinder style**

|   |                                   |
|---|-----------------------------------|
| C | Basic no mtgs.                    |
| A | Double rear clevis <sup>1,3</sup> |
| B | Single rear clevis <sup>1,3</sup> |
| F | Foot mount <sup>1,4</sup>         |
| J | Front flange <sup>1</sup>         |
| H | Rear flange <sup>1,3</sup>        |

Insert "/" to denote special

**Function**

|   |  |
|---|--|
| D | Double acting                            |
| K | Double rod                               |
| R | Single acting spring return <sup>6</sup> |
| E | Single acting spring extend <sup>4</sup> |

**Piston/seal material**

**Without magnet <sup>2</sup>**

|   |  |
|---|--|
| C | No bumpers class 1 std. temp. seals                |
| G | No bumpers class 5 fluorocarbon seals              |
| B | With bumpers class 1 std. temp. seals <sup>7</sup> |

**With magnet <sup>5</sup>**  
(Not available on spring extend models)

|   |  |
|---|--|
| N | No bumpers class 1 std. temp. seals                |
| M | With bumpers class 1 std. temp. seals <sup>7</sup> |

**Piston rod & bearings**

**Extra low profile rod bearing**

|   |  |
|---|--|
| P | Chrome plated steel rod not available on 12-25mm bores                 |
| Y | Stainless steel rod standard on 12-25mm bores and spring extend models |

**Long rod bearing <sup>2</sup>**

|   |  |
|---|--|
| C | Chrome plated steel rod not available on 12-25mm bores                 |
| A | Stainless steel rod standard on 12-25mm bores and spring extend models |

**Stroke length**

Specify stroke length required in mm.

**Ports**

**Bspp**

|   |                                  |
|---|----------------------------------|
| G | Ported each end                  |
| H | Both ports head                  |
| J | Both ports cap                   |
| K | Both ports cap face <sup>3</sup> |

**NPTF**  
(Not available on 12-25mm bores)

|   |                                  |
|---|----------------------------------|
| N | Ported each end                  |
| M | Both ports head                  |
| L | Both ports cap                   |
| P | Both ports cap face <sup>3</sup> |

**Rod threads**

| Inch   |                 |
|--------|-----------------|
| 4      | Male            |
| 9      | Female          |
| Metric |                 |
| 5      | Male            |
| 6      | Female          |
| 3      | Special rod end |

**Maximum stroke lengths**

| Bore | ELP bearing version |             | Long bearing version |             | Single acting version |
|------|---------------------|-------------|----------------------|-------------|-----------------------|
|      | Min. stroke*        | Max. stroke | Min. stroke*         | Max. stroke | Standard stroke       |
| 12   | 3                   | 50          | 4                    | 200         | 5,10                  |
| 16   | 3                   | 50          | 4                    | 200         | 5,10                  |
| 20   | 3                   | 50          | 8                    | 200         | 5,10                  |
| 25   | 3                   | 50          | 8                    | 200         | 5,10                  |
| 32   | 3                   | 100         | 9                    | 320         | 5,10                  |
| 40   | 3                   | 100         | 7                    | 320         | 5,10                  |
| 50   | 3                   | 100         | 13                   | 320         | 10, 20, 25            |
| 63   | 3                   | 100         | 18                   | 500         | 10, 20, 25            |
| 80   | 3                   | 150         | 23                   | 500         | 10, 20, 25            |
| 100  | 3                   | 150         | 18                   | 500         | 10, 20, 25            |

\* Minimum stroke for double rod cylinders: 12-63mm bores is 5mm  
 80 & 100mm bores is 10mm

**NOTES:**

- 1 Fitted with Mounting Accessory
- 2 Magnetic Piston Option must be specified along with Long Rod Bearing option to achieve Long Bearing Version
- 3 Porting Options 'K' and 'P' (Both ports cap face) not available with rear mountings
- 4 Single Acting Spring Extend available with stainless steel rod only.
- 5 For information regarding sensors, please refer to Electronic Sensors section.
- 6 Spring return is short bearing version only.
- 7 Bumper only available on head end for spring extend. Bumper only available on cap end for spring return.

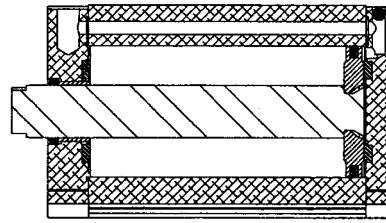
**Sensors**

For sensors see page B294.

**B**  
 Compact Cylinders  
 Actuator Products  
 P1Q Series  
 P1M Series  
 LP/LPM Series

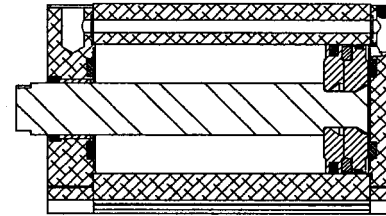
**Extra Low Profile Version**

The Extra Low Profile Bearing Version provides the most compact cylinder possible. This bearing version is recommended for applications that require shorter stroke lengths or that are light duty. It is available in stroke lengths up to 50mm in the smaller bore sizes and 150 mm in the larger bore sizes.

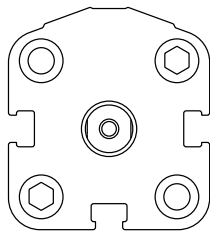


**Long Bearing Version**

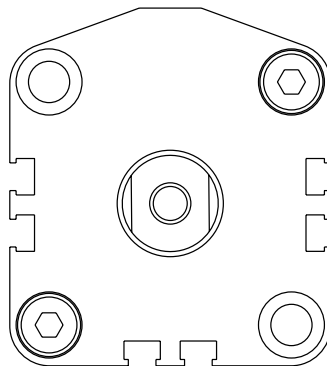
The Long Bearing Version provides additional rod bearing and piston bearing support and also includes a magnetic piston with bearing strip for greater piston bearing support. This Long Bearing version is required for stroke lengths beyond the Extra Low Profile maximum stroke length and is recommended for higher duty applications.



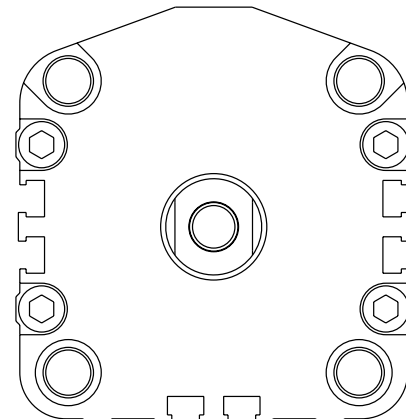
**Front profiles by bore size**



**Bores 12-25mm**



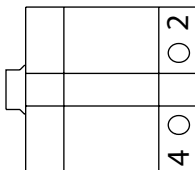
**Bores 32-50mm**



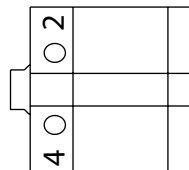
**Bores 63-100mm**

**Porting configurations**

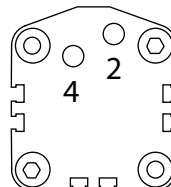
**Both Ports Cap**



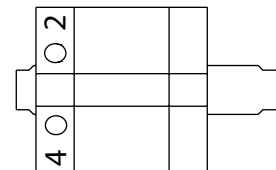
**Both Ports Head\***



**Both Ports Cap Face**



**Double Rod Both Ports One End**



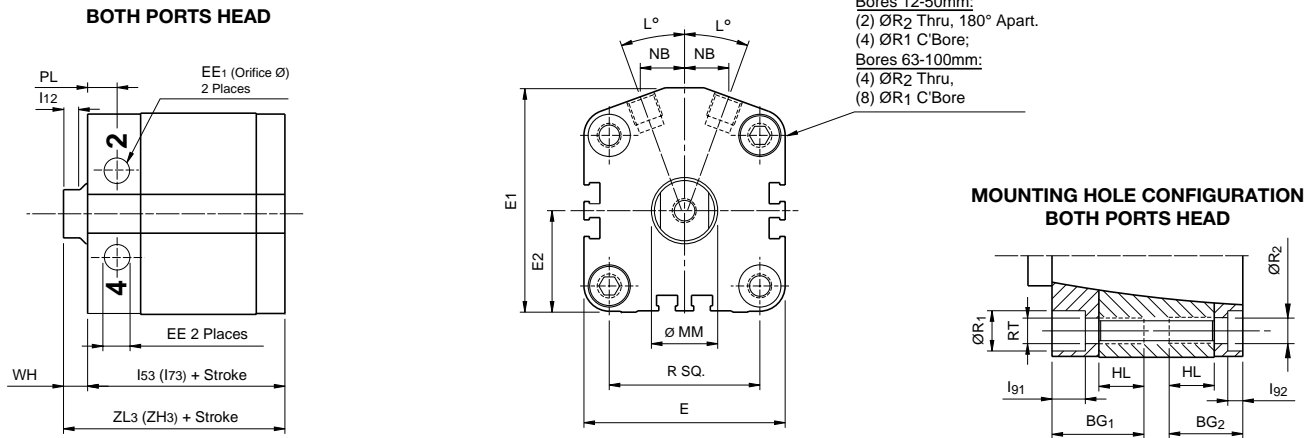
To retract cylinder apply air to port #2  
 To extend cylinder apply air to port #4

For a double rod cylinder, pressurize port #2 to retract the piston rod into the head containing the ports.

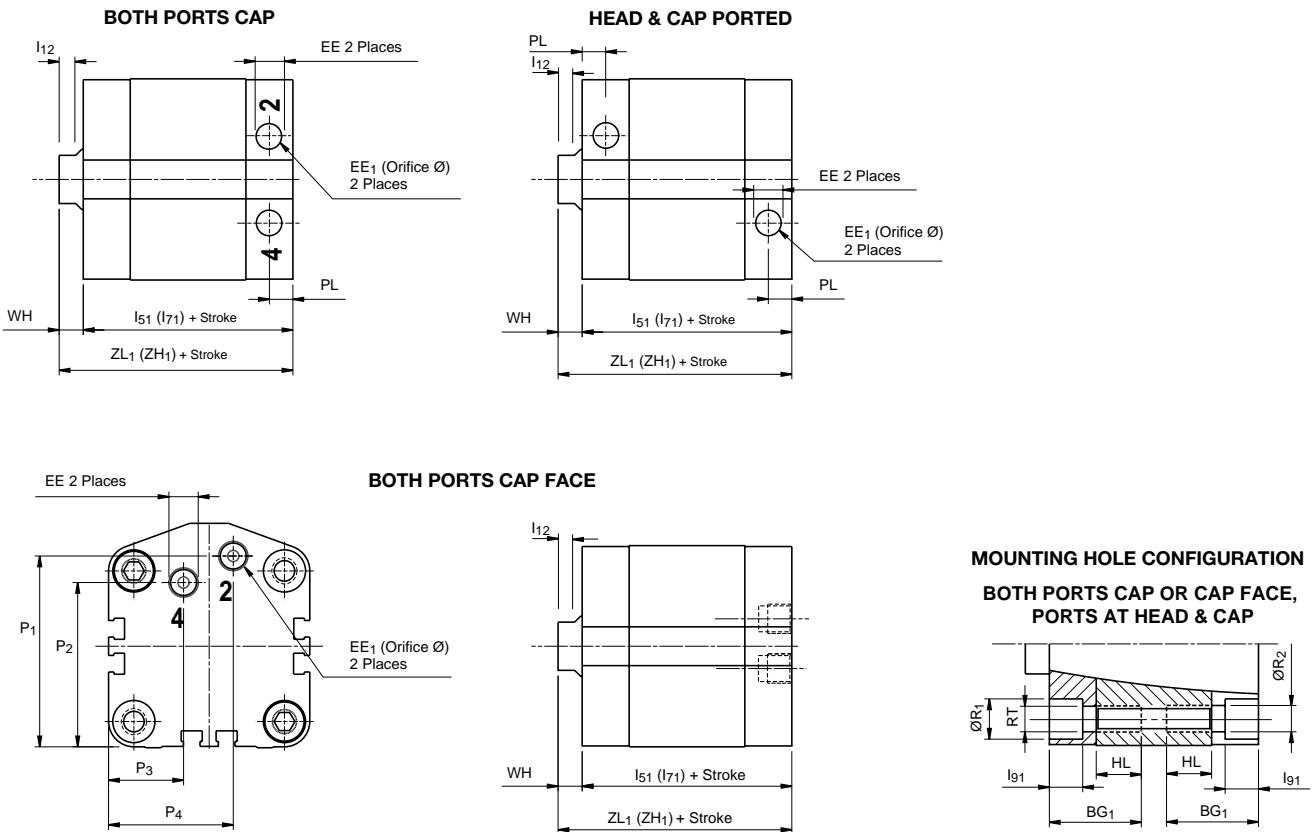
\* For 12mm to 16mm bores, although the location of ports #2 and #4 are reversed, porting functions shown above apply.

**B**  
 Compact Cylinders  
 Actuator Products  
 P1Q Series  
 P1M Series  
 LP/LPM Series

**All porting configurations**



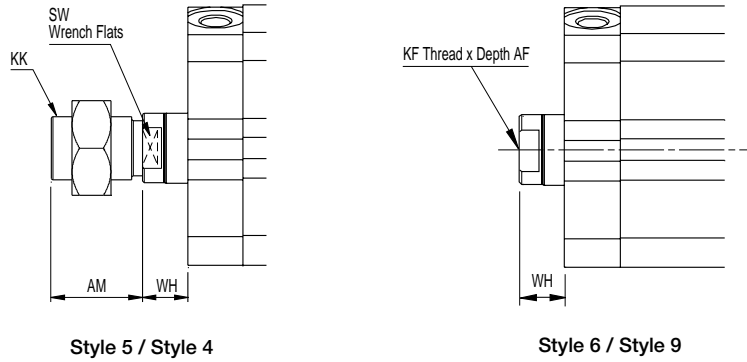
**Optional porting configurations**



Note: Magnetic Dimensions in Parentheses

For special rod ends, specify “3” in model number and give desired WH, AM or AF and KK or KF (length dimensions in millimeters).

Jam nut is supplied when cylinder is ordered with Style 4 or Style 5 rod end.



**B**  
Compact Cylinders  
Actuator Products  
  
Series  
P1Q  
  
Series  
P1M  
  
Series  
LP/LPM

| Bore size | Rod | AF      |         | AM      |         | KF      |         | KK       |         | WH             |         | I12 | SW |
|-----------|-----|---------|---------|---------|---------|---------|---------|----------|---------|----------------|---------|-----|----|
|           |     | Style 6 | Style 9 | Style 5 | Style 4 | Style 6 | Style 9 | Style 5  | Style 4 | Style 4, 9 & 6 | Style 5 |     |    |
| 12        | 6   | 6       | 5.4     | 9       | 8       | M3x0.5  | #8-32   | M5x0.8   | #8-32   | 3.5            | 5       | 3   | 5  |
| 16        | 8   | 8       | 5.4     | 10      | 8       | M4x0.7  | #8-32   | M6x1.0   | #8-32   | 3.5            | 5.5     | 3   | 7  |
| 20        | 10  | 7       | 7       | 12      | 8       | M5x0.8  | #10-32  | M8x1.25  | #10-32  | 4.5            | 6.5     | 4   | 9  |
| 25        | 10  | 12      | 10      | 15      | 9.5     | M6x1.0  | 1/4-28  | M10x1.25 | 1/4-28  | 5              | 7.5     | 4   | 9  |
| 32        | 12  | 13      | 13.3    | 20.5    | 12.7    | M8x1.25 | 5/16-24 | M12x1.25 | 5/16-24 | 7              | 8       | 5   | 10 |
| 40        | 16  | 13      | 18.3    | 20.5    | 16      | M8x1.25 | 3/8-24  | M14x1.5  | 3/8-24  | 7              | 8       | 5.5 | 13 |
| 50        | 20  | 15      | 17.6    | 26      | 19.5    | M10x1.5 | 1/2-20  | M18x1.5  | 1/2-20  | 8              | 7.5     | 5.5 | 16 |
| 63        | 20  | 15      | 17.6    | 26      | 19.5    | M10x1.5 | 1/2-20  | M18x1.5  | 1/2-20  | 8              | 7.5     | 5.5 | 16 |
| 80        | 25  | 21      | 24.3    | 32.5    | 25.5    | M16x2.0 | 5/8-18  | M22x1.5  | 5/8-18  | 10             | 11      | 6   | 21 |
| 100       | 25  | 27      | 27      | 32.5    | 28.5    | M20x2.5 | 3/4-16  | M22x1.5  | 3/4-16  | 12             | 11      | 6   | 21 |

| Bore size | BG1  | BG2  | E    | E1    | E2   | EE   |      | HL  | I91 | I92 | L   | NB | P1   | P2    |      |
|-----------|------|------|------|-------|------|------|------|-----|-----|-----|-----|----|------|-------|------|
|           |      |      |      |       |      | BSPP | NPTF |     |     |     |     |    |      |       |      |
| 12        | 16.5 | 11.5 | 27   | 31    | 14   | M5   | -    | 1   | 8   | 3.5 | 3.5 | 26 | 5.5  | 25    | 9.5  |
| 16        | 17   | 12   | 31.5 | 35    | 16   | M5   | -    | 1.2 | 8   | 4   | 4   | 20 | 7    | 29.5  | 9.5  |
| 20        | 19   | 14.5 | 38.5 | 42.5  | 19.5 | M5   | -    | 1.3 | 10  | 4.5 | 4.5 | 20 | 8    | 35    | 13.5 |
| 25        | 21   | 15   | 41.5 | 45.5  | 21   | M5   | -    | 1.8 | 10  | 5   | 5   | 20 | 8.5  | 38.5  | 14   |
| 32        | 25   | 17   | 48   | 56    | 24   | G1/8 | 1/8  | 2.7 | 10  | 4   | 4   | 25 | 9.5  | 45.5  | 16.5 |
| 40        | 25.5 | 17.5 | 56   | 62.5  | 28   | G1/8 | 1/8  | 3.4 | 10  | 4   | 4   | 20 | 11.5 | 51    | 12   |
| 50        | 29.5 | 23.5 | 67   | 74.5  | 33.5 | G1/8 | 1/8  | 4   | 14  | 5   | 5   | 20 | 14.5 | 63    | 54.5 |
| 63        | 34   | 28   | 82   | 86    | 40.5 | G1/8 | 1/8  | 5   | 18  | 6.5 | 8   | 20 | 17.5 | 73.5  | 64   |
| 80        | 43   | 34   | 98   | 106.5 | 48.5 | G1/4 | 1/4  | 5.5 | 22  | 8.5 | 10  | 20 | 25.5 | 92    | 79.5 |
| 100       | 44   | 35.5 | 119  | 126.5 | 59.5 | G1/4 | 1/4  | 6   | 22  | 8.5 | 10  | 20 | 31.5 | 111.5 | 97.5 |

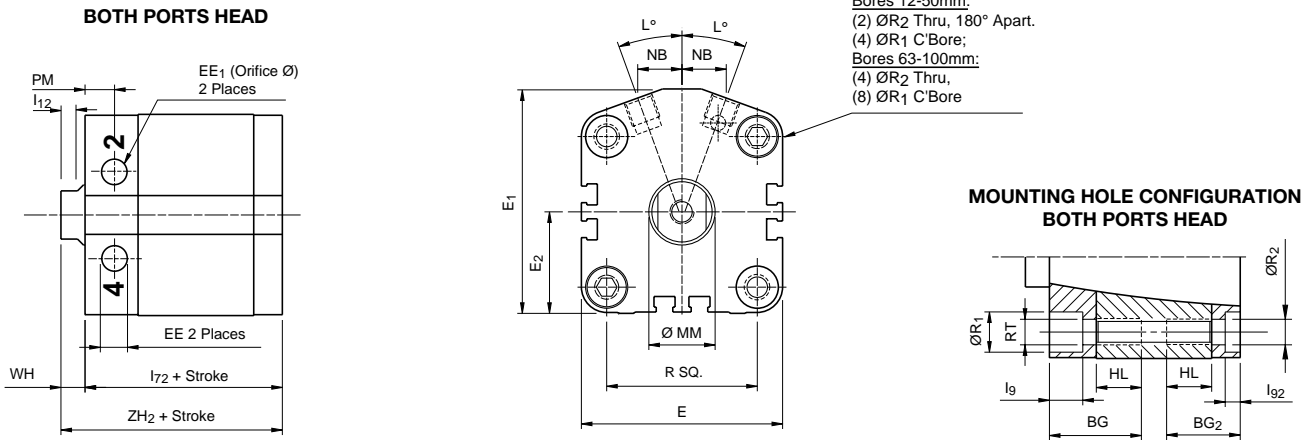
| Bore size | P3   | P4   | PL   | PM   | R    | R1   | R2* | RT  | Non-magnetic |      |      |      | Magnetic |      |      |      | ELP Max stroke |
|-----------|------|------|------|------|------|------|-----|-----|--------------|------|------|------|----------|------|------|------|----------------|
|           |      |      |      |      |      |      |     |     | I51          | I53  | ZL1  | ZL3  | I71      | I73  | ZH1  | ZH3  |                |
| 12        | 13.5 | 13.5 | 5    | 8.5  | 15.5 | 5.8  | 3.5 | M4  | 22           | 17   | 25.5 | 20.5 | 33       | 28   | 36.5 | 31.5 | 50             |
| 16        | 15.5 | 18   | 5    | 9    | 20   | 7.4  | 3.5 | M4  | 23.5         | 18.5 | 27   | 22   | 34.5     | 29.5 | 38   | 33   | 50             |
| 20        | 24.5 | 21.5 | 5    | 9    | 25.5 | 9    | 5.5 | M6  | 24           | 19.5 | 28.5 | 24   | 34       | 29.5 | 38.5 | 34   | 50             |
| 25        | 27.5 | 24.5 | 7    | 9    | 28   | 9    | 5.5 | M6  | 28.5         | 22.5 | 33.5 | 27.5 | 38.5     | 32.5 | 43.5 | 37.5 | 50             |
| 32        | 31.5 | 28.5 | 8    | 10.5 | 34   | 10.5 | 5.5 | M6  | 36.5         | 28.5 | 43.5 | 35.5 | 46       | 37.5 | 53   | 44.5 | 100            |
| 40        | 23   | 33   | 7.5  | 9.5  | 40   | 10.5 | 5.5 | M6  | 38.5         | 29.5 | 44.5 | 36.5 | 47.5     | 39.5 | 54.5 | 46.5 | 100            |
| 50        | 25   | 41.5 | 8    | 10   | 50   | 13.5 | 7.5 | M8  | 38.5         | 32.5 | 46.5 | 40.5 | 47.5     | 41.5 | 55.5 | 49.5 | 100            |
| 63        | 30   | 53   | 8    | 11   | 60   | 13.5 | 9.5 | M10 | 39.5         | 34   | 47.5 | 42   | 51.5     | 46   | 59.5 | 54   | 100            |
| 80        | 33   | 69.5 | 11.5 | 11.5 | 77   | 16.5 | 11  | M12 | 52           | 43   | 62   | 53   | 62.5     | 53.5 | 72.5 | 63.5 | 150            |
| 100       | 36.5 | 87.5 | 12   | 12   | 94   | 17   | 11  | M12 | 57           | 48.5 | 69   | 60.5 | 71.5     | 63   | 83.5 | 75   | 150            |

\*\*R2 thru” not available on 12mm and 16mm bores.

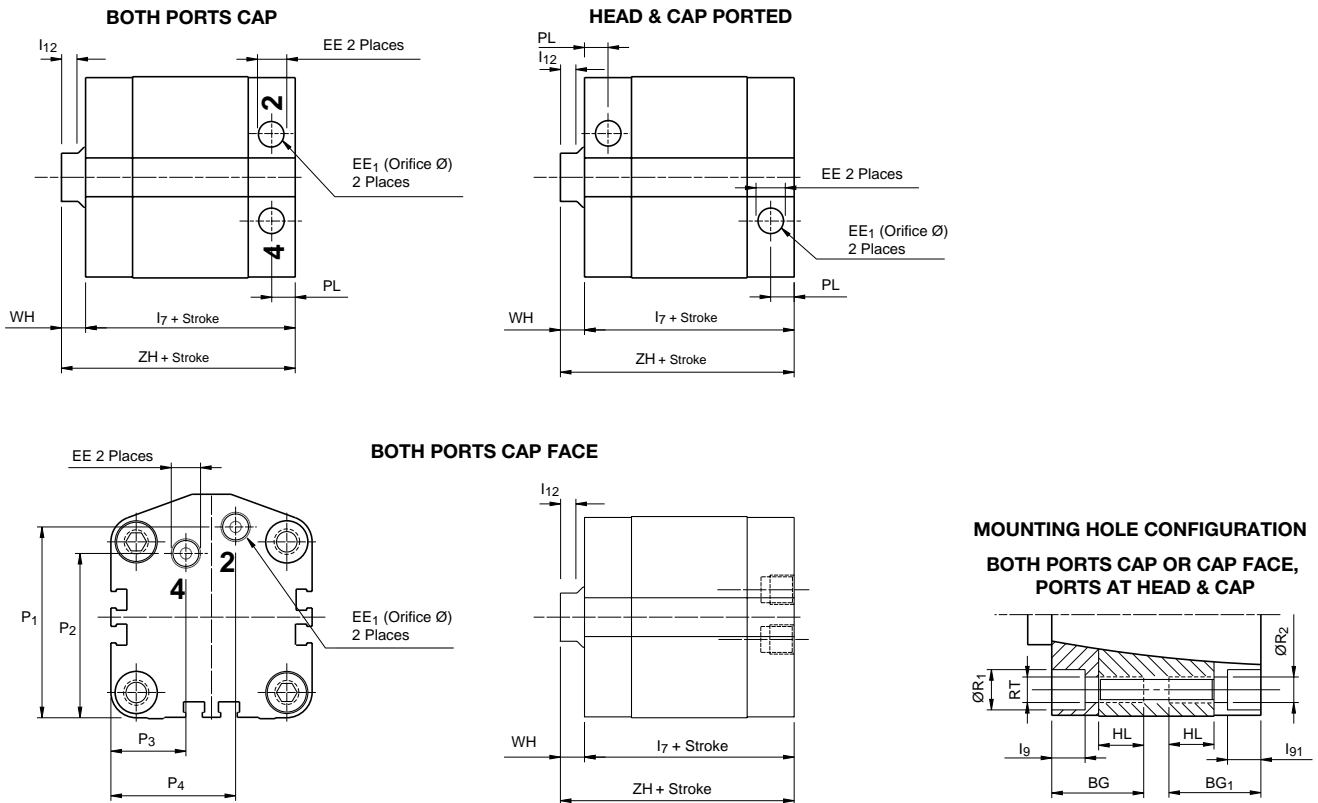




**All porting configurations**



**Optional porting configurations**

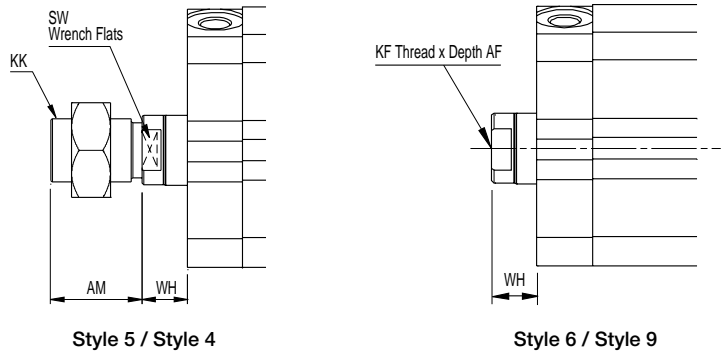


Note: Magnetic Dimensions in Parentheses

For special rod ends, specify “3” in model number and give desired WH, AM or AF and KK or KF (length dimensions in millimeters).

Jam nut is supplied when Style 4 or Style 5 rod end is specified.

**Note:** Magnetic piston and longer rod bearing are standard with Long Bearing Version.



**B**  
 Compact Cylinders  
 Actuator Products  
 P1Q Series  
 P1M Series  
 LP/LPM Series

| Bore size | Rod MM | AF      |         | AM      |         | KF      |         | KK       |         | WH             |         | I12 | SW |
|-----------|--------|---------|---------|---------|---------|---------|---------|----------|---------|----------------|---------|-----|----|
|           |        | Style 6 | Style 9 | Style 5 | Style 4 | Style 6 | Style 9 | Style 5  | Style 4 | Style 4, 9 & 6 | Style 5 |     |    |
| 12        | 6      | 6       | 5.4     | 9       | 8       | M3x0.5  | #8-32   | M5x0.8   | #8-32   | 3.5            | 5       | 3   | 5  |
| 16        | 8      | 8       | 5.4     | 10      | 8       | M4x0.7  | #8-32   | M6x1.0   | #8-32   | 3.5            | 5.5     | 3   | 7  |
| 20        | 10     | 7       | 7       | 12      | 8       | M5x0.8  | #10-32  | M8x1.25  | #10-32  | 4.5            | 6.5     | 4   | 9  |
| 25        | 10     | 12      | 10      | 15      | 9.5     | M6x1.0  | 1/4-28  | M10x1.25 | 1/4-28  | 5              | 7.5     | 4   | 9  |
| 32        | 12     | 13      | 13.3    | 20.5    | 12.7    | M8x1.25 | 5/16-24 | M12x1.25 | 5/16-24 | 7              | 8       | 5   | 10 |
| 40        | 16     | 13      | 18.3    | 20.5    | 16      | M8x1.25 | 3/8-24  | M14x1.5  | 3/8-24  | 7              | 8       | 5.5 | 13 |
| 50        | 20     | 15      | 17.6    | 26      | 19.5    | M10x1.5 | 1/2-20  | M18x1.5  | 1/2-20  | 8              | 7.5     | 5.5 | 16 |
| 63        | 20     | 15      | 17.6    | 26      | 19.5    | M10x1.5 | 1/2-20  | M18x1.5  | 1/2-20  | 8              | 7.5     | 5.5 | 16 |
| 80        | 25     | 21      | 24.3    | 32.5    | 25.5    | M16x2.0 | 5/8-18  | M22x1.5  | 5/8-18  | 10             | 11      | 6   | 21 |
| 100       | 25     | 27      | 27      | 32.5    | 28.5    | M20x2.5 | 3/4-16  | M22x1.5  | 3/4-16  | 12             | 11      | 6   | 21 |

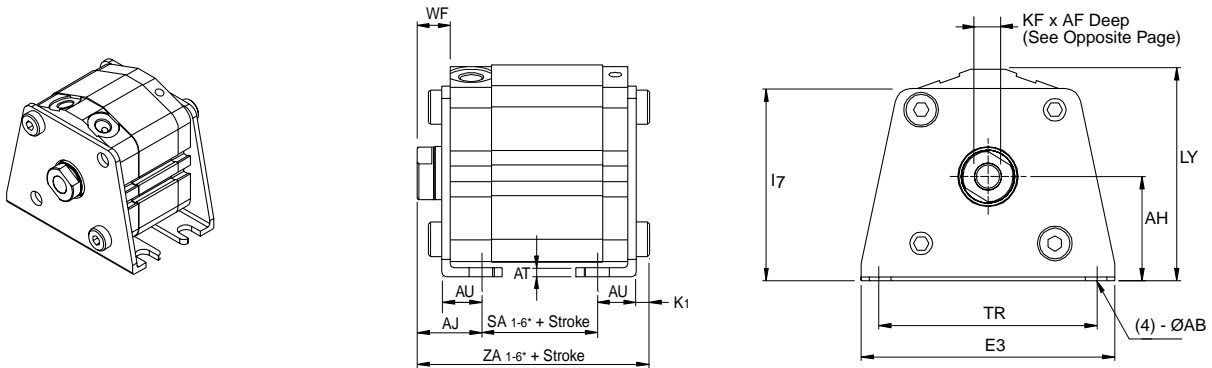
| Bore size | EE   |      |      |      |       |      |      |      |     |    |      |      |      |     |     |    |
|-----------|------|------|------|------|-------|------|------|------|-----|----|------|------|------|-----|-----|----|
|           | BG   | BG1  | BG2  | E    | E1    | E2   | BSPP | NPTF | EE1 | HL | l7   | l72  | l9   | l91 | l92 | L  |
| 12        | 21.5 | 16.5 | 11.5 | 27   | 31    | 14   | M5   | –    | 1   | 8  | 38.5 | 33.5 | 3.5  | 3.5 | 3.5 | 26 |
| 16        | 22   | 17   | 12   | 31.5 | 35    | 16   | M5   | –    | 1.2 | 8  | 40.5 | 35.5 | 5.5  | 4   | 4   | 20 |
| 20        | 24.5 | 19   | 14.5 | 38.5 | 42.5  | 19.5 | M5   | –    | 1.3 | 10 | 40   | 35.5 | 10.5 | 4.5 | 4.5 | 20 |
| 25        | 24.5 | 21   | 15   | 41.5 | 45.5  | 21   | M5   | –    | 1.8 | 10 | 42.5 | 36.5 | 10.5 | 5   | 5   | 20 |
| 32        | 27.5 | 25   | 17   | 48   | 56    | 24   | G1/8 | 1/8  | 2.7 | 10 | 48   | 40   | 14   | 4   | 4   | 25 |
| 40        | 27.5 | 25.5 | 17.5 | 56   | 62.5  | 28   | G1/8 | 1/8  | 3.4 | 10 | 49.5 | 41.5 | 14   | 4   | 4   | 20 |
| 50        | 31.5 | 29.5 | 23.5 | 67   | 74.5  | 33.5 | G1/8 | 1/8  | 4   | 14 | 49.5 | 43.5 | 13   | 5   | 5   | 20 |
| 63        | 37   | 34   | 28   | 82   | 86    | 40.5 | G1/8 | 1/8  | 5   | 18 | 54.5 | 49   | 6.5  | 6.5 | 8   | 20 |
| 80        | 43   | 43   | 34   | 98   | 106.5 | 48.5 | G1/4 | 1/4  | 5.5 | 22 | 62.5 | 53.5 | 9.5  | 8.5 | 10  | 20 |
| 100       | 44   | 44   | 35.5 | 119  | 126.5 | 59.5 | G1/4 | 1/4  | 6   | 22 | 71.5 | 63   | 9.5  | 8.5 | 10  | 20 |

| Bore size | P    |       |      |      |      |      |      |      |     |     |      |      | Min stroke | Max stroke |
|-----------|------|-------|------|------|------|------|------|------|-----|-----|------|------|------------|------------|
|           | NB   | P1    | P2   | P3   | P4   | PM   | R    | R1   | R2* | RT  | ZH   | ZH2  |            |            |
| 12        | 5.5  | 25    | 9.5  | 13.5 | 13.5 | 8.5  | 15.5 | 5.8  | 3.5 | M4  | 42   | 37   | 4          | 200        |
| 16        | 7    | 29.5  | 9.5  | 15.5 | 18   | 9    | 20   | 7.4  | 3.5 | M4  | 44   | 39   | 4          | 200        |
| 20        | 8    | 35    | 13.5 | 24.5 | 21.5 | 9    | 25.5 | 9    | 5.5 | M6  | 44.5 | 40   | 8          | 200        |
| 25        | 8.5  | 38.5  | 14   | 27.5 | 24.5 | 9    | 28   | 9    | 5.5 | M6  | 47.5 | 41.5 | 8          | 200        |
| 32        | 9.5  | 45.5  | 16.5 | 31.5 | 28.5 | 10.5 | 34   | 10.5 | 5.5 | M6  | 55   | 47   | 9          | 320        |
| 40        | 11.5 | 51    | 12   | 23   | 33   | 9.5  | 40   | 10.5 | 5.5 | M6  | 56.5 | 48.5 | 7          | 320        |
| 50        | 14.5 | 63    | 54.5 | 25   | 41.5 | 10   | 50   | 13.5 | 7.5 | M8  | 57.5 | 51.5 | 13         | 320        |
| 63        | 17.5 | 73.5  | 64   | 30   | 53   | 11   | 60   | 13.5 | 9.5 | M10 | 62.5 | 57   | 18         | 500        |
| 80        | 25.5 | 92    | 79.5 | 33   | 69.5 | 11.5 | 77   | 16.5 | 11  | M12 | 72.5 | 62.5 | 23         | 500        |
| 100       | 31.5 | 111.5 | 97.5 | 36.5 | 87.5 | 12   | 94   | 17   | 11  | M12 | 83.5 | 75   | 18         | 500        |

\* “R2 thru” not available on 12mm and 16mm bores.



**Foot Mounting – Style F**



Please note bearing, piston and porting configuration for selecting proper dimensions.

| Bore size | AB  | AH | AJ   | AT  | AU   | E <sub>3</sub> | l <sub>7</sub> | K <sub>1</sub> | LY   | TR  | Part number     |
|-----------|-----|----|------|-----|------|----------------|----------------|----------------|------|-----|-----------------|
| 12        | 4.5 | 17 | 19.5 | 2   | 8    | 44             | 29.5           | 2.8            | 34   | 35  | <b>P1M-4DMF</b> |
| 16        | 4.5 | 19 | 19.5 | 2   | 8    | 48             | 33.5           | 2.8            | 38   | 39  | <b>P1M-4FMF</b> |
| 20        | 6.5 | 24 | 20.5 | 3.2 | 9.2  | 62             | 42             | 4              | 47   | 50  | <b>P1M-4HMF</b> |
| 25        | 6.5 | 26 | 22.5 | 3.2 | 10.7 | 66             | 46             | 4              | 50.5 | 52  | <b>P1M-4JMF</b> |
| 32        | 6.5 | 30 | 25   | 3.2 | 11.2 | 71             | 54             | 4              | 62   | 60  | <b>P1M-4KMF</b> |
| 40        | 6.5 | 33 | 25   | 3.2 | 11.2 | 78             | 61             | 4              | 67.5 | 67  | <b>P1M-4LMF</b> |
| 50        | 9   | 39 | 29.5 | 3.2 | 14.7 | 95             | 72.5           | 5              | 80   | 82  | <b>P1M-4MMF</b> |
| 63        | 11  | 46 | 31   | 3.2 | 16.2 | 113            | 32             | 5              | 91.5 | 100 | <b>P1M-4NMF</b> |
| 80        | 13  | 59 | 35   | 4.5 | 19.5 | 140            | 42             | 7              | 117  | 118 | <b>P1M-4PMF</b> |
| 100       | 13  | 71 | 39   | 6   | 23   | 162            | 53             | 7              | 138  | 139 | <b>P1M-4QMF</b> |

| Bore size | ELP version non-magnetic |                   |                   |                   |                | ELP version magnetic |                   |                  |                   |               | Long bearing version |                   |                  |                   |               |                               |
|-----------|--------------------------|-------------------|-------------------|-------------------|----------------|----------------------|-------------------|------------------|-------------------|---------------|----------------------|-------------------|------------------|-------------------|---------------|-------------------------------|
|           | Both ports head          |                   | Optional porting  |                   | Min. ** stroke | Both ports head      |                   | Optional porting |                   | Min.** stroke | Both ports head      |                   | Optional porting |                   | Min.** stroke | Style 5 end length adjustment |
|           | SA <sub>1</sub>          | ZA <sub>1</sub> * | SA <sub>2</sub> * | ZA <sub>2</sub> * |                | SA <sub>3</sub>      | ZA <sub>3</sub> * | SA <sub>4</sub>  | ZA <sub>4</sub> * |               | SA <sub>5</sub>      | ZA <sub>5</sub> * | SA <sub>6</sub>  | ZA <sub>6</sub> * |               |                               |
| 12        | 5                        | 35.3              | 10                | 40.3              | 15             | 16                   | 46.3              | 21               | 51.3              | 4             | 21.5                 | 51.8              | 26.5             | 56.8              | 4             | 1.5                           |
| 16        | 6.5                      | 36.8              | 11.5              | 41.8              | 14             | 17.5                 | 47.8              | 22.5             | 52.8              | 4             | 23.5                 | 53.8              | 28.5             | 58.8              | 4             | 2                             |
| 20        | 7.5                      | 41.2              | 12                | 45.7              | 18             | 17.5                 | 51.2              | 22               | 55.7              | 8             | 23.5                 | 57.2              | 28               | 61.9              | 8             | 2                             |
| 25        | 7.5                      | 44.7              | 13.5              | 50.7              | 18             | 17.5                 | 54.7              | 23.5             | 60.7              | 8             | 21.5                 | 58.7              | 27.5             | 64.7              | 8             | 2.5                           |
| 32        | 12.5                     | 52.5              | 20.5              | 60.7              | 18             | 21.5                 | 61.7              | 29.5             | 69.9              | 9             | 24                   | 64                | 32               | 72.2              | 9             | 1                             |
| 40        | 13.5                     | 53.7              | 21.5              | 61.9              | 17             | 23.5                 | 63.7              | 31.5             | 71.9              | 7             | 25.5                 | 65.7              | 33.5             | 73.9              | 7             | 1                             |
| 50        | 9.5                      | 58.7              | 15.5              | 64.9              | 22             | 18.5                 | 67.7              | 24.5             | 73.9              | 13            | 20.5                 | 69.7              | 26.5             | 75.9              | 13            | -0.5                          |
| 63        | 8                        | 60.2              | 13.5              | 65.7              | 30             | 20                   | 72.2              | 25.5             | 77.7              | 18            | 23                   | 75.2              | 28.5             | 80.7              | 18            | -0.5                          |
| 80        | 13                       | 74.5              | 22                | 83.5              | 33             | 23.5                 | 85                | 32.5             | 94                | 23            | 23.5                 | 85                | 32.5             | 94                | 23            | 1                             |
| 100       | 14.5                     | 83.5              | 23                | 92                | 33             | 29                   | 98                | 37.5             | 106.5             | 18            | 29                   | 98                | 37.5             | 106.5             | 18            | -1                            |

\* For strokes less than 'min. stroke', only one bracket will be supplied at rod end.

\*\* Dimensions shown apply only for rod end styles 4, 6 and 9. For rod end style 5, please include the above length adjustment.

**Note:** Foot bracket mounting is not available with cap face porting

**B**

Compact Cylinders  
Actuator Products

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P1Q Series

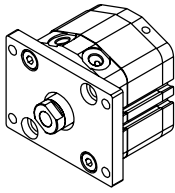
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P1M Series

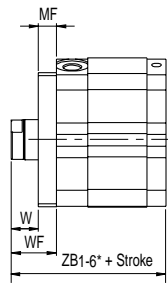
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LP/LPM Series

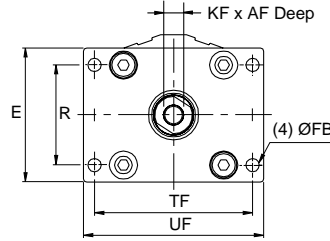
**Front Flange Mounting – Style J**



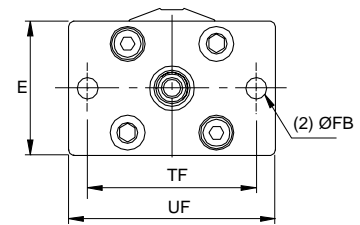
Please note bearing, piston and porting configuration for selecting proper dimensions.



**Bores 32-100mm**



**Bores 12-25mm**



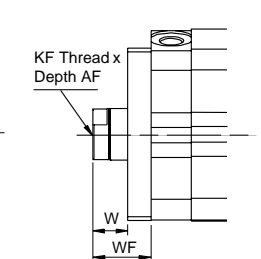
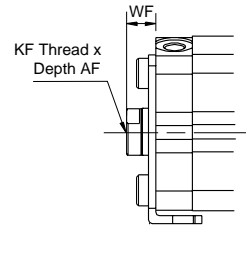
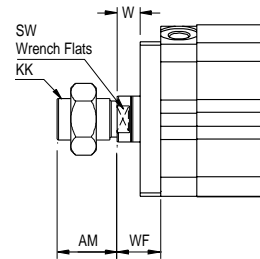
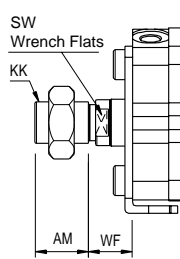
**B**  
 Compact Cylinders  
 Actuator Products  
 Series P1Q  
 Series P1M  
 Series LP/LPM

| Bore size | ELP version Non-magnetic |     |     |    |      |     | ELP version Magnetic |                  |                 |                  | Long bearing Version |                  | Style 5 rod end length adjustment | Part number     |
|-----------|--------------------------|-----|-----|----|------|-----|----------------------|------------------|-----------------|------------------|----------------------|------------------|-----------------------------------|-----------------|
|           | E                        | FB  | MF  | R  | TF   | UF  | Both ports head      | Optional Porting | Both ports head | Optional porting | Both ports head      | Optional porting |                                   |                 |
| 12        | 25                       | 4.5 | 5.5 | -  | 45   | 55  | ZB1*                 | ZB2*             | ZB3*            | ZB4*             | ZB5*                 | ZB6*             | 1.5                               | <b>P1M-4DMB</b> |
| 16        | 30                       | 4.5 | 5.5 | -  | 45   | 55  | 32                   | 37               | 43              | 48               | 49                   | 54               | 2                                 | <b>P1M-4FMB</b> |
| 20        | 39                       | 6.5 | 8   | -  | 50.5 | 62  | 34                   | 38.5             | 44              | 48.5             | 50                   | 54.5             | 2                                 | <b>P1M-4HMB</b> |
| 25        | 42                       | 6.5 | 8   | -  | 53   | 65  | 37.5                 | 43.5             | 47.5            | 53.5             | 51.5                 | 57.5             | 2.5                               | <b>P1M-4JMB</b> |
| 32        | 48                       | 5.5 | 8   | 34 | 58   | 68  | 45.5                 | 53.5             | 54.5            | 62.5             | 57                   | 65               | 1                                 | <b>P1M-4KMB</b> |
| 40        | 54                       | 5.5 | 8   | 40 | 66   | 76  | 46.5                 | 54.5             | 56.5            | 64.5             | 58.5                 | 66.5             | 1                                 | <b>P1M-4LMB</b> |
| 50        | 67                       | 6.5 | 9   | 50 | 79   | 90  | 50.5                 | 56.5             | 59.5            | 65.5             | 61.5                 | 67.5             | -0.5                              | <b>P1M-4MMB</b> |
| 63        | 80                       | 9   | 9   | 60 | 97   | 112 | 52                   | 57.5             | 64              | 69.5             | 67                   | 72.5             | -0.5                              | <b>P1M-4NMB</b> |
| 80        | 99                       | 11  | 11  | 77 | 116  | 134 | 63                   | 72               | 73.5            | 82.5             | 73.5                 | 82.5             | 1                                 | <b>P1M-4PMB</b> |
| 100       | 117                      | 11  | 11  | 94 | 137  | 154 | 70.5                 | 79               | 85              | 93.5             | 85                   | 93.5             | -1                                | <b>P1M-4QMB</b> |

\* Dimensions shown apply only for Rod End Styles 4, 6 and 9. For Rod End Style 5, please include the above length adjustment.

**Rod End Front Mounts F & J**

For special rod threads, specify "3" in model number and give desired AM or AF, WF and KK or KF.



**Foot Mounting - Style F**

**Foot Flange Mounting - Style J**

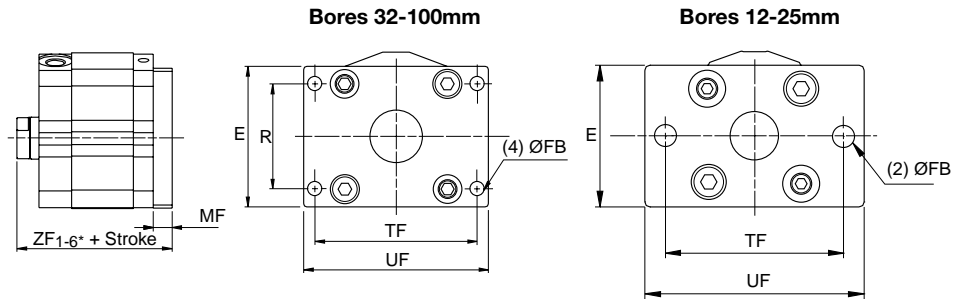
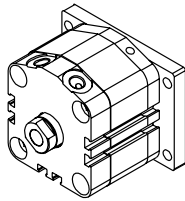
**Foot Mounting - Style F**

**Foot Flange Mounting - Style J**

| Bore size | AF      |         | AM      |         | KF      |         | KK      |          | W              |         | WF             |         | SW |
|-----------|---------|---------|---------|---------|---------|---------|---------|----------|----------------|---------|----------------|---------|----|
|           | Style 9 | Style 6 | Style 4 | Style 5 | Style 9 | Style 6 | Style 4 | Style 5  | Styles 9, 6, 4 | Style 5 | Styles 9, 6, 4 | Style 5 |    |
| 12        | 5.4     | 6       | 8       | 9       | #8-32   | M3X0.5  | #8-32   | M5X0.8   | 8              | 9.5     | 13.5           | 15      | 5  |
| 16        | 5.4     | 8       | 8       | 10      | #8-32   | M4x0.7  | #8-32   | M6x1.0   | 8              | 10      | 13.5           | 15.5    | 7  |
| 20        | 7       | 7       | 8       | 12      | #10-32  | M5x0.8  | #10-32  | M8x1.25  | 6.5            | 8.5     | 14.5           | 16.5    | 9  |
| 25        | 10      | 12      | 9.5     | 15      | 1/4-28  | M6x1.0  | 1/4-28  | M10x1.25 | 7              | 9.5     | 15             | 17.5    | 9  |
| 32        | 13.3    | 13      | 12.7    | 20.5    | 5/16-24 | M8x1.25 | 5/16-24 | M12x1.25 | 9              | 10      | 17             | 18      | 10 |
| 40        | 18.3    | 13      | 16      | 20.5    | 3/8-24  | M8x1.25 | 3/8-24  | M14x1.5  | 9              | 10      | 17             | 18      | 13 |
| 50        | 17.6    | 15      | 19.5    | 26      | 1/2-20  | M10x1.5 | 1/2-20  | M18x1.5  | 9              | 8.5     | 18             | 17.5    | 16 |
| 63        | 17.6    | 15      | 19.5    | 26      | 1/2-20  | M10x1.5 | 1/2-20  | M18x1.5  | 9              | 8.5     | 18             | 17.5    | 16 |
| 80        | 24.3    | 21      | 25.5    | 32.5    | 5/8-18  | M16x2.0 | 5/8-18  | M22x1.5  | 9              | 10      | 20             | 21      | 21 |
| 100       | 27      | 27      | 28.5    | 32.5    | 3/4-16  | M20x2.5 | 3/4-16  | M22x1.5  | 11             | 10      | 22             | 21      | 21 |



**Rear Flange Mounting – Style H**



Please note bearing, piston and porting configuration for selecting proper dimensions.

| Bore size | E   | FB  | MF  | R  | TF   | UF  | Part number     |
|-----------|-----|-----|-----|----|------|-----|-----------------|
| 12        | 25  | 4.5 | 5.5 | –  | 45   | 55  | <b>P1M-4DMB</b> |
| 16        | 30  | 4.5 | 5.5 | –  | 45   | 55  | <b>P1M-4FMB</b> |
| 20        | 39  | 6.5 | 8   | –  | 50.5 | 62  | <b>P1M-4HMB</b> |
| 25        | 42  | 6.5 | 8   | –  | 53   | 65  | <b>P1M-4JMB</b> |
| 32        | 48  | 5.5 | 8   | 34 | 58   | 68  | <b>P1M-4KMB</b> |
| 40        | 54  | 5.5 | 8   | 40 | 66   | 76  | <b>P1M-4LMB</b> |
| 50        | 67  | 6.5 | 9   | 50 | 79   | 90  | <b>P1M-4MMB</b> |
| 63        | 80  | 9   | 9   | 60 | 97   | 112 | <b>P1M-4NMB</b> |
| 80        | 99  | 11  | 11  | 77 | 116  | 134 | <b>P1M-4PMB</b> |
| 100       | 117 | 11  | 11  | 94 | 137  | 154 | <b>P1M-4QMB</b> |

| Bore size | ELP version non-magnetic |                       | ELP version magnetic |                       | Long bearing version |                       | Style 5 rod end length adjustment |
|-----------|--------------------------|-----------------------|----------------------|-----------------------|----------------------|-----------------------|-----------------------------------|
|           | Both ports head ZF1*     | Optional porting ZF2* | Both ports head ZF3* | Optional porting ZF4* | Both ports head ZF5* | Optional porting ZF6* |                                   |
| 12        | 26                       | 31                    | 37                   | 42                    | 42.5                 | 47.5                  | 1.5                               |
| 16        | 27.5                     | 32.5                  | 38.5                 | 43.5                  | 44.5                 | 49.5                  | 2                                 |
| 20        | 32                       | 36.5                  | 42                   | 46.5                  | 48                   | 52.5                  | 2                                 |
| 25        | 35.5                     | 41.5                  | 45.5                 | 51.5                  | 49.5                 | 55.5                  | 2.5                               |
| 32        | 43.5                     | 51.5                  | 52.5                 | 60.5                  | 55                   | 63                    | 1                                 |
| 40        | 44.5                     | 52.5                  | 54.5                 | 62.5                  | 56.5                 | 64.5                  | 1                                 |
| 50        | 49.5                     | 55.5                  | 58.5                 | 64.5                  | 60.5                 | 66.5                  | -0.5                              |
| 63        | 51                       | 57.5                  | 63                   | 68.5                  | 66                   | 71.5                  | -0.5                              |
| 80        | 64                       | 73                    | 74.5                 | 83.5                  | 74.5                 | 83.5                  | 1                                 |
| 100       | 71.5                     | 80                    | 86                   | 94.5                  | 86                   | 94.5                  | -1                                |

**Note:** Rear Flange mounting is not available with cap face porting.

\* Dimensions shown apply only for Rod End Styles 4, 6 and 9.

For Rod End Style 5, please include the above length adjustment.

**B**

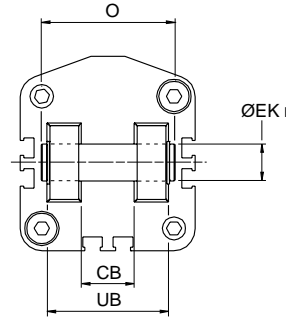
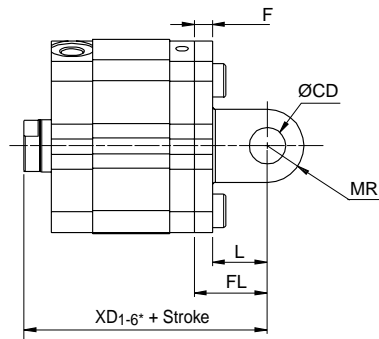
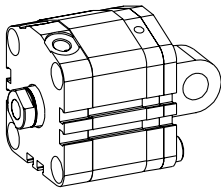
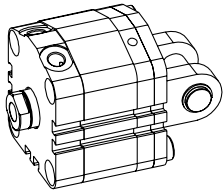
Compact Cylinders  
 Actuator Products

P1Q  
 Series

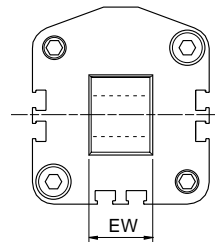
P1M  
 Series

LP/LPM  
 Series

**Rear Clevis Mounts – Styles A & B**



**Style A**



**Style B**

Please note bearing, piston and porting configuration for selecting proper dimensions.

| Bore size | CB  | CD/EK | EW  | F  | FL | L  | MR  | O    | UB | Double clevis kit part number | Single clevis kit part number** |
|-----------|-----|-------|-----|----|----|----|-----|------|----|-------------------------------|---------------------------------|
| 12        | 5   | 5     | 5   | 4  | 14 | 10 | 6.5 | 14.5 | 10 | <b>P1M-4DMT</b>               | <b>P1M-4DME</b>                 |
| 16        | 6.5 | 5     | 6.5 | 4  | 15 | 11 | 6.5 | 16.5 | 12 | <b>P1M-4FMT</b>               | <b>P1M-4FME</b>                 |
| 20        | 8   | 8     | 8   | 5  | 18 | 13 | 10  | 21   | 16 | <b>P1M-4HMT</b>               | <b>P1M-4HME</b>                 |
| 25        | 10  | 10    | 10  | 5  | 20 | 15 | 11  | 25.5 | 20 | <b>P1M-4JMT</b>               | <b>P1M-4JME</b>                 |
| 32        | 18  | 10    | 18  | 5  | 20 | 15 | 10  | 41.5 | 36 | <b>P1M-4KMT</b>               | <b>P1M-4KME</b>                 |
| 40        | 18  | 10    | 18  | 6  | 22 | 16 | 10  | 41.5 | 36 | <b>P1M-4LMT</b>               | <b>P1M-4LME</b>                 |
| 50        | 22  | 14    | 22  | 7  | 28 | 21 | 14  | 50.5 | 44 | <b>P1M-4MMT</b>               | <b>P1M-4MME</b>                 |
| 63        | 22  | 14    | 22  | 8  | 30 | 22 | 14  | 50.5 | 44 | <b>P1M-4NMT</b>               | <b>P1M-4NME</b>                 |
| 80        | 28  | 18    | 28  | 10 | 38 | 28 | 18  | 64   | 56 | <b>P1M-4PMT</b>               | <b>P1M-4PME</b>                 |
| 100       | 32  | 22    | 32  | 13 | 45 | 32 | 22  | 72   | 64 | <b>P1M-4QMT</b>               | <b>P1M-4QME</b>                 |

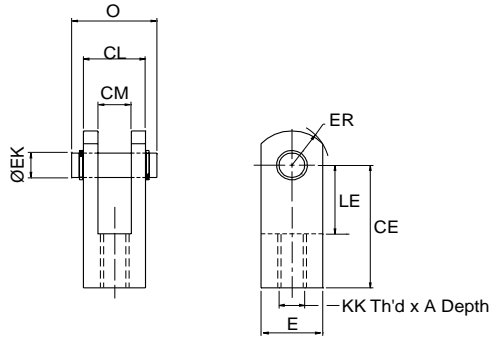
| Bore size | ELP version non-magnetic |                       | ELP version magnetic |                       | Long bearing version |                       | Style 5 rod end length adjustment |
|-----------|--------------------------|-----------------------|----------------------|-----------------------|----------------------|-----------------------|-----------------------------------|
|           | Both ports head XD1*     | Optional porting XD2* | Both ports head XD3* | Optional porting XD4* | Both ports head XD5* | Optional porting XD6* |                                   |
| 12        | 34.5                     | 39.5                  | 45.5                 | 50.5                  | 51                   | 56                    | 1.5                               |
| 16        | 37                       | 42                    | 48                   | 53                    | 54                   | 59                    | 2                                 |
| 20        | 42                       | 46.5                  | 52                   | 56.5                  | 58                   | 62.5                  | 2                                 |
| 25        | 47.5                     | 53.5                  | 57.5                 | 63.5                  | 61.5                 | 67.5                  | 2.5                               |
| 32        | 55.5                     | 63.5                  | 64.5                 | 72.5                  | 67                   | 75                    | 1                                 |
| 40        | 59.5                     | 66.5                  | 68.5                 | 76.5                  | 70.5                 | 78.5                  | 1                                 |
| 50        | 68.5                     | 74.5                  | 77.5                 | 83.5                  | 79.5                 | 85.5                  | -0.5                              |
| 63        | 72                       | 78.5                  | 84                   | 89.5                  | 87                   | 92.5                  | -0.5                              |
| 80        | 91                       | 100                   | 101.5                | 110.5                 | 101.5                | 110.5                 | 1                                 |
| 100       | 105.5                    | 114                   | 120                  | 128.5                 | 120                  | 128.5                 | -1                                |

\* Dimensions shown apply only for Rod End Styles 4, 6 and 9. For Rod End Style 5, please include the above length adjustment.

\*\* Single Clevis Kit can be used as mounting bracket for double clevis cylinders. Double Clevis Kit can be used as mounting kit for single clevis cylinders.

Note: Rear Clevis mounts are not available with cap face port.

**Rod Clevis**



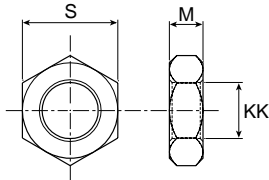
**Metric**

| Bore size | A    | E       | CE | KK       | ER   | LE   | EK (h9) | CM  | CL  | O    | Part number     |
|-----------|------|---------|----|----------|------|------|---------|-----|-----|------|-----------------|
| 12        | 7    | 9.5     | 16 | M5x0.8   | 6.5  | 7    | 5       | 5   | 9.5 | 14.5 | <b>P1M-4DRC</b> |
| 16        | 11   | 11      | 21 | M6x1.0   | 8    | 10   | 5       | 6.5 | 11  | 16.5 | <b>P1M-4FRC</b> |
| 20        | 8.5  | 16      | 25 | M8x1.25  | 10.5 | 11.5 | 8       | 8   | 16  | 21   | <b>P1M-4HRC</b> |
| 25        | 10.5 | 19      | 30 | M10x1.25 | 13   | 14   | 10      | 10  | 19  | 25.5 | <b>P1M-4JRC</b> |
| 32        | 16   | 22 Dia. | 30 | M12x1.25 | 12   | 14   | 10      | 18  | 36  | 41.5 | <b>P1M-4KRC</b> |
| 40        | 16   | 22 Dia. | 30 | M14x1.5  | 12   | 14   | 10      | 18  | 36  | 41.5 | <b>P1M-4LRC</b> |
| 50/63     | 20   | 28 Dia. | 40 | M18x1.5  | 16   | 20   | 14      | 22  | 44  | 50.5 | <b>P1M-4MRC</b> |
| 80        | 23   | 38 Dia. | 50 | M22x1.5  | 21   | 27   | 18      | 28  | 56  | 64   | <b>P1M-4PRC</b> |
| 100       | 24   | 44 Dia. | 55 | M22x1.5  | 24   | 31   | 22      | 32  | 64  | 72   | <b>P1M-4QRC</b> |

**Inch**

| Bore size | A  | E       | CE | KK      | ER   | LE   | EK (inch)<br>+0, -0.002 | CM  | CL (inch) | O (inch) | Part number       |
|-----------|----|---------|----|---------|------|------|-------------------------|-----|-----------|----------|-------------------|
| 12        | 6  | 9.5     | 16 | #8-32   | 6.5  | 7    | 3/16                    | 5   | 0.375     | 0.563    | <b>P1M-4DRC-T</b> |
| 16        | 6  | 11      | 21 | #8-32   | 8    | 10   | 3/16                    | 6.5 | 0.437     | 0.625    | <b>P1M-4FRC-T</b> |
| 20        | 6  | 16      | 25 | #10-32  | 10.5 | 11.5 | 5/16                    | 8   | 0.625     | 0.875    | <b>P1M-4HRC-T</b> |
| 25        | 8  | 19      | 30 | 1/4-28  | 13   | 14   | 3/8                     | 10  | 0.750     | 1.031    | <b>P1M-4JRC-T</b> |
| 32        | 16 | 22 Dia. | 30 | 5/16-24 | 12   | 14   | 3/8                     | 18  | 1.437     | 1.687    | <b>P1M-4KRC-T</b> |
| 40        | 16 | 22 Dia. | 30 | 3/8-24  | 12   | 14   | 3/8                     | 18  | 1.437     | 1.687    | <b>P1M-4LRC-T</b> |
| 50/63     | 20 | 28 Dia. | 40 | 1/2-20  | 16   | 20   | 1/2                     | 22  | 1.750     | 2.125    | <b>P1M-4MRC-T</b> |
| 80        | 23 | 38 Dia. | 50 | 5/8-18  | 21   | 27   | 3/4                     | 28  | 2.250     | 2.625    | <b>P1M-4PRC-T</b> |
| 100       | 24 | 44 Dia. | 55 | 3/4-16  | 24   | 31   | 7/8                     | 32  | 2.500     | 2.875    | <b>P1M-4QRC-T</b> |

**Jam Nuts**



**Style 4**

| Bore size | KK      | M     | S     | Part number       |
|-----------|---------|-------|-------|-------------------|
| 12        | #8-32   | 1/8   | 11/32 | <b>L073800080</b> |
| 16        | #8-32   | 1/8   | 11/32 | <b>L073800080</b> |
| 20        | #10-32  | 1/8   | 3/8   | <b>L073800100</b> |
| 25        | 1/4-28  | 5/32  | 7/16  | <b>L073800200</b> |
| 32        | 5/16-24 | 3/16  | 1/2   | <b>L073800300</b> |
| 40        | 3/8-24  | 7/32  | 9/16  | <b>L073800400</b> |
| 50        | 1/2-20  | 5/16  | 3/4   | <b>L073800600</b> |
| 63        | 1/2-20  | 5/16  | 3/4   | <b>L073800600</b> |
| 80        | 5/8-18  | 3/8   | 15/16 | <b>L073800800</b> |
| 100       | 3/4-16  | 27/64 | 1-1/8 | <b>L073800900</b> |

Dimensions in inches

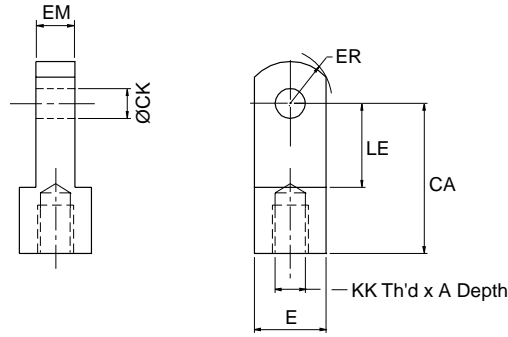
**Style 5**

| Bore size | KK       | M   | S  | Part number       |
|-----------|----------|-----|----|-------------------|
| 12        | M5x0.8   | 2.7 | 18 | <b>L075540005</b> |
| 16        | M6x1.0   | 3.2 | 10 | <b>L075540006</b> |
| 20        | M8x1.25  | 4   | 13 | <b>L075540008</b> |
| 25        | M10x1.25 | 5   | 17 | <b>L075540010</b> |
| 32        | M12x1.25 | 6   | 19 | <b>L075540012</b> |
| 40        | M14x1.5  | 7   | 22 | <b>L075540014</b> |
| 50        | M18x1.5  | 8   | 27 | <b>L075540018</b> |
| 63        | M18x1.5  | 8   | 27 | <b>L075540018</b> |
| 80        | M22x1.5  | 11  | 32 | <b>L075540022</b> |
| 100       | M22x1.5  | 11  | 32 | <b>L075540022</b> |

Dimensions in mm



**Rod Eye**



**Metric**

| Bore size | A    | E       | CA | KK       | ER   | LE   | CK | EM  | Part number     |
|-----------|------|---------|----|----------|------|------|----|-----|-----------------|
| 12        | 7    | 9.5 Sq. | 16 | M5x0.8   | 6.5  | 7    | 5  | 5   | <b>P1M-4DRE</b> |
| 16        | 8    | 11 Sq.  | 25 | M6x1.0   | 8    | 14   | 5  | 6.5 | <b>P1M-4FRE</b> |
| 20        | 8.5  | 16 Sq.  | 25 | M8x1.25  | 10.5 | 11.5 | 8  | 8   | <b>P1M-4HRE</b> |
| 25        | 10.5 | 19 Sq.  | 30 | M10x1.25 | 13   | 14   | 10 | 10  | <b>P1M-4JRE</b> |
| 32        | 15   | 22 Dia. | 30 | M12x1.25 | 12   | 14   | 10 | 18  | <b>P1M-4KRE</b> |
| 40        | 14   | 22 Dia. | 30 | M14x1.5  | 12   | 14   | 10 | 18  | <b>P1M-4LRE</b> |
| 50/63     | 18.5 | 28 Dia. | 40 | M18x1.5  | 16   | 20   | 14 | 22  | <b>P1M-4MRE</b> |
| 80        | 22   | 38 Dia. | 50 | M22x1.5  | 21   | 27   | 18 | 28  | <b>P1M-4PRE</b> |
| 100       | 22   | 44 Dia. | 55 | M22x1.5  | 24   | 31   | 22 | 32  | <b>P1M-4QRE</b> |

**Inch**

| Bore size | A  | E       | CA | KK      | ER   | LE   | CK (inch) | EM  | Part number       |
|-----------|----|---------|----|---------|------|------|-----------|-----|-------------------|
| 12        | 6  | 9.5 Sq. | 16 | #8-32   | 6.5  | 7    | 3/16      | 5   | <b>P1M-4DRE-T</b> |
| 16        | 6  | 11 Sq.  | 25 | #8-32   | 8    | 14   | 3/16      | 6.5 | <b>P1M-4FRE-T</b> |
| 20        | 6  | 16 Sq.  | 25 | #10-32  | 10.5 | 11.5 | 5/16      | 8   | <b>P1M-4HRE-T</b> |
| 25        | 8  | 19 Sq.  | 30 | 1/4-28  | 13   | 14   | 3/8       | 10  | <b>P1M-4JRE-T</b> |
| 32        | 12 | 22 Dia. | 30 | 5/16-24 | 12   | 14   | 3/8       | 18  | <b>P1M-4KRE-T</b> |
| 40        | 11 | 22 Dia. | 30 | 3/8-24  | 12   | 14   | 3/8       | 18  | <b>P1M-4LRE-T</b> |
| 50/63     | 18 | 28 Dia. | 40 | 1/2-20  | 16   | 20   | 1/2       | 22  | <b>P1M-4MRE-T</b> |
| 80        | 21 | 38 Dia. | 50 | 5/8-18  | 21   | 27   | 3/4       | 28  | <b>P1M-4PRE-T</b> |
| 100       | 21 | 44 Dia. | 55 | 3/4-16  | 24   | 31   | 7/8       | 32  | <b>P1M-4QRE-T</b> |

**B**  
 Compact Cylinders  
 Actuator Products  
 P1Q Series  
 P1M Series  
 LP/LPM Series



- Low profile design
- Flexible construction with special modification capability
- High density iron rod bearing provides maximum support for longer life
- Single and double acting versions available
- 6 mounting styles
- 8 bore sizes from 9/16" to 4"
- Strokes from 1/8" to 6"
- Permanent lubrication
- Non-lube service



**Operating information**


Operating pressure: 200 PSIG (17 bar)  
 Temperature range: LP -10°F to 200°F (-23°C to 93°C)  
 LPM -10°F to 140°F (-23°C to 60°C)  
 Filtration requirements: 40 micron, dry filtered air  
 For technical information see CD

**Ordering information**

|                  |                            |  |                                  |                                    |                 |                             |                          |          |  |   |
|------------------|----------------------------|--|----------------------------------|------------------------------------|-----------------|-----------------------------|--------------------------|----------|--|---|
| <b>1.50</b>      | <b>K</b>                   | <b>N</b>                                 | <b>LP</b>                        | <b>L</b>                           | <b>V</b>        | <b>B</b>                    | <b>E</b>                 | <b>S</b> | <b>9</b>   | <b>1.25"</b>                              |
| <b>Bore size</b> |                            |  | <b>Series</b>                    |                                    |                 |                             | <b>Spring</b>            |          |  | <b>Stroke length</b>                      |
| 0.56"            |                            |  | LP Standard                      |                                    |                 |                             | Blank None               |          |  | Specify stroke length required in inches. |
| 0.75"            |                            |  | LPM Magnetic Piston <sup>5</sup> |                                    |                 |                             | E Spring extended        |          |  |   |
| 1.12"            |                            |  |                                  | <b>Piston seal</b>                 |                 |                             | R Spring return          |          |  |   |
| 1.50"            |                            |  |                                  | Blank Standard seal                |                 |                             |                          |          | <b>Rod end thread style</b>                      |   |
| 2.00"            |                            |  |                                  | L Lipseal piston seal <sup>3</sup> |                 |                             |                          |          | 9 Standard female rod end                        |   |
| 2.50"            |                            |  |                                  |                                    | <b>Seals</b>    |                             |                          |          | 4 Optional male rod end                          |   |
| 3.00"            |                            |  |                                  |                                    | Blank Standard  |                             |                          |          | 3 Special rod end (specify dimensions or sketch) |   |
| 4.00"            |                            |  |                                  |                                    | V Class 5 seals |                             |                          |          |  |   |
|                  | <b>Double rod cylinder</b> |  |                                  |                                    |                 |                             | <b>Special features</b>  |          |  |   |
|                  | Blank Single rod           |  |                                  |                                    |                 |                             | Blank No special feature |          |  |   |
|                  | K Double rod               |  |                                  |                                    |                 |                             | S Special feature        |          |  |   |
|                  |                            | <b>Mounting style</b>                    |                                  |                                    |                 |                             |                          |          |  |   |
|                  |                            | N Basic (Std.)                           |                                  |                                    |                 |                             |                          |          |  |   |
|                  |                            | <b>Single rod styles</b>                 |                                  |                                    |                 | <b>Bumpers*</b>             |                          |          |  |   |
|                  |                            | 4F Head bolt                             |                                  |                                    |                 | Blank No bumpers            |                          |          |  |   |
|                  |                            | 4R Cap bolt                              |                                  |                                    |                 | B Bumpers both ends         |                          |          |  |   |
|                  |                            | 2F Head trunnion <sup>1</sup>            |                                  |                                    |                 | H Head end only             |                          |          |  |   |
|                  |                            | 2R Cap trunnion <sup>1</sup>             |                                  |                                    |                 | C Cap end only <sup>4</sup> |                          |          |  |   |
|                  |                            | 1 Cap pivot eye                          |                                  |                                    |                 |                             |                          |          |  |   |
|                  |                            | <b>Double rod styles</b>                 |                                  |                                    |                 |                             |                          |          |  |   |
|                  |                            | N Basic                                  |                                  |                                    |                 |                             |                          |          |  |   |
|                  |                            | 4R Cap bolt                              |                                  |                                    |                 |                             |                          |          |  |   |
|                  |                            | 2F Head trunnion                         |                                  |                                    |                 |                             |                          |          |  |   |
|                  |                            | <b>Hollow rod styles<sup>1,2,5</sup></b> |                                  |                                    |                 |                             |                          |          |  |   |
|                  |                            | NH Basic                                 |                                  |                                    |                 |                             |                          |          |  |   |
|                  |                            | 4RH Cap bolt                             |                                  |                                    |                 |                             |                          |          |  |   |
|                  |                            | 2FH Head trunnion                        |                                  |                                    |                 |                             |                          |          |  |   |

<sup>1</sup> Not available on 9/16" bore.  
<sup>2</sup> Hollow rods are used on double rod cylinders. All hollow rod options require the double rod prefix "K".  
<sup>3</sup> Lipseal piston is not available on LPM Series.  
<sup>4</sup> Not available on spring extend.  
<sup>5</sup> LPM Series with hollow rod option are not available on the 9/16", 3/4" and 1-1/8" bore sizes.

**Note:** For sensor specifications and part numbers, please refer to the Electronic Sensors section.

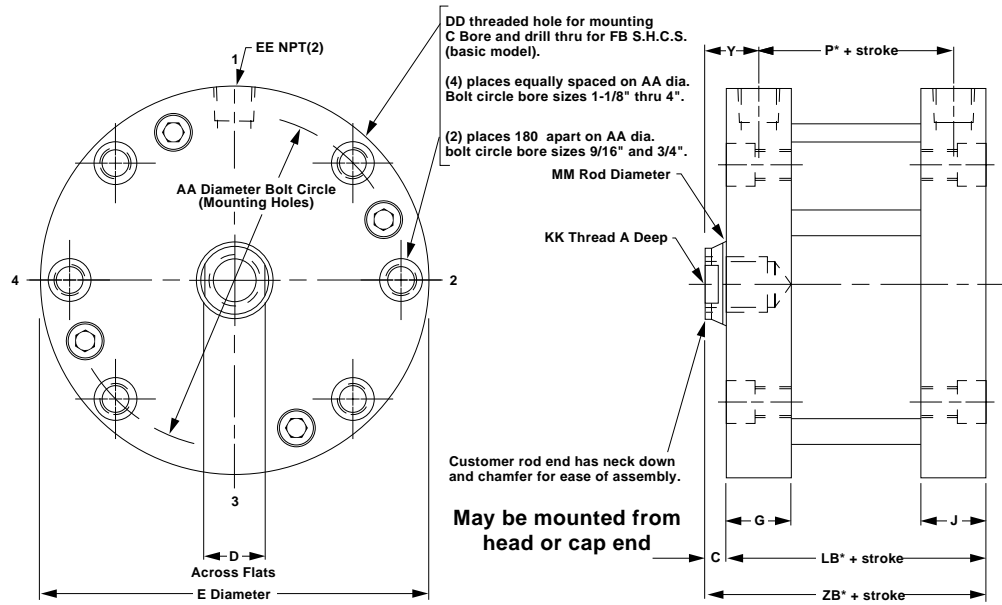
**Sensors**  
 For sensors see page B294. 

**B**  
 Compact Cylinders  
 Actuator Products  
 P1Q Series  
 P1M Series  
 LP/LPM Series

**Mounting Style N**

Cylinder Dimensions  
 Double Acting  
 Single Rod End,  
 Female Rod Style No. 9

Temperature: -10°F to 200°F (optional Fluorocarbon seals).  
 All air cylinders are permanently lubricated.  
 LPM Series maximum temperature 140°F.



| Bore size | A     | C   | D    | E     | G     | J     | P*    | Y     | AA    | DD      | EE     | FB   | KK      | LB*    | MM   | ZB*     |
|-----------|-------|-----|------|-------|-------|-------|-------|-------|-------|---------|--------|------|---------|--------|------|---------|
| 9/16      | 0.40  | 1/8 | 7/32 | 1-1/8 | 23/64 | 23/64 | 11/32 | 17/64 | 0.875 | #8-32   | #10-32 | #4   | #8-32   | 5/8    | 1/4  | 3/4     |
| 3/4       | 0.44  | 1/8 | 1/4  | 1-1/2 | 23/64 | 23/64 | 3/8   | 17/64 | 1.219 | #10-32  | #10-32 | #6   | #10-32  | 21/32  | 5/16 | 25/32   |
| 1-1/8     | 0.62  | 1/8 | 7/16 | 2     | 1/2   | 1/2   | 27/64 | 3/8   | 1.687 | #10-32  | 1/8    | #6   | 5/16-24 | 59/64  | 1/2  | 1-3/64  |
| 1-1/2     | 0.62  | 1/8 | 1/2  | 2-5/8 | 1/2   | 1/2   | 1/2   | 3/8   | 2.187 | 1/4-28  | 1/8    | #10  | 3/8-24  | 1      | 5/8  | 1-1/8   |
| 2         | 0.70† | 1/8 | 5/8  | 3-1/8 | 1/2   | 1/2   | 9/16  | 3/8   | 2.687 | 1/4-28  | 1/8    | #10  | 1/2-20  | 1-1/16 | 3/4  | 1-3/16  |
| 2-1/2     | 0.70† | 1/8 | 5/8  | 3-3/4 | 5/8   | 5/8   | 5/8   | 7/16  | 3.250 | 5/16-24 | 1/4    | 1/4  | 1/2-20  | 1-1/4  | 3/4  | 1-3/8   |
| 3         | 0.75† | 1/8 | 3/4  | 4-1/4 | 43/64 | 43/64 | 21/32 | 7/16  | 3.781 | 5/16-24 | 1/4    | 1/4  | 5/8-18  | 1-9/32 | 7/8  | 1-13/32 |
| 4         | 0.75† | 1/8 | 7/8  | 5-1/2 | 27/32 | 27/32 | 49/64 | 17/32 | 4.937 | 3/8-24  | 3/8    | 5/16 | 3/4-16  | 1-5/8  | 1    | 1-3/4   |

\* These dimensions are for the LP Series with standard piston.  
 † For strokes less than 0.25", A dimension = 0.66".

**Added length table for LPM or lipseal piston options**

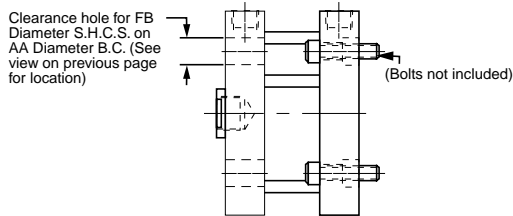
| Bore size | LPM option* |         |         |         |         |        | LP with lipseal piston option |         |         |         |         |
|-----------|-------------|---------|---------|---------|---------|--------|-------------------------------|---------|---------|---------|---------|
|           | P           | LB      | XD      | XJ      | ZB      | Stroke | P                             | LB      | XD      | XJ      | ZB      |
| 9/16†     | 15/16       | 1-7/32  | 2       | -       | 1-11/32 | 1/2    | 5/8                           | 29/32   | 1-11/16 | -       | 1-1/32  |
| 3/4†      | 31/32       | 1-1/4   | 2-1/32  | 1-3/16  | 1-3/8   | 1/2    | 21/32                         | 15/16   | 1-23/32 | 7/8     | 1-1/16  |
| 1-1/8†    | 63/64       | 1-31/64 | 2-3/8   | 1-23/64 | 1-39/64 | 9/16   | 43/64                         | 1-11/64 | 2-1/16  | 1-3/64  | 1-19/64 |
| 1-1/2     | 1-1/8       | 1-5/8   | 2-13/16 | 1-1/2   | 1-3/4   | 7/16   | 13/16                         | 1-5/16  | 2-1/2   | 1-3/16  | 1-7/16  |
| 2         | 1-9/32      | 1-25/32 | 3-1/32  | 1-21/32 | 1-29/32 | 7/16   | 61/64                         | 1-29/64 | 2-45/64 | 1-21/64 | 1-37/64 |
| 2-1/2     | 1-21/64     | 1-61/64 | 3-21/64 | 1-3/4   | 2-5/64  | 1/2    | 1                             | 1-5/8   | 3       | 1-27/64 | 1-3/4   |
| 3         | 1-27/64     | 2-3/64  | 3-53/64 | 1-53/64 | 2-11/64 | 1/2    | 1-3/32                        | 1-23/32 | 3-1/2   | 1-1/2   | 1-27/32 |
| 4         | 1-1/2       | 2-23/64 | 4-11/64 | 2       | 2-31/64 | 1/2    | 1-11/64                       | 2-1/32  | 3-27/32 | 1-43/64 | 2-5/32  |

Note minimum strokes for LPM option.  
 † These bore sizes not available for the LPM option with the hollow rod option.  
 \* The LPM option is only available with the standard quad seal.

**B**  
 Compact Cylinders  
 Actuator Products  
 Series P1Q  
 Series P1M  
 Series LP/LPM

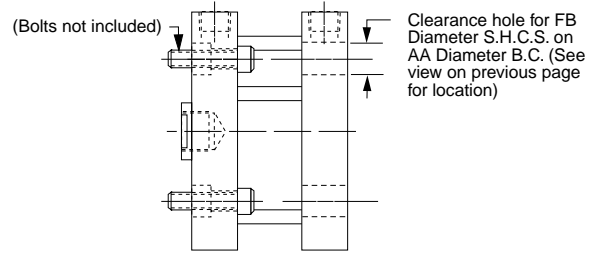
### Head Bolt Clearance Holes

Mounting Style 4F  
 Available Head End



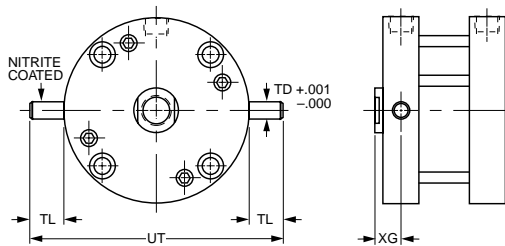
### Cap Bolt Clearance Holes

Mounting Style 4R  
 Available Cap End



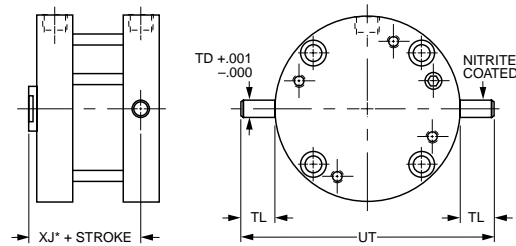
### Head Trunnion

Mounting Style 2F (9/16" bore not available)



### Cap Trunnion

Mounting Style 2R (9/16" bore not available)

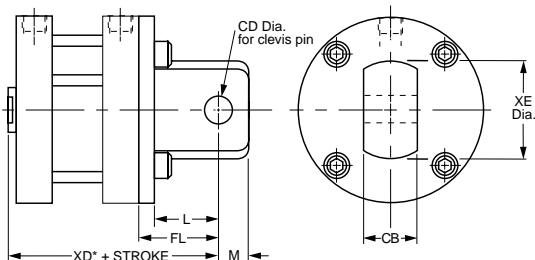


| Bore size | TD    | TL   | UT    | XG    | XJ*     |
|-----------|-------|------|-------|-------|---------|
| 3/4       | 0.125 | 5/16 | 2-1/8 | 5/16  | 19/32   |
| 1-1/8     | 0.250 | 1/2  | 3     | 3/8   | 51/64   |
| 1-1/2     | 0.250 | 1/2  | 3-5/8 | 3/8   | 7/8     |
| 2         | 0.250 | 1/2  | 4-1/8 | 3/8   | 15/16   |
| 2-1/2     | 0.312 | 5/8  | 5     | 29/64 | 1-3/64  |
| 3         | 0.312 | 5/8  | 5-1/2 | 15/32 | 1-1/16  |
| 4         | 0.375 | 3/4  | 7     | 35/64 | 1-17/64 |

\* These dimensions are for the LP Series with standard piston.

### Cap Pivot Eye

Mounting Style 1

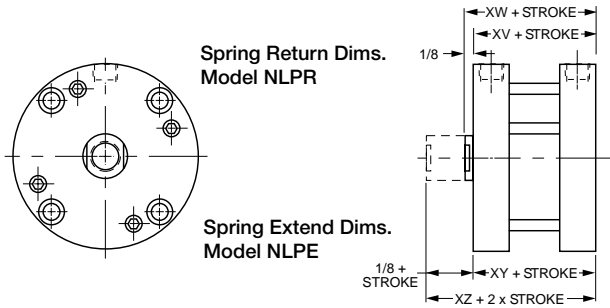


| Bore size | L      | M    | CB  | CD   | FL      | XD*     | XE    |
|-----------|--------|------|-----|------|---------|---------|-------|
| 9/16      | 1/2    | 1/4  | 3/8 | 3/16 | 21/32   | 1-13/32 | 19/32 |
| 3/4       | 1/2    | 1/4  | 3/8 | 3/16 | 21/32   | 1-7/16  | 3/4   |
| 1-1/8     | 1/2    | 1/4  | 3/8 | 3/16 | 49/64   | 1-13/16 | 3/4   |
| 1-1/2     | 13/16  | 7/16 | 3/4 | 3/8  | 1-1/16  | 2-3/16  | 1-3/8 |
| 2         | 13/16  | 7/16 | 3/4 | 3/8  | 1-1/8   | 2-5/16  | 1-3/8 |
| 2-1/2     | 13/16  | 7/16 | 3/4 | 3/8  | 1-1/4   | 2-5/8   | 1-3/8 |
| 3         | 1-9/32 | 9/16 | 1   | 5/8  | 1-21/32 | 3-1/16  | 1-7/8 |
| 4         | 1-9/32 | 9/16 | 1   | 5/8  | 1-11/16 | 3-7/16  | 1-7/8 |

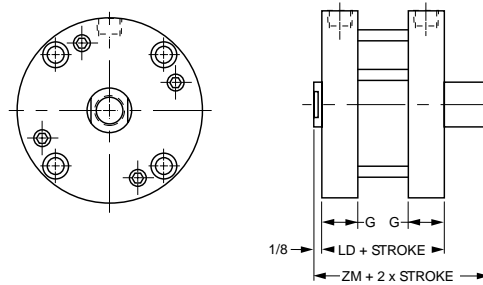
Order clevis pin from accessories when required.

\* These dimensions are for the LP Series with standard piston. See table on the previous page for dimensions for the lipseal piston or LPM options.

**Spring Extend & Spring Return Cylinders**  
 (Available through 2" stroke)



**Double Rod Spring Extend & Spring Return Cylinders**  
 (Available through 2" stroke)



**B**  
 Compact Cylinders  
 Actuator Products  
 Series P1Q  
 Series P1M  
 Series LP/LPM

| Bore size | 1/8" to 1" stroke |         |         |         | Over 1" to 2" stroke |         |         |         | Add this length to XV, XW, XY, XZ for Lipseal Piston |
|-----------|-------------------|---------|---------|---------|----------------------|---------|---------|---------|--|
|           | XV                | XW      | XY      | XZ      | XV                   | XW      | XY      | XZ      |  |
| 9/16      | 1                 | 1-1/8   | 57/64   | 1-1/64  | 1-11/16              | 1-13/16 | 1-37/64 | 1-45/64 | 9/32   |
| 3/4       | 1-1/64            | 1-9/64  | 59/64   | 1-3/64  | 1-45/64              | 1-53/64 | 1-39/64 | 1-47/64 | 9/32   |
| 1-1/8     | 1-23/64           | 1-31/64 | 1-9/32  | 1-13/32 | 1-63/64              | 2-7/64  | 1-29/32 | 2-1/32  | 1/4  |
| 1-1/2     | 1-25/64           | 1-33/64 | 1-11/32 | 1-15/32 | 2-1/64               | 2-9/64  | 1-31/32 | 2-3/32  | 5/16   |
| 2         | 1-11/64           | 1-19/64 | 1-13/32 | 1-17/32 | 1-51/64              | 1-59/64 | 2-1/32  | 2-5/32  | 25/64  |
| 2-1/2     | 1-3/8             | 1-1/2   | 1-23/32 | 1-27/32 | 2                    | 2-1/8   | 2-11/32 | 2-15/64 | 3/8  |
| 3         | 1-1/2             | 1-5/8   | 1-55/64 | 1-63/64 | 2-1/8                | 2-1/4   | 2-31/64 | 2-39/64 | 7/16   |
| 4         | 1-27/32           | 1-31/32 | 2-13/64 | 2-21/64 | 2-15/32              | 2-19/32 | 2-53/64 | 2-61/64 | 13/32  |

| Bore size | Spring return/extend – LP |         |         |              |         |         | Spring return/extend – LPM |         |              |           |         |  |
|-----------|---------------------------|---------|---------|--------------|---------|---------|----------------------------|---------|--------------|-----------|---------|--|
|           | ≥ 1/8", ≤ 1"              |         |         | <1", ≤ 2"    |         |         | ≥ 1/8", >1"                |         |              | >1", ≤ 2" |         |  |
|           | G                         | LD      | ZM      | Min.* stroke | LD      | ZM      | LD                         | ZM      | Min.* stroke | LD        | ZM      |  |
| 9/16      | 23/64                     | 1-1/8   | 1-3/8   | 5/16         | 1-13/16 | 2-1/16  | 1-23/32                    | 1-27/32 | 3/16         | 2-13/32   | 2-17/32 |  |
| 3/4       | 23/64                     | 1-11/64 | 1-27/64 | 1/8          | 1-55/64 | 2-7/64  | 1-49/64                    | 1-57/64 | 3/16         | 2-29/64   | 2-37/64 |  |
| 1-1/8     | 1/2                       | 1-1/2   | 1-3/4   | 1/8          | 2-1/8   | 2-3/8   | 2-1/16                     | 2-3/16  | 1/8          | 2-11/16   | 2-13/16 |  |
| 1-1/2     | 1/2                       | 1-11/16 | 1-15/16 | 1/8          | 2-5/16  | 2-9/16  | 2-5/16                     | 2-7/16  | 1/4          | 2-15/16   | 3-1/16  |  |
| 2         | 1/2                       | 1-31/64 | 1-47/64 | 1/8          | 2-7/64  | 2-23/64 | 2-13/64                    | 2-21/64 | 1/4          | 2-53/64   | 2-61/64 |  |
| 2-1/2     | 5/8                       | 1-3/4   | 2       | 1/8          | 2-3/8   | 2-5/8   | 2-29/64                    | 2-37/64 | 3/16         | 3-5/64    | 3-13/64 |  |
| 3         | 43/64                     | 1-29/32 | 2-5/32  | 1/8          | 2-17/32 | 2-25/32 | 2-43/64                    | 2-51/64 | 1/8          | 3-19/64   | 3-27/64 |  |
| 4         | 27/32                     | 2-1/4   | 2-1/2   | 1/8          | 2-7/8   | 3-1/8   | 2-63/64                    | 3-7/64  | 1/8          | 3-39/64   | 3-47/64 |  |

\* Note minimum strokes for LPM option.

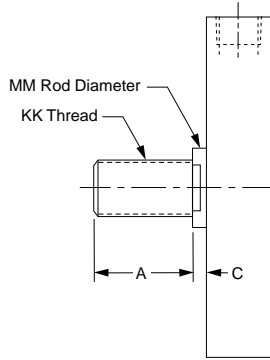
**Spring force data**

| 1/8" to 1" stroke |                         |                     | Over 1" to 2" stroke |                         |                     |
|-------------------|-------------------------|---------------------|----------------------|-------------------------|---------------------|
| Bore size         | Max. Spring force (lbs) | Spring rate (lb/in) | Bore dia.            | Max. Spring force (lbs) | Spring rate (lb/in) |
| 9/16              | 5.7                     | 4.25                | 9/16                 | 5.7                     | 1.75                |
| 3/4               | 9                       | 6                   | 3/4                  | 9                       | 2.5                 |
| 1-1/8             | 10                      | 6                   | 1-1/8                | 10                      | 2.5                 |
| 1-1/2             | 13                      | 5.5                 | 1-1/2                | 12                      | 2.25                |
| 2                 | 13                      | 5.5                 | 2                    | 12                      | 2.25                |
| 2-1/2             | 17.5                    | 6                   | 2-1/2                | 16                      | 2.5                 |
| 3 & 4             | 24                      | 6.5                 | 3 & 4                | 23                      | 2.75                |



**Optional Male Rod End**

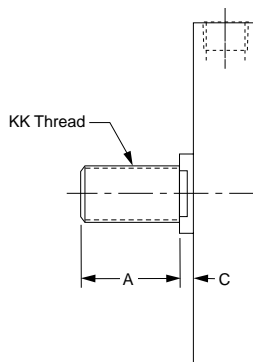
Specify #4



| Bore size | A    | C   | KK      | MM   |
|-----------|------|-----|---------|------|
| 9/16      | 0.38 | 1/8 | #8-32   | 1/4  |
| 3/4       | 0.50 | 1/8 | #10-32  | 5/16 |
| 1-1/8     | 0.50 | 1/8 | 5/16-24 | 1/2  |
| 1-1/2     | 0.50 | 1/8 | 3/8-24  | 5/8  |
| 2         | 0.62 | 1/8 | 1/2-20  | 3/4  |
| 2-1/2     | 0.62 | 1/8 | 1/2-20  | 3/4  |
| 3         | 0.75 | 1/8 | 5/8-18  | 7/8  |
| 4         | 0.75 | 1/8 | 3/4-16  | 1    |

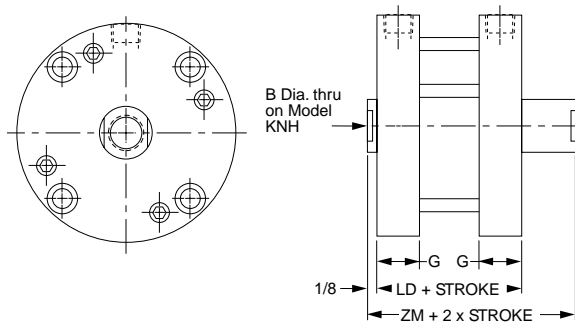
**Non-standard Rods**

For non-standard rod ends, please specify rod thread style 3 and provide the KK, A, and C dimensions as needed.



**Double or Hollow Rod Cylinders**

Note: Cylinders with hollow rod option should not be bottomed out during stroke.



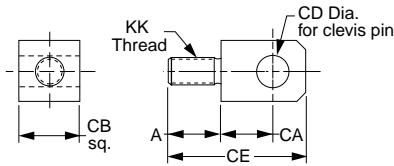
**LP double or hollow rod option, LPM, lipseal piston**

| Bore size | Standard double rod end or with hollow rod |       | LPM option |         | LP with lipseal piston option |         |         |         |
|-----------|--|-------|------------|---------|-------------------------------|---------|---------|---------|
|           | B  | G     | LD         | ZM      | LD                            | ZM      | LD      | ZM      |
| 9/16      | *  | 23/64 | 3/4        | 1       | 1-11/32                       | 1-15/32 | 1-1/32  | 1-9/32  |
| 3/4       | 9/64                                       | 23/64 | 13/16      | 1-1/16  | 1-13/32                       | 1-17/32 | 1-3/32  | 1-11/32 |
| 1-1/8     | 7/32                                       | 1/2   | 1-3/16     | 1-7/16  | 1-3/4                         | 1-7/8   | 1-7/16  | 1-11/16 |
| 1-1/2     | 9/32                                       | 1/2   | 1-19/64    | 1-35/64 | 1-59/64                       | 2-3/64  | 1-39/64 | 1-55/64 |
| 2         | 3/8  | 1/2   | 1-3/8      | 1-5/8   | 2-3/32                        | 2-7/32  | 1-49/64 | 2-1/64  |
| 2-1/2     | 3/8  | 5/8   | 1-5/8      | 1-7/8   | 2-21/64                       | 2-29/64 | 2       | 2-1/4   |
| 3         | 7/16                                       | 43/64 | 1-11/16    | 1-15/16 | 2-29/64                       | 2-37/64 | 2-1/8   | 2-3/8   |
| 4         | 1/2  | 27/32 | 2-1/32     | 2-9/32  | 2-49/64                       | 2-57/64 | 2-7/16  | 2-11/16 |

\*Hollow rod not available on 9/16" bore.



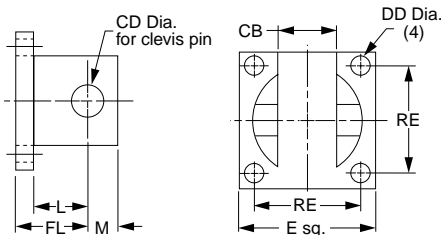
**Rod Eye**



| Bore size | A     | CA    | CB  | CD   | CE      | KK      | Part number       |
|-----------|-------|-------|-----|------|---------|---------|-------------------|
| 9/16      | 3/8   | 15/32 | 3/8 | 3/16 | 1-3/32  | #8-32   | <b>L073810008</b> |
| 3/4       | 3/8   | 15/32 | 3/8 | 3/16 | 1-3/32  | #10-32  | <b>L073810010</b> |
| 1-1/8     | 9/16  | 15/32 | 3/8 | 3/16 | 1-9/32  | 5/16-24 | <b>L073810020</b> |
| 1-1/2     | 5/8   | 23/32 | 3/4 | 3/8  | 1-25/32 | 3/8-24  | <b>L073810024</b> |
| 2-2-1/2   | 21/32 | 23/32 | 3/4 | 3/8  | 1-27/32 | 1/2-20  | <b>L073810032</b> |
| 3         | 21/32 | 1     | 1   | 5/8  | 2-3/8   | 5/8-18  | <b>L073810040</b> |
| 4         | 21/32 | 1     | 1   | 5/8  | 2-3/8   | 3/4-16  | <b>L073810048</b> |

**Clevis Bracket**

(Supplied with Pin)

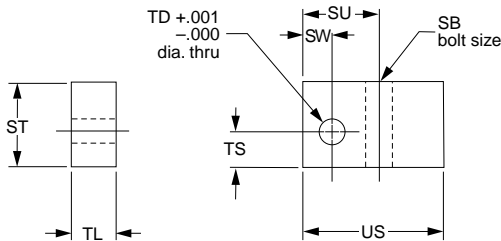


| E     | L     | M     | CB     | CD   | DD    | FL    | RE    | Part number       |
|-------|-------|-------|--------|------|-------|-------|-------|-------------------|
| 1     | 13/32 | 7/32  | 25/64  | 3/16 | 9/64  | 9/16  | 3/4   | <b>L073820012</b> |
| 1-3/4 | 25/32 | 13/32 | 49/64  | 3/8  | 11/64 | 15/16 | 1-3/8 | <b>L073820024</b> |
| 2-1/2 | 1     | 9/16  | 1-1/64 | 5/8  | 17/64 | 1-1/4 | 2     | <b>L073820040</b> |

Use L073820012 on 9/16", 3/4" and 1-1/8" bore.  
 Use L073820024 on 1-1/2", 2" and 2-1/2" bore.  
 Use L073820040 on 3" and 4" bore.

**Note:** The Clevis Bracket is an accessory for the rod eye or the cap pivot eye and cannot be mounted directly to the cylinder.

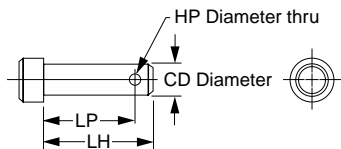
**Trunnion Bracket**



| SB   | ST    | SU     | SW   | TD   | TL  | TS    | US    | Part number       |
|------|-------|--------|------|------|-----|-------|-------|-------------------|
| 1/4  | 7/8   | 13/16  | 5/16 | .252 | 1/2 | 3/8   | 1-1/2 | <b>L073840016</b> |
| 5/16 | 1     | 15/16  | 3/8  | .314 | 5/8 | 29/64 | 1-5/8 | <b>L073840020</b> |
| 3/8  | 1-1/4 | 1-1/16 | 7/16 | .377 | 3/4 | 35/64 | 1-7/8 | <b>L073840024</b> |

Use L073840016 on 1-1/8", 1-1/2" and 2" bore.  
 Use L073840020 on 2-1/2" and 3" bore.  
 Use L073840024 on 4" bore.

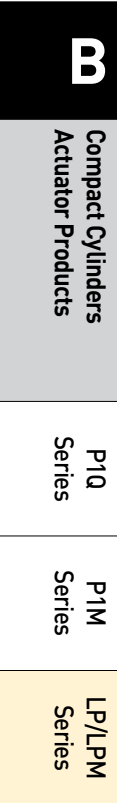
**Clevis Pin**



| CD   | HP   | LH    | LP      | Part number       |
|------|------|-------|---------|-------------------|
| 3/16 | 3/32 | 1     | 29/32   | <b>L073830012</b> |
| 3/8  | 5/32 | 1-5/8 | 1-15/32 | <b>L073830024</b> |
| 5/8  | 5/32 | 2     | 1-27/32 | <b>L073830040</b> |

**Service Kits**

| Bore size | Rod dia. | Standard piston, single rod cylinders |                           | Lipseal piston, single rod cylinders |                           |
|-----------|----------|---------------------------------------|---------------------------|--------------------------------------|---------------------------|
|           |          | Class 1 seals part number             | Class 5 seals part number | Class 1 seals part number            | Class 5 seals part number |
| 9/16      | 1/4"     | <b>SKS05LP251</b>                     | <b>SKS05LP255</b>         | <b>KS05LPL251</b>                    | <b>KS05LPL255</b>         |
| 3/4       | 5/16"    | <b>SKS07LP311</b>                     | <b>SKS07LP315</b>         | <b>KS07LPL311</b>                    | <b>KS07LPL315</b>         |
| 1-1/8     | 1/2"     | <b>SKS12LP501</b>                     | <b>SKS12LP505</b>         | <b>KS12LPL501</b>                    | <b>KS12LPL505</b>         |
| 1-1/2     | 5/8"     | <b>SKS15LP621</b>                     | <b>SKS15LP625</b>         | <b>KS15LPL621</b>                    | <b>KS15LPL625</b>         |
| 2         | 3/4"     | <b>SKS20LP751</b>                     | <b>SKS20LP755</b>         | <b>KS20LPL751</b>                    | <b>KS20LPL755</b>         |
| 2-1/2     | 3/4"     | <b>SKS25LP751</b>                     | <b>SKS25LP755</b>         | <b>KS25LPL751</b>                    | <b>KS25LPL755</b>         |
| 3         | 7/8"     | <b>SKS30LP871</b>                     | <b>SKS30LP875</b>         | <b>KS30LPL871</b>                    | <b>KS30LPL875</b>         |
| 4         | 1"       | <b>SKS40LP101</b>                     | <b>SKS40LP105</b>         | <b>KS40LPL101</b>                    | <b>KS40LPL105</b>         |



- Compact guided cylinder for heavy duty short stroke applications
- 9 Bore sizes, 16mm to 200mm
- Strokes 10 to 200mm depending on model
- Standard dowel holes on body and tool plate
- High load bearing option
- Internal bumpers and magnetic piston are standard
- Flexible porting: top, rear, side



### Operating information

Operating pressure: 1 MPa (145 PSIG / 10 bar)  
 Temperature range:  
 Nitrile seals (standard) 0°F to 165°F (-18°C to 74°C)  
 Fluorocarbon seals\* 0°F to 250°F (-18°C to 121°C)  
 \* See fluorocarbon seal option for high temperature applications.  
 Filtration requirements: 40 micron, dry filtered air  
 For technical information see CD

### Ordering information

**P5T – J 032 D H S N 100**

| Shaft / bearing type |  | Bore size  |       | Seals    |                          | Stroke length  |  |
|----------------------|--|------------|-------|----------|--------------------------|--|--|
| <b>J</b>             | Composite bearing, chrome plated shaft (std) | <b>016</b> | 16mm  | <b>S</b> | Nitrile (std)            | See table below for standard stroke lengths. Consult factory for special stroke lengths. |  |
| <b>H</b>             | Ball bearing, stainless steel shaft          | <b>020</b> | 20mm  | <b>F</b> | Fluorocarbon (high temp) |  |  |
| <b>C</b>             | Composite bearing, stainless steel shaft     | <b>025</b> | 25mm  |          |                          |  |  |
|                      |  | <b>032</b> | 32mm  |          |                          |  |  |
|                      |  | <b>040</b> | 40mm  |          |                          |  |  |
|                      |  | <b>050</b> | 50mm  |          |                          |  |  |
|                      |  | <b>063</b> | 63mm  |          |                          |  |  |
|                      |  | <b>080</b> | 80mm  |          |                          |  |  |
|                      |  | <b>100</b> | 100mm |          |                          |  |  |

| Port location / mounting |  |
|--------------------------|--|
| <b>D</b>                 | Dowel holes, top ports (std)                       |
| <b>R</b>                 | Dowel holes, rear ports, top plugged (std)         |
| <b>S</b>                 | Dowel holes, side ports <sup>1</sup> and top ports |

| Options  |   |
|----------|---|
| <b>N</b> | None (std)  |
| <b>B</b> | High load bearings <sup>2</sup>   |
| <b>A</b> | Bumpers, adjustable stop collars (extend only) and dual tool plate (side ports rec) <sup>3, 4</sup> |
| <b>E</b> | Bumpers and adjustable stop collars (extend only) <sup>3</sup>                                      |
| <b>G</b> | High load bearings, bumpers and adjustable stop collars (extend only) <sup>2, 3</sup>               |
| <b>D</b> | Dual tool plate <sup>3, 4</sup>   |
| <b>X</b> | Special   |

| Port style |   |
|------------|---|
| <b>H</b>   | NPTF (std)  |
| <b>G</b>   | BSPP  |
| <b>P</b>   | Flow control, BSPP port, prestolok tube (mm) <sup>1</sup>   |
| <b>F</b>   | Flow control, NPTF port, prestolok tube (inch) <sup>1</sup> |
| <b>B</b>   | Flow control, BSPP <sup>1</sup>                             |
| <b>N</b>   | Flow control, NPTF <sup>1</sup>                             |

| Standard strokes (mm)* |    |    |    |    |    |     |     |     |     |     |
|------------------------|----|----|----|----|----|-----|-----|-----|-----|-----|
| Bore size (mm)         | 10 | 25 | 40 | 50 | 75 | 100 | 125 | 150 | 175 | 200 |
| 16                     | •  | •  | •  | •  | •  | •   |     |     |     |     |
| 20                     |    | •  | •  | •  | •  | •   | •   |     |     |     |
| 25                     |    | •  |    | •  | •  | •   | •   | •   |     |     |
| 32 -100                |    | •  |    | •  | •  | •   | •   | •   | •   | •   |

\* Consult factory for special stroke lengths.

**NOTES:**

- 1 Cannot combine flow controls, side ports and 25mm stroke.
- 2 Not available with rear mounting and ports.
- 3 Not available with rear port location (R).
- 4 Includes high load bearings as standard.

**Sensors**  
 For sensors see page B294.

**B**  
 Guided Cylinders  
 Actuator Products

P5T Series

P5T2 Series

P5L Series

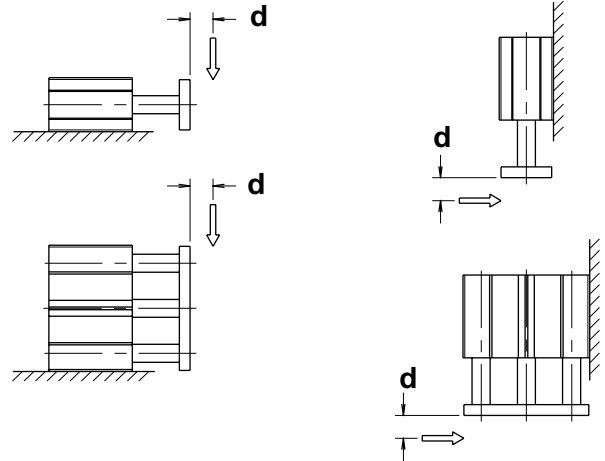
HB Series

P5E Series

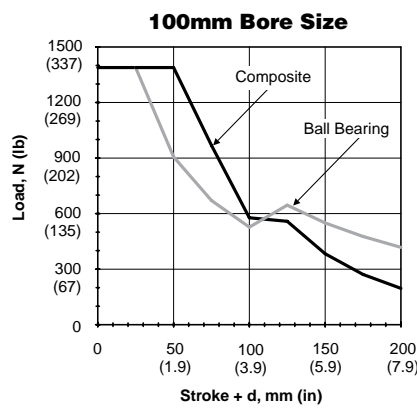
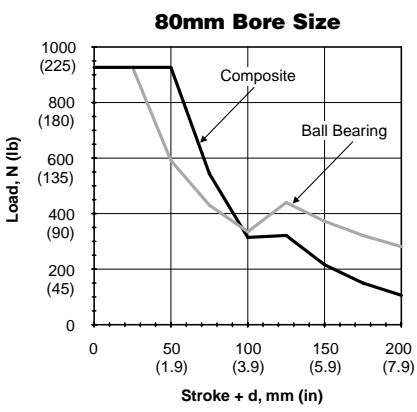
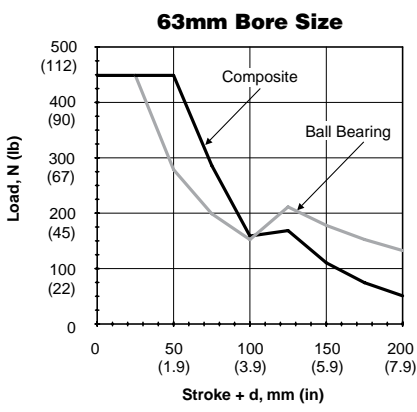
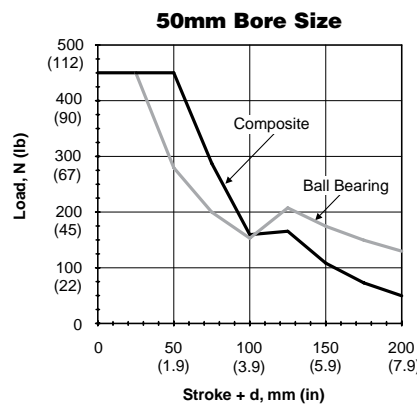
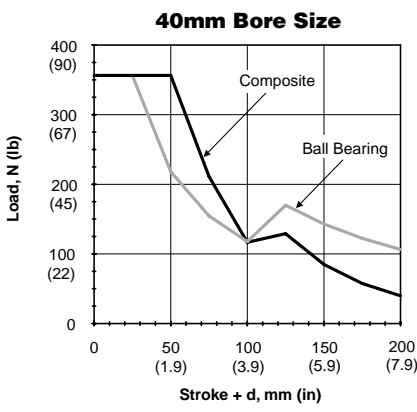
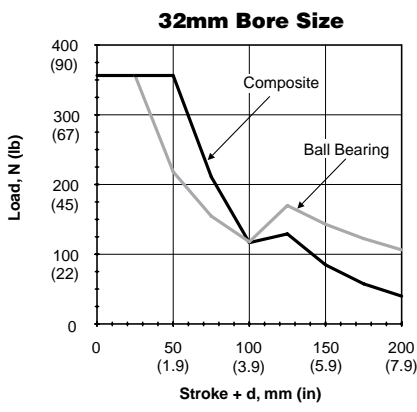
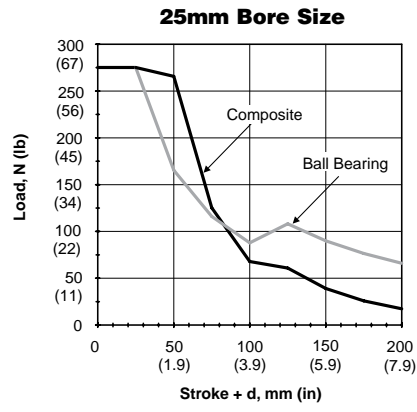
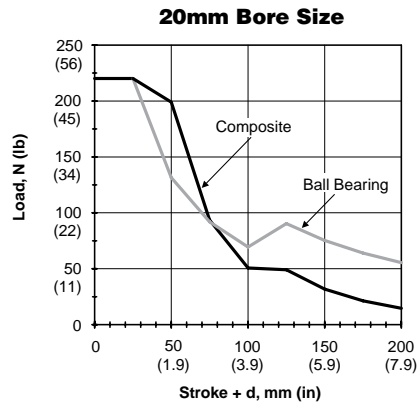
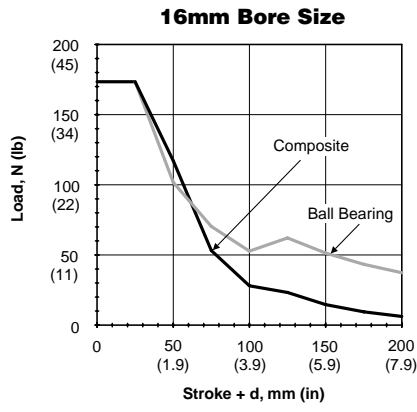
**Horizontal Load Capacity**  
**Standard Unit**

P5T Series units will have the same load capacity regardless of orientation. The graphs below show maximum load capacity based on a unit life of 10 million cycles.

**EXAMPLE:** A P5T-16 with “stroke + d” of 75mm and composite bushings would have a load capacity of 50N.



|          |                   |
|----------|-------------------|
| <b>B</b> | Guided Cylinders  |
|          | Actuator Products |
| P5T      | Series            |
| P5T2     | Series            |
| P5L      | Series            |
| HB       | Series            |
| P5E      | Series            |





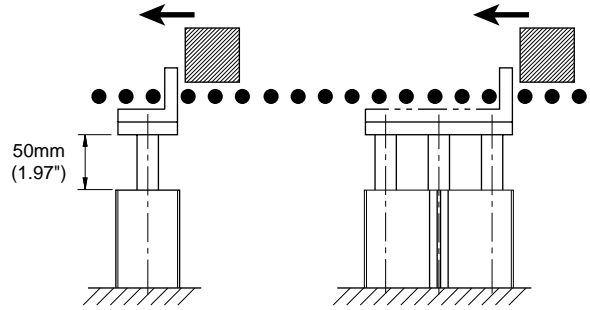
**Load Stopping Capacity Standard Unit**

P5T Series actuators are ideal for conveyor stopping applications. Units can be mounted horizontally or vertically.

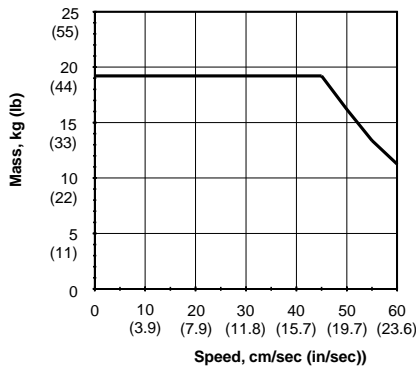
*Composite bushings are strongly recommended for this type of application.*

**EXAMPLE:** A P5T-50 unit with a stroke up to 50mm will stop an object moving at 40 cm/second (15.75 in/s) that weighs up to 50 kg (110 lb).

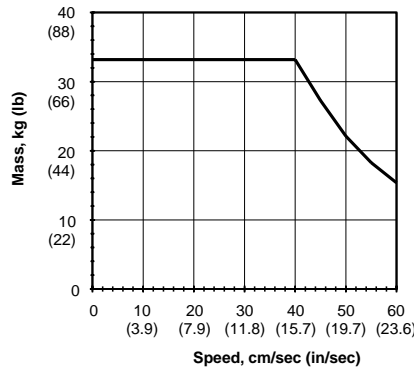
**Note:** The following graphs are based on 50mm of stroke.



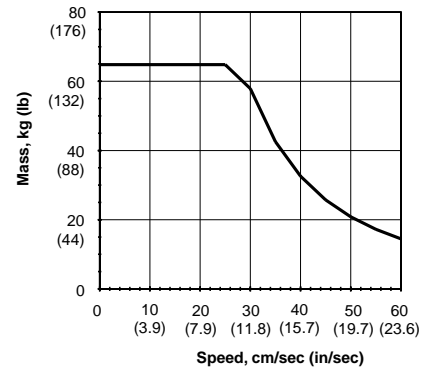
**16mm Bore Size**



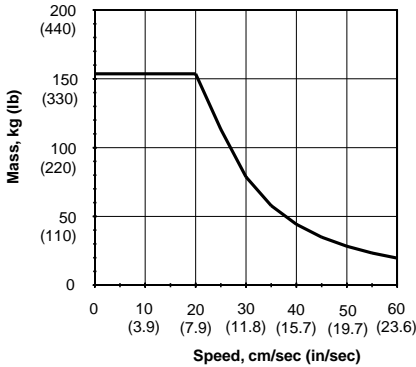
**20mm Bore Size**



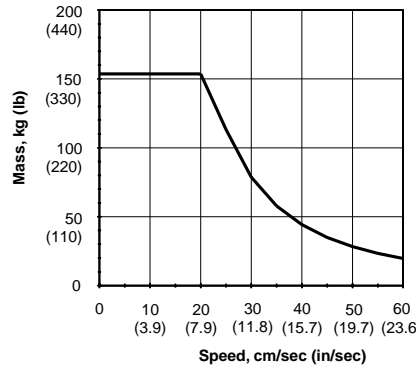
**25mm Bore Size**



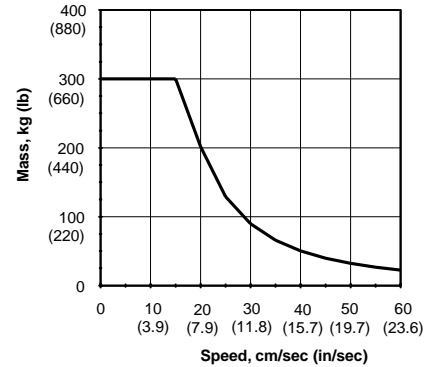
**32mm Bore Size**



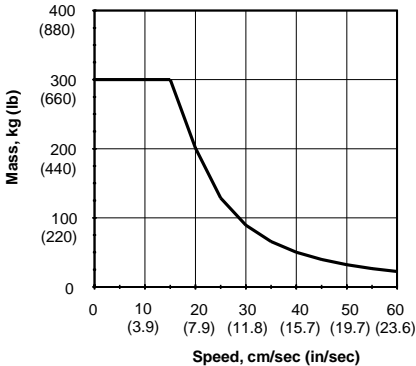
**40mm Bore Size**



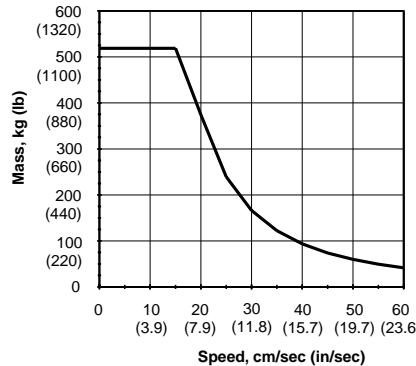
**50mm Bore Size**



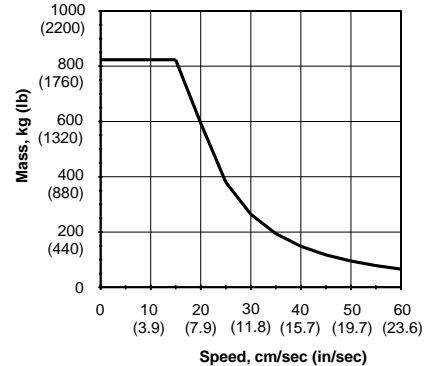
**63mm Bore Size**



**80mm Bore Size**



**100mm Bore Size**



**B**

Guided Cylinders  
 Actuator Products

P5T  
 Series

P5T2  
 Series

P5L  
 Series

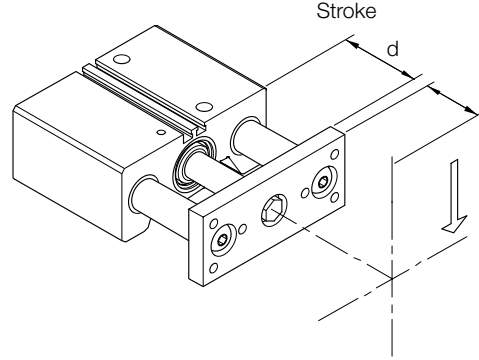
HB  
 Series

P5E  
 Series

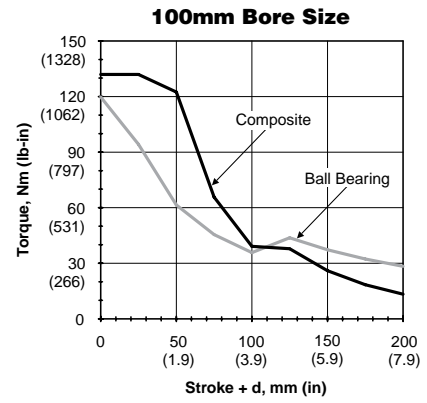
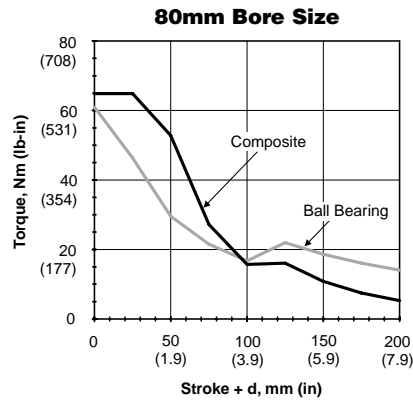
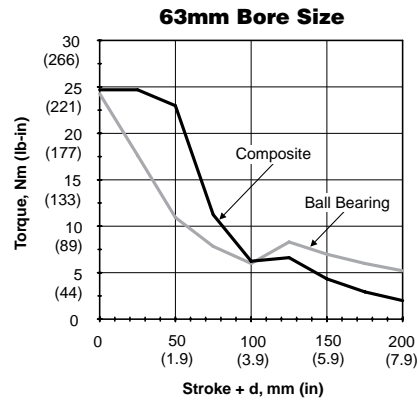
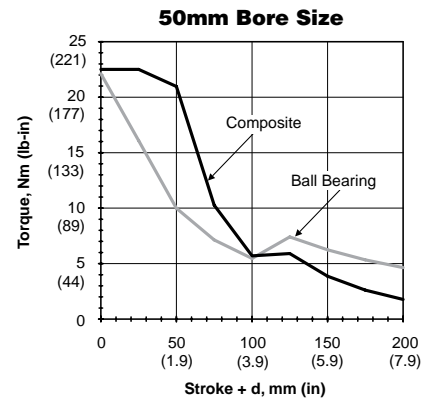
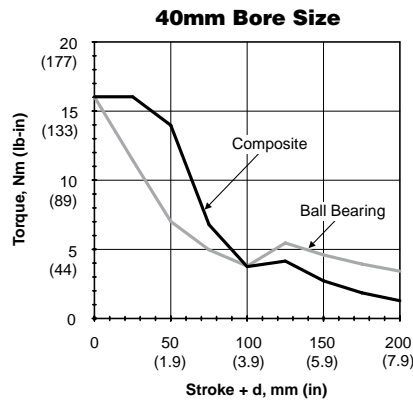
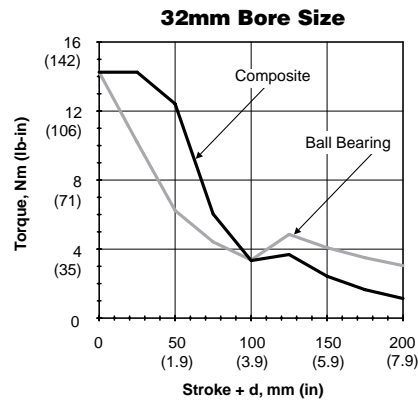
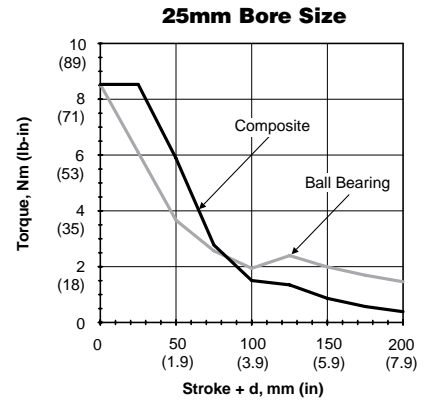
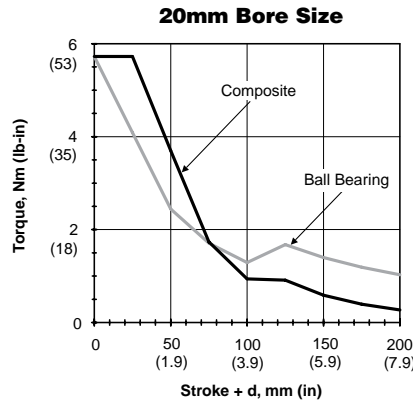
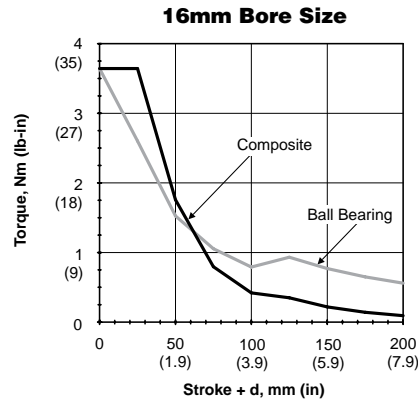
**Asymmetrical Torque Capacity Standard Unit**

Asymmetrical loading occurs when the load is applied to one side of the unit. P5T Series units can resist torsional loads that are asymmetrical.

**EXAMPLE:** A mechanism exerts an asymmetrical load of 15Nm on a P5T-50 with 50mm “stroke+d”. The P5T-50 with composite bushings will have adequate torsional capacity.



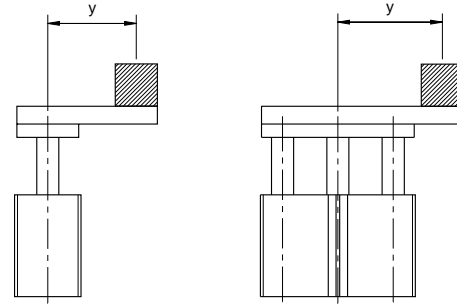
|          |                   |
|----------|-------------------|
| <b>B</b> | Guided Cylinders  |
|          | Actuator Products |
| P5T      | Series            |
| P5T2     | Series            |
| P5L      | Series            |
| HB       | Series            |
| P5E      | Series            |



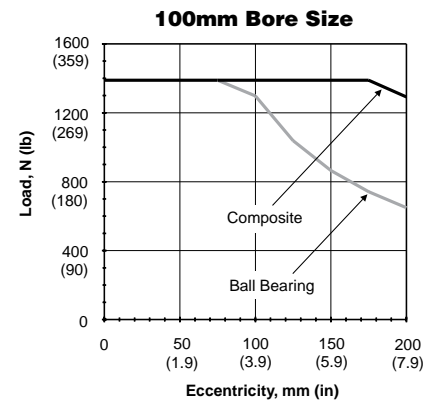
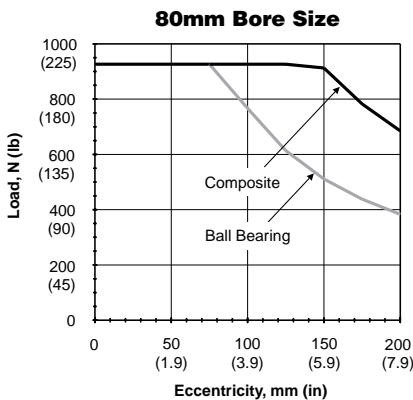
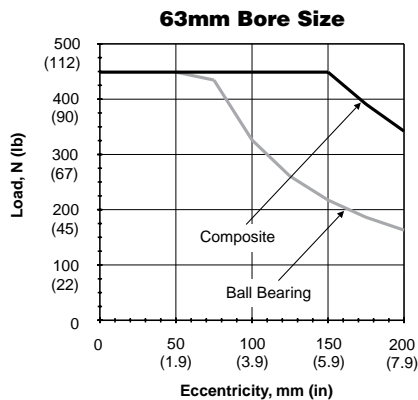
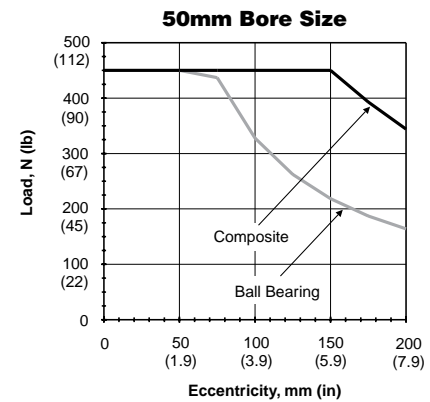
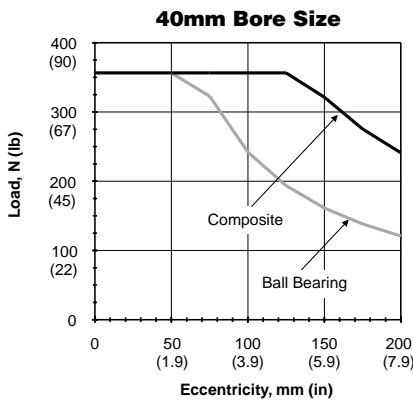
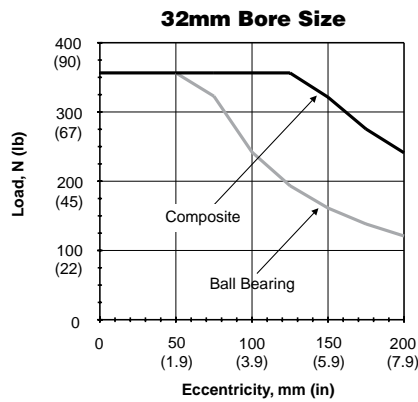
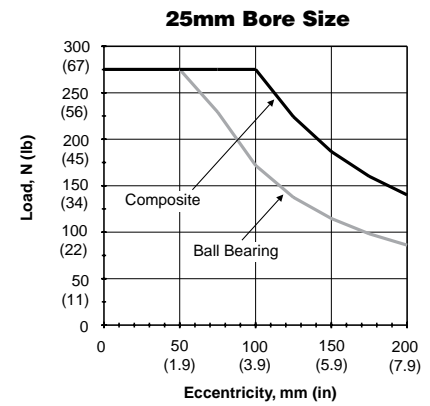
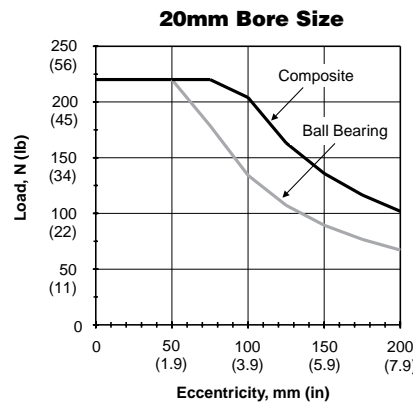
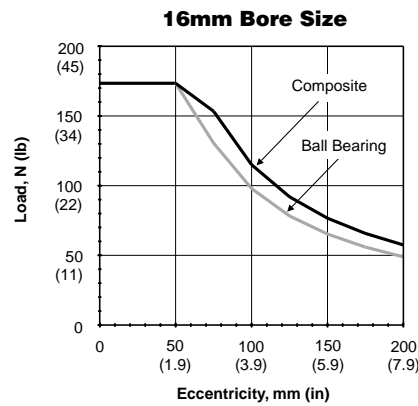
**Vertical Eccentric Load Capacity Standard Unit**

P5T Series units mounted vertically will have the same eccentric load capacity regardless of orientation. The graphs provide maximum load capacity for an eccentric mounted load. The load is assumed to be mounted at the face of the tooling plate.

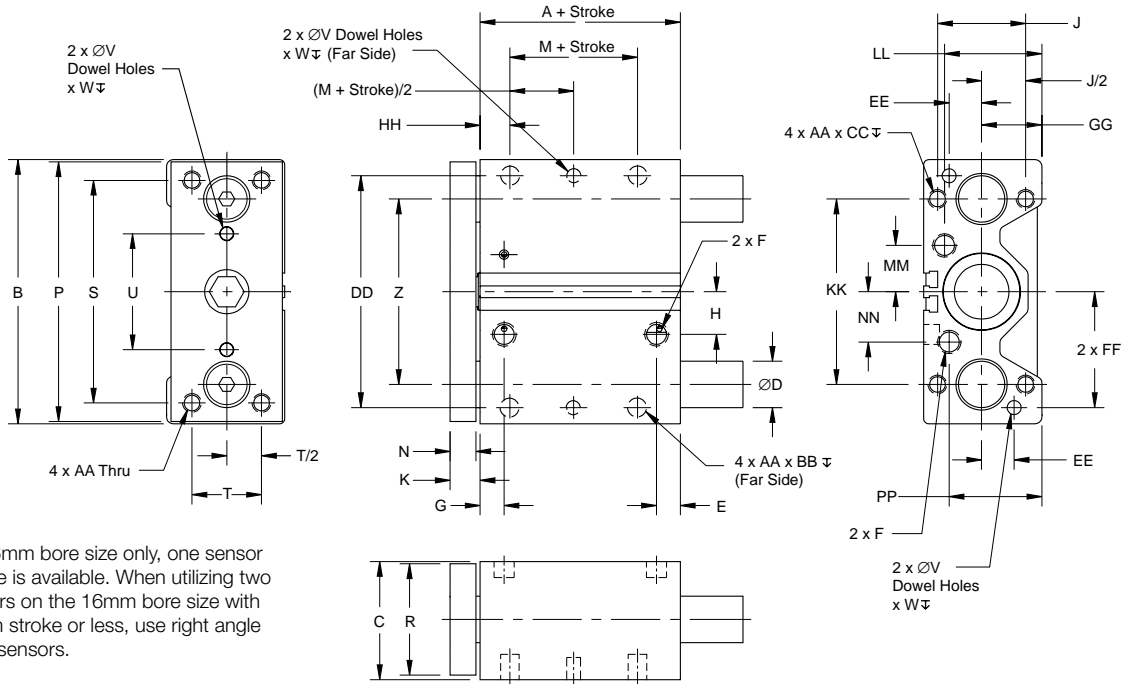
These load curves illustrate load ratings based on the bearing system of the product. Load rating is a key selection criterion but is not the only one to consider in the selection of a product.



*y = eccentricity distance*



|             |                                       |
|-------------|---------------------------------------|
| <b>B</b>    | Guided Cylinders<br>Actuator Products |
|             | P5T Series                            |
| P5T2 Series |                                       |
| P5L Series  |                                       |
| HB Series   |                                       |
| P5E Series  |                                       |



**Note:** On 16mm bore size only, one sensor groove is available. When utilizing two sensors on the 16mm bore size with 25mm stroke or less, use right angle short sensors.

Dimensions in mm (inch)

| Model | A**          | B          | C          | D          | D <sup>2</sup> | E**          | F                | G            | H            | J          | K           |
|-------|--------------|------------|------------|------------|----------------|--------------|------------------|--------------|--------------|------------|-------------|
| 16    | 37.75 (1.49) | 64 (2.52)  | 31 (1.22)  | 8 (0.315)  | 10 (0.394)     | 10.1 (0.40)  | M5/10-32         | 10.1 (0.40)  | 6.95 (0.27)  | 22 (0.866) | 9.94 (0.39) |
| 20    | 36 (1.42)    | 74 (2.91)  | 36 (1.42)  | 10 (0.394) | 12 (0.472)     | 19 (0.75)    | 1/8 NPTF or BSPP | 10 (0.39)    | 15.8 (0.62)  | 26 (1.024) | 9.94 (0.39) |
| 25    | 38 (1.50)    | 88 (3.46)  | 42 (1.65)  | 12 (0.472) | 16 (0.630)     | 21 (0.83)    | 1/8 NPTF or BSPP | 11.4 (0.45)  | 15.5 (0.61)  | 32 (1.260) | 9.94 (0.39) |
| 32    | 36 (1.42)    | 114 (4.49) | 51 (2.00)  | 16 (0.630) | 20 (0.787)     | 10.26 (0.40) | 1/8 NPTF or BSPP | 10.35 (0.41) | 18.42 (0.73) | 38 (1.496) | 13.1 (0.52) |
| 40    | 44 (1.73)    | 124 (4.88) | 52 (2.05)  | 16 (0.630) | 20 (0.787)     | 12.10 (0.48) | 1/8 NPTF or BSPP | 14.9 (0.59)  | 22.53 (0.89) | 38 (1.496) | 13.1 (0.52) |
| 50    | 44.9 (1.77)  | 140 (5.51) | 62 (2.44)  | 20 (0.787) | 25 (0.984)     | 14.5 (0.57)  | 1/4 NPTF or BSPP | 16.1 (0.63)  | 27 (1.06)    | 44 (1.732) | 14.7 (0.58) |
| 63    | 50.05 (1.97) | 150 (5.91) | 75 (2.95)  | 20 (0.787) | 25 (0.984)     | 16.4 (0.65)  | 1/4 NPTF or BSPP | 14.5 (0.57)  | 33 (1.30)    | 44 (1.732) | 14.7 (0.58) |
| 80    | 60.3 (2.37)  | 188 (7.40) | 95 (3.74)  | 25 (0.984) | 30 (1.181)     | 17.5 (0.610) | 3/8 NPTF or BSPP | 19 (0.75)    | 37 (1.46)    | 56 (2.205) | 18 (0.71)   |
| 100** | 67.5 (2.60)  | 224 (8.82) | 115 (4.53) | 30 (1.181) | 35 (1.38)      | 21.9 (0.862) | 3/8 NPTF or BSPP | 23 (0.91)    | 40 (1.57)    | 62 (2.441) | 18 (0.71)   |

| Model | M          | N           | P          | R           | S           | T          | U           | V          | W          | Z           | AA       | BB         |
|-------|------------|-------------|------------|-------------|-------------|------------|-------------|------------|------------|-------------|----------|------------|
| 16    | 7 (0.276)  | 7.94 (0.31) | 62 (2.44)  | 25.4 (1.00) | 52 (2.047)  | 16 (.630)  | 20 (0.787)  | 3 (0.118)  | 6 (0.236)  | 42 (1.654)  | M5x0.8   | 7.5 (0.30) |
| 20    | 10 (0.394) | 7.94 (0.31) | 72 (2.83)  | 31.8 (1.25) | 60 (2.362)  | 18 (.709)  | 30 (1.181)  | 4 (0.157)  | 6 (0.236)  | 52 (2.047)  | M5x0.8   | 7.5 (0.30) |
| 25    | 10 (0.394) | 7.94 (0.31) | 86 (3.39)  | 38 (1.50)   | 70 (2.756)  | 26 (1.024) | 34 (1.339)  | 4 (0.157)  | 6 (0.236)  | 62 (2.441)  | M6x1.0   | 9 (0.35)   |
| 32    | 5 (0.197)  | 11.1 (0.44) | 112 (4.41) | 44.5 (1.75) | 96 (3.780)  | 30 (1.181) | 50 (1.969)  | 6 (0.236)  | 6 (0.236)  | 80 (3.150)  | M8x1.25  | 11 (0.43)  |
| 40    | 10 (0.394) | 11.1 (0.44) | 122 (4.80) | 44.5 (1.75) | 106 (4.173) | 30 (1.181) | 60 (2.362)  | 6 (0.236)  | 6 (0.236)  | 90 (3.543)  | M8x1.25  | 11 (0.43)  |
| 50    | 10 (0.394) | 12.7 (0.50) | 138 (5.43) | 57.2 (2.25) | 120 (4.724) | 40 (1.575) | 60 (2.362)  | 8 (0.315)  | 8 (0.315)  | 100 (3.937) | M10x1.5  | 12 (0.47)  |
| 63    | 10 (0.394) | 12.7 (0.50) | 148 (5.83) | 69.9 (2.75) | 130 (5.118) | 50 (1.969) | 72 (2.835)  | 8 (0.315)  | 8 (0.315)  | 110 (4.331) | M10x1.5  | 15 (0.59)  |
| 80    | 15 (0.591) | 16 (0.63)   | 185 (7.28) | 89 (3.50)   | 160 (6.299) | 60 (2.362) | 92 (3.622)  | 10 (0.394) | 10 (0.394) | 140 (5.512) | M12x1.75 | 18 (0.71)  |
| 100   | 15 (0.591) | 16 (0.63)   | 221 (8.70) | 108 (4.25)  | 190 (7.480) | 80 (3.150) | 114 (4.488) | 10 (0.394) | 10 (0.394) | 170 (6.693) | M14x2.0  | 21 (0.83)  |

| Model | CC        | DD          | EE         | FF          | GG           | HH            | KK          | LL          | MM           | NN           | PP           | Piston Rod |
|-------|-----------|-------------|------------|-------------|--------------|---------------|-------------|-------------|--------------|--------------|--------------|------------|
| 16    | 10 (0.39) | 54 (2.126)  | 8 (0.315)  | 27 (1.063)  | 15 (0.591)   | 13.06 (0.514) | 42 (1.654)  | 22.5 (0.88) | 11.25 (0.44) | 9.7 (0.38)   | 23.0 (0.91)  | 8 (0.315)  |
| 20    | 10 (0.39) | 64 (2.520)  | 10 (0.394) | 32 (1.260)  | 17 (0.669)   | 13.06 (0.514) | 52 (2.126)  | 26.0 (1.02) | 15.4 (0.61)  | 15.4 (0.61)  | 26.0 (1.0)   | 10 (0.394) |
| 25    | 12 (0.47) | 76 (2.992)  | 11 (0.433) | 38 (1.496)  | 21 (0.827)   | 14.06 (0.553) | 62 (2.441)  | 33.4 (1.31) | 17 (0.67)    | 17 (0.67)    | 33.4 (1.31)  | 10 (0.394) |
| 32    | 16 (0.63) | 100 (3.937) | 14 (0.551) | 50 (1.969)  | 26 (1.024)   | 12.9 (0.508)  | 80 (3.150)  | 42 (1.65)   | 20 (0.79)    | 21.7 (0.85)  | 38 (1.50)    | 16 (0.630) |
| 40    | 16 (0.63) | 110 (4.33)  | 14 (0.551) | 55 (2.165)  | 26 (1.024)   | 13.9 (0.547)  | 90 (3.543)  | 41 (1.61)   | 24 (0.95)    | 26.4 (1.04)  | 37.9 (1.49)  | 16 (0.630) |
| 50    | 20 (0.79) | 124 (4.882) | 16 (0.630) | 62 (2.441)  | 30 (1.181)   | 14.3 (0.563)  | 100 (3.937) | 51 (2.01)   | 29 (1.14)    | 33 (1.30)    | 44 (1.73)    | 20 (0.787) |
| 63    | 20 (0.79) | 132 (5.197) | 18 (0.709) | 66 (2.598)  | 36.5 (1.437) | 16.3 (0.642)  | 110 (4.331) | 62 (2.44)   | 36 (1.42)    | 37.75 (1.49) | 57.75 (2.27) | 20 (0.787) |
| 80    | 24 (0.94) | 166 (6.535) | 22 (0.866) | 83 (3.268)  | 46.5 (1.831) | 21 (0.83)     | 140 (5.512) | 78 (3.07)   | 45 (1.77)    | 48 (1.89)    | 75.5 (2.97)  | 25 (0.984) |
| 100   | 28 (1.10) | 200 (7.874) | 24 (0.945) | 100 (3.937) | 56.5 (2.224) | 25 (0.98)     | 170 (6.693) | 91.5 (3.60) | 53 (2.09)    | 51 (2.01)    | 95.5 (3.76)  | 25 (0.984) |

D1 With linear ball bearing      D<sup>2</sup> With composite bushing  
 \*\* For Model 100 with 25mm stroke, A = 100.3 (3.95") and E = 28 (1.10")



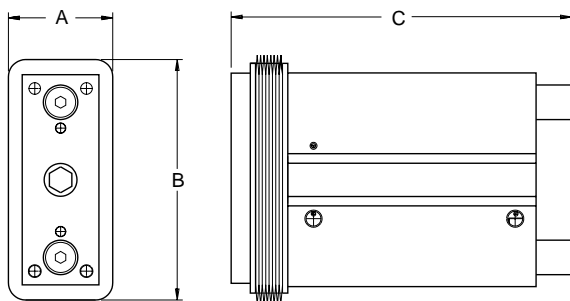
### Contaminant & Weld Flash Covers

A contaminant cover protects the guide rods and bearings from particles and fluid that could cause premature failure.

A weld flash cover protects guide rods and bearings from weld spatter.

Cover option can be ordered on models having the bearings both ends option.

**Consult factory to order.**



#### Weld Flash Cover Specifications

|                                  |  |
|----------------------------------|--|
| Coating material (exposed side)  | PVC (Black)                            |
| Base material                    | Nomex                                  |
| Coating material (other side)    | PVC (Black)                            |
| Material thickness range         | .012" - .016" (.3-.4mm)                |
| Temperature resistance (nomex)   |  |
| Briefly                          | 642°F (450°C)                          |
| Continuously                     | -22° to 572°F (-30° to 300°C)          |
| Temperature resistance (coating) |  |
| Briefly                          | 392°F (200°C)                          |
| Continuously                     | -22° to 302°F (-30° to 150°C)          |
| Resistant to                     | Chemicals, coolants, solvents, oil     |
| Characteristics                  | self-extinguishing, abrasion resistant |
| Material weight                  | 400 grams/square meter                 |

### Dimensions in mm (inch)

| Model | A             | B              | 10             | 25              | 40              | 50              | 75              | 100             | 125              | 150              | 175              | 200              |
|-------|---------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|------------------|
| 16    | 42<br>(1.65)  | 86<br>(3.39)   | 61.2<br>(2.41) | 100.2<br>(3.94) | 135.2<br>(5.32) | 135.2<br>(5.32) | 160.2<br>(6.31) | 200.2<br>(7.88) | -                | -                | -                | -                |
| 20    | 45<br>(1.77)  | 98<br>(3.86)   | -              | 106.9<br>(4.21) | 141.9<br>(5.59) | 141.9<br>(5.59) | 166.9<br>(6.57) | 216.9<br>(8.54) | 241.9<br>(9.52)  | -                | -                | -                |
| 25    | 49<br>(1.93)  | 112<br>(4.41)  | -              | 119.9<br>(4.72) | -               | 144.9<br>(5.70) | 169.9<br>(6.69) | 194.9<br>(7.67) | 241.9<br>(9.52)  | 266.9<br>(10.51) | -                | -                |
| 32    | 62<br>(2.44)  | 142<br>(5.59)  | -              | 127.9<br>(5.04) | -               | 152.9<br>(6.02) | 177.9<br>(7.00) | 202.9<br>(7.99) | 266<br>(10.47)   | 291<br>(11.46)   | 316<br>(12.44)   | 341<br>(13.43)   |
| 40    | 62<br>(2.44)  | 152<br>(5.98)  | -              | 127.9<br>(5.04) | -               | 152.9<br>(6.02) | 177.9<br>(7.00) | 202.9<br>(7.99) | 266<br>(10.47)   | 291<br>(11.46)   | 316<br>(12.44)   | 341<br>(13.43)   |
| 50    | 66<br>(2.60)  | 167<br>(6.57)  | -              | 134<br>(5.28)   | -               | 159<br>(6.26)   | 184<br>(7.24)   | 209<br>(8.23)   | 274.1<br>(10.79) | 299.1<br>(11.78) | 324.1<br>(12.76) | 349.1<br>(13.74) |
| 63    | 77<br>(3.03)  | 187<br>(7.36)  | -              | 134<br>(5.28)   | -               | 159<br>(6.26)   | 184<br>(7.24)   | 209<br>(8.23)   | 274.1<br>(10.79) | 299.1<br>(11.78) | 324.1<br>(12.76) | 349.1<br>(13.74) |
| 80    | 104<br>(4.09) | 244<br>(9.61)  | -              | 151.8<br>(5.98) | -               | 176.8<br>(6.96) | 201.8<br>(7.94) | 226.8<br>(8.93) | 290<br>(11.42)   | 315<br>(12.40)   | 340<br>(13.39)   | 365<br>(14.37)   |
| 100   | 109<br>(4.29) | 279<br>(10.98) | -              | 170.3<br>(6.70) | -               | 195.3<br>(7.69) | 220.3<br>(8.67) | 245.3<br>(9.66) | 308.4<br>(12.14) | 333.4<br>(13.13) | 358.4<br>(14.11) | 383.4<br>(15.09) |

### Seal Kits

| Bore size | Seal kit part number |                     |
|-----------|----------------------|---------------------|
|           | Nitrile seals        | Fluorocarbon seals  |
| 16        | <b>PSK-P5T16</b>     | <b>PSK-P5T16-F</b>  |
| 20        | <b>PSK-P5T20</b>     | <b>PSK-P5T20-F</b>  |
| 25        | <b>PSK-P5T25</b>     | <b>PSK-P5T25-F</b>  |
| 32        | <b>PSK-P5T32</b>     | <b>PSK-P5T32-F</b>  |
| 40        | <b>PSK-P5T40</b>     | <b>PSK-P5T40-F</b>  |
| 50        | <b>PSK-P5T50</b>     | <b>PSK-P5T50-F</b>  |
| 63        | <b>PSK-P5T63</b>     | <b>PSK-P5T63-F</b>  |
| 80        | <b>PSK-P5T80</b>     | <b>PSK-P5T80-F</b>  |
| 100       | <b>PSK-P5T100</b>    | <b>PSK-P5T100-F</b> |

**B**  
**Guided Cylinders**  
**Actuator Products**

P5T Series

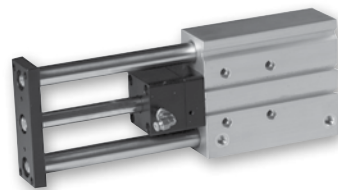
P5T2 Series

P5L Series

HB Series

P5E Series

- Compact guided cylinder for heavy duty short stroke applications
- 10 bore sizes 12mm to 100mm
- Strokes 10 to 200mm depending on model
- Rod lock option to hold position upon loss of air pressure
- High load bearing option
- Optional stop collars for adjustable stroke



**Operating information**

|                                  |                               |
|----------------------------------|-------------------------------|
| Operating pressure:              | 1 MPa (145 PSIG / 10 bar)     |
| Temperature range:               |                               |
| Nitrile seals (standard)         | -18°C to 74°C (0°F to 165°F)  |
| Fluorocarbon seals               | -18°C to 121°C (0°F to 250°F) |
| Operating characteristics:       | Double acting                 |
| Filtration requirements:         | 40 micron, dry filtered air   |
| For technical information see CD |                               |

**Ordering information**

**P5T2 A 032 J1 K N 1 B G J 025 A**

|                     |   |                  |       |                      |      |   |  |
|---------------------|---|------------------|-------|----------------------|------|---|--|
| <b>Construction</b> |   | <b>Bore size</b> |       | <b>Port location</b> |      | <b>Stroke length</b>  |  |
| A                   | Standard, metric mounting Threads               | 012              | 12mm  | 1                    | Top  | Order standard stroke from tables below using 3 digits, i.e. 025 = 25mm |  |
| E                   | Cushions <sup>6</sup> , metric mounting threads | 016              | 16mm  | 2                    | Side |   |  |
|                     |   | 020              | 20mm  | 3                    | Rear |   |  |
|                     |   | 025              | 25mm  |                      |      |   |  |
|                     |   | 032              | 32mm  |                      |      |   |  |
|                     |   | 040              | 40mm  |                      |      |   |  |
|                     |   | 050              | 50mm  |                      |      |   |  |
|                     |   | 063              | 63mm  |                      |      |   |  |
|                     |   | 080              | 80mm  |                      |      |   |  |
|                     |   | 100              | 100mm |                      |      |   |  |

|                         |  |
|-------------------------|--|
| <b>Bearings / shaft</b> |  |
| J1                      | Composite bushings, chrome plated rod                            |
| J3                      | Composite bushings, stainless steel rod                          |
| K1                      | Composite high load bearings, chrome plated rod <sup>7</sup>     |
| K3                      | Composite high load bearings, stainless steel rod <sup>7</sup>   |
| H3                      | Linear ball bearings, stainless steel rod                        |
| L3                      | Linear ball high load bearings, stainless steel rod <sup>7</sup> |

|                       |  |
|-----------------------|--|
| <b>Extend options</b> |  |
| A                     | Shock absorber <sup>1,9</sup>                    |
| K                     | Bumpers and adjustable stop collars <sup>2</sup> |
| L                     | Bumpers and shock absorbers <sup>3,9</sup>       |
| N                     | None   |

|                        |  |
|------------------------|--|
| <b>Retract options</b> |  |
| A                      | Shock absorber <sup>4,9</sup>                    |
| K                      | Bumpers and adjustable stop collars <sup>4</sup> |
| L                      | Bumpers and shock absorber <sup>4,9</sup>        |
| R                      | Rod lock (sizes 32-100 only)                     |
| N                      | None   |

|                           |        |              |
|---------------------------|--------|--------------|
| <b>Other options</b>      |        |              |
| Tool Plate                | Seals  |              |
|                           | Buna-N | Fluorocarbon |
| Front                     | G      | L            |
| Front & Rear <sup>5</sup> | H      | M            |

|                              |                            |           |          |
|------------------------------|----------------------------|-----------|----------|
| <b>Ports / flow controls</b> |                            |           |          |
| Ports                        | Flow controls <sup>5</sup> |           |          |
|                              | None                       | Prestolok | Threaded |
| NPTF                         | A                          | E         | P        |
| BSP or M5                    | B                          | F         | R        |

|             |                   |                               |   |   |      |
|-------------|-------------------|-------------------------------|---|---|------|
| <b>Type</b> | <b>Connection</b> | <b>Sensor option</b>          |   |   | None |
|             |                   | Proximity sensor <sup>8</sup> |   |   |      |
| PNP         | Lead type         | U                             | A | E | N    |
|             | Plug in           | V                             | B | F |      |
| NPN         | Lead type         | W                             | C | J |      |
|             | Plug in           | Y                             | D | K |      |

**Sensors**  
 For sensors see page B294.

|                                       |    |    |    |    |    |    |    |     |     |     |     |     |
|---------------------------------------|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|
| <b>Standard strokes, basic units*</b> |    |    |    |    |    |    |    |     |     |     |     |     |
| <b>Bore size</b>                      | 10 | 20 | 25 | 30 | 40 | 50 | 75 | 100 | 125 | 150 | 175 | 200 |
| 12 - 16                               | •  | •  |    | •  | •  | •  | •  | •   | •   | •   | •   | •   |
| 20 - 25                               |    | •  |    | •  | •  | •  | •  | •   | •   | •   | •   | •   |
| 32 - 100                              |    |    | •  |    |    | •  | •  | •   | •   | •   | •   | •   |

|   |    |    |    |    |    |    |    |     |     |     |     |     |
|---|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|
| <b>Standard strokes, cushioned units*</b> |    |    |    |    |    |    |    |     |     |     |     |     |
| <b>Bore Size</b>                          | 10 | 20 | 25 | 30 | 40 | 50 | 75 | 100 | 125 | 150 | 175 | 200 |
| 20 - 63                                   |    |    | •  |    |    | •  | •  | •   | •   | •   | •   | •   |
| 80 - 100                                  |    |    |    |    |    | •  | •  | •   | •   | •   | •   | •   |

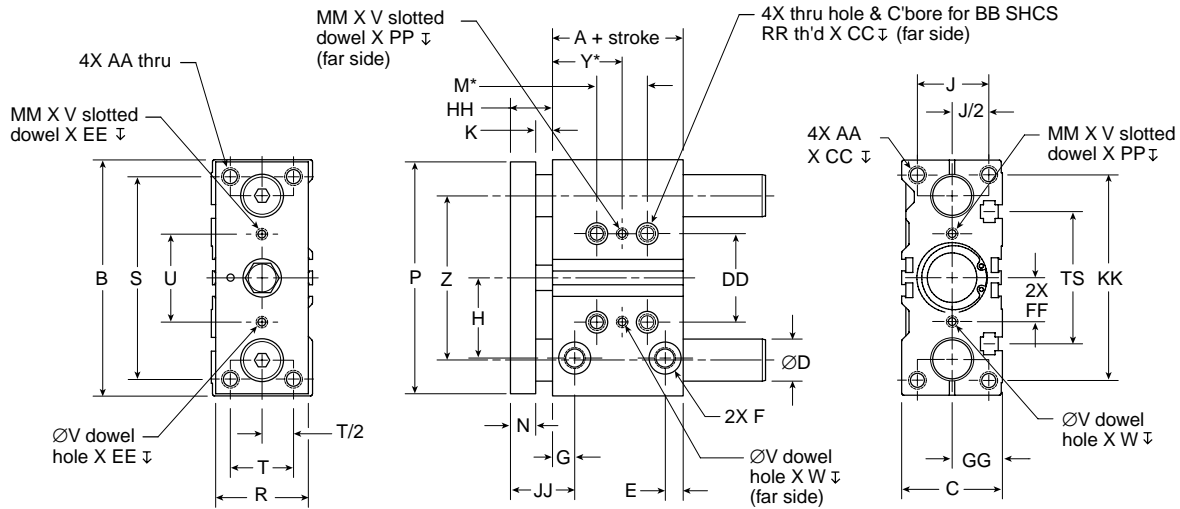
\*Consult factory for special stroke lengths.

**B**  
 Guided Cylinders  
 Actuator Products  
 P5T Series  
 P5T2 Series  
 P5L Series  
 HB Series  
 P5E Series

**Notes:**

- 1 not available with rear or side port; not available with retract option I; not available on 100mm size with 25mm stroke.
- 2 Not available with rear ports.
- 3 Not available with rear or side ports; not available with retract option a.
- 4 Not available with rod lock.
- 5 Not available with rear ports.
- 6 Cushions not available on sizes 12 & 16. Cushions may not be effective in combination with shocks or bumpers/stop collars.
- 7 High load bearings option only available with 50mm and greater strokes.
- 8 Consult factory for retract proximity sensors on rodlock unit.
- 9 Shock absorbers not available on sizes 12 & 16.





Dimensions in mm (inch)

Note: See next page for these stroke dependent dimensions.

| Bore | A              | B             | C              | D <sub>1</sub> | D <sub>2</sub> | E               | F                    | G               | H              | J            | K            | N            | P             | R            | S             | T            | U             |
|------|----------------|---------------|----------------|----------------|----------------|-----------------|----------------------|-----------------|----------------|--------------|--------------|--------------|---------------|--------------|---------------|--------------|---------------|
| 12   | 29<br>(1.14)   | 58<br>(2.28)  | 26<br>(1.02)   | 6<br>(0.24)    | 8<br>(0.31)    | 6.75<br>(0.27)  | M5x0.8*              | 10.5<br>(0.41)  | 7.5<br>(0.30)  | 18<br>(0.71) | 6<br>(0.24)  | 7<br>(0.28)  | 56<br>(2.20)  | 22<br>(0.87) | 48<br>(1.89)  | 14<br>(0.55) | 23<br>(0.91)  |
| 16   | 33<br>(1.30)   | 64<br>(2.52)  | 30<br>(1.18)   | 8<br>(0.31)    | 10<br>(0.39)   | 6.2<br>(0.24)   | M5x0.8*              | 12<br>(0.47)    | 16.5<br>(0.65) | 22<br>(0.87) | 5<br>(0.20)  | 8<br>(0.31)  | 62<br>(2.44)  | 25<br>(0.98) | 54<br>(2.13)  | 16<br>(0.63) | 24<br>(0.94)  |
| 20   | 37<br>(1.46)   | 83<br>(3.27)  | 36<br>(1.42)   | 10<br>(0.39)   | 12<br>(0.47)   | 10<br>(0.39)    | 1/8 BSPP<br>1/8 NPTF | 11<br>(0.43)    | 25<br>(0.98)   | 24<br>(0.94) | 8<br>(0.31)  | 8<br>(0.31)  | 81<br>(3.19)  | 30<br>(1.18) | 70<br>(2.76)  | 18<br>(0.71) | 28<br>(1.10)  |
| 25   | 37.5<br>(1.48) | 93<br>(3.66)  | 42<br>(1.65)   | 12<br>(0.47)   | 16<br>(0.63)   | 10.5<br>(0.41)  | 1/8 BSPP<br>1/8 NPTF | 10.5<br>(0.41)  | 30<br>(1.18)   | 30<br>(1.18) | 8<br>(0.31)  | 8<br>(0.31)  | 91<br>(3.58)  | 38<br>(1.50) | 78<br>(3.07)  | 26<br>(1.02) | 34<br>(1.34)  |
| 32   | 37.5<br>(1.48) | 112<br>(4.41) | 48<br>(1.89)   | 16<br>(0.63)   | 20<br>(0.79)   | 10.75<br>(0.42) | 1/8 BSPP<br>1/8 NPTF | 11.75<br>(0.46) | 37.5<br>(1.48) | 34<br>(1.34) | 10<br>(0.39) | 12<br>(0.47) | 110<br>(4.33) | 44<br>(1.73) | 96<br>(3.78)  | 30<br>(1.18) | 42<br>(1.65)  |
| 40   | 44<br>(1.73)   | 120<br>(4.72) | 54<br>(2.13)   | 16<br>(0.63)   | 20<br>(0.79)   | 11.5<br>(0.45)  | 1/8 BSPP<br>1/8 NPTF | 16<br>(0.63)    | 42<br>(1.65)   | 40<br>(1.57) | 10<br>(0.39) | 12<br>(0.47) | 118<br>(4.65) | 44<br>(1.73) | 104<br>(4.09) | 30<br>(1.18) | 50<br>(1.97)  |
| 50   | 44<br>(1.73)   | 148<br>(5.83) | 64<br>(2.52)   | 20<br>(0.79)   | 25<br>(0.98)   | 12.5<br>(0.49)  | 1/4 BSPP<br>1/4 NPTF | 16<br>(0.63)    | 49<br>(1.93)   | 46<br>(1.81) | 15<br>(0.59) | 13<br>(0.51) | 146<br>(5.75) | 60<br>(2.36) | 130<br>(5.12) | 40<br>(1.57) | 66<br>(2.60)  |
| 63   | 49<br>(1.93)   | 162<br>(6.38) | 78<br>(3.07)   | 20<br>(0.79)   | 25<br>(0.98)   | 13<br>(0.51)    | 1/4 BSPP<br>1/4 NPTF | 16<br>(0.63)    | 57<br>(2.24)   | 58<br>(2.28) | 15<br>(0.59) | 13<br>(0.51) | 158<br>(6.22) | 70<br>(2.76) | 130<br>(5.12) | 50<br>(1.97) | 80<br>(3.15)  |
| 80   | 56.5<br>(2.22) | 202<br>(7.95) | 91.5<br>(3.60) | 25<br>(0.98)   | 30<br>(1.18)   | 17<br>(0.67)    | 3/8 BSPP<br>3/8 NPTF | 18<br>(0.71)    | 74<br>(2.91)   | 54<br>(2.13) | 18<br>(0.71) | 22<br>(0.87) | 198<br>(7.80) | 75<br>(2.95) | 174<br>(6.85) | 52<br>(2.05) | 100<br>(3.94) |
| 100  | 66<br>(2.60)   | 240<br>(9.45) | 112<br>(4.41)  | 30<br>(1.18)   | 35<br>(1.38)   | 20<br>(0.79)    | 3/8 BSPP<br>3/8 NPTF | 23<br>(0.91)    | 94<br>(3.70)   | 48<br>(1.89) | 25<br>(0.98) | 25<br>(0.98) | 236<br>(9.29) | 89<br>(3.50) | 210<br>(8.27) | 64<br>(2.52) | 124<br>(4.88) |

| Bore | V <sup>+0.01<br/>-0.00</sup> | W            | Z             | AA            | BB  | CC           | DD            | EE            | FF             | GG           | HH           | JJ              | KK            | MM**          | PP          | RR            | TS            |
|------|------------------------------|--------------|---------------|---------------|-----|--------------|---------------|---------------|----------------|--------------|--------------|-----------------|---------------|---------------|-------------|---------------|---------------|
| 12   | 3.06<br>(0.12)               | 6<br>(0.24)  | 41<br>(1.61)  | M4<br>x 0.7   | M4  | 10<br>(0.39) | 23<br>(0.91)  | 4.5<br>(0.18) | 11.5<br>(0.45) | 13<br>(0.51) | 18<br>(0.71) | 23.5<br>(0.93)  | 50<br>(1.97)  | 3.5<br>(0.14) | 3<br>(0.12) | M5<br>x 0.8   | 37<br>(1.46)  |
| 16   | 3.06<br>(0.12)               | 6<br>(0.24)  | 46<br>(1.81)  | M5<br>x 0.8   | M4  | 10<br>(0.39) | 24<br>(0.94)  | 4.5<br>(0.18) | 12<br>(0.47)   | 15<br>(0.59) | 18<br>(0.71) | 25<br>(0.98)    | 56<br>(2.20)  | 3.5<br>(0.14) | 3<br>(0.12) | M5<br>x 0.8   | 38<br>(1.50)  |
| 20   | 3.06<br>(0.12)               | 6<br>(0.24)  | 54<br>(2.13)  | M5<br>x 0.8   | M5  | 12<br>(0.47) | 28<br>(1.10)  | 4.5<br>(0.18) | 14<br>(0.55)   | 18<br>(0.71) | 33<br>(1.30) | 27<br>(1.06)    | 72<br>(2.83)  | 3.5<br>(0.14) | 3<br>(0.12) | M6<br>x 1.0   | 44<br>(1.73)  |
| 25   | 4.06<br>(0.16)               | 6<br>(0.24)  | 64<br>(2.52)  | M6<br>x 1.0   | M5  | 12<br>(0.47) | 34<br>(1.34)  | 4.5<br>(0.18) | 17<br>(0.67)   | 21<br>(0.83) | 33<br>(1.30) | 26.5<br>(1.04)  | 82<br>(3.23)  | 4.5<br>(0.18) | 3<br>(0.12) | M6<br>x 1.0   | 50<br>(1.97)  |
| 32   | 4.06<br>(0.16)               | 6<br>(0.24)  | 78<br>(3.07)  | M8<br>x 1.25  | M6  | 16<br>(0.63) | 42<br>(1.65)  | 5.5<br>(0.22) | 21<br>(0.83)   | 24<br>(0.94) | 43<br>(1.69) | 33.75<br>(1.33) | 98<br>(3.86)  | 4.5<br>(0.18) | 3<br>(0.12) | M8<br>x 1.25  | 63<br>(2.48)  |
| 40   | 4.06<br>(0.16)               | 6<br>(0.24)  | 86<br>(3.39)  | M8<br>x 1.25  | M6  | 16<br>(0.63) | 50<br>(1.97)  | 5.5<br>(0.22) | 25<br>(0.98)   | 27<br>(1.06) | 44<br>(1.73) | 38<br>(1.50)    | 106<br>(4.17) | 4.5<br>(0.18) | 3<br>(0.12) | M8<br>x 1.25  | 72<br>(2.83)  |
| 50   | 5.04<br>(0.20)               | 8<br>(0.31)  | 110<br>(4.33) | M10<br>x 1.5  | M8  | 20<br>(0.79) | 66<br>(2.60)  | 5.5<br>(0.22) | 33<br>(1.30)   | 32<br>(1.26) | 52<br>(2.05) | 44<br>(1.73)    | 130<br>(5.12) | 6<br>(0.24)   | 4<br>(0.16) | M1<br>x 1.5   | 92<br>(3.62)  |
| 63   | 5.04<br>(0.20)               | 8<br>(0.31)  | 124<br>(4.88) | M10<br>x 1.5  | M8  | 20<br>(0.79) | 80<br>(3.15)  | 5.5<br>(0.22) | 40<br>(1.57)   | 39<br>(1.54) | 52<br>(2.05) | 44<br>(1.73)    | 142<br>(5.59) | 6<br>(0.24)   | 4<br>(0.16) | M10<br>x 1.5  | 110<br>(4.33) |
| 80   | 6.04<br>(0.24)               | 10<br>(0.39) | 156<br>(6.14) | M12<br>x 1.75 | M10 | 24<br>(0.94) | 100<br>(3.94) | 7.0<br>(0.28) | 50<br>(1.97)   | 46<br>(1.81) | 68<br>(2.68) | 58<br>(2.28)    | 180<br>(7.09) | 7<br>(0.28)   | 5<br>(0.20) | M12<br>x 1.75 | 140<br>(5.51) |
| 100  | 6.04<br>(0.24)               | 10<br>(0.39) | 188<br>(7.40) | M14<br>x 2.0  | M12 | 28<br>(1.10) | 124<br>(4.88) | 7.0<br>(0.28) | 62<br>(2.44)   | 56<br>(2.20) | 61<br>(2.40) | 73<br>(2.87)    | 221<br>(8.70) | 7<br>(0.28)   | 5<br>(0.20) | M14<br>x 2.0  | 166<br>(6.54) |

D1 with linear ball bearing; D2 with composite bushing  
 \* 10-32 fittings will fit into M5x0.8 ports.  
 \*\* Slot length





**Stroke dependent dimensions**

| Bore size | Dim | Standard stroke length (mm) |              |              |              |              |              |              |              |              |               |               |               |               |
|-----------|-----|-----------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|---------------|---------------|
|           |     | 10                          | 20           | 25           | 30           | 40           | 50           | 75           | 100          | 125          | 150           | 175           | 200           |               |
| 12        | M   | 20<br>(0.79)                | 20<br>(0.79) | N/A          | 20<br>(0.79) | 40<br>(1.57) | 40<br>(1.57) | 40<br>(1.57) | 40<br>(1.57) | 40<br>(1.57) | 110<br>(4.33) | 110<br>(4.33) | 110<br>(4.33) | 110<br>(4.33) |
|           | Y   | 15<br>(0.59)                | 15<br>(0.59) | N/A          | 15<br>(0.59) | 25<br>(0.98) | 25<br>(0.98) | 25<br>(0.98) | 25<br>(0.98) | 25<br>(0.98) | 60<br>(2.36)  | 60<br>(2.36)  | 60<br>(2.36)  | 60<br>(2.36)  |
| 16        | M   | 24<br>(0.94)                | 24<br>(0.94) | N/A          | 24<br>(0.94) | 44<br>(1.73) | 44<br>(1.73) | 44<br>(1.73) | 44<br>(1.73) | 44<br>(1.73) | 110<br>(4.33) | 110<br>(4.33) | 110<br>(4.33) | 110<br>(4.33) |
|           | Y   | 17<br>(0.67)                | 17<br>(0.67) | N/A          | 17<br>(0.67) | 27<br>(1.06) | 27<br>(1.06) | 27<br>(1.06) | 27<br>(1.06) | 27<br>(1.06) | 60<br>(2.36)  | 60<br>(2.36)  | 60<br>(2.36)  | 60<br>(2.36)  |
| 20, 25    | M   | N/A                         | 24<br>(0.94) | N/A          | 24<br>(0.94) | 44<br>(1.73) | 44<br>(1.73) | 44<br>(1.73) | 44<br>(1.73) | 44<br>(1.73) | 120<br>(4.72) | 120<br>(4.72) | 120<br>(4.72) | 120<br>(4.72) |
|           | Y   | N/A                         | 29<br>(1.14) | N/A          | 29<br>(1.14) | 39<br>(1.54) | 39<br>(1.54) | 39<br>(1.54) | 39<br>(1.54) | 39<br>(1.54) | 77<br>(3.03)  | 77<br>(3.03)  | 77<br>(3.03)  | 77<br>(3.03)  |
| 32        | M   | N/A                         | N/A          | 24<br>(0.94) | N/A          | N/A          | 48<br>(1.89) | 48<br>(1.89) | 48<br>(1.89) | 48<br>(1.89) | 124<br>(4.88) | 124<br>(4.88) | 124<br>(4.88) | 124<br>(4.88) |
|           | Y   | N/A                         | N/A          | 33<br>(1.30) | N/A          | N/A          | 45<br>(1.77) | 45<br>(1.77) | 45<br>(1.77) | 45<br>(1.77) | 83<br>(3.27)  | 83<br>(3.27)  | 83<br>(3.27)  | 83<br>(3.27)  |
| 40        | M   | N/A                         | N/A          | 24<br>(0.94) | N/A          | N/A          | 48<br>(1.89) | 48<br>(1.89) | 48<br>(1.89) | 48<br>(1.89) | 124<br>(4.88) | 124<br>(4.88) | 124<br>(4.88) | 124<br>(4.88) |
|           | Y   | N/A                         | N/A          | 34<br>(1.34) | N/A          | N/A          | 46<br>(1.81) | 46<br>(1.81) | 46<br>(1.81) | 46<br>(1.81) | 84<br>(3.31)  | 84<br>(3.31)  | 84<br>(3.31)  | 84<br>(3.31)  |
| 50        | M   | N/A                         | N/A          | 24<br>(0.94) | N/A          | N/A          | 48<br>(1.89) | 48<br>(1.89) | 48<br>(1.89) | 48<br>(1.89) | 124<br>(4.88) | 124<br>(4.88) | 124<br>(4.88) | 124<br>(4.88) |
|           | Y   | N/A                         | N/A          | 36<br>(1.42) | N/A          | N/A          | 48<br>(1.89) | 48<br>(1.89) | 48<br>(1.89) | 48<br>(1.89) | 86<br>(3.39)  | 86<br>(3.39)  | 86<br>(3.39)  | 86<br>(3.39)  |
| 63        | M   | N/A                         | N/A          | 24<br>(0.94) | N/A          | N/A          | 52<br>(2.05) | 52<br>(2.05) | 52<br>(2.05) | 52<br>(2.05) | 128<br>(5.04) | 128<br>(5.04) | 128<br>(5.04) | 128<br>(5.04) |
|           | Y   | N/A                         | N/A          | 38<br>(1.50) | N/A          | N/A          | 50<br>(1.97) | 50<br>(1.97) | 50<br>(1.97) | 50<br>(1.97) | 88<br>(3.46)  | 88<br>(3.46)  | 88<br>(3.46)  | 88<br>(3.46)  |
| 80        | M   | N/A                         | N/A          | 28<br>(1.10) | N/A          | N/A          | 52<br>(2.05) | 52<br>(2.05) | 52<br>(2.05) | 52<br>(2.05) | 128<br>(5.04) | 128<br>(5.04) | 128<br>(5.04) | 128<br>(5.04) |
|           | Y   | N/A                         | N/A          | 42<br>(1.65) | N/A          | N/A          | 54<br>(2.13) | 54<br>(2.13) | 54<br>(2.13) | 54<br>(2.13) | 92<br>(3.62)  | 92<br>(3.62)  | 92<br>(3.62)  | 92<br>(3.62)  |
| 100       | M   | N/A                         | N/A          | 48<br>(1.89) | N/A          | N/A          | 72<br>(2.83) | 72<br>(2.83) | 72<br>(2.83) | 72<br>(2.83) | 148<br>(5.83) | 148<br>(5.83) | 148<br>(5.83) | 148<br>(5.83) |
|           | Y   | N/A                         | N/A          | 35<br>(1.38) | N/A          | N/A          | 47<br>(1.85) | 47<br>(1.85) | 47<br>(1.85) | 47<br>(1.85) | 85<br>(3.35)  | 85<br>(3.35)  | 85<br>(3.35)  | 85<br>(3.35)  |

**B**  
**Guided Cylinders**  
**Actuator Products**  
**P5T**  
**Series**  
**P5T2**  
**Series**  
**P5L**  
**Series**  
**HB**  
**Series**  
**P5E**  
**Series**

**Rod Lock (R)**

P5T2 Series units in 32mm - 100mm bore sizes are available with an integral rod lock mechanism.

The powerful rod lock device is air/spring activated and enables the piston rod to be locked in any position. In the absence of air signal pressure, full holding force is applied to the piston rod. When an air signal pressure of 60 PSI (4 Bar) is applied, the locking device is released. Exhaust air can be piped away when a contaminant-free environment is required.

- Applications:**
- Vertical guided cylinders
  - In the event of pressure loss
  - In the event of electrical control failure

**Design tip:** The piston rod should not be moving when the locking device is activated. The locking device is not intended to repeatedly brake movement. See sample pneumatic circuit.

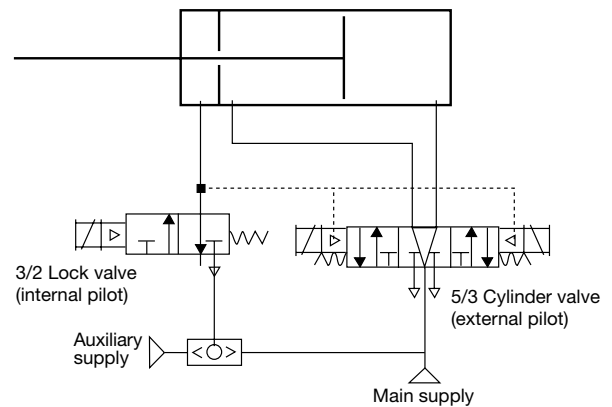
**Technical Data**

Maximum Pressure: 145 PSI (10 Bar)  
 Pressure Required to Unlock: 60 PSI (4 Bar)

| Bore size (mm) | Holding force @7 bar (102 PSI) |      |
|----------------|--------------------------------|------|
|                | lb                             | N    |
| 32             | 123                            | 550  |
| 40             | 193                            | 860  |
| 50             | 303                            | 1345 |
| 63             | 481                            | 2140 |
| 80             | 755                            | 3450 |
| 100            | 1211                           | 5390 |

**Rod Lock Circuit**

Lock valve must be maintained energized during cylinder motion, otherwise rod lock is engaged and cylinder valve shifts to mid position. For manual override of the rod lock, insert a shuttle valve and an auxiliary air supply to disable rod lock.



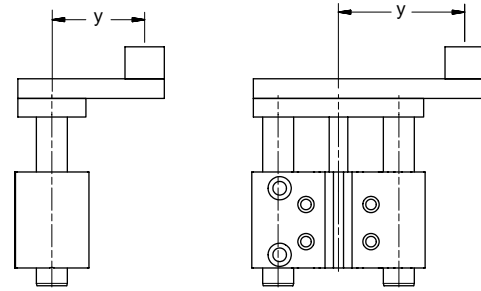


**Vertical Eccentric Load Capacity**

P5T2 Series units mounted vertically will have the same eccentric load capacity regardless of orientation. The graphs provide maximum load capacity for an eccentric mounted load. The load is assumed to be mounted at the face of the tool plate.

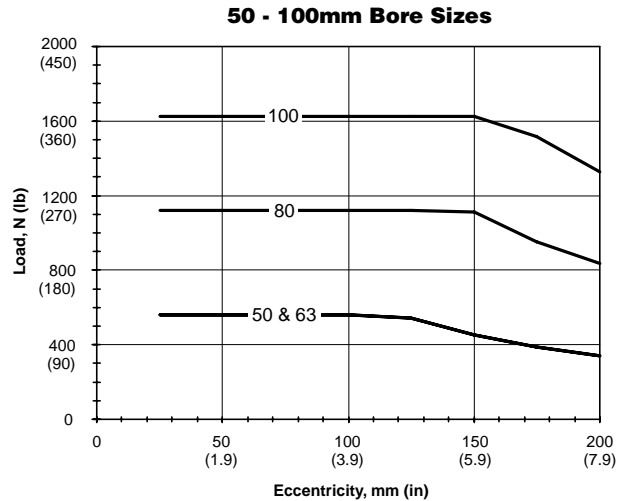
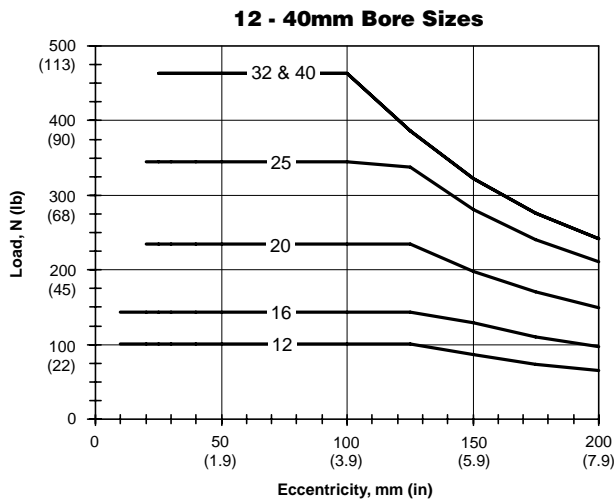
These load curves illustrate load ratings based on the bearing system of the product. Load rating is a key selection criterion but is not the only one to consider in the selection of a product.

**EXAMPLE:** A P5T2-050 unit will lift up to a 90-lb load, offset 170mm from actuator centerline.

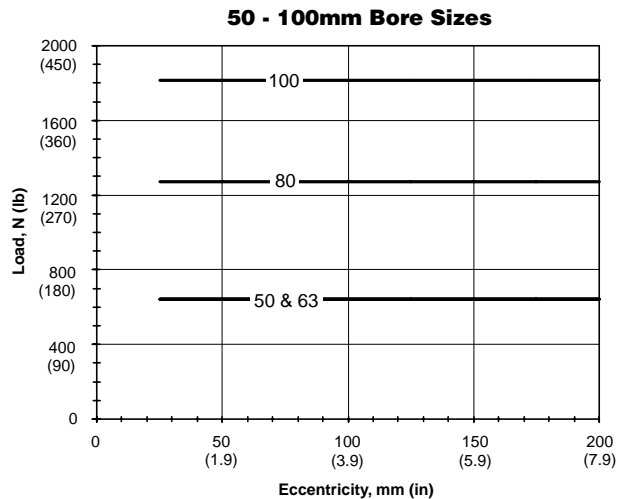
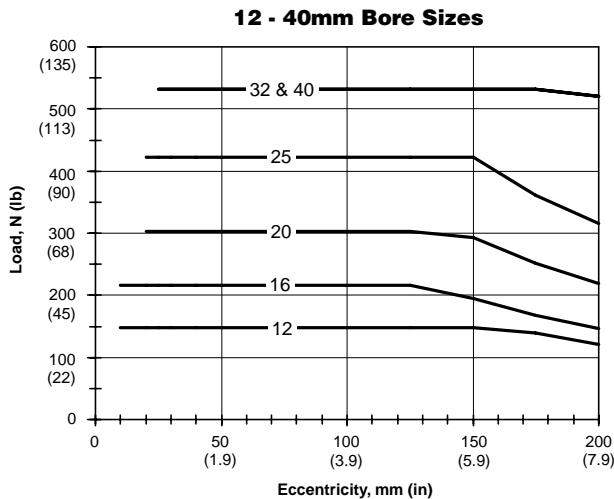


y = distance from the center of gravity of the moveable load to the center of the actuator.

**Standard unit**



**High load bearings**



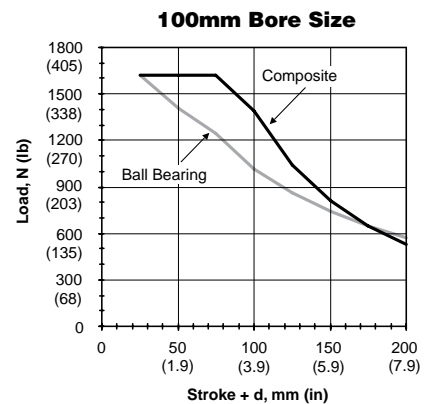
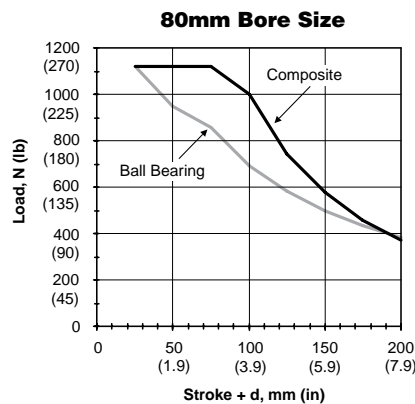
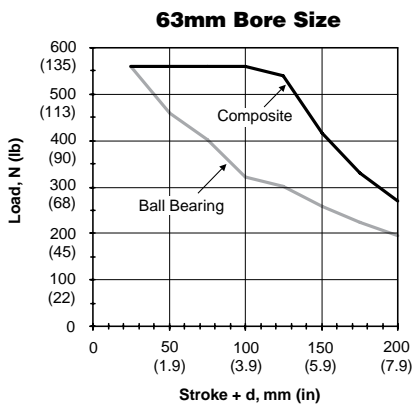
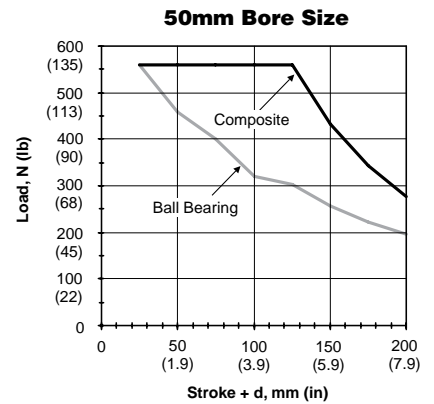
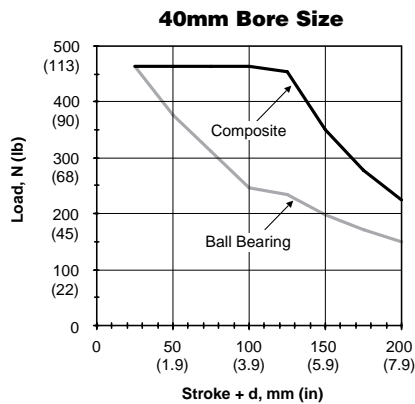
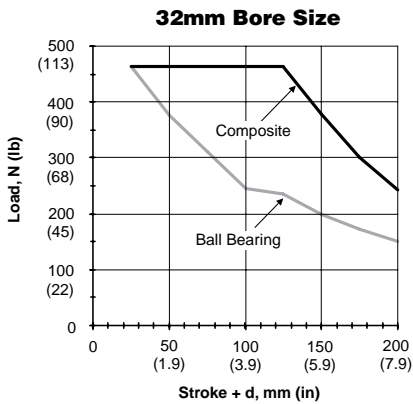
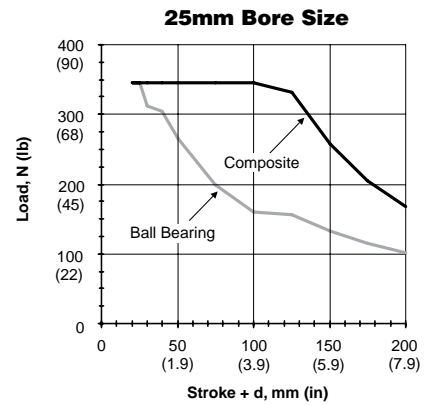
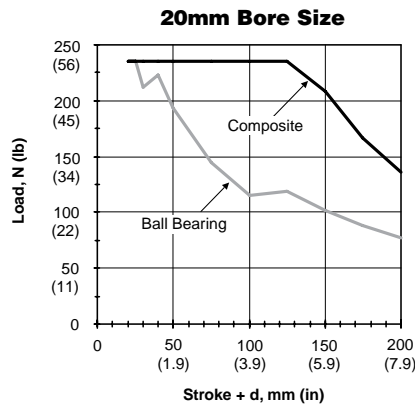
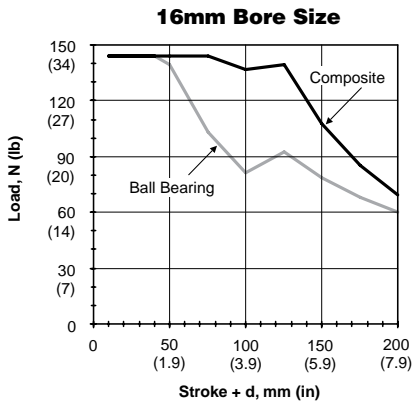
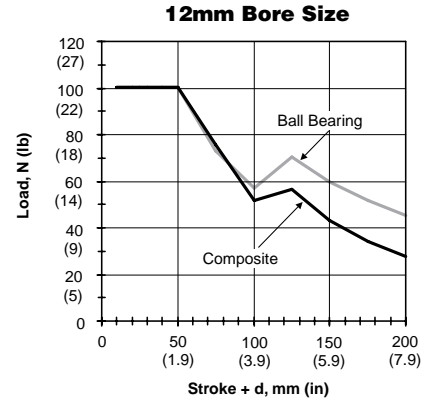
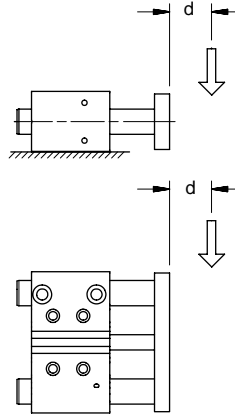
|             |                                       |
|-------------|---------------------------------------|
| <b>B</b>    | Guided Cylinders<br>Actuator Products |
|             | P5T Series                            |
| P5T2 Series |                                       |
| P5L Series  |                                       |
| HB Series   |                                       |
| P5E Series  |                                       |

**Horizontal Load Capacity with Standard Bearings (J1, J3, H3)**

P5T2 Series units will have the same load capacity regardless of orientation. The graphs below show maximum load capacity based on a unit life of 10 million cycles.

These load curves illustrate load ratings based on the bearing system of the product. Load rating is a key selection criterion but is not the only one to consider in the selection of a product.

**EXAMPLE:** A P5T2-016 with “stroke + d” of 100mm and linear ball bearings would have a load capacity of 80 N. The capacity would be 135 N with composite bushings.



|        |                   |
|--------|-------------------|
| B      | Guided Cylinders  |
|        | Actuator Products |
| Series | P5T               |
|        | P5T2              |
| Series | P5L               |
|        | HB                |
| Series | P5E               |



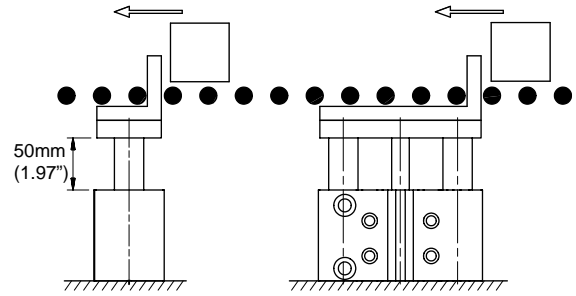
**Load Stopping Capacity**

P5T2 Series actuators are ideal for conveyor stopping applications. Units can be mounted horizontally or vertically. These load curves illustrate load ratings based on the bearing system of the product. Load rating is a key selection criterion but is not the only one to consider in the selection of a product.

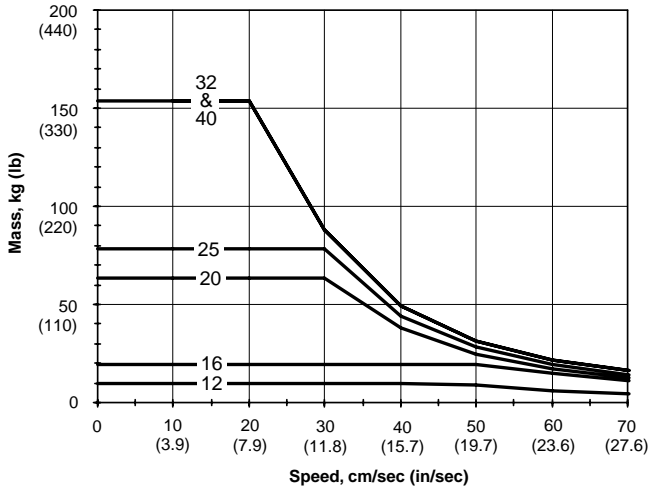
**Composite bushings are strongly recommended for this type of application.**

**EXAMPLE:** A P5T2-032 unit with a stroke up to 50mm will stop an object moving at 40 cm/second (15.7 in/s) that weighs up to 50 kg (110 lb).

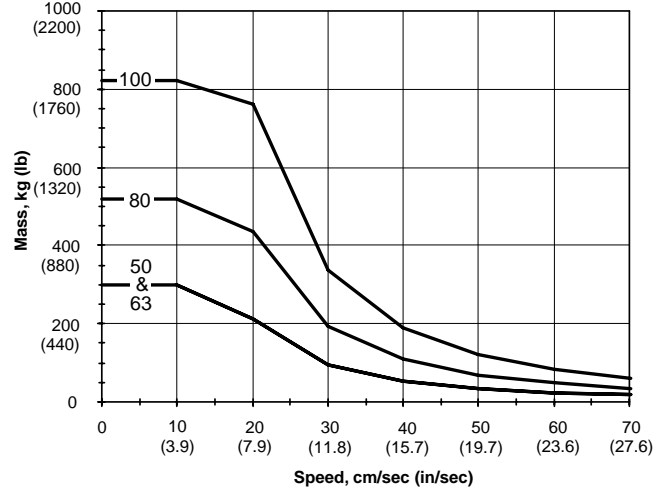
**Note:** The following graphs are based on 50mm of stroke.



**12 - 40mm Bore Sizes**



**50 - 100mm Bore Sizes**



**B**

Guided Cylinders  
 Actuator Products

P5T Series

P5T2 Series

P5L Series

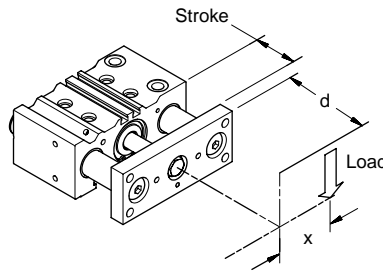
HB Series

P5E Series

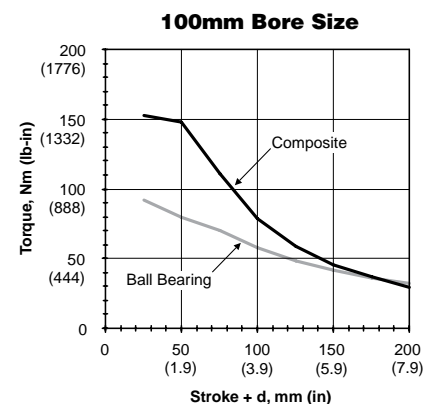
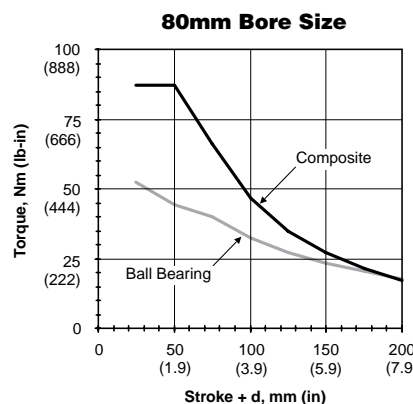
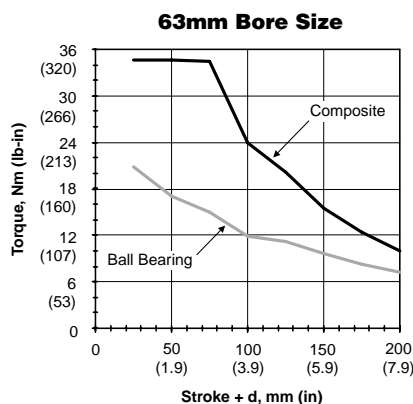
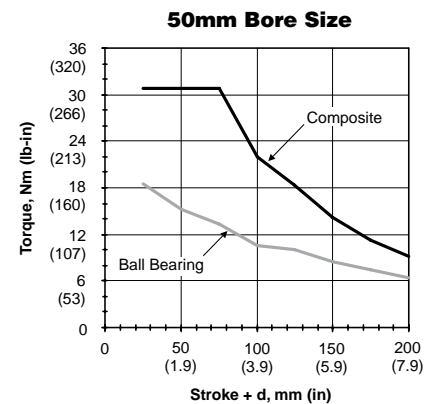
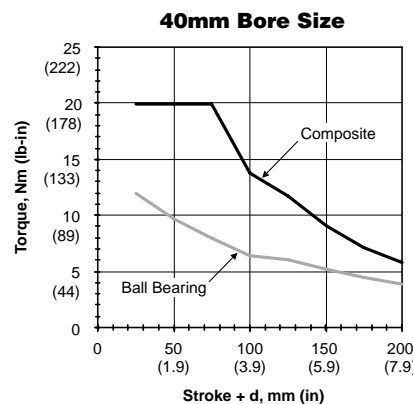
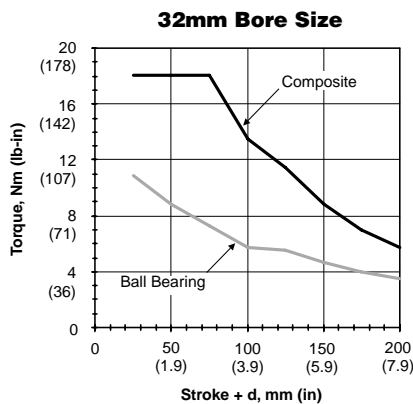
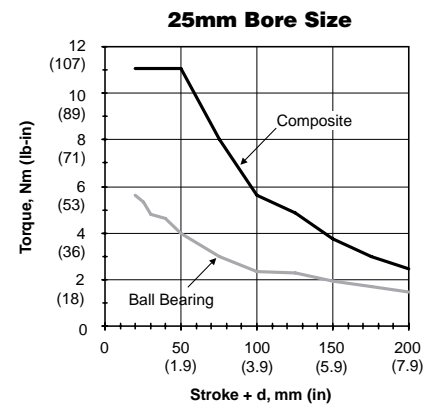
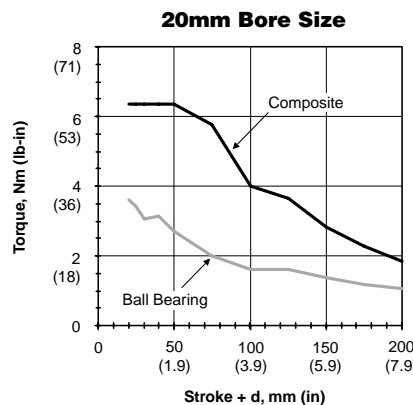
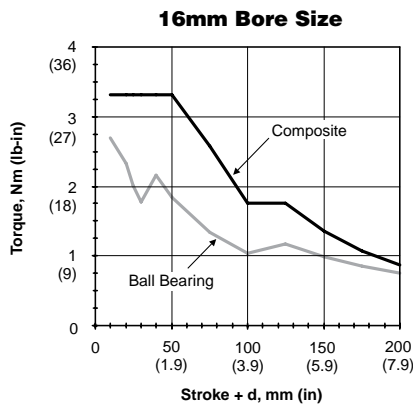
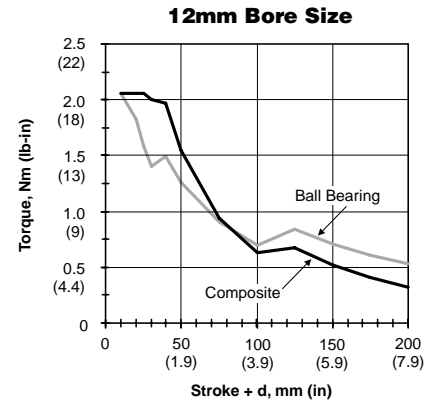
**Asymmetrical Torque Capacity with Standard Bearings (J1, J3, H3)**

Asymmetrical loading occurs when the load is applied to one side of the unit. P5T2 Series units can resist torsional loads that are asymmetrical up to the charted lines.

**EXAMPLE:** A mechanism exerts an asymmetrical load of 15 Nm on a unit with 50mm "stroke+d". The P5T2-050 with composite bushings will have adequate torsional capacity.



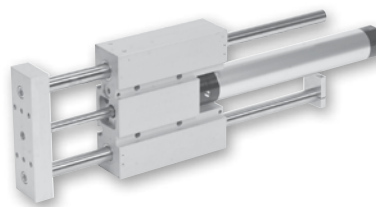
Torque is calculated by multiplying the distance 'x' by the load. The torque will be either Nm or lb-in.



|          |                   |
|----------|-------------------|
| <b>B</b> | Guided Cylinders  |
|          | Actuator Products |
| Series   | P5T               |
| Series   | P5T2              |
| Series   | P5L               |
| Series   | HB                |
| Series   | P5E               |



- 3 body styles (Thrust, Reach, Base)
- 8 bore sizes 20mm to 100mm
- Maximum strokes 400 to 1000mm depending on model
- 3 Bearing options: composite, ball bearing, self-aligning ball bearing
- Dowel holes standard on body and tool plate
- Available with adjustable stroke and shock absorbers
- Direct mount of thrust and reach to same size base
- Powered by P1L cylinder



**Operating information**

Operating pressure: 10 bar (145 PSIG)  
 Temperature range:  
     Standard seals -17°C to 74°C (0°F to 165°F)  
     Fluorocarbon seals\* -17°C to 121°C (0°F to 250°F) \*  
     See fluorocarbon seal option for high temperature applications.  
 Operating characteristics: Double acting  
 Filtration requirements: 40 micron, dry filtered air  
 For technical information see CD

**Ordering information**

**P5L - R L 100 J1 A A N F N - 0900 - A**

|                      |              |                  |       |                       |                                 |  |  |                      |                |
|----------------------|--------------|------------------|-------|-----------------------|---------------------------------|--|--|----------------------|----------------|
| <b>Series</b>        |              | <b>Bore size</b> |       | <b>Cylinder seals</b> |                                 | <b>Stroke length</b>   |  | <b>Design series</b> |                |
| T                    | Thrust slide | 020              | 20mm  | N                     | Nitrile (standard)              | -  | Order in 1mm increments.   | A                    | Current design |
| R                    | Reach slide  | 025              | 25mm  | V                     | Fluorocarbon (high temperature) | A**  | Machined T-slots (Sizes 50-100)  |                      |                |
| B                    | Base slide   | 032              | 32mm  |                       |                                 |  |  |                      |                |
| <b>Cylinder type</b> |              | 040              | 40mm  |                       |                                 | <b>T-slots</b>   |  |                      |                |
| L                    | P1L cylinder | 050              | 50mm  |                       |                                 | -  | Standard (Extruded T-slots on sizes 20-40, no T-slots on sizes 50-100) |                      |                |
|                      |              | 063              | 63mm  |                       |                                 | A**  | Machined T-slots (Sizes 50-100)  |                      |                |
|                      |              | 080              | 80mm  |                       |                                 | ** Not available on sizes 20-40  |  |                      |                |
|                      |              | 100              | 100mm |                       |                                 | <b>Proximity sensor options†</b>   |  |                      |                |
|                      |              |                  |       |                       |                                 | N  | No Sensor  |                      |                |
|                      |              |                  |       |                       |                                 | P  | PNP, lead type   |                      |                |
|                      |              |                  |       |                       |                                 | R  | NPN, lead type   |                      |                |
|                      |              |                  |       |                       |                                 | S  | PNP, plug in type  |                      |                |
|                      |              |                  |       |                       |                                 | T  | NPN, plug in type  |                      |                |
|                      |              |                  |       |                       |                                 | W  | Prox ready, 8mm (no sensor supplied)                                   |                      |                |
|                      |              |                  |       |                       |                                 | Z  | Prox ready, 12mm (no sensor supplied)                                  |                      |                |
|                      |              |                  |       |                       |                                 | † Note: Piston magnet is standard on all cylinders. Inductive proximity sensors are included with Options P, R, S & T. |  |                      |                |
|                      |              |                  |       |                       |                                 | <b>Cylinder port style</b>   |  |                      |                |
|                      |              |                  |       |                       |                                 | G  | BSPT ports   |                      |                |
|                      |              |                  |       |                       |                                 | H  | NPTF ports   |                      |                |
|                      |              |                  |       |                       |                                 | P  | BSPT ports w/ Presto-lok flow controls (mm)                            |                      |                |
|                      |              |                  |       |                       |                                 | F  | NPTF ports w/ Presto-lok flow controls (inch)                          |                      |                |
|                      |              |                  |       |                       |                                 | B  | BSPT ports w/ flow controls  |                      |                |
|                      |              |                  |       |                       |                                 | N  | NPTF ports w/ flow controls  |                      |                |

|                 |   |
|-----------------|---|
| <b>Bushings</b> |   |
| J1              | Composite bushing, chrome plated shafts                               |
| J2              | Composite bushing, oversized chrome plated shafts                     |
| J3              | Composite bushing, stainless steel shafts                             |
| J4              | Composite bushing, oversized stainless steel shafts                   |
| G1              | Composite bushing, chrome plated shafts, contaminant tolerant seals   |
| G3              | Composite bushing, stainless steel shafts, contaminant tolerant seals |
| H3              | Linear ball bearings, stainless steel shafts                          |
| H5              | Linear ball bearings, carbon steel shafts                             |
| S3*             | Self aligning linear ball bearings, stainless steel shafts            |
| S5*             | Self aligning linear ball bearings, carbon steel shafts               |

\* Not available 20mm bore models

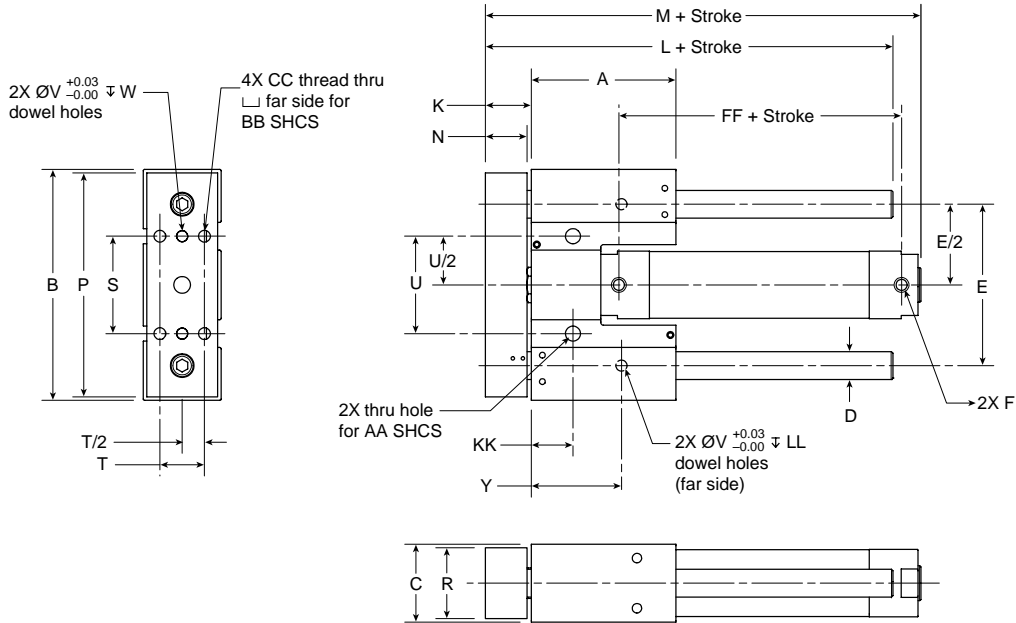
|                       |  |                        |  |
|-----------------------|--|------------------------|--|
| <b>Extend options</b> |  | <b>Retract options</b> |  |
| N                     | None   | N                      | None   |
| A                     | Shock/stroke adjusters                           | A                      | Shock/stroke adjusters                           |
| B                     | Bumpers (base slides only)                       | B                      | Bumpers only                                     |
| C                     | Cushions both ends                               | C                      | Cushions both ends                               |
| E                     | Micro-adjusters and cushions (both ends only)    | E                      | Micro-adjusters and cushions (both ends only)    |
| H                     | Cushions and bumpers (includes options C & K)    | H                      | Cushions and bumpers (includes options C & K)    |
| K                     | Bumpers and adjustable stop collars              | K                      | Bumpers and adjustable stop collars              |
| L                     | Shock absorbers and bumpers (N/A on base slides) | L                      | Shock absorbers and bumpers (N/A on base slides) |

Order P8S Series reed and solid state sensors separately from Electronic Sensors Section.

**Sensors**  
 For sensors see page B294.

**B**  
 Guided Cylinders  
 Actuator Products  
 P5T Series  
 P5T2 Series  
 P5L Series  
 HB Series  
 P5E Series

**Thrust Slides**



Dimensions in mm (inch)

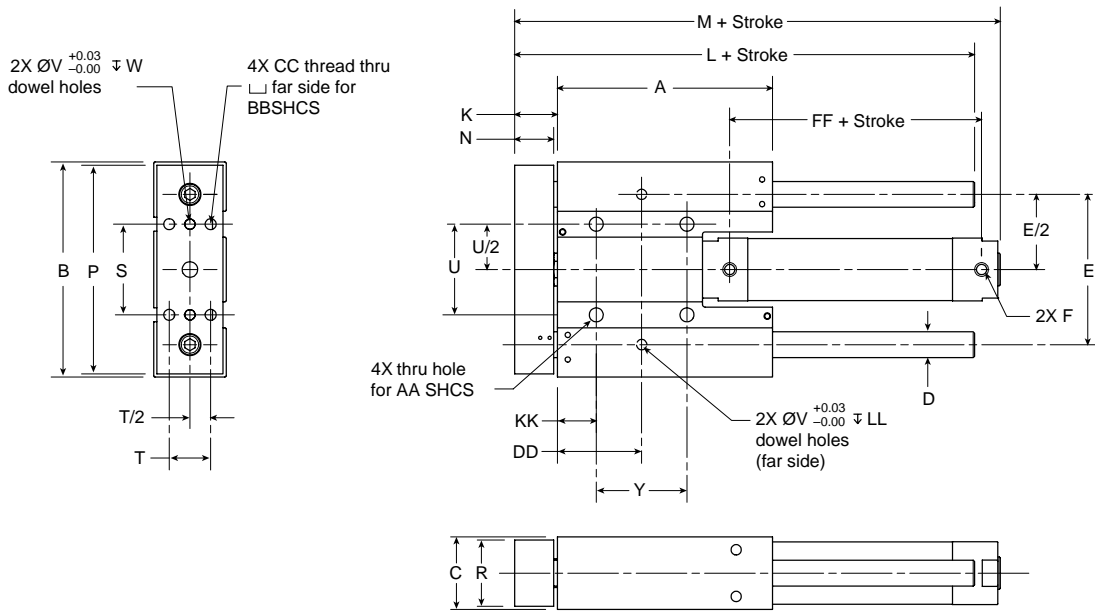
| Bore size | A            | B             | C            | Ds*         | Do*         | E             | F**  | K           | L             | M             | N           | P             | R            |
|-----------|--------------|---------------|--------------|-------------|-------------|---------------|------|-------------|---------------|---------------|-------------|---------------|--------------|
| 20        | 60<br>(2.4)  | 98<br>(3.9)   | 30<br>(1.2)  | 10<br>(0.4) | 12<br>(0.5) | 68<br>(2.7)   | 1/8† | 20<br>(0.8) | 86<br>(3.4)   | 114<br>(4.5)  | 17<br>(0.7) | 96<br>(3.8)   | 26<br>(1.0)  |
| 25        | 76<br>(3.0)  | 122<br>(4.8)  | 38<br>(1.5)  | 12<br>(0.5) | 16<br>(0.6) | 84<br>(3.3)   | 1/8† | 25<br>(1.0) | 107<br>(4.2)  | 126<br>(5.0)  | 22<br>(0.9) | 119<br>(4.7)  | 33<br>(1.3)  |
| 32        | 84<br>(3.3)  | 140<br>(5.5)  | 44<br>(1.7)  | 16<br>(0.6) | 20<br>(0.8) | 92<br>(3.6)   | 1/8  | 27<br>(1.1) | 117<br>(4.6)  | 140<br>(5.5)  | 24<br>(0.9) | 137<br>(5.4)  | 39<br>(1.5)  |
| 40        | 104<br>(4.1) | 166<br>(6.5)  | 56<br>(2.2)  | 20<br>(0.8) | 25<br>(1.0) | 116<br>(4.6)  | 1/8  | 33<br>(1.3) | 143<br>(5.6)  | 163<br>(6.4)  | 30<br>(1.2) | 161<br>(6.3)  | 51<br>(2.0)  |
| 50        | 130<br>(5.1) | 216<br>(8.5)  | 70<br>(2.8)  | 25<br>(1.0) | 30<br>(1.2) | 148<br>(5.8)  | 1/4  | 39<br>(1.5) | 175<br>(6.9)  | 195<br>(7.7)  | 36<br>(1.4) | 211<br>(8.3)  | 63<br>(2.5)  |
| 63        | 152<br>(6.0) | 260<br>(10.2) | 84<br>(3.3)  | 30<br>(1.2) | 40<br>(1.6) | 176<br>(6.9)  | 1/4  | 43<br>(1.7) | 203<br>(8.0)  | 219<br>(8.6)  | 40<br>(1.6) | 255<br>(10.0) | 77<br>(3.0)  |
| 80        | 180<br>(7.1) | 320<br>(12.6) | 102<br>(4.0) | 40<br>(1.6) | 50<br>(2.0) | 220<br>(8.7)  | 3/8  | 49<br>(1.9) | 237<br>(9.3)  | 249<br>(9.8)  | 46<br>(1.8) | 315<br>(12.4) | 95<br>(3.7)  |
| 100       | 222<br>(8.7) | 390<br>(15.4) | 120<br>(4.7) | 50<br>(2.0) | 60<br>(2.4) | 260<br>(10.2) | 1/2  | 59<br>(2.3) | 289<br>(11.4) | 306<br>(12.0) | 56<br>(2.2) | 383<br>(15.1) | 111<br>(4.4) |

| Bore size | S            | T           | U            | V              | W           | Y            | AA  | BB  | CC       | FF          | KK          | LL          |
|-----------|--------------|-------------|--------------|----------------|-------------|--------------|-----|-----|----------|-------------|-------------|-------------|
| 20        | 40<br>(1.6)  | 16<br>(0.6) | 40<br>(1.6)  | 4.03<br>(0.2)  | 4<br>(0.2)  | 36<br>(1.4)  | M5  | M4  | M5x0.8   | 45<br>(1.8) | 16<br>(0.6) | 4<br>(0.2)  |
| 25        | 48<br>(1.9)  | 20<br>(0.8) | 48<br>(1.9)  | 5.03<br>(0.2)  | 5<br>(0.2)  | 46<br>(1.8)  | M6  | M5  | M6x1.0   | 46<br>(1.8) | 22<br>(0.9) | 5<br>(0.2)  |
| 32        | 50<br>(2.0)  | 24<br>(0.9) | 50<br>(2.0)  | 6.03<br>(0.2)  | 6<br>(0.2)  | 53<br>(2.1)  | M8  | M6  | M8x1.25  | 43<br>(1.7) | 28<br>(1.1) | 6<br>(0.2)  |
| 40        | 70<br>(2.8)  | 32<br>(1.3) | 70<br>(2.8)  | 8.03<br>(0.3)  | 8<br>(0.3)  | 65<br>(2.6)  | M10 | M8  | M10x1.5  | 49<br>(1.9) | 30<br>(1.2) | 8<br>(0.3)  |
| 50        | 80<br>(3.1)  | 42<br>(1.7) | 80<br>(3.1)  | 8.03<br>(0.3)  | 8<br>(0.3)  | 83<br>(3.3)  | M10 | M8  | M10x1.5  | 53<br>(2.1) | 43<br>(1.7) | 8<br>(0.3)  |
| 63        | 100<br>(3.9) | 52<br>(2.0) | 100<br>(3.9) | 10.03<br>(0.4) | 10<br>(0.4) | 101<br>(4.0) | M12 | M10 | M12x1.75 | 52<br>(2.0) | 51<br>(2.0) | 10<br>(0.4) |
| 80        | 124<br>(4.9) | 62<br>(2.4) | 124<br>(4.9) | 12.03<br>(0.5) | 12<br>(0.5) | 127<br>(5.0) | M16 | M14 | M16x1.5  | 64<br>(2.5) | 65<br>(2.6) | 12<br>(0.5) |
| 100       | 148<br>(5.8) | 72<br>(2.8) | 148<br>(5.8) | 12.03<br>(0.5) | 12<br>(0.5) | 154<br>(6.1) | M20 | M16 | M20x2.5  | 66<br>(2.6) | 80<br>(3.1) | 12<br>(0.5) |

\* s = standard, o = oversized      \*\* NPTF or BSPT      † w/cushions M5/10-32



**Reach Slides**



Dimensions in mm (inch)

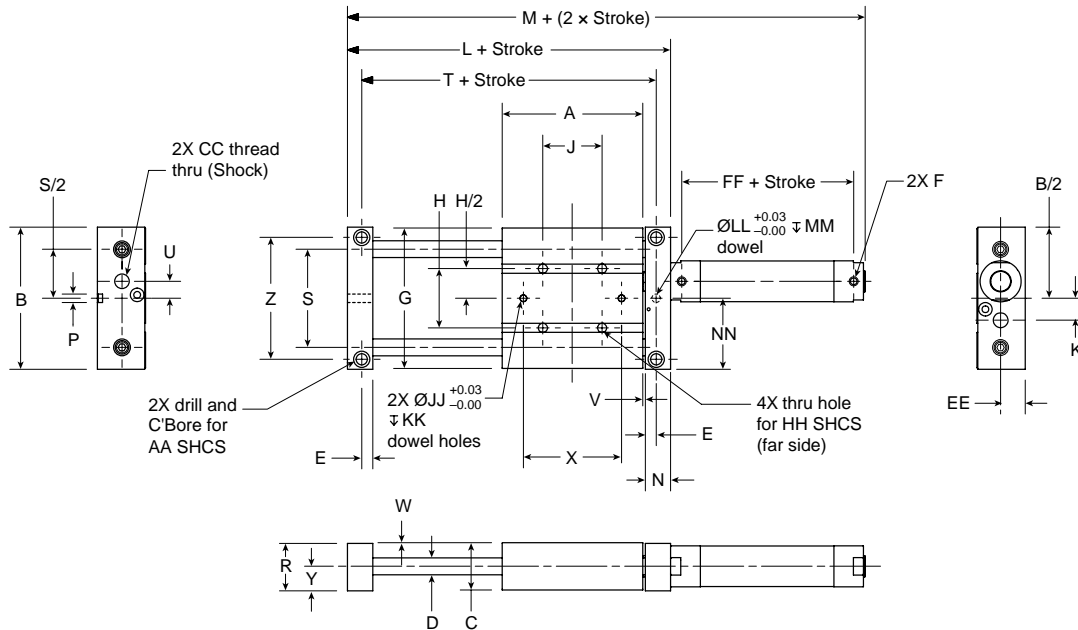
| Bore size | A             | B             | C            | Ds*         | Do*         | E             | F**  | K           | L             | M             | N           | P             | R            |
|-----------|---------------|---------------|--------------|-------------|-------------|---------------|------|-------------|---------------|---------------|-------------|---------------|--------------|
| 20        | 98<br>(3.9)   | 98<br>(3.9)   | 30<br>(1.2)  | 10<br>(0.4) | 12<br>(0.5) | 68<br>(2.7)   | 1/8† | 20<br>(0.8) | 124<br>(4.9)  | 152<br>(6.0)  | 17<br>(0.7) | 96<br>(3.8)   | 26<br>(1.0)  |
| 25        | 122<br>(4.8)  | 122<br>(4.8)  | 38<br>(1.5)  | 12<br>(0.5) | 16<br>(0.6) | 84<br>(3.3)   | 1/8† | 25<br>(1.0) | 153<br>(6.0)  | 172<br>(6.8)  | 22<br>(0.9) | 119<br>(4.7)  | 33<br>(1.3)  |
| 32        | 140<br>(5.5)  | 140<br>(5.5)  | 44<br>(1.7)  | 16<br>(0.6) | 20<br>(0.8) | 92<br>(3.6)   | 1/8  | 27<br>(1.1) | 173<br>(6.8)  | 196<br>(7.7)  | 24<br>(0.9) | 137<br>(5.4)  | 39<br>(1.5)  |
| 40        | 166<br>(6.5)  | 166<br>(6.5)  | 56<br>(2.2)  | 20<br>(0.8) | 25<br>(1.0) | 116<br>(4.6)  | 1/8  | 33<br>(1.3) | 205<br>(8.1)  | 225<br>(8.9)  | 30<br>(1.2) | 161<br>(6.3)  | 51<br>(2.0)  |
| 50        | 216<br>(8.5)  | 216<br>(8.5)  | 70<br>(2.8)  | 25<br>(1.0) | 30<br>(1.2) | 148<br>(5.8)  | 1/4  | 39<br>(1.5) | 261<br>(10.3) | 281<br>(11.1) | 36<br>(1.4) | 211<br>(8.3)  | 63<br>(2.5)  |
| 63        | 260<br>(10.2) | 260<br>(10.2) | 84<br>(3.3)  | 30<br>(1.2) | 40<br>(1.6) | 176<br>(6.9)  | 1/4  | 43<br>(1.7) | 311<br>(12.2) | 327<br>(12.9) | 40<br>(1.6) | 255<br>(10.0) | 77<br>(3.0)  |
| 80        | 320<br>(12.6) | 320<br>(12.6) | 102<br>(4.0) | 40<br>(1.6) | 50<br>(2.0) | 220<br>(8.7)  | 3/8  | 49<br>(1.9) | 377<br>(14.8) | 389<br>(15.3) | 46<br>(1.8) | 315<br>(12.4) | 9<br>(3.7)   |
| 100       | 390<br>(15.4) | 390<br>(15.4) | 120<br>(4.7) | 50<br>(2.0) | 60<br>(2.4) | 260<br>(10.2) | 1/2  | 59<br>(2.3) | 457<br>(18.0) | 474<br>(18.7) | 56<br>(2.2) | 383<br>(15.1) | 111<br>(4.4) |

| Bore size | S            | T           | U            | V              | W           | Y            | AA  | BB  | CC       | DD           | FF          | KK          | LL          |
|-----------|--------------|-------------|--------------|----------------|-------------|--------------|-----|-----|----------|--------------|-------------|-------------|-------------|
| 20        | 40<br>(1.6)  | 16<br>(0.6) | 40<br>(1.6)  | 4.03<br>(0.2)  | 4<br>(0.2)  | 40<br>(1.6)  | M5  | M4  | M5X0.8   | 36<br>(1.4)  | 45<br>(1.8) | 16<br>(0.6) | 4<br>(0.2)  |
| 25        | 48<br>(1.9)  | 20<br>(0.8) | 48<br>(1.9)  | 5.03<br>(0.2)  | 5<br>(0.2)  | 48<br>(1.9)  | M6  | M5  | M6X1.0   | 46<br>(1.8)  | 46<br>(1.8) | 22<br>(0.9) | 5<br>(0.2)  |
| 32        | 50<br>(2.0)  | 24<br>(0.9) | 50<br>(2.0)  | 6.03<br>(0.2)  | 6<br>(0.2)  | 50<br>(2.0)  | M8  | M6  | M8X1.25  | 53<br>(2.1)  | 43<br>(1.7) | 28<br>(1.1) | 6<br>(0.2)  |
| 40        | 70<br>(2.8)  | 32<br>(1.3) | 70<br>(2.8)  | 8.03<br>(0.3)  | 8<br>(0.3)  | 70<br>(2.8)  | M10 | M8  | M10X1.5  | 65<br>(2.6)  | 49<br>(1.9) | 30<br>(1.2) | 8<br>(0.3)  |
| 50        | 80<br>(3.1)  | 42<br>(1.7) | 80<br>(3.1)  | 8.03<br>(0.3)  | 8<br>(0.3)  | 80<br>(3.1)  | M10 | M8  | M10X1.5  | 83<br>(3.3)  | 53<br>(2.1) | 43<br>(1.7) | 8<br>(0.3)  |
| 63        | 100<br>(3.9) | 52<br>(2.0) | 100<br>(3.9) | 10.03<br>(0.4) | 10<br>(0.4) | 100<br>(3.9) | M12 | M10 | M12X1.75 | 101<br>(4.0) | 52<br>(2.0) | 51<br>(2.0) | 10<br>(0.4) |
| 80        | 124<br>(4.9) | 62<br>(2.4) | 124<br>(4.9) | 12.03<br>(0.5) | 12<br>(0.5) | 124<br>(4.9) | M16 | M14 | M16X1.5  | 127<br>(5.0) | 64<br>(2.5) | 65<br>(2.6) | 12<br>(0.5) |
| 100       | 148<br>(5.8) | 72<br>(2.8) | 148<br>(5.8) | 12.03<br>(0.5) | 12<br>(0.5) | 148<br>(5.8) | M20 | M16 | M20X2.5  | 154<br>(6.1) | 66<br>(2.6) | 80<br>(3.1) | 12<br>(0.5) |

\* s = standard, o = oversized      \*\* NPTF or BSPT      † w/cushions M5/10-32



**Base Slides**



Dimensions in mm (inch)

| Bore size | A             | B             | C            | Ds*         | Do*         | E           | F**  | G             | H            | J            | K           | L             | M             | N           | P+.03          | R            | S             |
|-----------|---------------|---------------|--------------|-------------|-------------|-------------|------|---------------|--------------|--------------|-------------|---------------|---------------|-------------|----------------|--------------|---------------|
| 20        | 98<br>(3.9)   | 100<br>(3.9)  | 30<br>(1.2)  | 10<br>(0.4) | 12<br>(0.5) | 8<br>(0.3)  | 1/8† | 98<br>(3.9)   | 40<br>(1.6)  | 40<br>(1.6)  | 18<br>(0.7) | 140<br>(5.5)  | 211<br>(8.3)  | 18<br>(0.7) | 5.03<br>(0.2)  | 30<br>(1.2)  | 68<br>(2.7)   |
| 25        | 122<br>(4.8)  | 124<br>(4.9)  | 38<br>(1.5)  | 12<br>(0.5) | 16<br>(0.6) | 14<br>(0.6) | 1/8† | 122<br>(4.8)  | 48<br>(1.9)  | 48<br>(1.9)  | 22<br>(0.9) | 176<br>(6.9)  | 247<br>(9.7)  | 24<br>(0.9) | 6.03<br>(0.2)  | 38<br>(1.5)  | 84<br>(3.3)   |
| 32        | 140<br>(5.5)  | 142<br>(5.6)  | 44<br>(1.7)  | 16<br>(0.6) | 20<br>(0.8) | 12<br>(0.5) | 1/8  | 140<br>(5.5)  | 50<br>(2.0)  | 50<br>(2.0)  | 22<br>(0.9) | 198<br>(7.8)  | 271<br>(10.7) | 26<br>(1.0) | 6.03<br>(0.2)  | 44<br>(1.7)  | 92<br>(3.6)   |
| 40        | 166<br>(6.5)  | 168<br>(6.6)  | 56<br>(2.2)  | 20<br>(0.8) | 25<br>(1.0) | 13<br>(0.5) | 1/8  | 166<br>(6.5)  | 70<br>(2.8)  | 70<br>(2.8)  | 26<br>(1.0) | 232<br>(9.1)  | 312<br>(12.3) | 30<br>(1.2) | 10.03<br>(0.4) | 56<br>(2.2)  | 116<br>(4.6)  |
| 50        | 216<br>(8.5)  | 218<br>(8.6)  | 70<br>(2.8)  | 25<br>(1.0) | 30<br>(1.2) | 16<br>(0.6) | 1/4  | 216<br>(8.5)  | 80<br>(3.1)  | 80<br>(3.1)  | 28<br>(1.1) | 292<br>(11.5) | 384<br>(15.1) | 35<br>(1.4) | 10.03<br>(0.4) | 70<br>(2.8)  | 148<br>(5.8)  |
| 63        | 260<br>(10.2) | 262<br>(10.3) | 84<br>(3.3)  | 30<br>(1.2) | 40<br>(1.6) | 19<br>(0.7) | 1/4  | 260<br>(10.2) | 100<br>(3.9) | 100<br>(3.9) | 42<br>(1.7) | 350<br>(13.8) | 442<br>(17.4) | 42<br>(1.7) | 12.03<br>(0.5) | 84<br>(3.3)  | 176<br>(6.9)  |
| 80        | 320<br>(12.6) | 322<br>(12.7) | 102<br>(4.0) | 40<br>(1.6) | 50<br>(2.0) | 24<br>(0.9) | 3/8  | 320<br>(12.6) | 124<br>(4.9) | 124<br>(4.9) | 42<br>(1.7) | 434<br>(17.1) | 545<br>(21.5) | 54<br>(2.1) | 16.03<br>(0.6) | 102<br>(4.0) | 220<br>(8.7)  |
| 100       | 390<br>(15.4) | 392<br>(15.4) | 120<br>(4.7) | 50<br>(2.0) | 60<br>(2.4) | 28<br>(1.1) | 1/2  | 390<br>(15.4) | 148<br>(5.8) | 148<br>(5.8) | 62<br>(2.4) | 528<br>(20.8) | 639<br>(25.2) | 66<br>(2.6) | 16.03<br>(0.6) | 120<br>(4.7) | 260<br>(10.2) |

| Bore size | T             | U           | V***       | W          | X             | Y           | Z             | AA  | CC  | EE          | FF          | HH  | JJ             | KK          | LL             | MM          | NN           |
|-----------|---------------|-------------|------------|------------|---------------|-------------|---------------|-----|-----|-------------|-------------|-----|----------------|-------------|----------------|-------------|--------------|
| 20        | 120<br>(4.7)  | 11<br>(0.4) | 3<br>(0.1) | 1<br>(0.0) | 68<br>(2.7)   | 14<br>(0.6) | 86<br>(3.4)   | M6  | M12 | 16<br>(0.6) | 45<br>(1.8) | M5  | 4.03<br>(0.2)  | 4<br>(0.2)  | 5.03<br>(0.2)  | 5<br>(0.2)  | 50<br>(2.0)  |
| 25        | 156<br>(6.1)  | 12<br>(0.5) | 3<br>(0.1) | 1<br>(0.0) | 84<br>(3.3)   | 18<br>(0.7) | 104<br>(4.1)  | M8  | M14 | 20<br>(0.8) | 46<br>(1.8) | M6  | 5.03<br>(0.2)  | 5<br>(0.2)  | 6.03<br>(0.2)  | 6<br>(0.2)  | 62<br>(2.4)  |
| 32        | 170<br>(6.7)  | 11<br>(0.4) | 3<br>(0.1) | 1<br>(0.0) | 92<br>(3.6)   | 21<br>(0.8) | 120<br>(4.7)  | M10 | M14 | 23<br>(0.9) | 43<br>(1.7) | M8  | 6.03<br>(0.2)  | 6<br>(0.2)  | 6.03<br>(0.2)  | 6<br>(0.2)  | 71<br>(2.8)  |
| 40        | 198<br>(7.8)  | 20<br>(0.8) | 3<br>(0.1) | 1<br>(0.0) | 116<br>(4.6)  | 27<br>(1.1) | 144<br>(5.7)  | M12 | M20 | 29<br>(1.1) | 49<br>(1.9) | M10 | 8.03<br>(0.3)  | 8<br>(0.3)  | 10.03<br>(0.4) | 10<br>(0.4) | 84<br>(3.3)  |
| 50        | 254<br>(10.0) | 22<br>(0.9) | 3<br>(0.1) | 1<br>(0.0) | 148<br>(5.8)  | 34<br>(1.3) | 188<br>(7.4)  | M16 | M25 | 36<br>(1.4) | 53<br>(2.1) | M10 | 8.03<br>(0.3)  | 8<br>(0.3)  | 10.03<br>(0.4) | 10<br>(0.4) | 109<br>(4.3) |
| 63        | 304<br>(12.0) | 30<br>(1.2) | 3<br>(0.1) | 1<br>(0.0) | 176<br>(6.9)  | 41<br>(1.6) | 224<br>(8.8)  | M20 | M25 | 43<br>(1.7) | 52<br>(2.0) | M12 | 10.03<br>(0.4) | 10<br>(0.4) | 12.03<br>(0.5) | 12<br>(0.5) | 131<br>(5.2) |
| 80        | 374<br>(14.7) | 36<br>(1.4) | 3<br>(0.1) | 1<br>(0.0) | 220<br>(8.7)  | 50<br>(2.0) | 276<br>(10.9) | M24 | M33 | 52<br>(2.0) | 64<br>(2.5) | M16 | 12.03<br>(0.5) | 12<br>(0.5) | 16.03<br>(0.6) | 16<br>(0.6) | 161<br>(6.3) |
| 100       | 452<br>(17.8) | 36<br>(1.4) | 3<br>(0.1) | 1<br>(0.0) | 260<br>(10.2) | 59<br>(2.3) | 336<br>(13.2) | M30 | M36 | 61<br>(2.4) | 66<br>(2.6) | M20 | 12.03<br>(0.5) | 12<br>(0.5) | 16.03<br>(0.6) | 16<br>(0.6) | 196<br>(7.7) |

\* s = standard, o = oversized      \*\* NPTF or BSPT      † w/cushions M5/10-32  
 \*\*\* Space between housing and end plate in both extend and retract positions.





**Horizontal Load Capacity & Deflection with Standard Shafting**

- Standard Composite w/ Chrome Plated or Stainless Steel Rods
- Recirculating Ball Bearings w/ Carbon or Stainless Steel Rods
- Self Aligning Ball Bearings w/ Carbon or Stainless Steel Rods

The graphs on the following two pages illustrate the maximum suggested side load at a given actuator stroke and distance (d) from the face of the tooling plate. The graphs include the weight of the support rods and tooling plate and are based on a bearing life of 10 million cycles under a dynamic loading condition. For an equivalent static load capacity multiply the information in these graphs by 1.5.

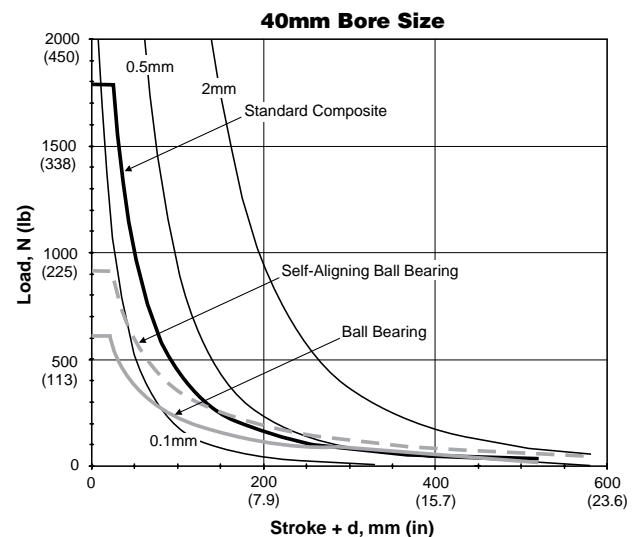
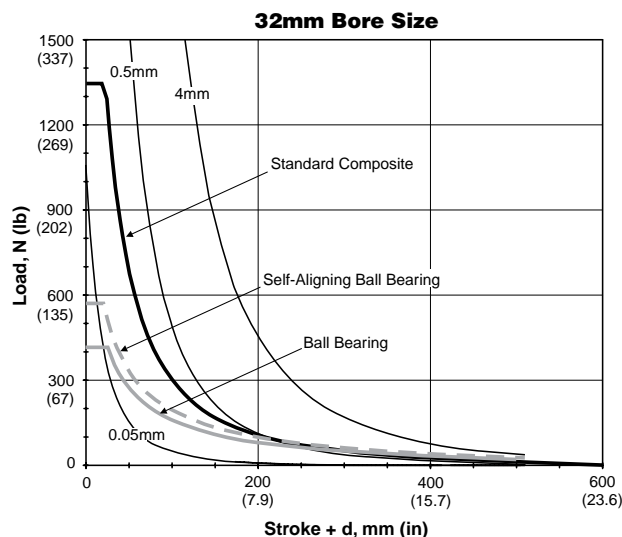
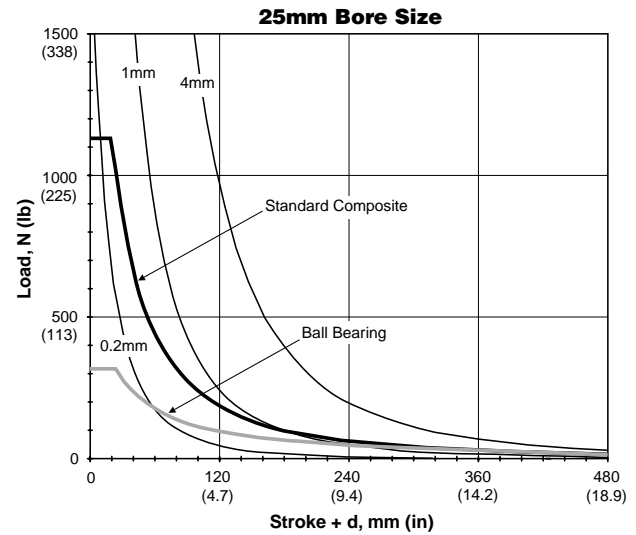
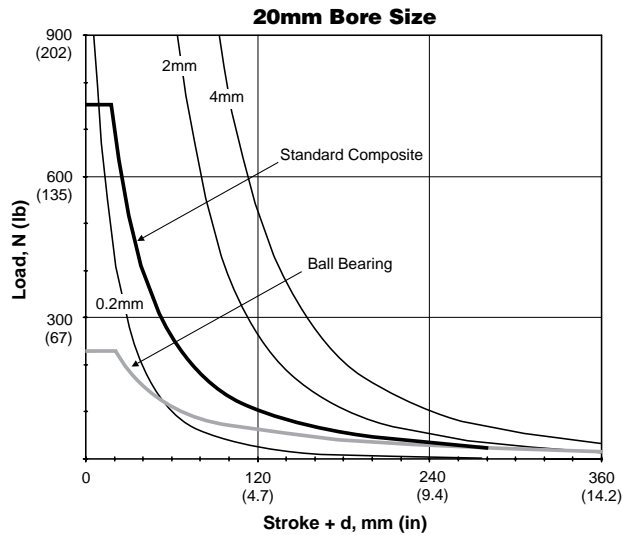
See the P5L options section of this catalog for more bearing selection information.

Dynamic loading is defined as a load which is affixed to the actuator tooling plate during the extend or retract motion of the actuator. Capacities are based on bearing and shafts only. Mounting bolts/hardware should be investigated per customer application.

**Note:** The following variables commonly affect the bearing life of a guided cylinder:

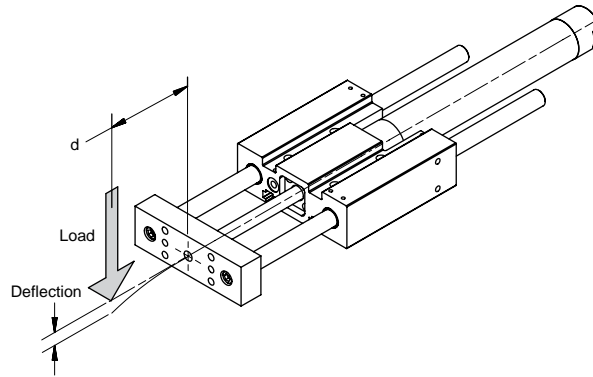
- Velocity
- Vibration
- Orientation
- Environment (Dust, moisture, etc.)

**P5L Thrust Slides**



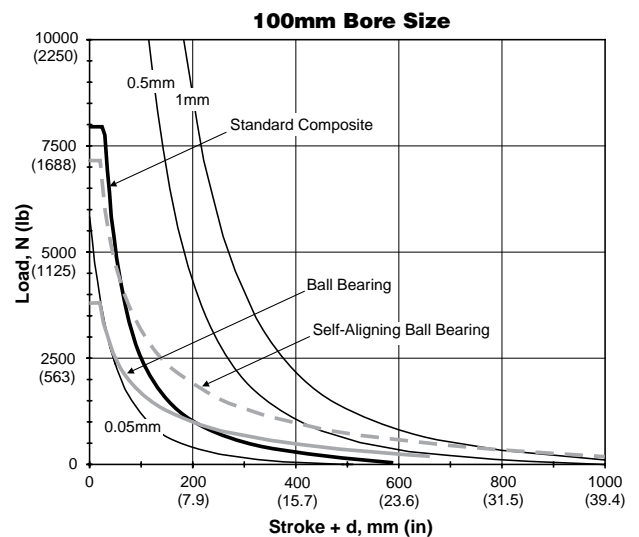
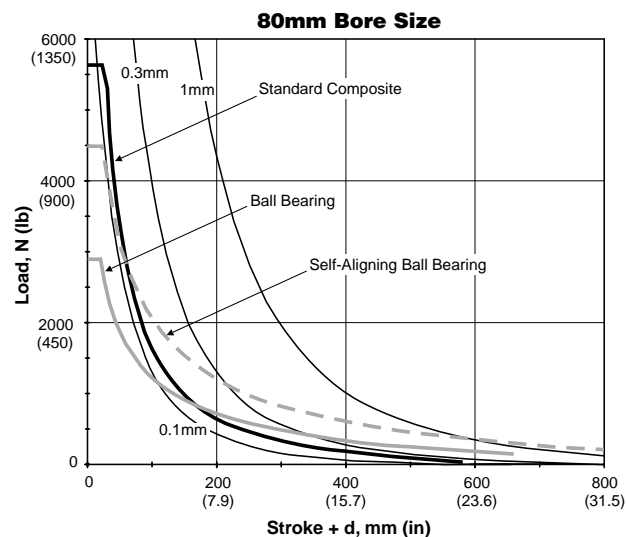
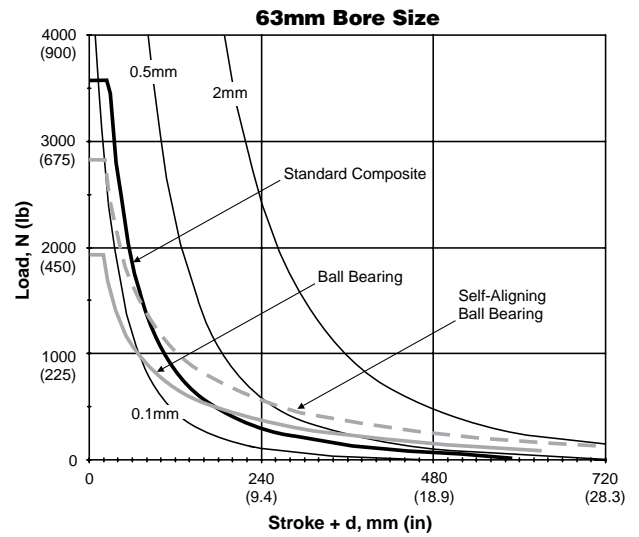
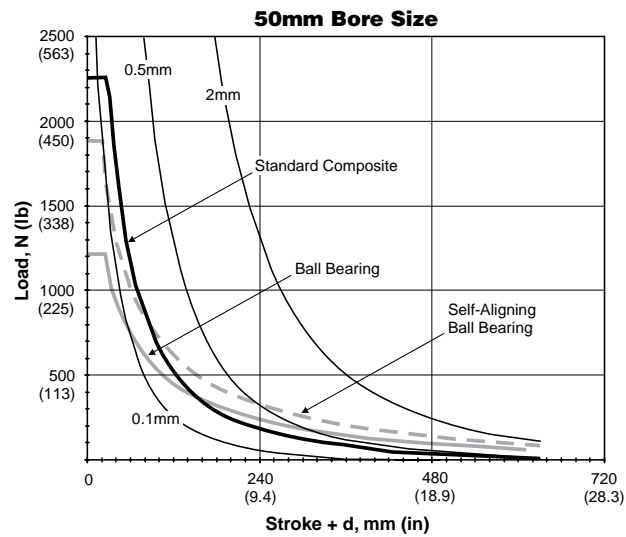
|          |                   |
|----------|-------------------|
| <b>B</b> | Guided Cylinders  |
|          | Actuator Products |
| P5T      | Series            |
| P5T2     | Series            |
| P5L      | Series            |
| HB       | Series            |
| P5E      | Series            |

**Horizontal Load Capacity & Deflection with Standard Shafting**



|               |                                       |
|---------------|---------------------------------------|
| <b>B</b>      | Guided Cylinders<br>Actuator Products |
|               | P5T<br>Series                         |
|               | P5T2<br>Series                        |
|               | P5L<br>Series                         |
| HB<br>Series  |                                       |
| P5E<br>Series |                                       |

**P5L Thrust Slides**



**Horizontal Load Capacity & Deflection with Oversized Shafting**

- Oversized Composite w/ Chrome Plated or Stainless Steel Rods

The graphs on the following two s illustrate the maximum suggested side load at a given actuator stroke and distance (d) from the face of the tooling plate. The graphs include the weight of the support rods and tooling plate and are based on a bearing life of 10 million cycles under a dynamic loading condition. For an equivalent static load capacity multiply the information in these graphs by 1.5.

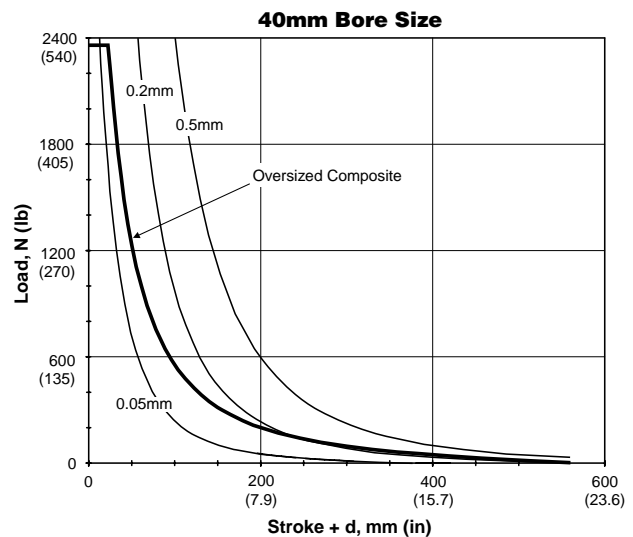
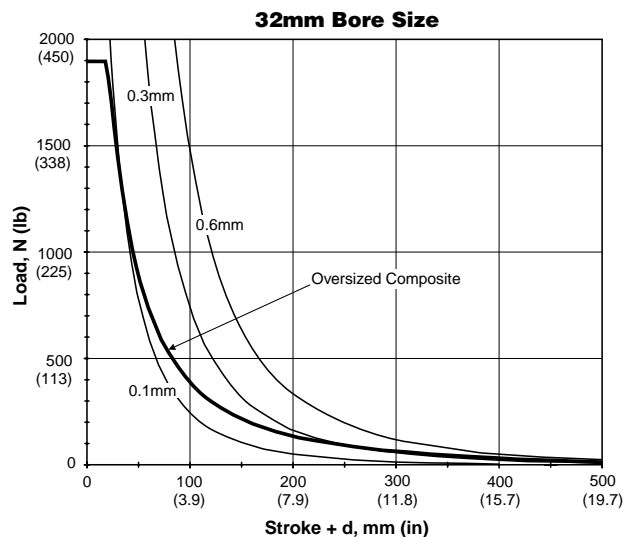
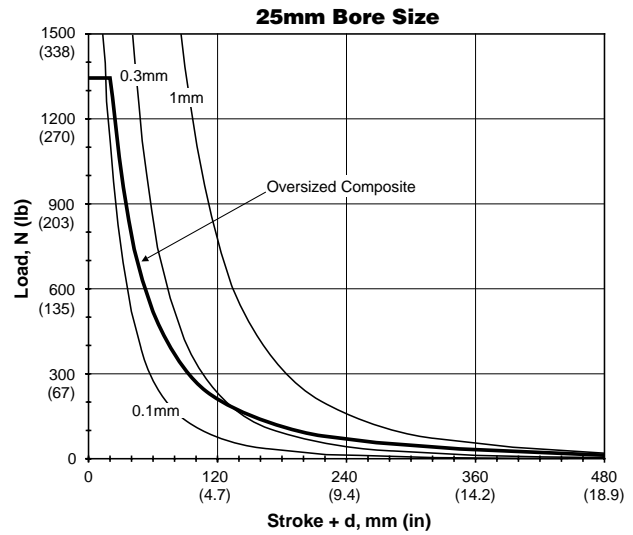
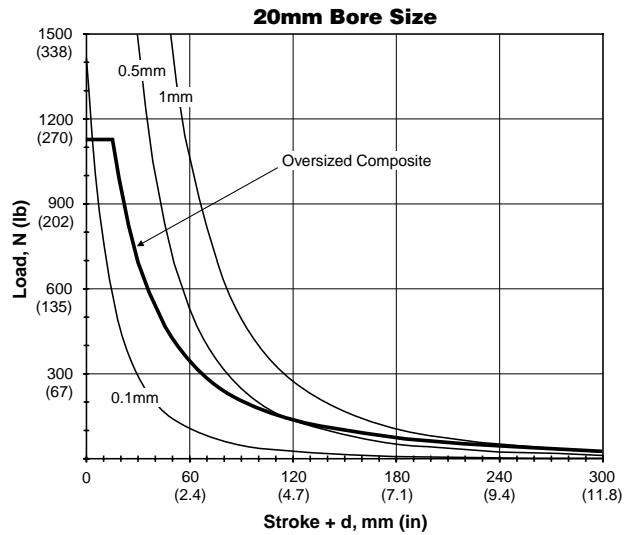
See the P5L options section of this catalog for more bearing selection information.

Dynamic loading is defined as a load which is affixed to the actuator tooling plate during the extend or retract motion of the actuator. Capacities are based on bearing and shafts only. Mounting bolts/hardware should be investigated per customer application.

**Note:** The following variables commonly affect the bearing life of a guided cylinder:

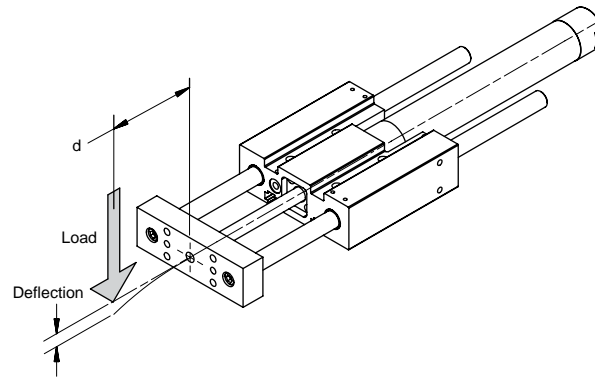
- Velocity
- Vibration
- Orientation
- Environment (Dust, moisture, etc.)

**P5L Thrust Slides**



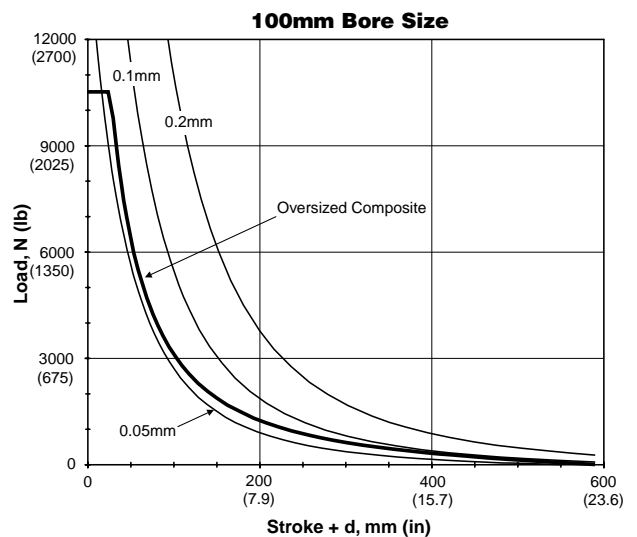
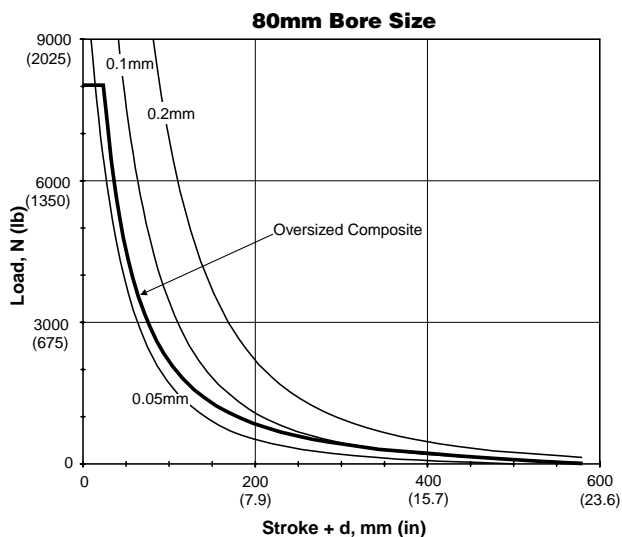
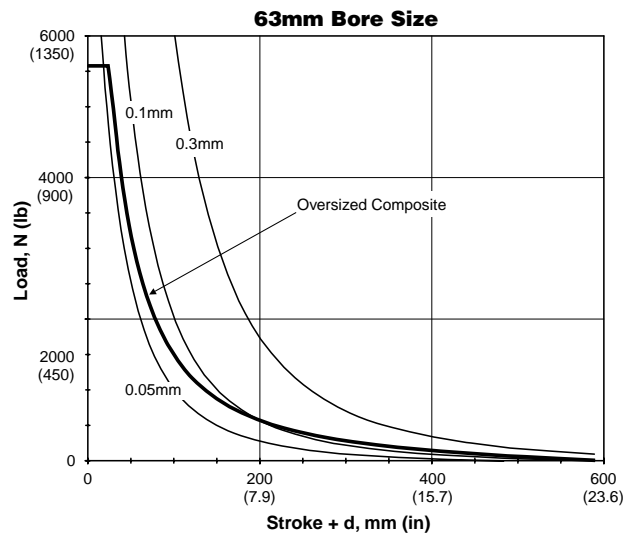
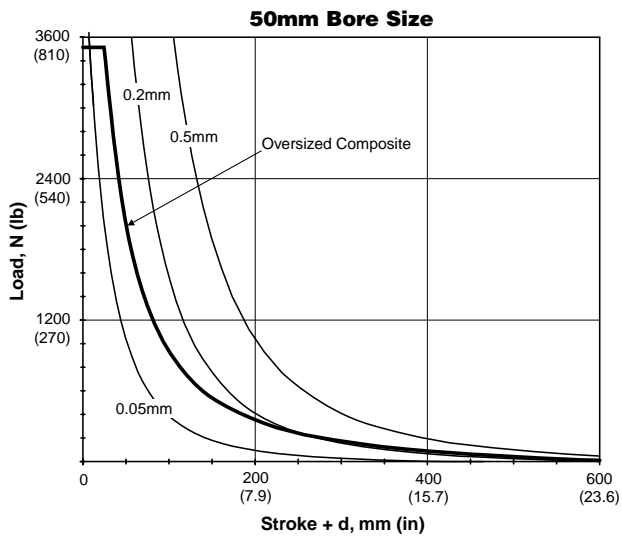
|             |                                       |
|-------------|---------------------------------------|
| <b>B</b>    | Guided Cylinders<br>Actuator Products |
|             | P5T Series                            |
| P5T2 Series |                                       |
| P5L Series  |                                       |
| HB Series   |                                       |
| P5E Series  |                                       |

**Horizontal Load Capacity & Deflection with Oversized Shafting**



|          |                   |
|----------|-------------------|
| <b>B</b> | Guided Cylinders  |
|          | Actuator Products |
| Series   | P5T               |
| Series   | P5T2              |
| Series   | P5L               |
| Series   | HB                |
| Series   | P5E               |

**P5L Thrust Slides**



**Horizontal Load Capacity & Deflection with Standard Shafting**

- Recirculating Ball Bearings w/ Carbon or Stainless Steel Rods
- Self Aligning Ball Bearings w/ Carbon or Stainless Steel Rods

The graphs on the following two pages illustrate the maximum suggested side load at a given actuator stroke and distance (d) from the face of the tooling plate. The graphs include the weight of the support rods and tooling plate and are based on a bearing life of 10 million cycles under a dynamic loading condition. For an equivalent static load capacity multiply the information in these graphs by 1.5.

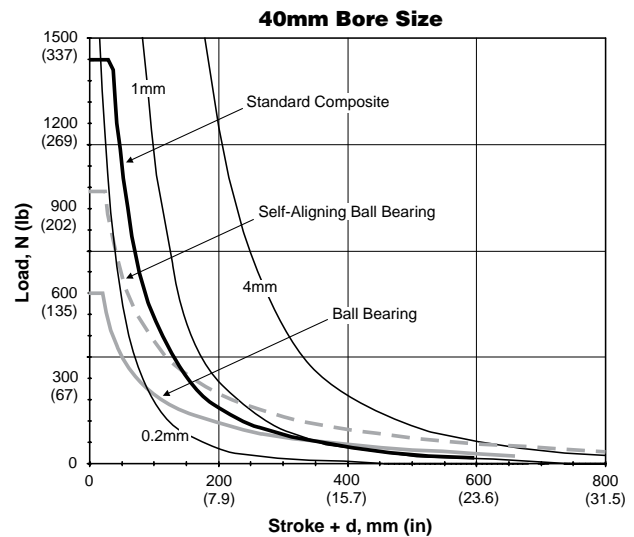
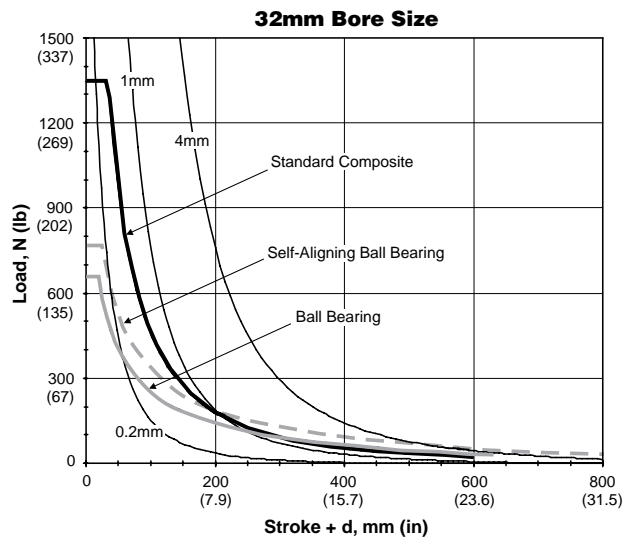
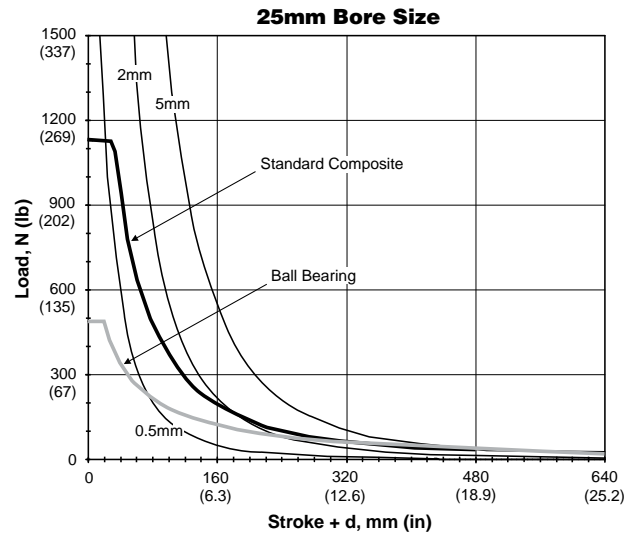
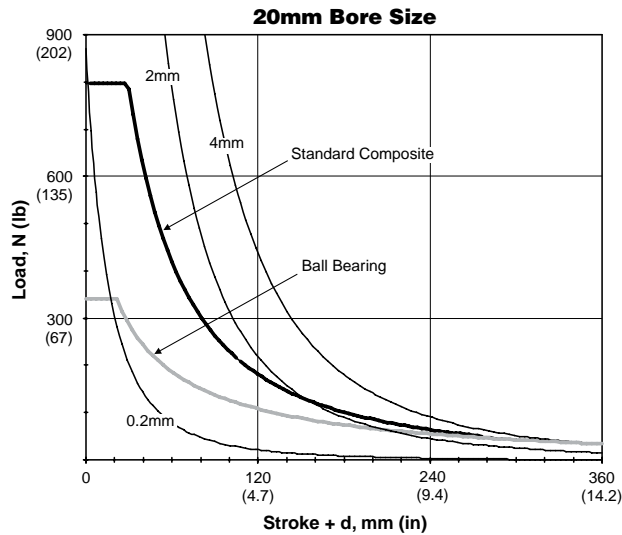
See the P5L options section of this catalog for more bearing selection information.

Dynamic loading is defined as a load which is affixed to the actuator tooling plate during the extend or retract motion of the actuator. Capacities are based on bearing and shafts only. Mounting bolts/hardware should be investigated per customer application.

**Note:** The following variables commonly affect the bearing life of a guided cylinder:

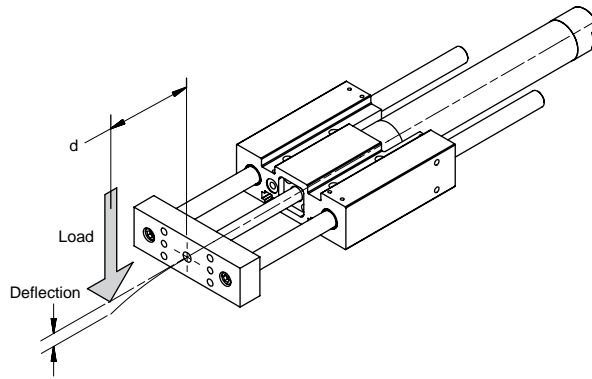
- Velocity
- Vibration
- Orientation
- Environment (Dust, moisture, etc.)

**P5L Reach Slides**



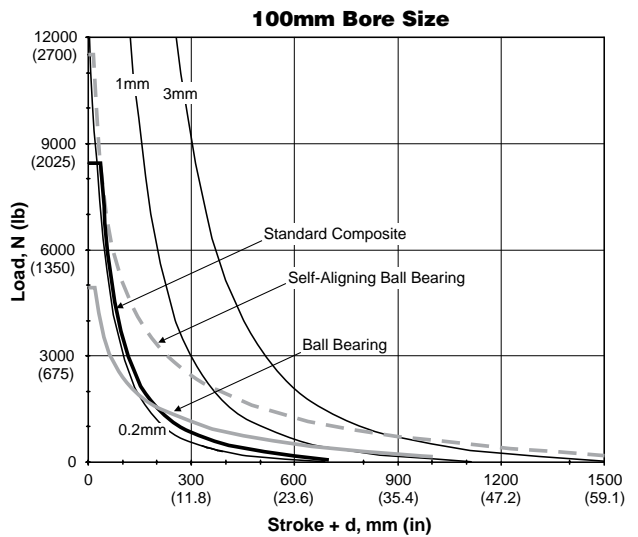
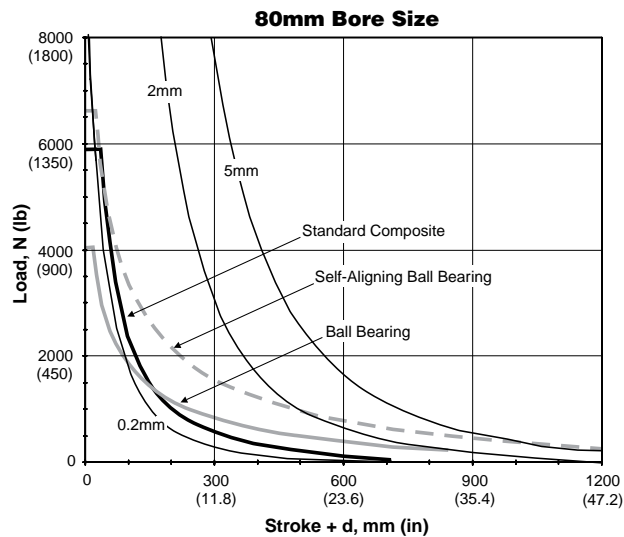
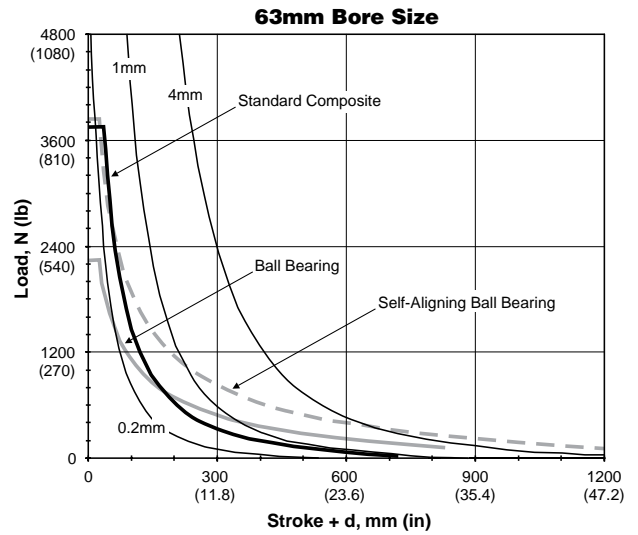
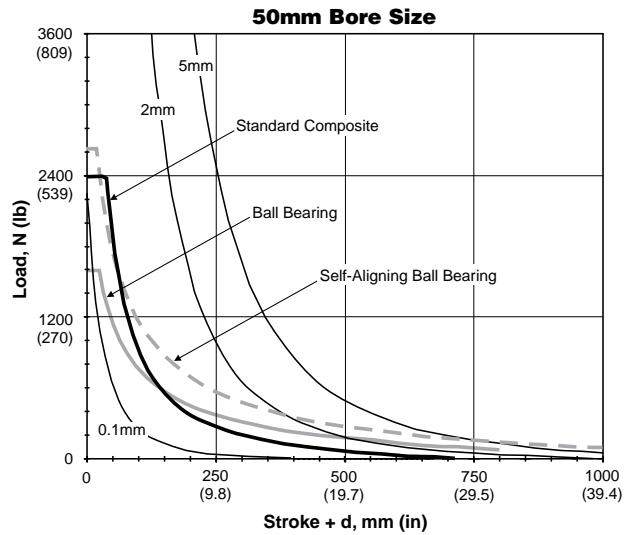
|                |                                       |
|----------------|---------------------------------------|
| <b>B</b>       | Guided Cylinders<br>Actuator Products |
|                | P5T<br>Series                         |
| P5T2<br>Series |                                       |
| P5L<br>Series  |                                       |
| HB<br>Series   |                                       |
| P5E<br>Series  |                                       |

**Horizontal Load Capacity & Deflection with Standard Shafting**



|          |                   |
|----------|-------------------|
| <b>B</b> | Guided Cylinders  |
|          | Actuator Products |
| P5T      | Series            |
| P5T2     | Series            |
| P5L      | Series            |
| HB       | Series            |
| P5E      | Series            |

**P5L Reach Slides**



**Horizontal Load Capacity & Deflection with Oversized Shafting**

- Oversized Composite w/ Chrome Plated or Stainless Steel Rods

The graphs on the following two pages illustrate the maximum suggested side load at a given actuator stroke and distance (d) from the face of the tooling plate. The graphs include the weight of the support rods and tooling plate and are based on a bearing life of 10 million cycles under a dynamic loading condition. For an equivalent static load capacity multiply the information in these graphs by 1.5.

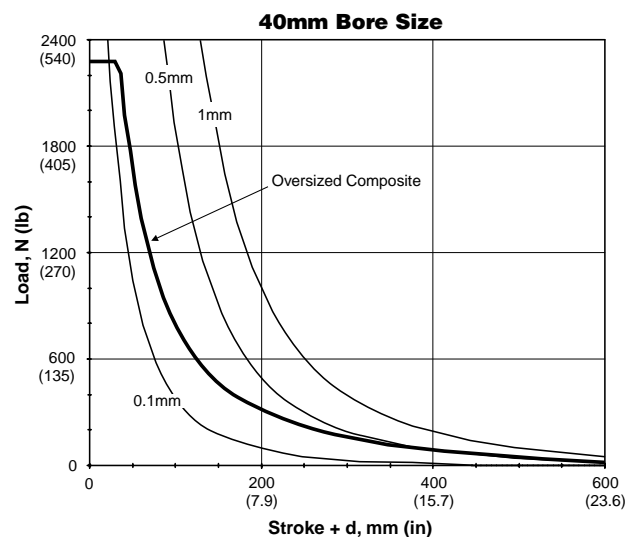
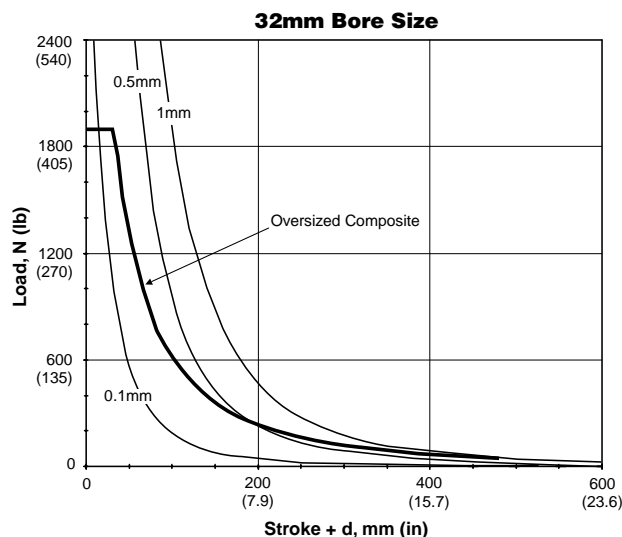
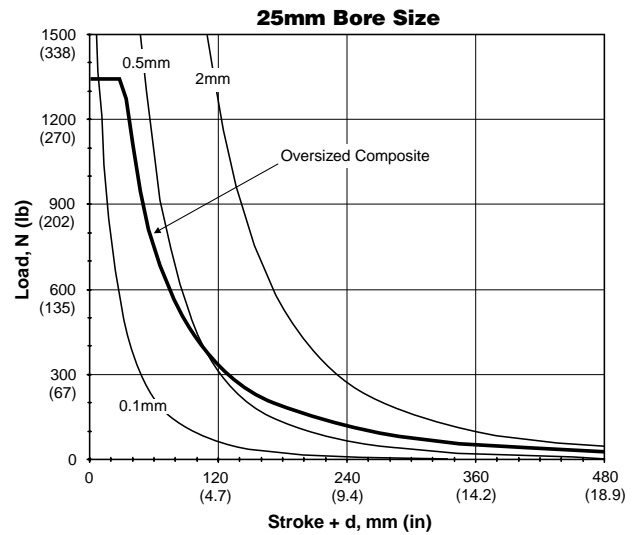
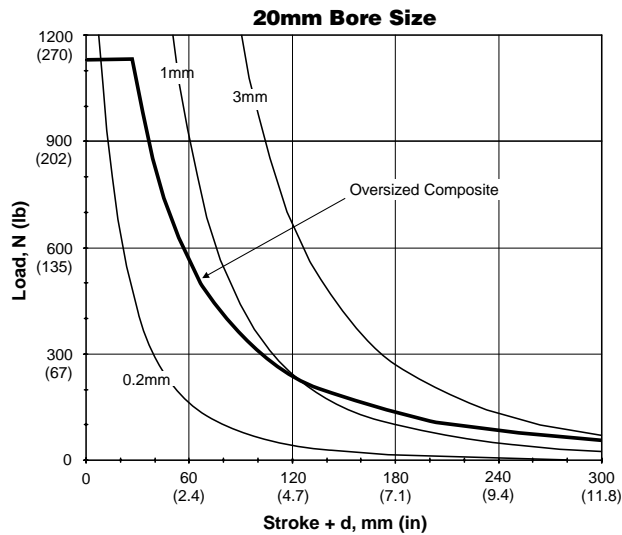
See the P5L options section of this catalog for more bearing selection information.

Dynamic loading is defined as a load which is affixed to the actuator tooling plate during the extend or retract motion of the actuator. Capacities are based on bearing and shafts only. Mounting bolts/hardware should be investigated per customer application.

**Note:** The following variables commonly affect the bearing life of a guided cylinder:

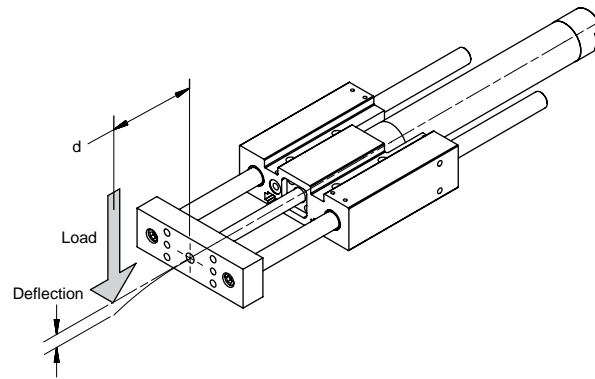
- Velocity
- Vibration
- Orientation
- Environment (Dust, moisture, etc.)

**P5L Reach Slides**



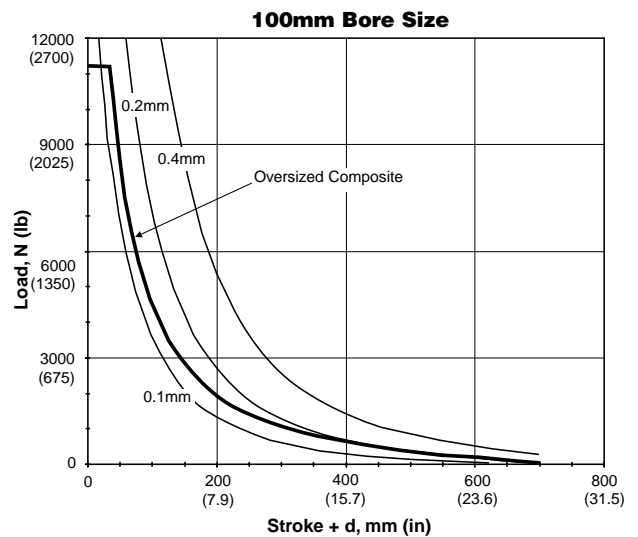
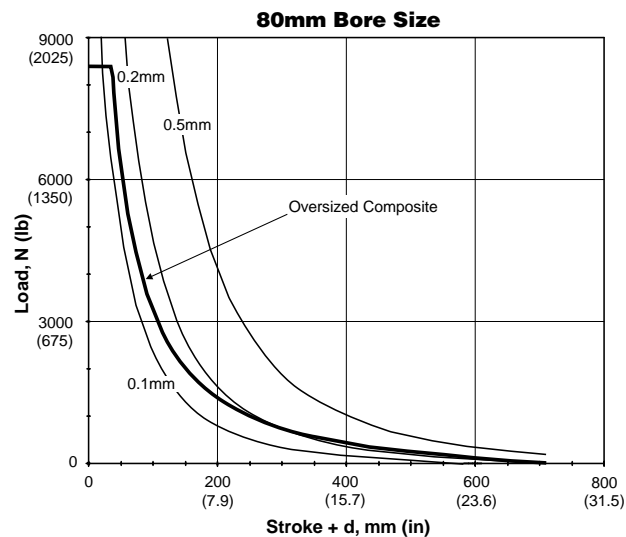
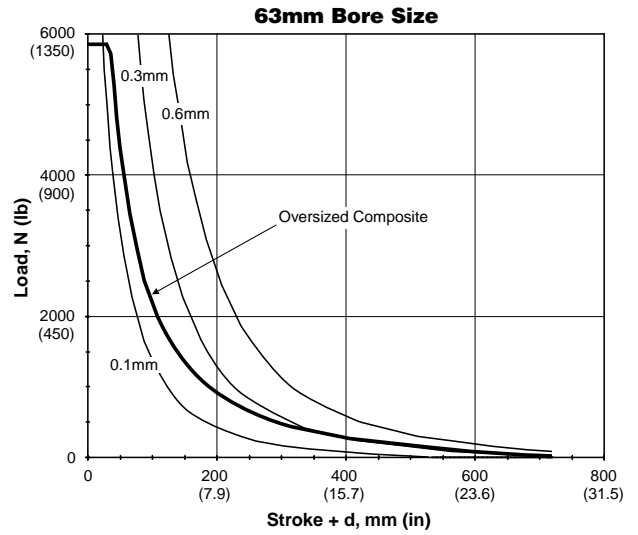
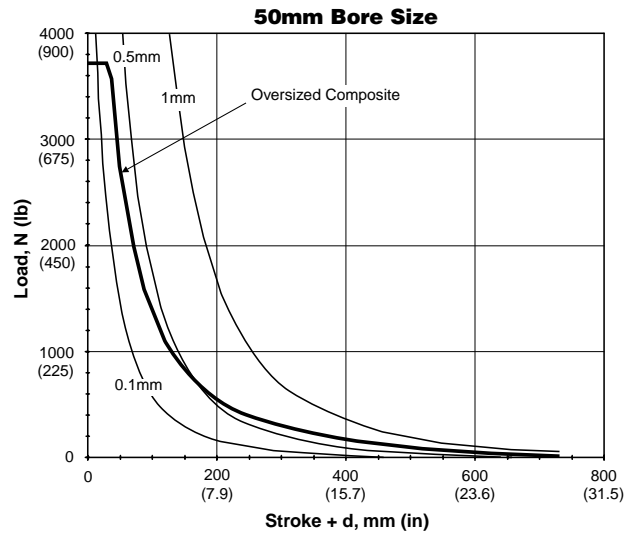
|          |                   |
|----------|-------------------|
| <b>B</b> | Guided Cylinders  |
|          | Actuator Products |
| P5T      | Series            |
| P5T2     | Series            |
| P5L      | Series            |
| HB       | Series            |
| P5E      | Series            |

**Horizontal Load Capacity & Deflection with Oversized Shafting**



|          |                   |
|----------|-------------------|
| <b>B</b> | Guided Cylinders  |
|          | Actuator Products |
| Series   | P5T               |
| Series   | P5T2              |
| Series   | P5L               |
| Series   | HB                |
| Series   | P5E               |

**P5L Reach Slides**





**Asymmetrical Torque Capacity**

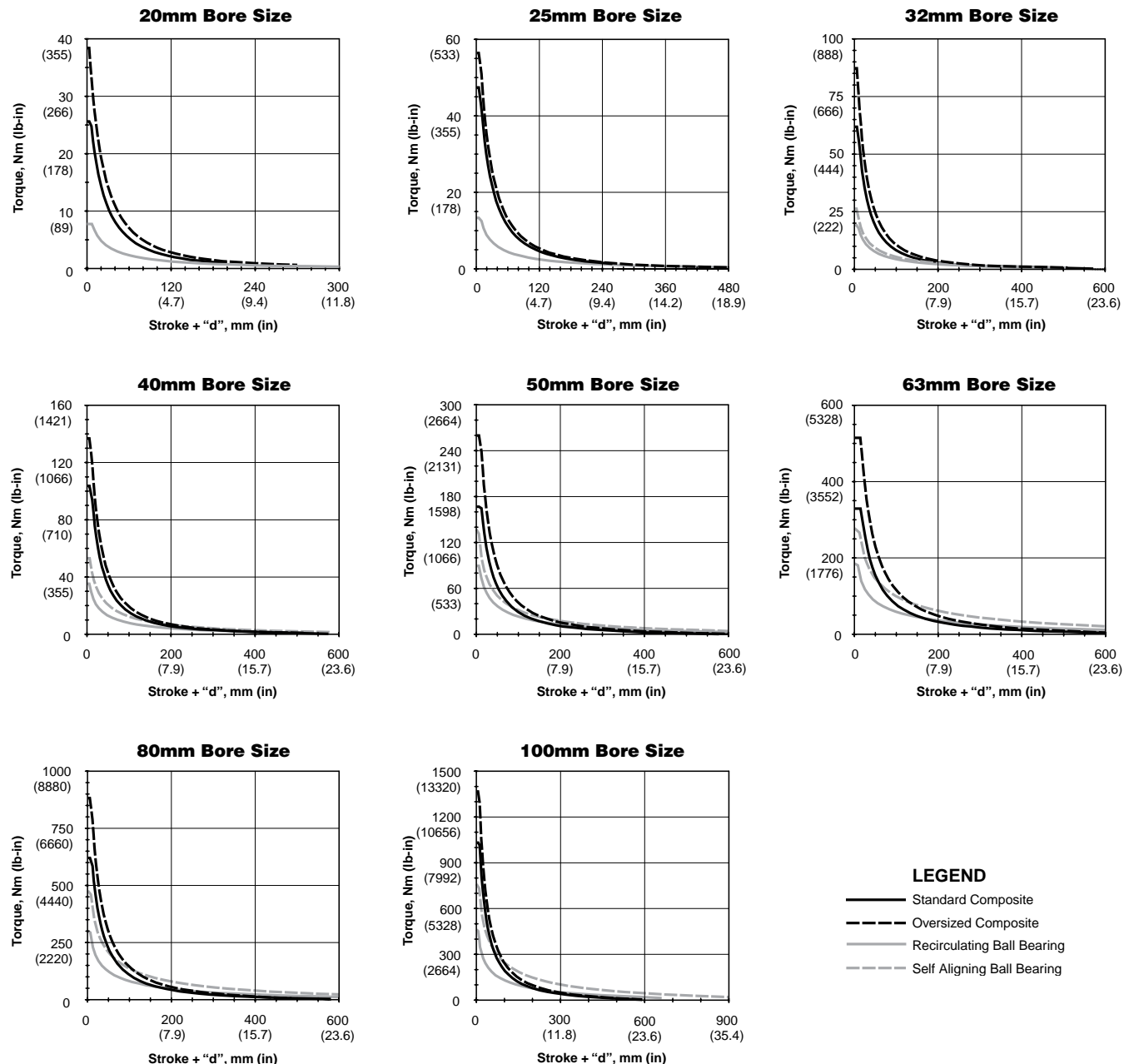
- Standard Composite w/ Chrome Plated or Stainless Steel Rods
- Oversized Composite w/ Chrome Plated or Stainless Steel Rods
- Recirculating Ball Bearings w/ Carbon or Stainless Steel Rods
- Self Aligning Ball Bearings w/ Carbon or Stainless Steel Rods

The graphs on the following two pages illustrate the maximum suggested asymmetrical load at a given actuator stroke and distance (d) from the face of the tooling plate. The graphs

include the weight of the support rods and tooling plate and are based on a bearing life of 10 million cycles under a dynamic loading condition. For an equivalent static load capacity multiply the information in these graphs by 1.5.

Dynamic loading is defined as a load which is affixed to the actuator tooling plate during the extend or retract motion of the actuator. Capacities are based on bearing and shafts only. Mounting bolts/hardware should be investigated per customer application. An asymmetrical load is defined as a perpendicular load applied at some horizontal distance, “m” from the center of the tooling plate.

**P5L Thrust Slides**

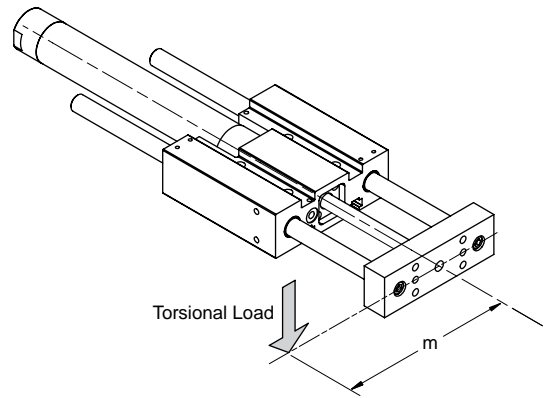


|             |                                       |
|-------------|---------------------------------------|
| <b>B</b>    | Guided Cylinders<br>Actuator Products |
|             | P5T Series                            |
| P5T2 Series |                                       |
| P5L Series  |                                       |
| HB Series   |                                       |
| P5E Series  |                                       |

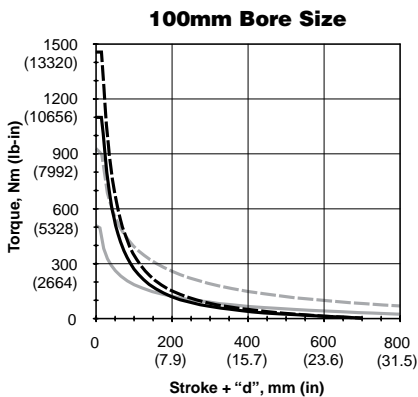
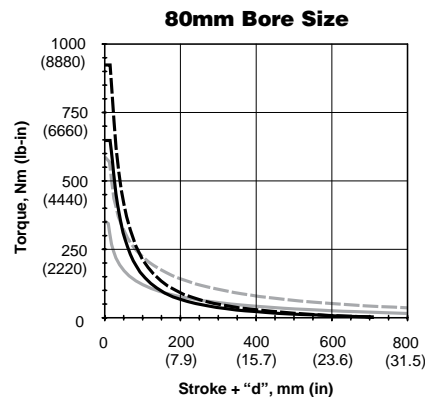
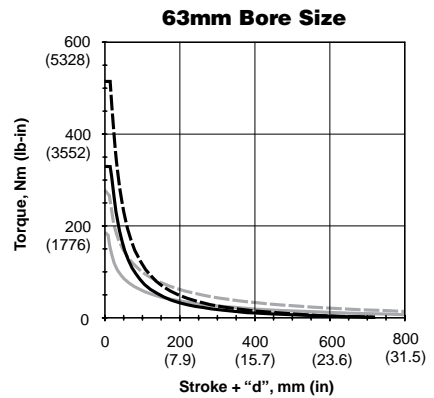
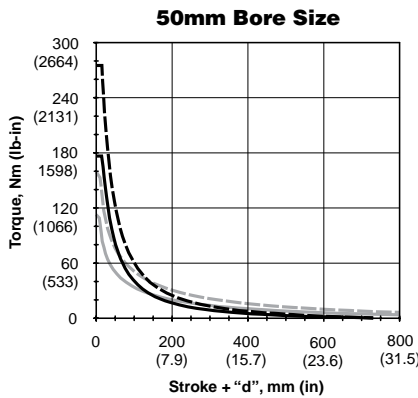
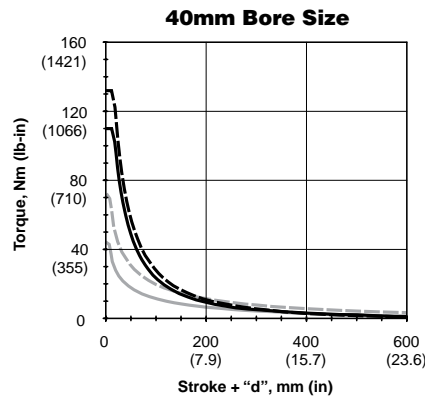
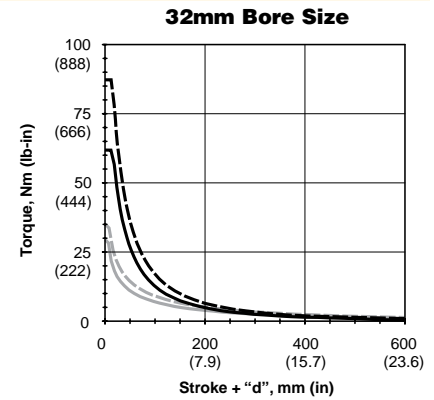
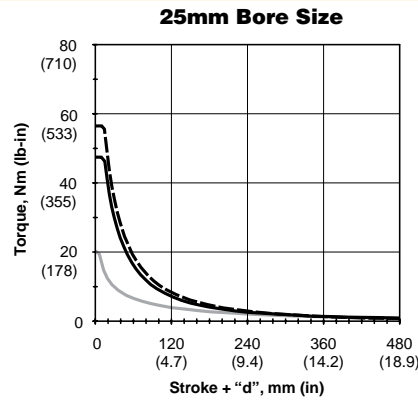
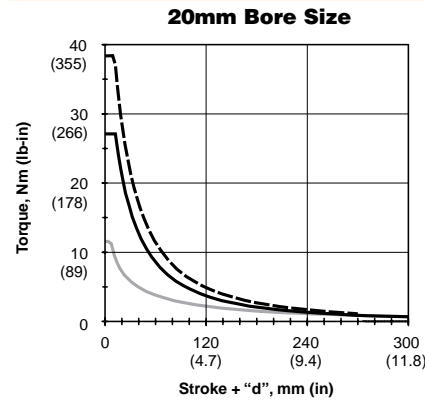
**Asymmetrical Torque Capacity**

**Note:** The following variables commonly affect the bearing life of a guided cylinder:

- Velocity
- Vibration
- Orientation
- Environment (Dust, moisture, etc.)



**P5L Reach Slides**



**LEGEND**

- Standard Composite
- - - Oversized Composite
- Recirculating Ball Bearing
- - - Self Aligning Ball Bearing

|          |                   |
|----------|-------------------|
| <b>B</b> | Guided Cylinders  |
|          | Actuator Products |
| Series   | P5T               |
| Series   | P5T2              |
| Series   | P5L               |
| Series   | HB                |
| Series   | P5E               |

**Vertical Eccentric Load Capacity**

- Standard Composite w/ Chrome Plated or Stainless Steel Rods
- Oversized Composite w/ Chrome Plated or Stainless Steel Rods
- Recirculating Ball Bearings w/ Carbon or Stainless Steel Rods
- Self Aligning Ball Bearings w/ Carbon or Stainless Steel Rods

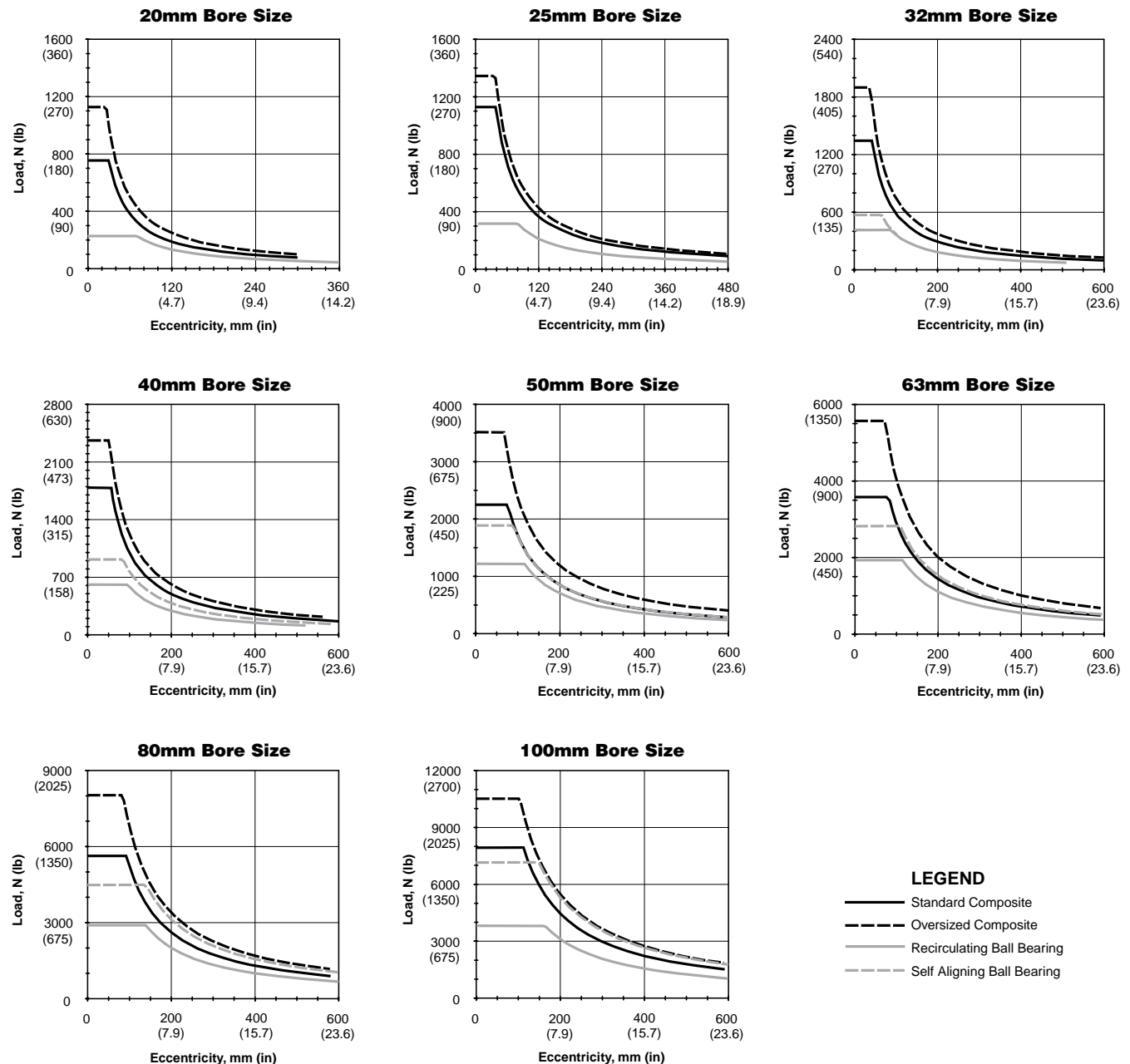
The graphs on the following two pages illustrate the maximum suggested eccentric load based on a stroke of 100mm (4 inches).

An eccentric load is defined as a load applied in the same direction as the motion of the cylinder however, acting at some distance (eccentricity "h") from the center of the tooling plate. Capacities are based on bearing and shafts only. Mounting bolts/hardware should be investigated per customer application.

**Note:** The following variables commonly affect the bearing life of a guided cylinder:

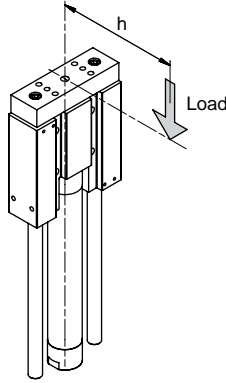
- Velocity
- Vibration
- Orientation
- Environment (Dust, moisture, etc.)

**P5L Thrust Slides**



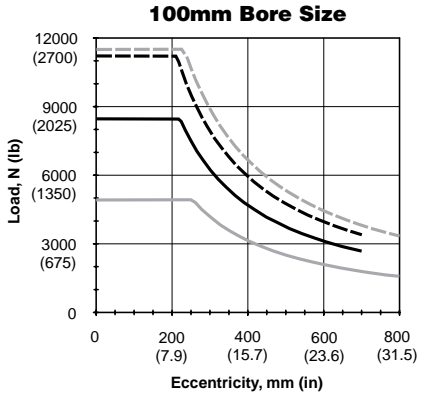
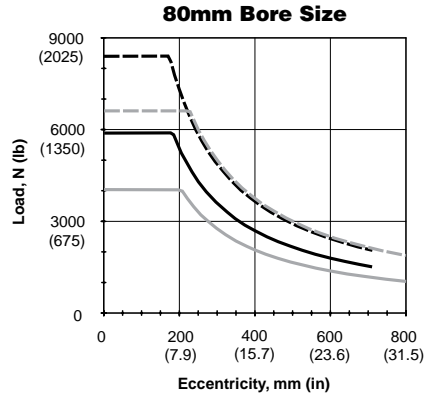
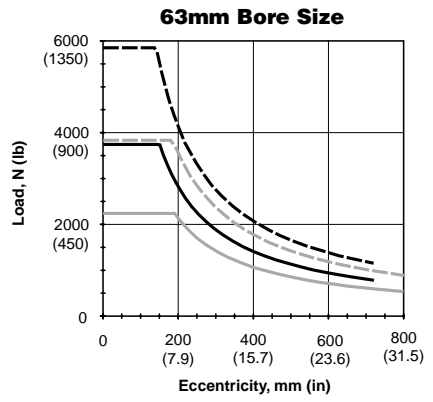
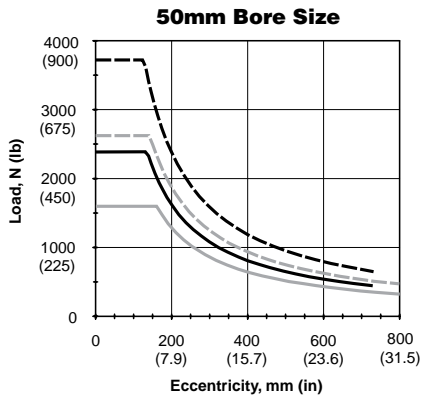
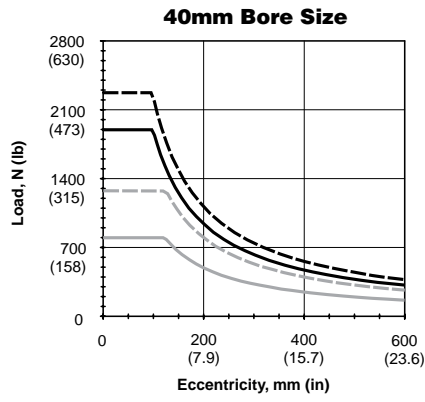
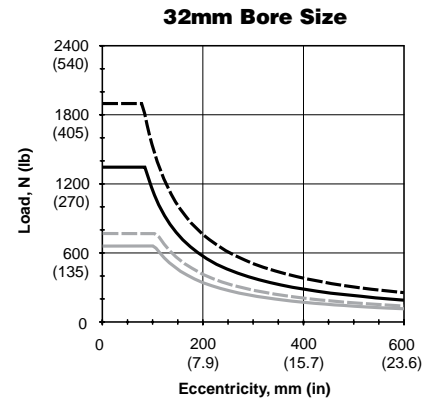
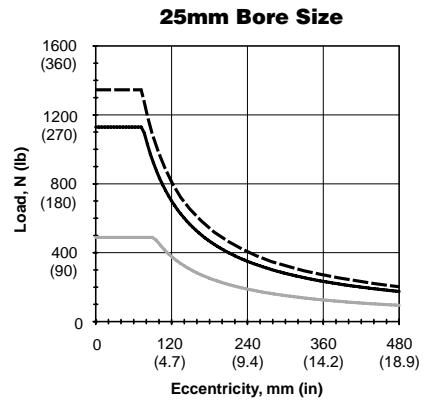
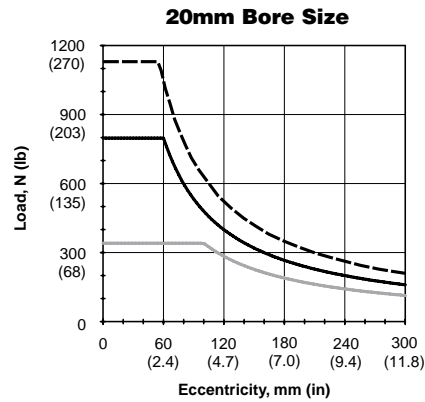
|             |                                       |
|-------------|---------------------------------------|
| <b>B</b>    | Guided Cylinders<br>Actuator Products |
|             | P5T Series                            |
| P5T2 Series |                                       |
| P5L Series  |                                       |
| HB Series   |                                       |
| P5E Series  |                                       |

**Vertical Eccentric Load Capacity**



**P5L Reach Slides**

|          |                   |
|----------|-------------------|
| <b>B</b> | Guided Cylinders  |
|          | Actuator Products |
| Series   | P5T               |
| Series   | P5T2              |
| Series   | P5L               |
| Series   | HB                |
| Series   | P5E               |



**LEGEND**

- Standard Composite
- - - Oversized Composite
- Recirculating Ball Bearing
- - - Self Aligning Ball Bearing

**Horizontal Load Capacity & Deflection with Standard Shafting**

- Standard Composite w/ Chrome Plated or Stainless Steel Rods
- Recirculating Ball Bearings w/ Carbon or Stainless Steel Rods
- Self Aligning Ball Bearings w/ Carbon or Stainless Steel Rods

The graphs on the following two pages illustrate the maximum suggested side load at a given actuator stroke. The graphs include the weight of the carriage and are based on a bearing life of 10 million cycles under a dynamic loading condition. For an equivalent static load capacity multiply the information in these graphs by 1.5.

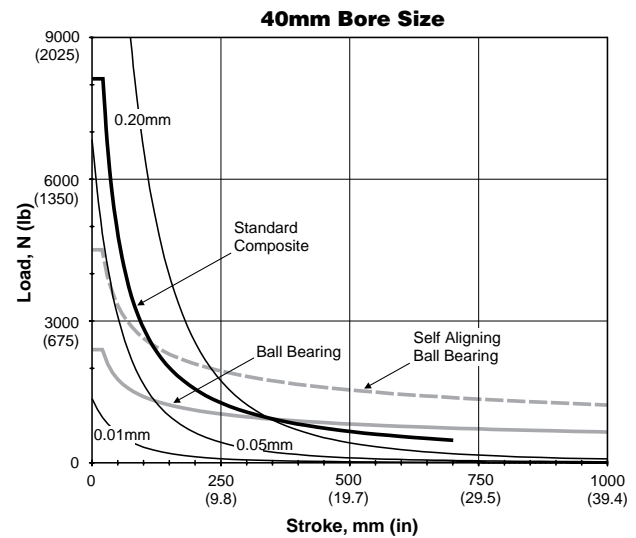
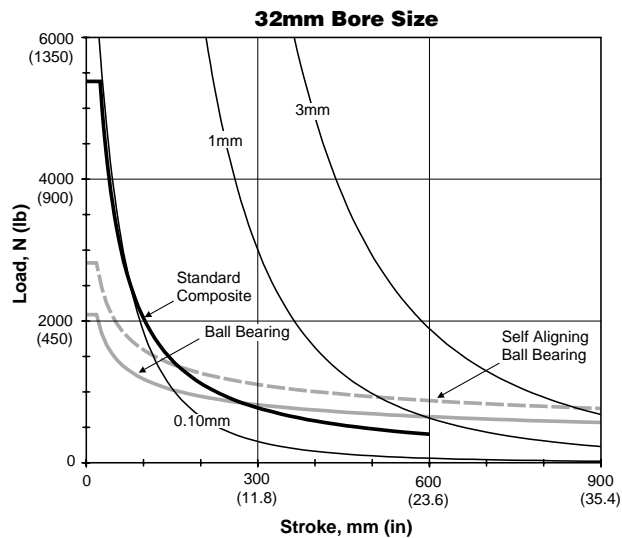
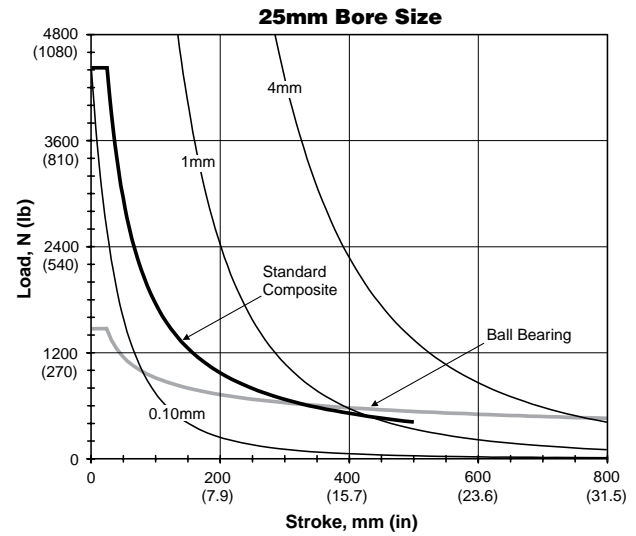
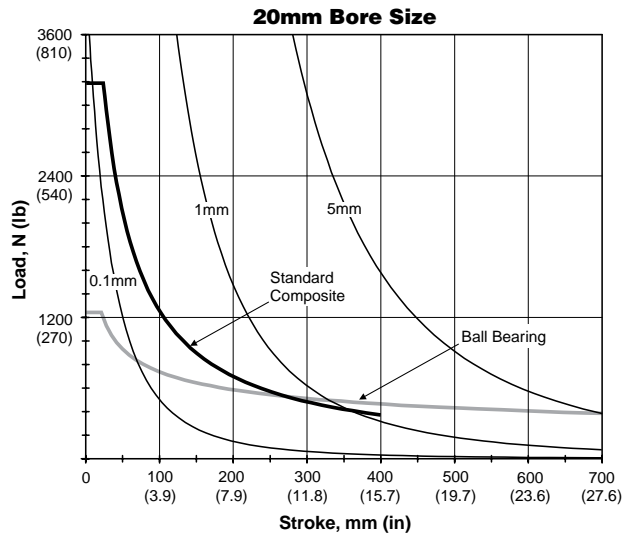
See the P5L options section of this catalog for more bearing selection information.

Dynamic loading is defined as a load which is affixed to the actuator tooling plate during the extend or retract motion of the actuator. Capacities are based on bearing and shafts only. Mounting bolts/hardware should be investigated per customer application.

**Note:** The following variables commonly affect the bearing life of a guided cylinder:

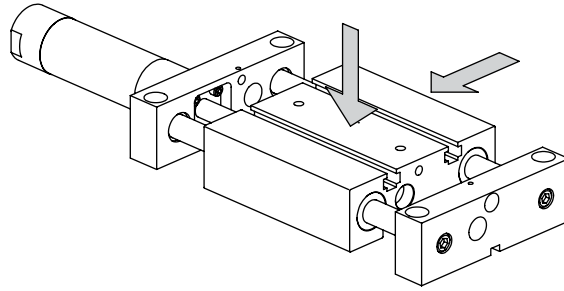
- Velocity
- Vibration
- Orientation
- Environment (Dust, moisture, etc.)

**P5L Base Slides**



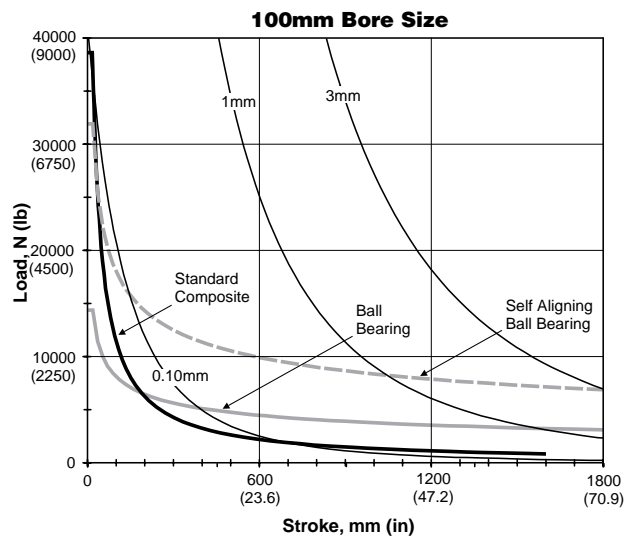
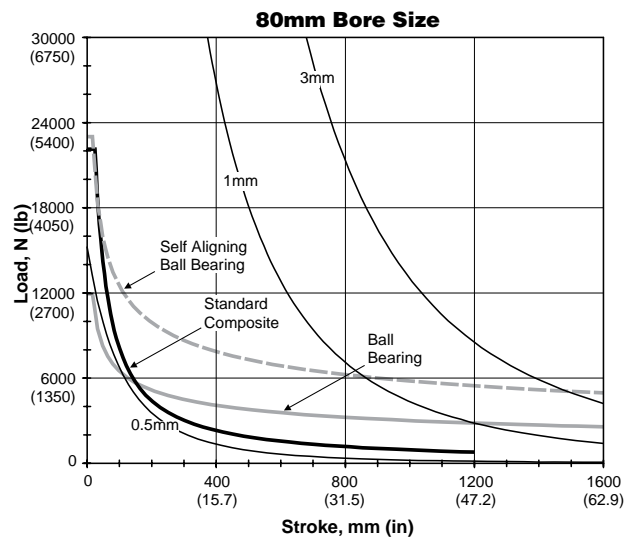
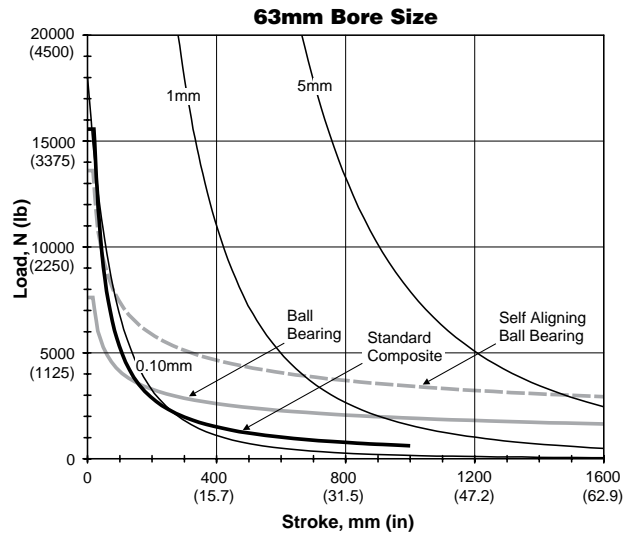
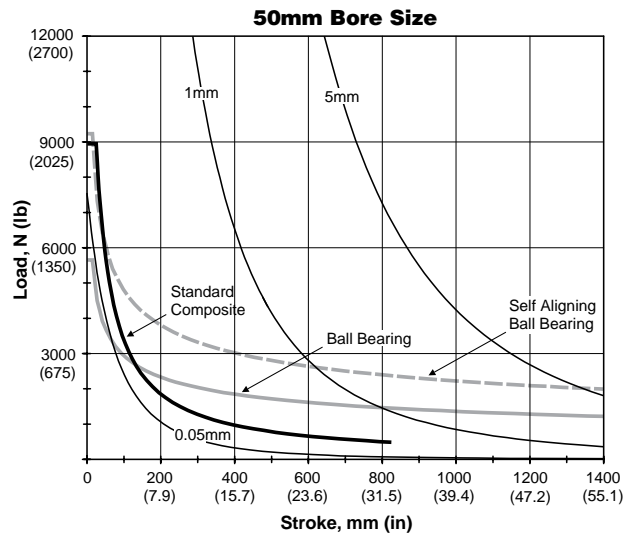
|          |                   |
|----------|-------------------|
| <b>B</b> | Guided Cylinders  |
|          | Actuator Products |
| P5T      | Series            |
| P5T2     | Series            |
| P5L      | Series            |
| HB       | Series            |
| P5E      | Series            |

**Horizontal Load Capacity & Deflection with Standard Shafting**



|            |                                       |
|------------|---------------------------------------|
| <b>B</b>   | Guided Cylinders<br>Actuator Products |
|            | Series P5T                            |
|            | Series P5T2                           |
|            | Series P5L                            |
| Series HB  |                                       |
| Series P5E |                                       |

**P5L Base Slides**



**Horizontal Load Capacity & Deflection with Oversized Shafting**

- Oversized Composite w/ Chrome Plated or Stainless Steel Rods

The graphs on the following two pages illustrate the maximum suggested side load at a given actuator stroke. The graphs include the weight of the carriage and are based on a bearing life of 10 million cycles under a dynamic loading condition. For an equivalent static load capacity multiply the information in these graphs by 1.5.

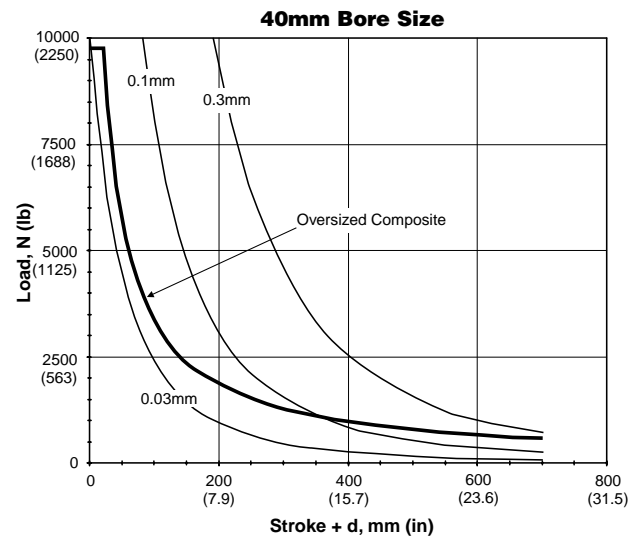
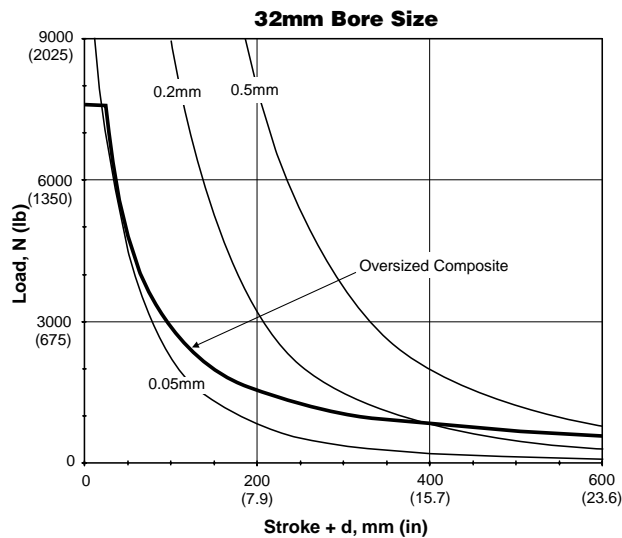
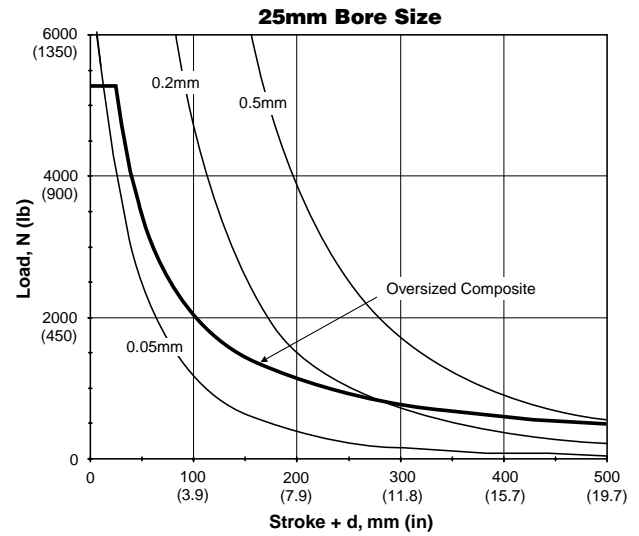
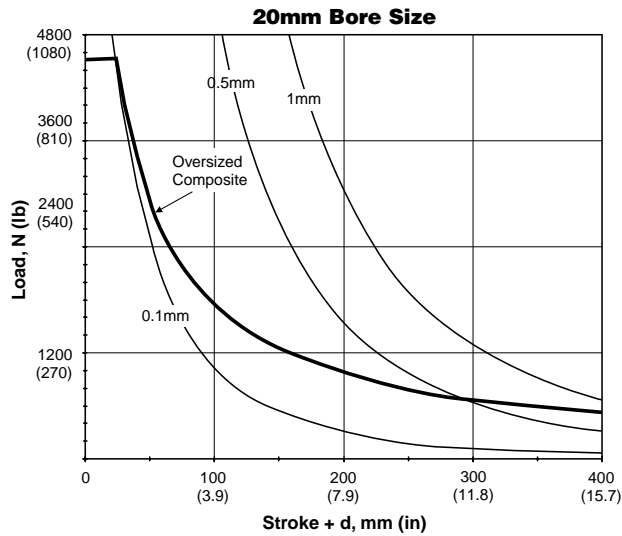
See the P5L options section of this catalog for more bearing selection information.

Dynamic loading is defined as a load which is affixed to the actuator tooling plate during the extend or retract motion of the actuator. Capacities are based on bearing and shafts only. Mounting bolts/hardware should be investigated per customer application.

**Note:** The following variables commonly affect the bearing life of a guided cylinder:

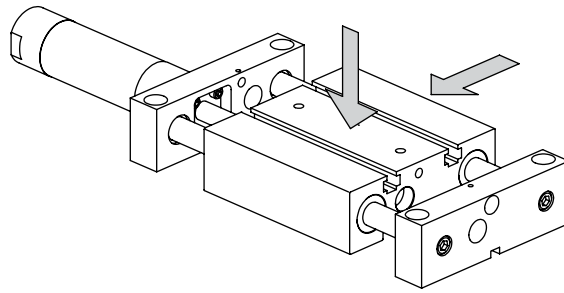
- Velocity
- Vibration
- Orientation
- Environment (Dust, moisture, etc.)

**P5L Base Slides**



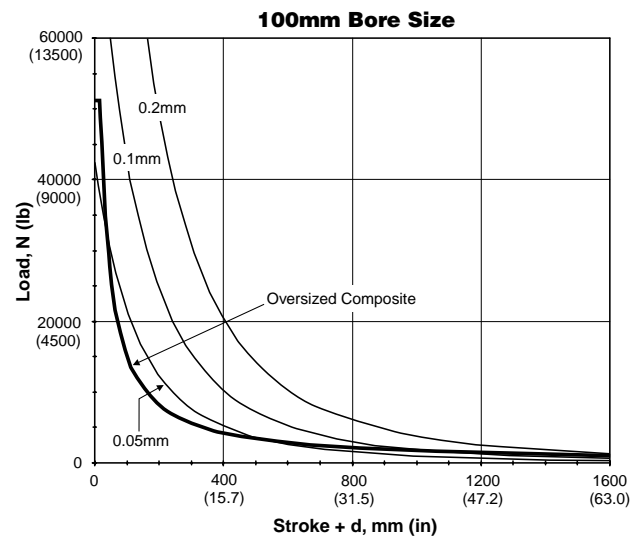
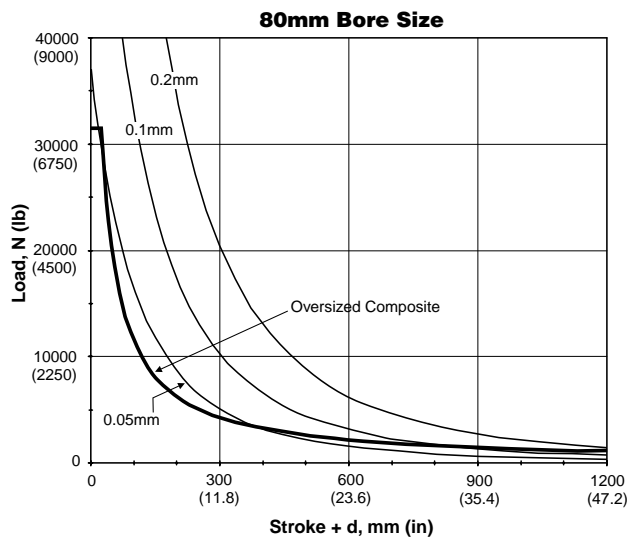
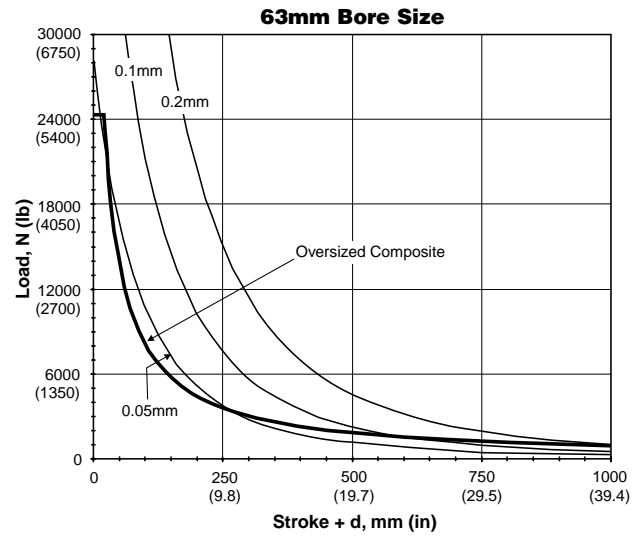
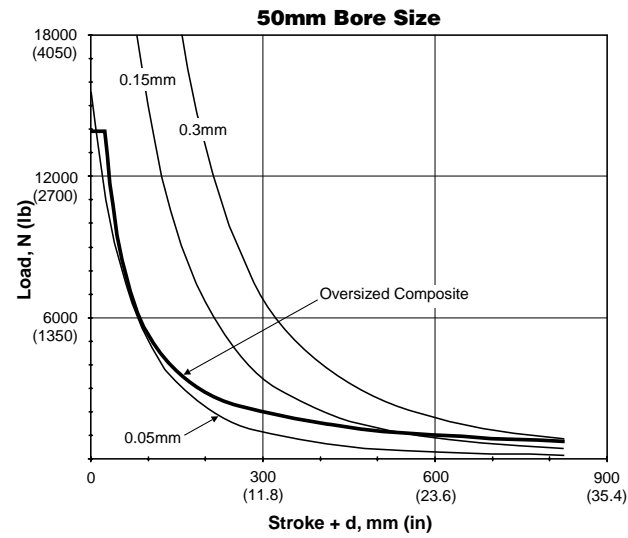
|             |                                       |
|-------------|---------------------------------------|
| <b>B</b>    | Guided Cylinders<br>Actuator Products |
|             | P5T Series                            |
| P5T2 Series |                                       |
| P5L Series  |                                       |
| HB Series   |                                       |
| P5E Series  |                                       |

**Horizontal Load Capacity & Deflection with Oversized Shafting**



|                |                                       |
|----------------|---------------------------------------|
| <b>B</b>       | Guided Cylinders<br>Actuator Products |
|                | P5T<br>Series                         |
| P5T2<br>Series |                                       |
| P5L<br>Series  |                                       |
| HB<br>Series   |                                       |
| P5E<br>Series  |                                       |

**P5L Base Slides**





**Symmetrical Roll Torsional Loading**

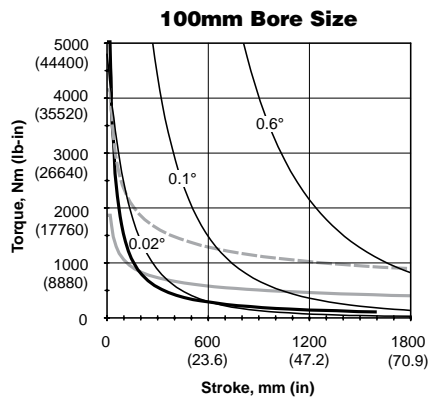
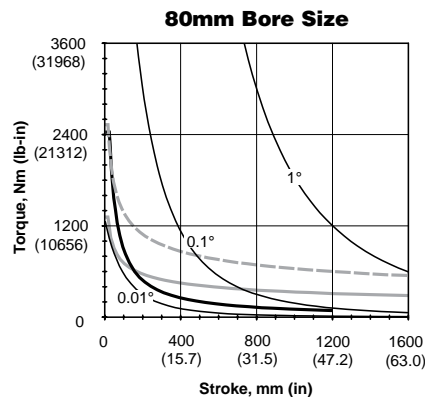
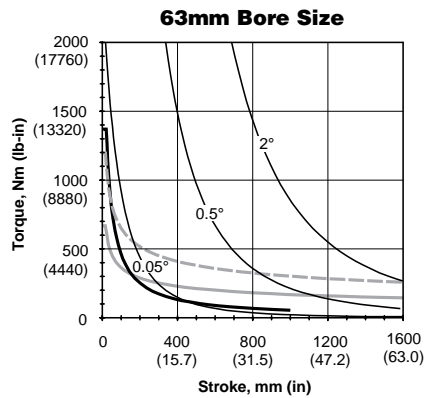
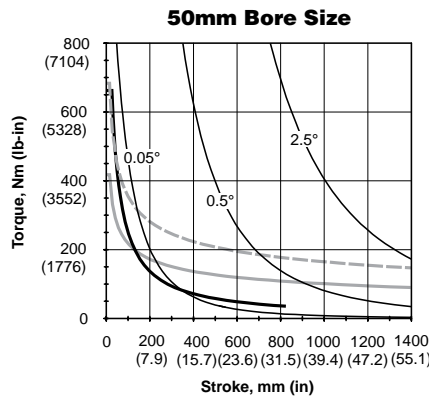
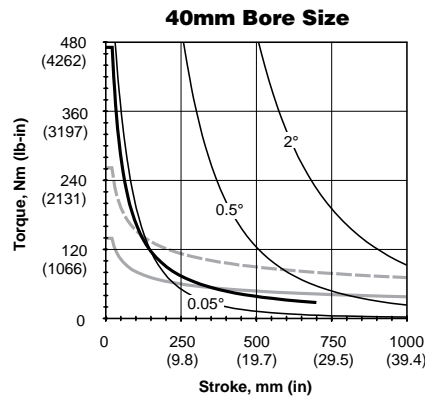
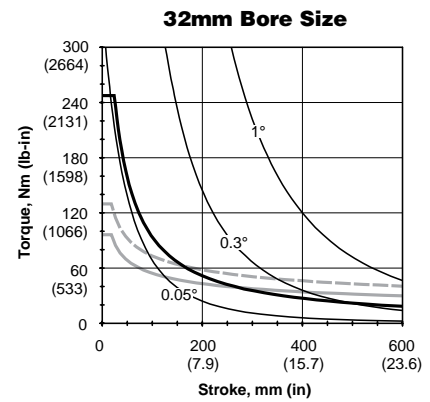
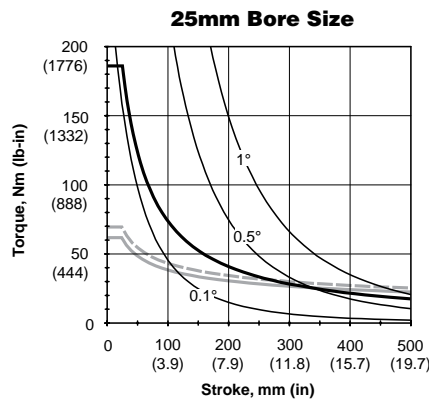
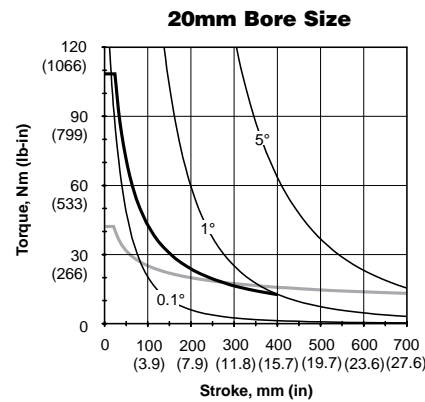
The graphs on the following two pages illustrate the maximum suggested roll load at a given actuator stroke. It is assumed that the moment loading is acting about the centerline of the carriage. The graphs include the weight of the carriage and are based on a bearing life of 10 million cycles under a dynamic loading condition. Capacities are based on bearing and shafts only. Mounting bolts/hardware should be investigated per customer application. For an equivalent static load capacity multiply the information in these graphs by 1.5.

Heavy lines show loading; lighter lines show various degrees of deflection.

**Note:** The following variables commonly affect the bearing life of a guided cylinder:

- Velocity
- Vibration
- Orientation
- Environment (Dust, moisture, etc.)

**Standard Shafting**

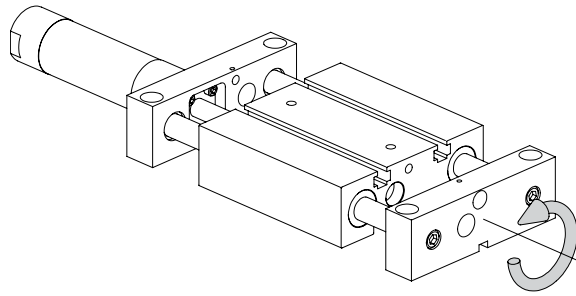


**LEGEND**

- Standard Composite
- Recirculating Ball Bearing
- - - Self Aligning Ball Bearing

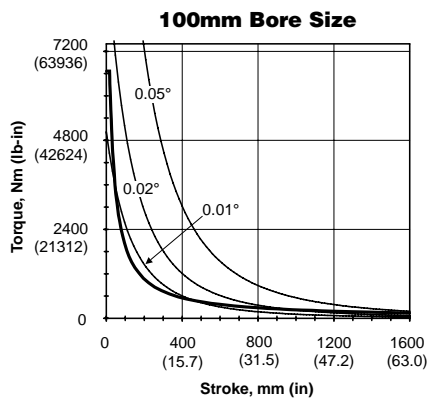
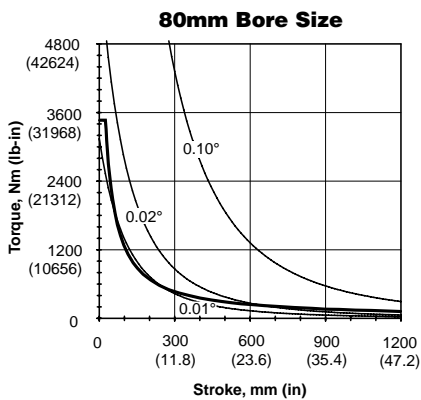
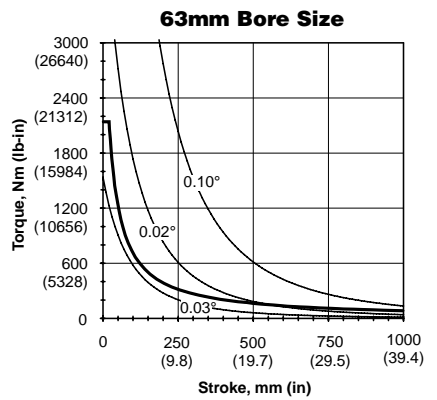
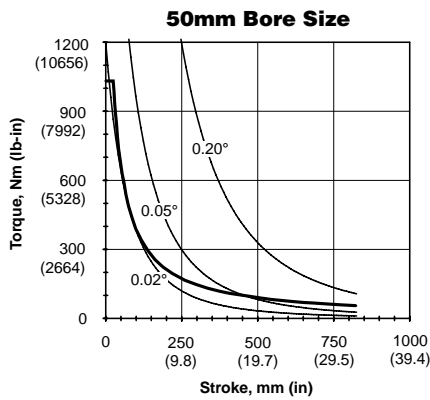
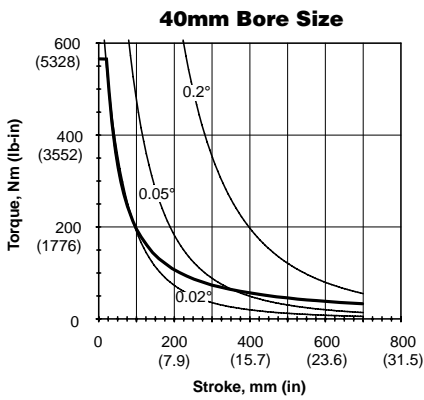
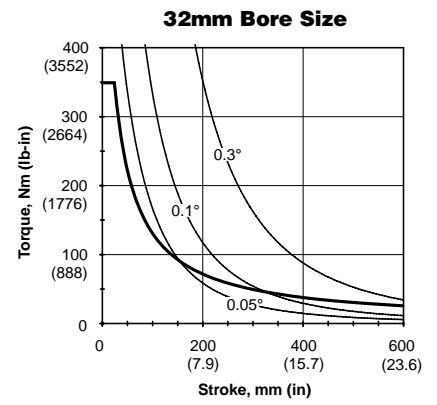
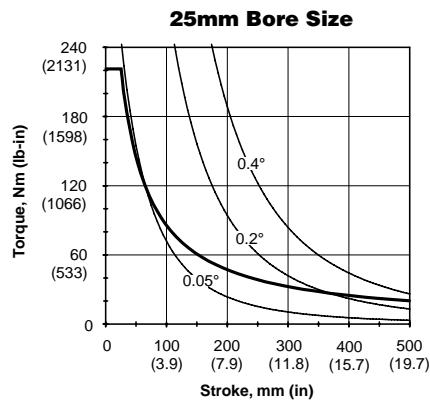
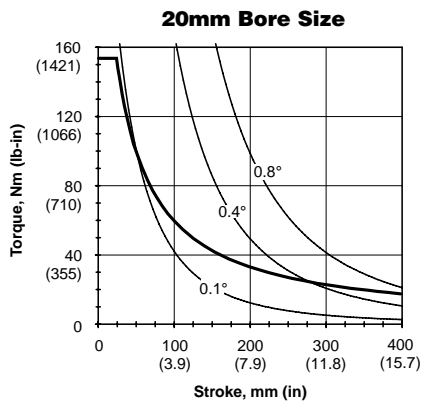
|             |                   |
|-------------|-------------------|
| <b>B</b>    | Guided Cylinders  |
|             | Actuator Products |
| P5T Series  |                   |
| P5T2 Series |                   |
| P5L Series  |                   |
| HB Series   |                   |
| P5E Series  |                   |

**Symmetrical Roll Torsional Loading**



**Oversized Shafting**

|   |                       |
|---|-----------------------|
| <b>B</b><br>Guided Cylinders<br>Actuator Products | <b>P5T</b><br>Series  |
|   | <b>P5T2</b><br>Series |
|   | <b>P5L</b><br>Series  |
|   | <b>HB</b><br>Series   |
|   | <b>P5E</b><br>Series  |



**Symmetrical Pitch Torsional Loading**

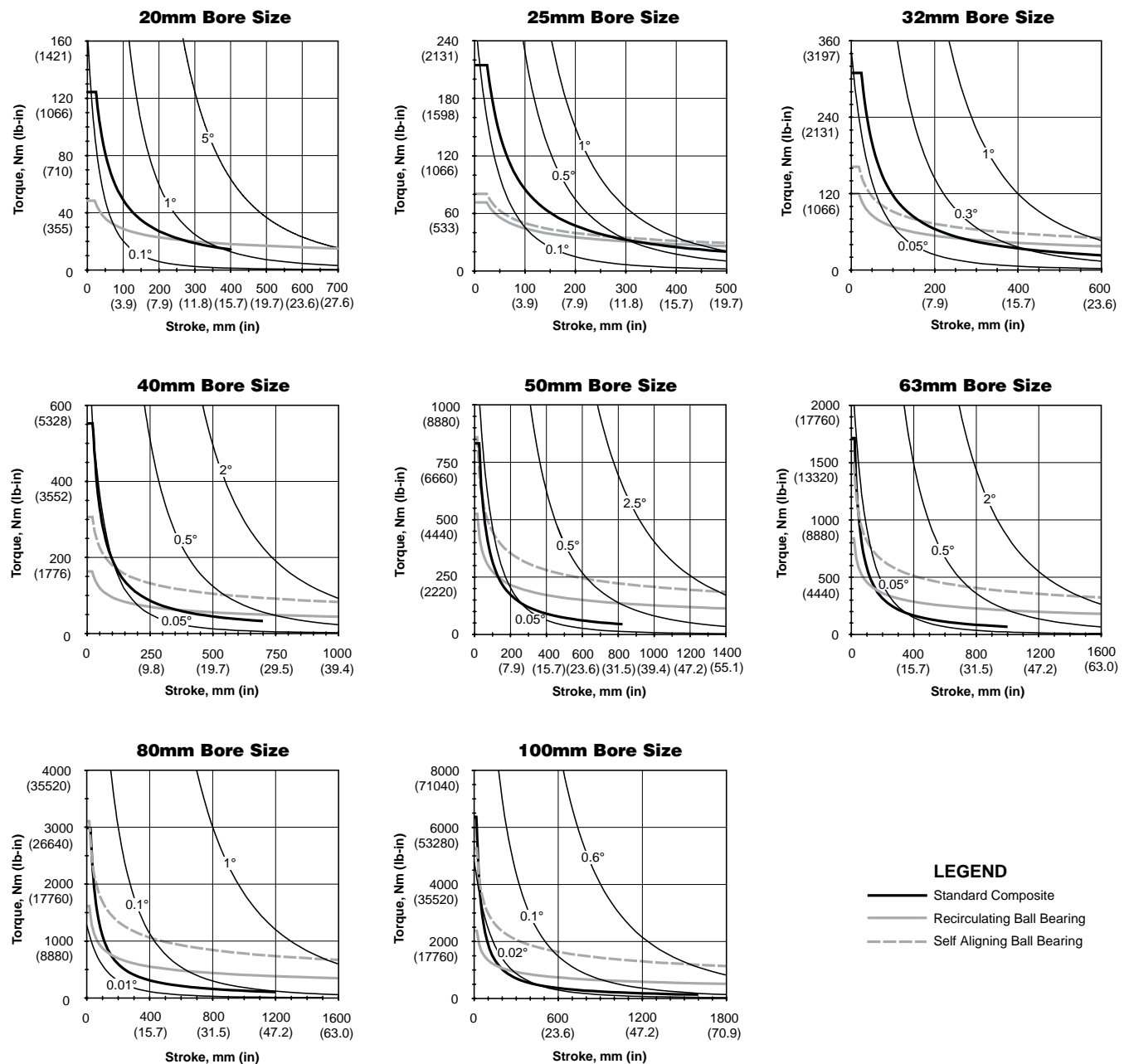
The graphs on the following two pages illustrate the maximum suggested pitch load at a given actuator stroke. It is assumed that the moment loading is acting about the centerline of the carriage. The graphs include the weight of the carriage and are based on a bearing life of 10 million cycles under a dynamic loading condition. Capacities are based on bearing and shafts only. Mounting bolts/hardware should be investigated per customer application. For an equivalent static load capacity multiply the information in these graphs by 1.5.

Heavy lines show loading; lighter lines show various degrees of deflection.

**Note:** The following variables commonly affect the bearing life of a guided cylinder:

- Velocity
- Vibration
- Orientation
- Environment (Dust, moisture, etc.)

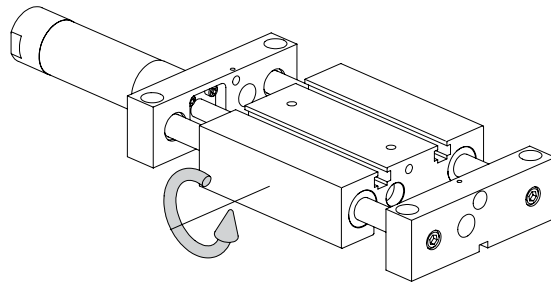
**Standard Shafting**



|             |                                       |
|-------------|---------------------------------------|
| <b>B</b>    | Guided Cylinders<br>Actuator Products |
|             | P5T Series                            |
| P5T2 Series |                                       |
| P5L Series  |                                       |
| HB Series   |                                       |
| P5E Series  |                                       |

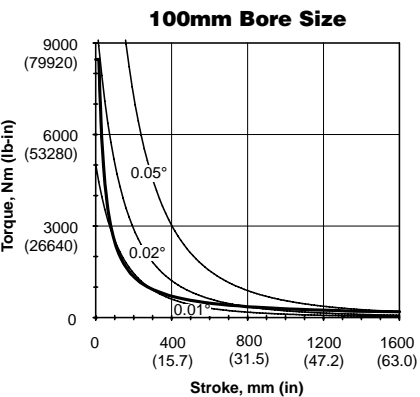
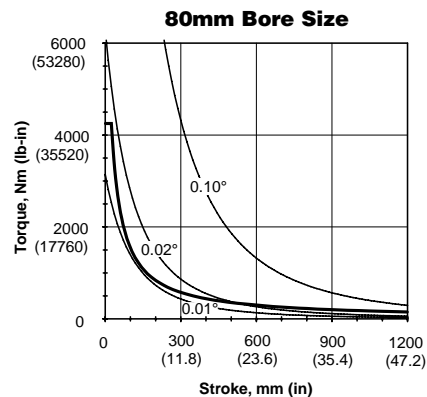
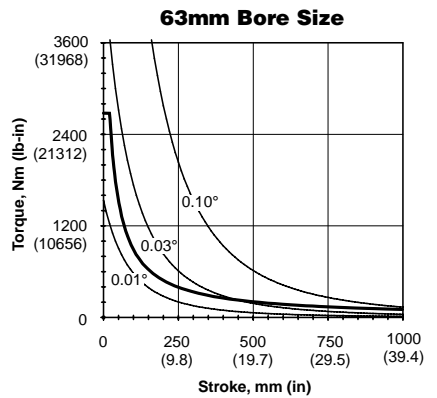
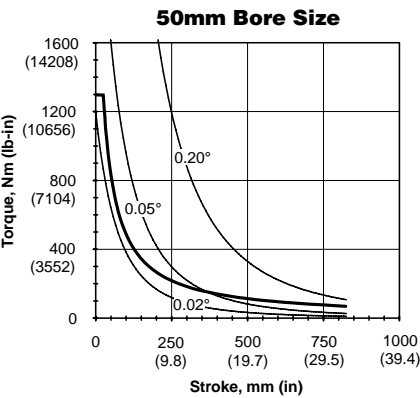
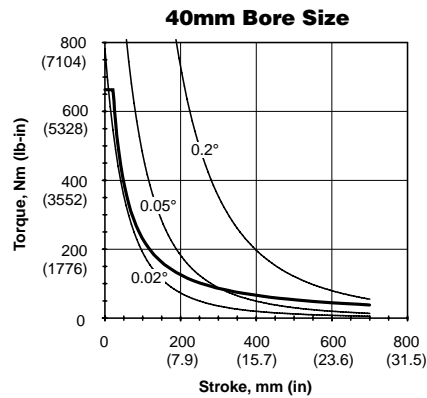
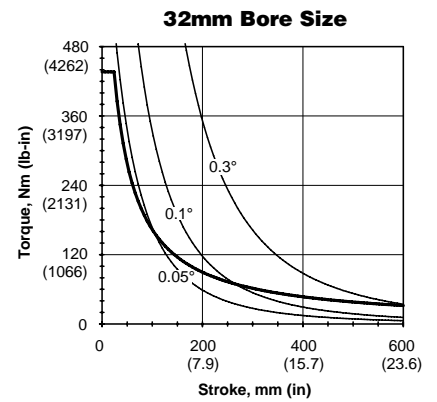
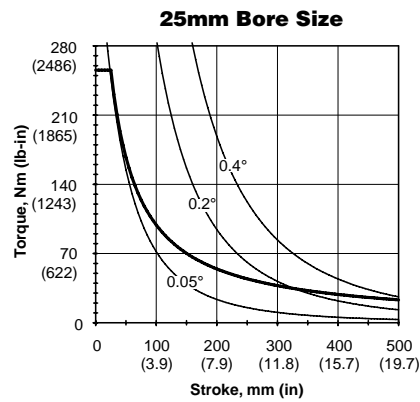
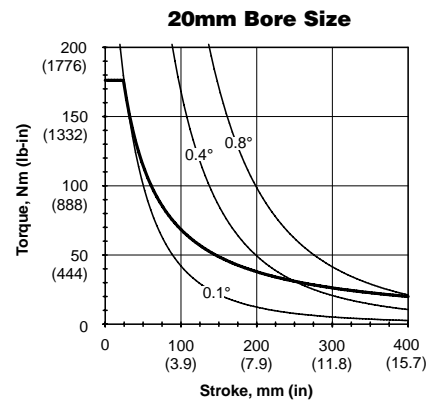


**Symmetrical Pitch Torsional Loading**



**Oversized Shafting**

|          |                   |
|----------|-------------------|
| <b>B</b> | Guided Cylinders  |
|          | Actuator Products |
| Series   | P5T               |
| Series   | P5T2              |
| Series   | P5L               |
| Series   | HB                |
| Series   | P5E               |



**Symmetrical Yaw Torsional Loading**

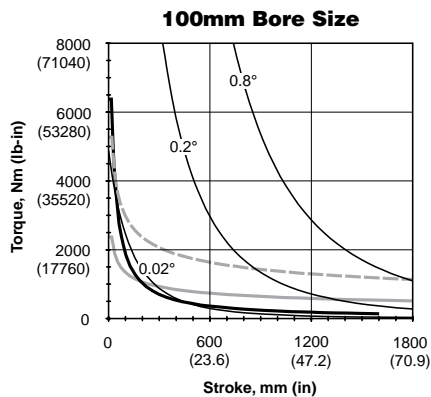
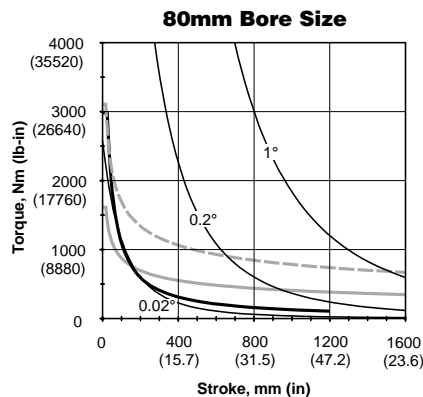
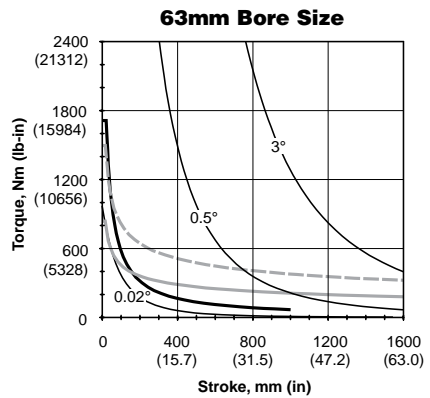
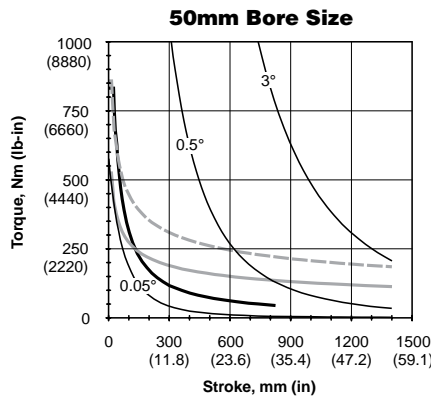
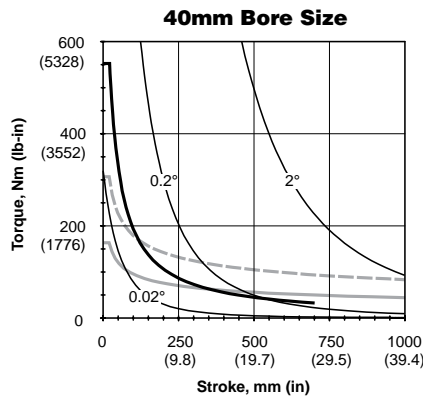
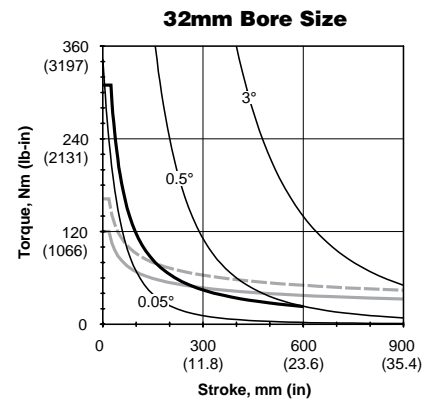
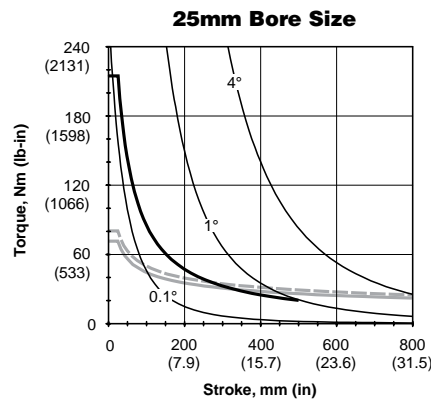
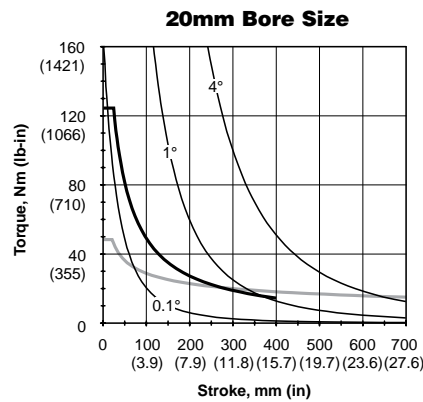
The graphs on the following two pages illustrate the maximum suggested yaw load at a given actuator stroke. It is assumed that the moment loading is acting about the centerline of the carriage. The graphs include the weight of the carriage and are based on a bearing life of 10 million cycles under a dynamic loading condition. Capacities are based on bearing and shafts only. Mounting bolts/hardware should be investigated per customer application. For an equivalent static load capacity multiply the information in these graphs by 1.5.

Heavy lines show loading; lighter lines show various degrees of deflection.

**Note:** The following variables commonly affect the bearing life of a guided cylinder:

- Velocity
- Vibration
- Orientation
- Environment (Dust, moisture, etc.)

**Standard Shafting**



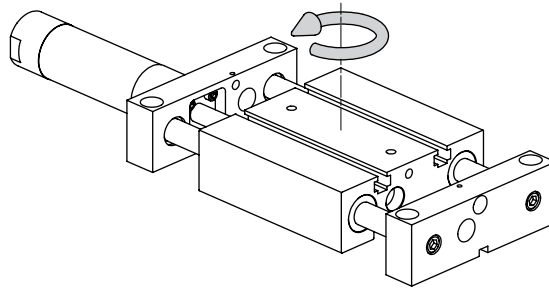
**LEGEND**

- Standard Composite
- Recirculating Ball Bearing
- - - Self Aligning Ball Bearing

|                |                                       |
|----------------|---------------------------------------|
| <b>B</b>       | Guided Cylinders<br>Actuator Products |
|                | P5T<br>Series                         |
| P5T2<br>Series |                                       |
| P5L<br>Series  |                                       |
| HB<br>Series   |                                       |
| P5E<br>Series  |                                       |

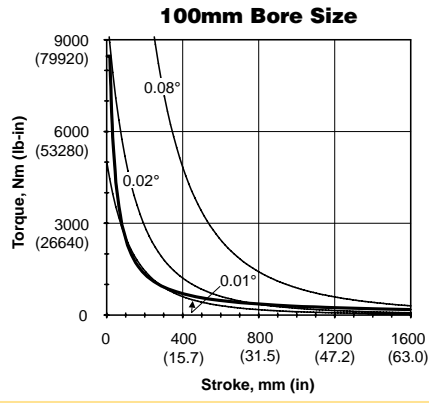
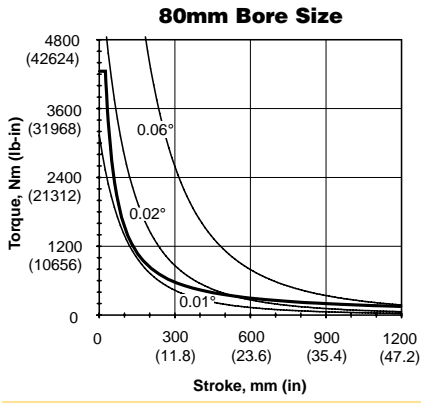
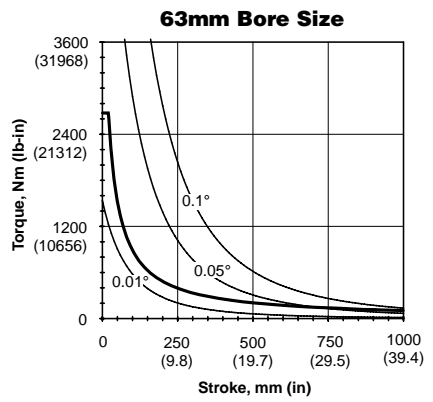
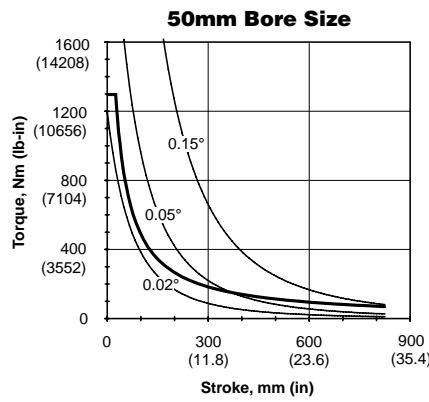
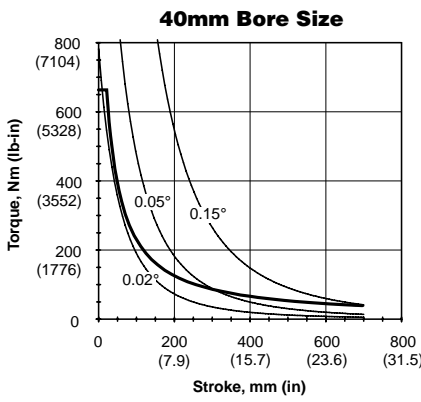
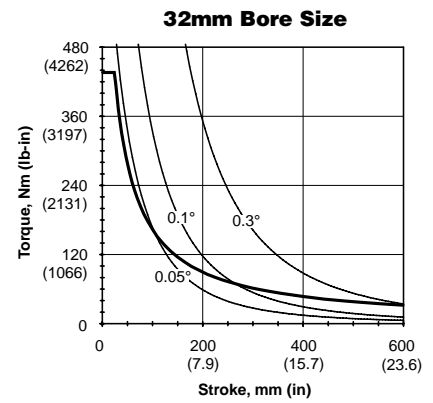
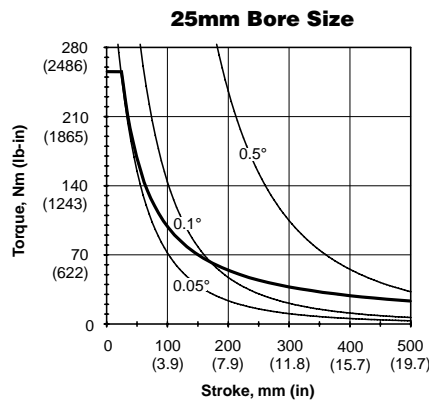
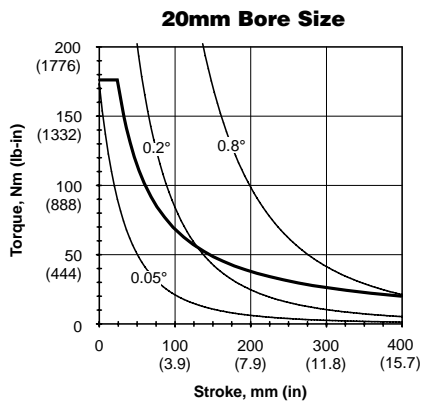


**Symmetrical Yaw Torsional Loading**



**Oversized Shafting**

|   |        |            |
|---|--------|------------|
| <b>B</b><br>Guided Cylinders<br>Actuator Products | Series | P5T        |
|   | Series | P5T2       |
|   | Series | <b>P5L</b> |
|   | Series | HB         |
|   | Series | P5E        |



- Medium duty to extremely heavy duty linear motion
- Powered by the 3MA or 4MA NFPA cylinder, with ISO options available
- Bore sizes 1-1/2", 2", and 2-1/2"
- Thrust, reach, and compact versions available
- Shock absorber, bumpers/stop collars, and proximity sensor options available



### Operating information

|                                  |          |   |
|----------------------------------|----------|---|
| Operating pressure:              | Maximum  | 100 PSIG (7 bar), air – 4MAJ cylinder<br>150 PSIG (10 bar), air – P1D cylinder<br>250 PSIG (17 bar), air – 3MA, 4MA and 2A cylinders<br>400 PSIG (28 bar), oil – 4ML cylinder only<br>750 PSIG (52 bar), oil – 3L cylinder only |
| Temperature range:               | Cylinder | Standard seals 0°F to 165°F (-18°C to 74°C)<br>Fluorocarbon seals* 0°F to 250°F (-18°C to 121°C)<br><br>* See fluorocarbon seal option for high temperature applications. Not available for 3MA or rod lock cylinders.          |
| Filtration requirements:         |          | 40 micron, dry filtered air   |
| For technical information see CD |          |   |

### Ordering information for HBC, HBT and HBR

|            |           |          |           |          |           |          |          |           |          |          |  |
|------------|-----------|----------|-----------|----------|-----------|----------|----------|-----------|----------|----------|--|
| <b>HBT</b> | <b>25</b> | <b>-</b> | <b>08</b> | <b>A</b> | <b>P1</b> | <b>T</b> | <b>F</b> | <b>4A</b> | <b>-</b> | <b>B</b> |  |
|------------|-----------|----------|-----------|----------|-----------|----------|----------|-----------|----------|----------|--|

| Series     |               |
|------------|---------------|
| <b>HBC</b> | Compact slide |
| <b>HBT</b> | Thrust slide  |
| <b>HBR</b> | Reach slide   |

| Stroke length   |  |
|---|--|
| Order in 1" increments. 4   |  |
| For 3-position units, specify intermediate and total stroke separated by a "/", i.e. 02/06. |  |
| Consult factory for strokes over 36".   |  |

| Bushings  |   |
|-----------|---|
| <b>T</b>  | Composite (standard)                      |
| <b>D</b>  | Linear ball bearing                       |
| <b>T1</b> | Composite with oversized support shafts   |
| <b>TC</b> | Composite with contaminant-tolerant seals |

| Design Series |                      |
|---------------|----------------------|
| <b>B</b>      | Current design level |

| Special Options   |          |
|---|----------|
| Blank   | standard |
| (Two digit code assigned by factory and applies when any "X" appears in the model number or when special options or features are required.) |          |

| Slide Configuration Options |   |
|-----------------------------|---|
| Blank                       | None  |
| <b>A</b>                    | Shock absorber, both ends                     |
| <b>A1</b>                   | Shock absorber, extend only                   |
| <b>A2</b>                   | Shock absorber, retract only                  |
| <b>A3</b>                   | Shock ready, both ends                        |
| <b>A4</b>                   | Shock ready, extend                           |
| <b>A5</b>                   | Shock ready, retract                          |
| <b>B</b>                    | Bumpers both ends 1                           |
| <b>B1</b>                   | Bumper & adjustable stop collar, extend only  |
| <b>B2</b>                   | Bumper retract only                           |
| <b>B3</b>                   | Bumper & adjustable stop collar, retract only |
| <b>B4</b>                   | Bumper & adjustable stop collar, both ends    |
| <b>C</b>                    | Cushions on cylinder, both ends 2             |
| <b>C1</b>                   | Cushion on cylinder, extend only 2            |
| <b>C2</b>                   | Cushion on cylinder, retract only 2           |
| <b>X</b>                    | Special slide configuration (please specify)  |

| Proximity Sensor Options |  |
|--------------------------|--|
| Blank                    | None   |
| <b>P</b>                 | PNP, flying lead type                            |
| <b>N</b>                 | NPN, flying lead type                            |
| <b>P1</b>                | PNP, plug-in connector                           |
| <b>N1</b>                | NPN, plug-in connector                           |
| <b>J</b>                 | 8mm sensor mounting bracket, no sensor supplied  |
| <b>J1</b>                | 12mm sensor mounting bracket, no sensor supplied |

Note: 8mm inductive proximity sensors are included with Options P, N, P1, N1. Magnetic piston is standard for 3MA, 4MA, 4MAJ, 4ML and P1D cylinders. Order reed and solid state sensors separately for these cylinders from the Electronic Sensors section.

| Cylinder Options |                               |
|------------------|-------------------------------|
| Blank            | None                          |
| <b>V</b>         | Fluorocarbon cylinder seals 3 |
| <b>L1</b>        | Left hand assembly            |
| <b>L3</b>        | Cylinder ports at position 3  |

| Other Options                         |                                  |
|---------------------------------------|----------------------------------|
| (More than one selection is possible) |                                  |
| Blank                                 | None                             |
| <b>F</b>                              | Flow controls (presto-lok)       |
| <b>G</b>                              | Flow controls (NPT)              |
| <b>K</b>                              | Stainless steel support shafting |

| Cylinder Type |  |
|---------------|--|
| <b>3A</b>     | 3MA NFPA air cylinder, NPTF ports 2  |
| <b>4A</b>     | 4MA NFPA air cylinder, NPTF ports  |
| <b>4J</b>     | 4MAJ NFPA air cylinder with manual override rodlock, NPTF ports, 100 PSIG max. |
| <b>D</b>      | P1D ISO cylinder w/ removable gland, BSPP ports                                |
| <b>D1</b>     | P1D ISO cylinder w/ removable gland, Standard Rodlock, BSPP ports              |
| <b>D2</b>     | P1D ISO cylinder w/ removable gland, manual override rodlock, BSPP ports       |
| <b>E</b>      | P1D ISO cylinder w/ removable gland, NPTF ports                                |
| <b>E1</b>     | P1D ISO cylinder w/ removable gland, standard rodlock, NPTF ports              |
| <b>E2</b>     | P1D ISO cylinder w/ removable gland, manual override rodlock, NPTF ports       |
| <b>4L</b>     | 4ML NFPA hydraulic cylinder, NPTF ports, 400 PSIG max. 2                       |
| <b>S</b>      | 2A NFPA steel air cylinder, 250 PSIG max.                                      |
| <b>S1</b>     | 3L NFPA steel hydraulic cylinder, 750 PSIG max.                                |
| <b>Q</b>      | No cylinder, NFPA cylinder mounting  |
| <b>Q1</b>     | No cylinder, ISO cylinder mounting   |
| <b>X</b>      | Special cylinder type (please specify)   |

**NOTES**

1 Option B includes options B1 and B2.

2 Cushions are not available with 4ML cylinders or 3MA cylinders on HB products.

3 Fluorocarbon seals not available with 3MA or rodlock cylinders.

4 P1D cylinders have strokes only in whole mm. The HB inch stroke will be changed (rounded up) to reflect this.

**Sensors**

For sensors see page B294.

**B**  
Guided Cylinders  
Actuator Products

P5T Series

P5T2 Series

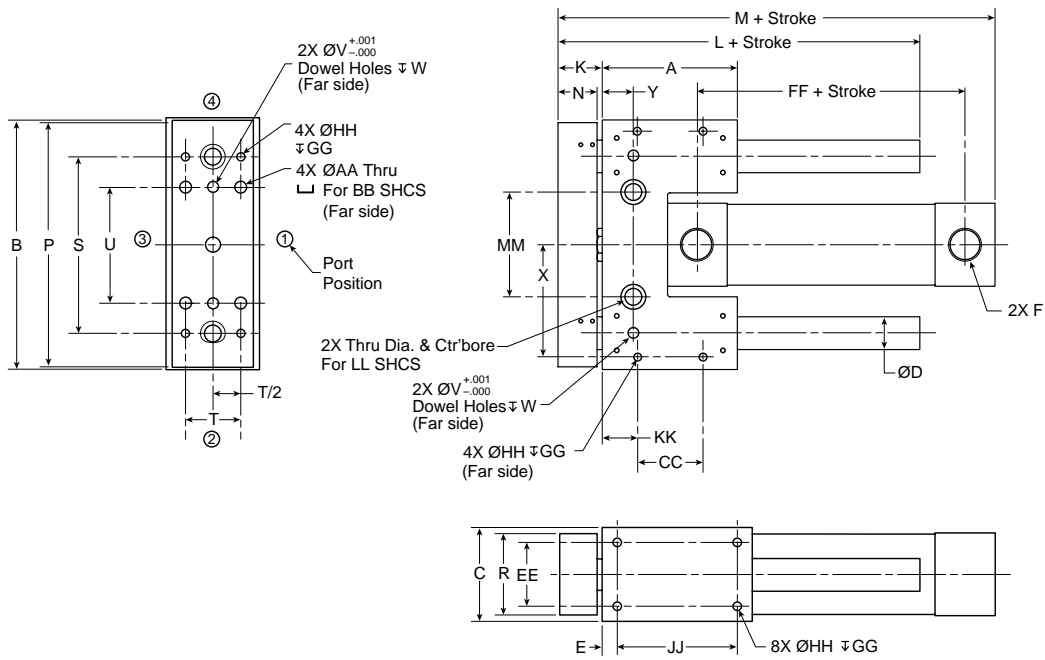
P5L Series

HB Series

P5E Series



**HBC Series**



**B**  
**Guided Cylinders**  
**Actuator Products**

**P5T**  
**Series**

**P5T2**  
**Series**

**P5L**  
**Series**

**HB**  
**Series**

**P5E**  
**Series**

| Model number    | A    | B    | C    | Ds*         | Do**        | E     | F NPTF           | F BSPP | K    | L    | M    | N    | P    | R    | S     | T     | U     |
|-----------------|------|------|------|-------------|-------------|-------|------------------|--------|------|------|------|------|------|------|-------|-------|-------|
| 15 <sup>1</sup> | 3.25 | 6.00 | 2.25 | 20mm (0.79) | 25mm (0.98) | 0.375 | 1/4 <sup>1</sup> | 1/4    | 1.06 | 5.19 | 6.26 | 0.94 | 5.88 | 1.94 | 4.250 | 1.375 | 2.750 |
| 20              | 4.00 | 7.25 | 2.75 | 25mm (0.98) | 30mm (1.18) | 0.500 | 3/8              | 1/4    | 1.31 | 6.39 | 7.00 | 1.19 | 7.13 | 2.44 | 5.000 | 1.750 | 3.250 |
| 25              | 5.00 | 9.00 | 3.25 | 30mm (1.18) | 35mm (1.38) | 0.500 | 3/8              | 3/8    | 1.56 | 7.82 | 8.38 | 1.44 | 8.88 | 2.88 | 6.500 | 2.000 | 3.750 |

| Model number    | V     | W    | X     | Y     | AA   | BB   | CC    | EE    | FF   | GG   | HH      | JJ   | KK   | LL  | MM    |
|-----------------|-------|------|-------|-------|------|------|-------|-------|------|------|---------|------|------|-----|-------|
| 15 <sup>1</sup> | 0.251 | 0.27 | 2.750 | 0.750 | 0.28 | 1/4  | 1.750 | 1.500 | 2.31 | 0.50 | 1/4-20  | 2.50 | 0.75 | 3/8 | 2.500 |
| 20              | 0.313 | 0.33 | 3.250 | 0.750 | 0.34 | 5/16 | 2.250 | 1.750 | 2.31 | 0.63 | 5/16-18 | 3.00 | 0.88 | 3/8 | 3.000 |
| 25              | 0.376 | 0.39 | 4.000 | 1.532 | 0.41 | 3/8  | 3.000 | 2.250 | 2.38 | 0.75 | 3/8-16  | 4.00 | 1.00 | 1/2 | 4.000 |

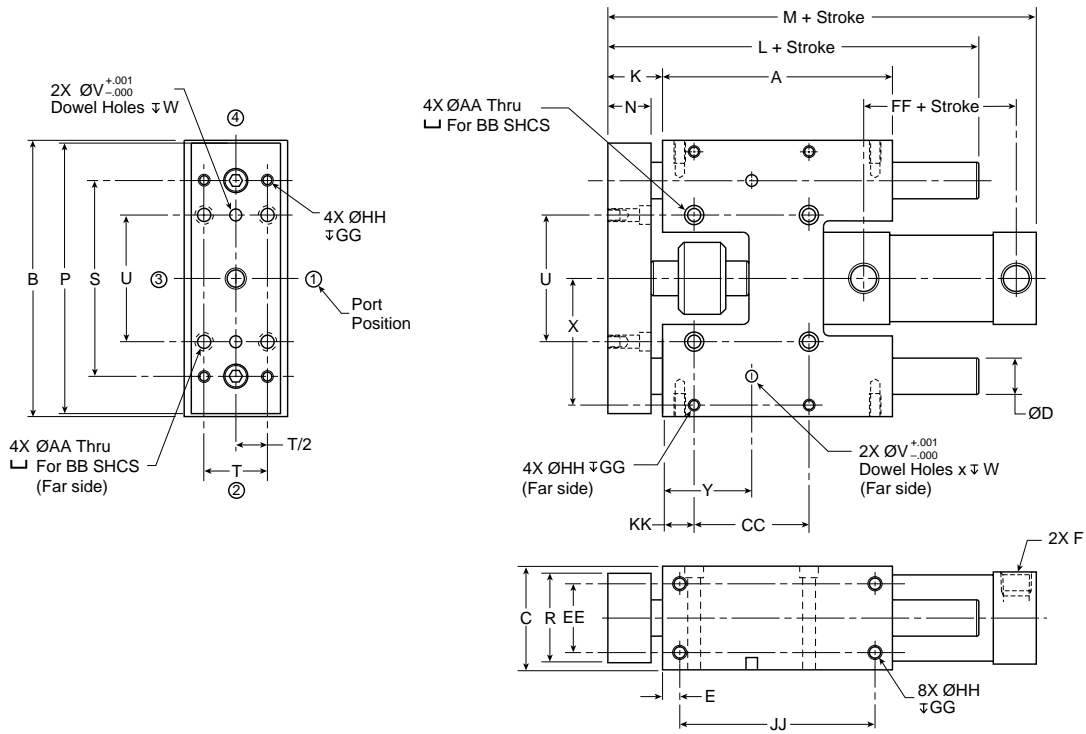
\* Standard shafting  
 \*\* Oversized shafting  
<sup>1</sup> Model 15 with Cylinder Type 3A (3MA cylinder) has 3/8" NPTF ports.

All dimensions in inches unless otherwise noted.





**HBT Series**



| Model number | A   | B    | C    | Ds*         | Do**        | E     | F NPTF | F BSPP | K    | L    | M     | N    | P    | R    | S     | T     |
|--------------|-----|------|------|-------------|-------------|-------|--------|--------|------|------|-------|------|------|------|-------|-------|
| 15           | 5.0 | 6.00 | 2.25 | 20mm (0.79) | 25mm (0.98) | 0.375 | 1/4 1  | 1/4    | 1.06 | 6.94 | 8.19  | 0.94 | 5.88 | 1.94 | 4.250 | 1.375 |
| 20           | 5.5 | 7.25 | 2.75 | 25mm (0.98) | 30mm (1.18) | 0.500 | 3/8    | 1/4    | 1.31 | 7.88 | 8.94  | 1.19 | 7.13 | 2.44 | 5.000 | 1.750 |
| 25           | 6.5 | 9.00 | 3.25 | 30mm (1.18) | 35mm (1.38) | 0.500 | 3/8    | 3/8    | 1.56 | 9.31 | 10.31 | 1.44 | 8.88 | 2.88 | 6.500 | 2.000 |

| Model number | U     | V     | W    | X     | Y     | AA   | BB   | CC    | EE    | FF   | GG   | HH      | JJ   | KK   |
|--------------|-------|-------|------|-------|-------|------|------|-------|-------|------|------|---------|------|------|
| 15           | 2.750 | 0.251 | 0.27 | 2.750 | 1.938 | 0.28 | 1/4  | 2.500 | 1.500 | 2.31 | 0.50 | 1/4-20  | 4.25 | 0.69 |
| 20           | 3.250 | 0.313 | 0.33 | 3.250 | 2.250 | 0.34 | 5/16 | 2.750 | 1.750 | 2.31 | 0.63 | 5/16-18 | 4.50 | 0.88 |
| 25           | 3.750 | 0.376 | 0.39 | 4.000 | 2.750 | 0.41 | 3/8  | 3.500 | 2.250 | 2.38 | 0.75 | 3/8-16  | 5.50 | 1.00 |

\* Standard shafting  
 \*\* Oversized shafting  
 1 Model 15 with Cylinder Type 3A (3MA cylinder) has 3/8" NPTF ports.

All dimensions in inches unless otherwise noted.

**B**

Guided Cylinders  
Actuator Products

---

P5T  
Series

---

P5T2  
Series

---

P5L  
Series

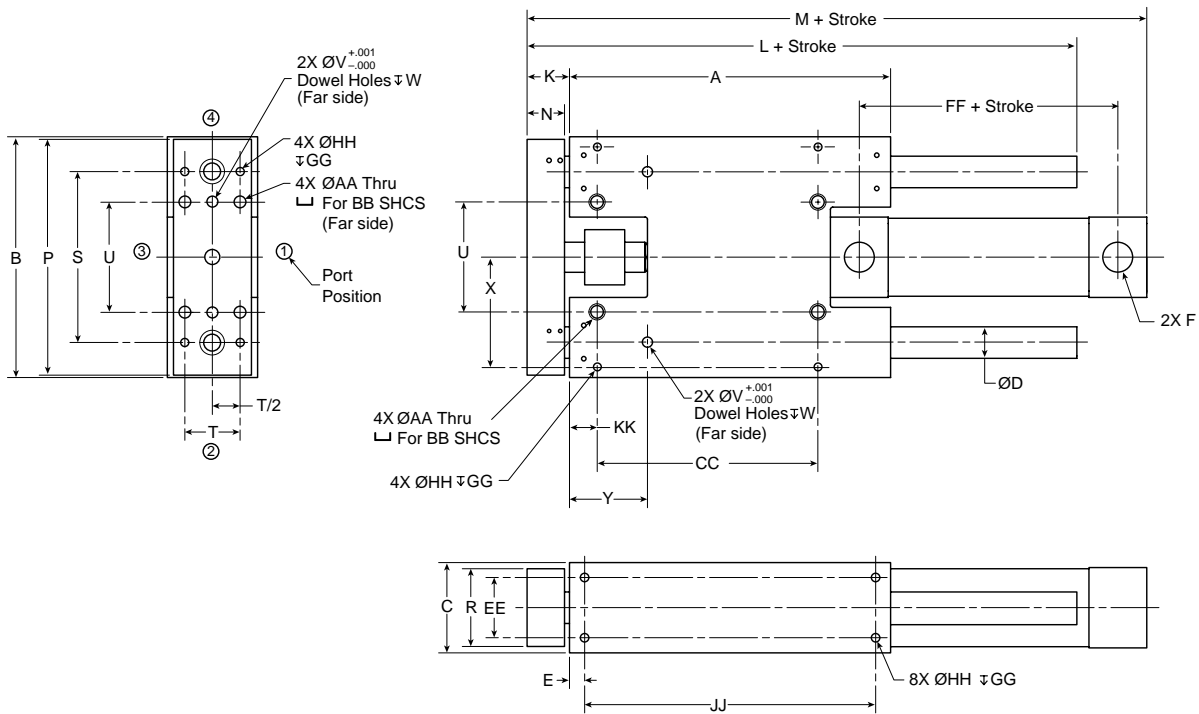
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HB  
Series

---

P5E  
Series

**HBR Series**



**B**  
**Guided Cylinders**  
**Actuator Products**

**P5T**  
**Series**

**P5T2**  
**Series**

**P5L**  
**Series**

**HB**  
**Series**

**P5E**  
**Series**

| Model number | A     | B    | C    | Ds*         | Do**        | E     | F NPTF | F BSPP | K    | L     | M     | N    | P    | R    | S     | T     |
|--------------|-------|------|------|-------------|-------------|-------|--------|--------|------|-------|-------|------|------|------|-------|-------|
| 15           | 8.00  | 6.00 | 2.25 | 20mm (0.79) | 25mm (0.98) | 0.375 | 1/4 1  | 1/4    | 1.06 | 9.94  | 11.19 | 0.94 | 5.88 | 1.94 | 4.250 | 1.375 |
| 20           | 10.00 | 7.25 | 2.75 | 25mm (0.98) | 30mm (1.18) | 0.500 | 3/8    | 1/4    | 1.31 | 12.39 | 13.44 | 1.19 | 7.13 | 2.44 | 5.000 | 1.750 |
| 25           | 12.00 | 9.00 | 3.25 | 30mm (1.18) | 35mm (1.38) | 0.500 | 3/8    | 3/8    | 1.56 | 14.82 | 15.82 | 1.44 | 8.88 | 2.88 | 6.500 | 2.000 |

| Model number | U     | V     | W    | X     | Y     | AA   | BB   | CC    | EE    | FF   | GG   | HH      | JJ    | KK   |
|--------------|-------|-------|------|-------|-------|------|------|-------|-------|------|------|---------|-------|------|
| 15           | 2.750 | 0.251 | 0.27 | 2.750 | 1.938 | 0.28 | 1/4  | 5.500 | 1.500 | 2.31 | 0.50 | 1/4-20  | 7.25  | 0.69 |
| 20           | 3.250 | 0.313 | 0.33 | 3.250 | 2.250 | 0.34 | 5/16 | 7.250 | 1.750 | 2.31 | 0.63 | 5/16-18 | 9.00  | 0.88 |
| 25           | 3.750 | 0.376 | 0.39 | 4.000 | 2.760 | 0.41 | 3/8  | 9.000 | 2.250 | 2.38 | 0.75 | 3/8-16  | 11.00 | 1.00 |

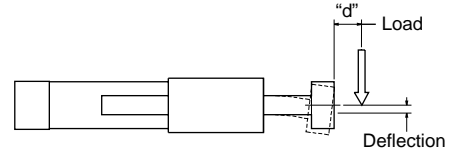
\* Standard shafting  
\*\* Oversized shafting  
1 Model 15 with Cylinder Type 3A (3MA cylinder) has 3/8" NPTF ports.

All dimensions in inches unless otherwise noted.



**Horizontal Load Capacity & Deflection with Standard Shafting**

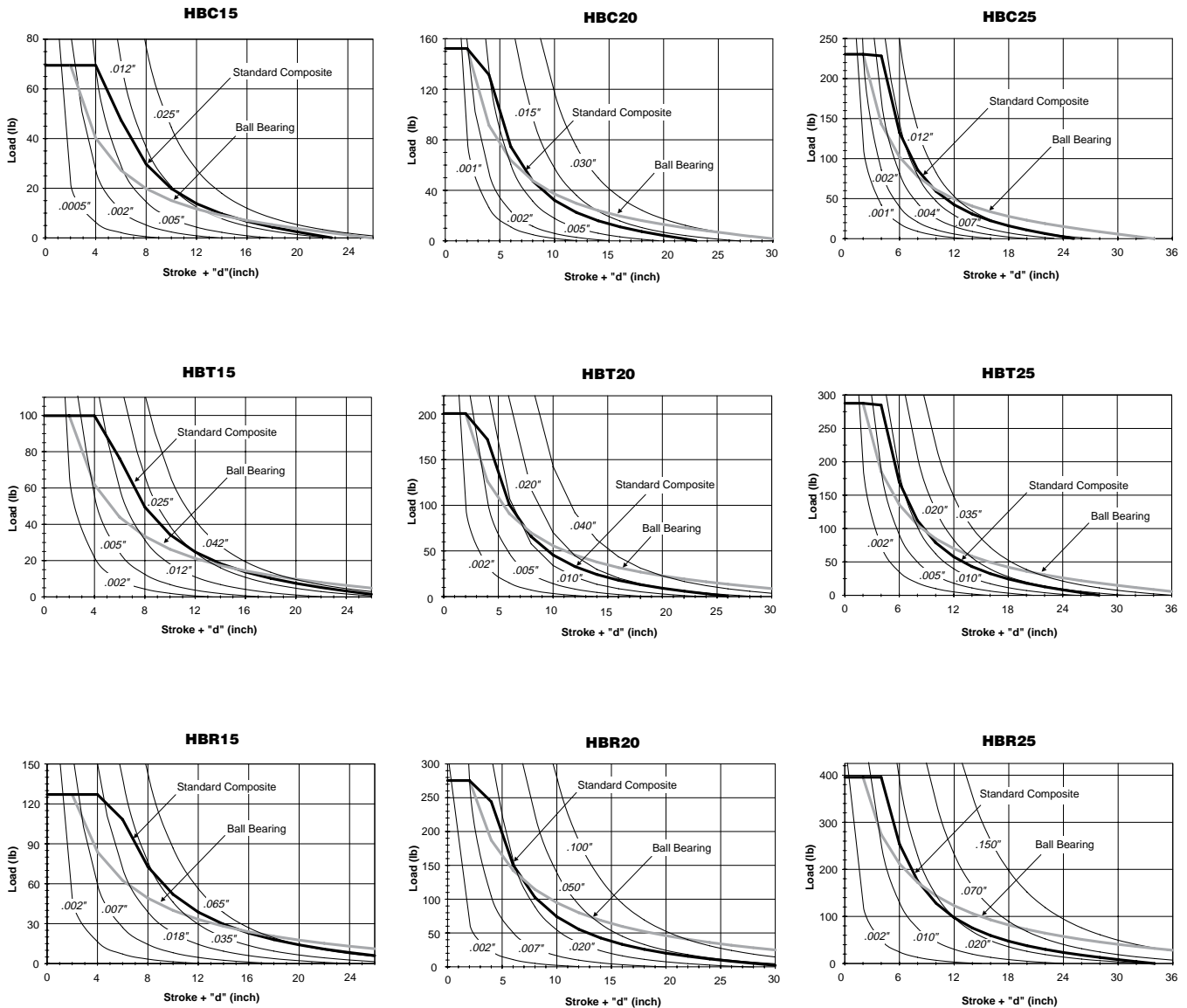
The graphs illustrate the side load vs. actuator stroke for the three HB slide sizes. Applied loads will cause a slight deflection of the support rods. The graphs include the weight of the support rods and tooling plate and are based on a bearing life equivalent to 10 million cycles for dynamic conditions. Higher dynamic loads will reduce cycle life. For static loads, multiply the information in the graph by 1.5.



**Note:** Actuator life may vary depending on the severity of the following variables:

- Acceleration
- Velocity
- Vibration
- Orientation

**EXAMPLE:**  
 An HBT15 with ball bearings and a "stroke+d" of 12" would have a load capacity of 20 lbs.

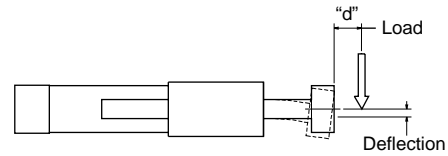


|               |                                       |
|---------------|---------------------------------------|
| <b>B</b>      | Guided Cylinders<br>Actuator Products |
|               | P5T<br>Series                         |
|               | P5T2<br>Series                        |
| P5L<br>Series |                                       |
| HB<br>Series  |                                       |
| P5E<br>Series |                                       |



**Horizontal Load Capacity & Deflection with Oversized Shafting**

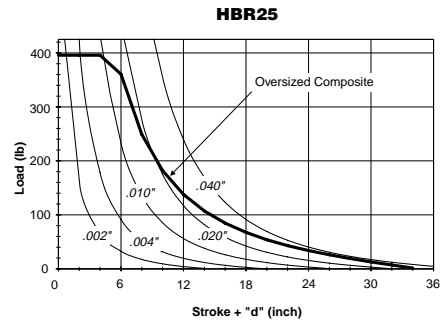
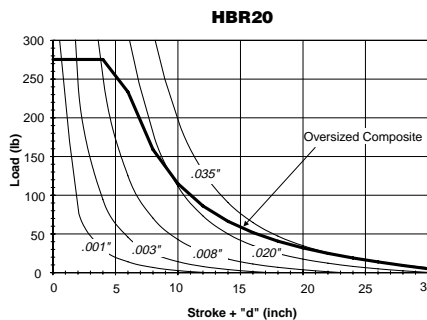
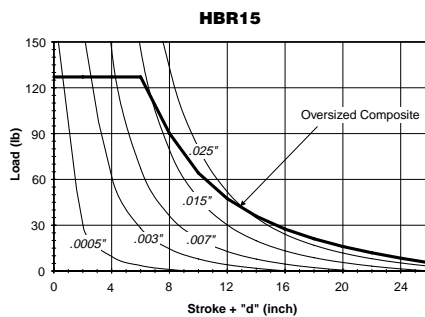
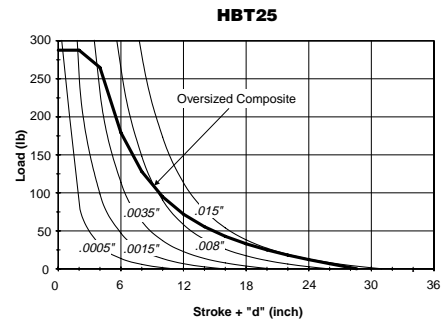
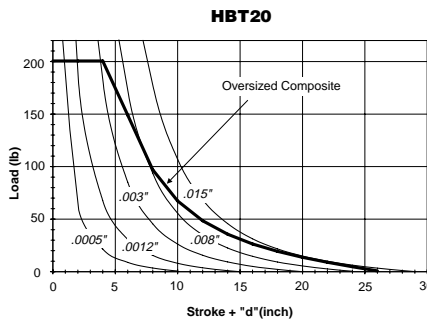
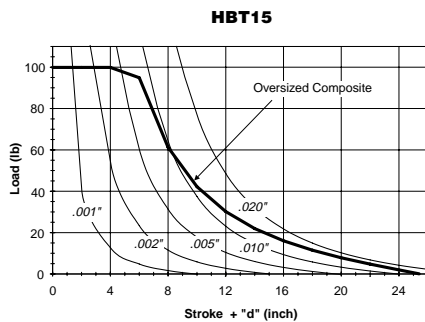
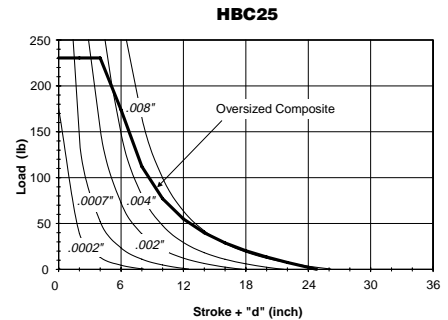
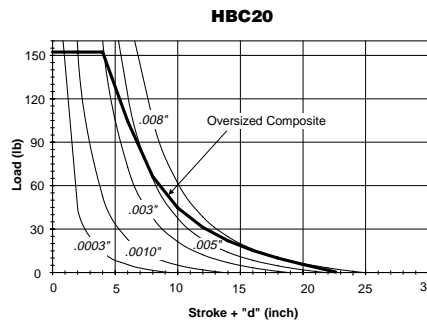
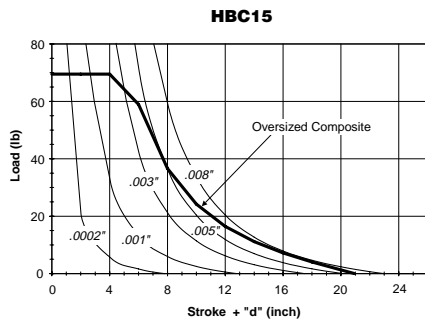
The graphs illustrate the side load vs. actuator stroke for the three HB slide sizes. Applied loads will cause a slight deflection of the support rods. Deflection distance is also shown. The graphs include the weight of the support rods and tooling plate and are based on a bearing life equivalent to 10 million cycles for dynamic conditions. Higher dynamic loads will reduce cycle life. For static loads, multiply the information in the graph by 1.5.



**Note:** Actuator life may vary depending on the severity of the following variables:

- Acceleration
- Velocity
- Vibration
- Orientation

**EXAMPLE:**  
 An HBT15 with oversized composite bushings and a "stroke+d" of 8" would have a load capacity of 60 lbs.



|          |                   |
|----------|-------------------|
| <b>B</b> | Guided Cylinders  |
|          | Actuator Products |
| Series   | P5T               |
| Series   | P5T2              |
| Series   | P5L               |
| Series   | HB                |
| Series   | P5E               |



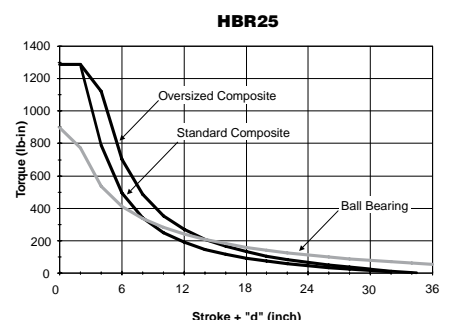
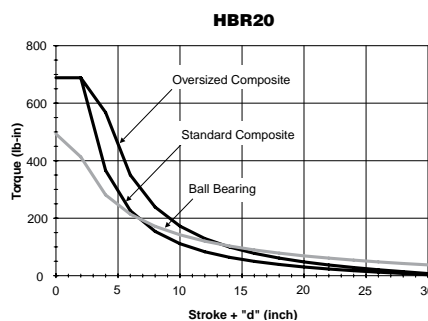
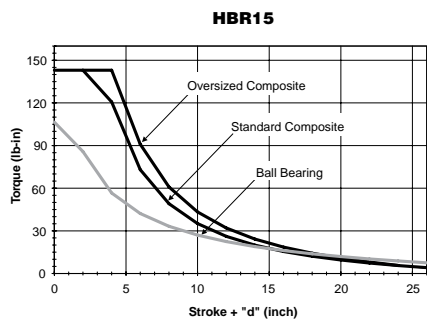
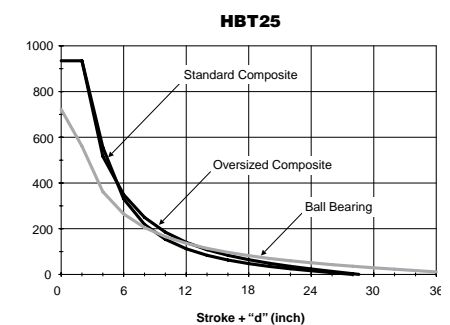
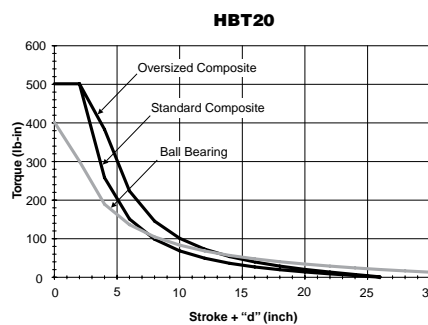
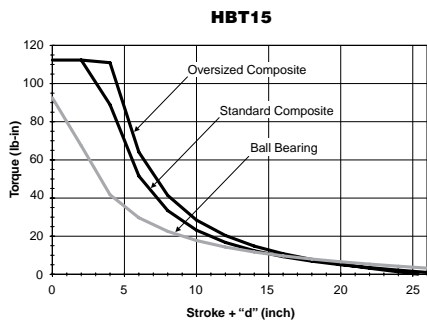
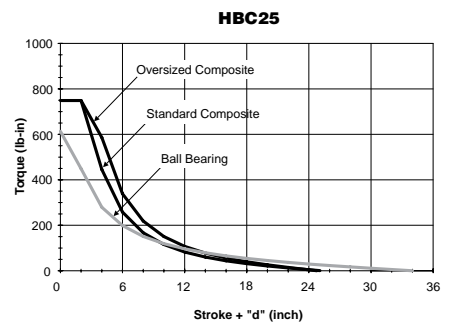
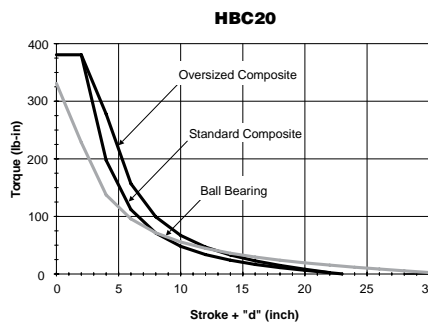
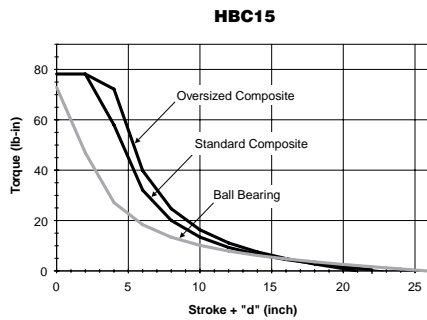
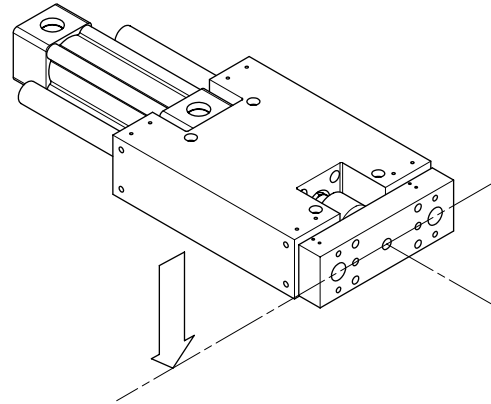
### Asymmetrical Torque Capacity

Asymmetrical loading occurs when the load is applied to one side of the unit. HB Series units can resist torsional loads that are asymmetrical. The graphs show torsional load capacity for both standard and oversized shafting under dynamic conditions. For static applications, multiply the information in the graphs by 1.5. The vertical load for HBN does not include the weight of the tool plate and support rods.

**Note:** Actuator life may vary depending on the severity of the following variables:

- Acceleration
- Velocity
- Vibration
- Orientation

### Torsional Load



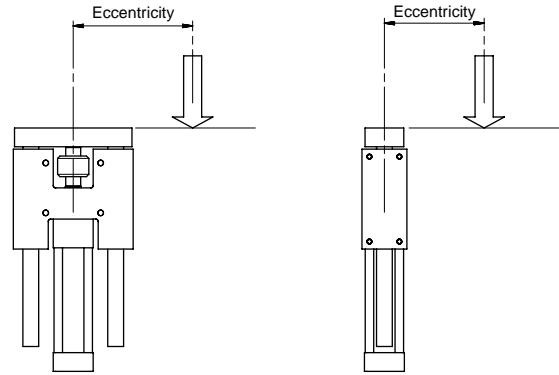
|             |                                       |
|-------------|---------------------------------------|
| <b>B</b>    | Guided Cylinders<br>Actuator Products |
|             | P5T Series                            |
| P5T2 Series |                                       |
| P5L Series  |                                       |
| HB Series   |                                       |
| P5E Series  |                                       |

**Vertical Eccentric Load Capacity**

HB Series units mounted vertically will have the same eccentric load capacity regardless of orientation. The graphs provide maximum load capacity for an eccentric mounted load on a 4" stroke cylinder. The load is assumed to be mounted at the face of the tooling plate.

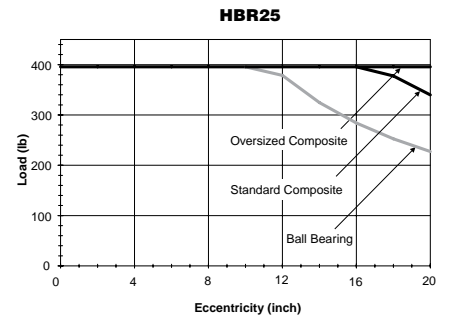
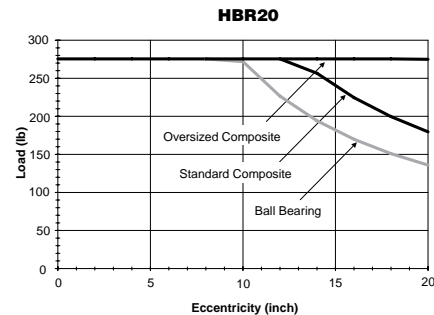
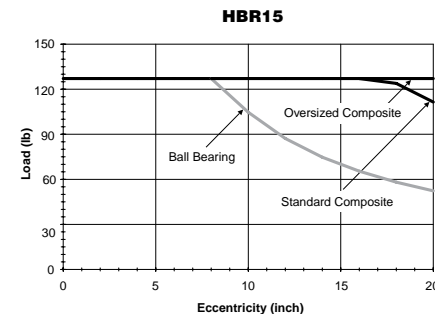
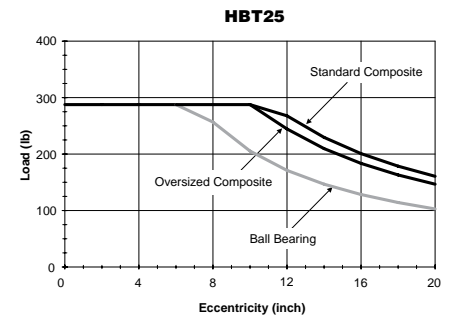
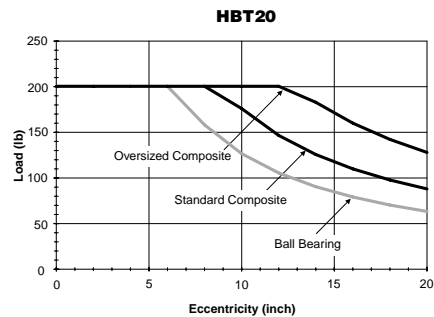
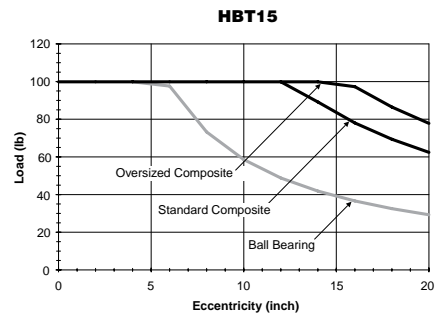
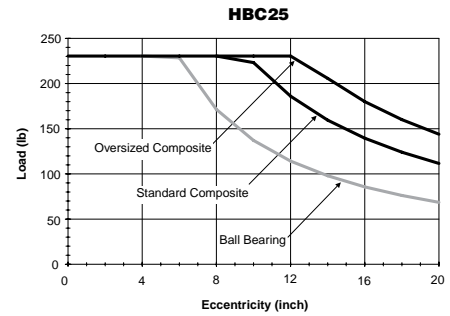
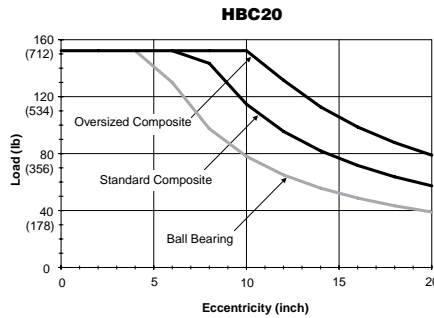
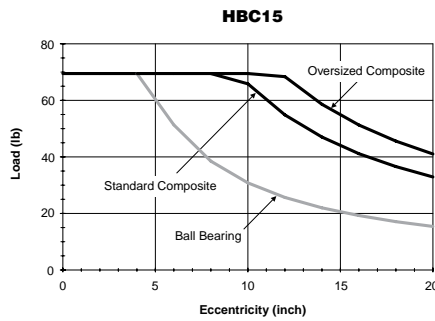
**Note:** Actuator life may vary depending on the severity of the following variables:

- Acceleration
- Velocity
- Vibration



**EXAMPLE:**

An HBT15 with ball bearings carrying an eccentric load with an eccentricity distance of 15" would have a load capacity of 40 lbs.



|          |                   |
|----------|-------------------|
| <b>B</b> | Guided Cylinders  |
|          | Actuator Products |
| P5T      | Series            |
| P5T2     | Series            |
| P5L      | Series            |
| HB       | Series            |
| P5E      | Series            |

- Low profile guided assembly
- Powered by the P1D cylinder
- Bore sizes 32, 40, 50, 63, 80 and 100mm
- Strokes to any practical length
- Rod lock options available
- Composite and ball bearing options available



### Operating information

Operating pressure: 145 PSIG (10 bar) maximum  
 Temperature range: 14°F to 165°F (-10°C to 74°C)  
 Filtration requirements: 40 micron, dry filtered air  
 For technical information see CD

### Ordering information

**P5E - J 032 F G N 0250**

| Shaft / bearing type |  |
|----------------------|--|
| <b>J</b>             | Composite bearing, chrome plated standard shaft              |
| <b>M</b>             | Composite bearing, chrome plated oversize shaft <sup>1</sup> |
| <b>C</b>             | Composite bearing, stainless steel shaft                     |
| <b>H</b>             | Ball bearing, stainless steel shaft                          |

| Bore size  |       |
|------------|-------|
| <b>032</b> | 32mm  |
| <b>040</b> | 40mm  |
| <b>050</b> | 50mm  |
| <b>063</b> | 63mm  |
| <b>080</b> | 80mm  |
| <b>100</b> | 100mm |

| Stroke length                                       |  |
|---|--|
| Specify whole millimeters, i.e. 0250 = 250mm stroke |  |

| Bumpers / Adjustable Stop Collars |   |
|-----------------------------------|---|
| <b>N</b>                          | None  |
| <b>B</b>                          | Bumpers, retract only <sup>2</sup>                                |
| <b>E</b>                          | Bumpers and adjustable stop collars, extend only                  |
| <b>T</b>                          | Bumpers both ends, adjustable stop collars on extend <sup>2</sup> |
| <b>R</b>                          | Bumpers and adjustable stop collars on retract <sup>2</sup>       |
| <b>S</b>                          | Bumpers and adjustable stop collars both ends <sup>2</sup>        |

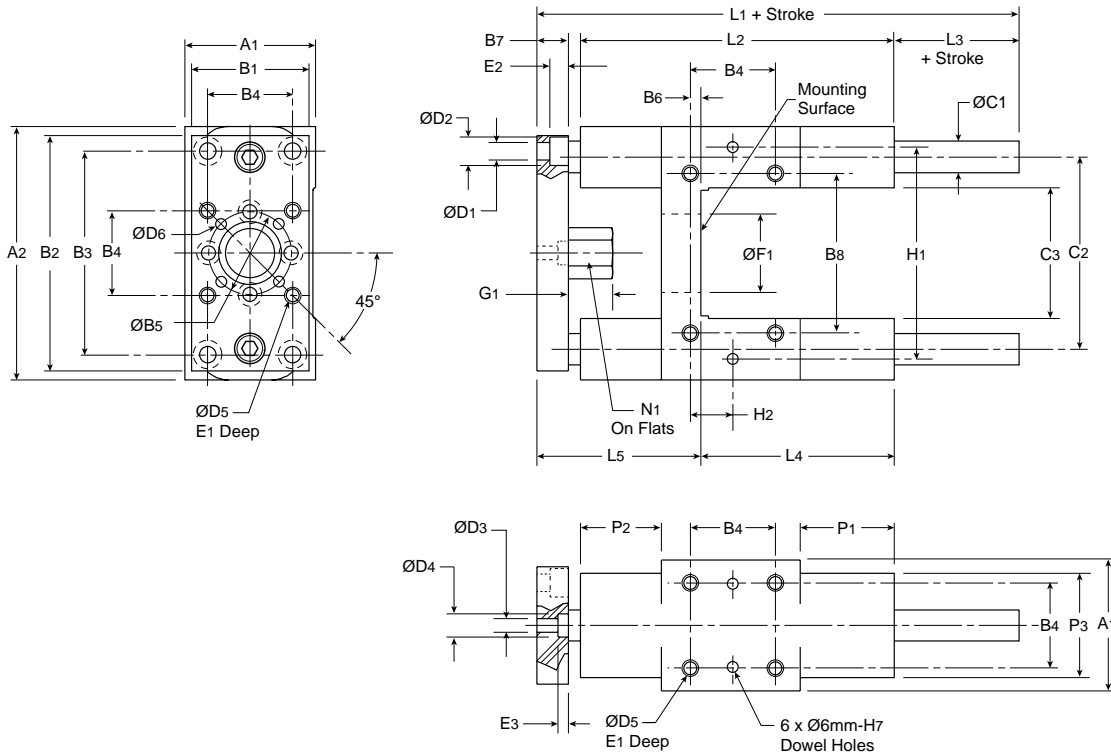
| Cylinder type <sup>3</sup> |   |
|----------------------------|---|
| <b>F</b>                   | P1D removable gland cylinder                        |
| <b>G</b>                   | P1D removable gland cylinder with cushions          |
| <b>K</b>                   | P1D rod lock cylinder with cushions                 |
| <b>S</b>                   | P1D manual override rod lock cylinder with cushions |
| <b>Q</b>                   | No cylinder   |
| <b>X</b>                   | Special – please specify                            |

| Port Style |   |
|------------|---|
| <b>H</b>   | NPTF (std)                                      |
| <b>G</b>   | BSPP  |
| <b>N</b>   | NPTF with flow controls (std. female ports)     |
| <b>B</b>   | BSPP with flow controls (ISO female ports)      |
| <b>F</b>   | Flow controls, NPTF port, prestolok tube (inch) |
| <b>P</b>   | Flow controls, BSPP port, prestolok tube (mm)   |

<sup>1</sup> Bumpers and adjustable stop collars are not available with oversize shaft option.  
<sup>2</sup> These options will increase the cylinder length. To achieve a specific usable stroke length with these options, add the corresponding value(s) in the adder table, please reference catalog 0900P-E, page F156 to the desired stroke length. See Bumper Options for explanation.  
 Adders are not used when P1D Rod Lock (K) or P1D Manual Override Rod Lock (S) are specified with bumpers.  
<sup>3</sup> Tie Rod Version or composite piston option must be specified as Special (X).

**Sensors**  
 For sensors see page B294.

|      |                                       |
|------|---------------------------------------|
| B    | Guided Cylinders<br>Actuator Products |
| P5T  | Series                                |
| P5T2 | Series                                |
| P5L  | Series                                |
| HB   | Series                                |
| P5E  | Series                                |



**Metric (inch)**

| Bore size | Metric        |               |                |               |               |                |                |                |                |               | ØC1 std.     |              | ØC1 O.S.        |               | Metric        |              |               |              |            |             |  |  |  |  |
|-----------|---------------|---------------|----------------|---------------|---------------|----------------|----------------|----------------|----------------|---------------|--------------|--------------|-----------------|---------------|---------------|--------------|---------------|--------------|------------|-------------|--|--|--|--|
|           | A1            | A2            | B1             | B2            | B3            | B4             | ØB5            | B6             | B7             | B8            | ØC1          | ØC1          | C2              | C3            | ØD1           | ØD2          | ØD3           | ØD4          | ØD5        | ØD6         |  |  |  |  |
| 32        | 50<br>(1.97)  | 97<br>(3.82)  | 45<br>(1.77)   | 92<br>(3.62)  | 78<br>(3.07)  | 32.5<br>(1.28) | 31.5<br>(1.24) | 4<br>(0.16)    | 12.7<br>(0.50) | 61<br>(2.40)  | 12<br>(0.47) | 16<br>(0.63) | 73.5<br>(2.89)  | 50<br>(1.97)  | 6.6<br>(0.26) | 11<br>(0.43) | 5.2<br>(0.20) | 9<br>(0.35)  | M6 x 1.00  | 4<br>(0.16) |  |  |  |  |
| 40        | 58<br>(2.28)  | 115<br>(4.53) | 50.8<br>(2.00) | 110<br>(4.33) | 84<br>(3.31)  | 38<br>(1.50)   | 31.5<br>(1.24) | 11<br>(0.43)   | 12.7<br>(0.50) | 69<br>(2.72)  | 16<br>(0.63) | 20<br>(0.79) | 86.5<br>(3.41)  | 58<br>(2.28)  | 6.6<br>(0.26) | 11<br>(0.43) | 5.2<br>(0.20) | 9<br>(0.35)  | M6 x 1.00  | 4<br>(0.16) |  |  |  |  |
| 50        | 70<br>(2.76)  | 137<br>(5.39) | 63<br>(2.48)   | 132<br>(5.20) | 100<br>(3.94) | 46.5<br>(1.83) | 50<br>(1.97)   | 19<br>(0.75)   | 16<br>(0.63)   | 85<br>(3.35)  | 20<br>(0.79) | 25<br>(0.98) | 103.5<br>(4.07) | 70<br>(2.76)  | 9<br>(0.35)   | 14<br>(0.55) | 6.4<br>(0.25) | 11<br>(0.43) | M8 x 1.25  | 4<br>(0.16) |  |  |  |  |
| 63        | 85<br>(3.35)  | 152<br>(5.98) | 82.5<br>(3.25) | 145<br>(5.71) | 105<br>(4.13) | 56.5<br>(2.24) | 50<br>(1.97)   | 15<br>(0.59)   | 16<br>(0.63)   | 100<br>(3.94) | 20<br>(0.79) | 25<br>(0.98) | 118.5<br>(4.67) | 85<br>(3.35)  | 9<br>(0.35)   | 14<br>(0.55) | 6.4<br>(0.25) | 11<br>(0.43) | M8 x 1.25  | 4<br>(0.16) |  |  |  |  |
| 80        | 105<br>(4.13) | 189<br>(7.44) | 100<br>(3.94)  | 180<br>(7.09) | 130<br>(5.12) | 72<br>(2.83)   | 76<br>(2.99)   | 21<br>(0.83)   | 19<br>(0.75)   | 130<br>(5.12) | 25<br>(0.98) | 30<br>(1.18) | 147<br>(5.79)   | 105<br>(4.13) | 11<br>(0.43)  | 17<br>(0.67) | 8.4<br>(0.33) | 14<br>(0.55) | M10 x 1.50 | 6<br>(0.24) |  |  |  |  |
| 100       | 130<br>(5.12) | 213<br>(8.39) | 120<br>(4.72)  | 200<br>(7.87) | 150<br>(5.91) | 89<br>(3.50)   | 76<br>(2.99)   | 24.5<br>(0.97) | 19<br>(0.75)   | 150<br>(5.91) | 25<br>(0.98) | 30<br>(1.18) | 171.5<br>(6.75) | 130<br>(5.12) | 11<br>(0.43)  | 17<br>(0.67) | 8.4<br>(0.33) | 14<br>(0.55) | M10 x 1.50 | 6<br>(0.24) |  |  |  |  |

| Bore size | Metric       |              |             |              |              |               |              |                |               |              |               |                |              |              |              |              |     | Port size  | Piston rod thread |
|-----------|--------------|--------------|-------------|--------------|--------------|---------------|--------------|----------------|---------------|--------------|---------------|----------------|--------------|--------------|--------------|--------------|-----|------------|-------------------|
|           | E1           | E2           | E3          | ØF1          | G1           | H1            | H2           | L1             | L2            | L3           | L4            | L5             | N1           | P1           | P2           | P3           |     |            |                   |
| 32        | 12<br>(0.47) | 7<br>(0.28)  | 4<br>(0.16) | 30<br>(1.18) | 17<br>(0.67) | 81<br>(3.19)  | 16<br>(0.63) | 153<br>(6.02)  | 120<br>(4.72) | 17<br>(0.67) | 71<br>(2.80)  | 64.7<br>(2.55) | 17<br>(0.67) | 36<br>(1.42) | 31<br>(1.22) | 40<br>(1.57) | 1/8 | M10 x 1.25 |                   |
| 40        | 12<br>(0.47) | 7<br>(0.28)  | 4<br>(0.16) | 35<br>(1.38) | 24<br>(0.94) | 99<br>(3.90)  | 19<br>(0.75) | 166<br>(6.54)  | 130<br>(5.12) | 20<br>(0.79) | 71<br>(2.80)  | 74.7<br>(2.94) | 17<br>(0.67) | 36<br>(1.42) | 36<br>(1.42) | 44<br>(1.73) | 1/4 | M12 x 1.25 |                   |
| 50        | 16<br>(0.63) | 9<br>(0.35)  | 9<br>(0.35) | 40<br>(1.57) | 27<br>(1.06) | 119<br>(4.69) | 23<br>(0.91) | 194<br>(7.64)  | 150<br>(5.90) | 25<br>(0.98) | 79<br>(3.11)  | 90<br>(3.54)   | 24<br>(0.94) | 42<br>(1.65) | 44<br>(1.73) | 50<br>(1.97) | 1/4 | M16 x 1.5  |                   |
| 63        | 16<br>(0.63) | 9<br>(0.35)  | 9<br>(0.35) | 45<br>(1.77) | 27<br>(1.06) | 132<br>(5.20) | 28<br>(1.10) | 224<br>(8.82)  | 180<br>(7.09) | 25<br>(0.98) | 109<br>(4.29) | 90<br>(3.54)   | 24<br>(0.94) | 58<br>(2.28) | 44<br>(1.73) | 60<br>(2.36) | 3/8 | M16 x 1.5  |                   |
| 80        | 20<br>(0.79) | 11<br>(0.43) | 5<br>(0.19) | 45<br>(1.77) | 32<br>(1.26) | 166<br>(6.54) | 36<br>(1.42) | 252<br>(9.92)  | 200<br>(7.87) | 30<br>(1.18) | 113<br>(4.45) | 109<br>(4.29)  | 30<br>(1.18) | 50<br>(1.97) | 52<br>(2.05) | 70<br>(2.76) | 3/8 | M20 x 1.5  |                   |
| 100       | 20<br>(0.79) | 11<br>(0.43) | 5<br>(0.20) | 55<br>(2.17) | 32<br>(1.26) | 190<br>(7.48) | 45<br>(1.77) | 272<br>(10.71) | 220<br>(8.66) | 30<br>(1.18) | 128<br>(5.04) | 114<br>(4.49)  | 30<br>(1.18) | 49<br>(1.93) | 51<br>(2.01) | 70<br>(2.76) | 1/2 | M20 x 1.5  |                   |

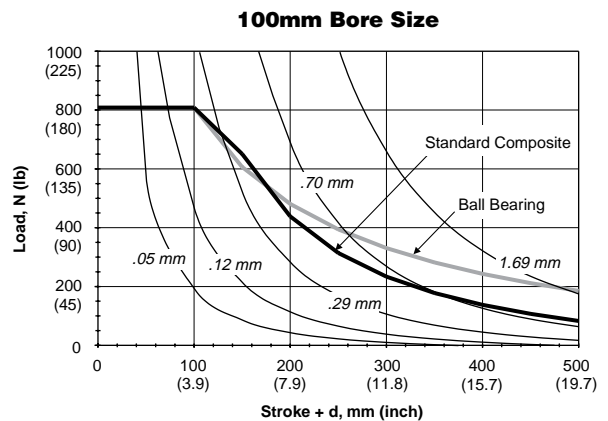
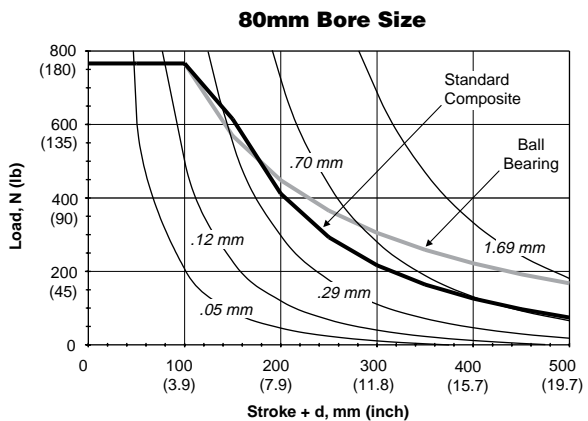
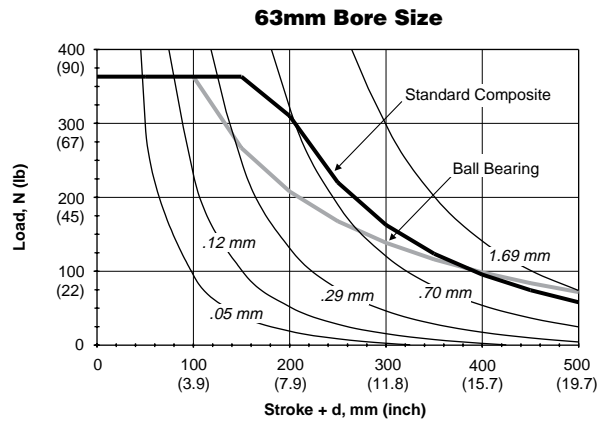
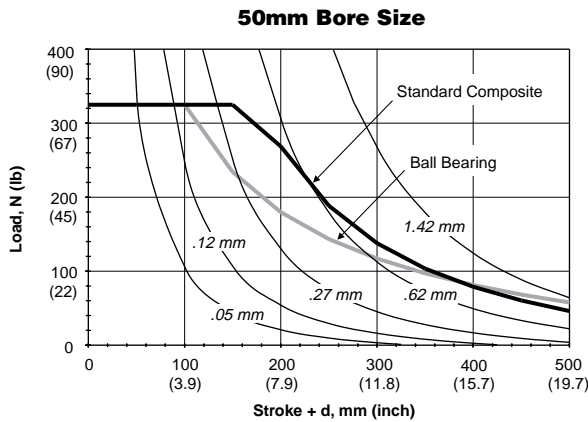
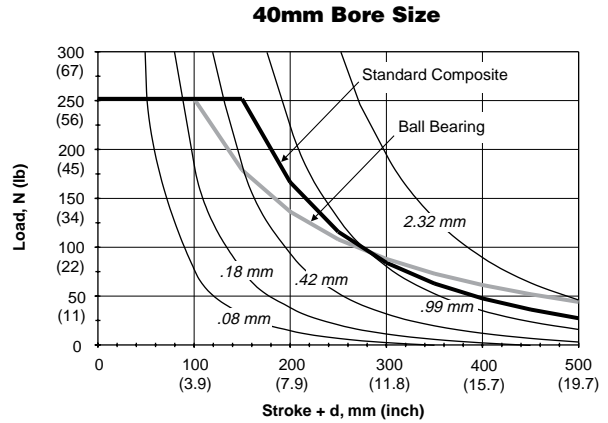
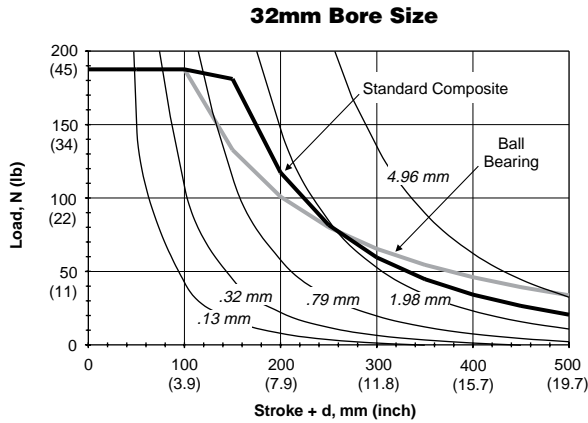
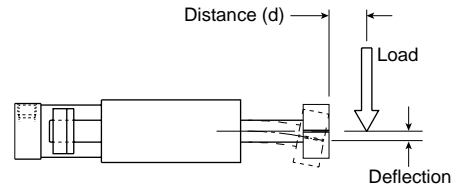




**Maximum Load Capacity with Standard Shaft**

The following curves are based on 10 million cycles at a speed of 0.20 m/s (40 fpm). Higher dynamic loads will reduce cycle life. For static conditions, multiply the information in the graphs by 1.5.

**EXAMPLE:** A P5E with 40mm bore, composite bushings and a “stroke+d” of 400mm will have a load capacity of 48N.

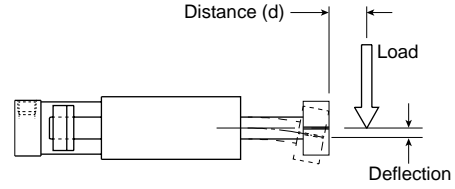


|             |                   |
|-------------|-------------------|
| <b>B</b>    | Guided Cylinders  |
|             | Actuator Products |
| P5T Series  |                   |
| P5T2 Series |                   |
| P5L Series  |                   |
| HB Series   |                   |
| P5E Series  |                   |

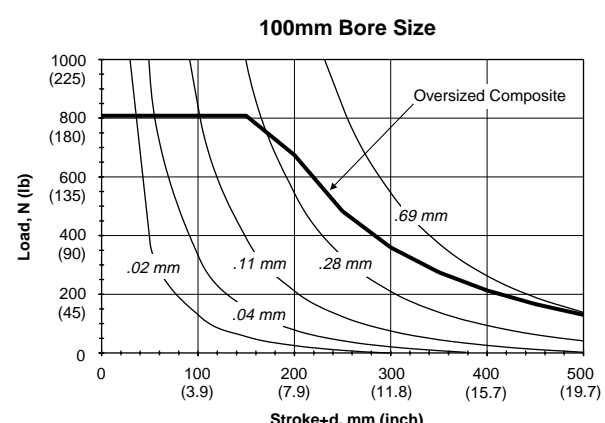
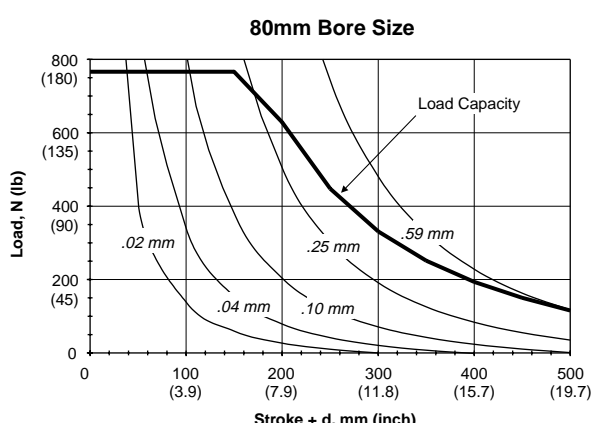
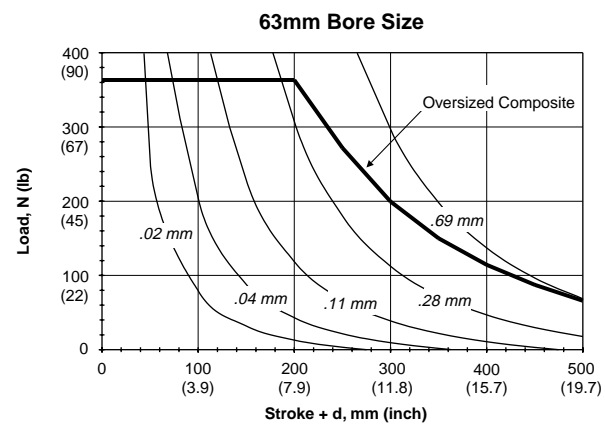
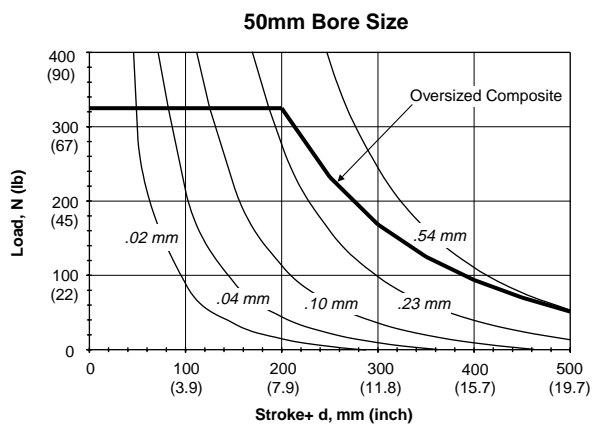
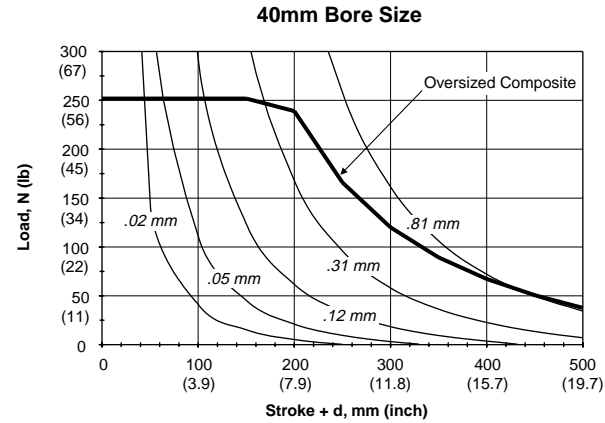
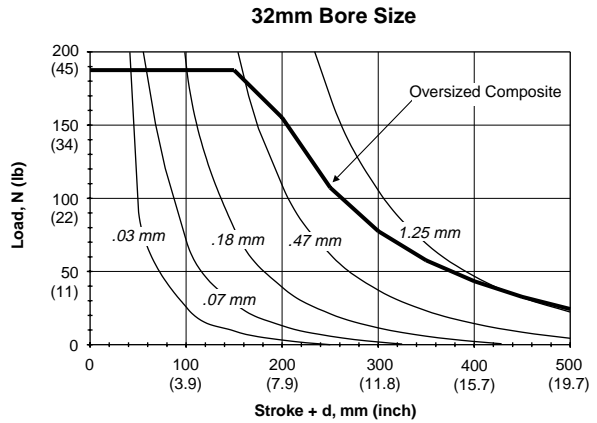
**Maximum Load Capacity with Oversized Shaft**

The following curves are based on 10 million cycles at a speed of 0.20 m/s (40 fpm). Higher dynamic loads will reduce cycle life. For static conditions, multiply the information in the graphs by 1.5.

**EXAMPLE:** A P5E with 63mm bore, oversized support shafts and a “stroke+d” of 300mm would have a load capacity of 200N.



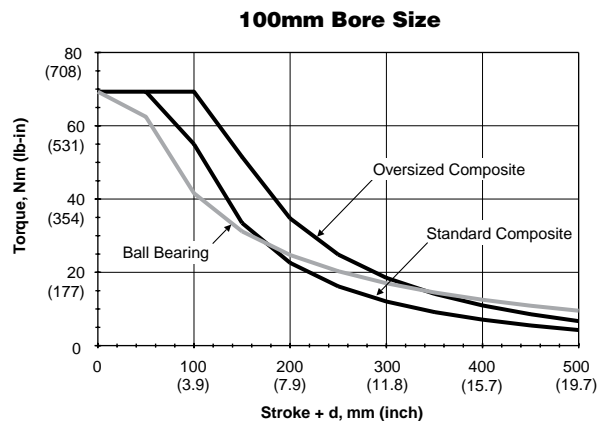
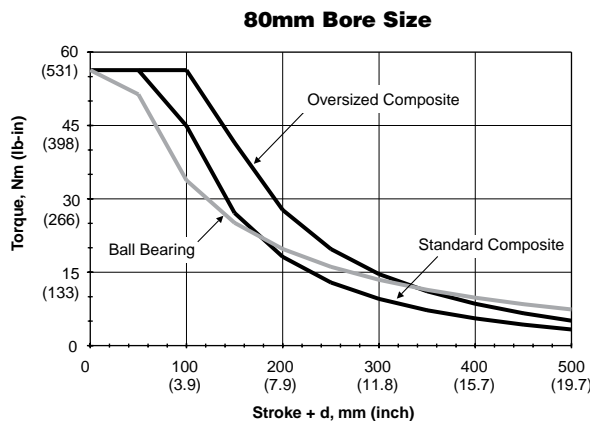
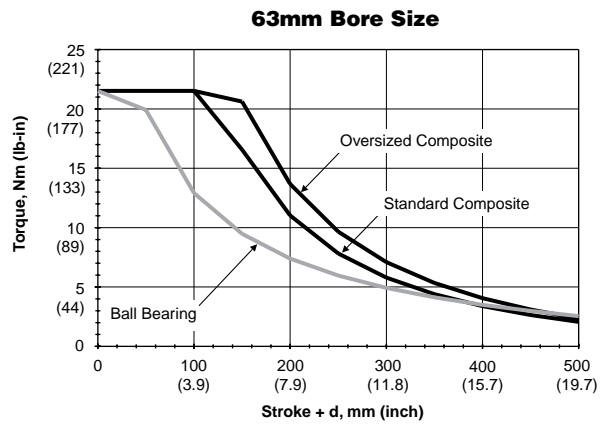
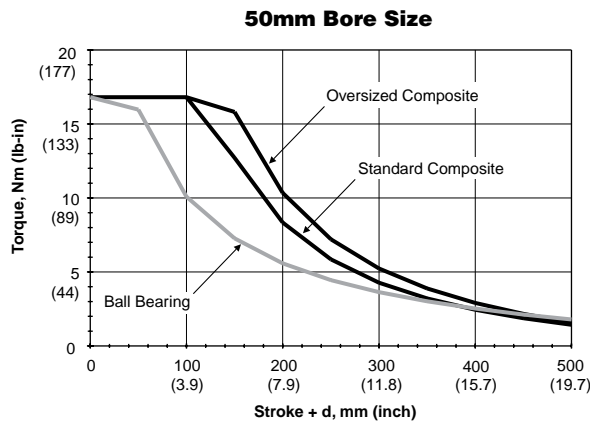
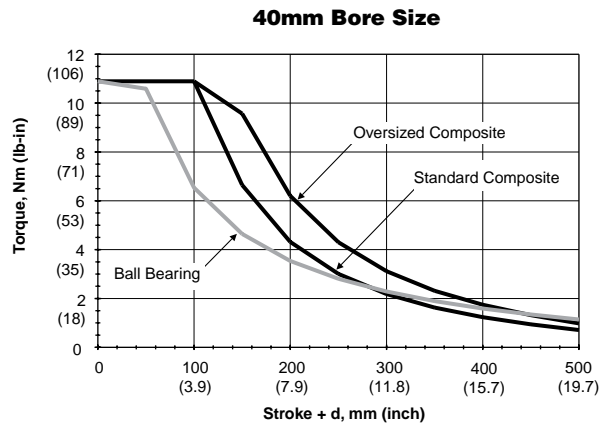
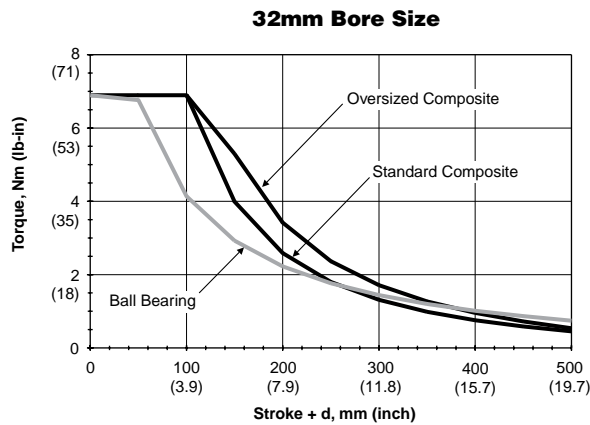
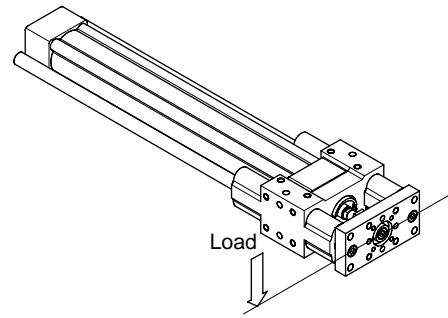
|            |                                       |
|------------|---------------------------------------|
| <b>B</b>   | Guided Cylinders<br>Actuator Products |
|            | P5T Series                            |
|            | P5T2 Series                           |
|            | P5L Series                            |
|            | HB Series                             |
| P5E Series |                                       |



**Asymmetrical Torque Capacity**

Asymmetrical loading occurs when an off-center load is applied to the unit. P5E Series units can resist torsional loads that are asymmetrical.

**EXAMPLE:** A P5E with 63mm bore, ball bearings and a “stroke + d” of 300mm would have an asymmetrical torque capacity of 5 Nm.



|             |                                       |
|-------------|---------------------------------------|
| <b>B</b>    | Guided Cylinders<br>Actuator Products |
|             | P5T Series                            |
| P5T2 Series |                                       |
| P5L Series  |                                       |
| HB Series   |                                       |
| P5E Series  |                                       |

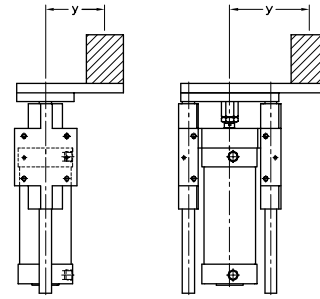
**Vertical Eccentric Load Capacity**

P5E Series units mounted vertically will have the same eccentric load capacity regardless of orientation. The graphs provide maximum load capacity for an eccentric mounted load. The load is assumed to be mounted at the face of the tooling plate.

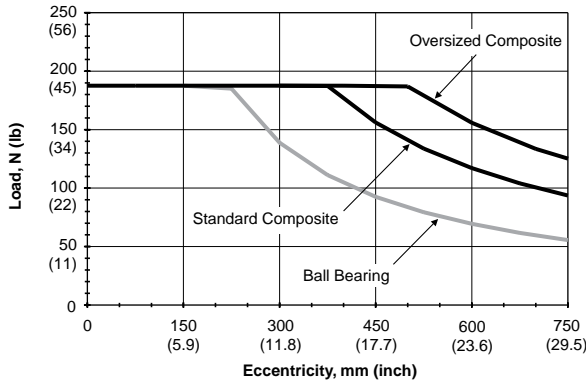
These load curves illustrate load ratings based on the bearing system of the product. Load rating is a key selection criterion but is not the only one to consider in the selection of a product.

**Note:** Charts are based on 100mm of stroke.

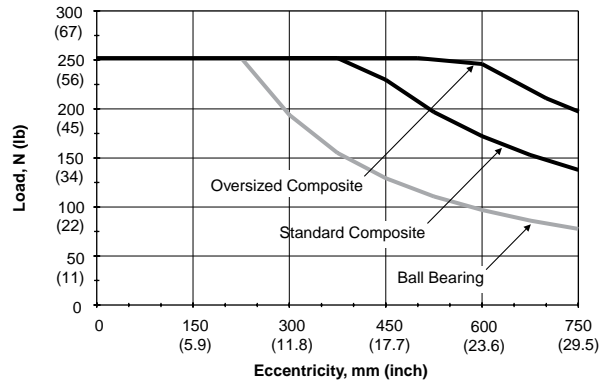
**EXAMPLE:** A P5E with a 40mm bore carrying an eccentric load located 300mm from the centerline has a capacity of approximately 200N (45 lbs).



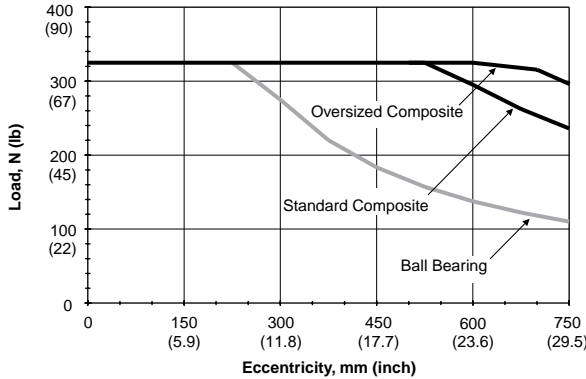
**32mm Bore Size**



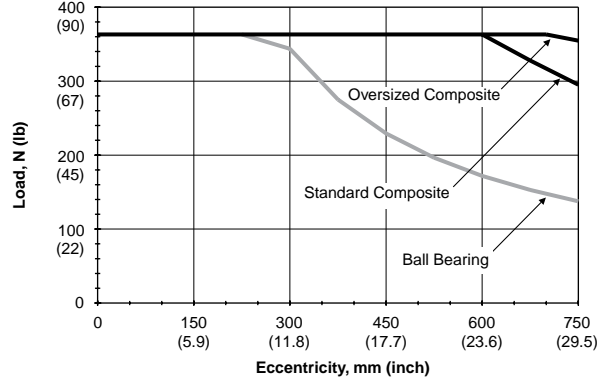
**40mm Bore Size**



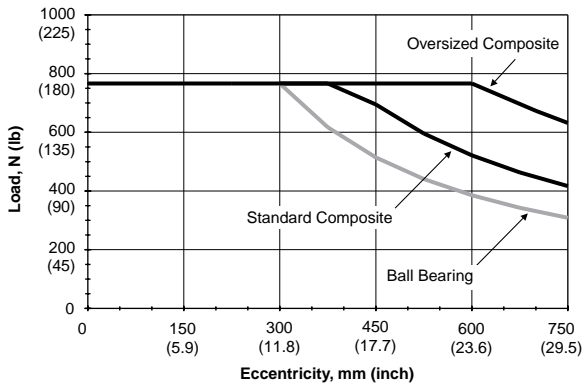
**50mm Bore Size**



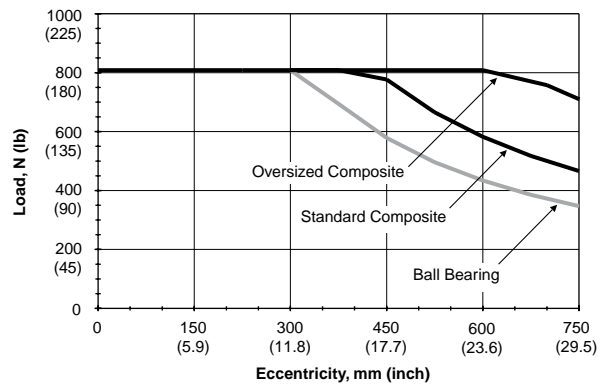
**63mm Bore Size**



**80mm Bore Size**



**100mm Bore Size**



|   |             |
|---|-------------|
| <b>B</b><br>Guided Cylinders<br>Actuator Products | P5T Series  |
|   | P5T2 Series |
|   | P5L Series  |
|   | HB Series   |
|   | P5E Series  |

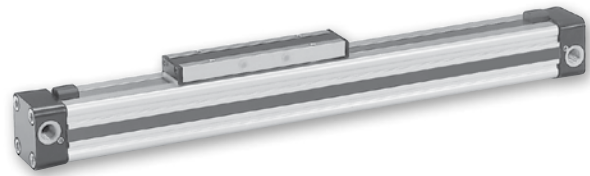




**General features**

| Characteristics          |                  | Description  |
|--------------------------|------------------|--|
| Type                     |                  | Rodless cylinder   |
| Series                   |                  | OSP-P  |
| Stroke length            |                  | 5.5m (216 inches)  |
| System                   |                  | Double-acting, with cushions and magnetic piston   |
| Mounting                 |                  | See drawings   |
| Air connection           |                  | Threaded   |
| Temperature range        | T <sub>min</sub> | -10°C (14°F)   |
|                          | T <sub>max</sub> | 80°C (176°F)   |
| Weight (mass)            |                  | See table below  |
| Installation             |                  | In any position  |
| Medium                   |                  | Filtered, nonlubricated compressed air   |
| Lubrication              |                  | Prelubricated at the factory (additional oil mist lubrication not required)<br>Option: special slow speed grease |
| Material                 | Cylinder profile | Anodized aluminum  |
|                          | Carrier (piston) | Anodized aluminum  |
|                          | End caps         | Aluminum, lacquered / plastic (P10)  |
|                          | Sealing bands    | Corrosion resistant steel  |
|                          | Seals            | NBR (Option: Fluorocarbon)   |
|                          | Screws           | Galvanized steel<br>Option: stainless steel  |
| Dust covers, wipers      |                  | Composite  |
| Max. operating pressure* | p <sub>max</sub> | 117 PSI<br>8 (bar)   |

\* Pressure quoted as gauge pressure



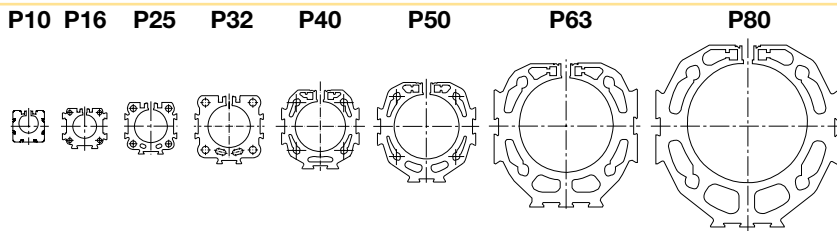
**Additional options**

- Clean room cylinders
- Stainless steel screws
- Slow speed lubrication
- Fluorocarbon seals
- Single end porting
- Air connection on the end-face
- Integrated valves
- End cap can be rotated 4 x 90° to position air connection as desired

**Weight (mass) kg**

| Cylinder series (Basic cylinder) | Weight (Mass) kg |                   |
|----------------------------------|------------------|-------------------|
|                                  | At 0 mm stroke   | per 100 mm stroke |
| <b>OSP-P10</b>                   | 0.087            | 0.052             |
| <b>OSP-P16</b>                   | 0.22             | 0.1               |
| <b>OSP-P25</b>                   | 0.65             | 0.197             |
| <b>OSP-P32</b>                   | 1.44             | 0.354             |
| <b>OSP-P40</b>                   | 1.95             | 0.415             |
| <b>OSP-P50</b>                   | 3.53             | 0.566             |
| <b>OSP-P63</b>                   | 6.41             | 0.925             |
| <b>OSP-P80</b>                   | 12.46            | 1.262             |

**Size Comparison**



**B**

Rodless Cylinders  
 Actuator Products

OSP-P  
 Series

P1X  
 Series

P1Z  
 Series

GDL  
 Series

**ORIGA SYSTEM PLUS – innovation from a proven design**

A new generation of linear drives which can be simply and neatly integrated into any machine layout.

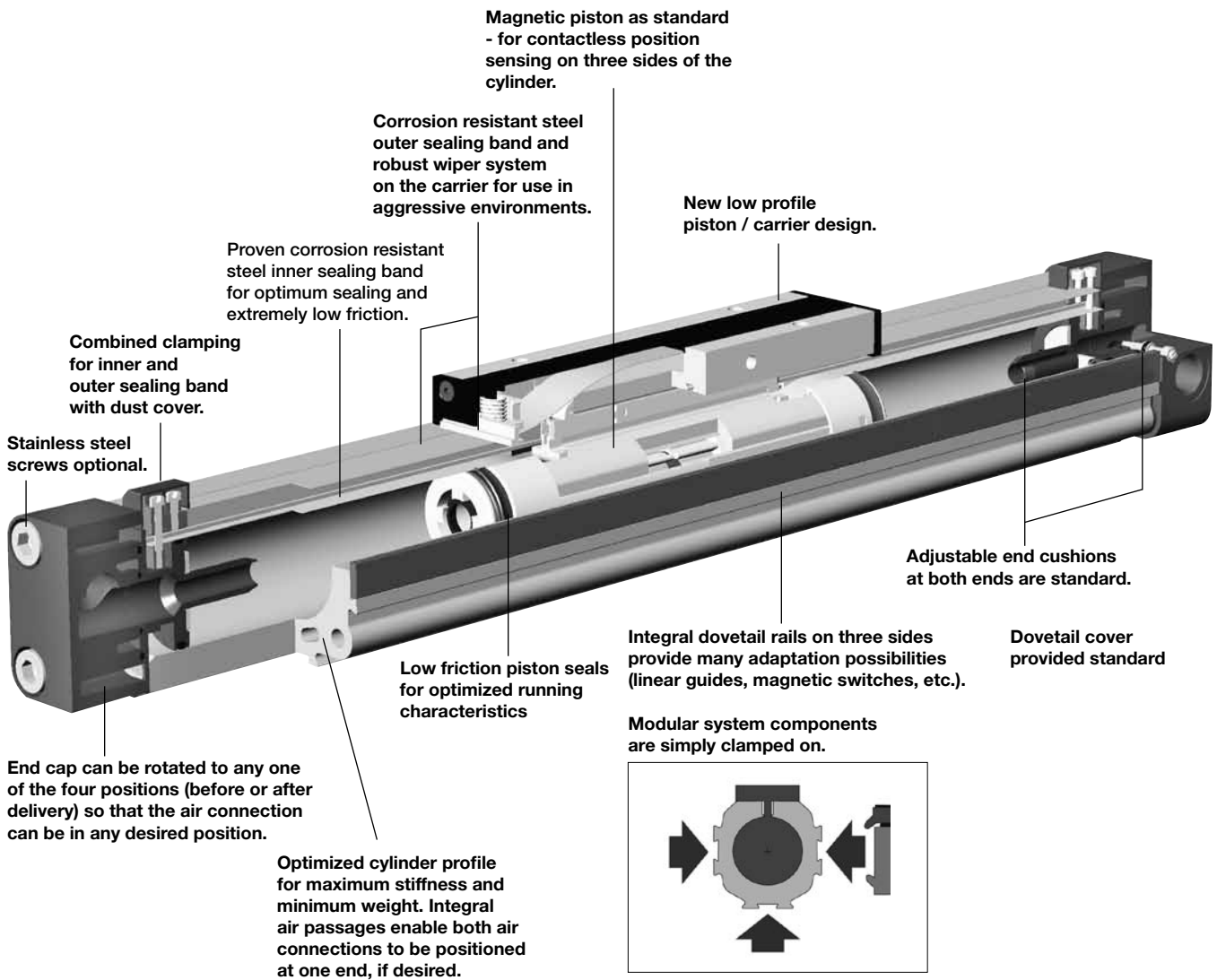
**A new modular linear drive system**

With this second generation linear drive the OSP-P series offers design engineers complete flexibility. The well known ORIGA cylinder has been further developed into a combined linear actuator, guidance and control package. It forms the basis for the the OSP-P linear drive system. All additional functions are designed into modular system components which replace the previous series of cylinders.

**Mounting rails on 3 sides**

Mounting rails on 3 sides of the cylinder enable modular components such as linear guides, brakes, valves, magnetic switches etc. to be fitted to the cylinder itself. This solves many installation problems, especially where space is limited. The modular system concept forms an ideal basis for additional customer-specific functions.

|          |  |
|----------|--|
| <b>B</b> | Rodless Cylinders<br>Actuator Products |
|          | OSP-P<br>Series                        |
|          | P1X<br>Series                          |
|          | P1Z<br>Series                          |
|          | GDL<br>Series                          |

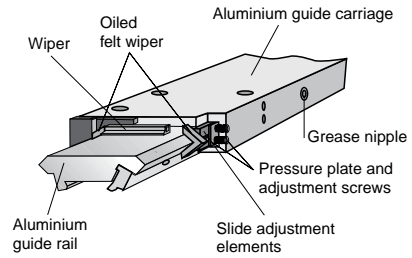


**Plain Bearing Guide SLIDELINE**

- Available on 16 to 80mm bore

**Features:**

- Adjustable composite slide elements – optional integral brake
- Integrated sealing system with wiper elements to remove dirt and lubricate the slideways
- Any length of stroke up to 5500 mm

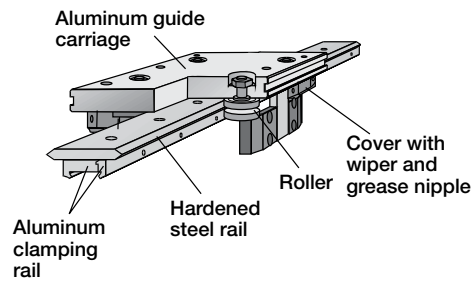


**Roller Guide POWERSLIDE**

- Available on 16 to 50mm bore

**Features:**

- Anodized aluminum guide carriage with vee rollers
- Hardened steel guide rail
- Multiple guide sizes can be used on the same drive
- Max. Speed  $v = 3$  m/s
- Integrated wiper and grease nipple
- Any length of stroke up to 3500 mm



**B**

Rodless Cylinders  
 Actuator Products

OSP-P  
 Series

P1X  
 Series

P1Z  
 Series

GDL  
 Series




**Ordering information / part numbering system for OSP-P rodless basic pneumatic series**

|             |  |                        |  |                             |          |                                      |   |          |                               |          |          |  |          |   |                                   |          |
|-------------|--|------------------------|--|-----------------------------|----------|--------------------------------------|---|----------|-------------------------------|----------|----------|--|----------|---|-----------------------------------|----------|
| 1-4         | 5-6  | 7                      | 8  | 9                           | 10       | 11                                   | 12-16   | 17       | 18                            | 19       | 20       | 21   | 22       | 23  | 24                                | 25       |
| <b>OSPP</b> | <b>25</b>                                    | <b>0</b>               | <b>1</b>   | <b>0</b>                    | <b>0</b> | <b>0</b>                             | <b>01100</b>  | <b>0</b> | <b>0</b>                      | <b>0</b> | <b>0</b> | <b>0</b>   | <b>0</b> | <b>1</b>                                      | <b>0</b>                          | <b>0</b> |
|             | <b>Bore</b>                                  |                        |  | <b>Lubrication</b>          |          |                                      | <b>Stroke</b>   |          | <b>Piston mounting</b>        |          |          | <b>Dovetail cover</b>                                    |          | <b>Version</b>                                |                                   |          |
|             | 10<br>16<br>25<br>32<br>40<br>50<br>63<br>80 |                        |  | 0 Standard<br>1 Flurocarbon |          |                                      | xxxxx   |          | 0 Standard*<br>1 Clevis mount |          |          | 0 Standard<br>X No Cover                                 |          | 0 Standard                                    |                                   |          |
|             |  |                        | <b>Seals</b>   |                             |          | <b>Fasteners</b>                     |   |          | <b>Cushions</b>               |          |          | <b>Additional carriages**</b>                            |          |   | <b>Switches</b>                   |          |
|             |  |                        | 0 Buna-N<br>1 Flurocarbon                                      |                             |          | 0 Chrome plated<br>1 Stainless steel |   |          | 0 Standard                    |          |          | 0 None<br>2 Slide / Proline<br>3 Slide / Proline with AB |          |   | 0 None, order switches separately |          |
|             |  | <b>Piston style</b>    |  |                             |          |                                      | <b>Port orientation†</b>  |          |                               |          |          |  |          | <b>Mounting</b>                               |                                   |          |
|             |  | 0 Standard<br>1 Tandem |  |                             |          |                                      | 0 Position #2 (both ends)<br>1 Position #3 (both ends)<br>2 Position #4 (both ends) |          |                               |          |          |  |          | 0 None<br>1 A1 type<br>4 B1 type<br>9 C1 type |                                   |          |
|             |  |                        | <b>Porting configurations‡</b>                                 |                             |          |                                      |   |          |                               |          |          |  |          |   |                                   |          |
|             |  |                        | 0 Standard<br>1 End Face (position #5) ‡<br>2 Single End Ports |                             |          |                                      |   |          |                               |          |          |  |          |   |                                   |          |

\* For Joint Clamp connecting plate, order separately  
 \*\*When selecting additional carriages, the tandem piston option must also be selected  
 † Single end ports can not be rotated in the field  
 ‡ Only available on 50mm bore

**Sensors**  
 For sensors see page B294.



**B**  
 Rodless Cylinders  
 Actuator Products  
 OSP-P Series  
 P1X Series  
 P1Z Series  
 GDL Series



### Loads, forces and moments

When sizing an OSP cylinder, consideration must be given to:

- Loads, forces and moments
- Performance of the pneumatic end cushions. The main factors are the mass to be cushioned and the piston speed (unless external cushioning is used, e. g. hydraulic shock absorbers)

To determine the maximum values for light, shock-free operation, which must not be exceeded even in dynamic operation.

**Load and moment data are based on speeds  $v \leq 0.5$  m/s.**

When working out the action force required, it is essential to take into account the friction forces generated by the specific application or load.

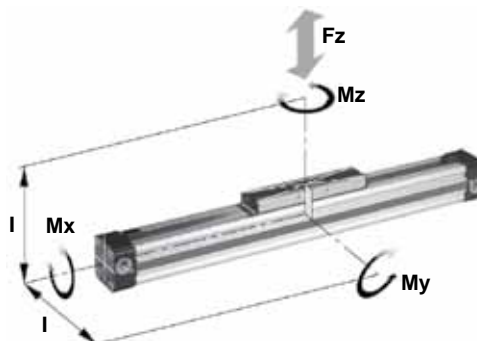
The sum total of each of these types of moments, divided by each of the maximum values, determines a Load-Moment Factor (LMF) should be equal to or less than 1.0. On horizontal mountings, the total load (L) should also be divided by the maximum load allowable and factored into the equation.

**Horizontal Mountings:**

$$\frac{L}{[L]} + \frac{M}{[M]} + \frac{M_s}{[M_s]} + \frac{M_v}{[M_v]} = LMF \leq 1.0$$

**Vertical Mountings:**

$$\frac{M}{[M]} + \frac{M_s}{[M_s]} + \frac{M_v}{[M_v]} = LMF \leq 1.0$$



$$M = F \cdot l$$

Bending moments are calculated from the center of the linear actuator

| Cylinder series (mm Ø) | Theoretical output force at 6 bar N (lb) | Actual output force $F_A$ at 6 bar N (lb) | Max. moments     |                  |                  | Max. load F N (lb) | Cushion length (mm) |
|------------------------|--|---|------------------|------------------|------------------|--------------------|---------------------|
|                        |  |   | $M_x$ Nm (in lb) | $M_y$ Nm (in lb) | $M_z$ Nm (in lb) |                    |                     |
| <b>OSP-P10</b>         | 47 (10.6)                                | 32 (7.2)                                  | 0.2 (1.8)        | 1 (8.9)          | 0.3 (2.7)        | 20 (4.5)           | 2.5 * (.09)         |
| <b>OSP-P16</b>         | 120 (26.9)                               | 78 (17.5)                                 | 0.45 (3.9)       | 4 (35.4)         | 0.5 (4.4)        | 120 (26.9)         | 11 (.43)            |
| <b>OSP-P25</b>         | 295 (66.3)                               | 250 (56.2)                                | 1.5 (13.3)       | 15 (132.8)       | 3 (26.6)         | 300 (67.4)         | 17 (.67)            |
| <b>OSP-P32</b>         | 483 (108.6)                              | 420 (94.4)                                | 3 (26.6)         | 30 (265.5)       | 5 (44.3)         | 450 (101.2)        | 20 (.79)            |
| <b>OSP-P40</b>         | 754 (169.5)                              | 640 (143.9)                               | 6 (53.1)         | 60 (531)         | 8 (70.8)         | 750 (168.6)        | 27 (1.06)           |
| <b>OSP-P50</b>         | 1178 (264.8)                             | 1000 (224.8)                              | 10 (88.5)        | 115 (1017.8)     | 15 (132.8)       | 1200 (269.8)       | 30 (1.18)           |
| <b>OSP-P63</b>         | 1870 (420.4)                             | 1550 (348.5)                              | 12 (106.2)       | 200 (1771)       | 24 (212.4)       | 1650 (370.9)       | 32 (1.26)           |
| <b>OSP-P80</b>         | 3016 (678)                               | 2600 (584.5)                              | 24 (212.4)       | 360 (3186)       | 48 (424.8)       | 2400 (539.5)       | 39 (1.54)           |

\* A rubber element (non-adjustable) is used for end cushioning.  
 To deform the rubber element enough to reach the absolute end position would require a Dp of 4 bar!

### Cushioning diagram

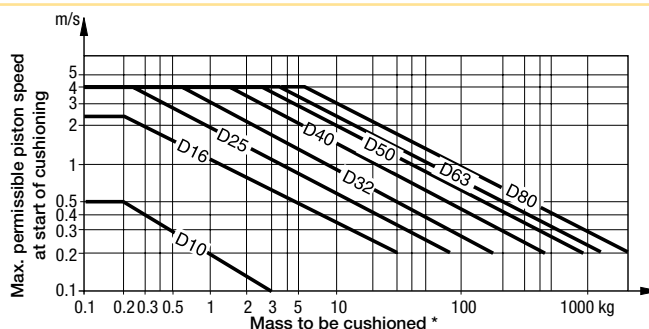
Determine the moving mass and follow the chart below to determine the maximum cylinder velocity.

Alternatively, take your desired velocity and moving mass to determine the required cylinder diameter.

If these maximum permissible values are exceeded, additional shock absorbers must be used.

For sizing a basic cylinder, use the adjacent chart. To size a cylinder with guide bearing, use the charts on the following page.

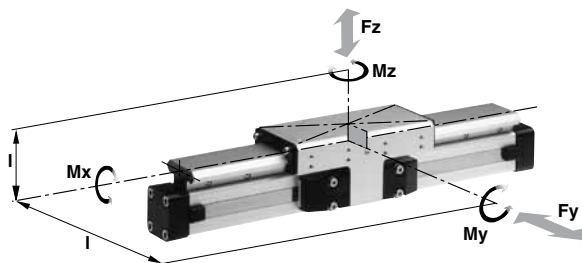
The peak piston velocity can be determined by assuming it is 50% greater than the average velocity. The peak velocity should be used in sizing the cylinder cushions.



\* For cylinders with linear guides or brakes, please be sure to take the mass of the carriage or the brake housing into account.

**SLIDELINE loads, forces and moments**

Stroke up to 5500 mm (longer strokes on request)



**Technical data**

The table shows the maximum permissible values for smooth operation, which should not be exceeded even under dynamic conditions.

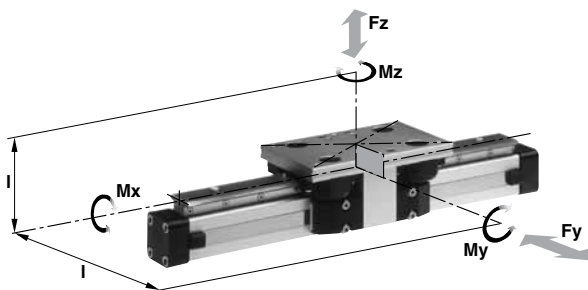
The load and moment figures apply to speeds  $v < 0.2$  m/s.

| Series | For linear drive | Max. moments (Nm) |     |     | Max. loads (N) | Mass of linear drive with guide (kg) |                           |                               |
|--------|------------------|-------------------|-----|-----|----------------|--------------------------------------|---------------------------|-------------------------------|
|        |                  | Mx                | My  | Mz  | Fy, Fz         | With 0mm stroke                      | Increase per 100mm stroke | Mass * of guide carriage (kg) |
| SL16   | OSP-P16          | 6                 | 11  | 11  | 325            | 0.57                                 | 0.22                      | 0.23                          |
| SL25   | OSP-P25          | 14                | 34  | 34  | 675            | 1.55                                 | 0.39                      | 0.61                          |
| SL32   | OSP-P32          | 29                | 60  | 60  | 925            | 2.98                                 | 0.65                      | 0.95                          |
| SL40   | OSP-P40          | 50                | 110 | 110 | 1500           | 4.05                                 | 0.78                      | 1.22                          |
| SL50   | OSP-P50          | 77                | 180 | 180 | 2000           | 6.72                                 | 0.97                      | 2.06                          |
| SL63   | OSP-P63          | 120               | 260 | 260 | 2500           | 11.66                                | 1.47                      | 3.32                          |
| SL80   | OSP-P80          | 120               | 260 | 260 | 2500           | 15.71                                | 1.81                      | 3.32                          |

\* Add the mass of the guide carriage to the mass to be cushioned.

**POWERSLIDE loads, forces and moments**

Stroke up to 3500 mm



**Technical data**

The table shows the maximum permissible values for smooth operation, which should not be exceeded even under dynamic conditions.

For further information and technical data see linear drives OSP-P.

**\* Please note:**

In the cushioning diagram, add the mass of the guide carriage to the mass to be cushioned.

| Series   | For linear drive | Max. moments (Nm) |     |     | Max. load (N) | Mass of linear drive with guide (kg) |                           |                               |
|----------|------------------|-------------------|-----|-----|---------------|--------------------------------------|---------------------------|-------------------------------|
|          |                  | Mx                | My  | Mz  | Fy, Fz        | With 0 mm stroke                     | Increase per 100mm stroke | Mass * of guide carriage (kg) |
| PS 16/25 | OSP-P16          | 14                | 45  | 45  | 1400          | 0.93                                 | 0.24                      | 0.7                           |
| PS 25/25 | OSP-P25          | 14                | 63  | 63  | 1400          | 1.5                                  | 0.4                       | 0.7                           |
| PS 25/35 | OSP-P25          | 20                | 70  | 70  | 1400          | 1.7                                  | 0.4                       | 0.8                           |
| PS 25/44 | OSP-P25          | 65                | 175 | 175 | 3000          | 2.6                                  | 0.5                       | 1.5                           |
| PS 32/35 | OSP-P32          | 20                | 70  | 70  | 1400          | 2.6                                  | 0.6                       | 0.8                           |
| PS 32/44 | OSP-P32          | 65                | 175 | 175 | 3000          | 3.4                                  | 0.7                       | 1.5                           |
| PS 40/44 | OSP-P40          | 65                | 175 | 175 | 3000          | 4.6                                  | 1.1                       | 1.5                           |
| PS 40/60 | OSP-P40          | 90                | 250 | 250 | 3000          | 6                                    | 1.3                       | 2.2                           |
| PS 50/60 | OSP-P50          | 90                | 250 | 250 | 3000          | 7.6                                  | 1.4                       | 2.3                           |
| PS 50/76 | OSP-P50          | 140               | 350 | 350 | 4000          | 11.5                                 | 1.8                       | 4.9                           |

\* Add the mass of the guide carriage to the mass to be cushioned.

**B**  
 Rodless Cylinders  
 Actuator Products

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OSP-P  
 Series

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P1X  
 Series

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P1Z  
 Series

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GDL  
 Series

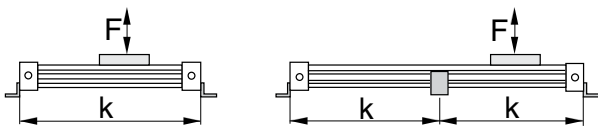
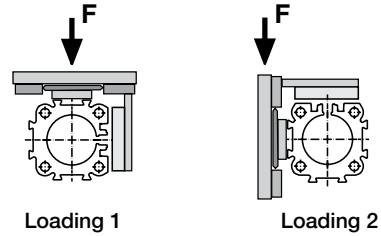
**Intermediate supports**

To avoid excessive bending and oscillation of the cylinder, intermediate supports may be required. The diagrams below show the maximum permissible support spacing based upon load.

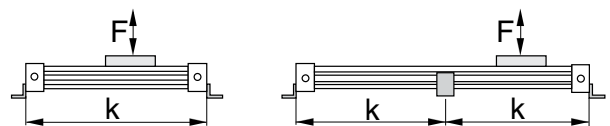
Bending up to 0.5 mm is permissible between supports. The intermediate supports are clamped to the dovetail profile and support the cylinder tube axially.

For cylinders with guide bearings, distinguish between loading scenario 1 and loading scenario 2.

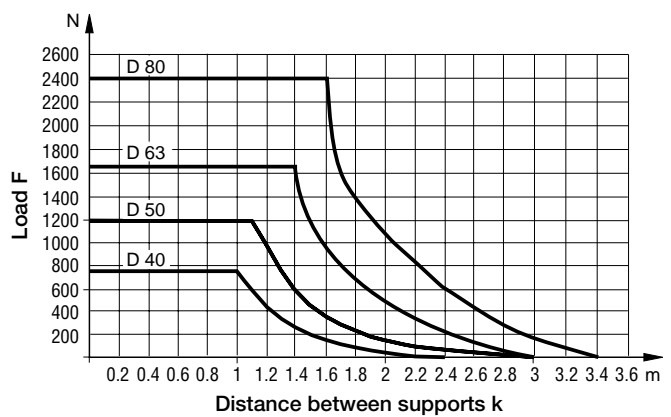
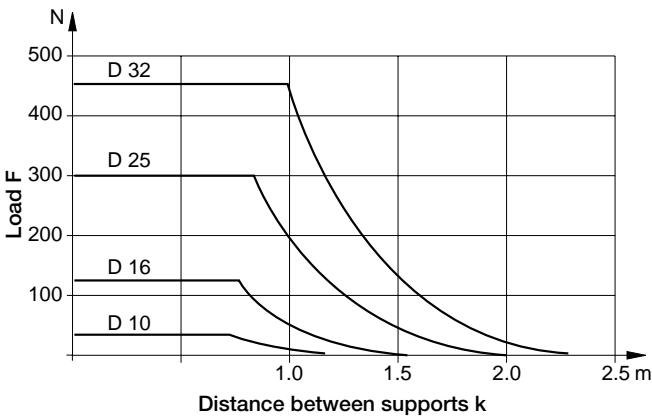
See accessories section for intermediate support dimensions and part numbers



**Basic cylinder 10 to 32mm bore intermediate supports**

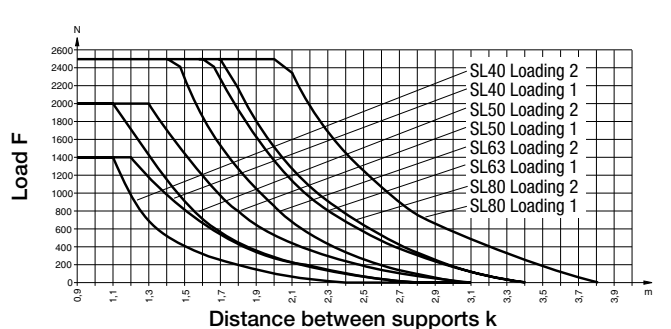
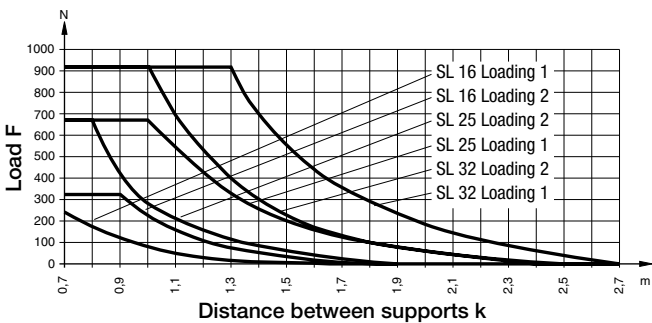


**Basic cylinder 40 to 80mm bore intermediate supports**

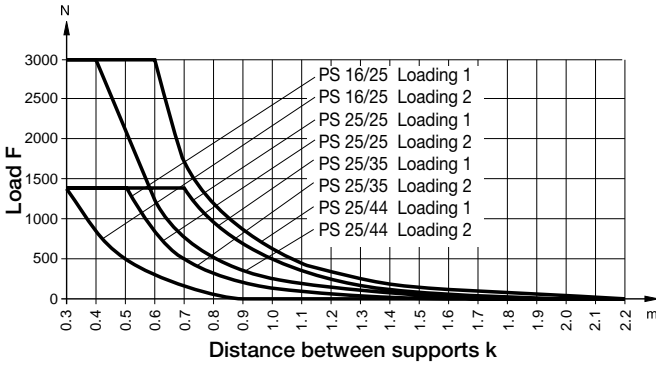


**SLIDELINE 16 to 32mm bore intermediate supports**

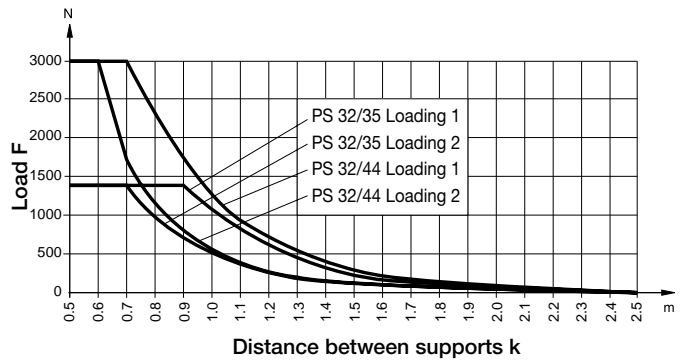
**SLIDELINE 40 to 80mm bore intermediate supports**



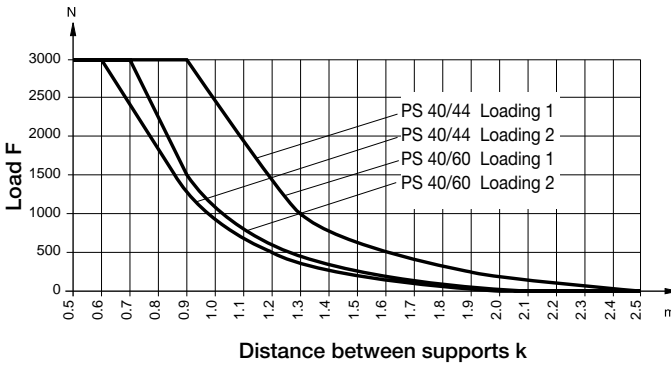
**POWERSLIDE 16/25, 25/25, 25/35, 25/44mm bore intermediate supports**



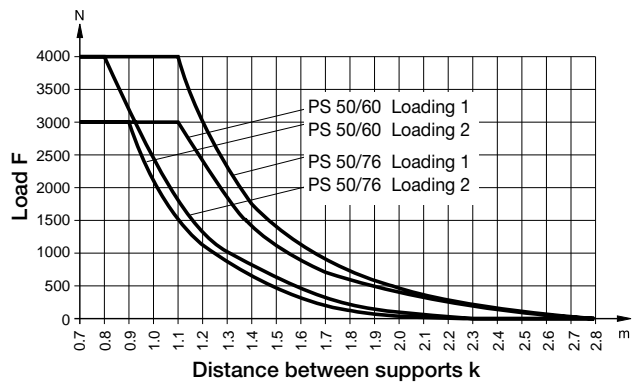
**POWERSLIDE 2/35, 32/44mm bore intermediate supports**



**POWERSLIDE 40/44, 40/60mm bore intermediate supports**

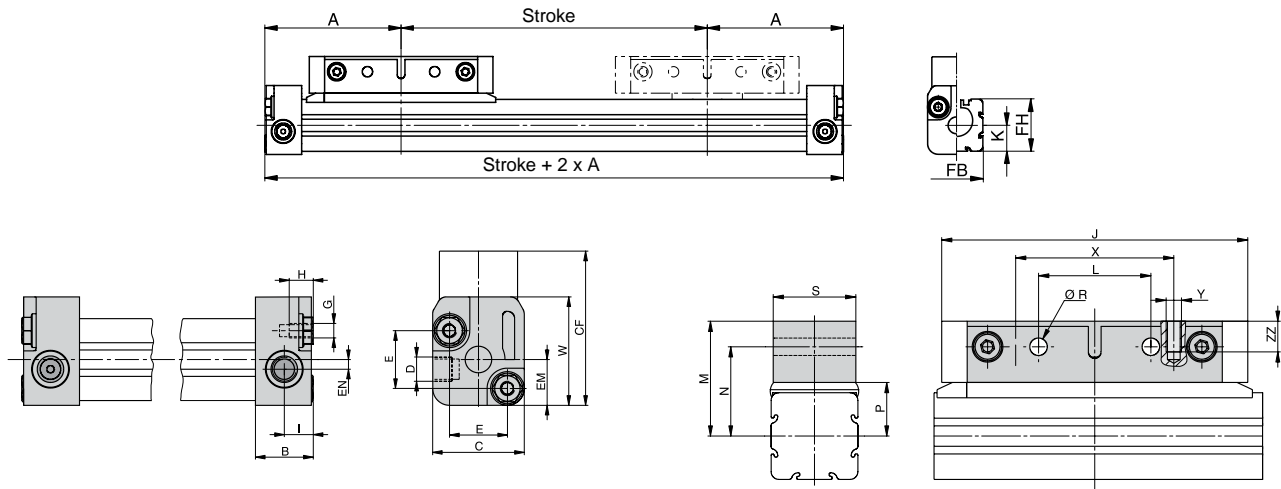


**POWERSLIDE 50/60, 50/76mm bore intermediate supports**



|          |                   |        |        |        |        |
|----------|-------------------|--------|--------|--------|--------|
| <b>B</b> | Actuator Products | Series | Series | Series | Series |
|          | Rodless Cylinders | OSP-P  | P1X    | P1Z    | GDL    |

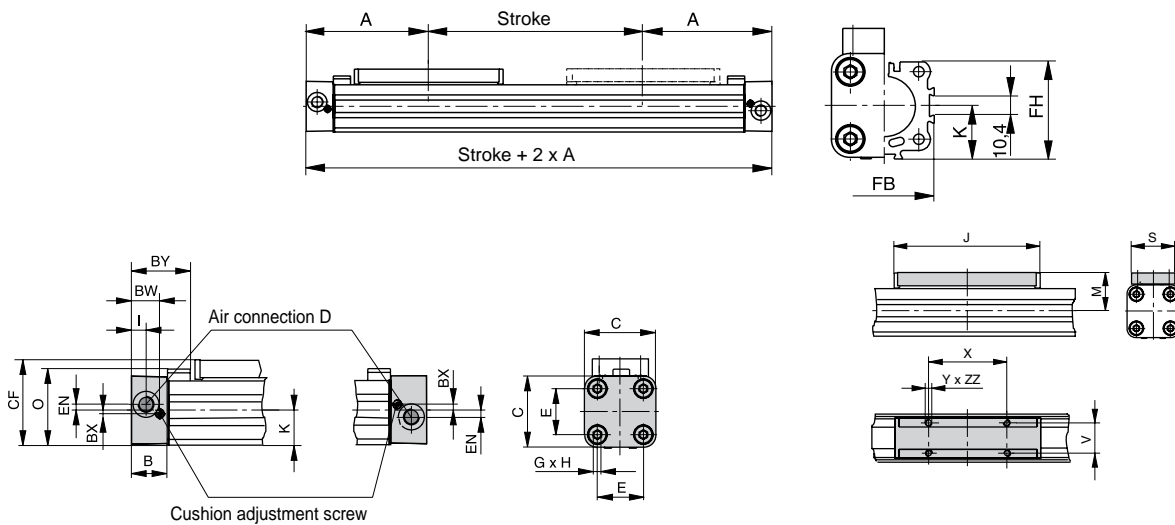
**Basic cylinder dimensions – 10mm bore**



**Dimensions (mm)**

| Series  | A    | B  | C  | D  | E  | G  | H | I | J  | K   | L  | M    | N    | P    | R   | S  | W    | X  | Y  | Z <sub>min</sub> | CF | EM  | EN | FB | FH | ZZ |
|---------|------|----|----|----|----|----|---|---|----|-----|----|------|------|------|-----|----|------|----|----|------------------|----|-----|----|----|----|----|
| OSP-P10 | 44.5 | 12 | 19 | M5 | 12 | M3 | 5 | 6 | 60 | 8.5 | 22 | 22.5 | 17.5 | 10.5 | 3.4 | 16 | 22.5 | 31 | M3 | 64               | 32 | 9.5 | 2  | 17 | 17 | 6  |

**Basic cylinder dimensions – 16 to 80mm bore**

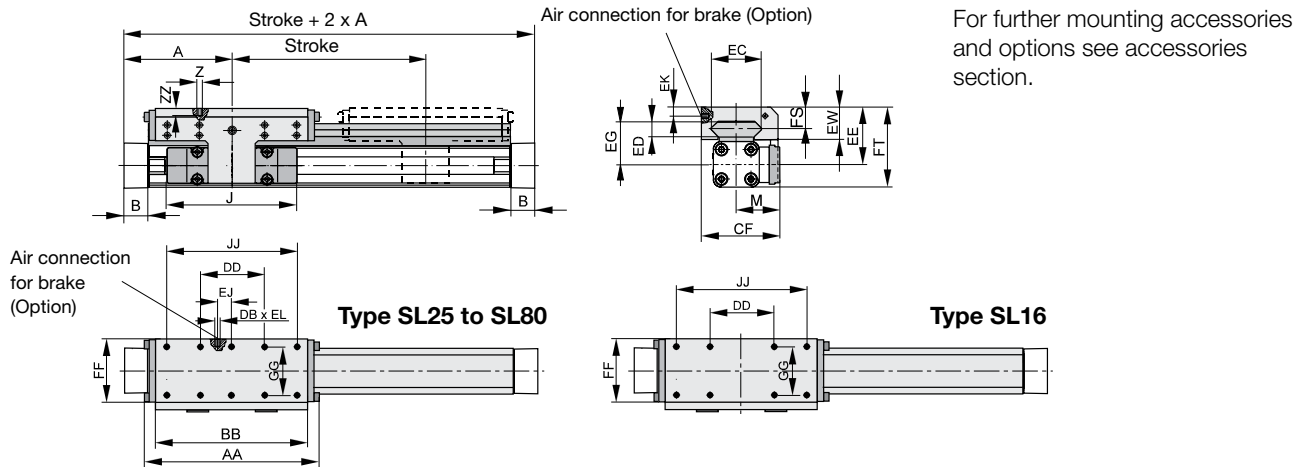


**Dimensions (mm)**

| Series  | A   | B    | C   | D      | E   | G  | H    | I   | J    | K  | M   | O    | S  | V    | X   | Y   | Z    | BW   | BX  | BY   | CF   | EN  | FB   | FH   | ZZ |
|---------|-----|------|-----|--------|-----|----|------|-----|------|----|-----|------|----|------|-----|-----|------|------|-----|------|------|-----|------|------|----|
| OSP-P16 | 65  | 14   | 30  | M5     | 18  | M3 | 9    | 5.5 | 69   | 15 | 23  | 33.2 | 22 | 16.5 | 36  | M4  | 81   | 10.8 | 1.8 | 28.4 | 38   | 3   | 30   | 27.2 | 7  |
| OSP-P25 | 100 | 22   | 41  | G1/827 | M5  | 15 | 9    | 117 | 21.5 | 31 | 47  | 33   | 25 | 65   | M5  | 128 | 17.5 | 2.2  | 40  | 52.5 | 3.6  | 40  | 39.5 | 8    |    |
| OSP-P32 | 125 | 25.5 | 52  | G1/436 | M6  | 15 | 11.5 | 152 | 28.5 | 38 | 59  | 36   | 27 | 90   | M6  | 170 | 20.5 | 2.5  | 44  | 66.5 | 5.5  | 52  | 51.7 | 1    |    |
| OSP-P40 | 150 | 28   | 69  | G1/454 | M6  | 15 | 12   | 152 | 34   | 44 | 72  | 36   | 27 | 90   | M6  | 212 | 21   | 3    | 54  | 78.5 | 7.5  | 62  | 63   | 10   |    |
| OSP-P50 | 175 | 33   | 87  | G1/470 | M6  | 15 | 14.5 | 200 | 43   | 49 | 86  | 36   | 27 | 110  | M6  | 251 | 27   | -    | 59  | 92.5 | 11   | 76  | 77   | 10   |    |
| OSP-P63 | 215 | 38   | 106 | G3/878 | M8  | 21 | 14.5 | 256 | 54   | 63 | 107 | 50   | 34 | 140  | M8  | 313 | 30   | -    | 64  | 117  | 12   | 96  | 96   | 16   |    |
| OSP-P80 | 260 | 47   | 132 | G1/296 | M10 | 25 | 22   | 348 | 67   | 80 | 133 | 52   | 36 | 190  | M10 | 384 | 37.5 | -    | 73  | 147  | 16.5 | 122 | 122  | 20   |    |

**B**  
 Rodless Cylinders  
 Actuator Products  
 OSP-P Series  
 P1X Series  
 P1Z Series  
 GDL Series

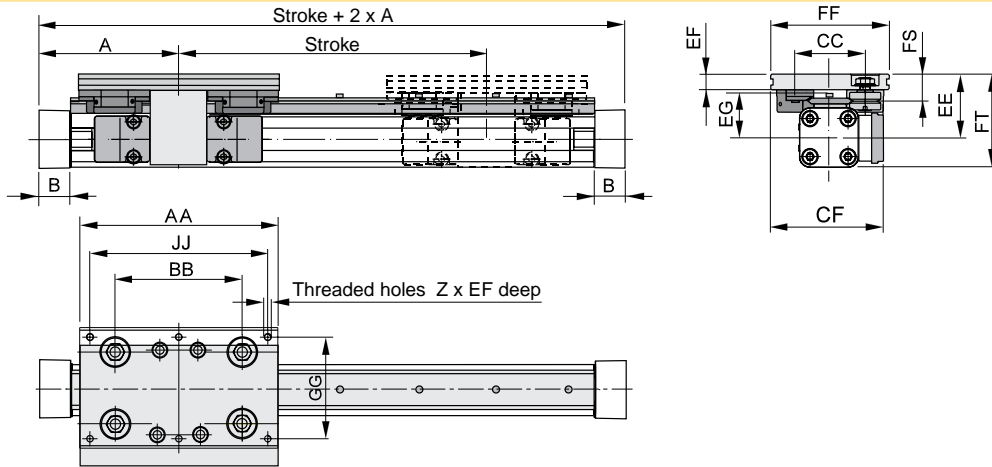
**SLIDELINE Dimensions**



**Dimensions (mm)**

| Series | A   | B    | J   | M    | Z  | AA  | BB  | DB | DD  | CF   | EC  | ED | EE | EG | EJ | EK | EL | EW | FF  | FT    | FS   | GG  | JJ  | ZZ |
|--------|-----|------|-----|------|----|-----|-----|----|-----|------|-----|----|----|----|----|----|----|----|-----|-------|------|-----|-----|----|
| SL 16  | 65  | 14   | 69  | 31   | M4 | 106 | 88  | -  | 30  | 55   | 36  | 8  | 40 | 30 | -  | -  | -  | 22 | 48  | 55    | 14   | 36  | 70  | 8  |
| SL 25  | 100 | 22   | 117 | 40.5 | M6 | 162 | 142 | M5 | 60  | 72.5 | 47  | 12 | 53 | 39 | 22 | 6  | 6  | 30 | 64  | 73.5  | 20   | 50  | 120 | 12 |
| SL 32  | 125 | 25.5 | 152 | 49   | M6 | 205 | 185 | M5 | 80  | 91   | 67  | 14 | 62 | 48 | 32 | 6  | 6  | 33 | 84  | 88    | 21   | 64  | 160 | 12 |
| SL 40  | 150 | 28   | 152 | 55   | M6 | 240 | 220 | M5 | 100 | 102  | 77  | 14 | 64 | 50 | 58 | 6  | 6  | 34 | 94  | 98.5  | 21.5 | 78  | 200 | 12 |
| SL 50  | 175 | 33   | 200 | 62   | M6 | 284 | 264 | M5 | 120 | 117  | 94  | 14 | 75 | 56 | 81 | 6  | 6  | 39 | 110 | 118.5 | 26   | 90  | 240 | 16 |
| SL 63  | 215 | 38   | 256 | 79   | M8 | 312 | 292 | -  | 130 | 152  | 116 | 18 | 86 | 66 | -  | -  | -  | 46 | 152 | 139   | 29   | 120 | 260 | 14 |
| SL 80  | 260 | 47   | 348 | 96   | M8 | 312 | 292 | -  | 130 | 169  | 116 | 18 | 99 | 79 | -  | -  | -  | 46 | 152 | 165   | 29   | 120 | 260 | 14 |

**POWERSLIDE Dimensions**



**Dimensions (mm)**

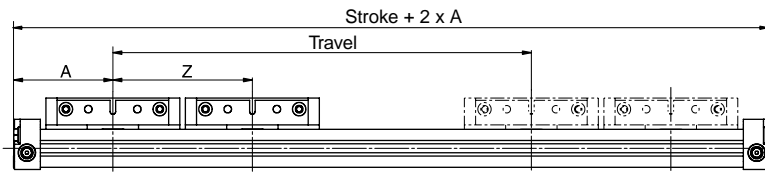
| Series   | A   | B    | Z     | AA  | BB  | CC  | CF    | EE   | EF   | EG   | FF  | FS   | FT    | GG  | JJ  |
|----------|-----|------|-------|-----|-----|-----|-------|------|------|------|-----|------|-------|-----|-----|
| PS 16/25 | 65  | 14   | 4xM6  | 120 | 65  | 47  | 80    | 49   | 12   | 35   | 80  | 21   | 64    | 64  | 100 |
| PS 25/25 | 100 | 22   | 6xM6  | 145 | 90  | 47  | 79.5  | 53   | 11   | 39   | 80  | 20   | 73.5  | 64  | 125 |
| PS 25/35 | 100 | 22   | 6xM6  | 156 | 100 | 57  | 89.5  | 52.5 | 12.5 | 37.5 | 95  | 21.5 | 73    | 80  | 140 |
| PS 25/44 | 100 | 22   | 6xM8  | 190 | 118 | 73  | 100   | 58   | 15   | 39   | 116 | 26   | 78.5  | 96  | 164 |
| PS 32/35 | 125 | 25.5 | 6xM6  | 156 | 100 | 57  | 95.5  | 58.5 | 12.5 | 43.5 | 95  | 21.5 | 84.5  | 80  | 140 |
| PS 32/44 | 125 | 25.5 | 6xM8  | 190 | 118 | 73  | 107   | 64   | 15   | 45   | 116 | 26   | 90    | 96  | 164 |
| PS 40/44 | 150 | 28   | 6xM8  | 190 | 118 | 73  | 112.5 | 75   | 15   | 56   | 116 | 26   | 109.5 | 96  | 164 |
| PS 40/60 | 150 | 28   | 6xM8  | 240 | 167 | 89  | 122.5 | 74   | 17   | 54   | 135 | 28.5 | 108.5 | 115 | 216 |
| PS 50/60 | 175 | 33   | 6xM8  | 240 | 167 | 89  | 130.5 | 81   | 17   | 61   | 135 | 28.5 | 123.5 | 115 | 216 |
| PS 50/76 | 175 | 33   | 6xM10 | 280 | 178 | 119 | 155.5 | 93   | 20   | 64   | 185 | 39   | 135.5 | 160 | 250 |

### Piston Options

Tandem pistons can be ordered to provide a larger mounting footprint. This option reduces the travel of the piston. When specifying the stroke of the cylinder, include the desired travel + Z dimension.

Please note Zmin dimension.

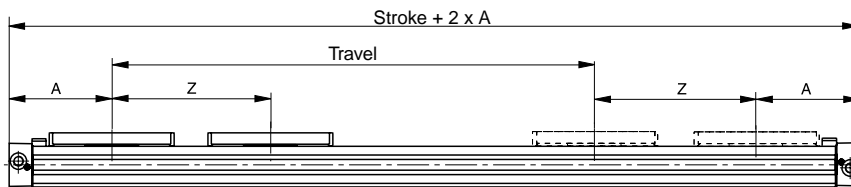
#### 10mm bore



#### Dimensions (mm)

| Series  | A    | Zmin |
|---------|------|------|
| OSP-P10 | 44.5 | 64   |

#### 16 to 80mm bore



#### Dimensions (mm)

| Series  | A   | Z min |
|---------|-----|-------|
| OSP-P16 | 65  | 81    |
| OSP-P25 | 100 | 128   |
| OSP-P32 | 125 | 170   |
| OSP-P40 | 150 | 212   |
| OSP-P50 | 175 | 251   |
| OSP-P63 | 215 | 313   |
| OSP-P80 | 260 | 384   |

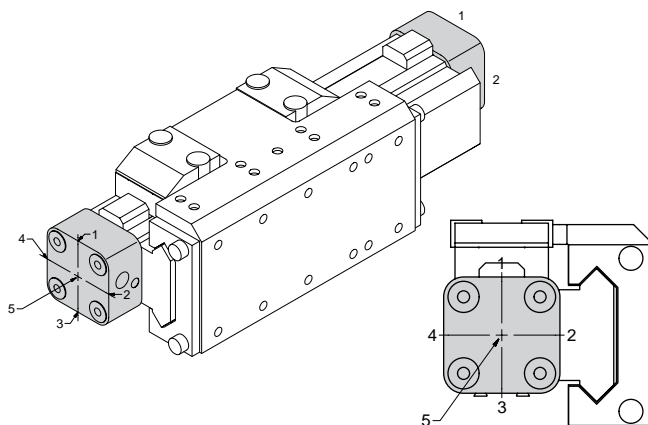
### Port orientation

When determining port orientation, the piston carriage is always at position 1. When a bearing system is order, the piston carriage is at position 1 and the bearing carriage is at position 2.

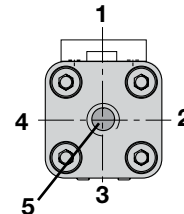
End caps can be field rotated to move port locations, excluding single ended port configurations

**Note:** Single end ports and port position 5 not available on 10 to 40mm bore.

#### Cylinder with guide end cap positioning



#### Basic cylinder end cap positioning





**Joint Clamp Connection  $\varnothing$  25-50 mm**

The joint clamp connection combines two OSP-P cylinders of the same size into a compact unit with high performance.

**Features**

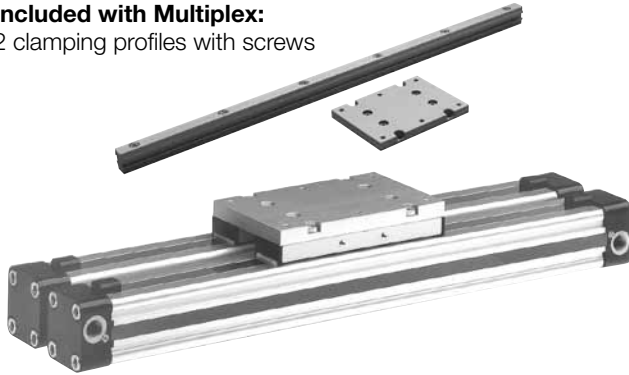
Increased load and torque capacity  
 Higher driving forces

**Included with Joint Clamp:**

2 clamping profiles with screws  
 1 mounting plate

**Included with Multiplex:**

2 clamping profiles with screws



| Series  | Order number |             |
|---------|--------------|-------------|
|         | Joint clamp  | Multiplex   |
| OSP-P25 | 20153-sssss  | 20035-sssss |
| OSP-P32 | 20290-sssss  | 20167-sssss |
| OSP-P40 | 20156-sssss  | 20036-sssss |
| OSP-P50 | 20292-sssss  | 20168-sssss |

Note: sssss = stroke of cylinder

**Clevis Mounting,  $\varnothing$  16-80 mm**

When external guides are used, parallelism deviations can lead to mechanical strain on the piston. This can be avoided by the use of a clevis mounting.

In the drive direction, the mounting has very little play.

Freedom of movement is provided as follows:

- Tilting in direction of movement
- Vertical compensation
- Tilting sideways
- Horizontal compensation

| Series  | Order number |           |
|---------|--------------|-----------|
|         | Standard     | Stainless |
| OSP-P16 | 20462        | 20463     |
| OSP-P25 | 20005        | 20092     |
| OSP-P32 | 20096        | 20094     |
| OSP-P40 | 20024        | 20093     |
| OSP-P50 | 20097        | 20095     |
| OSP-P63 | 20466        | 20467     |
| OSP-P80 | 20477        | 20478     |



**Inversion Mounting,  $\varnothing$  16-80 mm**

In dirty environments, or where there are special space restrictions, inversion of the cylinder is recommended.

The inversion bracket transfers the driving force to the opposite side of the cylinder. The size and position of the mounting holes are the same as on the standard cylinder.

**Please note:**

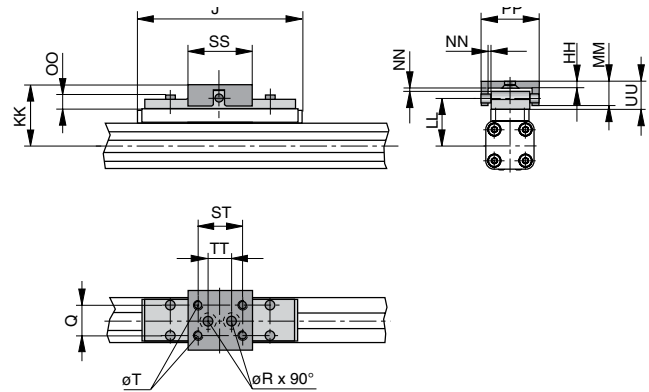
Other components of the OSP system such as **mid-section supports, magnetic switches** and the **external air passage for the 16mm bore**, can still be mounted on the free side of the cylinder.

When combining single end porting with inversion mountings, RS magnetic switches can only be mounted directly opposite to the external air-supply profile.



| Series  | Order number |
|---------|--------------|
| OSP-P16 | 20446        |
| OSP-P25 | 20037        |
| OSP-P32 | 20161        |
| OSP-P40 | 20039        |
| OSP-P50 | 20166        |
| OSP-P63 | 20459        |
| OSP-P80 | 20490        |

**Series OSP-P16 to 32**



**Dimensions (mm)**

| Series  | J   | Q  | T   | $\varnothing$ R | HH  | KK  | LL   | MM | NN* | OO  | PP | SS | ST | TT | UU |
|---------|-----|----|-----|-----------------|-----|-----|------|----|-----|-----|----|----|----|----|----|
| OSP-P16 | 69  | 10 | M4  | 4.5             | 3   | 34  | 26.6 | 10 | 1   | 8.5 | 26 | 28 | 20 | 10 | 11 |
| OSP-P25 | 117 | 16 | M5  | 5.5             | 3.5 | 52  | 39   | 19 | 2   | 9   | 38 | 40 | 30 | 16 | 21 |
| OSP-P32 | 152 | 25 | M6  | 6.6             | 6   | 68  | 50   | 28 | 2   | 13  | 62 | 60 | 46 | 40 | 30 |
| OSP-P40 | 152 | 25 | M6  | -               | 6   | 74  | 56   | 28 | 2   | 13  | 62 | 60 | 46 | -  | 30 |
| OSP-P50 | 200 | 25 | M6  | -               | 6   | 79  | 61   | 28 | 2   | 13  | 62 | 60 | 46 | -  | 30 |
| OSP-P63 | 256 | 37 | M8  | -               | 8   | 100 | 76   | 34 | 3   | 17  | 80 | 80 | 65 | -  | 37 |
| OSP-P80 | 348 | 38 | M10 | -               | 8   | 122 | 96   | 42 | 3   | 16  | 88 | 90 | 70 | -  | 42 |

\* Dimension NN gives the possible plus and minus play in horizontal and vertical movement, which also makes tilting sideways possible.

**B**  
 Rodless Cylinders  
 Actuator Products  
 Series OSP-P  
 Series P1X  
 Series P1Z  
 Series GDL



**Active Brake (Basic Cylinder)**



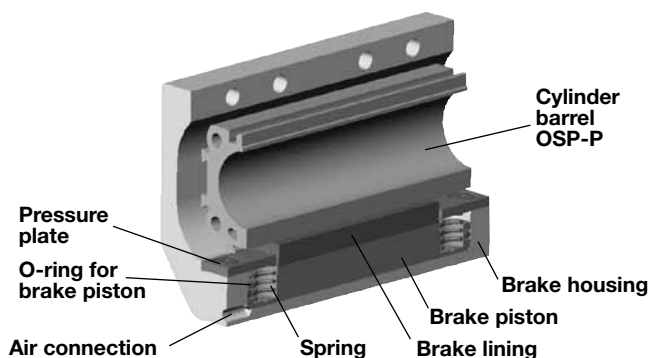
**Series AB25 to 80 for basic cylinder**

**Features**

- Actuated by pressurization
- Released by spring actuation
- Holds position, even under changing load conditions

**Note:**

Cannot be used in combination with intermediate supports or position sensors.



**Forces and Weights (SLIDELINE Guide Required)**

| Series | Max. braking force (N) <sup>(1)</sup> | Brake pad way (mm) | Mass (kg)               |                           |        | Active brake order number |
|--------|---------------------------------------|--------------------|-------------------------|---------------------------|--------|---------------------------|
|        |                                       |                    | Linear drive with brake |                           |        |                           |
|        |                                       |                    | 0 mm stroke             | Increase per 100mm stroke | Brake* |                           |
| AB 25  | 350                                   | 2.5                | 1.0                     | 0.197                     | 0.35   | 20806                     |
| AB 32  | 590                                   | 2.5                | 2.02                    | 0.354                     | 0.58   | 20807                     |
| AB 40  | 900                                   | 2.5                | 2.83                    | 0.415                     | 0.88   | 20808                     |
| AB 50  | 1400                                  | 2.5                | 5.03                    | 0.566                     | 1.50   | 20809                     |
| AB 63  | 2170                                  | 3.0                | 9.45                    | 0.925                     | 3.04   | 20810                     |
| AB 80  | 4000                                  | 3.0                | 18.28                   | 1.262                     | 5.82   | 20811                     |

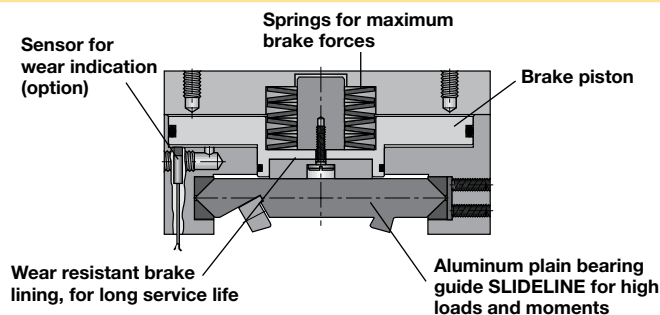
<sup>(1)</sup> – at 6 bar  
 both chambers pressurized with 6 bar  
 – oil on the braking surface will reduce braking effectiveness

**\* Please Note:**  
 The mass of the brake should be added to the total moving mass when using the cushioning diagram.

**Multi-Brake**

The Multi-Brake is a passive device. When the air pressure is removed the brake is actuated and movement of the cylinder is blocked. The brake is released by pressurization.

The high friction, wear resistant brake linings allow the Multi-Brake to be used as a dynamic brake to stop cylinder movement in the shortest possible time. The powerful springs also allow the Multi-Brake to be used in applications where non-precision positioning is required



| Series   | Max. brake force N (lb) <sup>(1)</sup> | Mass of linear drive with guide kg (lb) |                            | Mass* guide carriage kg (lb) |
|----------|--|---|----------------------------|------------------------------|
|          |  | With 0 mm stroke                        | Increase per 100 mm stroke |                              |
| MB-SL 25 | 470 (105.7)                            | 2.04 (5.5)                              | 0.39 (1.0)                 | 1.10 (2.9)                   |
| MB-SL 32 | 790 (177.6)                            | 3.82 (10.2)                             | 0.65 (1.7)                 | 1.79 (4.8)                   |
| MB-SL 40 | 1200 (269.8)                           | 5.16 (13.8)                             | 0.78 (2.1)                 | 2.34 (6.3)                   |
| MB-SL 50 | 1870 (420.4)                           | 8.29 (22.2)                             | 0.97 (2.6)                 | 3.63 (9.7)                   |
| MB-SL 63 | 2900 (651.9)                           | 13.31 (35.7)                            | 1.47 (3.9)                 | 4.97 (13.3)                  |
| MB-SL 80 | 2900 (651.9)                           | 17.36 (46.5)                            | 1.81 (4.8)                 | 4.97 (13.3)                  |

<sup>(1)</sup> Braking surface dry – oil on the braking surface will reduce the braking force

\* In the cushioning diagram, the mass of the guide carriage has to be added to the total moving mass.

**B**  
 Rodless Cylinders  
 Actuator Products  
 OSP-P Series  
 PIX Series  
 P1Z Series  
 GDL Series

**End cap mountings,  $\phi$  10-80 mm**

On the face of each end cap there are four threaded holes for mounting the actuator. The hole layout is square, so that the mounting can be fitted to the bottom, top or either side, regardless of the position chosen for the air connection.

**Material:**

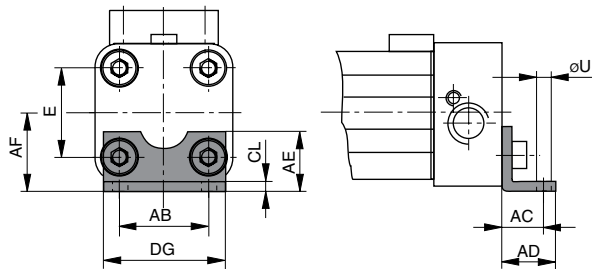
**Series OSP-P10 – P32:** Galvanized steel.

**Series OSP-P40 – P80:** Anodized aluminum.

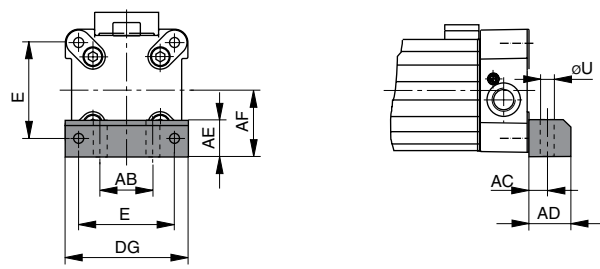
The mountings are supplied in pairs.



**Series OSP-P16 to 32: Type A1**



**Series OSP-P40 to 80: Type C1**



**Dimensions (mm)**

| Series  | E  | $\phi U$ | AB | AC   | AD | AE   | AF | CL  | DG   |
|---------|----|----------|----|------|----|------|----|-----|------|
| OSP-P10 | —  | 3.6      | 12 | 10   | 14 | 20.2 | 11 | 1.6 | 18.4 |
| OSP-P16 | 18 | 3.6      | 18 | 10   | 14 | 12.5 | 15 | 1.6 | 26   |
| OSP-P25 | 27 | 5.8      | 27 | 16   | 22 | 18   | 22 | 2.5 | 39   |
| OSP-P32 | 36 | 6.6      | 36 | 18   | 26 | 20   | 30 | 3   | 50   |
| OSP-P40 | 54 | 9        | 30 | 12.5 | 24 | 24   | 38 | —   | 68   |
| OSP-P50 | 70 | 9        | 40 | 12.5 | 24 | 30   | 48 | —   | 86   |
| OSP-P63 | 78 | 11       | 48 | 15   | 30 | 40   | 57 | —   | 104  |
| OSP-P80 | 96 | 14       | 60 | 17.5 | 35 | 50   | 72 | —   | 130  |

(\* = Pair)

**Mounting type**

| Series  | A1       | B1       | C1      | D1       | E1       |
|---------|----------|----------|---------|----------|----------|
| OSP-P10 | 0240     | —        | —       | —        | —        |
| OSP-P16 | 20408FIL | —        | —       | 20434FIL | 20435FIL |
| OSP-P25 | 2010     | 20311FIL | —       | 20008FIL | 2009FIL  |
| OSP-P32 | 3010     | 20313FIL | —       | 20157FIL | 20158FIL |
| OSP-P50 | —        | —        | 5010FIL | 20162FIL | 20163FIL |
| OSP-P63 | —        | —        | 6010FIL | 20451FIL | 20452FIL |
| OSP-P80 | —        | —        | 8010FIL | 20480FIL | 20482FIL |

Mounting kits can be ordered via the above part numbers.

**Note:** Mounting kits are provided in pairs.

**B**  
 Rodless Cylinders  
 Actuator Products  
 Series  
 OSP-P  
 Series  
 P1X  
 Series  
 P1Z  
 Series  
 GDL

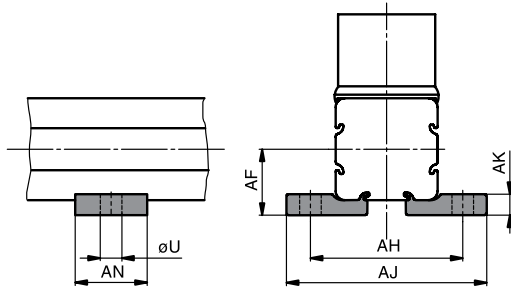
**Intermediate supports, ø 10-80 mm**

**Note on types E1 and D1 (P16 – P80):**

The intermediate supports can also be mounted on the underside of the actuator, in which case its distance from the center of the actuator is different.



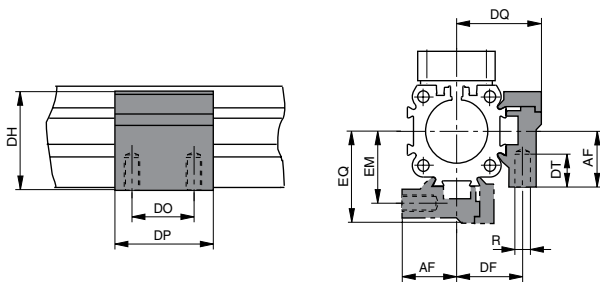
**Series OSP-10, Type E1**



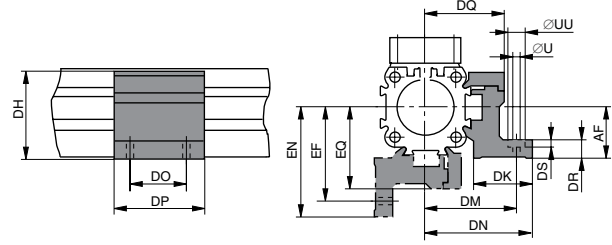
**Dimensions (mm) Series OSP-P10**

| Series  | U   | AF | AH   | AJ   | AK  | AN |
|---------|-----|----|------|------|-----|----|
| OSP-P10 | 3.6 | 11 | 25.4 | 33.4 | 3.5 | 12 |

**Series OSP-16 to 80, Type D1**



**Series OSP-P16 to P80: Type E1**



**Dimension Table (mm) – Series OSP-P16 to P80**

| Series  | R   | U   | UU | AF | DF   | DH    | DK | DM | DN   | DO | DP | DQ   | DR | DS  | DT  | EF   | EM   | EN   | EQ |
|---------|-----|-----|----|----|------|-------|----|----|------|----|----|------|----|-----|-----|------|------|------|----|
| OSP-P16 | M3  | 3.4 | 6  | 15 | 20   | 29.2  | 24 | 32 | 36.4 | 18 | 30 | 27   | 6  | 3.4 | 6.5 | 32   | 20   | 36.4 | 27 |
| OSP-P25 | M5  | 5.5 | 10 | 22 | 27   | 38    | 26 | 40 | 47.5 | 36 | 50 | 34.5 | 8  | 5.7 | 10  | 41.5 | 28.5 | 49   | 36 |
| OSP-P32 | M5  | 5.5 | 10 | 30 | 33   | 46    | 27 | 46 | 54.5 | 36 | 50 | 40.5 | 10 | 5.7 | 10  | 48.5 | 35.5 | 57   | 43 |
| OSP-P40 | M6  | 7   | -  | 38 | 35   | 61    | 34 | 53 | 60   | 45 | 60 | 45   | 10 | -   | 11  | 56   | 38   | 63   | 48 |
| OSP-P50 | M6  | 7   | -  | 48 | 40   | 71    | 34 | 59 | 67   | 45 | 60 | 52   | 10 | -   | 11  | 64   | 45   | 72   | 57 |
| OSP-P63 | M8  | 9   | -  | 57 | 47.5 | 91    | 44 | 73 | 83   | 45 | 65 | 63   | 12 | -   | 16  | 79   | 53.5 | 89   | 69 |
| OSP-P80 | M10 | 11  | -  | 72 | 60   | 111.5 | 63 | 97 | 112  | 55 | 80 | 81   | 15 | -   | 25  | 103  | 66   | 118  | 87 |

**B**

Rodless Cylinders  
 Actuator Products

OSP-P  
 Series

P1X  
 Series


P1Z  
 Series

GDL  
 Series

**Adaptor profile, ø 16-50 mm**

**Adaptor profile OSP**


A universal attachment for mounting of valves etc.  
 Solid material

|   | Series  | Order number |           |
|---|---------|--------------|-----------|
|   |         | Standard     | Stainless |
|  | OSP-P16 | 20432FIL     | 20438FIL  |
|   | OSP-P25 | 20006FIL     | 20186FIL  |
|   | OSP-P32 | 20006FIL     | 20186FIL  |
|   | OSP-P40 | 20025FIL     | 20267FIL  |
|   | OSP-P50 | 20025FIL     | 20267FIL  |

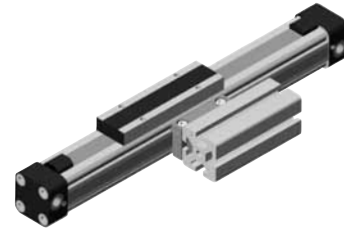
**T-Slot Profile ø 16-50 mm**

**T-slot profile OSP**

A universal attachment for mounting with standard T-Nuts

|  | Series  | Order number |           |
|--|---------|--------------|-----------|
|  |         | Standard     | Stainless |
|  | OSP-P16 | 20433FIL     | 20439FIL  |
|  | OSP-P25 | 20007FIL     | 20187FIL  |
|  | OSP-P32 | 20007FIL     | 20187FIL  |
|  | OSP-P40 | 20026FIL     | 20268FIL  |
|  | OSP-P50 | 20026FIL     | 20268FIL  |

Note: Can be used in conjunction with IPS T-nut (20-058).




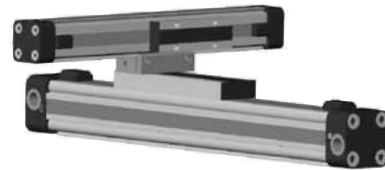
Combination of Series OSP-P with system profiles

**Connection profile, ø 16-50 mm**

**For combining**

Series OSP-P with system profiles  
 Series OSP-P with Series OSP-P

|   | Series  | Order number |
|---|---------|--------------|
|  | OSP-P16 | 20849FIL     |
|   | OSP-P25 | 20850FIL     |
|   | OSP-P32 | 20850FIL     |
|   | OSP-P40 | 20851FIL     |
|   | OSP-P50 | 20851FIL     |



Combination of Series OSP-P with Series OSP-P

**B**  
 Rodless Cylinders  
 Actuator Products  
 OSP-P Series  
 P1X Series  
 P1Z Series  
 GDL Series

**Other Options**



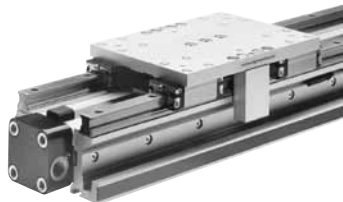
**PROLINE**  
 The compact aluminum roller guide for high loads and velocities and utilizes the GDL Guide Bearing



**STARLINE**  
 Recirculating ball bearing guide for very high loads and precision



**KF Guide**  
 Recirculating ball bearing guide – the mounting dimensions correspond to FESTO Type: DGPL-KF



**Heavy Duty Guide HD**  
 for heavy duty applications



**Integrated VOE Valves**



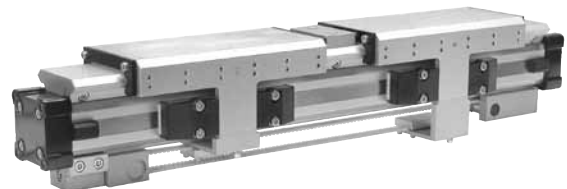
**SENSOFLEX SFI-plus**  
 Incremental measuring system with 0.1 (1.0) mm resolution



**Variable Stop VS**  
 The variable stop provides simple stroke limitation  
 Available on STARLINE only



**Clean Room Version**  
 Certified to DIN EN ISO 14644-1



**Rodless Cylinder**  
 For synchronized bi-parting movements  
 Available on SLIDELINE Guide Bearing only

**B**

Rodless Cylinders  
 Actuator Products

OSP-P  
 Series

P1X  
 Series

P1Z  
 Series

GDL  
 Series

**Service packs**

|   | Bore sizes  |             |             |             |             |             |             |
|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|   | 16mm        | 25mm        | 32mm        | 40mm        | 50mm        | 63mm        | 80mm        |
| BUNA service pack single piston                             | 11111xsssss | 11112xsssss | 11113xsssss | 11114xsssss | 11115xsssss | 11116xsssss | 11118xsssss |
| Fluorocarbon service pack single piston                     | 11121xsssss | 11122xsssss | 11123xsssss | 11124xsssss | 11125xsssss | 11126xsssss | 11128xsssss |
| BUNA service pack single piston - slow speed grease         | 11131xsssss | 11132xsssss | 11133xsssss | 11134xsssss | 11135xsssss | 11136xsssss | 11138xsssss |
| Fluorocarbon service pack single piston - slow speed grease | 11141xsssss | 11142xsssss | 11143xsssss | 11144xsssss | 11145xsssss | 11146xsssss | 11148xsssss |

Note: sssss = stroke of cylinder

**Service Pack Information**

Service Packs contain all the components necessary to completely rebuild a Parker rodless cylinder, are available. Each pack contains a complete seal kit, inner and outer bands, Parker grease tube, cleaning tool and repair instructions. It's all packaged in an easy-to-ship, easy-to-store box clearly labeled to indicate the cylinder type, bore and stroke for which it is intended. Contact your local Parker distributor for more information.

**Seal kits**

|   | Bore sizes |          |          |          |          |          |          |
|---|------------|----------|----------|----------|----------|----------|----------|
|   | 16mm       | 25mm     | 32mm     | 40mm     | 50mm     | 63mm     | 80mm     |
| BUNA seal kit - standard cylinder         | 11052      | 11053    | 11054    | 11055    | 11056    | 11057    | 11058    |
| Fluorocarbon seal kit - standard cylinder | 11059      | 11060    | 11061    | 11062    | 11063    | 11064    | 11065    |
| Seal kit - sideline carriage              | 11066      | 11067    | 11068    | 11069    | 11070    | —        | —        |
| Seal kit active brake - standard cylinder | —          | 11822FIL | 11823FIL | 11824FIL | 11825FIL | 11826FIL | 11827FIL |
| Seal kit - multibrake                     | —          | 11089FIL | 11090FIL | 11091FIL | 11092FIL | 11093FIL | —        |

**Seal Kit Information**

Seal Kits include all seals, a tube of grease, bearing shoe, scraper and cleaning tool.

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GDL Series

- 7 bore sizes – 16mm through 63mm
- Two port locations standard
- Large carriage for stability
- Integral sensor mounting rail
- Optional adjustable stroke and shock absorbers



**Operating information**

Maximum pressure: 100 PSIG (7 bar)  
 Minimum pressure: Ø16, Ø20 bores 29 PSI (2 bar)  
 Ø25, Ø32, Ø40 bores 14.5 PSI (1 bar)  
 Ø50, Ø63 bores 7 PSI (0.5 bar)  
 Proof pressure: 152 PSI (10.5 bar)  
 Temperature range: 40°F to 140°F (5°C to 60°C)  
 Filtration requirements: Filtered, nonlubricated compressed air  
 For technical information see CD

**Ordering Information**

|  |                    |  |                 |   |               |  |                                   |  |   |   |   |           |
|--|--------------------|--|-----------------|---|---------------|--|-----------------------------------|--|---|---|---|-----------|
| <b>P1X</b>   | <b>N</b>           | <b>032</b>   | <b>D</b>        | <b>A</b>  | <b>N</b>      | <b>0500</b>  | <b>W</b>                          | <b>D</b>   | <b>N</b>  | <b>N</b>  | <b>N</b>                                      | <b>-B</b> |
| Series   | Construction       | Bore size  | Carriage        | Piston / Shock style  | Seal material | Stroke length*   | Basic or options                  | Porting options  | Carriage mounting style   | Mounting options  | Fastener Type                                 |           |
| P1X Global Rodless   | N Inch<br>M Metric | 016 16mm<br>020 20mm<br>025 25mm<br>032 32mm<br>040 40mm<br>050 50mm<br>063 63mm | D Double acting | A Cushions both ends (standard)<br>R Cushion right end only*<br>L Cushion left end only*<br>N No cushions or shock absorbers<br>H Shock absorber both ends**<br>B Shock absorber right end only**<br>C Shock absorber left end only** | N Standard    | B† Standard<br>W† With options<br>/ Special (for factory use only) | N NPTF (Std)<br>G BSPP<br>Q BSPT* | D Basic mount<br>J Inverted basic mount<br>A Swivel mount<br>G Inverted swivel mount | No Foot mount<br>End mount foot bracket<br>Bottom mount foot bracket<br>Intermediate supports | N (std) F A†† No support<br>H M B†† One support<br>K P C†† Two supports<br>T R D†† Three supports | N Standard - zinc-plated<br>S Stainless steel |           |
| <p>* Stroke is ALWAYS in mm.<br/>                 † When "B" is specified, the remaining digits in the part number are not necessary. If "W" is used, the remaining digits in the part number must be filled out.<br/>                 †† Not available on 40, 50 and 63mm bore sizes.</p> |                    |  |                 |   |               |  |                                   |  |   |   |   |           |
| <p>Essential Information      Sensors      For sensors see page B294. </p>   |                    |  |                 |   |               |  |                                   |  |   |   |   |           |

B

Rodless Cylinders  
Actuator Products

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OSP-P Series

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P1X Series

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P1Z Series

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GDL Series



**Specifications**

|                             |   |                  |                        |                   |
|-----------------------------|---|------------------|------------------------|-------------------|
| <b>Model</b>                | <b>P1X (Standard w/switch)</b>  |                  |                        |                   |
| Operating medium            | Compressed air  |                  |                        |                   |
| Maximum pressure            | 100 PSI (7 bar)   |                  |                        |                   |
| Minimum pressure            | Ø16, Ø20 bores  | 29 PSI (2 bar)   |                        |                   |
|                             | Ø25, Ø32, Ø40 bores   | 14.5 PSI (1 bar) |                        |                   |
| Proof pressure              | Ø50, Ø63 bores  | 7 PSI (0.5 bar)  |                        |                   |
|                             | 152 PSI (10.5 bar)  |                  |                        |                   |
| Bore size mm (inch nominal) | 16 (5/8)  | 20 (3/4), 25 (1) | 32 (1-1/4), 40 (1-1/2) | 50 (2), 63 (21/2) |
| Port size – N series        | M5 (10-32)  | 1/8 NPT          | 1/4 NPT                | 3/8 NPT           |
| Port size – M series        | M5 (10-32)  | 1/8 Rc           | 1/4 Rc                 | 3/8 Rc            |
| Ambient temperature °F (°C) | 40 to 140°F (5 to 60°C)   |                  |                        |                   |
| Stroke tolerance in.        | ±0.080 to 39"   | ±0.100 to 118"   | ±0.120 to 196"         |                   |
| Piston speed, *in./sec.     | 2-80 IPS with side ports on each end (Ø16 & Ø20 bores 2-40 IPS with single end porting with 39" stroke) (Ø25, Ø32, Ø40, Ø50 & Ø63 bores 2-40 IPS with single end porting with 78" stroke) |                  |                        |                   |
| Cushion                     | Air cushion standard  |                  |                        |                   |
| Lubrication                 | Not required (if you choose to lubricate your system, continuing lubrication will be required.)   |                  |                        |                   |

\*Actual piston speed with one end ports will vary depending on stroke length.

**Weight & theoretical force characteristics**

| Bore | Area in <sup>2</sup> | Weights               |     |       |     |      |     |                               |      |   |     |     |     |     |
|------|----------------------|-----------------------|-----|-------|-----|------|-----|-------------------------------|------|---|-----|-----|-----|-----|
|      |                      | Weight at zero stroke |     |       |     |      |     | Weight per 1" (25.4mm) stroke |      | Theoretical force (lbs) At pressure (PSI) |     |     |     |     |
|      |                      | M00                   |     | MLB   |     | MLB1 |     | lbs                           | kg   | 30  | 40  | 60  | 80  | 100 |
| 16   | 0.31                 | 0.70                  | 0.3 | 0.73  | 0.3 | 0.77 | 0.4 | 0.07                          | 0.03 | 9   | 12  | 19  | 25  | 31  |
| 20   | 0.49                 | 1.15                  | 0.5 | 1.19  | 0.5 | 1.28 | 0.6 | 0.10                          | 0.04 | 15  | 20  | 29  | 39  | 49  |
| 25   | 0.84                 | 2.21                  | 1.0 | 2.43  | 1.1 | 2.43 | 1.1 | 0.15                          | 0.07 | 23  | 30  | 46  | 61  | 76  |
| 32   | 1.26                 | 3.31                  | 1.5 | 3.53  | 1.6 | 3.75 | 1.7 | 0.20                          | 0.09 | 38  | 50  | 69  | 100 | 125 |
| 40   | 1.96                 | 5.29                  | 2.4 | 5.51  | 2.5 | —    | —   | 0.27                          | 0.12 | 59  | 78  | 117 | 156 | 195 |
| 50   | 3.08                 | 7.94                  | 3.6 | 8.16  | 3.7 | —    | —   | 0.40                          | 0.18 | 91  | 122 | 182 | 243 | 304 |
| 63   | 4.86                 | 13.67                 | 6.2 | 14.33 | 6.5 | —    | —   | 0.63                          | 0.28 | 145                                       | 193 | 290 | 386 | 483 |

**Moments**

Figure 1 shows the maximum allowable moments for each of the three types of loading: pitch, roll and yaw.

The sum total of each of these types of moments, divided by each of the maximum values, determines a Load-Moment Factor (LMF) should be equal to or less than 1.0. On horizontal mountings, the total load (L) should also be divided by the maximum load allowable (Figure 2) and factored into the equation.

Horizontal mountings:

$$\frac{L}{[L]} + \frac{M}{[M]} + \frac{Ms}{[Ms]} + \frac{Mv}{[Mv]} = LMF \leq 1.0$$

Vertical mountings:

$$\frac{M}{[M]} + \frac{Ms}{[Ms]} + \frac{Mv}{[Mv]} = LMF \leq 1.0$$

**Figure 1**

| Bore size | Maximum allowable moments n-m (lb-in) |            |                  |            |                 |          |
|-----------|---------------------------------------|------------|------------------|------------|-----------------|----------|
|           | [M] Pitch moment                      |            | [Ms] Roll moment |            | [Mv] Yaw moment |          |
|           | Std.                                  | Inverted   | Std.             | Inverted   | Std.            | Inverted |
| 16        | 5 (44)                                | 3.5 (31)   | 1 (9)            | 0.5 (4)    | 1 (9)           | 1 (9)    |
| 20        | 10 (89)                               | 7 (62)     | 1.5 (13)         | 0.7 (6)    | 3 (27)          | 3 (27)   |
| 25        | 17 (150)                              | 12 (106)   | 5 (44)           | 2.5 (22)   | 10 (89)         | 10 (89)  |
| 32        | 36 (319)                              | 25 (221)   | 10 (89)          | 5 (44)     | 21 (186)        | 21 (186) |
| 40        | 77 (682)                              | 54 (478)   | 23 (204)         | 11.5 (102) | 26 (230)        | 26 (230) |
| 50        | 154 (1363)                            | 108 (956)  | 32 (283)         | 16 (142)   | 42 (372)        | 42 (372) |
| 63        | 275 (2434)                            | 193 (1708) | 52 (460)         | 26 (230)   | 76 (673)        | 76 (673) |

**Figure 2**

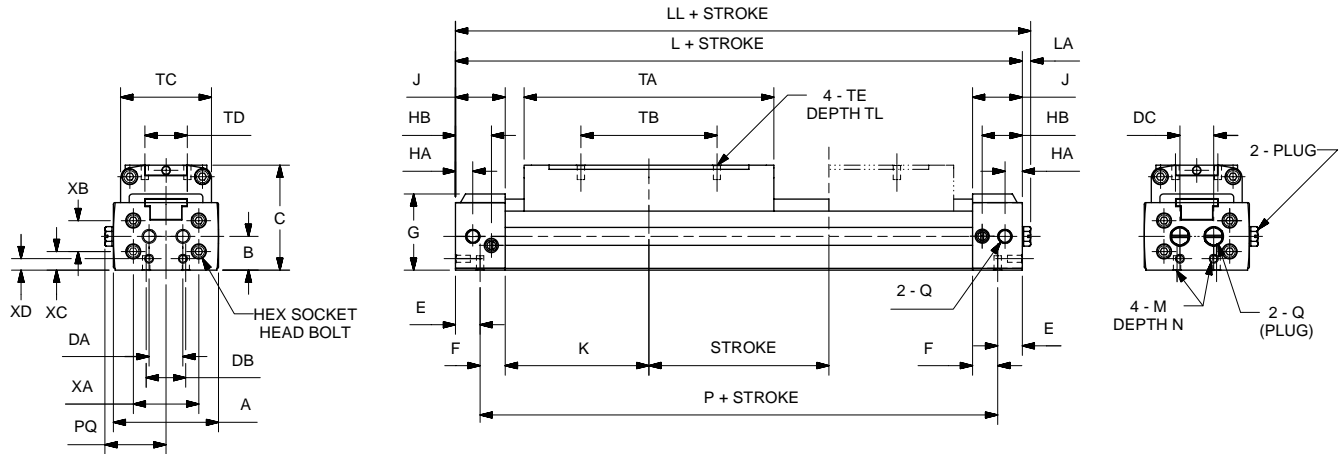
| Bore size | Max. allowable load [L] N (lbs) |            | Max. unsupported length mm (in) at max. load |
|-----------|---------------------------------|------------|--|
|           | Std.                            | Inverted   |  |
| 16        | 141 (32)                        | 70 (16)    | 450 (17.7)                                   |
| 20        | 198 (45)                        | 101 (23)   | 551 (21.7)                                   |
| 25        | 356 (81)                        | 180 (41)   | 899 (35.4)                                   |
| 32        | 616 (140)                       | 308 (70)   | 749 (29.5)                                   |
| 40        | 959 (218)                       | 480 (109)  | 1000 (39.4)                                  |
| 50        | 1456 (331)                      | 726 (165)  | 1300 (51.2)                                  |
| 63        | 2297 (522)                      | 1148 (261) | 1600 (63.0)                                  |

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 P1X Series  
 P1Z Series  
 GDL Series





**Basic cylinder**



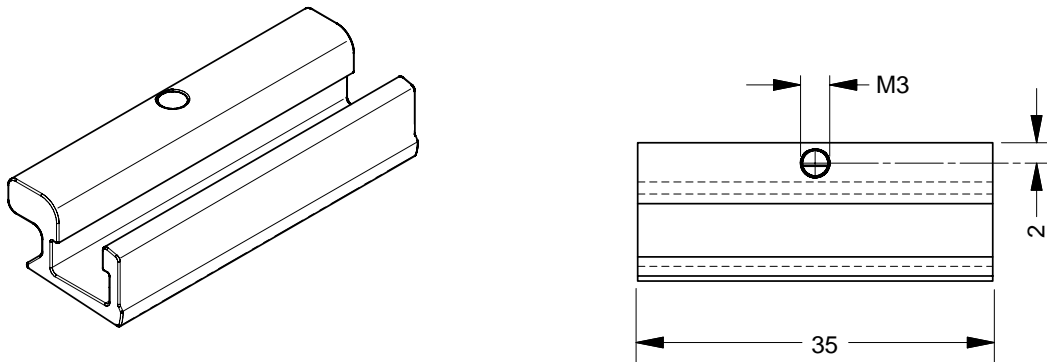
| Bore (mm) | A            | B            | C            | DA           | DB           | DC           | E              | F              | G            | HA            | HB             | J              | K              | L             | LL              | LA            | M            | N             |
|-----------|--------------|--------------|--------------|--------------|--------------|--------------|----------------|----------------|--------------|---------------|----------------|----------------|----------------|---------------|-----------------|---------------|--------------|---------------|
| 16        | 1.46<br>(37) | 0.47<br>(12) | 1.46<br>(37) | 0.47<br>(12) | 0.55<br>(14) | 0.47<br>(12) | 0.34<br>(8.5)  | 0.35<br>(9)    | 1.06<br>(27) | 0.24<br>(6)   | 0.55<br>(14)   | 0.69<br>(17.5) | 2.24<br>(57)   | 5.87<br>(149) | 5.98<br>(152)   | 0.12<br>(3)   | 5-40<br>(M3) | 0.20<br>(5)   |
| 20        | 1.73<br>(44) | 0.55<br>(14) | 1.65<br>(42) | 0.55<br>(14) | 0.63<br>(16) | 0.63<br>(16) | 0.41<br>(10.5) | 0.45<br>(11.5) | 1.22<br>(31) | 0.34<br>(8.5) | 0.73<br>(18.5) | 0.87<br>(22)   | 2.46<br>(62.5) | 6.65<br>(169) | 6.75<br>(171.5) | 0.10<br>(2.5) | 8-32<br>(M4) | 0.26<br>(6.5) |

| Bore (mm) | P             | PQ             | Q                   | TA            | TB           | TC           | TD           | TE           | TL          | XA           | XB           | XC            | XD          |
|-----------|---------------|----------------|---------------------|---------------|--------------|--------------|--------------|--------------|-------------|--------------|--------------|---------------|-------------|
| 16        | 5.20<br>(132) | 0.83<br>(21)   | 10-32 NPT<br>(M5)   | 3.47<br>(88)  | 1.89<br>(48) | 1.26<br>(32) | 0.59<br>(15) | 5-40<br>(M3) | 0.20<br>(5) | 0.91<br>(23) | 0.43<br>(11) | 0.26<br>(6.5) | 0.16<br>(4) |
| 20        | 5.83<br>(148) | 0.97<br>(24.5) | 1/8 NPT<br>(1/8 Rc) | 3.94<br>(100) | 2.36<br>(60) | 1.50<br>(38) | 0.71<br>(18) | 8-32<br>(M4) | 0.24<br>(6) | 1.10<br>(28) | 0.63<br>(16) | 0.24<br>(6)   | 0.20<br>(5) |

inches (mm)

**Sensor adapter bracket**

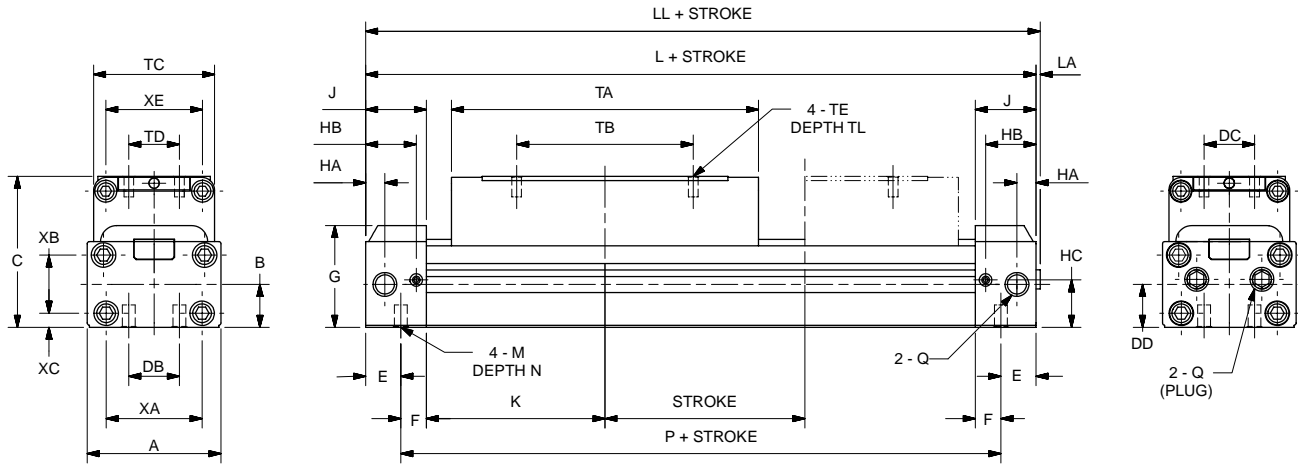
**Part number P8S-TMA0Y**  
 (Shown larger than actual size)



NOTE: Must be ordered separately when ordering sensors.



**Basic cylinder**

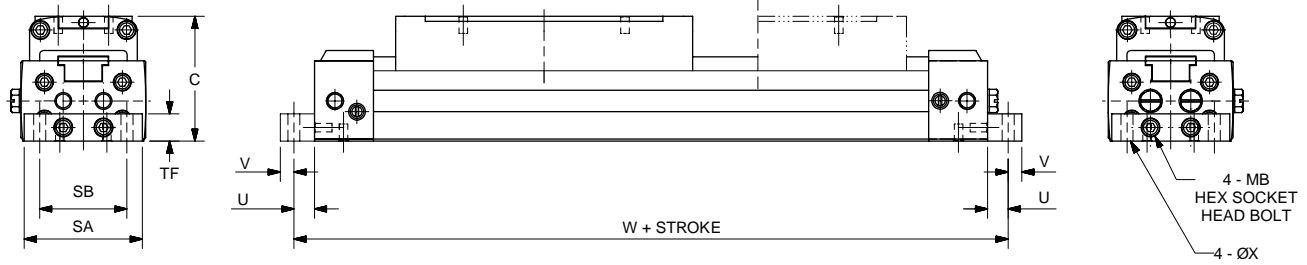


| Series       | Bore (mm) |            |             |           |           |           |           |           |           |             |            |             |             |           |            |             |               |            |              |           |
|--------------|-----------|------------|-------------|-----------|-----------|-----------|-----------|-----------|-----------|-------------|------------|-------------|-------------|-----------|------------|-------------|---------------|------------|--------------|-----------|
|              | A         | B          | C           | DB        | DC        | DD        | E         | F         | G         | HA          | HB         | HC          | J           | K         | L          | LL          | LA            | M          | N            |           |
| OSP-P Series | 25        | 2.09 (53)  | 0.67 (17)   | 2.09 (53) | 0.79 (20) | 1.02 (26) | 0.75 (19) | 0.55 (14) | 0.39 (10) | 1.59 (40.5) | 0.30 (7.5) | 0.79 (20)   | 0.74 (18.9) | 0.95 (24) | 2.80 (71)  | 7.48 (190)  | 7.56 (192)    | 0.08 (2)   | 1/4-20 (M6)  | 0.35 (9)  |
|              | 32        | 2.60 (66)  | 0.73 (18.5) | 2.24 (57) | 1.26 (32) | 1.06 (27) | 0.83 (21) | 0.59 (15) | 0.51 (13) | 1.71 (43.5) | 0.39 (10)  | 0.93 (23.5) | 0.85 (21.5) | 1.10 (28) | 3.35 (85)  | 8.90 (226)  | 9.00 (228.5)  | 0.10 (2.5) | 1/4-20 (M6)  | 0.35 (9)  |
| P1X Series   | 40        | 3.15 (80)  | 0.87 (22)   | 2.64 (67) | 1.42 (36) | 1.38 (35) | 1.10 (28) | 0.67 (17) | 0.55 (14) | 2.03 (51.5) | 0.51 (13)  | 1.02 (26)   | 1.06 (27)   | 1.22 (31) | 3.58 (91)  | 9.61 (244)  | 9.71 (246.5)  | 0.10 (2.5) | 5/16-18 (M8) | 0.47 (12) |
|              | 50        | 3.78 (96)  | 1.10 (28)   | 3.23 (82) | 1.77 (45) | 1.38 (35) | 1.38 (35) | 0.91 (23) | 0.63 (16) | 2.40 (61)   | 0.59 (15)  | 1.30 (33)   | 1.39 (35.3) | 1.54 (39) | 3.54 (90)  | 10.16 (258) | 10.26 (260.5) | 0.10 (2.5) | 5/16-18 (M8) | 0.47 (12) |
| P1Z Series   | 63        | 4.65 (118) | 1.38 (35)   | 3.74 (95) | 1.97 (50) | 1.54 (39) | 1.65 (42) | 0.75 (19) | 0.79 (20) | 2.91 (74)   | 0.59 (15)  | 1.26 (32)   | 1.69 (43)   | 1.54 (39) | 4.29 (109) | 11.65 (296) | 11.75 (298.5) | 0.10 (2.5) | 3/8-16 (M10) | 0.59 (15) |

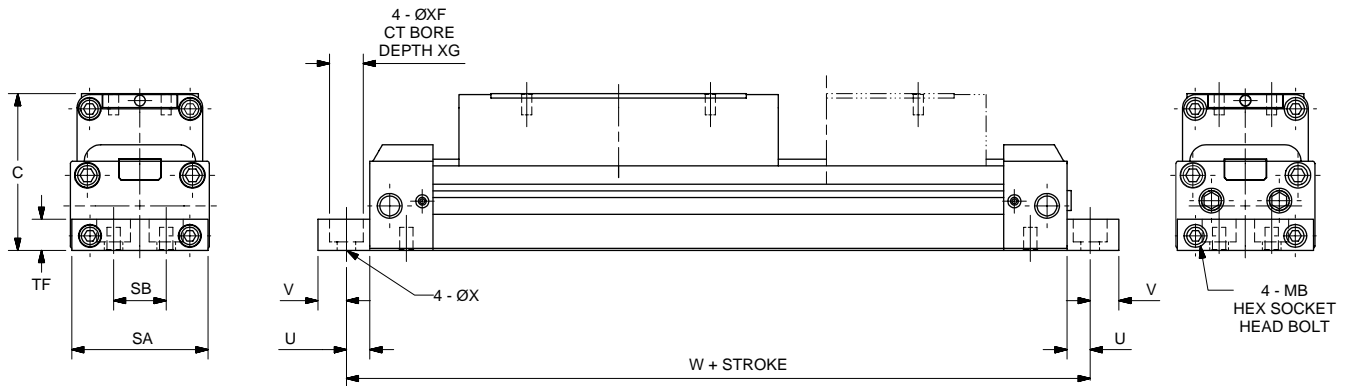
| Series     | Bore (mm) |             |                  |            |            |            |           |              |           |           |           |            |           |
|------------|-----------|-------------|------------------|------------|------------|------------|-----------|--------------|-----------|-----------|-----------|------------|-----------|
|            | P         | Q           | TA               | TB         | TC         | TD         | TE        | TL           | XA        | XB        | XC        | XE         |           |
| GDL Series | 25        | 6.38 (162)  | 1/8 NPT (1/8 Rc) | 4.80 (122) | 2.76 (70)  | 1.89 (48)  | 0.79 (20) | 10-24 (M5)   | 0.32 (8)  | 1.50 (38) | 0.91 (23) | 0.22 (5.5) | 1.58 (40) |
|            | 32        | 7.72 (196)  | 1/4 NPT (1/4 Rc) | 5.28 (134) | 3.15 (80)  | 2.21 (56)  | 0.79 (20) | 1/4-20 (M6)  | 0.35 (9)  | 1.89 (48) | 0.98 (25) | 0.24 (6)   | 1.85 (47) |
|            | 40        | 8.27 (210)  | 1/4 NPT (1/4 Rc) | 5.83 (148) | 3.54 (90)  | 2.68 (68)  | 1.18 (30) | 1/4-20 (M6)  | 0.43 (11) | 2.36 (60) | 1.18 (30) | 0.28 (7)   | 2.28 (58) |
|            | 50        | 8.35 (212)  | 3/8 NPT (3/8 Rc) | 5.98 (152) | 3.94 (100) | 3.15 (80)  | 1.18 (30) | 5/16-18 (M8) | 0.51 (13) | 2.91 (74) | 1.42 (36) | 0.39 (10)  | 2.76 (70) |
|            | 63        | 10.16 (258) | 3/8 NPT (3/8 Rc) | 6.61 (168) | 4.33 (110) | 4.02 (102) | 1.58 (40) | 5/16-18 (M8) | 0.51 (13) | 3.78 (96) | 1.65 (42) | 0.55 (14)  | 3.54 (90) |

inches (mm)

**16 to 32 mm bore sizes**



**40 to 63 mm bore sizes**

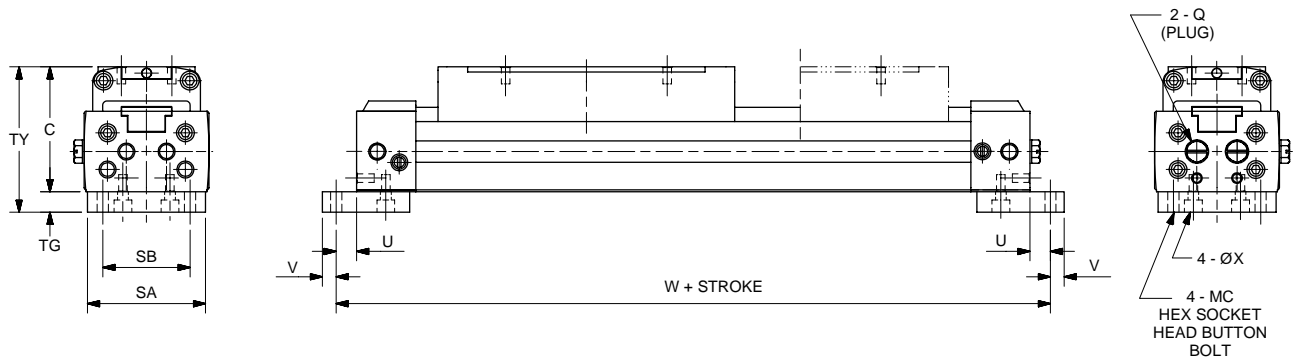


| Bore (mm) | C            | SA            | SB           | TF           | U              | V              | W              | X             | XF             | XG             | MB    |
|-----------|--------------|---------------|--------------|--------------|----------------|----------------|----------------|---------------|----------------|----------------|-------|
| 16        | 1.46<br>(37) | 1.38<br>(35)  | 1.02<br>(26) | 0.32<br>(8)  | 0.24<br>(6)    | 0.16<br>(4)    | 6.34<br>(161)  | 0.14<br>(3.6) | —              | —              | M3x10 |
| 20        | 1.65<br>(42) | 1.69<br>(43)  | 1.30<br>(33) | 0.39<br>(10) | 0.24<br>(6)    | 0.24<br>(6)    | 7.13<br>(181)  | 0.19<br>(4.7) | —              | —              | M4x12 |
| 25        | 2.09<br>(53) | 2.05<br>(52)  | 0.79<br>(20) | 0.47<br>(12) | 0.35<br>(9)    | 0.43<br>(11)   | 8.19<br>(208)  | 0.28<br>(7)   | —              | —              | M5x50 |
| 32        | 2.24<br>(57) | 2.52<br>(64)  | 1.26<br>(32) | 0.47<br>(12) | 0.35<br>(9)    | 0.43<br>(11)   | 9.61<br>(244)  | 0.28<br>(7)   | —              | —              | M5x50 |
| 40        | 2.64<br>(67) | 3.15<br>(80)  | 1.18<br>(30) | 0.59<br>(15) | 0.49<br>(12.5) | 0.45<br>(11.5) | 10.60<br>(269) | 0.35<br>(9)   | 0.51<br>(13)   | 0.34<br>(8.7)  | M6x55 |
| 50        | 3.23<br>(82) | 3.70<br>(94)  | 1.57<br>(40) | 0.79<br>(20) | 0.49<br>(12.5) | 0.45<br>(11.5) | 11.10<br>(283) | 0.35<br>(9)   | 0.51<br>(13)   | 0.34<br>(8.7)  | M8x65 |
| 63        | 3.74<br>(95) | 4.57<br>(116) | 1.89<br>(48) | 0.98<br>(25) | 0.59<br>(15)   | 0.59<br>(15)   | 12.80<br>(326) | 0.43<br>(11)  | 0.61<br>(15.5) | 0.41<br>(10.5) | M8x70 |

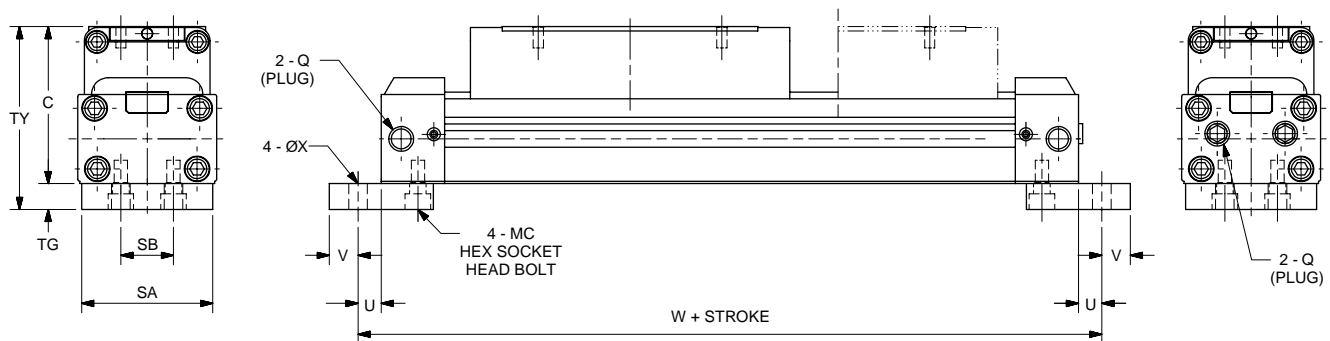
inches (mm)



**16 to 20 mm bore sizes**



**25 to 32 mm bore sizes**



| Bore (mm) | C            | Q                   | SA           | SB           | TG           | TY           | U           | V            | W             | X             | MC              |
|-----------|--------------|---------------------|--------------|--------------|--------------|--------------|-------------|--------------|---------------|---------------|-----------------|
| 16        | 1.46<br>(37) | 10-32<br>(M5)       | 1.38<br>(35) | 1.02<br>(26) | 0.24<br>(6)  | 1.69<br>(43) | 0.24<br>(6) | 0.16<br>(4)  | 6.34<br>(161) | 0.13<br>(3.4) | 5-40, 1/4 LG    |
| 20        | 1.65<br>(42) | 1/8 NPT<br>(1/8 Rc) | 1.69<br>(43) | 1.30<br>(33) | 0.32<br>(8)  | 1.97<br>(50) | 0.24<br>(6) | 0.24<br>(6)  | 7.13<br>(181) | 0.18<br>(4.5) | 8-32, 3/8 LG    |
| 25        | 2.09<br>(53) | 1/8 NPT<br>(1/8 Rc) | 1.97<br>(50) | 0.79<br>(20) | 0.39<br>(10) | 2.48<br>(63) | 0.35<br>(9) | 0.43<br>(11) | 8.19<br>(208) | 0.28<br>(7)   | 1/4-20 x 1/2 LG |
| 32        | 2.24<br>(57) | 1/4 NPT<br>(1/4 Rc) | 2.52<br>(64) | 1.26<br>(32) | 0.39<br>(10) | 2.64<br>(67) | 0.35<br>(9) | 0.43<br>(11) | 9.61<br>(244) | 0.28<br>(7)   | 1/4-20 x 1/2 LG |
| 40        | 2.64<br>(67) | 1/4 NPT<br>(1/4 Rc) | —            | —            | —            | —            | —           | —            | —             | —             | —               |
| 50        | 3.23<br>(82) | 3/8 NPT<br>(3/8 Rc) | —            | —            | —            | —            | —           | —            | —             | —             | —               |
| 63        | 3.74<br>(95) | 3/8 NPT<br>(3/8 Rc) | —            | —            | —            | —            | —           | —            | —             | —             | —               |

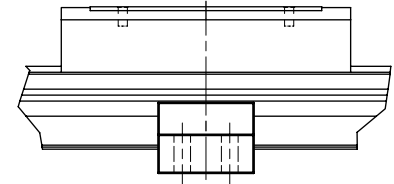
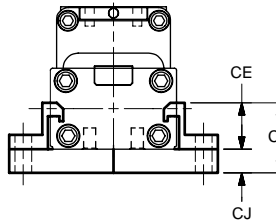
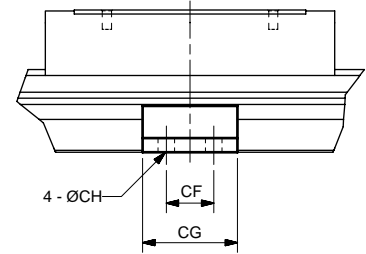
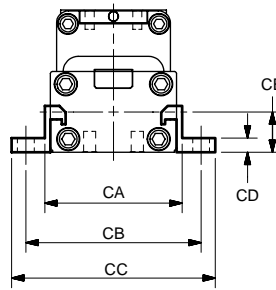
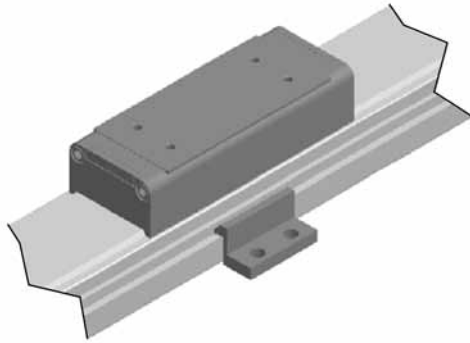
inches (mm)

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 Series P1X  
 Series P1Z  
 Series GDL



**Intermediate support brackets**

**End mount**



**Intermediate support brackets (2 per kit)**

| Bore (mm) | CA             | CB             | CC             | CD            | CE              | CF            | CG            | CH            |
|-----------|----------------|----------------|----------------|---------------|-----------------|---------------|---------------|---------------|
| 16        | 1.654<br>(42)  | 2.205<br>(56)  | 2.52<br>(64)   | 0.118<br>(3)  | 0.472<br>(12)   | 0.787<br>(20) | 1.378<br>(35) | 0.157<br>(4)  |
| 20        | 1.929<br>(49)  | 2.52<br>(64)   | 2.953<br>(75)  | 0.157<br>(4)  | 0.551<br>(14)   | 0.787<br>(20) | 1.496<br>(38) | 0.197<br>(5)  |
| 25        | 2.362<br>(60)  | 2.992<br>(76)  | 3.465<br>(88)  | 0.236<br>(6)  | 0.768<br>(19.5) | 0.787<br>(20) | 1.575<br>(40) | 0.276<br>(7)  |
| 32        | 2.913<br>(74)  | 3.465<br>(88)  | 3.937<br>(100) | 0.236<br>(6)  | 0.846<br>(21.5) | 0.787<br>(20) | 1.575<br>(40) | 0.276<br>(7)  |
| 40        | 3.543<br>(90)  | 4.252<br>(108) | 4.882<br>(124) | 0.236<br>(6)  | 0.965<br>(24.5) | 1.181<br>(30) | 2.362<br>(60) | 0.354<br>(9)  |
| 50        | 4.173<br>(106) | 4.882<br>(124) | 5.512<br>(140) | 0.315<br>(8)  | 1.201<br>(30.5) | 1.181<br>(30) | 2.362<br>(60) | 0.354<br>(9)  |
| 63        | 5.118<br>(130) | 5.984<br>(152) | 6.772<br>(172) | 0.394<br>(10) | 1.516<br>(38.5) | 1.969<br>(50) | 3.543<br>(90) | 0.433<br>(11) |

| Bore (mm) | CJ            | CK              | Kit part number       |                   |
|-----------|---------------|-----------------|-----------------------|-------------------|
|           |               |                 | End mount or no mount | Bottom mount      |
| 16        | 0.236<br>(6)  | 0.709<br>(18)   | <b>L080180016</b>     | <b>L080190016</b> |
| 20        | 0.315<br>(8)  | 0.866<br>(22)   | <b>L080180020</b>     | <b>L080190020</b> |
| 25        | 0.394<br>(10) | 1.161<br>(29.5) | <b>L080180025</b>     | <b>L080190025</b> |
| 32        | 0.394<br>(10) | 1.24<br>(31.5)  | <b>L080180032</b>     | <b>L080190032</b> |
| 40        | —             | —               | <b>L080180040</b>     |                   |
| 50        | —             | —               | <b>L080180050</b>     |                   |
| 63        | —             | —               | <b>L080180063</b>     |                   |

inches (mm)

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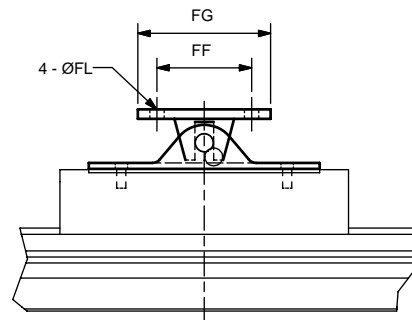
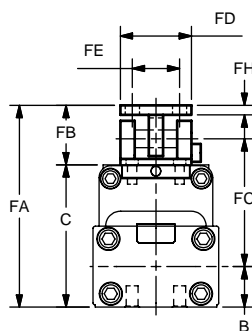
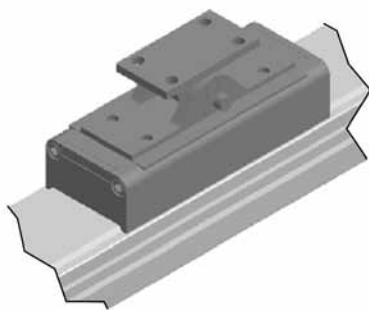
P1X  
 Series

P1Z  
 Series

GDL  
 Series

**Swivel mount**

Absorbs misalignment between cylinder and load



FJ dimension is the maximum horizontal float

FK dimension is the maximum vertical float

**Swivel mounts**

| Bore (mm) | FA          | FB         | FC           | FD         | FE         | FF         | FG         | FH        |
|-----------|-------------|------------|--------------|------------|------------|------------|------------|-----------|
| 16        | 2.238 (58)  | 0.827 (21) | 1.339 (34)   | 0.945 (24) | 0.673 (16) | 1.181 (30) | 1.575 (40) | 0.118 (3) |
| 20        | 2.638 (67)  | 0.984 (25) | 1.535 (39)   | 1.181 (30) | 0.787 (20) | 1.575 (40) | 2.205 (56) | 0.157 (4) |
| 25        | 3.071 (78)  | 0.984 (25) | 1.85 (47)    | 1.181 (30) | 0.787 (20) | 1.575 (40) | 2.205 (56) | 0.157 (4) |
| 32        | 3.74 (95)   | 1.496 (38) | 2.185 (55.5) | 1.772 (45) | 1.181 (30) | 1.969 (50) | 2.756 (70) | 0.236 (6) |
| 40        | 4.134 (105) | 1.496 (38) | 2.441 (62)   | 1.772 (45) | 1.181 (30) | 1.969 (50) | 2.756 (70) | 0.236 (6) |
| 50        | 4.961 (126) | 1.732 (44) | 2.874 (73)   | 2.362 (60) | 1.575 (40) | 2.756 (70) | 3.543 (90) | 0.315 (8) |
| 63        | 5.472 (139) | 1.732 (44) | 3.11 (79)    | 2.362 (60) | 1.575 (40) | 2.756 (70) | 3.543 (90) | 0.315 (8) |

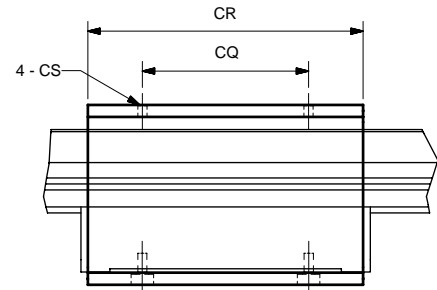
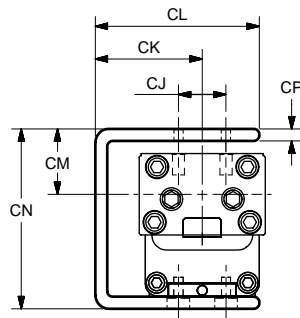
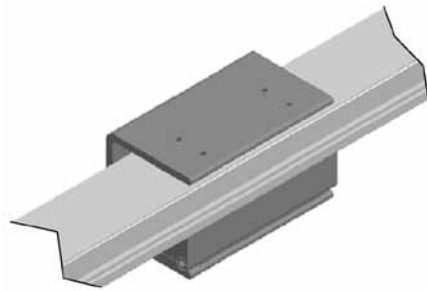
inches (mm)

| Bore (mm) | FJ           | FK    | FL    | B     | C     | Part number       |
|-----------|--------------|-------|-------|-------|-------|-------------------|
| 16        | inches 0.118 | 0.118 | 0.134 | 0.472 | 1.457 | <b>L078930016</b> |
|           | mm 3         | 3     | 3.4   | 12    | 37    |                   |
| 20        | inches 0.118 | 0.118 | 0.177 | 0.551 | 1.654 | <b>L080160020</b> |
|           | mm 3         | 3     | 4.5   | 14    | 42    | <b>L08016M020</b> |
| 25        | inches 0.118 | 0.118 | 0.236 | 0.669 | 2.087 | <b>L080160025</b> |
|           | mm 3         | 3     | 6     | 17    | 53    | <b>L08016M025</b> |
| 32        | inches 0.197 | 0.197 | 0.276 | 0.728 | 2.244 | <b>L080160032</b> |
|           | mm 5         | 5     | 7     | 18.5  | 57    | <b>L08016M032</b> |
| 40        | inches 0.197 | 0.197 | 0.276 | 0.866 | 2.638 | <b>L080160040</b> |
|           | mm 5         | 5     | 7     | 22    | 67    | <b>L08016M040</b> |
| 50        | inches 0.197 | 0.197 | 0.354 | 1.102 | 3.228 | <b>L080160050</b> |
|           | mm 5         | 5     | 9     | 28    | 82    | <b>L08016M050</b> |
| 63        | inches 0.197 | 0.197 | 0.354 | 1.378 | 3.74  | <b>L080160063</b> |
|           | mm 5         | 5     | 9     | 35    | 95    | <b>L08016M063</b> |

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 P1X Series  
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 GDL Series

**Inverted mount**

Provides mounting surface 180° from carriage



**Inverted mounts\***

| Bore (mm) |        | CJ    | CK    | CL    | CM    | CN    | CP    | CQ    | CR    | CS      | Part number**     |
|-----------|--------|-------|-------|-------|-------|-------|-------|-------|-------|---------|-------------------|
| 16        | inches | 0.591 | 1.398 | 1.969 | 1.142 | 2.362 | 0.236 | 1.89  | 3.465 | 5-40    | <b>L080170016</b> |
|           | mm     | 15    | 35.5  | 50    | 29    | 60    | 6     | 48    | 88    |         | <b>L08017M016</b> |
| 20        | inches | 0.709 | 1.28  | 1.969 | 1.024 | 2.362 | 0.236 | 2.362 | 3.937 | 8-32    | <b>L080170020</b> |
|           | mm     | 18    | 32.5  | 50    | 26    | 60    | 6     | 60    | 100   |         | <b>L08017M020</b> |
| 25        | inches | 0.787 | 1.772 | 2.717 | 1.102 | 2.795 | 0.197 | 2.756 | 4.567 | 10-24   | <b>L080170025</b> |
|           | mm     | 20    | 45    | 69    | 28    | 71    | 5     | 70    | 116   |         | <b>L08017M025</b> |
| 32        | inches | 0.787 | 2.126 | 3.209 | 1.319 | 3.15  | 0.276 | 3.15  | 5.039 | 1/4-20  | <b>L080170032</b> |
|           | mm     | 20    | 54    | 81.5  | 33.5  | 80    | 7     | 80    | 128   |         | <b>L08017M032</b> |
| 40        | inches | 1.181 | 2.48  | 3.76  | 1.496 | 3.602 | 0.315 | 3.543 | 5.433 | 1/4-20  | <b>L080170040</b> |
|           | mm     | 30    | 63    | 95.5  | 38    | 91.5  | 8     | 90    | 138   |         | <b>L08017M040</b> |
| 50        | inches | 1.181 | 2.913 | 4.449 | 1.89  | 4.429 | 0.394 | 3.937 | 5.591 | 5/16-18 | <b>L080170050</b> |
|           | mm     | 30    | 74    | 113   | 48    | 112.5 | 10    | 100   | 142   |         | <b>L08017M050</b> |
| 63        | inches | 1.575 | 3.465 | 5.433 | 2.283 | 5.157 | 0.512 | 4.331 | 6.22  | 5/16-18 | <b>L080170063</b> |
|           | mm     | 40    | 88    | 138   | 58    | 131   | 13    | 110   | 158   |         | <b>L08017M063</b> |

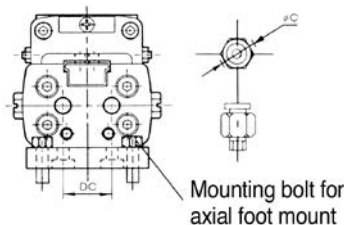
\*Inverted mounts not available with adjustable stroke, shock absorber or tube center support bracket.

\*\*Use this part number when ordering as a separate part. When ordering with cylinder, use "C" option as part of cylinder part number.

**End port piping**

Refer to Figure 3 to determine when end port piping can be used with various types of mountings relative to fitting clearance.

On all bore sizes with foot mounting, the end port pipe fittings will obstruct the mounting holes. To avoid this problem, mount the cylinder first and tighten the mounting bolts and then attach the pipe fittings to the cylinder ports.



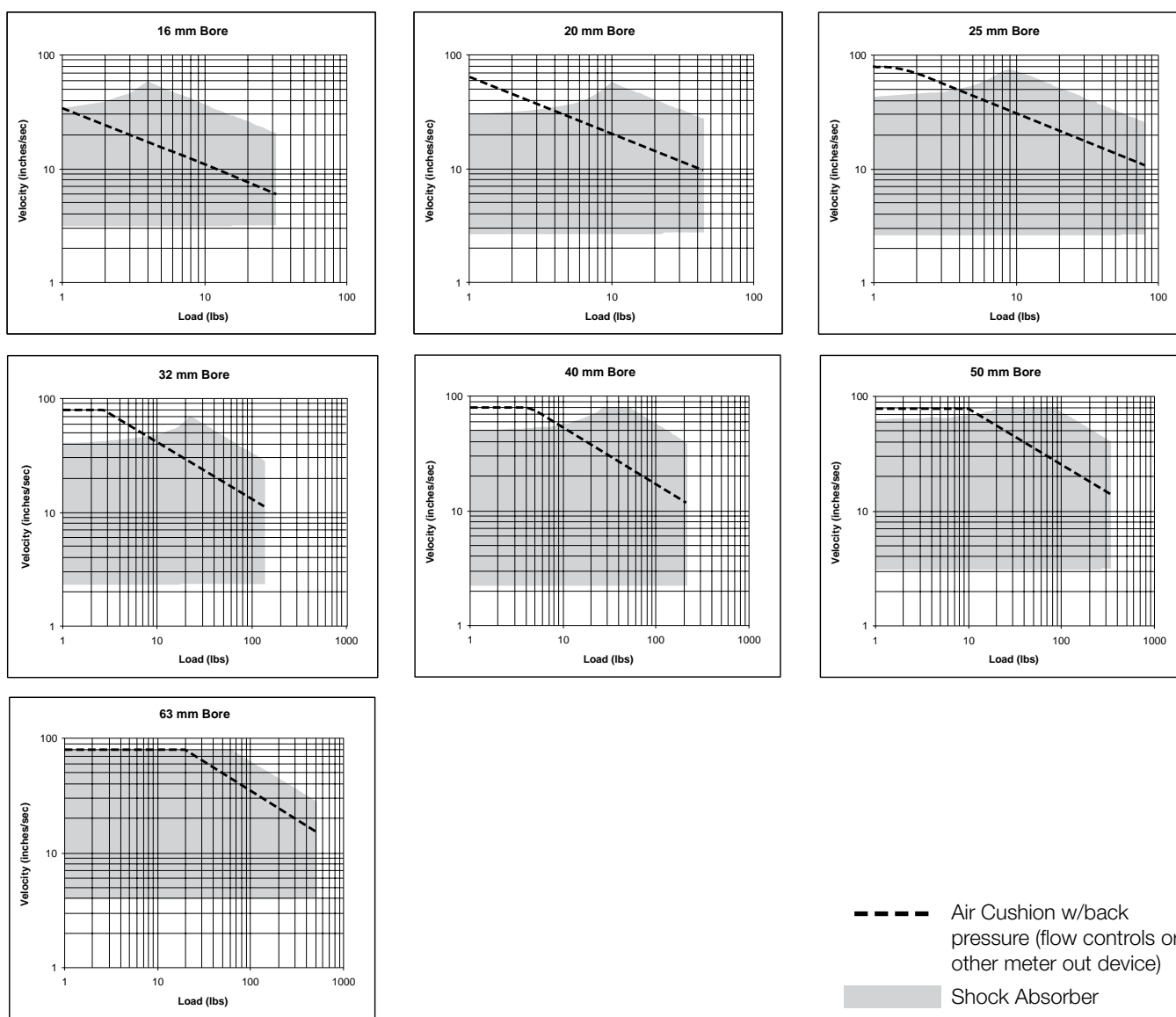
**Figure 3**

| Bore (mm) | øC [O.D. of fittings - mm (in.)] |                 |              |
|-----------|----------------------------------|-----------------|--------------|
|           | No mount                         | End mount       | Bottom mount |
| 16        | 12 (0.472)                       |                 | 12 (0.472)   |
| 20        | 16 (0.630)                       | End Port Piping | 16 (0.630)   |
| 25        | 26 (1.024)                       | Not Available   | 26 (1.024)   |
| 32        | 27 (1.065)                       |                 | 27 (1.063)   |
| 40        | 35 (1.378)                       | 26 (1.024)      |              |
| 50        | 35 (1.378)                       | 30 (1.181)      |              |
| 63        | 39 (1.535)                       | 34 (1.339)      |              |

**Shock absorber specifications**

| Cylinder                                  | 16mm          | 20mm       | 25mm        | 32mm       | 40mm       | 50, 63mm   |
|---|---------------|------------|-------------|------------|------------|------------|
| Shock absorber number                     | 0887790016    | 0887790020 | 0887790025  | 0887790032 | 0887790040 | 0887790050 |
| Max. energy absorption - in.-lbs (kgf-m)  | 26.0 (0.3)    | 60.8 (0.7) | 104.2 (1.2) | 226 (2.6)  | 608 (7.0)  | 1042 (12)  |
| Stroke - inches                           | 0.236         | 0.315      | 0.394       | 0.590      | 0.787      | 0.984      |
| Energy absorption / hour - in.-lbs / hour | 54,700        | 109,380    | 187,510     | 338,560    | 729,200    | 750,000    |
| Max. impact velocity - in. / sec.         | 59            | 59         | 78.7        | 78.7       | 98.4       | 118.1      |
| Max. cycle rate per hour                  | 2100          | 1800       | 1800        | 1500       | 1200       | 720        |
| Ambient temperature - °F (°C)             | 41-140 (5-60) |            |             |            |            |            |
| Spring return force - lb. Extended        | 0.65          | 0.45       | 0.65        | 1.33       | 2.20       | 3.60       |
| Compressed                                | 1.01          | 0.97       | 1.33        | 2.65       | 4.86       | 7.49       |
| Return time - Sec.                        | 0.3           | 0.3        | 0.3         | 0.3        | 0.4        | 0.4        |

**Performance data (16 to 32mm bores)**



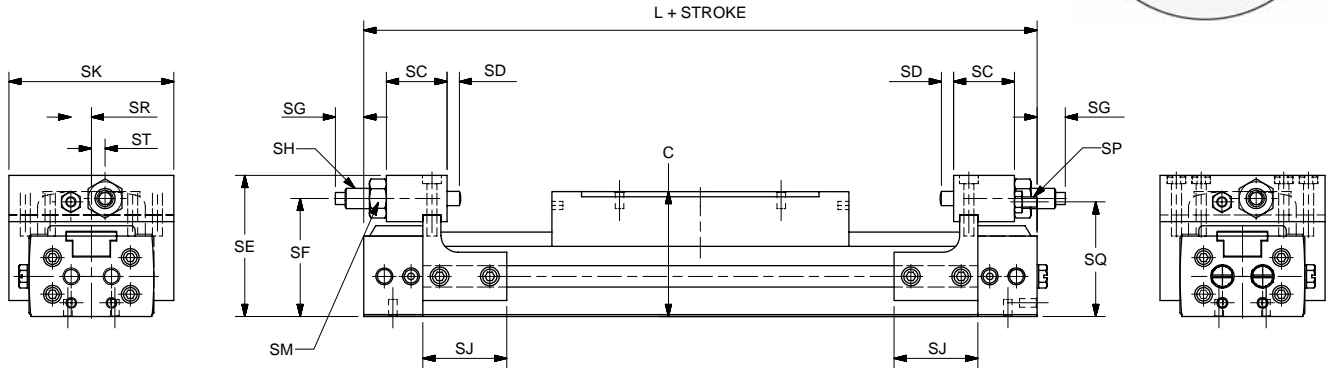
- Notes:**
1. If the cylinder is vertical in orientation, double the total load for bottom shock absorber.
  2. Use the total load that is being moved by shock absorber. If a weight transfer application, this would include La.
  3. If final velocity cannot be easily determined, use two times the stroke divided by the stroke time.

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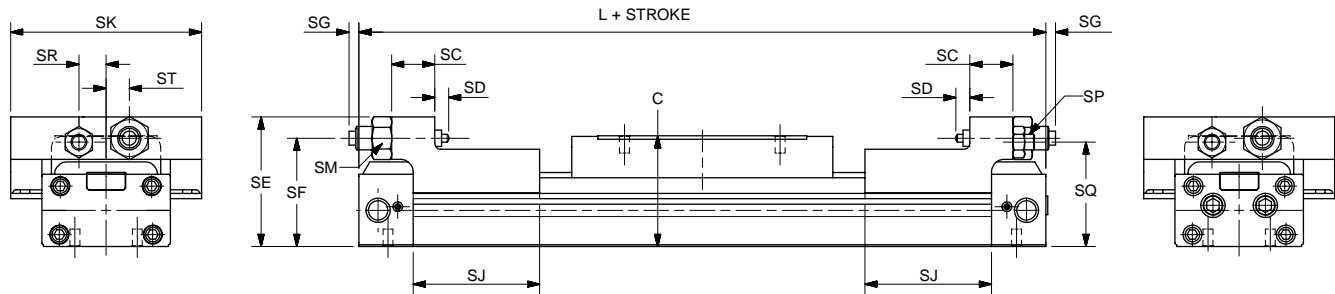
**16 to 25 mm bore sizes**



| Bore<br>(mm) | SC             | SD            | SE             | SF             | SG             |               | SH<br>in-lbs | SJ           | SK           | SP | SQ           | SR           | ST           | C            | L             |
|--------------|----------------|---------------|----------------|----------------|----------------|---------------|--------------|--------------|--------------|----|--------------|--------------|--------------|--------------|---------------|
|              |                |               |                |                | Max            | Min           |              |              |              |    |              |              |              |              |               |
| 16           | 0.71<br>(18)   | 0.16<br>(4)   | 1.65<br>(42)   | 1.38<br>(35)   | 0.57<br>(14.5) | 0.18<br>(4.5) | 26           | 0.98<br>(25) | 1.93<br>(49) | M3 | 1.34<br>(34) | 0.24<br>(6)  | 0.16<br>(4)  | 1.46<br>(37) | 5.87<br>(149) |
| 20           | 0.89<br>(22.5) | 0.14<br>(3.5) | 1.89<br>(48)   | 1.57<br>(40)   | 0.57<br>(14.5) | 0.18<br>(4.5) | 61           | 1.54<br>(39) | 2.24<br>(57) | M4 | 1.50<br>(38) | 0.32<br>(8)  | 0.20<br>(5)  | 1.65<br>(42) | 6.65<br>(169) |
| 25           | 0.79<br>(20)   | 0.10<br>(2.5) | 2.46<br>(62.5) | 2.03<br>(51.5) | 0.57<br>(14.5) | 0.18<br>(4.5) | 104          | 1.97<br>(50) | 3.03<br>(77) | M6 | 1.97<br>(50) | 0.47<br>(12) | 0.39<br>(10) | 2.09<br>(53) | 7.48<br>(190) |

inches (mm)  
 SH = max. energy absorption

**32 to 63 mm bore sizes**



| Bore<br>(mm) | SC           | SD          | SE             | SF             | SG           |              | SH<br>in-lbs | SJ           | SK            | SP  | SQ             | SR           | ST           | C            | L              |
|--------------|--------------|-------------|----------------|----------------|--------------|--------------|--------------|--------------|---------------|-----|----------------|--------------|--------------|--------------|----------------|
|              |              |             |                |                | Max          | Min          |              |              |               |     |                |              |              |              |                |
| 32           | 0.87<br>(22) | 0.28<br>(7) | 2.62<br>(66.5) | 2.19<br>(55.5) | 1.06<br>(27) | 0.67<br>(17) | 226          | 2.56<br>(65) | 3.86<br>(98)  | M8  | 2.11<br>(53.5) | 0.55<br>(14) | 0.47<br>(12) | 2.24<br>(57) | 8.90<br>(226)  |
| 40           | 1.26<br>(32) | 0.28<br>(7) | 3.09<br>(78.5) | 2.58<br>(65.5) | 1.34<br>(34) | 0.94<br>(24) | 608          | 2.56<br>(65) | 4.41<br>(112) | M10 | 2.50<br>(63.5) | 0.67<br>(17) | 0.47<br>(12) | 2.64<br>(67) | 9.61<br>(244)  |
| 50           | 1.50<br>(38) | 0.32<br>(8) | 3.90<br>(99)   | 3.15<br>(80)   | 2.17<br>(55) | 1.77<br>(45) | 1042         | 2.76<br>(70) | 5.35<br>(136) | M12 | 3.05<br>(77.5) | 0.87<br>(22) | 0.67<br>(17) | 3.23<br>(82) | 10.16<br>(258) |
| 63           | 1.50<br>(38) | 0.32<br>(8) | 4.41<br>(112)  | 3.68<br>(93.5) | 1.73<br>(44) | 1.34<br>(34) | 1042         | 2.76<br>(70) | 6.22<br>(158) | M16 | 3.50<br>(89)   | 0.98<br>(25) | 0.79<br>(20) | 3.74<br>(95) | 11.65<br>(296) |

inches (mm)  
 SH = max. energy absorption

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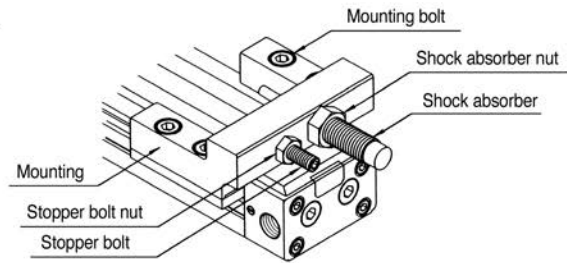
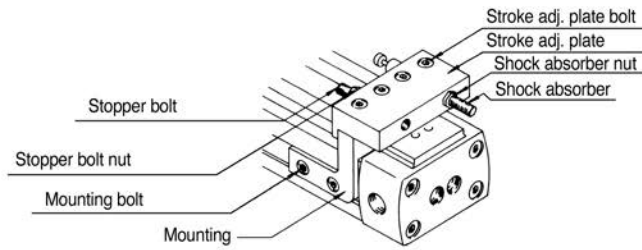
P1Z  
 Series

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GDL  
 Series



**Positioning of stroke adjustment unit**



**ø16-ø25**

- (1) Moving the stroke adjustment unit.  
The stroke adjustment unit can be moved by loosening the mounting bolts.
- (2) Locking of stroke adjustment unit.  
After moving the stroke adjustment unit to the appropriate position, lock it there by tightening the mounting bolts to the torque values shown in Figure 4. Insufficient torque may cause the stroke adjustment unit to slip out of position.

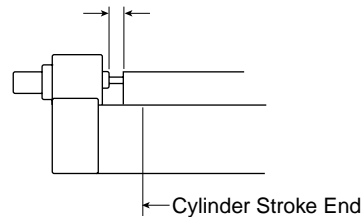
**Figure 4**  
**Torque values for tightening stroke adjustment unit.**

| Bore size | Tightening torque     |                                |
|-----------|-----------------------|--------------------------------|
|           | Mounting bolt (lb-in) | Stroke adj. plate bolt (lb-in) |
| 16mm      | 9-11                  | 4-6                            |
| 20mm      | 22-24                 |                                |
| 25mm      | 46-50                 | 22-24                          |
| 32mm      | 195-213               | -                              |
| 40mm      | 390-415               | -                              |
| 50, 63mm  | 682-735               | -                              |

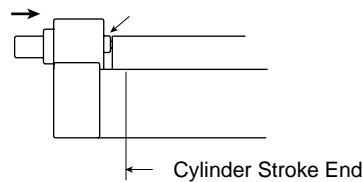
**ø32-ø63**

- (4) Adjustment of shock absorber.  
Adjust the absorption energy of the shock absorber by changing the operating stroke of the shock absorber. This is done by loosening the shock absorber nut and turning the unit. When adjustment is complete, tighten the shock absorber nut to the torque values shown in Figure 12a.
- (5) Notes on usage.  
The shock absorber absorbs rated energy with rated stroke. The factory setting allows a small amount of shock absorber stroke before it bottoms out. Readjust the location of the shock absorber so that the complete stroke of the absorber is utilized.

Absorption energy as set at factory:  
Small margin with stroke of shock absorber.



Adjust the position of the shock absorber until the plunger of the shock absorber is fully depressed.



- (3) Stroke adjustment using the stopper bolt.  
Adjust the stroke by loosening the stopper bolt nut and turning the stopper bolt. After adjusting the stroke, tighten the stopper bolt nut to the torque values shown in Figure 5. When adjusting the 16-25 mm cylinders, due to the small amount of clearance between the table and the stroke adjustment plate, adjust the stroke by moving the complete stroke adjustment unit.

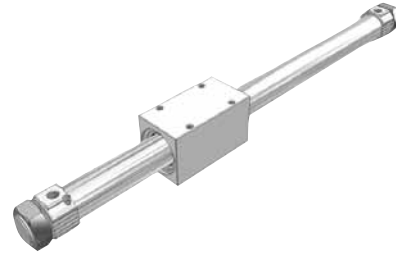
**Figure 5**  
**Torque values for tightening stopper bolt nut and shock absorber nut.**

| Bore size | Tightening torque        |                            |
|-----------|--------------------------|----------------------------|
|           | Stopper bolt nut (lb-in) | Shock absorber nut (lb-in) |
| 16mm      | 10-11                    | 12-16                      |
| 20mm      | 22-24                    | 26-35                      |
| 25mm      | 73-84                    | 40-53                      |
| 32mm      | 195-213                  | 66-89                      |
| 40mm      | 390-425                  | 195-266                    |
| 50mm      | 682-735                  | 487-620                    |
| 63mm      | 1772-1914                | 487-620                    |

**B**  
**Actuator Products**  
**Rodless Cylinders**

Series OSP-P  
Series P1X  
Series P1Z  
Series GDL

- Available in 3 bores with stroke lengths up to 2000 mm
- Adjustable air cushioning is available on all cylinders
- The load is fixed onto the mobile carriage by 4 tapped holes
- The cylinder is attached by the ends with jam nuts, flanges or foot mounts



**Specifications for P1Z series magnetically coupled rodless**

|                              |   |                             |                   |
|------------------------------|---|-----------------------------|-------------------|
| Operating medium             | Compressed air  |                             |                   |
| Maximum pressure - bar (PSI) | 7 (100)   |                             |                   |
| Minimum pressure - bar (PSI) | 2 (29)  |                             |                   |
| Bore size mm (inch nominal)  | 16 (5/8)  | 20 (3/4)                    | 32 (1 1/4)        |
| Port size                    | M5 BSPP, 10-32 NPT  | 1/8 BSPP, 1/8 NPT           | 1/8 BSPP, 1/8 NPT |
| Ambient temperature °F (°C)  | 15 to 140°F (-10 to 160°C)  |                             |                   |
| Maximum stroke mm (inch)     | 1000 (39.4)   | 1500 (59.1)                 | 2000 (78.7)       |
| Stroke tolerance mm          | +1.5/-0   | <=1000 +1.5/-0; >1000 +2/-0 |                   |
| Piston speed m/s (inch/sec)  | 0.1 to 0.4 (4 to 15.75)   |                             |                   |
| Max. coupling force N (lbs)  | 157 (35)  | 236 (53)                    | 703 (158)         |
| Cushion                      | Air cushion standard  |                             |                   |
| Lubrication                  | Not required (If you choose to lubricate your system, continuing lubrication will be required.) |                             |                   |

**Technical data**

| Bore size | Weights               |      |                           |      |      |
|-----------|-----------------------|------|---------------------------|------|------|
|           | Weight at zero stroke |      | Weight per 25mm of stroke |      |      |
| mm        | inch                  | kg   | lbs                       | kg   | lbs  |
| 16        | 5/8                   | 0.28 | 0.62                      | 0.01 | 0.02 |
| 20        | 3/4                   | 0.46 | 1.01                      | 0.02 | 0.05 |
| 32        | 1-1/4                 | 1.35 | 2.98                      | 0.04 | 0.08 |

**Conditions of use**

If external lubrication is added, this must always be continued.

Working medium, air quality

Working medium: Dry, filtered compressed air to ISO 8573-1 class 3. 4. 3. or better

**B**

Rodless Cylinders  
 Actuator Products

OSP-P  
 Series

P1X  
 Series

P1Z  
 Series

GDL  
 Series

| Standard cylinder (15 positions) |   |   |   |                |   |   |                          |   |   | Options (16 positions)              |   |   |                          |   |   |   |   |
|----------------------------------|---|---|---|----------------|---|---|--------------------------|---|---|-------------------------------------|---|---|--------------------------|---|---|---|---|
| P                                | 1 | Z | M | 0              | 1 | 6 | S                        | N | N | 0                                   | 5 | 0 | 0                        | B | F | M | N |
|                                  |   |   |   | Bore           |   |   | Cushioning               |   |   | Strokes                             |   |   | Mounting kit*            |   |   |   |   |
|                                  |   |   |   | 016    Ø 16 mm |   |   | N    None (Ø 16 only)    |   |   | 0200    200 mm                      |   |   | F    Footmount           |   |   |   |   |
|                                  |   |   |   | 020    Ø 20 mm |   |   | A    Adjustable Cushions |   |   | 1000    1000 mm                     |   |   | L    Flanges             |   |   |   |   |
|                                  |   |   |   | 032    Ø 32 mm |   |   |                          |   |   |                                     |   |   | N    None (std.)         |   |   |   |   |
|                                  |   |   |   |                |   |   |                          |   |   | Options *                           |   |   | Cylinder port type       |   |   |   |   |
|                                  |   |   |   |                |   |   |                          |   |   | B†    None                          |   |   | M†    Metric (Ø 16 only) |   |   |   |   |
|                                  |   |   |   |                |   |   |                          |   |   | W    With options                   |   |   | B†    BSPP (Ø 20 & 32)   |   |   |   |   |
|                                  |   |   |   |                |   |   |                          |   |   | † Standard when "B" option is used. |   |   | N    NPTF (Ø 20 & 32)    |   |   |   |   |

\* Cylinders are supplied with mounting nuts fitted on each endplate.

| Ø  | Stroke (mm) | (in)      |
|----|-------------|-----------|
| 16 | 0 to 1000   | 0 to 39.4 |
| 20 | 0 to 1500   | 0 to 59.1 |
| 32 | 0 to 2000   | 0 to 78.7 |

Order code examples:

- P1ZM016SNN0100B    Ø 16 mm bore 100 mm stroke cylinder supplied with mounting nut on each endplate
- P1ZM020SAN1000WFBN    Ø 20 mm bore 1 m stroke cylinder with foot mount on each endplate

**Basic version**

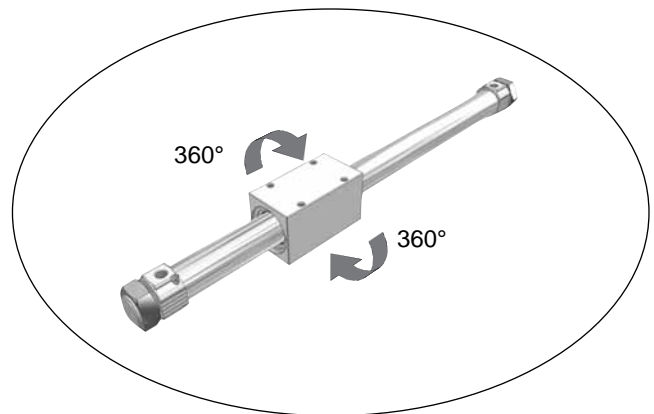
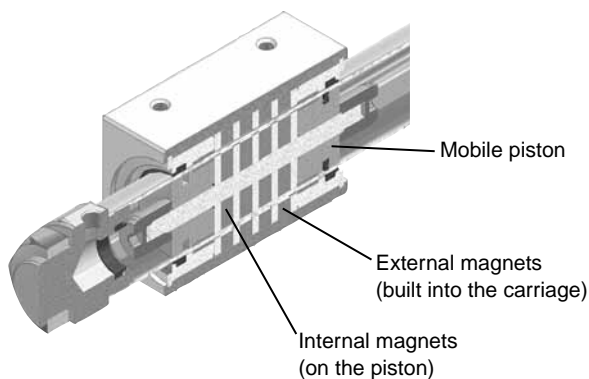
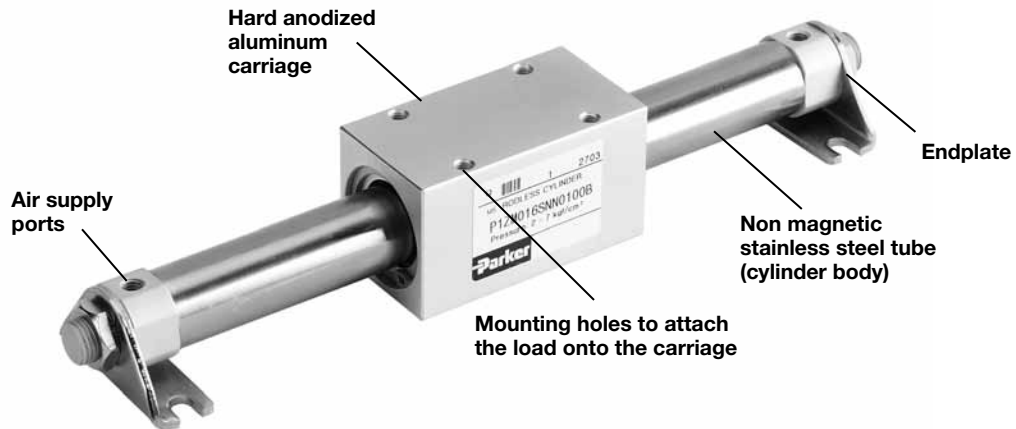
The magnetic rodless cylinder is a pneumatic cylinder featuring a mobile piston fitted with annular magnets. The mobile carriage is also equipped with magnets to provide magnetic coupling between the piston and carriage. It incorporates the following features:

- end of stroke cushioning/bumpers
- mounting:
  - threaded endcaps
  - optional foot mount
  - optional flange mount



**Sensors**

For sensors see page B294.



**Cushioning**

Ø 16 mm: non-adjustable bumper or adjustable pneumatic cushioning

Ø 20 and 32 mm: adjustable pneumatic cushioning

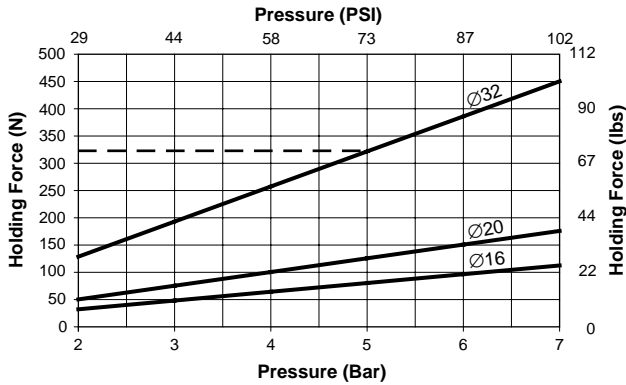
**Mounting**

The mobile carriage is free to rotate 360° around the cylinder axis. This feature facilitates the adaptation of the cylinder to various mounting arrangements.

The load must be guided by an external device.

|            |  |
|------------|--|
| <b>B</b>   | Rodless Cylinders<br>Actuator Products |
|            | OSP-P Series                           |
| P1X Series |  |
| P1Z Series |  |
| GDL Series |  |

**Technical data**



**Example:**

Pressure: 5 bar

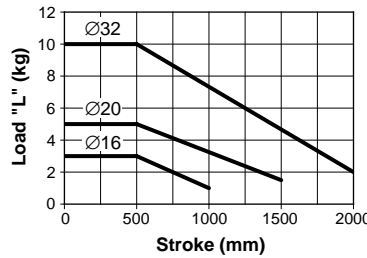
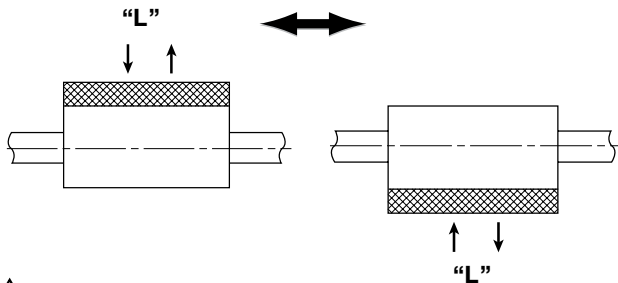
$F_{max} = 322 \text{ N}$  for Ø 32 mm cylinder

⚠ Calculate the kinetic energy due to the load moved

Acceleration or deceleration should not exceed the magnetic coupling force of cylinder

**Load diagrams**

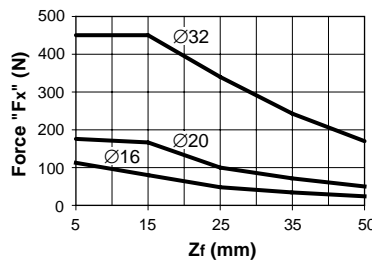
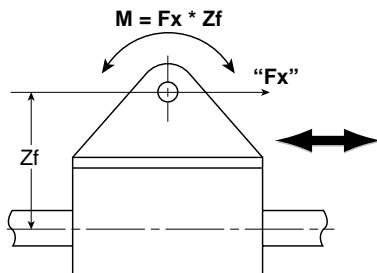
**Permissible radial loads, horizontal mounting**



| Ø  | L Max. |        |
|----|--------|--------|
|    | (kg)   | (lbs.) |
| 16 | 3      | 6.6    |
| 20 | 5      | 11.0   |
| 32 | 10     | 22.0   |

⚠ The load must be guided by a device from outside the cylinder

**Permissible axial loads, horizontal mounting**

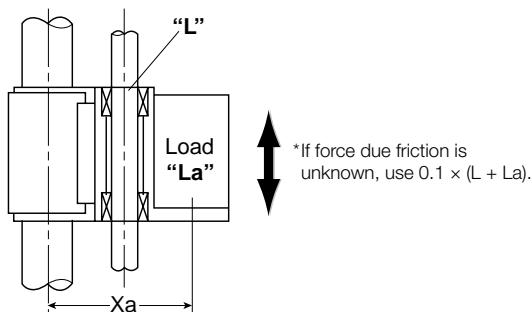


| Ø  | Max. Moment M |           | Max. Fx* |        |
|----|---------------|-----------|----------|--------|
|    | (Nm)          | (in-lbs.) | (N)      | (lbs.) |
| 16 | 1.2           | 11        | 112      | 25     |
| 20 | 2.5           | 22        | 175      | 39     |
| 32 | 8.5           | 75        | 450      | 101    |

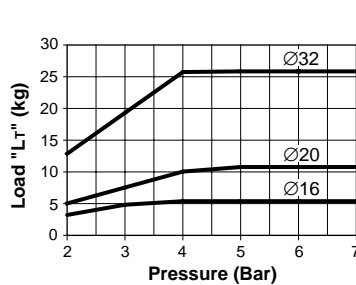
\* at 7 bar

⚠ The load must be guided by a device from outside the cylinder

**Permissible axial loads, vertical mounting**



\*If force due to friction is unknown, use  $0.1 \times (L + La)$ .



| Ø  | Max. load T |        | Max. XA |       |
|----|-------------|--------|---------|-------|
|    | (kg)        | (lbs.) | (mm)    | (in.) |
| 16 | 5           | 11     | 122     | 4.8   |
| 20 | 10          | 22     | 142     | 5.6   |
| 32 | 24          | 53     | 174     | 6.8   |

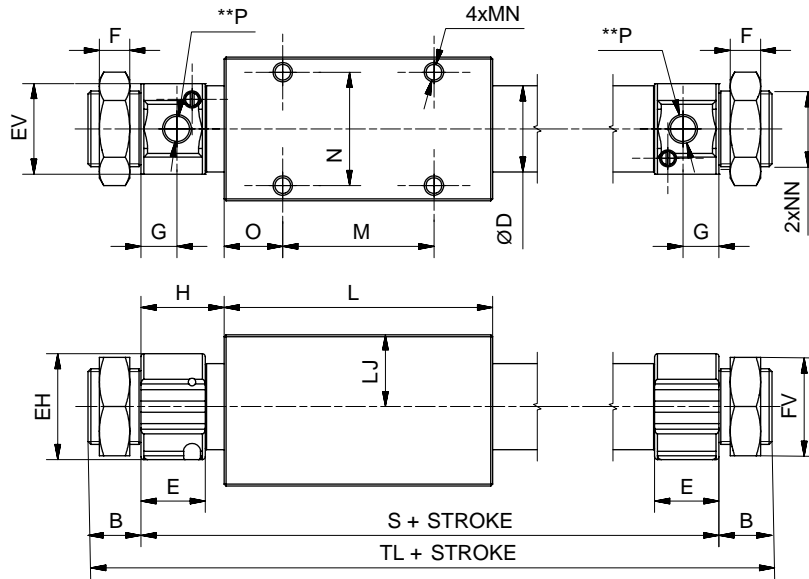
\* at 6.5 bar

**L** = Load guided by external device  
**La** = Direct mounting onto the cylinder  
**Ff** = Force due to friction\*

**LT** = Load weight + guiding device weight + force due to friction

**Dimensions**

\*\* = Air supply Ports



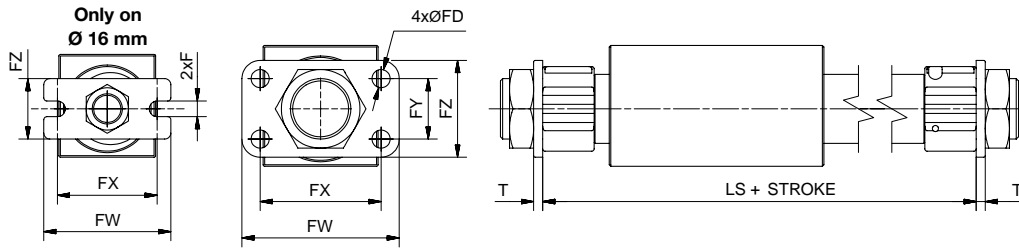
| Ø  | A            | AA           | B            | ØD             | E            | ØEH          | ØEV          | F           | FV           | G             | H              | L            | LJ           | M            | N            | O              |
|----|--------------|--------------|--------------|----------------|--------------|--------------|--------------|-------------|--------------|---------------|----------------|--------------|--------------|--------------|--------------|----------------|
| 16 | 32<br>(1.26) | 34<br>(1.34) | 10<br>(0.39) | 18<br>(0.71)   | 11<br>(0.43) | 18<br>(0.71) | 18<br>(0.71) | 4<br>(0.16) | 14<br>(0.55) | 5.5<br>(0.22) | 15.5<br>(0.61) | 61<br>(2.40) | 16<br>(0.63) | 34<br>(1.34) | 25<br>(0.98) | 13.5<br>(0.53) |
| 20 | 38<br>(1.50) | 40<br>(1.57) | 14<br>(0.55) | 22.8<br>(0.90) | 17<br>(0.67) | 28<br>(1.10) | 24<br>(0.94) | 8<br>(0.31) | 26<br>(1.02) | 9.5<br>(0.37) | 22<br>(0.87)   | 71<br>(2.80) | 19<br>(0.75) | 40<br>(1.57) | 30<br>(1.18) | 15.5<br>(0.61) |
| 32 | 60<br>(2.36) | 60<br>(2.36) | 16<br>(0.63) | 35<br>(1.38)   | 17<br>(0.67) | 40<br>(1.57) | 36<br>(1.42) | 8<br>(0.31) | 32<br>(1.26) | 9.5<br>(0.37) | 23<br>(0.91)   | 87<br>(3.43) | 30<br>(1.18) | 50<br>(1.97) | 40<br>(1.57) | 18.5<br>(0.73) |

| Ø  | P                   | MN           | NN            | S             | TL            |
|----|---------------------|--------------|---------------|---------------|---------------|
| 16 | M5 x 0.8<br>(10-32) | M4 x 0.7 x 6 | M10 x 1 x 6   | 92<br>(3.62)  | 112<br>(4.41) |
| 20 | G 1/8<br>(1/8)      | M5 x 0.8 x 8 | M20 x 1.5 x 7 | 115<br>(4.53) | 143<br>(5.63) |
| 32 | G 1/8<br>(1/8)      | M6 x 1 x 10  | M26 x 1.5 x 7 | 133<br>(5.24) | 165<br>(6.50) |

**B**  
 Rodless Cylinders  
 Actuator Products  
 OSP-P Series  
 P1X Series  
 P1Z Series  
 GDL Series

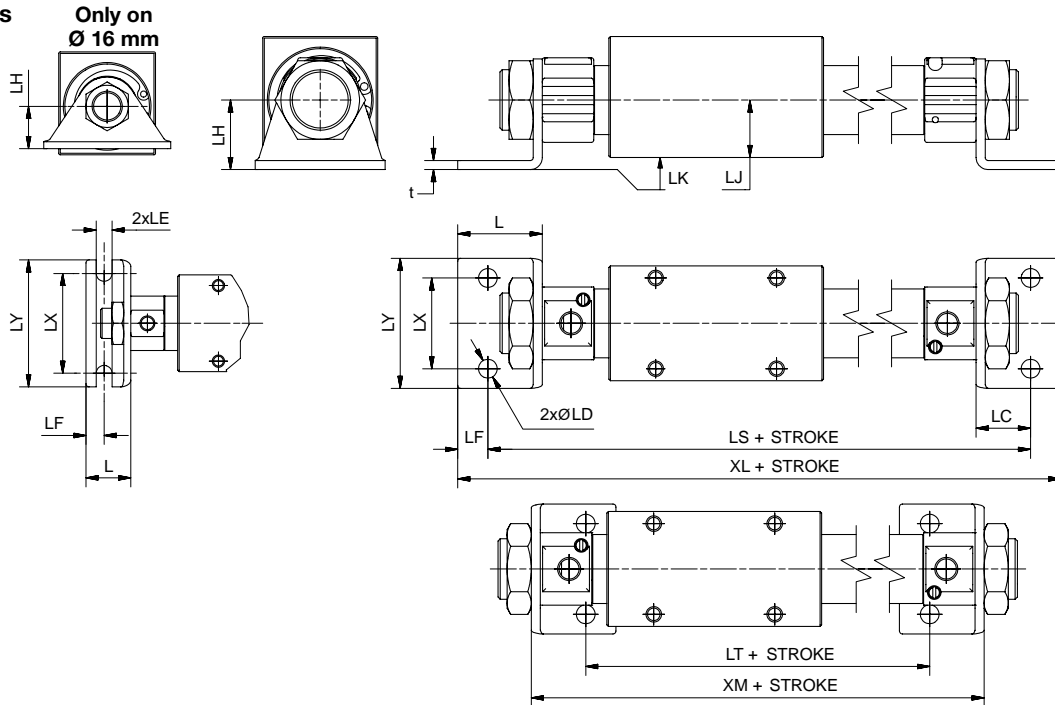
**Mountings**

**Flanges**



| Ø  | F             | ØFD         | FW           | FX           | FY           | FZ           | T             | LS            | Order code       |
|----|---------------|-------------|--------------|--------------|--------------|--------------|---------------|---------------|------------------|
| 16 | 5.2<br>(0.20) | -           | 42<br>(1.65) | 33<br>(1.30) | -            | 20<br>(0.79) | 2.3<br>(0.09) | 92<br>(3.62)  | <b>PDC15-FH</b>  |
| 20 | -             | 6<br>(0.24) | 52<br>(2.05) | 40<br>(1.57) | 20<br>(0.78) | 32<br>(1.26) | 3<br>(0.12)   | 115<br>(4.53) | <b>PK1A20-FH</b> |
| 32 | -             | 7<br>(0.28) | 80<br>(3.15) | 64<br>(2.52) | 28<br>(1.10) | 44<br>(1.73) | 5<br>(0.20)   | 133<br>(5.24) | <b>PK1A25-FH</b> |

**Brackets**



| Ø  | t             | L              | LC            | ØLD           | LE            | LF           | LH           | LJ           | LK            | LX           | LY           | LS              | LT           | XL              | XM             | Order code        |
|----|---------------|----------------|---------------|---------------|---------------|--------------|--------------|--------------|---------------|--------------|--------------|-----------------|--------------|-----------------|----------------|-------------------|
| 16 | 2.3<br>(0.09) | 14.8<br>(0.58) | 8.8<br>(0.35) | -             | 5.2<br>(0.20) | 6<br>(0.24)  | 14<br>(0.55) | 16<br>(0.63) | -2<br>(-0.08) | 33<br>(1.30) | 42<br>(1.65) | 109.6<br>(4.32) | 79<br>(3.11) | 121.6<br>(4.79) | 96.6<br>(3.80) | <b>PDC15-LB*</b>  |
| 20 | 3<br>(0.12)   | 28<br>(1.10)   | 18<br>(0.71)  | 6.2<br>(0.24) | -             | 10<br>(0.39) | 23<br>(0.91) | 19<br>(0.75) | 4<br>(0.16)   | 30<br>(1.18) | 43<br>(1.69) | 151<br>(5.94)   | 85<br>(3.35) | 171<br>(6.73)   | 121<br>(4.76)  | <b>PK1A20-LB*</b> |
| 32 | 3<br>(0.12)   | 35<br>(1.38)   | 23<br>(0.91)  | 7<br>(0.28)   | -             | 12<br>(0.47) | 30<br>(1.18) | 30<br>(1.18) | 0<br>(0)      | 46<br>(1.81) | 62<br>(2.44) | 179<br>(7.05)   | **           | 203<br>(7.99)   | **             | <b>PK1A25-LB*</b> |

\* Set of 2 pcs  
 \*\* Impossible mounting

**B**

Rodless Cylinders  
Actuator Products

OSP-P  
Series

P1X  
Series

P1Z  
Series

GDL  
Series



The magnetic rodless cylinder is a pneumatic cylinder featuring a mobile piston with annular magnets.

The mobile carriage is also equipped with magnets to give magnetic coupling between the piston and carriage. The carriage slides along the main tube and is guided by two guide rods.

It incorporates the following features:

- Built-in guide rods
- Adjustable end-of-stroke bumpers
- Optional magnetic piston sensing
- Optional transfer porting

**Guidance**

The guided version consists of a carriage fitted with 4 plain bearings, guided on 2 rods.

This design provides high rigidity, accurate guidance and smooth movement of the carriage.

**End of stroke**

Each endplate can be fitted with an adjustable bumper or self-compensating shock absorbers.

**Optional transfer porting**

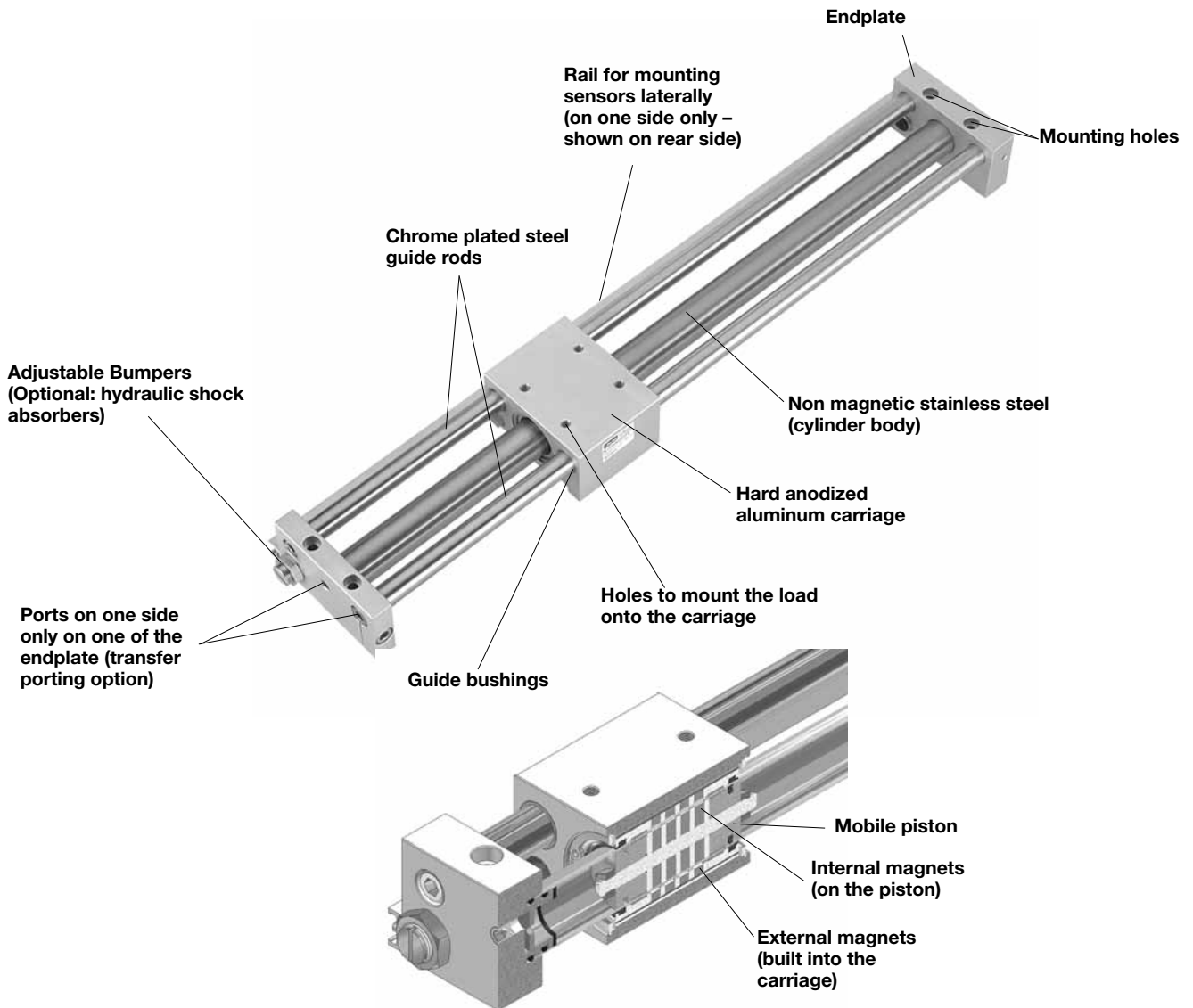
Cylinder air supply is located on one end only to facilitate cylinder installation and avoid long tube lengths for longer strokes.

**Options**

The following options are available to enhance the Magnetic Rodless cylinder functions:

- External bumpers: when low operating pressure, light loads and short strokes.
- External hydraulic shock absorbers: recommended for arduous applications.
- Reed and solid state sensors: provide sensing at an adjustable position along the entire stroke of the cylinder.

|  |              |
|--|--------------|
| <b>B</b><br>Rodless Cylinders<br>Actuator Products | OSP-P Series |
|  | P1X Series   |
|  | P1Z Series   |
|  | GDL Series   |





| Standard cylinder (15 positions)  | Options (16 positions)       |             |                       |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
|---|------------------------------|-------------|-----------------------|---------|----------|-----------|-----|-----------|------------|----|-----------|-----------------|---|--------------------------|----------|--|---|--------|---|------------------------------|--|---------|--|------|--------|------|---------|---------|--|----|------|---|--------------|-----------------------|--|-----|-----|------|-----------------------|---|--|--|----------------------|-----------|--|--|----------------|
| <p><b>P 1 Z M 0 1 6 T N N</b></p> <table border="1" style="margin-bottom: 10px;"> <tr><th colspan="2">Bore</th></tr> <tr><td>016</td><td>Ø 16 mm</td></tr> <tr><td>020</td><td>Ø 20 mm</td></tr> <tr><td>032</td><td>Ø 32 mm</td></tr> </table> <table border="1" style="margin-bottom: 10px;"> <tr><th colspan="2">Cushioning</th></tr> <tr><td>C</td><td>Adjustable stop</td></tr> <tr><td>H</td><td>Hydraulic shock absorber</td></tr> </table> <table border="1" style="margin-bottom: 10px;"> <tr><th colspan="2">Function</th></tr> <tr><td>G</td><td>Guided</td></tr> <tr><td>T</td><td>Guided with transfer porting</td></tr> </table>          | Bore                         |             | 016                   | Ø 16 mm | 020      | Ø 20 mm   | 032 | Ø 32 mm   | Cushioning |    | C         | Adjustable stop | H   | Hydraulic shock absorber | Function |  | G | Guided | T | Guided with transfer porting | <p><b>0 5 0 0 B N M L</b></p> <table border="1" style="margin-bottom: 10px;"> <tr><th colspan="2">Strokes</th></tr> <tr><td>0200</td><td>200 mm</td></tr> <tr><td>1000</td><td>1000 mm</td></tr> </table> <table border="1" style="margin-bottom: 10px;"> <tr><th colspan="2">Options</th></tr> <tr><td>B†</td><td>None</td></tr> <tr><td>W</td><td>With options</td></tr> </table> <table border="1" style="margin-bottom: 10px;"> <tr><th colspan="2">End of stroke sensing</th></tr> <tr> <th>NPN</th> <th>PNP</th> <th>Reed</th> <th>Sensors type (Qty: 2)</th> </tr> <tr> <td>L</td> <td></td> <td></td> <td>With rail, no sensor</td> </tr> <tr> <td>N† (std.)</td> <td></td> <td></td> <td>No sensor rail</td> </tr> </table> <p><small>† Standard when "B" option is used.</small></p> | Strokes |  | 0200 | 200 mm | 1000 | 1000 mm | Options |  | B† | None | W | With options | End of stroke sensing |  | NPN | PNP | Reed | Sensors type (Qty: 2) | L |  |  | With rail, no sensor | N† (std.) |  |  | No sensor rail |
| Bore  |                              |             |                       |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
| 016   | Ø 16 mm                      |             |                       |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
| 020   | Ø 20 mm                      |             |                       |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
| 032   | Ø 32 mm                      |             |                       |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
| Cushioning  |                              |             |                       |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
| C   | Adjustable stop              |             |                       |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
| H   | Hydraulic shock absorber     |             |                       |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
| Function  |                              |             |                       |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
| G   | Guided                       |             |                       |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
| T   | Guided with transfer porting |             |                       |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
| Strokes   |                              |             |                       |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
| 0200  | 200 mm                       |             |                       |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
| 1000  | 1000 mm                      |             |                       |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
| Options   |                              |             |                       |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
| B†  | None                         |             |                       |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
| W   | With options                 |             |                       |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
| End of stroke sensing   |                              |             |                       |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
| NPN   | PNP                          | Reed        | Sensors type (Qty: 2) |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
| L   |                              |             | With rail, no sensor  |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
| N† (std.)   |                              |             | No sensor rail        |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Ø</th> <th>Stroke (mm)</th> <th>(in)</th> </tr> </thead> <tbody> <tr> <td>16</td> <td>0 to 750</td> <td>0 to 29.5</td> </tr> <tr> <td>20</td> <td>0 to 1000</td> <td>0 to 39.4</td> </tr> <tr> <td>32</td> <td>0 to 1000</td> <td>0 to 59.1</td> </tr> </tbody> </table> <p>Order code examples:</p> <ul style="list-style-type: none"> <li>- P1ZM016GCN0100B    Ø 16 mm bore 100 mm stroke cylinder supplied with adjustable stop</li> <li>- P1ZM020GHN1000WNBL    Ø 20 mm bore 1 m stroke cylinder with hydraulic shock absorbers and rail for sensors</li> </ul> | Ø                            | Stroke (mm) | (in)                  | 16      | 0 to 750 | 0 to 29.5 | 20  | 0 to 1000 | 0 to 39.4  | 32 | 0 to 1000 | 0 to 59.1       | <p><b>Note:</b> Order Sensors separately.</p> |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
| Ø   | Stroke (mm)                  | (in)        |                       |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
| 16  | 0 to 750                     | 0 to 29.5   |                       |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
| 20  | 0 to 1000                    | 0 to 39.4   |                       |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |
| 32  | 0 to 1000                    | 0 to 59.1   |                       |         |          |           |     |           |            |    |           |                 |   |                          |          |  |   |        |   |                              |  |         |  |      |        |      |         |         |  |    |      |   |              |                       |  |     |     |      |                       |   |  |  |                      |           |  |  |                |

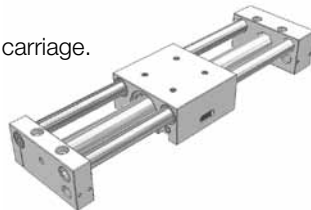
### Range

#### Magnetic rodless cylinder, guided version

Available in 3 diameters with possible strokes up to 1500 mm (59 in).

4 tapped mounting holes on the carriage.

Endcap mounting provided by 4 tapped and counterbored holes.



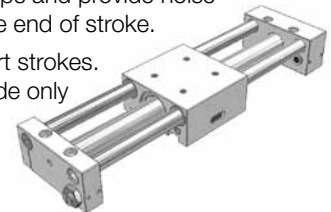
### Options

#### External adjustable bumpers

Can be fitted on cylinder endcaps and provide noise reduction and adjustment at the end of stroke.

Used when light loads and short strokes.

Pneumatic air supply on one side only (transfer porting option).



#### External hydraulic shock absorbers

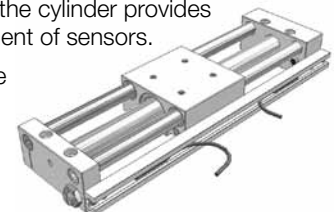
Self-compensating hydraulic shock absorbers can be used instead of bumpers for a greater cushioning effect at the end of stroke.

They are recommended for arduous applications.

#### Reed or solid state sensors:

A rail fitted on one side only of the cylinder provides mounting and position adjustment of sensors.

The rail is located on same side as the end of stroke stops.



**General features**

**Specifications for P1Z series magnetically coupled rodless**

|                             |   |                             |                   |
|-----------------------------|---|-----------------------------|-------------------|
| Operating medium            | Compressed Air  |                             |                   |
| Maximum pressure bar (PSI)  | 7 (100)   |                             |                   |
| Minimum pressure bar (IPS)  | 2 (29)  |                             |                   |
| Bore size mm (inch nominal) | 16 (5/8)  | 20 (3/4)                    | 32 (1 1/4)        |
| Port size                   | M5 BSPP, 10-32 NPT  | 1/8 BSPP, 1/8 NPT           | 1/8 BSPP, 1/8 NPT |
| Ambient temperature °F (°C) | 15 to 140°F (-10 to 160°C)  |                             |                   |
| Maximum stroke mm (inch)    | 750 (29.5)  | 1000 (39.4)                 | 1500 (59.1)       |
| Stroke tolerance mm         | +1.5/-0   | <=1000 +1.5/-0; >1000 +2/-0 |                   |
| Piston speed m/s (inch/sec) | 0.1 to 0.4 (4 to 15.75)   |                             |                   |
| Max. coupling force N (Lbs) | 157 (35)  | 236 (53)                    | 703 (158)         |
| Cushion                     | Air cushion standard  |                             |                   |
| Lubrication                 | Not required (If you choose to lubricate your system, continuing lubrication will be required.) |                             |                   |

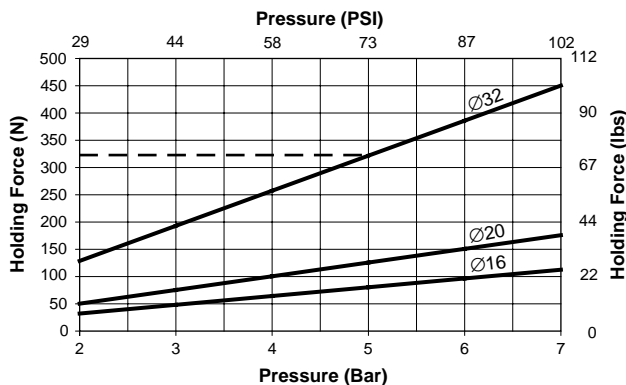
**Weights**

| Bore size |       | Weight at zero stroke |      | Weight per 25mm of stroke |      |
|-----------|-------|-----------------------|------|---------------------------|------|
| mm        | inch  | kg                    | lbs  | kg                        | lbs  |
| 16        | 5/8   | 0.9                   | 1.98 | 0.05                      | 0.11 |
| 20        | 3/4   | 1.52                  | 3.35 | 0.08                      | 0.17 |
| 32        | 1-1/4 | 3.63                  | 8.00 | 0.13                      | 0.29 |

**Options**

| Function                  | Description  |
|---------------------------|--|
|                           | Sensors mounting in T-slot   |
| Detection                 | Reed or solid state sensors (PNP or NPN)                                     |
| External rubber bumpers   | Supplied pre-fitted in endplates if chosen                                   |
| Hydraulic shock absorbers | Self-compensating shock absorbers supplied pre-fitted in endplates if chosen |

**Pressure in the cylinder / pneumatic holding force**



**Example:**

Pressure: 5 bar (73 PSI)

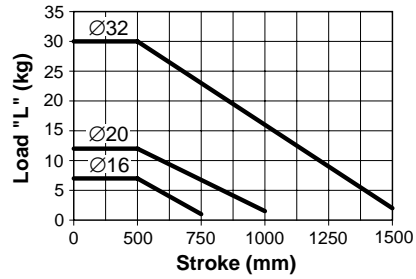
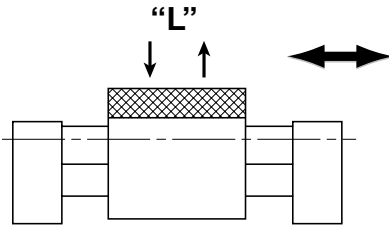
$F_{max} = 322 \text{ N (72 lbs.)}$  for Ø 32 mm cylinder

⚠ Calculate the kinetic energy due to the load moved.

Acceleration or deceleration should not exceed the magnetic coupling force of cylinder.

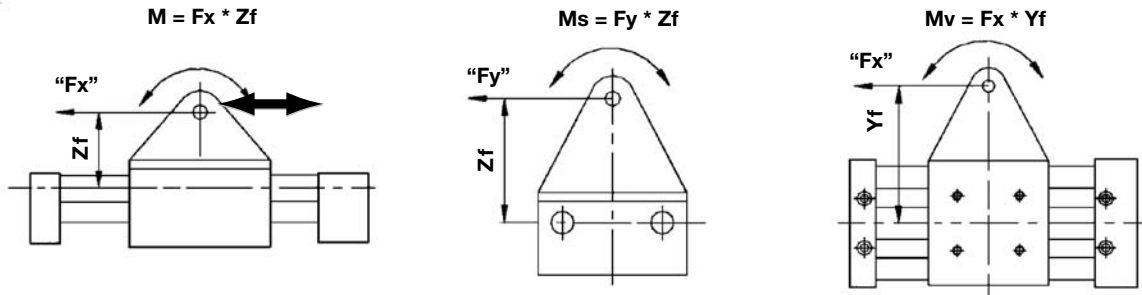
**Load diagrams**

**Permissible radial loads, horizontal mounting**



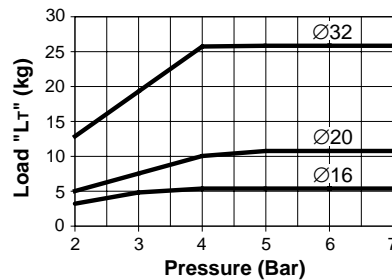
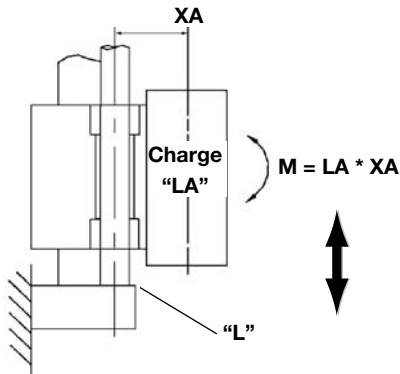
| Ø         | L Max. |        |
|-----------|--------|--------|
|           | (kg)   | (lbs.) |
| <b>16</b> | 7      | 15     |
| <b>20</b> | 12     | 26     |
| <b>32</b> | 30     | 66     |

**Permissible axial loads, horizontal mounting**



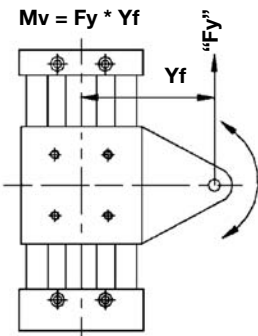
| Ø  | Max. moment M |           | Max. moment Ms |           | Max. moment Mv |           |
|----|---------------|-----------|----------------|-----------|----------------|-----------|
|    | (Nm)          | (in-lbs.) | (Nm)           | (in-lbs.) | (Nm)           | (in-lbs.) |
| 16 | 2.4           | 21        | 0.5            | 4.4       | 2.4            | 21        |
| 20 | 5             | 44        | 1              | 8.9       | 5              | 44        |
| 32 | 15            | 133       | 3              | 26.6      | 15             | 133       |

**Permissible axial loads, vertical mounting**



| Ø  | Max. load LT* | Max. XA |
|----|---------------|---------|
|    | (kg)          | (mm)    |
| 16 | 5             | 122     |
| 20 | 10            | 142     |
| 32 | 24            | 174     |

\* at 6.5 bar



- L** = Load guided by external device
  - LA** = Mounting direct onto cylinder
  - LT** = Load weight + guiding device weight + force due to friction
  - Ff\*** = Force due to friction
- \*If force due to friction is unknown, use  $0.1 * (L + LA)$

**B**

Rodless Cylinders  
 Actuator Products

OSP-P  
 Series

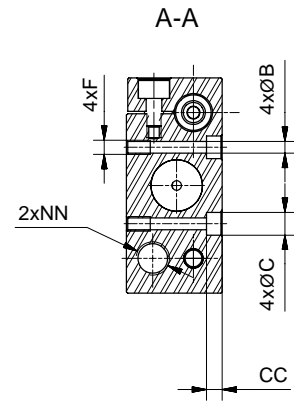
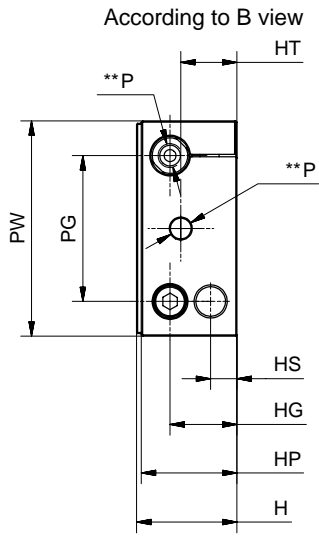
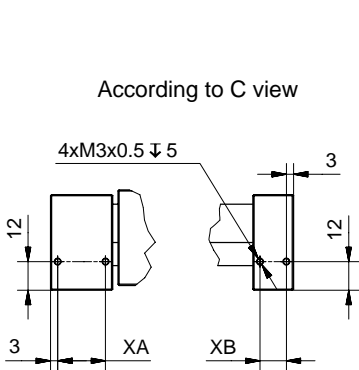
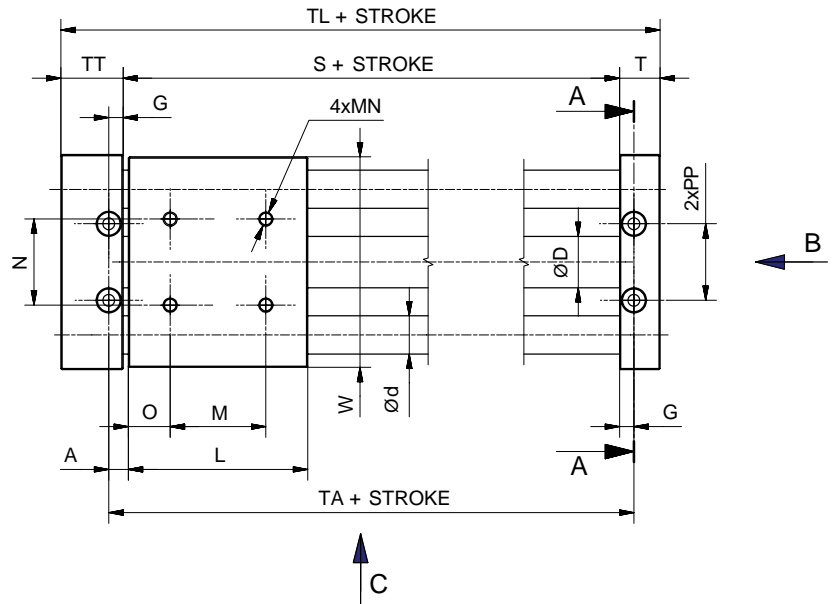
P1X  
 Series

P1Z  
 Series

GDL  
 Series

**Dimensions**

\*\* = Air supply ports



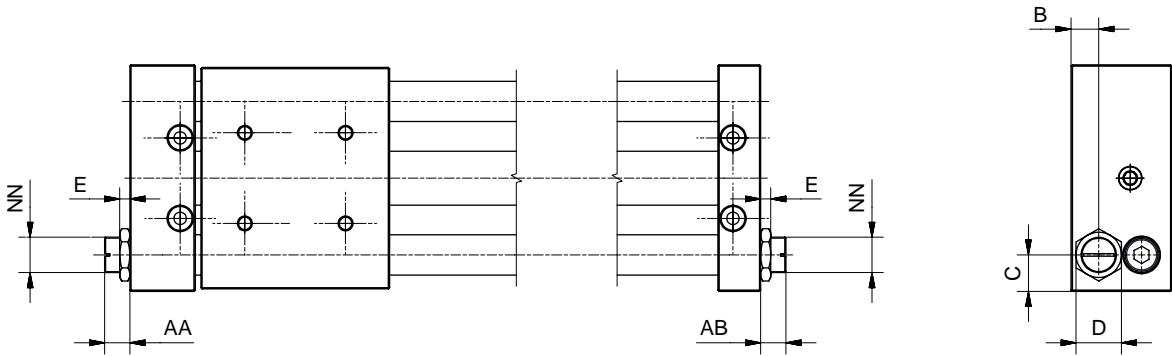
| Ø  | A             | ØB           | ØC           | CC           | ØD             | Ød          | F            | G           | H            | HP             | HG           | HS          | HT             | L            | M            | N            | MN             |
|----|---------------|--------------|--------------|--------------|----------------|-------------|--------------|-------------|--------------|----------------|--------------|-------------|----------------|--------------|--------------|--------------|----------------|
| 16 | 8<br>(.31)    | 4.3<br>(.17) | 8<br>(.31)   | 4.5<br>(.18) | 17.4<br>(.69)  | 12<br>(.47) | M5x0.8 x 10  | 6<br>(.24)  | 34<br>(1.34) | 33.5<br>(1.32) | 25<br>(0.98) | 12<br>(.47) | 21.5<br>(0.85) | 65<br>(2.56) | 34<br>(1.34) | 30<br>(1.18) | M5 x 0.8 x 8   |
| 20 | 8<br>(.31)    | 5.5<br>(.22) | 9.5<br>(.37) | 6.5<br>(.26) | 21.4<br>(.84)  | 16<br>(.63) | M6x1 x 10    | 6<br>(.24)  | 42<br>(1.65) | 40<br>(1.57)   | 28<br>(1.10) | 12<br>(.47) | 23.5<br>(.93)  | 75<br>(2.95) | 40<br>(1.57) | 36<br>(1.42) | M6 x 1 x 10    |
| 32 | 13.5<br>(.53) | 8.7<br>(.34) | 14<br>(.55)  | 8<br>(.31)   | 33.6<br>(1.32) | 20<br>(.79) | M10x1.5 x 15 | 10<br>(.39) | 66<br>(2.60) | 64<br>(2.52)   | 46<br>(1.81) | 20<br>(.79) | 41<br>(1.61)   | 91<br>(3.58) | 60<br>(2.36) | 50<br>(1.97) | M8 x 1.25 x 12 |

| Ø  | NN            | O              | P        | PG           | PW            | PP           | T            | TT           | S            | TA            | TL            | W             | XA           | XB           |
|----|---------------|----------------|----------|--------------|---------------|--------------|--------------|--------------|--------------|---------------|---------------|---------------|--------------|--------------|
| 16 | M10 x 1 x 6   | 15.5<br>(0.61) | M5 x 0.8 | 50<br>(1.97) | 70<br>(2.76)  | 27<br>(1.06) | 14<br>(0.55) | 23<br>(0.91) | 69<br>(2.76) | 81<br>(3.19)  | 106<br>(4.17) | 68<br>(2.68)  | 17<br>(0.67) | 8<br>(0.31)  |
| 20 | M14 x 1.5 x 7 | 17.5<br>(0.69) | G1/8     | 61<br>(2.40) | 90<br>(3.54)  | 32<br>(1.26) | 17<br>(0.67) | 26<br>(1.02) | 79<br>(3.11) | 91<br>(3.58)  | 122<br>(4.80) | 88<br>(3.46)  | 20<br>(0.79) | 11<br>(0.43) |
| 32 | M20 x 1.5 x 7 | 15.5<br>(0.61) | G1/8     | 86<br>(3.39) | 122<br>(4.80) | 50<br>(1.97) | 20<br>(0.79) | 28<br>(1.10) | 97<br>(3.82) | 117<br>(4.61) | 145<br>(5.71) | 118<br>(4.65) | 22<br>(0.87) | 14<br>(0.55) |

**B**  
 Rodless Cylinders  
 Actuator Products  
 OSP-P Series  
 P1X Series  
 P1Z Series  
 GDL Series

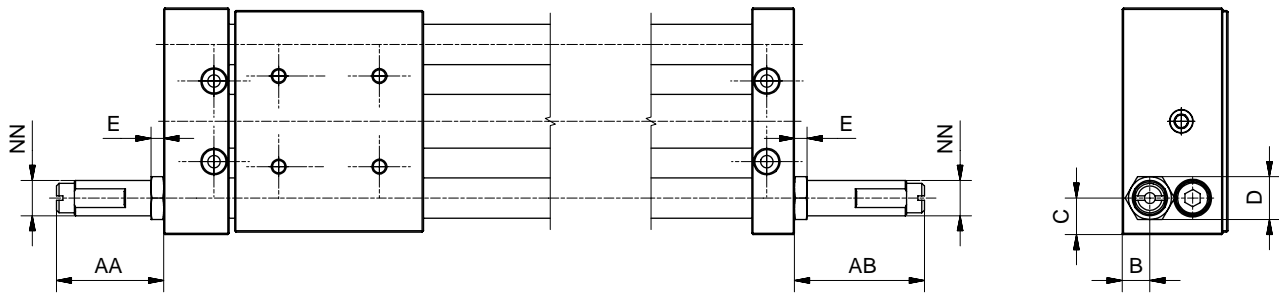


**Optional external adjustable bumpers**



| Ø  | AA            | AB            | B            | C              | D            | E           | NN        |
|----|---------------|---------------|--------------|----------------|--------------|-------------|-----------|
| 16 | 7.5<br>(0.30) | 6.5<br>(0.26) | 12<br>(0.47) | 10<br>(0.39)   | 14<br>(0.55) | 4<br>(0.16) | M10 x 1   |
| 20 | 10<br>(0.39)  | 10<br>(0.39)  | 11<br>(0.43) | 14.5<br>(0.57) | 18<br>(0.71) | 4<br>(0.16) | M14 x 1.5 |
| 32 | 11<br>(0.43)  | 12<br>(0.47)  | 20<br>(0.79) | 18<br>(0.71)   | 26<br>(1.02) | 8<br>(0.31) | M20 x 1.5 |

**External hydraulic shock absorbers**



| Ø  | AA           | AB           | B            | C              | D            | E           | NN        |
|----|--------------|--------------|--------------|----------------|--------------|-------------|-----------|
| 16 | 18<br>(0.71) | 27<br>(1.06) | 12<br>(0.47) | 10<br>(0.39)   | 13<br>(0.51) | 3<br>(0.12) | M10 x 1   |
| 20 | 50<br>(1.97) | 59<br>(2.32) | 11<br>(0.43) | 14.5<br>(0.57) | 17<br>(0.67) | 5<br>(0.20) | M14 x 1.5 |
| 32 | 56<br>(2.20) | 66<br>(2.60) | 20<br>(0.79) | 18<br>(0.71)   | 24<br>(0.94) | 6<br>(0.24) | M20 x 1.5 |

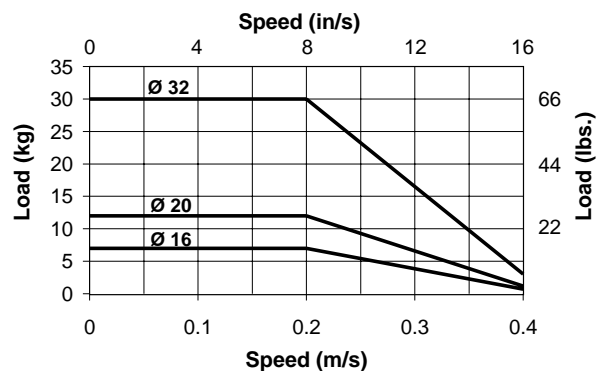
**Loads / speeds diagram**

The diagram to the right exhibits the P1Z cylinders maximum capacities with an adjustable bumper.

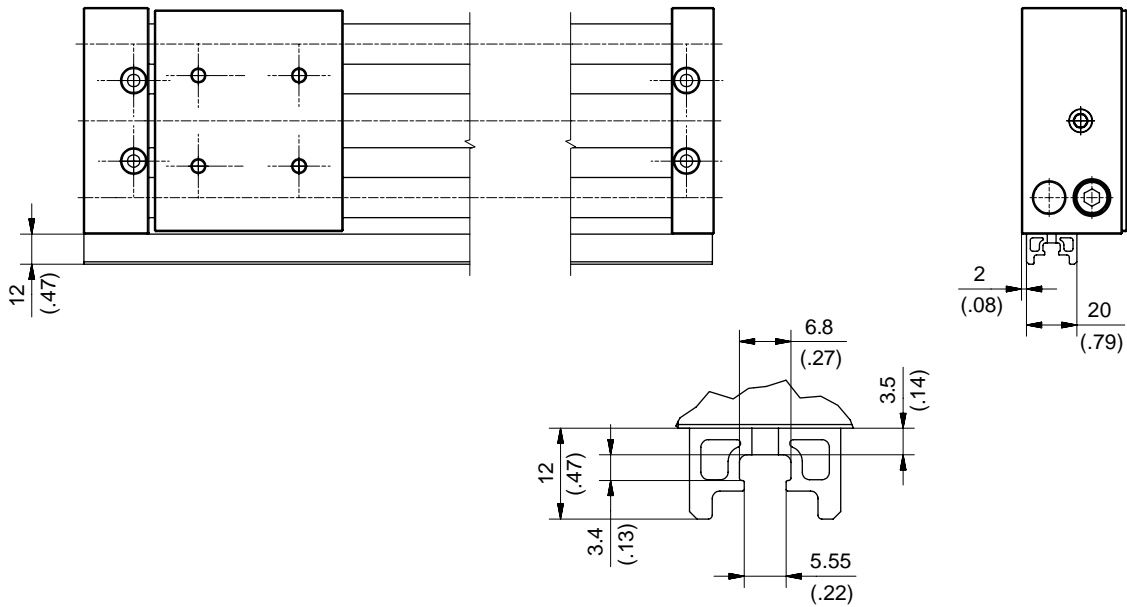
If the intersection exhibits between speed and load is above the curves, it is imperative to use hydraulic shock absorbers to prevent cylinder damage.

**Example:**

- Ø 32 mm cylinder with a 0.3 m/s speed and 25 kg load
- Choose the hydraulic shock absorber option
- Ø 20mm cylinder with 0.2 m/s speed and 10 kg load
- Choose the adjustable bumpers option



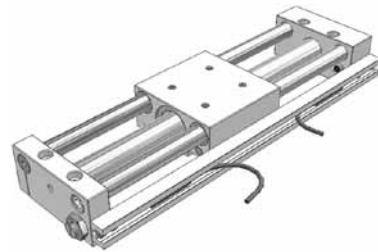
**Optional sensor rail**



**Detection**

Reed or solid state sensor mounting is possible on one cylinder side only.

External aluminum profile integrates 1 T-slot for sensor mounting.



**Repair kits**

| Ø                  | Basic version       | Guided version      |
|--------------------|---------------------|---------------------|
| 16 (Cushioned)     | <b>P1ZM016SAN-R</b> | –                   |
| 16 (Non-cushioned) | <b>P1ZM016SNN-R</b> | <b>P1ZM016GNN-R</b> |
| 20                 | <b>P1ZM020SAN-R</b> | <b>P1ZM020GNN-R</b> |
| 32                 | <b>P1ZM032SAN-R</b> | <b>P1ZM032GNN-R</b> |

**B**  
 Rodless Cylinders  
 Actuator Products  
 OSP-P Series  
 P1X Series  
 P1Z Series  
 GDL Series

**GDL Product line overview**



| Characteristic  | Unit                                       | Description  |
|---|--|--|
| Full profile wipers   |  | Rollershoes and cassette are provided with snap-on full profile wipers. The snap-on full profile wipers are easily replaceable with available wipers kits.   |
| Acceleration and deceleration   | m/s <sup>2</sup><br>(ft/sec <sup>2</sup> ) | 40 m/s <sup>2</sup> maximum<br>(131 ft/s <sup>2</sup> maximum)   |
| Guide installation  |  | Possible in any position.  |
| Drag adjustment set screw   |  | Cassettes can be adjusted at the factory or by the customer.<br>Rollershoes can be set-up by the customer to incorporate the drag adjustment set screw feature. The drag adjustment set screw components are supplied with each pair of rollershoes. |
| Standard lubrication  |  | Lifetime lubrication with standard grease-packed roller bearings.  |
| Speed   | m/s (ft/s)                                 | Up to 10 m/s (or up to 33 ft/s)  |
| Materials for high performance or standard versions / corrosion resistant |  | Rail: Aluminum alloy   |
|   |  | Guideways: Hardened high alloy spring steel  |
|   |  | Cassettes / rollershoes / top plates: Aluminum alloy   |
|   |  | Rollers: Bearing steel / Stainless steel bearing steel   |
| Bearing types   |  | Steel axial needle,<br>Specials on request (ex: anti-magnetic, grease free, high dynamics) - consult factory   |
| Operating temperature   | C (F)                                      | -10° to 80°C (+14 to 176°F) temperature range  |
| Specials available  |  | Custom length cassettes and rollershoes for 100 piece lots minimum.  |
|   |  | Keyed butt-jointed rail sections up to 4000mm.   |
|   |  | Solid continuous length rails between 4000.  |
|   |  | Offset or non-standard "L11" dimensions on opposite ends of cut rails.   |
|   |  | Integrated metal scraper with standard full profile wiper currently available.<br>Rail underside blind mounting holes.   |

**B**

**Rodless Cylinders  
 Actuator Products**

**OSP-P  
 Series**

**P1X  
 Series**

**P1Z  
 Series**

**GDL  
 Series**

**Descriptions of the various GDL series available:**

**High Performance Series:**

(Sizes FDC12HP-... thru FDC45HP-...)

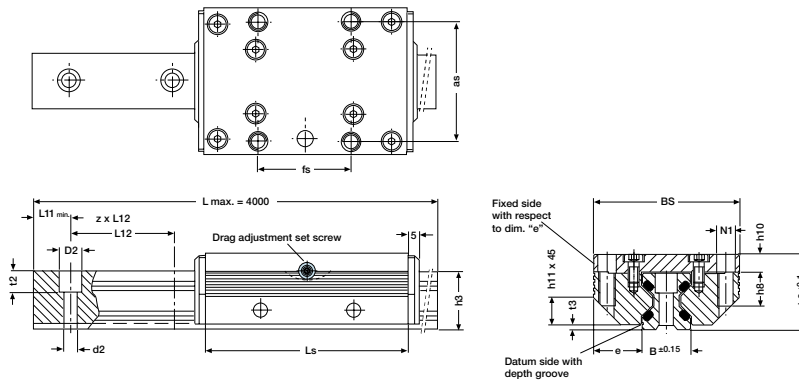
The High Performance series is the basis for GDL's development, which is used in the majority of applications. High Performance guides consist of 8 axial needle roller bearings, running on precision polished and hardened alloy spring steel guideways. These guide bearings are grease packed and shielded, while offering the highest load and moment rating capacities within the GDL product line.

**Standard Performance Series:**

(Sizes FDC12SP-... thru FDC45SP-...)

The Standard Performance series is intended for minor loads and moments for particularly economical guidance solutions. Standard Performance guides consist of 8 radial ball roller bearings, running on precision polished and hardened alloy spring steel guideways. These guide bearings are grease packed and sealed, while offering the lowest load and moment ratings available within the GDL product line, with the exception of the Grease-Free and the Anti-Friction / Corrosion Resistant series. Standard Performance series is the second most commonly used GDL guides for various applications and also provides excellent running behavior.

**Cassette with double sided rail**



**Dimensions for both standard FDC version guides**

| Size | Length |      | BS  | h3   | h9 | as  | d2   | D2 | e     | fs | h8 | h10  | h11 | L11 min. | L12 | t2   | t3  | N1  |
|------|--------|------|-----|------|----|-----|------|----|-------|----|----|------|-----|----------|-----|------|-----|-----|
|      | Ls     | B    |     |      |    |     |      |    |       |    |    |      |     |          |     |      |     |     |
| 12   | 64     | 12.0 | 37  | 14.7 | 19 | 30  | 3.4  | 6  | 12.50 | 25 | 8  | 4.0  | 6   | 10       | 40  | 5.5  | 1.4 | M4  |
| 15   | 78     | 15.5 | 47  | 18.7 | 24 | 38  | 4.5  | 8  | 15.75 | 30 | 10 | 5.0  | 8   | 10       | 60  | 6.0  | 2.0 | M5  |
| 20   | 92     | 21.0 | 63  | 22.6 | 30 | 53  | 5.5  | 10 | 21.00 | 40 | 12 | 7.0  | 11  | 10       | 60  | 7.0  | 2.0 | M6  |
| 25   | 98     | 23.0 | 70  | 27.0 | 36 | 57  | 6.6  | 11 | 23.50 | 45 | 16 | 8.5  | 13  | 10       | 60  | 10.0 | 2.5 | M8  |
| 35   | 135    | 32.0 | 100 | 37.0 | 48 | 82  | 9.0  | 15 | 34.00 | 62 | 20 | 10.5 | 20  | 12       | 80  | 11.5 | 3.5 | M10 |
| 45   | 165    | 45.0 | 120 | 46.0 | 60 | 100 | 11.0 | 18 | 37.50 | 80 | 24 | 13.5 | 22  | 16       | 105 | 14.5 | 4.0 | M12 |

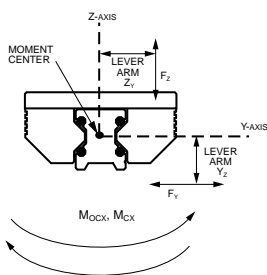
Dimensions (mm)

**Dimensions for both underside mounting hole FDC version guides (Ref. ordering instructions)**

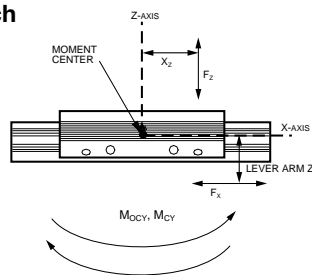
| Size | Length |      | BS  | h3   | h9 | as  | d2   | D2 | e     | fs | h8 | h10  | h11 | L11 min. | L12 | t2   | t3  | N1  |
|------|--------|------|-----|------|----|-----|------|----|-------|----|----|------|-----|----------|-----|------|-----|-----|
|      | Ls     | B    |     |      |    |     |      |    |       |    |    |      |     |          |     |      |     |     |
| 12   | 64     | 12.0 | 37  | 14.7 | 19 | 30  | 3.4  | 6  | 12.50 | 29 | 8  | 4.0  | 6   | 10       | 40  | 5.5  | 1.4 | M4  |
| 15   | 78     | 15.5 | 47  | 18.7 | 24 | 38  | 4.5  | 8  | 15.75 | 34 | 10 | 5.0  | 8   | 10       | 60  | 6.0  | 2.0 | M5  |
| 20   | 92     | 21.0 | 63  | 22.6 | 30 | 53  | 5.5  | 10 | 21.00 | 40 | 12 | 7.0  | 11  | 10       | 60  | 7.0  | 2.0 | M6  |
| 25   | 98     | 23.0 | 70  | 27.0 | 36 | 57  | 6.6  | 11 | 23.50 | 45 | 16 | 8.5  | 13  | 10       | 60  | 10.0 | 2.5 | M8  |
| 35   | 135    | 32.0 | 100 | 37.0 | 48 | 82  | 9.0  | 15 | 34.00 | 62 | 20 | 10.5 | 20  | 12       | 80  | 11.5 | 3.5 | M10 |
| 45   | 165    | 45.0 | 120 | 46.0 | 60 | 100 | 11.0 | 18 | 37.50 | 90 | 24 | 13.5 | 22  | 16       | 105 | 14.5 | 4.0 | M12 |

Dimensions (mm)

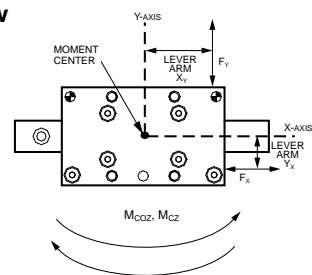
**Roll**



**Pitch**



**Yaw**



**Load & moment rating capacities (for cassettes on double sided rail)**

| Dynamic load rating C (N) | Static load rating Co (N) | Static moment rating capacities: |                 |               | Dynamic moment rating capacities: |                |              | Cassette weight (kg) | Rail weight (kg) | Cassette series |
|---------------------------|---------------------------|----------------------------------|-----------------|---------------|-----------------------------------|----------------|--------------|----------------------|------------------|-----------------|
|                           |                           | Roll Mox (Nm)                    | Pitch Mocy (Nm) | Yaw Mocz (Nm) | Roll Mcx (Nm)                     | Pitch Mcy (Nm) | Yaw Mcz (Nm) |                      |                  |                 |
| 2800                      | 3000                      | 27                               | 43              | 43            | 25                                | 40             | 40           | 0.1                  | 0.4              | FDC12HP-...     |
| 4200                      | 3400                      | 37                               | 58              | 58            | 45                                | 72             | 72           | 0.3                  | 0.8              | FDC15HP-...     |
| 5400                      | 5400                      | 76                               | 111             | 111           | 76                                | 111            | 111          | 0.4                  | 0.9              | FDC20HP-...     |
| 9000                      | 10100                     | 158                              | 222             | 222           | 142                               | 198            | 198          | 0.6                  | 1.8              | FDC25HP-...     |
| 12500                     | 18000                     | 423                              | 559             | 559           | 294                               | 388            | 388          | 1.5                  | 3.2              | FDC35HP-...     |
| 21200                     | 25900                     | 827                              | 983             | 983           | 678                               | 806            | 806          | 2.9                  | 5.5              | FDC45HP-...     |

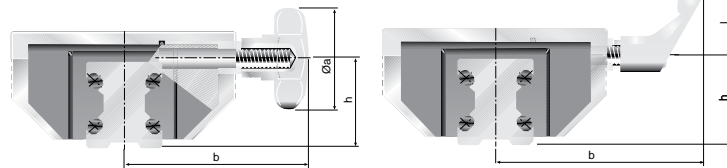


**GDL Aluminum roller guides**

**High performance cassettes with lock device**



**Special cassette types**



The locking cassette with star grip handle can be stopped at any desired location on the rail. The clamping device does not exert forces on the rail guideways.

The clamping device is used in fixtures which are movable manually, clamping and stop ledgers, feeding of tools and work pieces. Also available with L-ratchet handle.

**Star grip handle dimensions**

| Size | Øa  | b   | h    | Clamp force | Part numbers star grip knob |
|------|-----|-----|------|-------------|-----------------------------|
| 12   | N/A |     |      |             |                             |
| 15   | 25  | 41  | 19.0 | 200         | <b>FDC15HP-00020000</b>     |
| 20   | 25  | 49  | 23.0 | 250         | <b>FDC20HP-00020000</b>     |
| 25   | 32  | 56  | 28.0 | 250         | <b>FDC25HP-00020000</b>     |
| 35   | 50  | 83  | 38.5 | 350         | <b>FDC35HP-00020000</b>     |
| 45   | 63  | 101 | 48.0 | 750         | <b>FDC45HP-00020000</b>     |

Dimensions (mm), Force (N) with normal manual tightening.

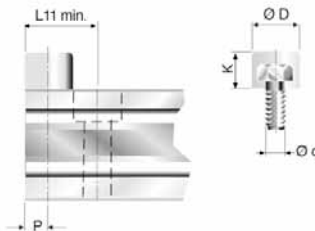
**L-ratchet handle dimensions**

| Size | l   | b    | h    | Clamp force | Part numbers L-ratchet handle |
|------|-----|------|------|-------------|-------------------------------|
| 12   | N/A |      |      |             |                               |
| 15   | 45  | 59.5 | 19.0 | 200         | <b>FDC15HP-00010000</b>       |
| 20   | 45  | 67.5 | 23.0 | 250         | <b>FDC20HP-00010000</b>       |
| 25   | 45  | 71   | 28.0 | 250         | <b>FDC25HP-00010000</b>       |
| 35   | 63  | 96   | 38.5 | 350         | <b>FDC35HP-00010000</b>       |
| 45   | 78  | 116  | 48.0 | 750         | <b>FDC45HP-00010000</b>       |

| Size | Ød  | ØD | K  | L11 min. | P    | Order number  |
|------|-----|----|----|----------|------|---------------|
| 12   | M5  | 12 | 8  | 15.0     | 6.0  | <b>63504A</b> |
| 15   | M5  | 12 | 8  | 16.0     | 6.0  | <b>63504A</b> |
| 20   | M5  | 12 | 8  | 17.0     | 6.0  | <b>63504A</b> |
| 25   | M6  | 15 | 10 | 20.5     | 7.5  | <b>63505A</b> |
| 35   | M8  | 19 | 13 | 26.5     | 9.5  | <b>63506A</b> |
| 45   | M10 | 24 | 16 | 33.0     | 12.0 | <b>63507A</b> |

Dimensions (mm)

**End of stroke stop screws**

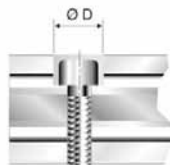


The stop screws are screwed into threads (option) on the guide rails. The end of stroke stopping energy is reduced by a rubber cap. With guide rails where the L11 is less than the standard minimum, we offset the mounting hole by half of its diameter.

**Note:** Customer must drill and tap the holes for the stop screws.

**GDL accessories**

**Rail mounting screw covers**



**Material:** Wear resistant plastic, resistant to oil and aging.

**Mounting:** Put a plastic plate on top and pound in uniformly. Remove residual burrs with a soft brush or fingernail.

**Note:** Use respective order numbers for ordering separately or include in rail part number.

| Size | Cylindrical screw DIN912 | Ø D | Order number  |
|------|--------------------------|-----|---------------|
| 12   | M3                       | 6   | <b>87752A</b> |
| 15   | M4                       | 8   | <b>87753A</b> |
| 20   | M5                       | 10  | <b>87754A</b> |
| 25   | M6                       | 11  | <b>87755A</b> |
| 35   | M8                       | 15  | <b>87756A</b> |
| 45   | M10                      | 18  | <b>87757A</b> |

Dimensions (mm)

**GDL Aluminum roller guides**

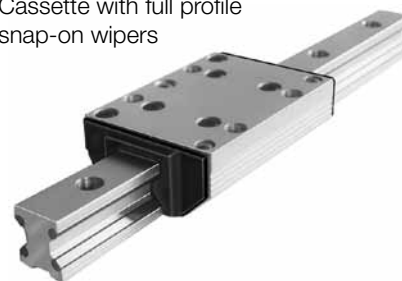
**Version with wipers**

Integrated into an additional cover, a felt wiper is saturated with oil. Although dependent on the degree of contaminants, these wipers last for

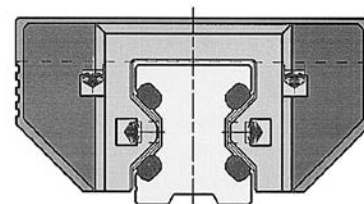
some 6000km, after which the felt wipers can either be washed or replaced.

For optimal cassette rolling performance, all holes in the guide rails should be filled with the plastic rail mounting screw covers.

Cassette with full profile snap-on wipers



Full profile snap-on wiper



**Order numbers for replacement wiper kits**

| FDC series and size | Respective order number |
|---------------------|-------------------------|
| 12                  | <b>84457B</b>           |
| 15                  | <b>84480B</b>           |
| 20                  | <b>84481B</b>           |
| 25                  | <b>84482B</b>           |
| 35                  | <b>84483B</b>           |
| 45                  | <b>84484B</b>           |

\*wiper kits are sold in pairs

NOTE: Use respective order numbers for ordering separately as replacements, or specify in cassette part number.

**GDL's keyed butt-jointed rail option**

GUIDELINE rails can be precisely fastened together using a factory offered keyed butt-joint option for continuous rail lengths, as shown in Figures 1 & 2.

Two rail sections are clamped together with mating round bar stock pieces that seat tangent to both rail section guideways on each side of the rail. While the rail sections are clamped together, a keyway slot is machined in the top and bottom sides of the rail, across the butt-joint. Screw holes are then drilled through the rail inside the keyway slot, so the opposing keyways can be drawn together tightly with screws. The round bar stock clamp is then removed, providing a rigid and well aligned keyed butt-joint.

The keyed butt-joint option provides optimum alignment of all guideways from one rail section to the next. This allows for optimum "smooth" guidance of the cassette bearings, while crossing rail butt-joints.

The keyed butt-jointed rail option is currently available in the FDR version 25, 35, & 45 mm rail sizes. For a keyed butt-joint on rail sizes 25, 35 or 45 mm, specify P/N:# GDL-BJK

Consult factory for other size possibilities.



Figure 1

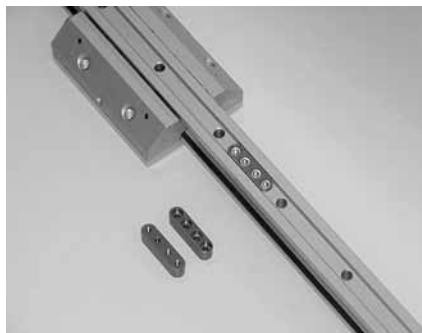


Figure 2

GDL coupled with structural aluminum extrusion material and OSP-E actuator

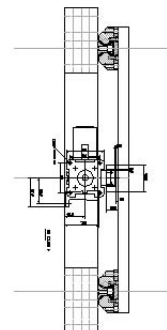


Figure 3

GDL linear guides couple well with various structural aluminum extrusions and Parker-Origa OSP-P and OSP-E actuators. Mounting can be easily accomplished using standard fasteners and mounting brackets. See Figure 3 above.

**B**  
 Rodless Cylinders  
 Actuator Products  
 OSP-P Series  
 P1X Series  
 P1Z Series  
 GDL Series

**Ordering Information / Part Numbering System for GDL Rails**

|   |   |  |   |   |   |  |   |  |    |  |    |                                   |    |   |    |   |    |
|---|---|--|---|---|---|--|---|--|----|--|----|-----------------------------------|----|---|----|---|----|
| 1   | 2 | 3  | 4 | 5   | 6 | 7  | 8 | 9  | 10 | 11   | 12 | 13                                | 14 | 15  | 16 | 17  | 18 |
| F   | D | R  | 1 | 2   | H | 0  | 0 | 0  | 0  | 0  | 0  | -                                 | 0  | 0   | 0  | 0   | 0  |
| <b>Series</b><br>FD Double sided rail guide* (standard) |   | <b>Rail Size</b><br>1 2*<br>1 5*<br>2 0*<br>2 5*<br>3 5*<br>4 5* |   | <b>Guideway Material</b><br>H High performance alloy steel* (standard)<br>S Stainless steel |   | <b>Coatings</b><br>0 Anodized aluminum* (standard)<br>Z Custom (consult factory) |   | <b>"L11" Dimension</b><br>00 Equal on both sides* (standard)<br>?? Actual dimension (mm)** |    | <b>Mounting Holes</b><br>0 Topside thru hole* (standard)<br>1 Underside blind thread<br>Z Custom (consult factory) |    | <b>Length (mm)</b><br>- 0 0 0 0 0 |    | <b>Screw Covers</b><br>0 None* (standard)<br>1 Yes* |    | <b>Long Rail Joining Option</b><br>0 None* (standard)<br>1 Keyed butt joint (size 25-45 only)<br>2 Unkeyed butt joint |    |
| *Stocked Item   |   |  |   |   |   |  |   |  |    |  |    |                                   |    |   |    |   |    |

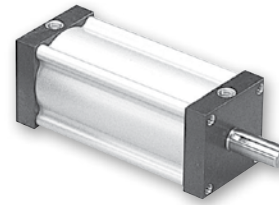
Note: Maximum length is 4 meters on Size 12.  
 \*\* As measured from left side while viewing the depth groove line.  
 Note: Quantity supplied to cover all rail holes.

**Ordering Information / Part Numbering System for GDL Cassettes**

|  |   |  |   |  |   |  |   |  |    |   |    |  |    |   |    |   |  |
|--|---|--|---|--|---|--|---|--|----|---|----|--|----|---|----|---|--|
| 1  | 2 | 3  | 4 | 5  | 6 | 7  | 8 | 9  | 10 | 11  | 12 | 13   | 14 | 15  | 16 |   |  |
| F  | D | C  | 1 | 2  | H | P  | - | 0  | 0  | 0   | 0  | 0  | 0  | 0   | 0  |   |  |
| <b>Series</b><br>FD Double sided rail cassette* (standard) |   | <b>Rail Size</b><br>1 2*<br>1 5*<br>2 0*<br>2 5*<br>3 5*<br>4 5*                               |   | <b>Bearing Options</b><br>HP Axial needle - high performance alloy steel* (standard)<br>SP Single row radial ball - standard performance - alloy steel* (standard)<br>ZZ Factory** (consult factory) |   | <b>Grease</b><br>0 High performance* (standard)<br>Z Custom (consult factory)  |   | <b>Lubrication Options</b><br>0 None* (standard)<br>Z Custom (consult factory)** |    | <b>Coatings</b><br>0 Anodized and standard hardware* (standard)<br>1 Anodized and stainless steel hardware*<br>Z Custom (consult factory) |    | <b>Mounting Holes</b><br>0 Topside threaded thru* (standard)<br>1 Underside hole thru (unthreaded)<br>2 Underside hole thru (threaded) |    | <b>Adjustment</b><br>0 None* (standard)<br>1 Adjusted to specific rail* |    | <b>Cassette Length</b><br>0 Normal length* (standard)<br>Z Custom (consult factory)** |  |
| <b>Cassette</b><br>C Standard                              |   | <b>Locking Mechanism</b><br>0 None* (standard)<br>1 "L" ratchet handle*<br>2 Star grip handle* |   | <b>Wiper Options</b><br>0 With felt wipers* (standard)<br>1 Without*<br>2 With felt wipers and scrapers*   |   | *Locking mechanism only available on FD Series size 15 thru 45 with Axial Needle Bearing - High Performance - Alloy Steel. |   |  |    |   |    |  |    |   |    |   |  |
| *Stocked Item  |   |  |   |  |   |  |   |  |    |   |    |  |    |   |    |   |  |
| **Minimum Order Quantity Required                          |   |  |   |  |   |  |   |  |    |   |    |  |    |   |    |   |  |

**B**  
 Rodless Cylinders  
 Actuator Products  
 OSP-P Series  
 PIX Series  
 P1Z Series  
 GDL Series



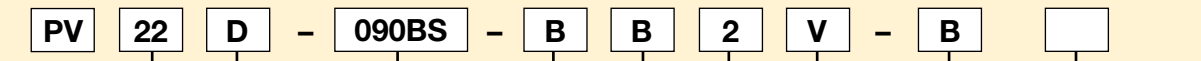


- Single or double vane rotary actuator
- 8 model sizes
- Output torque @ 100 PSIG: 8 to 1800 lb-in
- Standard rotations:  
 Single vane units:  $280^\circ \pm 1^\circ$   
 (except size 10 & 11:  $275^\circ \pm 2.5^\circ$ )  
 Double vane units:  $100^\circ \pm 1^\circ$   
 (except size 10 & 11:  $95^\circ \pm 2.5^\circ$ )  
 Available with stroke adjusters and internal stops to provide 90° and 180° rotation
- Stainless steel shaft
- Optional radial ball bushing shaft bearing

**Operating information**

Operating pressure: 150 PSIG air  
 Temperature range: †  
 Nitrile seals 30°F to 180°F  
 Fluorocarbon seals\* 30°F to 250°F  
 \* See fluorocarbon seal option for high temperature applications.  
 † For low temperature version, please consult factory.  
 Filtration requirements: 40 micron, dry filtered air  
 For technical information see CD

**Ordering information**



| Model |    |    |    |
|-------|----|----|----|
| 10    | 22 | 33 | 42 |
| 11    |    | 36 | 44 |
|       |    |    | 46 |

| Vanes / maximum rotation |   |
|--------------------------|---|
| Omit                     | Single Vane, 280° Rotation (275° on PV10, PV11) |
| D                        | Double Vane, 100° Rotation (95° on PV10, PV11)  |

| Rotation Options<br>(may order more than one) |   |
|---|---|
| Omit  | Standard Units (no stroke adjusters, bumpers or switches)                             |
| 090A  | Stroke Adjusters adjustable from 60° to maximum unit rotation (preadjusted to 90°)    |
| 180A  | Stroke Adjusters (single vane only) adjustable from 60° to 190° (preadjusted to 180°) |
| 090B  | Internal bumpers, 90° rotation <sup>4</sup>   |
| 180B  | Internal bumpers, 180° rotation (single vane only)                                    |
| 090S  | Magnets <sup>1</sup> added, 90° setting   |
| 180S  | Magnets <sup>1</sup> added, 180° setting (single vane only)                           |

1. Switches can be used with stroke adjusters or bumpers (example: PV22D-090BS-BB2-B).
2. Not available with switches or stroke adjusters.
3. No tapped mounting holes in face opposite the flange.
4. 90° bumpers (090B) not available on PV10/11 sizes.

**Note:**  
 Order Hall effect sensors and reed switches separately from the Electronic Sensors section.

| Special options   |          |
|---|----------|
| Omit  | Standard |
| Two digit code assigned by factory when any "X" appears in the model number or when special options or features are required. |          |

| Design series |                       |
|---------------|-----------------------|
| B             | Current design series |

| Options |                      |
|---------|----------------------|
| Omit    | None                 |
| L       | Radial ball bushings |
| V       | Fluorocarbon seals   |

| Ports |   |
|-------|---|
| 2     | NPTF Top (Std) (10-32 on PV10 & PV11)         |
| 7     | NPTF Rear <sup>2</sup> (10-32 on PV10 & PV11) |

| Shaft |                                    |
|-------|------------------------------------|
| B     | Single male keyed (Std)            |
| C     | Double end male keyed <sup>2</sup> |

| Mounting |                               |
|----------|-------------------------------|
| B        | Base / Front (Std)            |
| R        | Rear Flange <sup>2,3</sup>    |
| F        | Front Flange                  |
| S        | Base / Rear Face <sup>2</sup> |

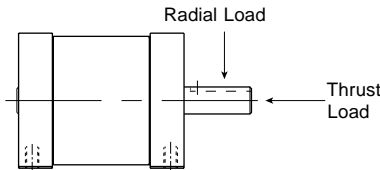
**Sensors**  
 For sensors see page B294.

**B**  
 Rotary Actuators  
 Actuator Products  
 PV Series  
 PRN(A) Series  
 PTR Series  
 HP Series  
 P1V-S Series



**Quick reference data**

| Model number | Maximum rotation (Degrees) | Actual output torque (lb-in) at specified input pressure (PSI) |      |      | Displacement (in <sup>3</sup> ) | Maximum breakaway pressure (PSI) | Maximum bypass leakage @100 psi (CFM) | Unit weight (lb) |
|--------------|----------------------------|--|------|------|---------------------------------|----------------------------------|---------------------------------------|------------------|
|              |                            | 50   | 75   | 100  |                                 |                                  |                                       |                  |
| 10           | 275°                       | 4  | 6    | 8    | 0.52                            | 25                               | 0.15                                  | 0.38             |
| 10D          | 95°                        | 8  | 12   | 16   | 0.37                            | 20                               | 0.20                                  | 0.38             |
| 11           | 275°                       | 8  | 12   | 16   | 1.04                            | 20                               | 0.15                                  | 0.50             |
| 11D          | 95°                        | 17   | 25   | 33   | 0.74                            | 15                               | 0.20                                  | 0.50             |
| 22           | 280°                       | 32   | 48   | 64   | 3.67                            | 15                               | 0.20                                  | 0.50             |
| 22D          | 100°                       | 68   | 101  | 135  | 2.62                            | 10                               | 0.25                                  | 1.75             |
| 33           | 280°                       | 75   | 112  | 150  | 8.70                            | 15                               | 0.20                                  | 3.44             |
| 33D          | 100°                       | 155  | 235  | 315  | 6.20                            | 10                               | 0.25                                  | 3.56             |
| 36           | 280°                       | 150  | 220  | 300  | 17.40                           | 15                               | 0.20                                  | 5.19             |
| 36D          | 100°                       | 315  | 470  | 630  | 12.40                           | 10                               | 0.25                                  | 5.50             |
| 42           | 280°                       | 140  | 210  | 285  | 17.80                           | 15                               | 0.20                                  | 7.13             |
| 42D          | 100°                       | 300  | 450  | 600  | 14.58                           | 10                               | 0.25                                  | 7.50             |
| 44           | 280°                       | 285  | 425  | 570  | 35.61                           | 15                               | 0.20                                  | 8.81             |
| 44D          | 100°                       | 600  | 900  | 1200 | 29.17                           | 10                               | 0.25                                  | 9.38             |
| 46           | 280°                       | 425  | 640  | 850  | 53.41                           | 15                               | 0.20                                  | 10.50            |
| 46D          | 100°                       | 900  | 1350 | 1800 | 43.75                           | 10                               | 0.25                                  | 10.75            |



**Kinetic energy ratings and bearing load capacities**

| Model number | Composite bushing load capacities (lb)* |        | Radial ball bushing load capacities (lb)* |        | Distance between centerline bearings | Maximum kinetic energy rating for models based on configuration (in-lb) |                  |         |
|--------------|---|--------|---|--------|--------------------------------------|---|------------------|---------|
|              | Radial                                  | Thrust | Radial                                    | Thrust |                                      | Standard  | Stroke adjusters | Bumpers |
| 10           | 15                                      | 7      | 50  | 15     | 0.88                                 | 0.03  | 0.12             | 0.05    |
| 11           | 15                                      | 7      | 50  | 15     | 1.50                                 | 0.06  | 0.12             | 0.09    |
| 22           | 50                                      | 25     | Consult factory                           |        | 2.38                                 | 0.25  | 0.50             | 0.38    |
| 33           | 100                                     | 50     | Consult factory                           |        | 3.50                                 | 0.75  | 1.50             | 1.13    |
| 36           | 100                                     | 50     | Consult factory                           |        | 6.50                                 | 1.00  | 1.50             | 1.50    |
| 42           | 200                                     | 75     | Consult factory                           |        | 2.75                                 | 2.00  | 4.00             | 3.00    |
| 44           | 200                                     | 75     | Consult factory                           |        | 4.75                                 | 2.50  | 4.00             | 3.75    |
| 46           | 200                                     | 75     | Consult factory                           |        | 6.75                                 | 3.00  | 4.00             | 4.75    |

\* Bearing capacities only. Check Kinetic Energy ratings to determine if actuator will stop load.

**Seal kit ordering information**

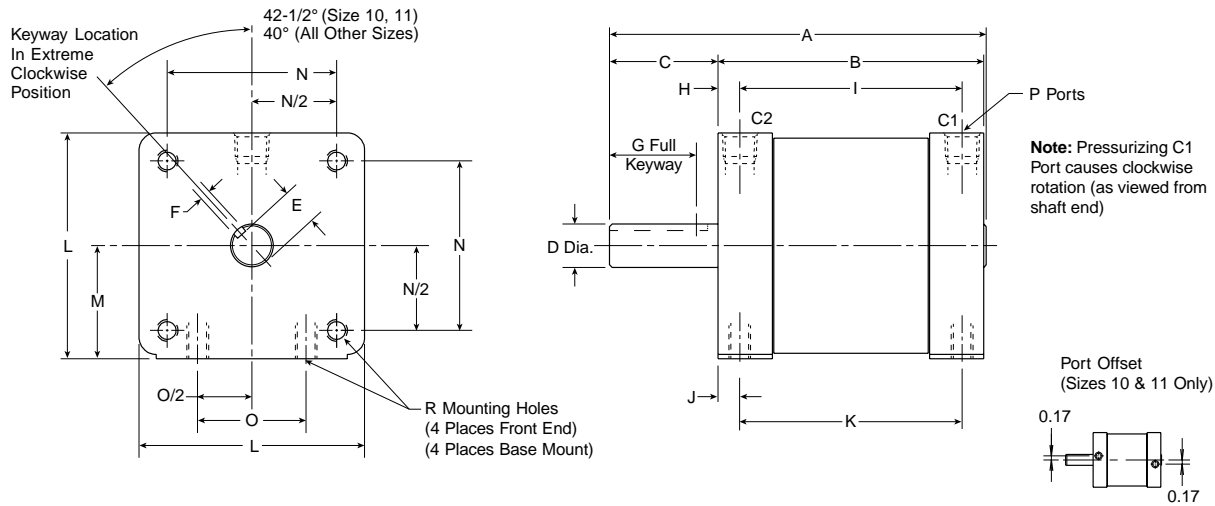
|                     |                     |                 |
|---------------------|---------------------|-----------------|
| <b>PSK</b>          | <b>PV22D</b>        | <b>V</b>        |
| <b>Series</b>       | <b>Model number</b> | <b>Material</b> |
| PSK Parker seal kit | PV22D Model number  | Omit Nitrile    |
|                     |                     | V Fluorocarbon  |

**Seal kit installation tool**

| Model (S)     | Items  | Seal guide kit number |
|---------------|--------|-----------------------|
| PV10 & 11 (D) | 21, 22 | ATS-PV1               |
| PV22 (D)      | 21, 22 | ATS-PV2               |
| PV33 & 36 (D) | 21, 22 | ATS-PV3               |

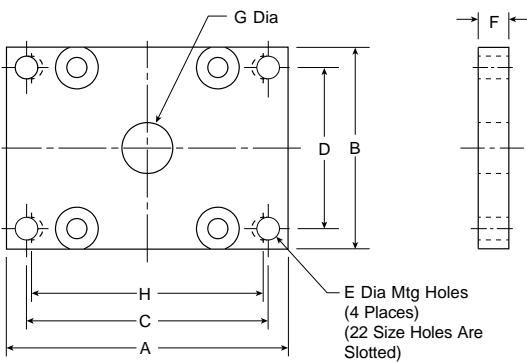
**B**  
 Rotary Actuators  
 Actuator Products  
 PV Series  
 PRN(A) Series  
 PTR Series  
 HP Series  
 PIV-S Series

**Standard Face/Base Mount (B) and Male Keyed Shaft (B)**



| Model number | A      | B    | C    | D              | E              | F              | G    | H    | I    | J    | K     | L    | M     | N     | O     | P        | R                      |
|--------------|--------|------|------|----------------|----------------|----------------|------|------|------|------|-------|------|-------|-------|-------|----------|------------------------|
| 10           | 2.280  | 1.38 | 0.88 | 0.312<br>0.311 | 0.258<br>0.253 | 0.094<br>0.095 | 0.63 | 0.19 | 1.00 | 0.19 | 1.000 | 1.62 | 0.810 | 1.220 | 0.750 | 10-32    | 8-32 x<br>0.25 DP      |
| 11           | 2.905  | 2.00 | 0.88 | 0.312<br>0.311 | 0.258<br>0.253 | 0.094<br>0.095 | 0.63 | 0.19 | 1.63 | 0.19 | 1.625 | 1.62 | 0.810 | 1.220 | 0.750 | 10-32    | 8-32 x<br>0.25 DP      |
| 22           | 4.340  | 3.06 | 1.25 | 0.500<br>0.499 | 0.423<br>0.418 | 0.125<br>0.126 | 0.94 | 0.25 | 2.56 | 0.25 | 2.560 | 2.50 | 1.250 | 2.000 | 1.250 | 1/8 NPTF | 1/4-20NC x<br>0.38 DP  |
| 33           | 6.180  | 4.40 | 1.75 | 0.749<br>0.748 | 0.644<br>0.639 | 0.188<br>0.189 | 1.38 | 0.35 | 3.70 | 0.26 | 3.875 | 3.00 | 1.500 | 2.436 | 1.500 | 1/4 NPTF | 5/16-18NC x<br>0.47 DP |
| 36           | 9.180  | 7.40 | 1.75 | 0.749<br>0.748 | 0.644<br>0.639 | 0.188<br>0.189 | 1.38 | 0.35 | 6.70 | 0.26 | 6.875 | 3.00 | 1.500 | 2.436 | 1.500 | 1/4 NPTF | 5/16-18NC x<br>0.47 DP |
| 42           | 6.280  | 4.00 | 2.25 | 0.999<br>0.998 | 0.859<br>0.854 | 0.250<br>0.251 | 2.00 | 0.50 | 3.00 | 0.50 | 3.000 | 4.50 | 2.250 | 3.500 | 2.375 | 1/4 NPTF | 3/8-16NC x<br>0.75 DP  |
| 44           | 8.280  | 6.00 | 2.25 | 0.999<br>0.998 | 0.859<br>0.854 | 0.250<br>0.251 | 2.00 | 0.50 | 5.00 | 0.50 | 5.000 | 4.50 | 2.250 | 3.500 | 2.375 | 1/4 NPTF | 3/8-16NC x<br>0.75 DP  |
| 46           | 10.280 | 8.00 | 2.25 | 0.999<br>0.998 | 0.859<br>0.854 | 0.250<br>0.251 | 2.00 | 0.50 | 7.00 | 0.50 | 7.000 | 4.50 | 2.250 | 3.500 | 2.375 | 1/4 NPTF | 3/8-16NC x<br>0.75 DP  |

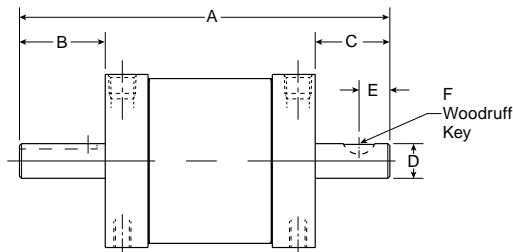
**Flange Mount (F, R)\***



| Model number | A    | B    | C     | D     | E     | F    | G    | H     |
|--------------|------|------|-------|-------|-------|------|------|-------|
| 10           | 2.50 | 1.62 | 2.000 | 1.250 | 0.203 | 0.19 | 0.41 | N/A   |
| 11           | 2.50 | 1.62 | 2.000 | 1.250 | 0.203 | 0.19 | 0.41 | N/A   |
| 22           | 3.50 | 2.50 | 3.000 | 2.000 | 0.281 | 0.25 | 0.66 | 2.875 |
| 33           | 4.50 | 3.00 | 3.750 | 2.000 | 0.344 | 0.38 | 0.84 | N/A   |
| 36           | 4.50 | 3.00 | 3.750 | 2.000 | 0.344 | 0.38 | 0.84 | N/A   |
| 42           | 7.32 | 4.51 | 5.905 | 2.953 | 0.551 | 0.63 | 1.61 | N/A   |
| 44           | 7.32 | 4.51 | 5.905 | 2.953 | 0.551 | 0.63 | 1.61 | N/A   |
| 46           | 7.32 | 4.51 | 5.905 | 2.953 | 0.551 | 0.63 | 1.61 | N/A   |

Note: The face opposite the flange mount does not contain tapped mounting holes. Consult factory if needed.

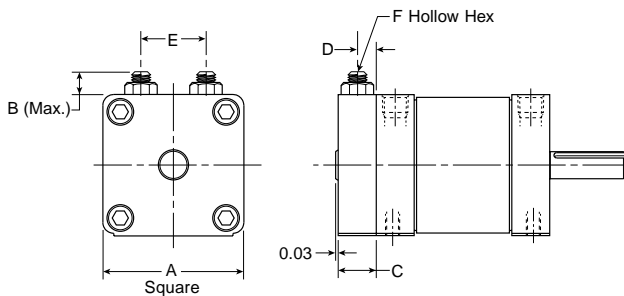
**Double End Male Keyed Shaft (C)**



**Note:** Not available with switches or stroke adjustment. Consult factory for rear port option.

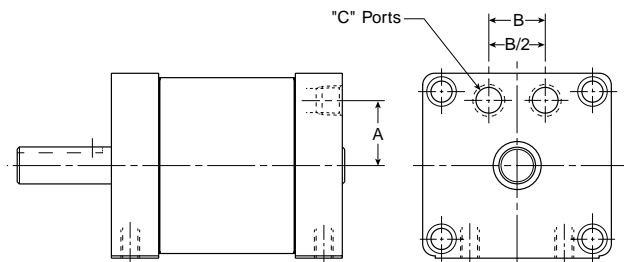
| Model number | A     | B    | C    | D              | E    | F      |
|--------------|-------|------|------|----------------|------|--------|
| 10           | 2.75  | 0.88 | 0.50 | 0.312<br>0.311 | 0.28 | #302.5 |
| 11           | 3.38  | 0.88 | 0.50 | 0.312<br>0.311 | 0.28 | #302.5 |
| 22           | 5.06  | 1.25 | 0.75 | 0.500<br>0.499 | 0.44 | #404   |
| 33           | 7.15  | 1.75 | 1.00 | 0.749<br>0.748 | 0.56 | #606   |
| 36           | 10.15 | 1.75 | 1.00 | 0.749<br>0.748 | 0.56 | #606   |
| 42           | 7.53  | 2.25 | 1.28 | 0.999<br>0.998 | 0.72 | #808   |
| 44           | 9.53  | 2.25 | 1.28 | 0.999<br>0.998 | 0.72 | #808   |
| 46           | 11.53 | 2.25 | 1.28 | 0.999<br>0.998 | 0.72 | #808   |

**Adjustable Rotation Stop (090A, 180A)**



| Model number | A    | B    | C    | D    | E    | F    |
|--------------|------|------|------|------|------|------|
| 10           | 1.62 | 0.63 | 0.47 | 0.24 | 0.75 | 3/32 |
| 11           | 1.62 | 0.63 | 0.47 | 0.24 | 0.75 | 3/32 |
| 22           | 2.50 | 1.00 | 0.72 | 0.36 | 1.25 | 5/32 |
| 33           | 3.00 | 1.16 | 0.97 | 0.48 | 1.56 | 3/16 |
| 36           | 3.00 | 1.16 | 0.97 | 0.48 | 1.56 | 3/16 |
| 42           | 4.50 | 1.38 | 1.25 | 0.56 | 2.25 | 7/32 |
| 44           | 4.50 | 1.38 | 1.25 | 0.56 | 2.25 | 7/32 |
| 46           | 4.50 | 1.38 | 1.25 | 0.56 | 2.25 | 7/32 |

**Rear Port (7)**



| Model number | A    | B    | C        |
|--------------|------|------|----------|
| 10           | 0.54 | 0.50 | 10-32    |
| 11           | 0.54 | 0.50 | 10-32    |
| 22           | 0.88 | 0.75 | 1/8 NPTF |
| 33           | 1.09 | 0.90 | 1/8 NPTF |
| 36           | 1.09 | 0.90 | 1/8 NPTF |
| 42           | 1.68 | 1.00 | 1/4 NPTF |
| 44           | 1.68 | 1.00 | 1/4 NPTF |
| 46           | 1.68 | 1.00 | 1/4 NPTF |

**B**

Rotary Actuators  
 Actuator Products

PV  
 Series

PRN(A)  
 Series

PTR  
 Series

HP  
 Series

P1V-S  
 Series



- Single or double vane rotary actuator
- 3 standard rotations: 90°, 180°, or 270°
- Output torque @ 0.7 MPa:  
 16 to 1120 N•cm (1.4 to 99 in-lb)
- Internal bumpers are standard
- Shock absorbers are available for high inertia loads



**Operating information**

Operating pressure: 100 PSIG  
 Temperature range: -5°C to 80°C (-23°F to 176°F)  
 Filtration requirements: 40 micron, dry filtered air  
 For technical information see CD

**Ordering information**

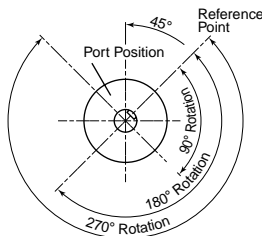
| <b>PRNA</b>   | <b>20</b>  | <b>S - 90 - 90 S</b>  |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
|---|--|---|------------------------------|------|---|--|---|-----|------------------------------------|-----|--|-----|---|-----|-----|-----|--|------|---|-------------|---|-------------|
| <table border="1"> <tr><th>Type</th></tr> <tr><td>PRNA</td><td>Sizes 1-20</td></tr> <tr><td>PRN</td><td>Sizes 30-800</td></tr> </table> | Type   | PRNA  | Sizes 1-20                   | PRN  | Sizes 30-800                            | <table border="1"> <tr><th>Size</th></tr> <tr><td>1</td></tr> <tr><td>3</td></tr> <tr><td>10</td></tr> <tr><td>20</td></tr> <tr><td>30</td></tr> <tr><td>50</td></tr> <tr><td>150</td></tr> <tr><td>300</td></tr> <tr><td>800</td></tr> </table> | Size  | 1   | 3                                  | 10  | 20   | 30  | 50  | 150 | 300 | 800 | <table border="1"> <tr><th>Type</th></tr> <tr><td>S</td><td>Single vane</td></tr> <tr><td>D</td><td>Double vane</td></tr> </table> | Type | S | Single vane | D | Double vane |
| Type  |  |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| PRNA  | Sizes 1-20                                       |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| PRN   | Sizes 30-800                                     |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| Size  |  |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| 1   |  |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| 3   |  |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| 10  |  |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| 20  |  |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| 30  |  |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| 50  |  |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| 150   |  |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| 300   |  |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| 800   |  |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| Type  |  |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| S   | Single vane                                      |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| D   | Double vane                                      |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
|   |  | <table border="1"> <tr><th>Porting</th></tr> <tr><td>Omit</td><td>Standard porting</td></tr> <tr><td>S</td><td>Rear porting (sizes 3-20 only)</td></tr> </table>  | Porting                      | Omit | Standard porting                        | S  | Rear porting (sizes 3-20 only)                |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| Porting   |  |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| Omit  | Standard porting                                 |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| S   | Rear porting (sizes 3-20 only)                   |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
|   |  | <table border="1"> <tr><th>Rotation angle</th></tr> <tr><td>90</td><td>90° (all sizes, single and double vane)</td></tr> <tr><td>100</td><td>100° (sizes 50 through 800, double vane only)</td></tr> <tr><td>180</td><td>180° (all sizes, single vane only)</td></tr> <tr><td>270</td><td>270° (single vane only, not available on size 1)</td></tr> <tr><td>280</td><td>280° (sizes 50 through 800, single vane only)</td></tr> </table> | Rotation angle               | 90   | 90° (all sizes, single and double vane) | 100  | 100° (sizes 50 through 800, double vane only) | 180 | 180° (all sizes, single vane only) | 270 | 270° (single vane only, not available on size 1) | 280 | 280° (sizes 50 through 800, single vane only) |     |     |     |  |      |   |             |   |             |
| Rotation angle  |  |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| 90  | 90° (all sizes, single and double vane)          |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| 100   | 100° (sizes 50 through 800, double vane only)    |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| 180   | 180° (all sizes, single vane only)               |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| 270   | 270° (single vane only, not available on size 1) |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| 280   | 280° (sizes 50 through 800, single vane only)    |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
|   |  | <table border="1"> <tr><th>Oscillating reference point*</th></tr> <tr><td>40</td><td>40°</td></tr> <tr><td>45</td><td>45°</td></tr> <tr><td>90</td><td>90°</td></tr> </table>   | Oscillating reference point* | 40   | 40°                                     | 45   | 45°   | 90  | 90°                                |     |  |     |   |     |     |     |  |      |   |             |   |             |
| Oscillating reference point*  |  |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| 40  | 40°  |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| 45  | 45°  |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |
| 90  | 90°  |   |                              |      |   |  |   |     |                                    |     |  |     |   |     |     |     |  |      |   |             |   |             |

\* See specification tables for availability of rotation angle /reference point combinations for the selected model.

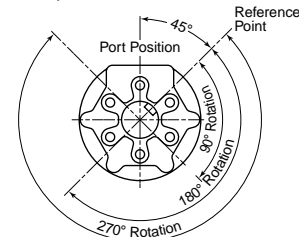
**Sensors**  
 For sensors see page B294.

**Reference point and rotation orientations**

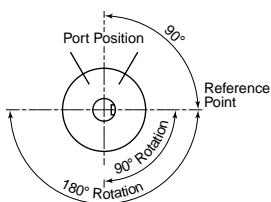
**PRNA1S/D, PRNA3S/D, PRNA10S/D, PRNA20S/D, PRN30S/D**  
 Reference point at 45°



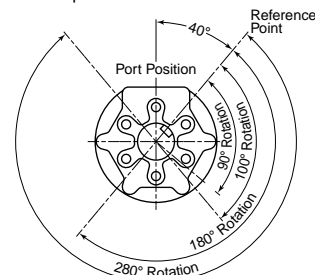
**PRN50, 150, 300, 800**  
 Reference point at 45°



**PRN1AS, PRNA3S, PRNA10S, PRNA20S**  
 Reference point at 90°



**PRN50, 150, 300, 800**  
 Reference point at 40°





**Quick reference data – PRNA miniature**

| Type        | Model number | Theoretical output torque |         |                  |         |                   |         |                   |         | Maximum breakaway pressure |      | Unit weight |        |
|-------------|--------------|---------------------------|---------|------------------|---------|-------------------|---------|-------------------|---------|----------------------------|------|-------------|--------|
|             |              | 0.3 MPa (45 PSI)          |         | 0.5 MPa (75 PSI) |         | 0.7 MPa (100 PSI) |         | 1.0 MPa (145 PSI) |         | MPa                        | PSI  | kg          | lb     |
|             |              | Ncm                       | (in-lb) | Ncm              | (in-lb) | Ncm               | (in-lb) | Ncm               | (in-lb) |                            |      |             |        |
| Single vane | PRNA1S       | 8                         | (0.7)   | 13               | (1.2)   | 19                | (1.6)   | —                 | —       | 0.08                       | (12) | 0.04        | (0.08) |
|             | PRNA3S       | 17                        | (1.5)   | 31               | (3)     | 45                | (4.0)   | —                 | —       | 0.10                       | (15) | 0.07        | (0.15) |
|             | PRNA10S      | 46                        | (4.1)   | 86               | (7.6)   | 127               | (11)    | —                 | —       | 0.10                       | (15) | 0.14        | (0.31) |
|             | PRNA20S      | 80                        | (7.1)   | 159              | (14)    | 240               | (21)    | 350               | (31)    | 0.10                       | (15) | 0.25        | (0.55) |
| Double vane | PRNA1D       | 17                        | (1.5)   | 28               | (2.5)   | 41                | (3.6)   | —                 | —       | 0.10                       | (15) | 0.04        | (0.09) |
|             | PRNA3D       | 32                        | (2.9)   | 54               | (4.8)   | 76                | (6.7)   | —                 | —       | 0.07                       | (10) | 0.07        | (0.16) |
|             | PRNA10D      | 101                       | (8.9)   | 168              | (15)    | 235               | (21)    | —                 | —       | 0.07                       | (10) | 0.15        | (0.33) |
|             | PRNA20D      | 165                       | (15)    | 330              | (29)    | 530               | (47)    | 800               | (71)    | 0.06                       | (9)  | 0.26        | (0.57) |

**Quick reference data – PRN**

| Type        | Model number | Theoretical output torque |         |                  |         |                   |         |                   |         | Maximum breakaway pressure |      | Unit weight |        |
|-------------|--------------|---------------------------|---------|------------------|---------|-------------------|---------|-------------------|---------|----------------------------|------|-------------|--------|
|             |              | 0.3 MPa (45 PSI)          |         | 0.5 MPa (75 PSI) |         | 0.7 MPa (100 PSI) |         | 1.0 MPa (145 PSI) |         | MPa                        | PSI  | kg          | (lb)   |
|             |              | Ncm                       | (in-lb) | Ncm              | (in-lb) | Ncm               | (in-lb) | Ncm               | (in-lb) |                            |      |             |        |
| Single vane | PRN30S       | 180                       | (16)    | 319              | (28)    | 480               | (42)    | 720               | (64)    | 0.10                       | (15) | 0.47        | (1.04) |
|             | PRN50S       | 259                       | (23)    | 479              | (42)    | 700               | (62.0)  | 1060              | (94)    | 0.10                       | (15) | 0.8         | (1.8)  |
|             | PRN150S      | 850                       | (75)    | 1500             | (133)   | 2100              | (186)   | 3050              | (270)   | 0.08                       | (12) | 2.0         | (4.4)  |
|             | PRN300S      | 1650                      | (146)   | 2850             | (252)   | 4050              | (358)   | 5750              | (509)   | 0.08                       | (12) | 3.7         | (8.2)  |
|             | PRN800S      | 5910                      | (523)   | 10200            | (903)   | 14400             | (1274)  | 20500             | (1814)  | 0.05                       | (7)  | 13          | (28)   |
| Double vane | PRN30D       | 440                       | (39)    | 770              | (68)    | 1120              | (99)    | 1660              | (147)   | 0.08                       | (12) | 0.48        | (1.06) |
|             | PRN50D       | 579                       | (51)    | 1040             | (92.0)  | 1510              | (134)   | 2250              | (199)   | 0.08                       | (12) | 0.8         | (1.8)  |
|             | PRN150D      | 1900                      | (168)   | 3500             | (310)   | 4800              | (425)   | 6900              | (611)   | 0.06                       | (9)  | 2.0         | (4.4)  |
|             | PRN300D      | 3900                      | (345)   | 6800             | (602)   | 9700              | (858)   | 1370              | (121)   | 0.06                       | (9)  | 4.3         | (9.5)  |
|             | PRN800D      | 12000                     | (1062)  | 20600            | (1823)  | 28800             | (2549)  | 41100             | (3637)  | 0.05                       | (7)  | 13          | (28)   |

**Kinetic energy ratings and bearing load capacities – sizes 1 to 30**

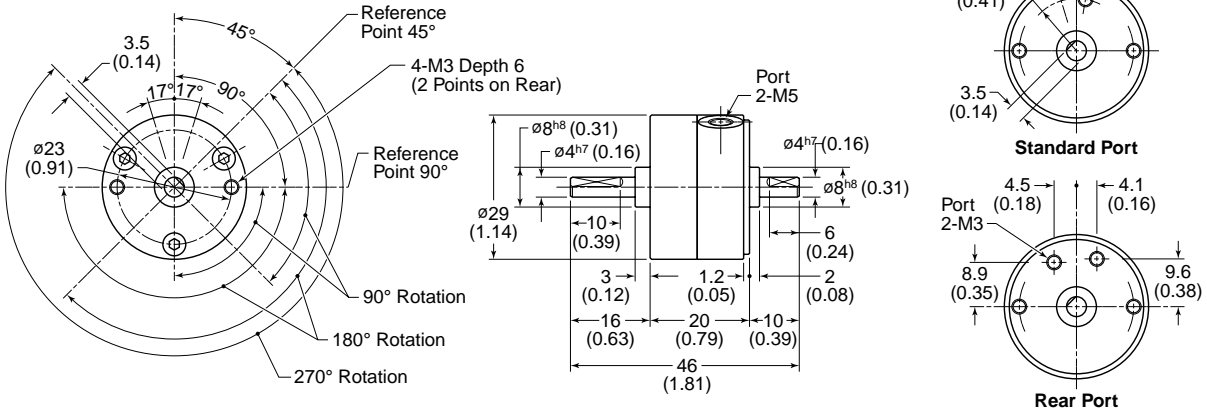
| Model number | Bearing load capacities |     |             |    | Distance between centerline bearings |     | Maximum kinetic energy rating |       |
|--------------|-------------------------|-----|-------------|----|--------------------------------------|-----|-------------------------------|-------|
|              | Thrust load             |     | Radial load |    | mm                                   | in  | mJ                            | in-lb |
|              | N                       | lb  | N           | lb |                                      |     |                               |       |
| PRNA1S       | 1                       | 0.2 | 10          | 2  | 15                                   | 0.6 | 0.8                           | 0.01  |
| PRNA3S       | 4                       | 0.9 | 40          | 9  | 20                                   | 0.8 | 4                             | 0.03  |
| PRNA10S      | 4                       | 0.9 | 50          | 11 | 30                                   | 1.2 | 8                             | 0.07  |
| PRNA20S      | 25                      | 5.6 | 300         | 67 | 42                                   | 1.7 | 40                            | 0.35  |
| PRN30S       | 30                      | 6.7 | 400         | 90 | 48                                   | 1.9 | 67                            | 0.60  |

**Kinetic energy ratings and bearing load capacities – sizes 50 to 800**

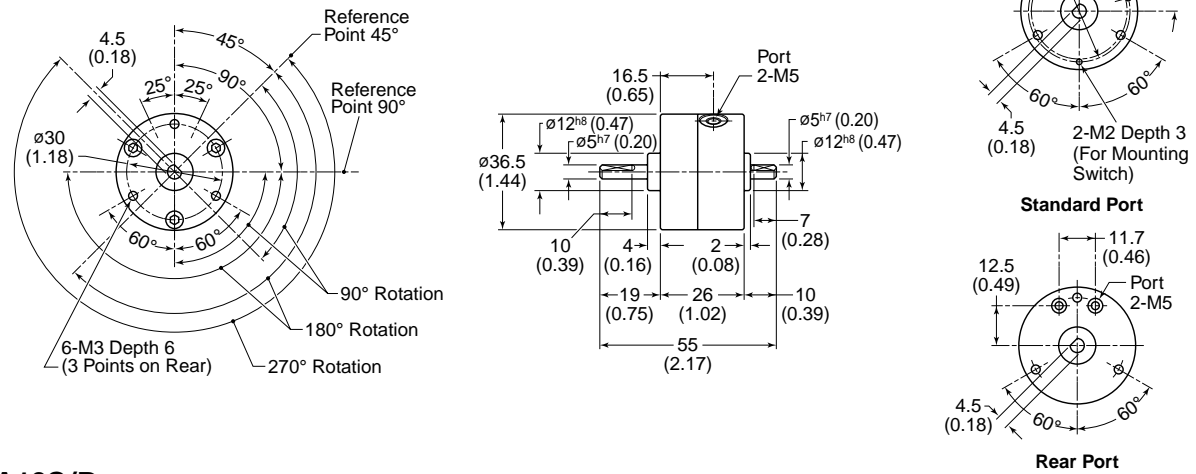
| Model     | Bearing load capacities |       |             |      |                                      |     | Maximum kinetic energy rating |       |                            |       |                            |          |
|-----------|-------------------------|-------|-------------|------|--------------------------------------|-----|-------------------------------|-------|----------------------------|-------|----------------------------|----------|
|           | Thrust load             |       | Radial load |      | Distance between centerline bearings |     | Standard unit                 |       | Shock absorber (per cycle) |       | Shock absorber (per cycle) |          |
|           | N                       | lb    | N           | lb   | mm                                   | in  | J                             | in-lb | J                          | in-lb | J/hr                       | in-lb/hr |
| PRN50S/D  | 44.1                    | 9.9   | 588         | 132  | 66                                   | 2.6 | 0.13                          | 1.2   | 7.8                        | 69    | 3100                       | 27000    |
| PRN150S/D | 88.2                    | 19.8  | 1176        | 264  | 79.5                                 | 3.1 | 0.6                           | 5.3   | 10                         | 231   | 11300                      | 100000   |
| PRN300S/D | 147                     | 33.0  | 1960        | 441  | 97.5                                 | 3.8 | 8.0                           | 70    | 20                         | 462   | 22000                      | 194000   |
| PRN800S/D | 490                     | 110.2 | 4900        | 1102 | 138.5                                | 5.5 | 10.5                          | 92    | 156                        | 1387  | 56500                      | 500000   |



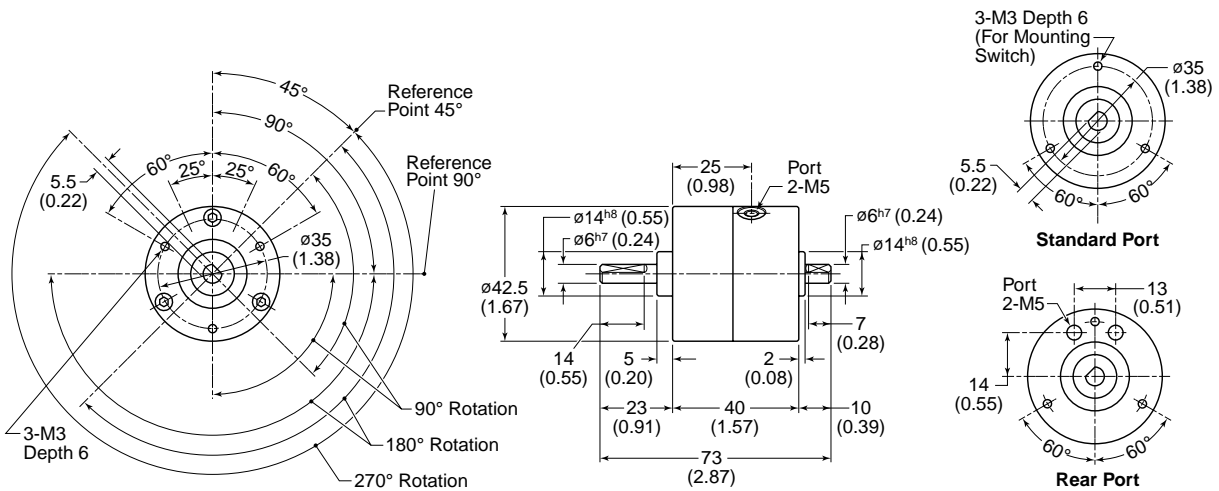
**PRNA1S**



**PRNA3S/D**



**PRNA10S/D**

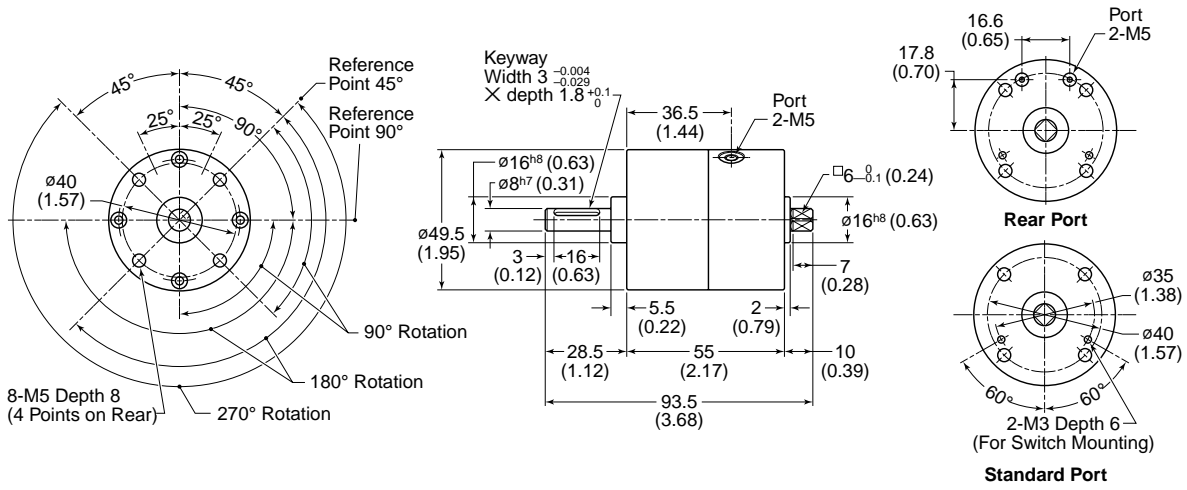


Dimensions in mm (inch)

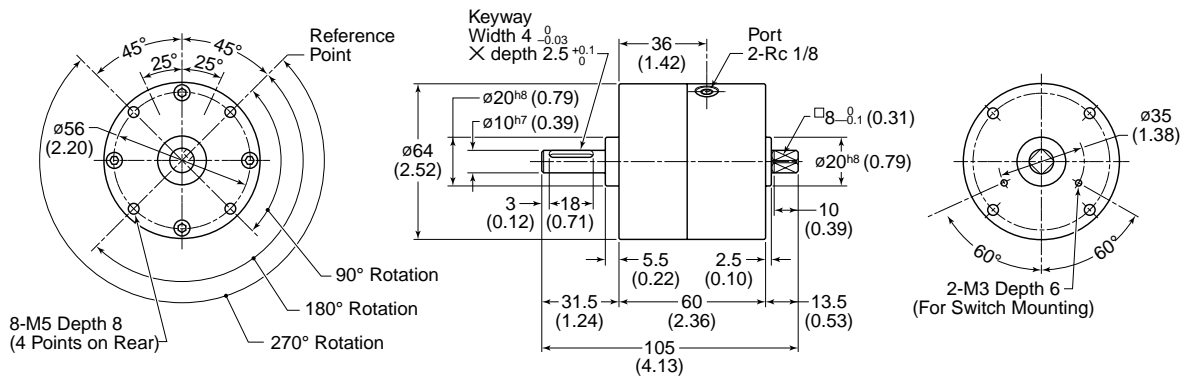
|          |                   |
|----------|-------------------|
| <b>B</b> | Rotary Actuators  |
|          | Actuator Products |
| Series   | PV                |
| Series   | PRN(A)            |
| Series   | PTR               |
| Series   | HP                |
| Series   | P1V-S             |



**PRNA20S/D**



**PRN30S/D**

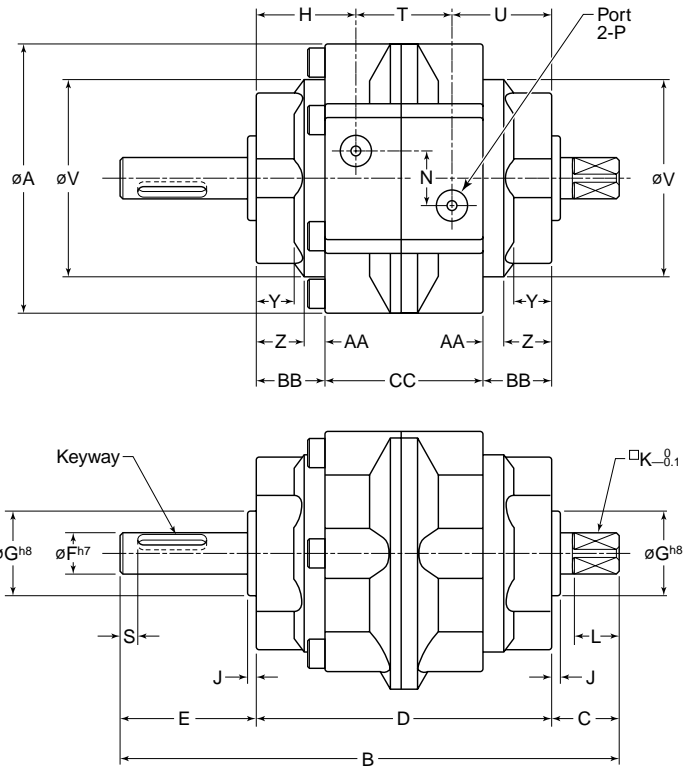
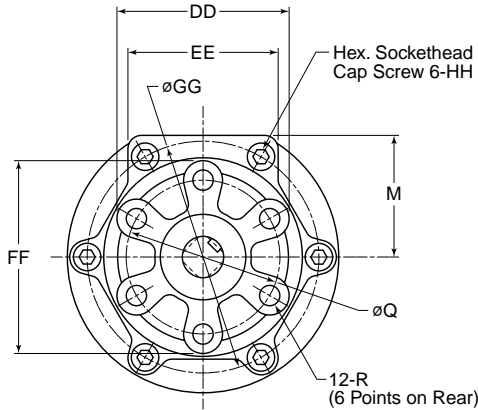


Dimensions in mm (inch)



**PRN Sizes 50 to 800**

**B**  
 Rotary Actuators  
 Actuator Products  
 PV  
 Series  
 PRN(A)  
 Series  
 PTR  
 Series  
 HP  
 Series  
 P1V-S  
 Series



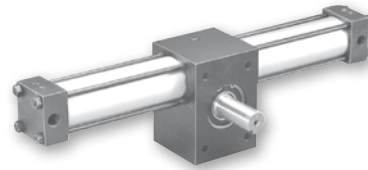
Dimensions in mm (inch)

| Model number | A               | B              | C              | D             | E              | F            | G            | H              | J             | K            | L            | M            | N            | P     | Q             | R                       | S            |
|--------------|-----------------|----------------|----------------|---------------|----------------|--------------|--------------|----------------|---------------|--------------|--------------|--------------|--------------|-------|---------------|-------------------------|--------------|
| PRN50        | 79<br>(3.11)    | 145<br>(5.71)  | 19.5<br>(0.77) | 86<br>(3.39)  | 39.5<br>(1.56) | 12<br>(0.47) | 25<br>(0.98) | 29<br>(1.14)   | 2.5<br>(0.10) | 10<br>(0.39) | 13<br>(0.51) | 36<br>(1.42) | 16<br>(0.63) | Rc1/8 | 45<br>(1.77)  | M6 x 1,<br>Depth 9      | 5<br>(0.20)  |
| PRN150       | 110<br>(4.33)   | 180<br>(7.09)  | 23.5<br>(0.93) | 103<br>(4.06) | 53.5<br>(2.11) | 17<br>(0.67) | 30<br>(1.18) | 34.5<br>(1.36) | 3<br>(0.12)   | 13<br>(0.51) | 16<br>(0.63) | 51<br>(2.01) | 24<br>(0.94) | Rc1/4 | 70<br>(2.76)  | M8 x 1.25,<br>Depth 12  | 5<br>(0.20)  |
| PRN300       | 141.5<br>(5.57) | 220<br>(8.66)  | 30<br>(1.18)   | 125<br>(4.92) | 65<br>(2.56)   | 25<br>(0.98) | 45<br>(1.77) | 41.5<br>(1.63) | 3.5<br>(0.14) | 19<br>(0.75) | 22<br>(0.87) | 66<br>(2.60) | 32<br>(1.26) | Rc3/8 | 80<br>(3.15)  | M10 x 1.5,<br>Depth 15  | 5<br>(0.20)  |
| PRN800       | 196<br>(7.72)   | 285<br>(11.22) | 44.5<br>(1.75) | 171<br>(6.73) | 69.5<br>(2.74) | 40<br>(1.57) | 70<br>(2.76) | 53.5<br>(2.11) | 4.5<br>(0.18) | 32<br>(1.26) | 35<br>(1.38) | 90<br>(3.54) | 44<br>(1.73) | Rc1/2 | 120<br>(4.72) | M12 x 1.75,<br>Depth 18 | 10<br>(0.39) |

| Model number | T            | U              | V              | Y              | Z              | AA             | BB             | CC            | DD             | EE            | FF             | GG            | HH       | Keyway width x depth x length   |
|--------------|--------------|----------------|----------------|----------------|----------------|----------------|----------------|---------------|----------------|---------------|----------------|---------------|----------|---|
| PRN50        | 28<br>(1.10) | 29<br>(1.14)   | 58<br>(2.28)   | 11<br>(0.43)   | 14<br>(0.55)   | 6<br>(0.24)    | 20<br>(0.79)   | 46<br>(1.81)  | 51<br>(2.01)   | 44<br>(1.73)  | 57<br>(2.24)   | 68<br>(2.68)  | M5 x 30  | 4 <sup>0</sup> <sub>-0.03</sub> x 2.5 <sup>+0.1</sup> <sub>0</sub> x 20 |
| PRN150       | 34<br>(1.34) | 34.5<br>(1.36) | 85.2<br>(3.35) | 10.5<br>(0.41) | 15.5<br>(0.61) | 8<br>(0.31)    | 23.5<br>(0.93) | 56<br>(2.20)  | 75<br>(2.95)   | 61<br>(2.40)  | 85<br>(3.35)   | 97<br>(3.82)  | M6 x 35  | 5 <sup>0</sup> <sub>-0.03</sub> x 3 <sup>+0.1</sup> <sub>0</sub> x 36   |
| PRN300       | 42<br>(1.65) | 41.5<br>(1.63) | 110<br>(4.33)  | 13<br>(0.51)   | 17.5<br>(0.69) | 10<br>(0.39)   | 27.5<br>(1.08) | 70<br>(2.76)  | 88.5<br>(3.48) | 78<br>(3.07)  | 98.5<br>(3.88) | 125<br>(4.92) | M8 x 45  | 7 <sup>0</sup> <sub>-0.03</sub> x 4 <sup>+0.1</sup> <sub>0</sub> x 40   |
| PRN800       | 64<br>(2.52) | 53.5<br>(2.11) | 152<br>(5.98)  | 14.5<br>(0.57) | 21.1<br>(0.83) | 11.4<br>(0.45) | 32.5<br>(1.28) | 106<br>(4.17) | 130<br>(5.12)  | 110<br>(4.33) | 145<br>(5.71)  | 173<br>(6.81) | M12 x 70 | 12 <sup>0</sup> <sub>-0.043</sub> x 5 <sup>+0.2</sup> <sub>0</sub> x 40 |



- Rack and pinion rotary actuator
- 5 bore sizes from 1" to 3-1/4"
- Output torque @ 100 PSIG: 39 lb-in to 2281 lb-in
- Standard rotations: 90°, 180°, 270°, 360°
- Available as single or double rack, 3 position, air/oil, antitbacklash
- Optional bumpers, cushions, stroke adjusters, shock absorbers



**Sensors**

For sensors see page B294.



**Operating information**

Operating pressure: 250 PSIG  
 Temperature range:  
     Nitrile seals 0°F to 180°F  
     Fluorocarbon seals 0°F to 250°F  
 Filtration requirements: 40 micron, dry filtered air  
 For technical information see CD

**Ordering information**

**PTR 25 1 - 090 3 F P - A B 2 1 M V - C**

**Model 1**

|    |             |
|----|-------------|
| 10 | 1" Bore     |
| 15 | 1-1/2" Bore |
| 20 | 2" Bore     |
| 25 | 2-1/2" Bore |
| 32 | 3-1/4" Bore |

**Rotation 2**

|     |      |
|-----|------|
| 090 | 90°  |
| 180 | 180° |
| 270 | 270° |
| 360 | 360° |

Or specify any other rotation.

**Configuration**

|   |                         |
|---|-------------------------|
| 1 | Single Rack             |
| 2 | Double Rack             |
| 3 | Three Position Actuator |
| 6 | Air/Oil Operation       |
| 7 | Antibacklash            |

**Mounting**

|   |                      |
|---|----------------------|
| A | Face/base (standard) |
| F | Front flange         |
| G | Foot flange          |
| P | Pilot ring           |
| R | Rear flange          |
| X | Special              |

**Design Series**

|   |         |
|---|---------|
| C | Current |
|---|---------|

**Special Options**

|      |          |
|------|----------|
| Omit | Standard |
|------|----------|

(Two-digit code assigned by factory and applies when any "X" or "9" appears in the model number or when special options or features are required.)

**Seals**

|      |              |
|------|--------------|
| Omit | Nitrile      |
| V    | Fluorocarbon |
| X    | Special      |

**Port flow controls**

|      |  |
|------|--|
| Omit | None                                   |
| P    | Flow control both rotations            |
| R    | Flow control CW rotation <sup>3</sup>  |
| S    | Flow control CCW rotation <sup>3</sup> |

**Port location**

|   |                         |
|---|-------------------------|
| 1 | Position 1 (standard)   |
| 2 | Position 2              |
| 3 | Position 3              |
| 4 | Position 4 <sup>8</sup> |
| 5 | Position 5 <sup>6</sup> |
| 9 | Special                 |

**Shaft**

|   |                              |
|---|------------------------------|
| A | Female keyed                 |
| B | Single male keyed (standard) |
| C | Double male keyed            |
| R | Preload keyway               |
| X | Special                      |

**Standard options**

|      |   |
|------|---|
| Omit | None  |
| M    | Magnetic piston ring  |
| S    | Shaft seal cover  |
| Q    | Prepped for external air/oil tank                                     |
| L    | Air/oil cushion & flow control adj. at location 1 (opposite standard) |

**Cushion / Bumpers**

|      |                                     |
|------|-------------------------------------|
| Omit | None                                |
| 1    | Cushioned CW rotation <sup>3</sup>  |
| 2    | Cushioned CCW rotation <sup>3</sup> |
| 3    | Cushioned both rotations            |
| 4    | Four cushions <sup>4</sup>          |
| 5    | Bumper CW rotation <sup>3</sup>     |
| 6    | Bumper CCW rotation <sup>3</sup>    |
| 7    | Bumper both rotations               |
| 9    | Special                             |

**Stroke adjusters**

|      |  |
|------|--|
| Omit | None   |
| D    | 0-30° CW rotation <sup>3, 5</sup>              |
| E    | 0-30° CCW rotation <sup>3, 5</sup>             |
| F    | 0-30° both rotations <sup>5</sup>              |
| H    | Shock/stroke adj. CW rotation <sup>3, 7</sup>  |
| K    | Shock/stroke adj. CCW rotation <sup>3, 7</sup> |
| L    | Shock/stroke adj. both rotations <sup>7</sup>  |
| X    | Special  |

**Port type**

|   |  |
|---|--|
| 1 | SAE straight thread                      |
| 2 | NPTF                                     |
| 4 | BSPP (ISO 1179-1 with ISO 228-1 threads) |
| 9 | Special                                  |

**Other options**

Detail in clear text:

- Proximity Sensors
- Feedback Potentiometer

**Notes:**

- Cylinder bore size. See appropriate tables for torque output.
- For 3-position units, specify middle and total rotation separated by a "/", ie 090/180. To obtain equal rotation both sides of midstroke (theoretical 12:00), order unit with 5° longer rotation than standard with stroke adjusters.
- Viewed from shaft end.
- Double rack models only.
- Reduces to 10° with cushions.
- Not available with cushions or stroke adjusters.
- Refer to Catalog 0900-E page H45 for option configuration compatibility.
- Not available on double rack models

**B**  
 Rotary Actuators  
 Actuator Products  
 PV Series  
 PRN(A) Series  
 PTR Series  
 HP Series  
 PIV-S Series

**Quick reference data**

| Model       |             | Typ. actual output torque @ 100 PSI (lb-in) | Theoretical output torque* (lb-in) versus input pressure (PSI) |      |      |      | Displacement per degree rotation (in <sup>3</sup> /°) | Maximum angular backlash (minutes) | Tolerance (degrees) |
|-------------|-------------|---|--|------|------|------|---|------------------------------------|---------------------|
| Single rack | Double rack |   | 50   | 75   | 100  | 250  |   |                                    |                     |
| 101         |             | 35  | 19   | 29   | 39   | 98   | 0.007   | 60                                 | -0, +5              |
|             | 102         | 70  | 39   | 59   | 79   | 197  | 0.014   | 60                                 | -0, +5              |
| 151         |             | 100   | 59   | 88   | 118  | 294  | 0.021   | 45                                 | -0, +4              |
|             | 152         | 200   | 118  | 177  | 236  | 590  | 0.042   | 45                                 | -0, +4              |
| 201         |             | 250   | 141  | 212  | 282  | 705  | 0.049   | 35                                 | -0, +3              |
| 251         |             | 375   | 215  | 322  | 430  | 1074 | 0.075   | 35                                 | -0, +3              |
|             | 202         | 500   | 282  | 423  | 565  | 1410 | 0.099   | 35                                 | -0, +3              |
|             | 252         | 750   | 430  | 644  | 859  | 2148 | 0.150   | 35                                 | -0, +3              |
| 321         |             | 1000  | 570  | 856  | 1141 | 2852 | 0.199   | 25                                 | -0, +2              |
|             | 322         | 2000  | 1141   | 1711 | 2281 | 5703 | 0.398   | 25                                 | -0, +2              |

\* Allow 10% for friction loss. Allow 20% on air/oil units. Use the single rack torque values for all air/oil, three position, and anti-backlash actuators.

**Bearing load capacities and kinetic energy ratings**

| Model | Bearing load capacities* (lb) |        | Distance between bearings | Maximum kinetic energy absorption rating for models based on configuration (lb-in) |        |           |  |
|-------|-------------------------------|--------|---------------------------|--|--------|-----------|--|
|       | Radial                        | Thrust |                           | Standard or stroke adjusters   | Bumper | Cushion** | Shock absorbers (per cycle / per hour) |
| 10    | 100                           | 50     | 1.40                      | 0.5  | 0.75   | 5.00      | 15/150,000                             |
| 15    | 250                           | 125    | 2.15                      | 1.50   | 2.25   | 15.00     | 35/200,000                             |
| 20    | 500                           | 250    | 2.15                      | 3.00   | 4.50   | 35.00     | 140/350,000                            |
| 25    | 750                           | 375    | 2.50                      | 5.50   | 8.25   | 55.00     | 140/300,000                            |
| 32    | 1000                          | 500    | 3.75                      | 12.00  | 18.00  | 155.00    | N/A                                    |

\* Bearing capacities only. Check Kinetic Energy ratings to determine if actuator will stop load.

\*\* Assuming positive back pressure provided by meter-out flow control.

**Seal kit ordering information**

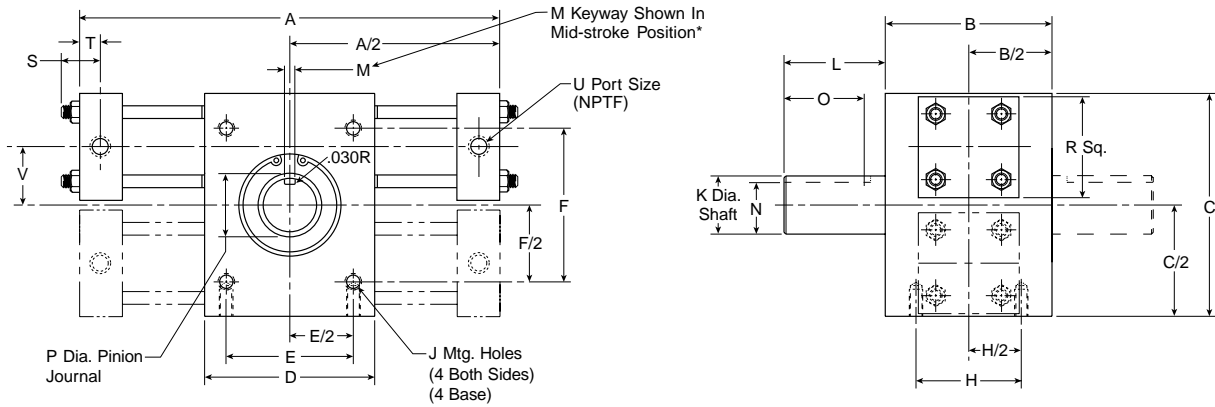
- Standard units are equipped with Nitrile seals.
- Optional seal compounds are available.
- Seal kit part numbers as shown:

|                 |   |            |      |                                   |
|-----------------|---|------------|------|-----------------------------------|
| PSK             | — | PTR322     | V    |                                   |
| Parker seal kit |   | Base model | Omit | Standard                          |
|                 |   |            | V    | Fluorocarbon                      |
|                 |   |            | Q    | Quad ring piston seals            |
|                 |   |            | W    | Corboxilated nitrile piston seals |

**B**  
 Rotary Actuators  
 Actuator Products  
 PV Series  
 PRN(A) Series  
 PTR Series  
 HP Series  
 P1V-S Series

**Standard Face Base Mount (A) and Male Keyed Shaft (B)**

Double Male Keyed Shaft (C) shown in phantom



| Model number | Rotation (Degrees) | A        | B     | C     | D | E     | F     | H     | J                   | K              | L     | M              | N              |
|--------------|--------------------|----------|-------|-------|---|-------|-------|-------|---------------------|----------------|-------|----------------|----------------|
| 10           | 90°                | 6-11/16  |       |       |   |       |       |       |                     |                |       |                |                |
|              | 180°               | 8-1/4    | 2     | 3     | 2 | 1.500 | 2.000 | 1.500 | 1/4-20<br>x 3/8 DP  | 0.500<br>0.499 | 7/8   | 0.125<br>0.127 | 0.430<br>0.425 |
|              | 360°               | 11-7/16  |       |       |   |       |       |       |                     |                |       |                |                |
| 15           | 90°                | 9-1/8    |       |       |   |       |       |       |                     |                |       |                |                |
|              | 180°               | 11-3/16  | 3     | 4-1/4 | 3 | 2.000 | 3.000 | 2.000 | 5/16-18<br>x 1/2 DP | 0.875<br>0.874 | 1-7/8 | 0.188<br>0.190 | 0.771<br>0.761 |
|              | 360°               | 15-3/8   |       |       |   |       |       |       |                     |                |       |                |                |
| 20           | 90°                | 11-3/16  |       |       |   |       |       |       |                     |                |       |                |                |
|              | 180°               | 14-1/16  | 3     | 5     | 4 | 2.500 | 3.500 | 2.000 | 3/8-16<br>x 1/2 DP  | 1.125<br>1.124 | 1-7/8 | 0.250<br>0.252 | 0.986          |
|              | 360°               | 19-11/16 |       |       |   |       |       |       |                     |                |       |                |                |
| 25           | 90°                | 12-9/16  |       |       |   |       |       |       |                     |                |       |                |                |
|              | 180°               | 15-1/2   | 3-1/2 | 6     | 4 | 2.500 | 4.500 | 2.000 | 1/2-13<br>x 3/4 DP  | 1.375<br>1.374 | 2-1/4 | 0.313<br>0.315 | 1.201<br>1.191 |
|              | 360°               | 20-5/8   |       |       |   |       |       |       |                     |                |       |                |                |
| 32           | 90°                | 16-5/8   |       |       |   |       |       |       |                     |                |       |                |                |
|              | 180°               | 21-1/8   | 5     | 8     | 5 | 3.000 | 5.000 | 2.500 | 3/4-10<br>x 1 DP    | 1.750<br>1.749 | 3-1/2 | 0.375<br>0.377 | 1.542<br>1.532 |
|              | 360°               | 29-3/8   |       |       |   |       |       |       |                     |                |       |                |                |

| Model number | O     | P    | R     | S    | T    | U   | V       |
|--------------|-------|------|-------|------|------|-----|---------|
| 10           | 5/8   | 0.59 | 1-1/2 | 1/4  | 0.31 | 1/8 | 3/4     |
| 15           | 1-1/2 | 0.98 | 2     | 5/16 | 0.41 | 1/4 | 1-1/16  |
| 20           | 1-1/2 | 1.18 | 2-1/2 | 3/8  | 0.41 | 1/4 | 1-1/4   |
| 25           | 1-3/4 | 1.38 | 3     | 3/8  | 0.41 | 1/4 | 1-1/2   |
| 32           | 3     | 1.77 | 3-3/4 | 7/16 | 0.56 | 3/8 | 1-15/16 |

\* To obtain equal rotation both sides of midstroke (theoretical 12:00), order 5° longer rotation than standard with stroke adjusters.

**B**

Rotary Actuators  
Actuator Products

PV Series

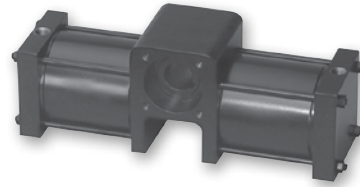
PRN(A) Series

PTR Series

HP Series

PIV-S Series

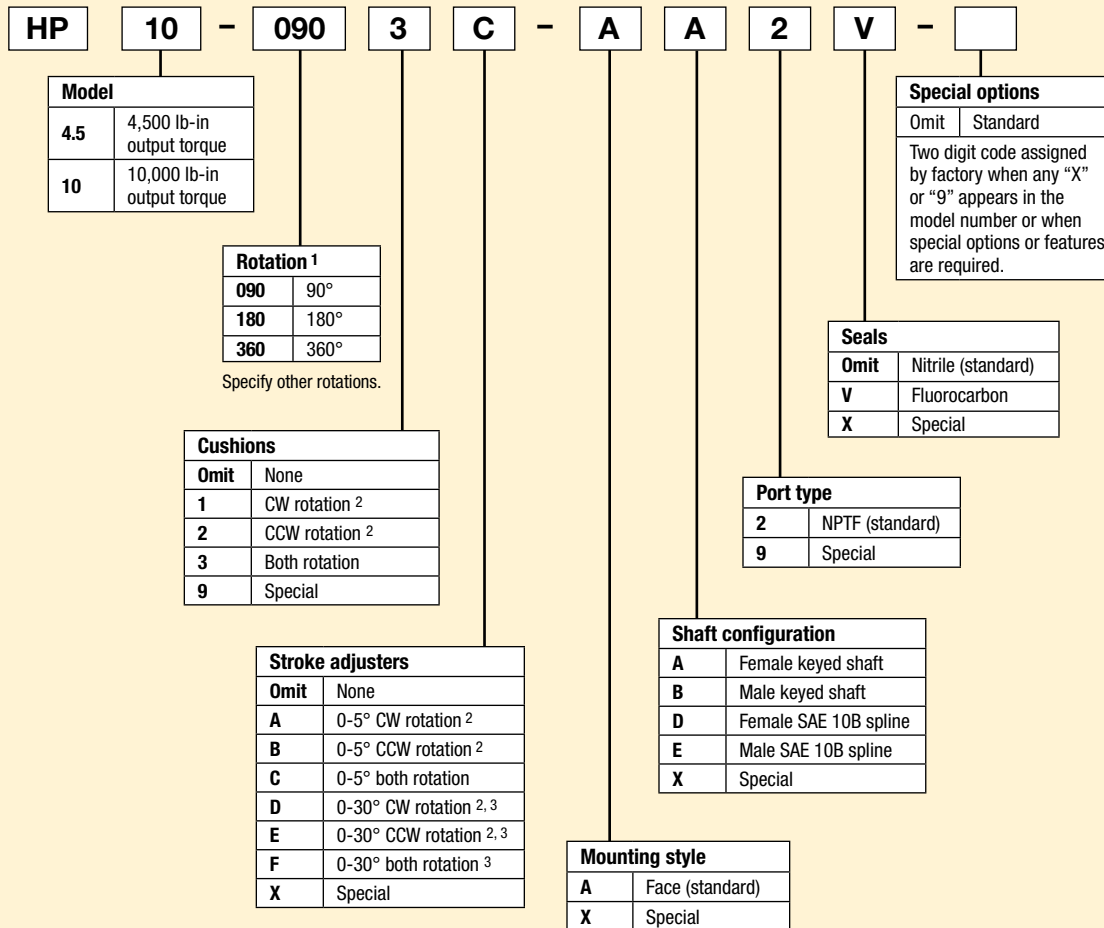
- Rack & pinion rotary actuator
- 2 large bore models
- 3 standard rotations: 90°, 180°, 360°
- Standard output torque at 100 PSIG: 4,500 and 10,000 lb-in
- Large female pinion
- Available with adjustable cushions and stroke adjusters



**Operating information**

Operating pressure: 100 PSIG  
 Temperature range:  
     Nitrile seals 0°F to 180°F  
     Fluorocarbon seals 0°F to 250°F  
 Filtration requirements: 40 micron, dry filtered air  
 For technical information see CD

**Ordering information**



**Notes:**

- 1 To obtain equal rotation both sides of midstroke (theoretical 12:00), order 5° longer rotation than standard with stroke adjusters.
- 2 Viewed from shaft end.
- 3 Cannot combine with cushions.

**Sensors**

For sensors see page B294.



**B**  
 Rotary Actuators  
 Actuator Products  
 PV Series  
 PRN(A) Series  
 PTR Series  
 HP Series  
 P1V-S Series



**Quick reference data**

| Model | Rotation* (Degrees) | Displacement (Cubic inches) | Weight (lb) | Bore size | Actual torque output at 100 psi (lb-in) | Maximum rotational tolerance (degrees) | Maximum angular backlash (minutes) |
|-------|---------------------|-----------------------------|-------------|-----------|---|--|------------------------------------|
| 4.5   | 90°                 | 79.93                       | 63          | 6"        | 4,500                                   | -0, +2                                 | 15                                 |
|       | 180°                | 159.86                      | 75          |           |   |  |                                    |
|       | 360°                | 319.72                      | 95          |           |   |  |                                    |
| 10    | 90°                 | 177.64                      | 125         | 8"        | 10,000                                  | -0, +2                                 | 15                                 |
|       | 180°                | 355.28                      | 147         |           |   |  |                                    |
|       | 360°                | 710.56                      | 190         |           |   |  |                                    |

\* To obtain equal rotation both sides of midstroke (theoretical 12:00), order 5° longer rotation than standard with stroke adjusters.

**Bearing load capacities and kinetic energy ratings**

| Model | Radial load (lb) per bearing |        | Thrust load (lb) |        | Distance between bearings (in.) | Maximum kinetic energy rating for models based on configuration (in-lb) |                  |         |
|-------|------------------------------|--------|------------------|--------|---------------------------------|---|------------------|---------|
|       | Dynamic                      | Static | Dynamic          | Static |                                 | Standard  | Stroke adjusters | Cushion |
| 4.5   | 2,000                        | 3,000  | 300              | 450    | 2.77                            | 45  | 45               | 650     |
| 10    | 2,000                        | 3,000  | 500              | 750    | 3.63                            | 100   | 100              | 1450    |

**Seal kit ordering information**

- Standard units are equipped with Nitrile seals.
- Optional seal compounds are available.
- Seal kit part numbers as shown:

|   |              |                 |   |  |              |            |   |  |          |  |      |          |   |              |   |          |
|---|--------------|-----------------|---|--|--------------|------------|---|--|----------|--|------|----------|---|--------------|---|----------|
| <table border="1" style="width: 100%; text-align: left;"> <tr> <td style="padding: 2px;"><b>PSK</b></td> </tr> <tr> <td style="padding: 2px;">Parker seal kit</td> </tr> </table> | <b>PSK</b>   | Parker seal kit | — | <table border="1" style="width: 100%; text-align: left;"> <tr> <td style="padding: 2px;"><b>HP4.5</b></td> </tr> <tr> <td style="padding: 2px;">Base model</td> </tr> </table> | <b>HP4.5</b> | Base model | — | <table border="1" style="width: 100%; text-align: left;"> <tr> <td style="padding: 2px;"><b>V</b></td> <td style="padding: 2px;"></td> </tr> <tr> <td style="padding: 2px;">Omit</td> <td style="padding: 2px;">Standard</td> </tr> <tr> <td style="padding: 2px;">V</td> <td style="padding: 2px;">Fluorocarbon</td> </tr> <tr> <td style="padding: 2px;">N</td> <td style="padding: 2px;">Non-Lube</td> </tr> </table> | <b>V</b> |  | Omit | Standard | V | Fluorocarbon | N | Non-Lube |
| <b>PSK</b>  |              |                 |   |  |              |            |   |  |          |  |      |          |   |              |   |          |
| Parker seal kit   |              |                 |   |  |              |            |   |  |          |  |      |          |   |              |   |          |
| <b>HP4.5</b>  |              |                 |   |  |              |            |   |  |          |  |      |          |   |              |   |          |
| Base model  |              |                 |   |  |              |            |   |  |          |  |      |          |   |              |   |          |
| <b>V</b>  |              |                 |   |  |              |            |   |  |          |  |      |          |   |              |   |          |
| Omit  | Standard     |                 |   |  |              |            |   |  |          |  |      |          |   |              |   |          |
| V   | Fluorocarbon |                 |   |  |              |            |   |  |          |  |      |          |   |              |   |          |
| N   | Non-Lube     |                 |   |  |              |            |   |  |          |  |      |          |   |              |   |          |

**B**

Rotary Actuators  
 Actuator Products

PV  
 Series

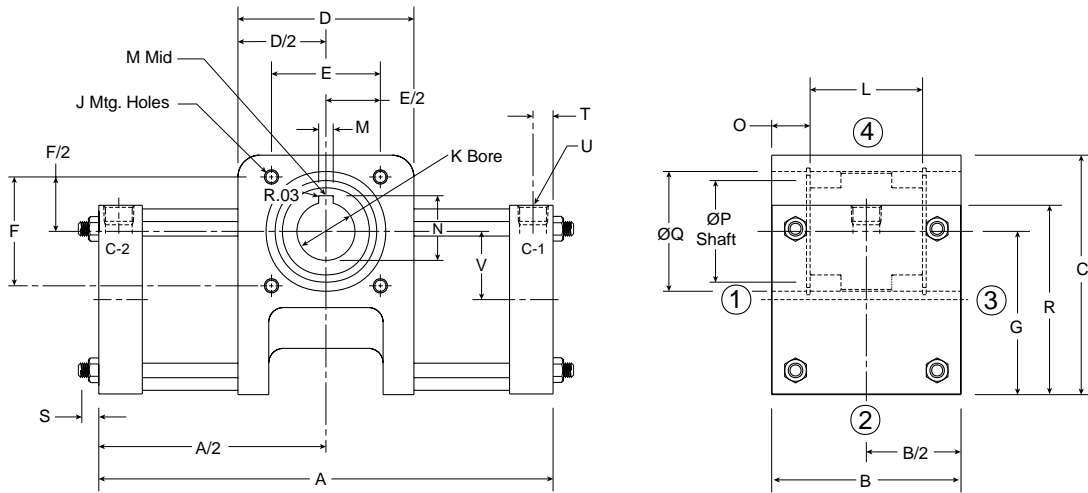
PRN(A)  
 Series

PTR  
 Series

HP  
 Series

P1V-S  
 Series

**Standard face mount (A) and female keyed shaft (A) shown**



**Notes:** Pressure on C-1 port gives clockwise rotation.  
 Pressure on C-2 port gives counterclockwise rotation.

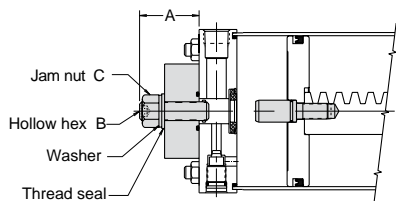
Numbers above represent possible mounting and port positions.

| Model number | Rotation (Degrees) | A      | B     | C      | D     | E     | F     | G     | J                  | K              |
|--------------|--------------------|--------|-------|--------|-------|-------|-------|-------|--------------------|----------------|
| 4.5          | 90°                | 15-5/8 |       |        |       |       |       |       |                    |                |
|              | 180°               | 22-1/4 | 6.525 | 8-1/4  | 6.063 | 3.750 | 3.750 | 5.615 | 7/16-14 x 21/32 DP | 2.000<br>2.003 |
|              | 360°               | 33     |       |        |       |       |       |       |                    |                |
| 10           | 90°                | 18     |       |        |       |       |       |       |                    |                |
|              | 180°               | 26-3/4 | 8.525 | 10-1/2 | 7.813 | 5.000 | 5.000 | 7.265 | 5/8-11 x 15/16 DP  | 2.250<br>2.253 |
|              | 360°               | 39-5/8 |       |        |       |       |       |       |                    |                |

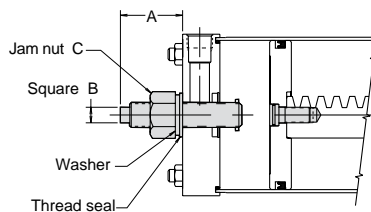
| Model number | L     | M     | N     | O      | P     | Q     | R     | S   | T    | U        | V    |
|--------------|-------|-------|-------|--------|-------|-------|-------|-----|------|----------|------|
| 4.5          | 3-7/8 | 0.500 | 2.223 | 1-5/16 | 3-1/2 | 4-1/8 | 6-1/2 | 5/8 | 0.69 | 3/4 NPTF | 2.35 |
|              |       | 0.502 | 2.233 |        |       |       |       |     |      |          |      |
| 10           | 5     | 0.625 | 2.525 | 1-3/4  | 4-1/2 | 5-1/4 | 8-1/2 | 3/4 | 0.69 | 3/4 NPTF | 3.00 |
|              |       | 0.628 | 2.535 |        |       |       |       |     |      |          |      |

**Stroke Adjusters (A - F)**

5° stroke adjust option with cushion option

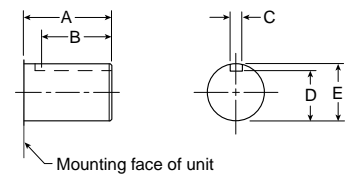


5° or 30° stroke adjust option without cushion option



| Cushioned end cap |                 |      |       | Non-cushioned end cap |         |                 |      |      |       |          |
|-------------------|-----------------|------|-------|-----------------------|---------|-----------------|------|------|-------|----------|
| Model number      | (1) Turn Adjust | A    |       | B                     | C       | (1) Turn Adjust | A    |      |       |          |
|                   |                 | 5°   | 30°   |                       |         |                 | 5°   | 30°  |       |          |
| 4.5               | 2.5°            | 2.50 | 5/8   | 1.00-14               | 1.50-12 | 2.0°            | 2.00 | 2.81 | 3/8   | 3/4-16   |
|                   |                 |      |       |                       |         |                 |      |      |       |          |
| 10                | 2.0°            | 2.50 | 15/16 | 1.50-12               | 1.50-12 | 1.5°            | 2.56 | 3.50 | 15/16 | 1-1/2-12 |
|                   |                 |      |       |                       |         |                 |      |      |       |          |

**Male Shaft (B)**




| Model number | A    | B    |
|--------------|------|------|
| 4.5          | 2.61 | 2.38 |
| 10           | 4.38 | 3.38 |

| Model number | C     | D     | E     |
|--------------|-------|-------|-------|
| 4.5          | 0.561 | 1.928 | 2.249 |
|              | 0.562 | 1.933 | 2.250 |
| 10           | 0.625 | 1.888 | 2.249 |
|              | 0.627 | 1.893 | 2.250 |


- Stainless steel air motor
- Approved for use in food grade applications
- Seven different sizes
- Powers ranging from 20 to 1,200 watts
- Speeds from 5 to 24,000 rpm
- Fluor rubber seals



**Operating information**

Operating pressure: Max. 7 bar (Max. 6 bar in explosive atmospheres) 

Temperature range: -30 °C to 100 °C

Ambient temperature: -20 °C to 40 °C in explosive atmospheres 

Filtration requirements: 40 µm filtered, oil mist or dry unlubricated compressed air

For technical information see CD

**Ordering Information**

|                              |  |   |  |   |
|------------------------------|--|---|--|---|
| <b>P 1 V - S</b>             | <b>0 2 0</b>   | <b>A</b>  | <b>0</b>   | <b>E 5 0</b>  |
| <b>Air Motor Range</b>       | <b>Motor Size</b>  | <b>Function</b>   | <b>Optional Functions</b>  | <b>Free Speed per min</b>   |
| P1V-S   Stainless Vane Motor | 002   20 W<br>008   80 W<br>012   120 W<br>020   200 W<br>030   300 W<br>060   600 W<br>120   1200 W | A   Keyed Shaft, Reversible<br>D   Threaded Shaft, Reversible | 0   Standard<br>C*   Continuous Lubrication - Free Operation<br>Z*   Spring Loaded Vanes<br>M*   Multi: Combination of C+Z<br>D**   Standard with Brake<br>E**   Option C with Brake<br>F**   Option Z with Brake<br>G**   Option M with Brake | 0005   5<br>001   10<br>999   9990<br>A00   10000<br>E00   14000<br>E50   14500<br>N00   22000<br>Q00   24000 |
|                              |  |   | * Not for P1V-S002 and P1V-S008<br>** Only for P1V-S020 and P1V-S030   |   |

**B**

Rotary Actuators  
 Actuator Products

PV Series

PRN(A) Series

PTR Series

HP Series

P1V-S Series



**Important!**

Before carrying out service activities, make sure the air motor is vented. Before disassembling the motor, disconnect the primary air hose to ensure that the air supply is interrupted.

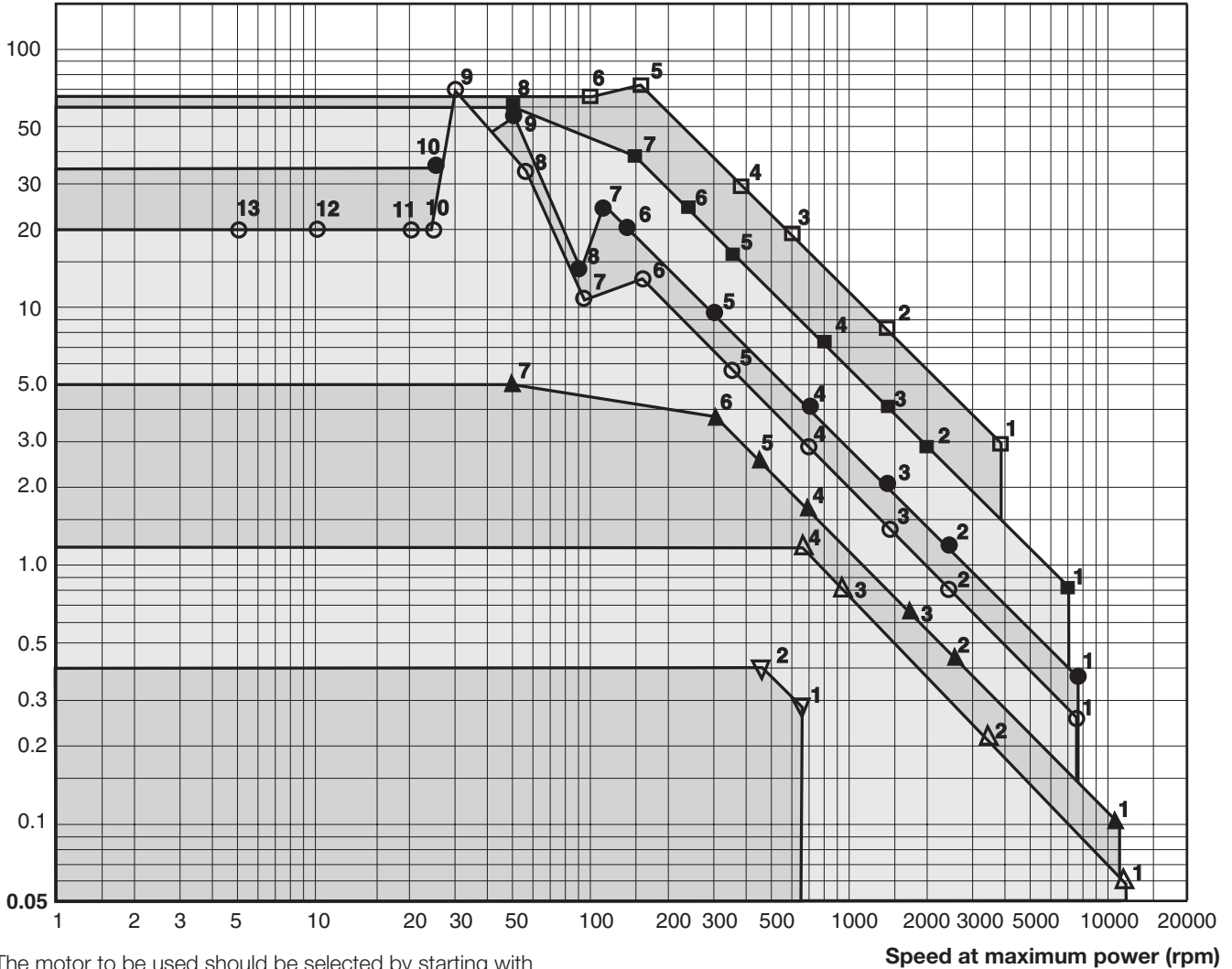


**NOTE!**

All technical data in the catalog are typical values. The air quality is a major factor in the service life of the motor, see ISO 8573-1.

Choice of Air Motor

**Torque at Maximum Power [Nm]**



The motor to be used should be selected by starting with the torque needed at a specific shaft speed. Since maximum power is reached at half the motor's free speed, the motor should be chosen so that the operating point is as close as possible to the maximum power of the motor.

Use the above graph to choose the correct motor size. The graph contains the points for the maximum torque of each motor at maximum output. Add your operating point to the graph, then select a marked point above and to the right of your point.

Then use the correct working diagram of the chosen motor to get more detailed technical data. Always select a motor whose requisite technical data are in the shaded area. Also use the correction diagram to find out what operation with different supply pressures would mean for the motor.

Tip: Select a motor which is slightly too fast and powerful, then regulate its speed and torque with a pressure regulator and/or throttle to achieve the optimum working point.

|          |                                       |
|----------|---------------------------------------|
| <b>B</b> | Rotary Actuators<br>Actuator Products |
| PV       | Series                                |
| PRN(A)   | Series                                |
| PTR      | Series                                |
| HP       | Series                                |
| P1V-S    | Series                                |

| Series    | Watts | Air motors in diagram on previous page |                              |
|-----------|-------|--|------------------------------|
| P1V-S002A | 20    | ▽1                                     | P1V-S002A0130                |
|           |       | ▽2                                     | P1V-S002A0095                |
| P1V-S008A | 80    | △1                                     | P1V-S008A0Q00                |
|           |       | △2                                     | P1V-S008A0700                |
|           |       | △3                                     | P1V-S008A0190                |
|           |       | △4                                     | P1V-S008A0130                |
| P1V-S012A | 120   | ▲1                                     | P1V-S012A0N00, P1V-S012D0N00 |
| P1V-S012D |       | ▲2                                     | P1V-S012A0550, P1V-S012D0550 |
|           |       | ▲3                                     | P1V-S012A0360, P1V-S012D0360 |
|           |       | ▲4                                     | P1V-S012A0140, P1V-S012D1400 |
|           |       | ▲5                                     | P1V-S012A0090, P1V-S012D0090 |
|           |       | ▲6                                     | P1V-S012A0060, P1V-S012D0060 |
|           |       | ▲7                                     | P1V-S012A0010, P1V-S012D0010 |
| P1V-S020A | 200   | ○1                                     | P1V-S020A0E50, P1V-S020D0E50 |
| P1V-S020D |       | ○2                                     | P1V-S020A0460, P1V-S020D0460 |
|           |       | ○3                                     | P1V-S020A0240, P1V-S020D0240 |
|           |       | ○4                                     | P1V-S020A0140, P1V-S020D0140 |
|           |       | ○5                                     | P1V-S020A0070, P1V-S020D0070 |
|           |       | ○6                                     | P1V-S020A0035, P1V-S020D0035 |
|           |       | ○7                                     | P1V-S020A0018, P1V-S020D0018 |
|           |       | ○8                                     | P1V-S020A0011                |
|           |       | ○9                                     | P1V-S020A0006                |
|           |       | ○10                                    | P1V-S020A0005, P1V-S020D0005 |
|           |       | ○11                                    | P1V-S020A0002                |
|           |       | ○12                                    | P1V-S020A0001                |
|           |       | ○13                                    | P1V-S020A00005               |
| P1V-S030A | 300   | ●1                                     | P1V-S030A0E50, P1V-S030D0E50 |
| P1V-S030D |       | ●2                                     | P1V-S030A0460, P1V-S030D0460 |
|           |       | ●3                                     | P1V-S030A0240, P1V-S030D0240 |
|           |       | ●4                                     | P1V-S030A0140, P1V-S030D0140 |
|           |       | ●5                                     | P1V-S030A0060, P1V-S030D0060 |
|           |       | ●6                                     | P1V-S030A0028, P1V-S030D0028 |
|           |       | ●7                                     | P1V-S030A0023                |
|           |       | ●8                                     | P1V-S030A0018, P1V-S030D0018 |
|           |       | ●9                                     | P1V-S030A0010                |
|           |       | ●10                                    | P1V-S030A0005, P1V-S030D0005 |
| P1V-S060A | 600   | ■1                                     | P1V-S060A0E00                |
|           |       | ■2                                     | P1V-S060A0400                |
|           |       | ■3                                     | P1V-S060A0270                |
|           |       | ■4                                     | P1V-S060A0170                |
|           |       | ■5                                     | P1V-S060A0072                |
|           |       | ■6                                     | P1V-S060A0048                |
|           |       | ■7                                     | P1V-S060A0030                |
|           |       | ■8                                     | P1V-S060A0010                |
| P1V-S120A | 1200  | □1                                     | P1V-S120A0800                |
|           |       | □2                                     | P1V-S120A0270                |
|           |       | □3                                     | P1V-S120A0110                |
|           |       | □4                                     | P1V-S120A0078                |
|           |       | □5                                     | P1V-S120A0032                |
|           |       | □6                                     | P1V-S120A0012                |

Most popular.

**B**  
 Rotary Actuators  
 Actuator Products  
 PV Series  
 PRN(A) Series  
 PTR Series  
 HP Series  
 P1V-S Series



**Parallel and Angular Grippers**

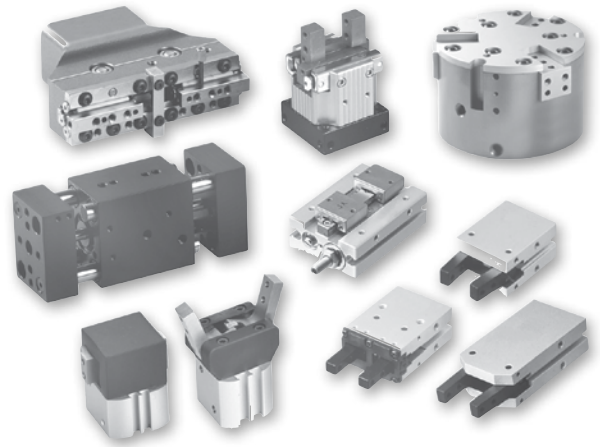
- Miniature
- Precision
- High force
- Long stroke
- Heavy duty
- Compact
- Clean room
- Locking

**Common Options**














- Sensors
- Dust covers
- Stroke adjuster
- Alternate seals
- Clean room

**Specifications**

- Stroke Ranges: to 6.0 inches
- Grip Forces: to 2800 lbs
- Operating Characteristics:
  - Single acting
  - Double acting
  - Spring open or closed



**Parallel Grippers**


|   | Series        | Max. Strokes | Total grip force (lb) | Clean room | Spring open | Spring close | Synch | Non-synch | Reed hall | Prox | High temp seals |
|---|---------------|--------------|-----------------------|------------|-------------|--------------|-------|-----------|-----------|------|-----------------|
|    | GPR           | 10-20 mm     | 11-46                 |            |             |              |       |           |           | S    |                 |
|    | GPCR          | 4-14 mm      | 6-51                  |            | O           |              |       |           |           | S    |                 |
|   | P5G-HPM       | 0.13-0.25 in | 22-43                 | O          | O           |              |       | X         |           |      | O               |
|  | P5G-HP (mini) | 0.16-0.25 in | 25-35                 |            |             |              | X     |           |           |      |                 |
|  | P5G-HP        | 0.25-1.50 in | 35-694                |            |             |              | X     |           |           | S    |                 |
|  | GPT           | 0.625 in     | 46-86                 |            |             |              | X     |           | S         | S    | O               |
|  | P5G-AP        | 5.3-17.9 mm  | 31-208                |            | O           | O            | X     |           | O         | O    | O               |
|  | GPEL          | 16-22 mm     | 10-27                 |            |             |              |       | X         |           | S    |                 |
|  | GPD L         | 16-80 mm     | 10-65                 |            |             |              | X     |           |           | S    |                 |
|  | P5G-HPL       | 0.25-1 in    | 25-33                 | O          |             |              | X     | O         | S         |      | O               |
|  | P5G-HP-P      | 0.5-3.0 in   | 23-498                |            |             |              | X     |           |           | S    | O               |
|  | GPK           | 24-50 mm     | 20-90                 |            |             |              | X     |           |           | S    |                 |
|  | P5G-HPW       | 0.75-4.50 in | 45-450                |            |             |              | X     | O         |           | S    | O               |

X = standard  
 O = optional  
 S = order separately









Please reference CD for ordering and specification information.

**B**  
 Grippers  
 Actuator Products

**Three Jaw Grippers**

|   | Series  | Strokes     | Total grip force (lb) | Dust cover | Spring open | Spring close | Synch | Non-synch | Reed hall | Prox | High temp seals |
|---|---------|-------------|-----------------------|------------|-------------|--------------|-------|-----------|-----------|------|-----------------|
|  | P5G-HPC | 0.3-1.38 in | 80-2800               |            |             |              |       | X         | S         |      | O               |

**Angular Grippers**

|   | Series | Max. Stroke | Total grip force (lb) | Dust cover | Spring open | Spring close | Synch | Reed hall | Prox | High temp seals |
|---|--------|-------------|-----------------------|------------|-------------|--------------|-------|-----------|------|-----------------|
|    | GVC    | 30°         | 1.25 - 36             |            | O           |              | X     |           | S    |                 |
|    | GAA    | 30°         | 2.7 - 6.3             |            |             |              | X     | S         | S    | O               |
|    | P5G-HA | 30°         | 11 - 134              |            |             |              | X     | S         |      | O               |
|   | P5G-AA | 30°         | 17.4 - 198            |            |             | O            | X     | S         | O    | O               |
|  | P5G-HA | 12°         | 62 - 220              |            |             |              | X     |           | S    | O               |
|  | GVH    | 180°        | 5 - 54                |            |             |              | X     |           | S    |                 |
|  | GAW    | 180°        | 2.7 - 6.3             |            |             |              | X     | S         | S    | O               |
|  | P5G-AW | 180°        | 14 - 65               |            |             | O            | X     | S         | O    | O               |

X = standard  
 O = optional  
 S = order separately

**B**

Grippers  
 Actuator Products

Grippers

**Sensors**

For sensors see Catalog 1900-2/US.



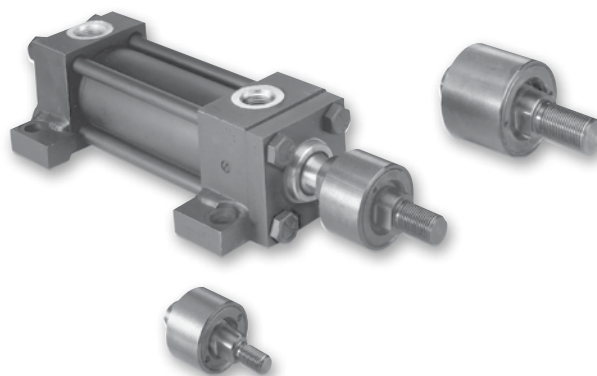
Please reference CD for ordering and specification information.



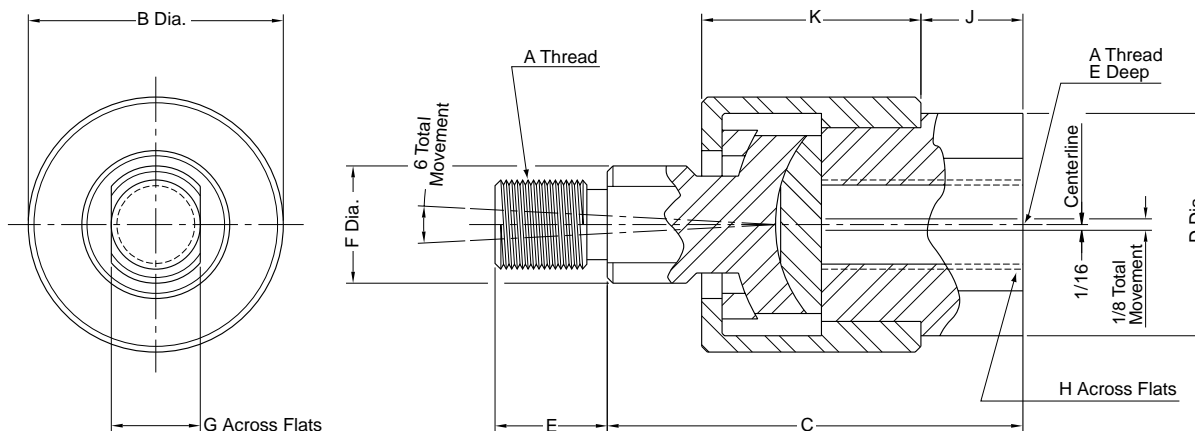
**Linear Alignment Couplers are available in 12 standard thread sizes...**

**Cost Saving Features and Benefits Include...**

- Maximum reliability for trouble-free operation, long life and lower operating costs
- Increased cylinder life by reducing wear on piston and rod bearings
- Stainless steel versions available. Please consult factory.
- Simplifying cylinder installation and reducing assembly costs
- Increase rod bearing and rod seal life for lower maintenance costs



**Alignment coupler**



See table 1 for part numbers and dimensions

**Table 1 – Part numbers and dimensions**

| A         | B     | C      | D     | E     | F      | G       | H       | J     | K       | Max. pull load (lbs.) | Approx. weight (Lbs.) | Part number       |
|-----------|-------|--------|-------|-------|--------|---------|---------|-------|---------|-----------------------|-----------------------|-------------------|
| 5/16 -24  | 1-1/8 | 1-3/4  | 15/16 | 1/2   | 1/2    | 3/8     | 3/4     | 3/8   | 15/16   | 1200                  | 0.35                  | <b>1347570031</b> |
| 3/8 -24   | 1-1/8 | 1-3/4  | 15/16 | 1/2   | 1/2    | 3/8     | 3/4     | 3/8   | 15/16   | 2425                  | 0.35                  | <b>1347570038</b> |
| 7/16 -20  | 1-3/8 | 2      | 1-1/8 | 3/4   | 5/8    | 1/2     | 7/8     | 3/8   | 1-3/32  | 3250                  | 0.55                  | <b>1347570044</b> |
| 1/2 -20   | 1-3/8 | 2      | 1-1/8 | 3/4   | 5/8    | 1/2     | 7/8     | 3/8   | 1-3/32  | 4450                  | 0.55                  | <b>1347570050</b> |
| 5/8 -18   | 1-3/8 | 2      | 1-1/8 | 3/4   | 5/8    | 1/2     | 7/8     | 3/8   | 1-3/32  | 6800                  | 0.55                  | <b>1347570063</b> |
| 3/4 -16   | 2     | 2-5/16 | 1-5/8 | 1-1/8 | 1-5/16 | 3/4     | 1-5/16  | 7/16  | 1-9/32  | 9050                  | 1.4                   | <b>1347570075</b> |
| 7/8 -14   | 2     | 2-5/16 | 1-5/8 | 1-1/8 | 1-5/16 | 3/4     | 1-5/16  | 7/16  | 1-9/32  | 14450                 | 1.4                   | <b>1347570088</b> |
| 1-14      | 3-1/8 | 3      | 2-3/8 | 1-5/8 | 1-7/16 | 1-1/4   | 1-7/8   | 3/4   | 1-25/32 | 19425                 | 4.8                   | <b>1347570100</b> |
| 1-1/4 -12 | 3-1/8 | 3      | 2-3/8 | 1-5/8 | 1-7/16 | 1-1/4   | 1-7/8   | 3/4   | 1-25/32 | 30500                 | 4.8                   | <b>1347570125</b> |
| 1-1/4 -12 | 3-1/2 | 4      | 2     | 2     | 1-1/2  | 1-1/4   | 1-11/16 | 3/4   | 2-1/2   | 30500                 | 6.9                   | <b>1337390125</b> |
| 1-1/2 -12 | 4     | 4-3/8  | 2-1/4 | 2-1/4 | 1-3/4  | 1-1/2   | 1-15/16 | 7/8   | 2-3/4   | 45750                 | 9.8                   | <b>1337390150</b> |
| 1-3/4 -12 | 4     | 4-3/8  | 2-1/4 | 2-1/4 | 1-3/4  | 1-1/2   | 1-15/16 | 7/8   | 2-3/4   | 58350                 | 9.8                   | <b>1337390175</b> |
| 1-7/8 -12 | 5     | 5-5/8  | 3     | 3     | 2-1/4  | 1-15/16 | 2-5/8   | 1-3/8 | 3-3/8   | 67550                 | 19.8                  | <b>1337390188</b> |

**How to order linear alignment couplers**

When ordering a cylinder with a threaded male rod end, specify the coupler of equal thread size by part number as listed in Table 1, i.e.; Piston Rod “KK” or “CC” dimension is 3/4" - 16", specify coupler part number 1347570075.

**B**  
 Actuator Accessories  
 Linear Alignment  
 4TK Series  
 PRL Series





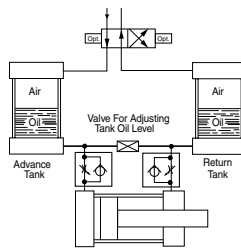
**4TK Air-Oil Tanks – For Smoother Hydraulic Flow**

Parker Air-Oil tanks provide a means to convert shop air pressure into hydraulic pressure. Compressed air is applied directly to the oil in the air-oil tank to convert it into hydraulic pressure. The hydraulic pressure is at a 1-to-1 ratio, i.e. 80 PSIG air produces 80 PSIG hydraulic pressure.

All Parker Air-Oil tanks have a fiberglass tube which shows the proper oil level. They also contain two fluid flow baffles. The top baffle disperses the incoming air over the surface of the oil in such a way to avoid agitation and aeration. The bottom baffle insures a smooth flow pattern that minimizes oil turbulence and eliminates swirling, funneling or splashing which in turn could cause oil aeration or the oil to be blown from the tank into the exhaust air.

Air-Oil tanks are used to smooth out the cylinder piston rod travel and to prevent chatter. They are mainly used in slow speed circuits. Since each tank is designed for a specific port size, increasing the port size in a tank to lower the fluid velocity is not recommended. A tank with a larger port size should be selected.

Fluid velocity in or out of the tank through standard ports should be less than 6 feet per second to prevent aeration of the oil. To limit the fluid velocity, flow controls should be applied to the air side of the tank to restrict the exhaust. Metered-in flow controls on the air side may aid in the reduction of aeration. Additional flow controls on the oil side may aid in controlling the actuator motion.



In a basic air-oil circuit the advance tank is connected to the cap end port of a hydraulic cylinder and the return tank to the head end port. Shop air is applied alternately to the two tanks through a 4-way air control valve. The oil in the advance tank is forced into the cap end of the cylinder to cause the piston rod to extend. At the same time, oil from the head end port is forced into the return tank, the air side of which is open to exhaust. To return the cylinder to retract position, air pressure is applied to the oil in the return tank.

**Operating information**

|                                  |                             |
|----------------------------------|-----------------------------|
| Operating pressure               | 17 bar (250 PSIG) maximum   |
| Operating temperature            | 74°C (165°F) maximum        |
| Filtration requirements          | 40 micron, dry filtered air |
| For technical information see CD |                             |

**Table A – Rated capacities - cubic inches (in<sup>3</sup>)**

| Bore size | Usable tank volume (Cu. In.) per internal height of tank |     |     |     |     |     |     |     |     |     |      |      |
|-----------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
|           | 4  | 6   | 8   | 10  | 12  | 14  | 16  | 18  | 20  | 24  | 28   | 32   |
| 2-1/2     | 9  | 17  | 27  | 35  | 44  | 52  | 62  | 70  | 79  | 97  | 115  | 132  |
| 3-1/4     | 16   | 30  | 46  | 60  | 76  | 91  | 107 | 121 | 137 | 167 | 198  | 228  |
| 4         | 18   | 33  | 58  | 73  | 98  | 120 | 144 | 166 | 191 | 237 | 283  | 330  |
| 5         | 29   | 53  | 92  | 116 | 155 | 189 | 228 | 261 | 300 | 373 | 446  | 519  |
| 6         | 42   | 77  | 133 | 168 | 224 | 273 | 329 | 378 | 434 | 539 | 645  | 750  |
| 8         | 75   | 137 | 237 | 300 | 400 | 487 | 587 | 675 | 775 | 963 | 1150 | 1338 |

**Ordering information**

Example: 4.00CB4TKU 6.000

|                                 |                             |                                       |
|---------------------------------|-----------------------------|---------------------------------------|
| <b>4.00</b>                     | <b>U</b>                    | <b>6.000</b>                          |
| <b>Tank diameter (inches)</b>   | <b>Ports</b>                | <b>Tank height*</b>                   |
| 2.50                            | U NPTF                      | Internal height in inches             |
| 3.25                            |                             | * Less than 4 Inches, Consult Factory |
| 4.00                            |                             |                                       |
| 5.00                            |                             |                                       |
| 6.00                            |                             |                                       |
| 8.00                            |                             |                                       |
| <b>Tank mounting style</b>      | <b>Special modification</b> |                                       |
| TEF Sleeve nut with side tap    | S Special                   |                                       |
| TE Sleeve nut                   |                             |                                       |
| TB Tie rods extended, air end   |                             |                                       |
| TC Tie rods extended, oil end   |                             |                                       |
| TD Tie rods extended, both ends |                             |                                       |
| C Side lug (3MA style)          |                             |                                       |
| CB Side end angles              |                             |                                       |
| NB Base bar                     |                             |                                       |

**Note:** Standard air-oil tanks are designed for use with petroleum base hydraulic oil. If other fluids will be used, please consult the factory. For larger than 8" Bore Sizes consult factory.



**B**

Actuator Accessories  
 Actuator Products

Linear Alignment

4TK Series

PRL Series

The PRL Series rod lock is used in applications where the locking of linear travel is required. It is commonly used in workholding applications and for locking tools and fixtures in the event of air pressure or electrical control failure.

**Application**

- **Clamping:** Without an appropriate air signal to the rod lock pressure port, the rod lock clamps to the precision metric rod and prevents rod movement in the axial direction.
- **Delatching:** When 4 Bar (58 PSIG) of air pressure is applied to the port, the rod lock releases and allows free movement of the rod. This will be required for installation.
- **Locking Direction:** The rod lock is designed specifically to prevent rod movement in the axial direction only. It is not recommended for locking rotary rod motion.
- **Rod Material:** The Series PRL rod lock is a precision locking device, therefore strict rod tolerances and rod material specifications are required to ensure safe and proper operation. Minimum requirements for the rod material include a chrome plated surface finish of 10 microinches or less and a surface hardness of 52 Rc. Rod material may be ordered separately in custom lengths. See next page for how to order.
- **Environment:** The rod lock is recommended for use in dry, clean conditions. Please take precautions to prevent moisture from entering the pressure port or the exhaust port of the locking device.



There should be no relative motion between the rod and the Rod Lock Device when the locking device is activated. The locking device is not intended to brake a movement in repeated sequences.

**Considerations for Rod Sizing**

When applying a rod lock device, it is important to consider the loading forces which will be imposed on the rod in the axial direction.

For applications where the rod lock and its associated load impose a compressive force on the rod, please consider the axial compression force and rod length to select the appropriate rod diameter for preventing rod buckling.

In situations where the rod lock and its associated load place the rod in tension, please take care to securely fasten the rod ends to the machine member.

**Operating information**

|                                  |                              |
|----------------------------------|------------------------------|
| Working pressure                 | Max. 10 bar (145 PSIG)       |
| Working temperature              | -20° to 80°C (-4°F to 176°F) |
| Locking pressure                 | 4 bar (58 PSIG) ±10%         |
| Filtration requirements          | 40 micron, dry filtered air  |
| For technical information see CD |                              |

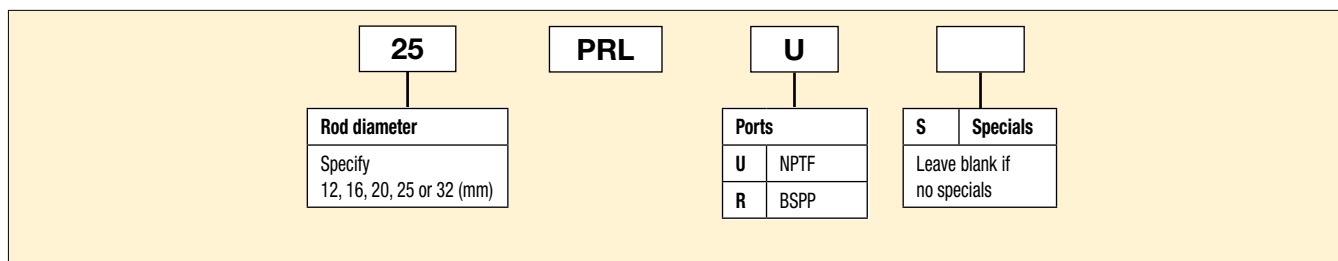
**Holding Forces**

| Model number | Holding force |             |
|--------------|---------------|-------------|
|              | Pounds (lbs.) | Newtons (N) |
| 12PRL*       | 123           | 550         |
| 16PRL*       | 193           | 860         |
| 20PRL*       | 481           | 2140        |
| 25PRL*       | 1211          | 5390        |
| 32PRL*       | 1894          | 8425        |

\* Character reserved for port style

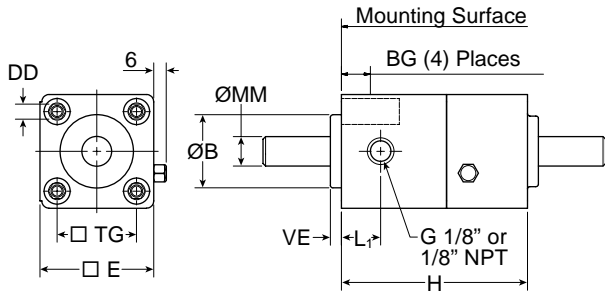
**Ordering information**

Example: 25PRLU

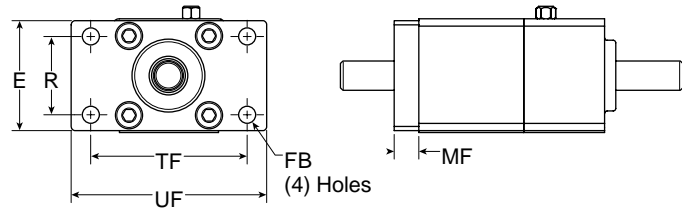


**B**  
 Actuator Accessories  
 Linear Alignment  
 4TK Series  
 PRL Series

**Basic rod lock**



**Rod lock with flange mount**



**Table 1 – Mounting dimensions**

| Part   | Rod dia.<br>MM | B<br>D11 | BG | DD  | E     | FB | H     | L1 | MF | R  | TF  | TG   | UF  | VE  |
|--------|----------------|----------|----|-----|-------|----|-------|----|----|----|-----|------|-----|-----|
| 12PRL* | 12.00 (-.04)   | 30       | 16 | M6  | 46.5  | 7  | 76    | 16 | 10 | 32 | 64  | 32.5 | 80  | 4.5 |
| 16PRL* | 16.00 (-.04)   | 35       | 16 | M6  | 51    | 9  | 81.1  | 16 | 10 | 36 | 72  | 38   | 92  | 4.5 |
| 20PRL* | 20.00 (-.04)   | 45       | 16 | M8  | 76    | 9  | 100.8 | 26 | 12 | 50 | 100 | 56.5 | 129 | 5   |
| 25PRL* | 25.00 (-.04)   | 55       | 16 | M10 | 114.5 | 14 | 146   | 50 | 16 | 75 | 150 | 89   | 186 | 4   |
| 32PRL* | 32.00 (-.04)   | 60       | 20 | M12 | 140   | 16 | 165.2 | 60 | 20 | 90 | 180 | 110  | 220 | 6   |

\* Character reserved for port style

**Flange mounting kit**

Mounting kits are available separately from the rod lock device. Please use the following part numbers to order. Mounting fasteners are included with the kits.

| Model number | Flange mount |
|--------------|--------------|
| 12PRL*       | L075370032   |
| 16PRL*       | L075370040   |
| 20PRL*       | L075370063   |
| 25PRL*       | L075370100   |
| 32PRL*       | L075370125   |

\* Character reserved for port style

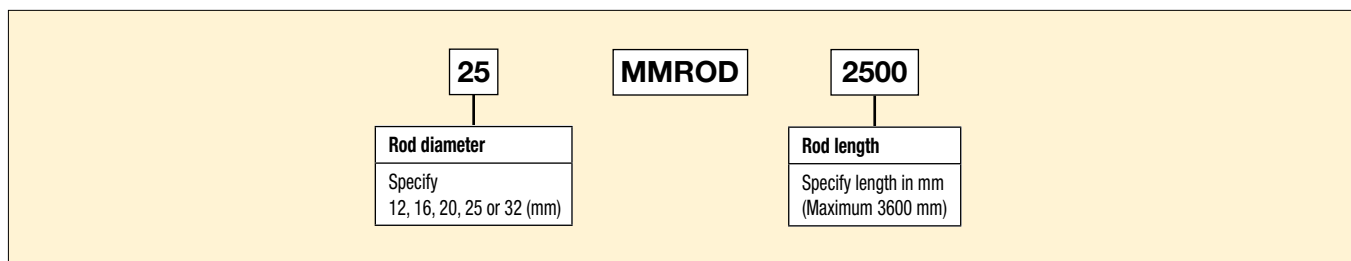
**Metric rod material**

Rods will be supplied in the specified length with chamfered ends. Please note, the rod material is case hardened and requires annealing prior to machining. Parker is pleased to quote custom machined rods per customer supplied drawings.

**⚠ Caution:** Using piston rod material which does not meet the tolerance and finished conditions as listed on the previous page may prevent the locking device from properly holding the intended load.

**How to order**

Example: 25MMROD2500



**Parker Pneumatic**

**Electronic Sensors**  
*Solid State, Reed and Proximity Sensors*

|   |
|---|
| <b>B</b>                                |
| Electronic Sensors<br>Actuator Products |
| Selection<br>Guide                      |
| Drop-in<br>Sensors                      |
| Solid State /<br>Reed Sensors           |
| Weld Immune<br>Sensors                  |
| Cordset /<br>Connect Block              |
| NAMUR<br>Sensors                        |
| Proximity<br>Sensors                    |



**PNP Solid State Sensor Selection Guide**

| Series                            | Bore size or type             | 3M flying leads         | 10m flying leads        | 8mm quick connect*  | 8mm quick connect w/ 1 m lead* | 12mm quick connect* | Bracket   | Sensor page #      | Bracket page # |      |     |
|-----------------------------------|-------------------------------|-------------------------|-------------------------|---------------------|--------------------------------|---------------------|-----------|--------------------|----------------|------|-----|
| P1Q                               | 12mm - 25mm                   | P8S-CPFLS               | N/A                     | P8S-CPSHS           | N/A                            | P8S-CPMHS           | N/A       | N/A                | N/A            |      |     |
|                                   | 32mm - 100mm                  | P8S-CPFLR               | N/A                     | P8S-CPSHR           | N/A                            | P8S-CPMHR           | N/A       | N/A                | N/A            |      |     |
| Compact cylinders                 | P1M standard sensor           | All                     | P8S-GPFLX               | P8S-GPFTX           | P8S-GPSHX                      | P8S-GPSCX           | P8S-GPMHX | N/A                | B298           | N/A  |     |
|                                   | P1M right angle sensor        | All                     | P8S-SPELXD              | P8S-SPETXD          | P8S-SPTHXD                     | N/A                 | N/A       | N/A                | B301           | N/A  |     |
|                                   | LPM                           | 9/16"                   | L076990000 <sup>2</sup> | N/A                 | L07699000C                     | N/A                 | N/A       | N/A                | N/A            | B305 | N/A |
|                                   |                               | 3/4" - 1-1/8"           | L077000000 <sup>2</sup> | N/A                 | L07700000C                     | N/A                 | N/A       | N/A                | N/A            | B305 | N/A |
| 1-1/2" - 2"                       |                               | L077010000 <sup>2</sup> | N/A                     | L07701000C          | N/A                            | N/A                 | N/A       | N/A                | B305           | N/A  |     |
| 2-1/2" - 4"                       |                               | L077020000 <sup>2</sup> | N/A                     | L07702000C          | N/A                            | N/A                 | N/A       | N/A                | B305           | N/A  |     |
| Round body cylinders              | P1L                           | 20 - 25mm               | P8S-GPFLX               | P8S-GPFTX           | P8S-GPSHX                      | P8S-GPSCX           | P8S-GPMHX | P8S-TMC01          | B298           | B301 |     |
|                                   |                               | 32 - 63mm               | P8S-GPFLX               | P8S-GPFTX           | P8S-GPSHX                      | P8S-GPSCX           | P8S-GPMHX | P8S-TMC02          | B298           | B301 |     |
|                                   |                               | 80 - 100mm              | P8S-GPFLX               | P8S-GPFTX           | P8S-GPSHX                      | P8S-GPSCX           | P8S-GPMHX | P8S-TMC03          | B298           | B301 |     |
|                                   | SRM/SRDM                      | 9/16" - 3/4"            | P8S-GPFLX               | P8S-GPFTX           | P8S-GPSHX                      | P8S-GPSCX           | P8S-GPMHX | P8S-TMC01          | B298           | B301 |     |
|                                   |                               | 1-1/16" - 2-1/2"        | P8S-GPFLX               | P8S-GPFTX           | P8S-GPSHX                      | P8S-GPSCX           | P8S-GPMHX | P8S-TMC02          | B298           | B301 |     |
|                                   | P                             | 1-1/8" - 2-1/2"         | P8S-GPFLX               | P8S-GPFTX           | P8S-GPSHX                      | P8S-GPSCX           | P8S-GPMHX | P8S-TMC02          | B298           | B301 |     |
|                                   |                               | 3" - 4"                 | P8S-GPFLX               | P8S-GPFTX           | P8S-GPSHX                      | P8S-GPSCX           | P8S-GPMHX | P8S-TMC03          | B298           | B301 |     |
| Tie rod cylinders                 | 3MA/4MA standard sensor       | 1-1/2" - 5"             | P8S-GPFLX               | P8S-GPFTX           | P8S-GPSHX                      | P8S-GPSCX           | P8S-GPMHX | N/A                | B298           | N/A  |     |
|                                   | 3MA/4MA                       | 6" - 8"                 |                         |                     |                                |                     |           | P8S-TMA0X          | B298           | N/A  |     |
|                                   | 3MA/4MA mini global sensor    | 1-1/8" - 5"             | P8S-MPFLX               | P8S-MPFTX           | P8S-MPSHX                      | N/A                 | N/A       | P8S-TMA0Z          | B300           | N/A  |     |
| Iso cylinders                     | P1A standard sensor           | 10-25mm                 | P8S-GPFLX               | P8S-GPFTX           | P8S-GPSHX                      | P8S-GPSCX           | P8S-GPMHX | P8S-TMC01          | B298           | B301 |     |
|                                   | P1A right angle sensors       | 10mm                    | P1A-2XMK <sup>1</sup>   | N/A                 | N/A                            | N/A                 | N/A       | P1A-2CCC           | B304           | B304 |     |
|                                   |                               | 12mm                    | P1A-2XMK <sup>1</sup>   | N/A                 | N/A                            | N/A                 | N/A       | P1A-2DCC           | B304           | B304 |     |
|                                   |                               | 16mm                    | P1A-2XMK <sup>1</sup>   | N/A                 | N/A                            | N/A                 | N/A       | P1A-2FCC           | B304           | B304 |     |
|                                   |                               | 20mm                    | P1A-2XMK <sup>1</sup>   | N/A                 | N/A                            | N/A                 | N/A       | P1A-2HCC           | B304           | B304 |     |
|                                   |                               | 25mm                    | P1A-2XMK <sup>1</sup>   | N/A                 | N/A                            | N/A                 | N/A       | P1A-2JCC           | B304           | B304 |     |
|                                   | P1D standard & clean profiles | All                     | P8S-GPFLX               | P8S-GPFTX           | P8S-GPSHX                      | P8S-GPSCX           | P8S-GPMHX | N/A                | B298           | N/A  |     |
| P1D standard profile mini sensors | All                           | P8S-MPFLX               | P8S-MPFTX               | P8S-MPSHX           | N/A                            | N/A                 | N/A       | B300               | N/A            |      |     |
| P1D tie rod version               | All                           | P8S-GPFLX               | P8S-GPFTX               | P8S-GPSHX           | P8S-GPSCX                      | P8S-GPMHX           | P8S-TMA0X | B298               | N/A            |      |     |
| Rodless cylinders                 | P1X                           | All                     | P8S-GPFLX               | P8S-GPFTX           | P8S-GPSHX                      | P8S-GPSCX           | P8S-GPMHX | P8S-TMA0Y          | B298           | N/A  |     |
|                                   | P1Z                           | All                     | P8S-GPFLX               | P8S-GPFTX           | P8S-GPSHX                      | P8S-GPSCX           | P8S-GPMHX | N/A                | B298           | N/A  |     |
|                                   | OSP-P                         | All                     | KL3308 <sup>1</sup>     | KL3309 <sup>4</sup> | KL3312                         | N/A                 | N/A       | N/A                | B303           | N/A  |     |
| Guided cylinders                  | P5T                           | Flush mount             | P8S-GPFLX               | P8S-GPFTX           | P8S-GPSHX                      | P8S-GPSCX           | P8S-GPMHX | N/A                | B298           | N/A  |     |
|                                   |                               | Right angle             | P8S-SPELXD              | P8S-SPETXD          | P8S-SPTHXD                     | N/A                 | N/A       | Included w/ sensor | B299           | N/A  |     |
|                                   | P5T2                          | All                     | P8S-GPFLX               | P8S-GPFTX           | P8S-GPSHX                      | P8S-GPSCX           | P8S-GPMHX | N/A                | B298           | N/A  |     |
|                                   | P5E                           | All                     | P8S-GPFLX               | P8S-GPFTX           | P8S-GPSHX                      | P8S-GPSCX           | P8S-GPMHX | N/A                | B298           | N/A  |     |
|                                   | HB                            | All                     | P8S-GPFLX               | P8S-GPFTX           | P8S-GPSHX                      | P8S-GPSCX           | P8S-GPMHX | N/A                | B298           | N/A  |     |
|                                   |                               | 20 - 25mm               | P8S-GPFLX               | P8S-GPFTX           | P8S-GPSHX                      | P8S-GPSCX           | P8S-GPMHX | P8S-TMC01          | B298           | B301 |     |
|                                   |                               | 32 - 63mm               | P8S-GPFLX               | P8S-GPFTX           | P8S-GPSHX                      | P8S-GPSCX           | P8S-GPMHX | P8S-TMC02          | B298           | B301 |     |
| P5L                               | 80 - 100mm                    | P8S-GPFLX               | P8S-GPFTX               | P8S-GPSHX           | P8S-GPSCX                      | P8S-GPMHX           | P8S-TMC03 | B298               | B301           |      |     |
|                                   |                               |                         |                         |                     |                                |                     |           |                    |                |      |     |
| Rotary actuators                  | PV WR XR                      | Normally open           | SMH-1P <sup>2</sup>     | N/A                 | SMH-1PC                        | N/A                 | N/A       | N/A                | B307           | N/A  |     |
|                                   |                               | Normally closed         | SMC-1P <sup>2</sup>     | N/A                 | SMC-1PC                        | N/A                 | N/A       | N/A                | B307           | N/A  |     |
|                                   | PRN(A)                        | All                     | N/A                     | N/A                 | N/A                            | N/A                 | N/A       | N/A                | N/A            | N/A  |     |
|                                   | PTR                           | 10, 15                  | SWH-1P <sup>3</sup>     | N/A                 | SWH-1PC                        | N/A                 | N/A       | Included           | B308           | N/A  |     |
| 20, 25, 32                        |                               | SWH-2P <sup>3</sup>     | N/A                     | SWH-2PC             | N/A                            | N/A                 | Included  | B308               | N/A            |      |     |

1. Flying leads are 2 meters in length  
 2. Flying Leads are 1.5 meters in length

3. Flying leads are 1 meter in length  
 4. Flying leads are 5 meter in length

Note: See page B309 for Weld Immune Sensors and pages B311-B313 for NAMUR Intrinsically Safe Sensors.  
 \* See page B317 for cord sets.



**NPN Solid State Sensor Selection Guide**

| Series                            | Bore size or type          | 3m flying leads         | 10m flying leads        | 8mm quick connect* | 8mm quick connect w/ 1m lead* | 12mm quick connect* | Bracket   | Sensor page # | Bracket page # |      |      |
|-----------------------------------|----------------------------|-------------------------|-------------------------|--------------------|-------------------------------|---------------------|-----------|---------------|----------------|------|------|
| P1Q                               | 12mm - 25mm                | P8S-CNFLS               | N/A                     | P8S-CNSHS          | N/A                           | P8S-CNMHS           | N/A       | N/A           | N/A            |      |      |
|                                   | 32mm - 100mm               | P8S-CNFLR               | N/A                     | P8S-CNSHR          | N/A                           | P8S-CNMHR           | N/A       | N/A           | N/A            |      |      |
| Compact cylinders                 | P1M standard sensor        | All                     | P8S-GNFLX               | P8S-GNFTX          | P8S-GNSHX                     | P8S-GNSCX           | P8S-GNMHX | N/A           | B298           | N/A  |      |
|                                   | P1M right angle sensor     | All                     | P8S-SNELX               | P8S-SNETX          | P8S-SNTHX                     | N/A                 | N/A       | N/A           | B301           | N/A  |      |
|                                   | LPM                        | 9/16"                   | L076950000 <sup>2</sup> | N/A                | L07695000C                    | N/A                 | N/A       | N/A           | N/A            | B305 | N/A  |
|                                   |                            | 3/4" - 1-1/8"           | L076960000 <sup>2</sup> | N/A                | L07696000C                    | N/A                 | N/A       | N/A           | N/A            | B305 | N/A  |
|                                   |                            | 1-1/2" - 2"             | L076970000 <sup>2</sup> | N/A                | L07697000C                    | N/A                 | N/A       | N/A           | N/A            | B305 | N/A  |
| 2-1/2" - 4"                       |                            | L076980000 <sup>2</sup> | N/A                     | L07698000C         | N/A                           | N/A                 | N/A       | N/A           | B305           | N/A  |      |
| Round body cylinders              | P1L                        | 20 - 25mm               | P8S-GNFLX               | P8S-GNFTX          | P8S-GNSHX                     | P8S-GNSCX           | P8S-GNMHX | P8S-TMC01     | B298           | B301 |      |
|                                   |                            | 32 - 63mm               | P8S-GNFLX               | P8S-GNFTX          | P8S-GNSHX                     | P8S-GNSCX           | P8S-GNMHX | P8S-TMC02     | B298           | B301 |      |
|                                   |                            | 80 - 100mm              | P8S-GNFLX               | P8S-GNFTX          | P8S-GNSHX                     | P8S-GNSCX           | P8S-GNMHX | P8S-TMC03     | B298           | B301 |      |
|                                   | SRM/SRDM                   | 9/16" - 3/4"            | P8S-GNFLX               | P8S-GNFTX          | P8S-GNSHX                     | P8S-GNSCX           | P8S-GNMHX | P8S-TMC01     | B298           | B301 |      |
|                                   |                            | 1-1/16" - 2-1/2"        | P8S-GNFLX               | P8S-GNFTX          | P8S-GNSHX                     | P8S-GNSCX           | P8S-GNMHX | P8S-TMC02     | B298           | B301 |      |
|                                   | P                          | 1-1/8" - 2-1/2"         | P8S-GNFLX               | P8S-GNFTX          | P8S-GNSHX                     | P8S-GNSCX           | P8S-GNMHX | P8S-TMC02     | B298           | B301 |      |
|                                   |                            | 3" - 4"                 | P8S-GNFLX               | P8S-GNFTX          | P8S-GNSHX                     | P8S-GNSCX           | P8S-GNMHX | P8S-TMC03     | B298           | B301 |      |
| Tie rod cylinders                 | 3MA/4MA standard sensor    | 1-1/2" - 5"             | P8S-GNFLX               | P8S-GPNFTX         | P8S-GNSHX                     | P8S-GPNSCX          | P8S-GNMHX | N/A           | B298           | N/A  |      |
|                                   | 3MA/4MA                    | 6" - 8"                 |                         |                    |                               |                     | P8S-TMA0X | B298          | N/A            |      |      |
|                                   | 3MA/4MA mini-global sensor | 1-1/8" - 5"             | P8S-MNFLX               | P8S-MNFTX          | P8S-MNSHX                     | N/A                 | N/A       | P8S-TMA0Z     | B300           | N/A  |      |
| ISO cylinders                     | P1A standard sensor        | 10-25mm                 | P8S-GNFLX               | P8S-GNFTX          | P8S-GNSHX                     | P8S-GNSCX           | P8S-GNMHX | P8S-TMC01     | B298           | B301 |      |
|                                   |                            | 10mm bore               | P1A-2XLK <sup>1</sup>   | N/A                | N/A                           | N/A                 | N/A       | P1A-2CCC      | B304           | B304 |      |
|                                   | P1A right angle sensors    | 12mm bore               | P1A-2XLK <sup>1</sup>   | N/A                | N/A                           | N/A                 | N/A       | P1A-2DCC      | B304           | B304 |      |
|                                   |                            | 16mm bore               | P1A-2XLK <sup>1</sup>   | N/A                | N/A                           | N/A                 | N/A       | P1A-2FCC      | B304           | B304 |      |
|                                   |                            | 20mm bore               | P1A-2XLK <sup>1</sup>   | N/A                | N/A                           | N/A                 | N/A       | P1A-2HCC      | B304           | B304 |      |
|                                   |                            | 25mm bore               | P1A-2XLK <sup>1</sup>   | N/A                | N/A                           | N/A                 | N/A       | P1A-2JCC      | B304           | B304 |      |
| P1D standard & clean profiles     | All                        | P8S-GNFLX               | P8S-GNFTX               | P8S-GNSHX          | P8S-GNSCX                     | P8S-GNMHX           | N/A       | B298          | N/A            |      |      |
| P1D standard profile mini Sensors | All                        | P8S-MNFLX               | P8S-MNFTX               | P8S-MNSHX          | N/A                           | N/A                 | N/A       | B300          | N/A            |      |      |
| P1D tie rod version               | All                        | P8S-GNFLX               | P8S-GNFTX               | P8S-GNSHX          | P8S-GNSCX                     | P8S-GNMHX           | P8S-TMA0X | B298          | N/A            |      |      |
| Rodless Cylinders                 | P1X                        | All                     | P8S-GNFLX               | P8S-GNFTX          | P8S-GNSHX                     | P8S-GNSCX           | P8S-GNMHX | P8S-TMA0Y     | B298           | N/A  |      |
|                                   | P1Z                        | All                     | P8S-GNFLX               | P8S-GNFTX          | P8S-GNSHX                     | P8S-GNSCX           | P8S-GNMHX | N/A           | B298           | N/A  |      |
|                                   | OSP-P                      | All                     | N/A                     | N/A                | N/A                           | N/A                 | N/A       | N/A           | N/A            | N/A  |      |
| Guided cylinders                  | P5T                        | Flush mount             | P8S-GNFLX               | P8S-GNFTX          | P8S-GNSHX                     | P8S-GNSCX           | P8S-GNMHX | N/A           | B298           | N/A  |      |
|                                   |                            | Right angle             | P8S-SNELX               | P8S-SNETX          | P8S-SNTHX                     | N/A                 | N/A       | N/A           | B299           | N/A  |      |
|                                   | P5T2                       | All                     | P8S-GNFLX               | P8S-GNFTX          | P8S-GNSHX                     | P8S-GNSCX           | P8S-GNMHX | N/A           | B298           | N/A  |      |
|                                   | P5E                        | All                     | P8S-GNFLX               | P8S-GNFTX          | P8S-GNSHX                     | P8S-GNSCX           | P8S-GNMHX | N/A           | B298           | N/A  |      |
|                                   | HB                         | All                     | P8S-GNFLX               | P8S-GNFTX          | P8S-GNSHX                     | P8S-GNSCX           | P8S-GNMHX | N/A           | B298           | N/A  |      |
|                                   |                            | P5L                     | 20 - 25mm               | P8S-GNFLX          | P8S-GNFTX                     | P8S-GNSHX           | P8S-GNSCX | P8S-GNMHX     | P8S-TMC01      | B298 | B301 |
| 32 - 63mm                         |                            |                         | P8S-GNFLX               | P8S-GNFTX          | P8S-GNSHX                     | P8S-GNSCX           | P8S-GNMHX | P8S-TMC02     | B298           | B301 |      |
| 80 - 100mm                        | P8S-GNFLX                  |                         | P8S-GNFTX               | P8S-GNSHX          | P8S-GNSCX                     | P8S-GNMHX           | P8S-TMC03 | B298          | B301           |      |      |
| Rotary actuators                  | PV WR XR                   | Normally open           | SMH-1N <sup>2</sup>     | N/A                | SMC-1NC                       | N/A                 | N/A       | N/A           | B307           | N/A  |      |
|                                   |                            | Normally closed         | SMC-1N <sup>2</sup>     | N/A                | SMC-1NC                       | N/A                 | N/A       | N/A           | B307           | N/A  |      |
|                                   | PRN(A)                     | All                     | See page B306           |                    |                               |                     |           |               |                |      |      |
| PTR                               | 10, 15                     | SWH-1N <sup>3</sup>     | N/A                     | SWH-1NC            | N/A                           | N/A                 | Included  | B308          | N/A            |      |      |
|                                   | 20, 25, 32                 | SWH-2N <sup>3</sup>     | N/A                     | SWH-2NC            | N/A                           | N/A                 | Included  | B308          | N/A            |      |      |

1 Flying leads are 2 meters in length  
 2 Flying Leads are 1.5 meters in length  
 3 Flying leads are 1 meter in length

Note: See page B309 for Weld Immune Sensors and pages B311-B313 for NAMUR Intrinsically Safe Sensors.

\* See page B317 for cord sets.



**B**  
 Electronic Sensors  
 Actuator Products  
 Selection Guide  
 Drop-in Sensors  
 Solid State / Reed Sensors  
 Weld Immune Sensors  
 Cordset / Connect Block  
 NAMUR Sensors  
 Proximity Sensors



**Reed Sensor Selection Guide**

| Series                            | Bore size or type          | 3m flying leads         | 10m flying leads        | 8mm quick connect*  | 8 mm quick connect w/ 1 m lead* | 12mm quick connect* | Bracket   | Sensor page #      | Bracket page # |      |     |
|-----------------------------------|----------------------------|-------------------------|-------------------------|---------------------|---------------------------------|---------------------|-----------|--------------------|----------------|------|-----|
| P1Q                               | 12mm - 25mm                | P8S-CRFLS               | N/A                     | P8S-CRSHS           | N/A                             | P8S-CRMHS           | N/A       | N/A                | N/A            |      |     |
|                                   | 32mm - 100mm               | P8S-CRFLR               | N/A                     | P8S-CRSHR           | N/A                             | P8S-CRMHR           | N/A       | N/A                | N/A            |      |     |
| Compact cylinders                 | P1M standard sensor        | All                     | P8S-GRFLX               | P8S-GRFTX           | P8S-GRSHX                       | P8S-GRSCX           | P8S-GRMHX | N/A                | B299           | N/A  |     |
|                                   | P1M right angle sensor     | All                     | P8S-SRELX               | P8S-SRETX           | P8S-SRTHX                       | N/A                 | N/A       | N/A                | B301           | N/A  |     |
|                                   | LPM                        | 9/16"                   | L077030000 <sup>1</sup> | N/A                 | L07703000C                      | N/A                 | N/A       | N/A                | N/A            | B305 | N/A |
|                                   |                            | 3/4" - 1-1/8"           | L077040000 <sup>1</sup> | N/A                 | L07704000C                      | N/A                 | N/A       | N/A                | N/A            | B305 | N/A |
| 1-1/2" - 2"                       |                            | L077050000 <sup>1</sup> | N/A                     | L07705000C          | N/A                             | N/A                 | N/A       | N/A                | B305           | N/A  |     |
|                                   | 2-1/2" - 4"                | L077060000 <sup>1</sup> | N/A                     | L07706000C          | N/A                             | N/A                 | N/A       | N/A                | B305           | N/A  |     |
| Round body cylinders              | P1L                        | 20 - 25mm               | P8S-GRFLX               | P8S-GRFTX           | P8S-GRSHX                       | P8S-GRSCX           | P8S-GRMHX | P8S-TMC01          | B299           | B301 |     |
|                                   |                            | 32 - 63mm               | P8S-GRFLX               | P8S-GRFTX           | P8S-GRSHX                       | P8S-GRSCX           | P8S-GRMHX | P8S-TMC02          | B299           | B301 |     |
|                                   |                            | 80 - 100mm              | P8S-GRFLX               | P8S-GRFTX           | P8S-GRSHX                       | P8S-GRSCX           | P8S-GRMHX | P8S-TMC03          | B299           | B301 |     |
|                                   | SRM/SRDM                   | 9/16" - 3/4"            | P8S-GRFLX               | P8S-GRFTX           | P8S-GRSHX                       | P8S-GRSCX           | P8S-GRMHX | P8S-TMC01          | B299           | B301 |     |
|                                   |                            | 1-1/16" - 2-1/2"        | P8S-GRFLX               | P8S-GRFTX           | P8S-GRSHX                       | P8S-GRSCX           | P8S-GRMHX | P8S-TMC02          | B299           | B301 |     |
|                                   | P                          | 1-1/8" - 2-1/2"         | P8S-GRFLX               | P8S-GRFTX           | P8S-GRSHX                       | P8S-GRSCX           | P8S-GRMHX | P8S-TMC02          | B299           | B301 |     |
|                                   |                            | 3" - 4"                 | P8S-GRFLX               | P8S-GRFTX           | P8S-GRSHX                       | P8S-GRSCX           | P8S-GRMHX | P8S-TMC03          | B299           | B301 |     |
| Tie rod cylinders                 | 3MA/4MA standard sensor    | 1-1/2" - 5"             | P8S-GRFLX               | P8S-GRFTX           | P8S-GRSHX                       | P8S-GRSCX           | P8S-GRMHX | N/A                | B299           | N/A  |     |
|                                   | 3MA/4MA                    | 6" - 8"                 |                         |                     |                                 |                     |           | P8S-TMA0X          | B299           | N/A  |     |
|                                   | 3MA/4MA mini global sensor | 1-1/8" - 5"             | P8S-MRFLX               | P8S-MRFTX           | P8S-MRSHX                       | N/A                 | N/A       | P8S-TMA0Z          | B299           | N/A  |     |
| ISO cylinders                     | P1A standard sensor        | 10-25mm                 | P8S-GRFLX               | P8S-GRFTX           | P8S-GRSHX                       | P8S-GRSCX           | P8S-GRMHX | P8S-TMC01          | B299           | B301 |     |
|                                   | P1A alternate sensors      | 10mm bore               | P1A-2XRL                | N/A                 | P1A-2XSH                        | N/A                 | N/A       | P1A-2CCB           | B304           | B304 |     |
|                                   |                            | 12mm bore               | P1A-2XRL                | N/A                 | P1A-2XSH                        | N/A                 | N/A       | P1A-2DCB           | B304           | B304 |     |
|                                   |                            | 16mm bore               | P1A-2XRL                | N/A                 | P1A-2XSH                        | N/A                 | N/A       | P1A-2FCB           | B304           | B304 |     |
|                                   |                            | 20mm bore               | P1A-2XRL                | N/A                 | P1A-2XSH                        | N/A                 | N/A       | P1A-2HCB           | B304           | B304 |     |
|                                   |                            | 25mm bore               | P1A-2XRL                | N/A                 | P1A-2XSH                        | N/A                 | N/A       | P1A-2JCB           | B304           | B304 |     |
| P1D standard & clean profiles     | All                        | P8S-GRFLX               | P8S-GRFTX               | P8S-GRSHX           | P8S-GRSCX                       | P8S-GRMHX           | N/A       | B299               | N/A            |      |     |
| P1D standard profile mini sensors | All                        | P8S-MRFLX               | P8S-MRFTX               | P8S-MRSHX           | N/A                             | N/A                 | N/A       | B300               | N/A            |      |     |
| P1D tie rod version               | All                        | P8S-GRFLX               | P8S-GRFTX               | P8S-GRSHX           | P8S-GRSCX                       | P8S-GRMHX           | P8S-TMA0X | B299               | N/A            |      |     |
| Rodless cylinders                 | P1X                        | All                     | P8S-GRFLX               | P8S-GRFTX           | P8S-GRSHX                       | P8S-GRSCX           | P8S-GRMHX | P8S-TMA0Y          | B299           | N/A  |     |
|                                   | P1Z                        | All                     | P8S-GRFLX               | P8S-GRFTX           | P8S-GRSHX                       | P8S-GRSCX           | P8S-GRMHX | N/A                | B299           | N/A  |     |
|                                   | OSP-P                      | All                     | KL3301 <sup>3</sup>     | KL3300 <sup>4</sup> | KL3302                          | N/A                 | N/A       | Included w/ sensor | B303           | N/A  |     |
| Guided cylinders                  | P5T                        | Flush mount             | P8S-GRFLX               | P8S-GRFTX           | P8S-GRSHX                       | P8S-GRSCX           | P8S-GRMHX | N/A                | B299           | N/A  |     |
|                                   |                            | Right angle             | P8S-SRELX               | P8S-SRETX           | P8S-SRTHX                       | N/A                 | N/A       | N/A                | B299           | N/A  |     |
|                                   | P5T2                       | All                     | P8S-GRFLX               | P8S-GRFTX           | P8S-GRSHX                       | P8S-GRSCX           | P8S-GRMHX | N/A                | B299           | N/A  |     |
|                                   | P5E                        | All                     | P8S-GRFLX               | P8S-GRFTX           | P8S-GRSHX                       | P8S-GRSCX           | P8S-GRMHX | N/A                | B299           | N/A  |     |
|                                   | HB                         | All                     | P8S-GRFLX               | P8S-GRFTX           | P8S-GRSHX                       | P8S-GRSCX           | P8S-GRMHX | N/A                | B299           | N/A  |     |
| P5L                               |                            | 20 - 25mm               | P8S-GRFLX               | P8S-GRFTX           | P8S-GRSHX                       | P8S-GRSCX           | P8S-GRMHX | P8S-TMC01          | B299           | B299 |     |
|                                   |                            | 32 - 63mm               | P8S-GRFLX               | P8S-GRFTX           | P8S-GRSHX                       | P8S-GRSCX           | P8S-GRMHX | P8S-TMC02          | B299           | B299 |     |
|                                   | 80 - 100mm                 | P8S-GRFLX               | P8S-GRFTX               | P8S-GRSHX           | P8S-GRSCX                       | P8S-GRMHX           | P8S-TMC03 | B299               | B299           |      |     |
| Rotary actuators                  | PV WR XR                   | N.O. high amp           | SMR-1 <sup>1</sup>      | N/A                 | SMR-1C                          | N/A                 | N/A       | N/A                | B307           | N/A  |     |
|                                   |                            | N.O. low amp            | SMR-1L <sup>1</sup>     | N/A                 | SMR-1LC                         | N/A                 | N/A       | N/A                | B307           | N/A  |     |
|                                   |                            | N.C.                    | SMD-1L <sup>1</sup>     | N/A                 | SMD-1LC                         | N/A                 | N/A       | N/A                | B307           | N/A  |     |
| PRN                               | 50 - 800                   | See model code          |                         |                     |                                 |                     |           | B306               | N/A            |      |     |
| PTR                               | 10, 15                     | SWR-1 <sup>2</sup>      | N/A                     | SWR-1C              | N/A                             | N/A                 | Included  | B308               | N/A            |      |     |
|                                   | 20, 25, 32                 | SWR-2 <sup>2</sup>      | N/A                     | SWR-2C              | N/A                             | N/A                 | Included  | B308               | N/A            |      |     |

1. Flying leads are 1.5 meters in length  
 2. Flying Leads are 1 meters in length

3. Flying leads are 2 meter in length  
 4. Flying leads are 5 meter in length

Note: See page B309 for Weld Immune Sensors and pages B311-B313 for NAMUR Intrinsically Safe Sensors.  
 \* See page B317 for cord sets.



**P8S Global Drop-In Solid State Sensors**

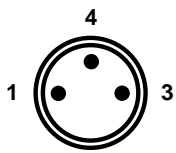


| Wiring                        | PNP sensor       | NPN sensor       | PNP sensor<br>ATEX certified |
|-------------------------------|------------------|------------------|------------------------------|
| 3m flying leads               | <b>P8S-GPFLX</b> | <b>P8S-GNFLX</b> | <b>P8S-GPFLX/EX</b>          |
| 10m flying leads              | <b>P8S-GPFTX</b> | <b>P8S-GNFTX</b> | N/A                          |
| 0.3m lead with 8mm connector  | <b>P8S-GPSHX</b> | <b>P8S-GNSHX</b> |                              |
| 0.3m lead with 12mm connector | <b>P8S-GPMHX</b> | <b>P8S-GNMHX</b> |                              |
| 1m lead with 8mm connector    | <b>P8S-GPSCX</b> | <b>P8S-GNSCX</b> |                              |

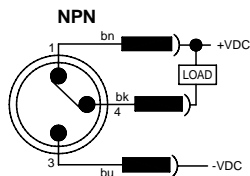
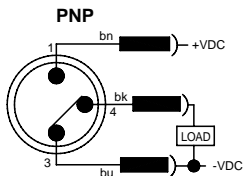
**B**  
 Electronic Sensors  
 Actuator Products  
 Selection Guide  
 Drop-in Sensors  
 Solid State / Reed Sensors  
 Weld Immune Sensors  
 Cordset / Connect Block  
 NAMUR Sensors  
 Proximity Sensors

**Wiring connection**

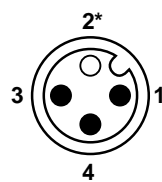
**Flying lead or 8 mm connector (shown)**



| Pin | Wire  | Function                 |
|-----|-------|--------------------------|
| 1   | Brown | Operating voltage (+VDC) |
| 4   | Black | Output signal (N.O.)     |
| 3   | Blue  | -VDC                     |

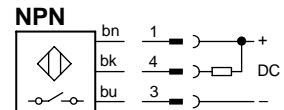
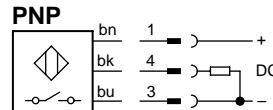


**12 mm connector**



| Pin | Wire  | Function                 |
|-----|-------|--------------------------|
| 1   | Brown | Operating voltage (+VDC) |
| 4   | Black | Output signal (N.O.)     |
| 2*  | White | Not used                 |
| 3   | Blue  | -VDC                     |

\* Pin 2 not present.





**P8S Global Drop-in Reed Sensors**

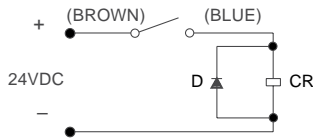


| Wiring                        | Reed sensor      |
|-------------------------------|------------------|
| 3m flying leads               | <b>P8S-GRFLX</b> |
| 10m flying leads              | <b>P8S-GRFTX</b> |
| 0.3m lead with 8mm connector  | <b>P8S-GRSHX</b> |
| 0.3m lead with 12mm connector | <b>P8S-GRMHX</b> |
| 1m lead with 8mm connector    | <b>P8S-GRSCX</b> |

**Circuit for switching contact protection (for inductive loads, e.g. solenoids, relays)**

**(Required for proper operation 24VDC)**

Put diode parallel to load (CR) following polarity as shown below.

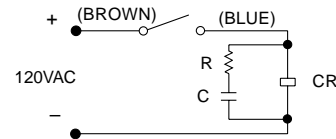


D: Diode: select a diode with the breakdown voltage and current rating according to the load.

**Typical Example** – 100 volt, 1 amp diode  
 CR: Relay coil (under 0.5W coil rating)

**(Recommended for longer life 120 VAC)**

Put a resistor and capacitor in parallel with the load (CR). Select the resistor and capacitor according to the load.



**Typical Example:**

CR: Relay coil (under 2W coil rating)  
 R: Resistor 1 K $\Omega$  - 5 K $\Omega$ , 1/4 W  
 C: Capacitor 0.1  $\Omega$ F, 600 V

**⚠ Caution**

- Use an ampmeter to test reed sensor current. Testing devices such as incandescent light bulbs may subject the reed sensor to high in-rush loads.
- **NOTE:** When checking an unpowered reed sensor for continuity with a digital ohmmeter the resistance reading will change from infinity to a very large resistance (2 M ohm) when the sensor is activated. This is due to the presence of a diode in the reed sensor.
- Anti-magnetic shielding is recommended for reed sensors exposed to high external RF or magnetic fields.
- The magnetic field strength of the piston magnet is designed to operate with our sensors. Other manufacturers' sensors may not operate correctly in conjunction with these magnets.

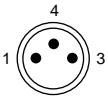
- Use relay coils for reed sensor contact protection.
- The operation of some 120 VAC PLC's (especially some older Allen-Bradley PLC's) can overload the reed sensor. The sensor may fail to release after the piston magnet has passed. This problem may be corrected by the placement of a 700 to 1K OHM resistor between the sensor and the PLC input terminal. Consult the manufacturer of the PLC for appropriate circuit.
- Sensors with long wire leads (greater than 15 feet) can cause capacitance build-up and sticking will result. Attach a resistor in series with the reed sensor (the resistor should be installed as close as possible to the sensor). The resistor should be selected such that  $R \text{ (ohms)} > E/0.3$ .

**P8S Mini-Global Drop-In Solid State Sensors**

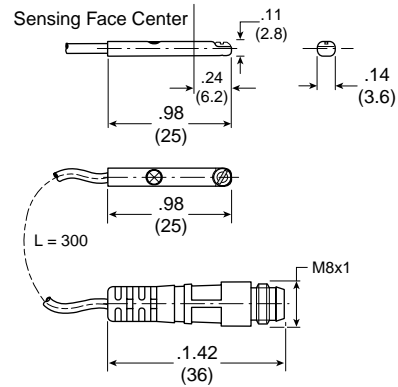
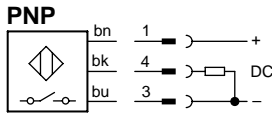
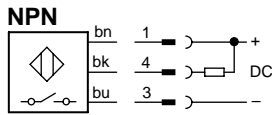


| Wiring                       | PNP sensor       | NPN sensor       |
|------------------------------|------------------|------------------|
| 3m flying leads              | <b>P8S-MPFLX</b> | <b>P8S-MNFLX</b> |
| 10m flying leads             | <b>P8S-MPFTX</b> | <b>P8S-MNFTX</b> |
| 0.3m lead with 8mm connector | <b>P8S-MPSHX</b> | <b>P8S-MNSHX</b> |

**Wiring connection**



| Pin | Wire  | Function |
|-----|-------|----------|
| 1   | Brown | +VDC     |
| 4   | Black | NO       |
| 3   | Blue  | - VDC    |



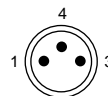
**B**  
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**P8S Mini-Global Drop-In Reed Sensors**

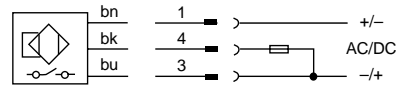


| Wiring                       | Reed sensor      |
|------------------------------|------------------|
| 3m flying leads              | <b>P8S-MRFLX</b> |
| 10m flying leads             | <b>P8S-MRFTX</b> |
| 0.3m lead with 8mm connector | <b>P8S-MRSHX</b> |

**Wiring connection**



| Pin | Wire  | Function               |
|-----|-------|------------------------|
| 1   | Brown | Operating voltage (+V) |
| 4   | Black | Output signal          |
| 3   | Blue  | Ground (-V)            |



**Caution**

- Use an ammeter to test reed sensor current. Testing devices such as incandescent light bulbs may subject the reed sensor to high in-rush loads.
- **NOTE:** When checking an unpowered reed sensor for continuity with a digital ohmmeter the resistance reading will change from infinity to a very large resistance (2 M ohm) when the sensor is activated. This is due to the presence of a diode in the reed sensor.
- Anti-magnetic shielding is recommended for reed sensors exposed to high external RF or magnetic fields.
- The magnetic field strength of the piston magnet is designed to operate with our sensors. Other manufacturers' sensors may not operate correctly in conjunction with these magnets.

- Use relay coils for reed sensor contact protection.
- The operation of some 120 VAC PLC's (especially some older Allen-Bradley PLC's) can overload the reed sensor. The sensor may fail to release after the piston magnet has passed. This problem may be corrected by the placement of a 700 to 1K OHM resistor between the sensor and the PLC input terminal. Consult the manufacturer of the PLC for appropriate circuit.
- Sensors with long wire leads (greater than 15 feet) can cause capacitance build-up and sticking will result. Attach a resistor in series with the reed sensor (the resistor should be installed as close as possible to the sensor). The resistor should be selected such that R (ohms) > E/0.3.

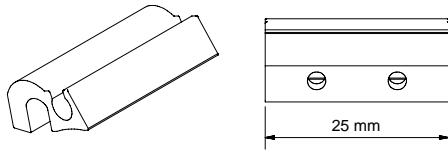
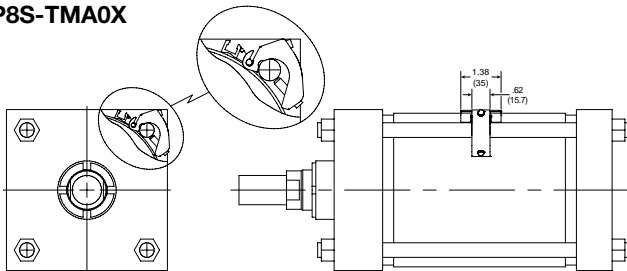


### Tie Rod Bracket Assembly Part Number and Dimensions

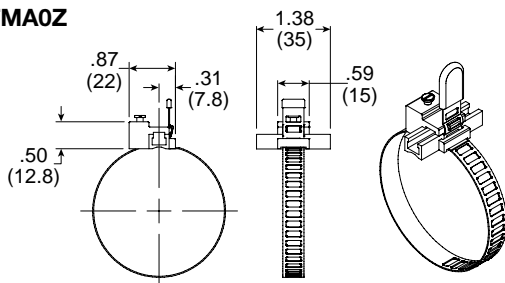
Tie Rod Bracket Assembly is necessary for Global and Mini-Global Sensor installation on all tie rod construction cylinders. This includes all Intermediate Trunnion mounts (Style DD or MT4); some 1-1/8" bore 3MA Series mounts; and all 6"-8" bore Sensors and bracket assemblies must be ordered separately.

Part number P8S-TMA0X fits 1-1/2" to 8" bores and 32-200mm bores for Global Sensors  
 Part number P8S-TMA0Z fits 1-1/8" bore for Mini-Global Sensors

#### P8S-TMA0X



#### P8S-TMA0Z



### Round body bracket assembly part numbers Sensors and brackets must be ordered separately

| Bore size       | Round body bracket |
|-----------------|--------------------|
| 9/16" - 1-1/16" | <b>P8S-TMC01</b>   |
| 20 - 25mm       | <b>P8S-TMC01</b>   |
| 1-1/8" - 2-1/2" | <b>P8S-TMC02</b>   |
| 32 - 63mm       | <b>P8S-TMC02</b>   |
| 3" - 4"         | <b>P8S-TMC03</b>   |
| 80 - 100mm      | <b>P8S-TMC03</b>   |

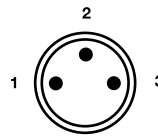
## Electronic Sensors P8S Drop-in Sensors

### P8S Right Angle Solid State Sensors

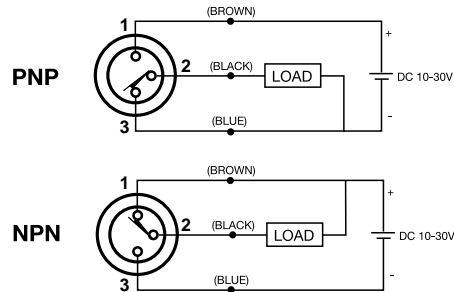


| Wiring                       | PNP sensors       | NPN sensors      |
|------------------------------|-------------------|------------------|
| 0.2m lead with 8mm connector | <b>P8S-SPTHXD</b> | <b>P8S-SNTHX</b> |
| 3m flying leads              | <b>P8S-SPELXD</b> | <b>P8S-SNELX</b> |
| 10m flying leads             | <b>P8S-SPETXD</b> | <b>P8S-SNETX</b> |

### Wiring connection



| Pin | Wire  | Function                 |
|-----|-------|--------------------------|
| 1   | Brown | Operating voltage (+VDC) |
| 2   | Black | Output signal (N.O.)     |
| 3   | Blue  | -VDC                     |

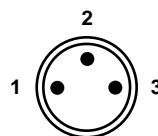


### P8S Right Angle Reed Sensors



| Wiring                       | Reed sensors     |
|------------------------------|------------------|
| 0.2m lead with 8mm connector | <b>P8S-SRTHX</b> |
| 3m flying leads              | <b>P8S-SRELX</b> |
| 10m flying leads             | <b>P8S-SRETX</b> |

### Wiring connection



| Pin | Wire  | Function                     |
|-----|-------|------------------------------|
| 1   | Brown | Operating voltage (+V)       |
| 3   | Black | Not used                     |
| 2   | Blue  | Output signal (-V or Ground) |

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**OSP-P Magnetic Switches for T-Slot – Series RST & EST**

Magnetic switches are used for electrical sensing of the position of the piston, e.g. at its end positions. They can also be used for sensing of intermediate positions.

Sensing is contactless, based on magnets which are built-in as standard. A yellow LED indicates operating status.

The universal magnetic switches are suitable for all OSP-P Actuators.

1) For the magnetic switch temperature range, please take into account the surface temperature and the self-heating properties of the linear drive.



**Characteristics**

| Electrical characteristics                               | Unit            | Type RST  | Type EST   |
|--|-----------------|---|--|
| Switching output   |                 | Reed  | PNP  |
| Operating voltage  | V               | 10-30 AC/DC   | 10-30 DC   |
| Ripple   |                 | –   | ≤ 10%  |
| Voltage drop   | V               | ≤ 3   | ≤ 2  |
| Electrical configuration                                 |                 | Two wire  | Three wire   |
| Output function  |                 | normally open<br>normally closed                                  | normally open  |
| Permanent current  | mA              | ≤ 100   | ≤ 100  |
| Breaking capacity  | W               | ≤ 6 peak  | –  |
| Power consumption at UB = 24V, switched on, without load | mA              | –   | ≤ 10   |
| Function indicator                                       |                 | LED, yellow (not for normally closed)                             |  |
| Response time  | ms              | ≤ 2   | ≤ 0.5  |
| Sensitivity  | mT              | 2 – 4   | 2 – 4  |
| Time delay before availability                           | ms              | –   | ≤ 2  |
| Reverse polarity protection                              |                 | Yes   | Yes  |
| Short-circuit protection                                 |                 | No  | Yes (pulsed)   |
| Switchable capacity load                                 | µF              | 0.1 at 100 W, 24 VDC  |  |
| Switching frequency                                      | Hz              | ≤ 400   | ≤ 5k   |
| Repeatability  | mm              | ≤ 0.2   | ≤ 0.2  |
| Hysteresis   | mm              | ≤ 1.5   | ≤ 1.5  |
| EMC  | EN              | 60947-5-2   |  |
| Lifetime   |                 | ≥ 35 Mio. cycles with PLC load                                    | Unlimited  |
| Power-up pulse suppression                               |                 | –   | Yes  |
| Protection for inductive load                            |                 | –   | Yes  |
| Mechanical characteristics                               | Unit            | Type RST  | Type EST   |
| Housing  |                 | Plastic / PA66 + PA6I red   |  |
| Cable cross section                                      | mm <sup>2</sup> | 2 x 0.14  | 3 x 0.14   |
| Cable type*  |                 | PUR, black  | PUR, black   |
| Bending radius   | mm              | ≥ 36  | ≥ 30   |
| Weight (Mass)  | kg              | ca. 0.030 RST-K<br>ca. 0.010 RST-S                                | ca. 0.030 EST-K<br>ca. 0.010 EST-S                                     |
| Degree of protection                                     | IP              | 67 to DIN EN 60529  |  |
| Ambient temperature range**                              | °C              | -25°C to +80°C  | -25°C to +75°C<br>at UB=10 – 30 V<br>-25°C to +80°C<br>at UB=10 – 28 V |
| – with adapter   | °C              | -25°C to +60°C  |  |
| Adapter tightening torque                                | Nm              | 0.15 (tightening torque of screwing adapter onto magnetic switch) |  |
| Shock resistance   |                 |   |  |
| Vibration to EN 60068-2-6                                | G               | 15, 11 ms, 10 to 55 Hz, 1 mm                                      |  |
| Shock to EN 60068-2-27                                   | G               | 50, 11 ms   |  |
| Bump to EN 60068-2-29                                    | G               | 30, 11 ms, 1000 bumps each axis                                   |  |

|          |                            |
|----------|----------------------------|
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|          | Weld Immune Sensors        |
|          | Cordset / Connect Block    |
|          | NAMUR Sensors              |
|          | Proximity Sensors          |

**Ordering Information**

| Version   | Voltage         | Type         | Order number   |
|---|-----------------|--------------|----------------|
| Magnetic switch, reed contact, normally open, LED indicator, cable 2 m                        | 10-30 V AC / DC | <b>RST-K</b> | <b>KL 3301</b> |
| Magnetic switch, reed contact, normally open, LED indicator, cable 5 m                        | 10-30 V AC / DC | <b>RST-K</b> | <b>KL 3300</b> |
| Magnetic switch, reed contact, normally open, snap connector M8, LED indicator, cable 0.24 m  | 10-30 V AC / DC | <b>RST-S</b> | <b>KL 3302</b> |
| Magnetic switch, reed contact, normally open, screw connector M8, LED indicator, cable 0.24 m | 10-30 V AC / DC | <b>RST-S</b> | <b>KL 3303</b> |
| Magnetic switch, reed contact, normally closed, cable 5 m                                     | 10-30 V AC / DC | <b>RST-K</b> | <b>KL 3305</b> |
| Magnetic switch, electronic, PNP LED indicator, cable 2 m                                     | 10-30 V DC      | <b>EST-K</b> | <b>KL 3308</b> |
| Magnetic switch, electronic, PNP LED indicator, cable 5 m                                     | 10-30 V DC      | <b>EST-K</b> | <b>KL 3309</b> |
| Magnetic switch, electronic, PNP snap connector M8, LED indicator                             | 10-30 V DC      | <b>EST-S</b> | <b>KL 3312</b> |
| Magnetic switch, electronic, PNP screw connector M8, LED indicator                            | 10-30 V DC      | <b>EST-S</b> | <b>KL 3306</b> |

Included in delivery: 1 magnetic switch  
 1 adapter for dovetail groove mounting

**Accessories**

| Description                              | Type          | Order number   |
|--|---------------|----------------|
| Cable M8, 2.5 m without lock nut         | <b>KS 25</b>  | <b>KY 3240</b> |
| Cable M8, 5.0 m without lock nut         | <b>KS 50</b>  | <b>KY 3241</b> |
| Cable M8, 10.0 m without lock nut        | <b>KS 100</b> | <b>KY 3140</b> |
| Cable M8, 2.5 m with lock nut            | <b>KSG 25</b> | <b>KC 3102</b> |
| Cable M8, 5.0 m with lock nut            | <b>KSG 50</b> | <b>KC 3104</b> |
| Adapter for dovetail groove (pack of 10) |               | <b>KL 3333</b> |

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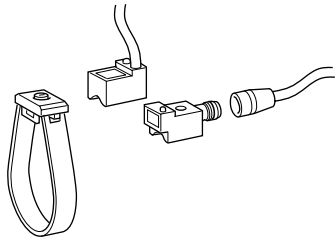
NAMUR  
 Sensors

Proximity  
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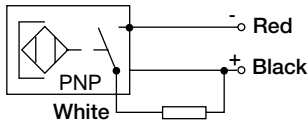
**P1A Series Solid State Sensors**

These sensors are of solid-state type, with no moving parts. Short-circuit and transient protection is incorporated as standard. The integral electronics make these sensors suitable for applications with very high switching frequencies.

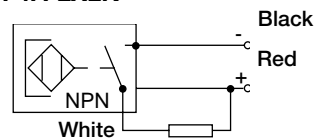


**Wiring connection**

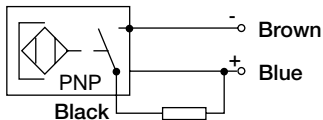
**P1A-2XMK**



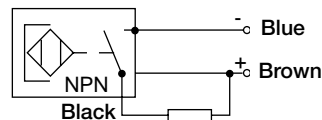
**P1A-2XLK**



**P1A-2XHK, P1A-2XJH**

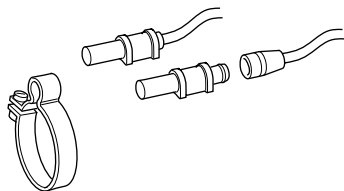


**P1A-2XEK, P1A-2XFH**

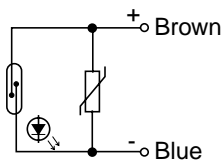


**P1A Series Reed Sensors**

The reed sensors incorporate a well-proven, universal-voltage, compact reed switch element; making them suitable for a wide range of applications. They can work with electronic control systems or conventional relay systems.



**Wiring connection**



**Electronic Sensors**

| Output    | Cable length | Weight (lb) | Part number                |
|-----------|--------------|-------------|----------------------------|
| PNP, N.O. | 2 m          | 0.09        | <b>P1A-2XMK, Rt. angle</b> |
| NPN, N.O. | 2 m          | 0.09        | <b>P1A-2XLK, Rt. angle</b> |
| PNP, N.O. | 2 m          | 0.022       | <b>P1A-2XHK</b>            |
| NPN, N.O. | 2 m          | 0.022       | <b>P1A-2XEK</b>            |
| PNP, N.O. | *            | 0.033       | <b>P1A-2XJH</b>            |
| NPN, N.O. | *            | 0.033       | <b>P1A-2XFH</b>            |

**Mounting Brackets**

| Fits cylinder bore size | Weight (lb) | Part number     |
|-------------------------|-------------|-----------------|
| 10mm                    | 0.01        | <b>P1A-2CCC</b> |
| 12mm                    | 0.01        | <b>P1A-2DCC</b> |
| 16mm                    | 0.0176      | <b>P1A-2FCC</b> |
| 20mm                    | 0.0176      | <b>P1A-2HCC</b> |
| 25mm                    | 0.022       | <b>P1A-2JCC</b> |

**Cable for Sensors**

| Cable length | Weight (lb) | Part number         |
|--------------|-------------|---------------------|
| 3 m          | 0.12        | <b>9126344341**</b> |
| 10 m         | 0.4         | <b>9126344342**</b> |

\* Cable ordered separately

\*\* Cable includes female part connector for sensor

**Electronic Sensors**

| Output        | Cable length | Weight (lb) | Part number     |
|---------------|--------------|-------------|-----------------|
| Making (N.O.) | 3m           | 0.12        | <b>P1A-2XRL</b> |
| Making (N.O.) | *            | 0.004       | <b>P1A-2XSH</b> |

**Mounting Brackets**

| Fits cylinder bore size | Weight (lb) | Part number     |
|-------------------------|-------------|-----------------|
| 10mm                    | 0.004       | <b>P1A-2CCB</b> |
| 12mm                    | 0.005       | <b>P1A-2DCB</b> |
| 16mm                    | 0.006       | <b>P1A-2FCB</b> |
| 20mm                    | 0.009       | <b>P1A-2HCB</b> |
| 25mm                    | 0.010       | <b>P1A-2JCB</b> |

**Cable for Sensors**

| Cable length | Weight (lb) | Part number         |
|--------------|-------------|---------------------|
| 3 m          | 0.12        | <b>9126344341**</b> |
| 10 m         | 0.4         | <b>9126344342**</b> |

\* Cable ordered separately

\*\* Cable includes female part connector for sensor

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**LP/LPM Series Sensors**

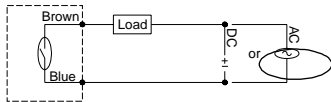
| Bore size      | Reed (Low AMP)    | NPN sinking       | PNP sourcing      |
|----------------|-------------------|-------------------|-------------------|
| 9/16"          | <b>L077030000</b> | <b>L076950000</b> | <b>L076990000</b> |
| 3/4", 1-1/8"   | <b>L077040000</b> | <b>L076960000</b> | <b>L077000000</b> |
| 1-1/2", 2"     | <b>L077050000</b> | <b>L076970000</b> | <b>L077010000</b> |
| 2-1/2", 3", 4" | <b>L077060000</b> | <b>L076980000</b> | <b>L077020000</b> |

**Note:** For sensors with an 8mm connector, replace the last digit with a 'C'. For example: L07696000C.

**Circuits**

**Reed Sensor**

NOTE: Polarity must be observed for DC operation only.



\*Number in parentheses pertains to inductive loads.

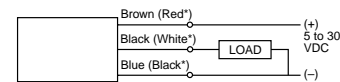
**NPN Sensor – Sinking Output**

Color of Cable ..... Black  
 "On" State Voltage Drop ..... 1.5V Maximum



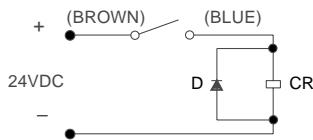
**PNP Sensor – Sourcing Output**

Color of Cable ..... Black  
 "On" State Voltage Drop ..... 1.5V Maximum



**Circuit for Switching Contact Protection (Inductive Loads) – for Reed Sensor Only (Required for proper operation 24V DC)**

Put Diode parallel to load (CR) following polarity as shown below.

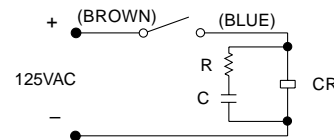


D: Diode: select a Diode with the breakdown voltage and current rating according to the load.

Typical Example – 100 Volt, 1 Amp Diode  
 CR: Relay coil (under 0.5W coil rating)  
 (Recommended for longer life 125 VAC)

\*Wire colors in parentheses pertain to sensors manufactured before 10/15/93.

Put a resistor and capacitor in parallel with the load (CR). Select the resistor and capacitor according to the load.



Typical Example:  
 CR: Relay coil (under 2W coil rating)  
 R: Resistor 1 KΩ – 5 KΩ, 1/4 W  
 C: Capacitor 0.1 μF, 600 V

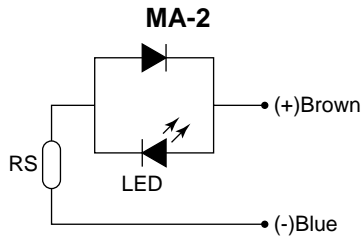
**⚠ Caution**

- Use an ammeter to test reed sensor current. Testing devices such as incandescent light bulbs may subject the reed sensor to high in-rush loads.
- NOTE: When checking an unpowered reed sensor for continuity with a digital ohmmeter the resistance reading will change from infinity to a very large resistance (2 M ohm) when the sensor is activated. This is due to the presence of a diode in the reed sensor.
- Anti-magnetic shielding is recommended for reed sensors exposed to high external RF or magnetic fields.
- The magnetic field strength of the piston magnet is designed to operate with our sensors. Other manufacturers' sensors may not operate correctly in conjunction with these magnets.

- Current capabilities are relative to operational temperatures.
- Use relay coils for reed sensor contact protection.
- The operation of some 120 VAC PLC's (especially some older Allen-Bradley PLC's) can overload the reed sensor. The sensor may fail to release after the piston magnet has passed. This problem may be corrected by the placement of a 700 to 1K OHM resistor between the sensor and the PLC input terminal. Consult the manufacturer of the PLC for appropriate circuit.
- Sensors with long wire leads (greater than 15 feet) can cause capacitance build-up and sticking will result. Attach a resistor in series with the reed sensor (the resistor should be installed as close as possible to the sensor). The resistor should be selected such that R (ohms) >E/0.3.

**PRNA Sizes 3 to 30 Sensors**

**Fixed position sensor**



**Variable position sensor**

| Size | Part number |
|------|-------------|
| 1    | FR-1PRN     |
| 3    | FR-3PRN     |
| 10   | FR-10PRN    |
| 20   | FR-20PRN    |
| 30   | FR-30PRN    |

**Model code and ordering information**

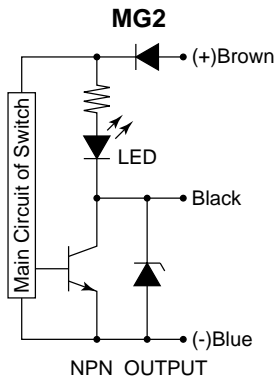
Example: SR20 - 180 - 90

| SR | 20          | 180             | 90                     |
|----|-------------|-----------------|------------------------|
|    | <b>Size</b> | <b>Rotation</b> | <b>Reference point</b> |
|    | 3           | 090 90°         | 45 45°                 |
|    | 10          | 100 100°        | 90 90°                 |
|    | 20          | 180 180°        |                        |
|    | 30          | 270 270°        |                        |

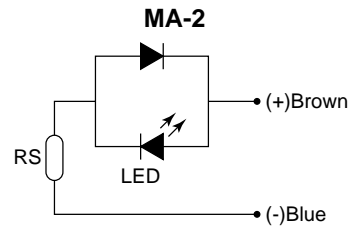
**B**  
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 Cordset / Connect Block  
 NAMUR Sensors  
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**PRN Sizes 50 to 800 Sensors**

**Solid state sensors**



**Reed sensors**



**Model code and ordering information**

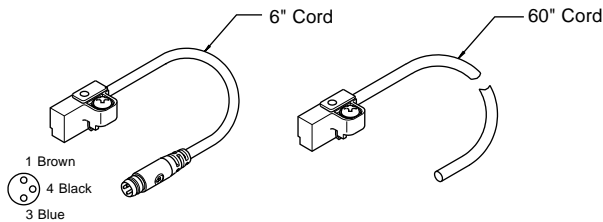
Example: FM50 - 90 - 45 - MA 2

| FM | 50          | 90              | 45                     | MA                 | 2                     |
|----|-------------|-----------------|------------------------|--------------------|-----------------------|
|    | <b>Size</b> | <b>Rotation</b> | <b>Reference point</b> | <b>Sensor type</b> | <b>Number sensors</b> |
|    | 50          | 090 90°         | 45 45°                 | MA Reed            | 2 Standard            |
|    | 150         | 180 180°        | 90 90°                 | MG Solid State     |                       |
|    | 300         | 270 270°        |                        |                    |                       |
|    | 800         |                 |                        |                    |                       |

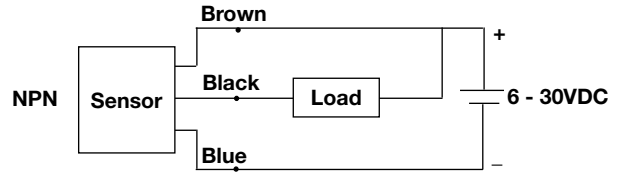
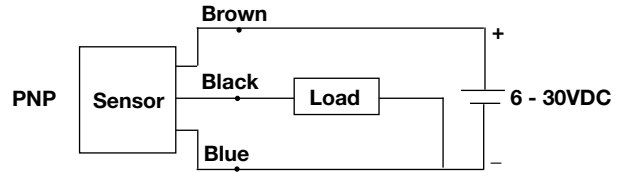


**Solid State (Hall Effect) Sensors**

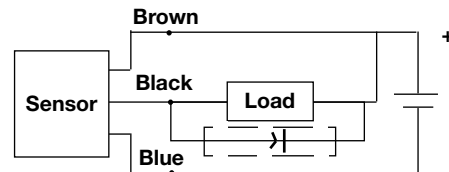
| Type | LED color | Logic | Cable/Connector            | Part number    |
|------|-----------|-------|----------------------------|----------------|
| N.O. | Green     | PNP   | 1.5m black with leads      | <b>SMH-1P</b>  |
| N.O. | Red       | NPN   |                            | <b>SMH-1N</b>  |
| N.C. | Yellow    | PNP   |                            | <b>SMC-1P</b>  |
| N.C. | White/Red | NPN   | 0.15m black with connector | <b>SMC-1N</b>  |
| N.O. | Green     | PNP   |                            | <b>SMH-1PC</b> |
| N.O. | Red       | NPN   |                            | <b>SMH-1NC</b> |
| N.C. | Yellow    | PNP   | <b>SMC-1PC</b>             |                |
| N.C. | White/Red | NPN   | <b>SMC-1NC</b>             |                |



**Wiring connection**



**Protection circuit\***



\* When connecting an inductive load (relay, solenoid valve, etc.), a protection circuit is recommended. Use a 100V, 1A diode. (NPN connection shown.)

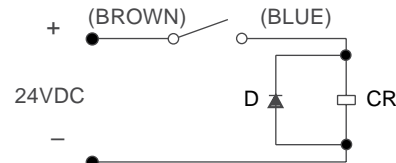
**Reed Sensors**

Reed sensors are available in a normally open or normally closed configuration. The low amp sensor is suitable for connection to PLCs or other low current devices. The high amp sensor can be used to drive sequencers, relays, coils, or other devices directly.

| Type | LED color | Rating   | Cable/Connector           | Part number   |
|------|-----------|----------|---------------------------|---------------|
| N.O. | Green     | High Amp | 1.5m Gray with Leads      | <b>SMR-1</b>  |
| N.O. | Red       | Low Amp  |                           | <b>SMR-1L</b> |
| N.C. | Yellow    | Low Amp  | 0.15m Gray with Connector | <b>SMD-1L</b> |
| N.O. | Green     | High Amp |                           | <b>SMR-1C</b> |
| N.O. | Red       | Low Amp  | <b>SMR-1LC</b>            |               |
| N.C. | Yellow    | Low Amp  | <b>SMD-1LD</b>            |               |

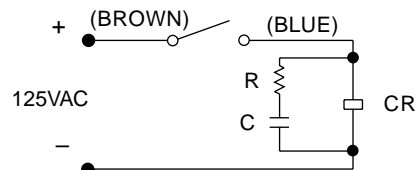
**Integral circuit for switching contact protection**

(Required for proper operation 24V DC)  
 Put Diode parallel to load (CR) with polarity as shown below.



D: Diode: select a Diode with the breakdown voltage and current rating according to the load.  
 CR: Relay coil (under 0.5 W coil rating)

(Recommended for longer sensor life 125V AC)  
 Put resistor and capacitor parallel to load (CR).

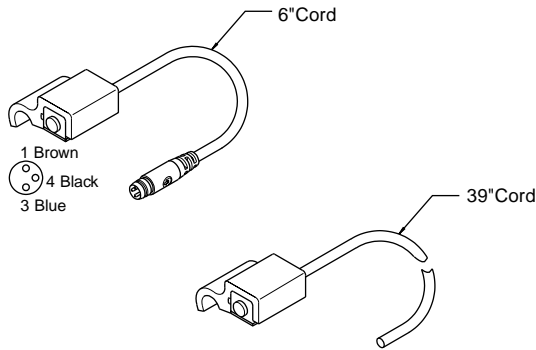


CR: Relay coil (under 2 W coil ratings)  
 R: Resistor under 1 K ohm  
 C: Capacitor 0.1 µF

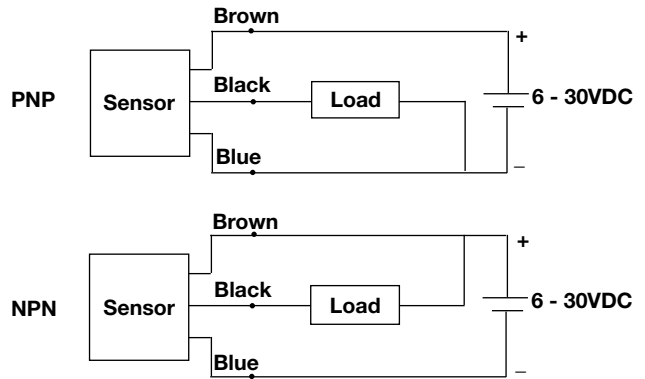
**Solid State (Hall Effect) Sensors**

| PTR model | PNP                        |                          | NPN                        |                          |
|-----------|----------------------------|--------------------------|----------------------------|--------------------------|
|           | With 6" male quick connect | With 39" potted-in leads | With 6" male quick connect | With 39" potted-in leads |
| 10        | SWH-1PC                    | SWH-1P                   | SWH-1NC                    | SWH-1N                   |
| 15        | SWH-1PC                    | SWH-1P                   | SWH-1NC                    | SWH-1N                   |
| 20        | SWH-2PC                    | SWH-2P                   | SWH-2NC                    | SWH-2N                   |
| 25        | SWH-2PC                    | SWH-2P                   | SWH-2NC                    | SWH-2N                   |
| 32        | SWH-2PC                    | SWH-2P                   | SWH-2NC                    | SWH-2N                   |

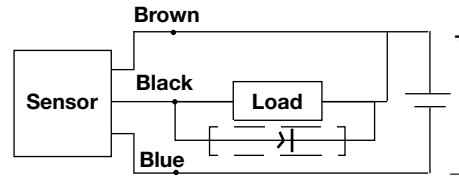
Note: Sensors with male quick connect option require female cordsets to be ordered separately. Please reference catalog 0900P-E, page M22.



**Wiring connection**



**Protection circuit\***



\* When connecting an inductive load (relay, solenoid valve, etc.), a protection circuit is recommended. Use a 100V, 1A diode. (NPN connection shown.)

**Reed Sensors**

| PTR model | With 6" male quick connect | With 39" potted-in leads |
|-----------|----------------------------|--------------------------|
| 10        | SWR-1C                     | SWR-1                    |
| 15        | SWR-1C                     | SWR-1                    |
| 20        | SWR-2C                     | SWR-2                    |
| 25        | SWR-2C                     | SWR-2                    |
| 32        | SWR-2C                     | SWR-2                    |

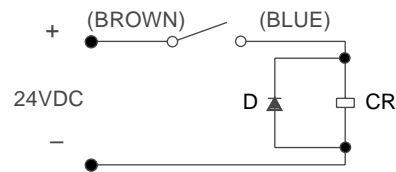
Sensors with male quick connect option require female cordsets to be ordered separately.

Note: Please reference catalog 0900P-E, page M22

**Protection circuit (Inductive loads)**

(Required for proper operation 24VDC)

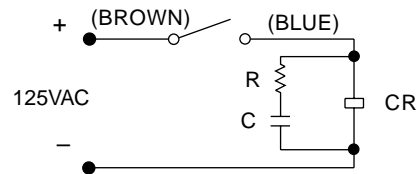
Select a diode with a breakdown voltage and current rating according to the load (CR). Place a diode in parallel to the load with the polarity as indicated:



CR: Relay coil (under 0.5W coil rating)

(Recommended for longer sensor life 125VAC)

Select a resistor and capacitor according to the load (CR). Place a resistor and capacitor in parallel to the load:



CR: Relay coil (under 2W coil rating)

R: Resistor under 1 K ohm

C: Capacitor 0.1 μF

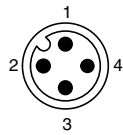
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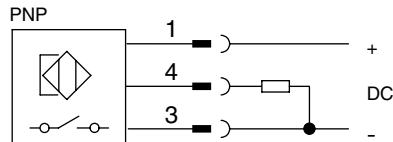
**Weld Immune Sensors**



- Weld immune in all welding applications (AC, DC and medium frequency welding).
- Sensor locks the output during the welding process; when welding process stops, the sensor updates the output accordingly.
- NOTE: Tie rod construction of the P1D Series can be ordered directly in the model code.

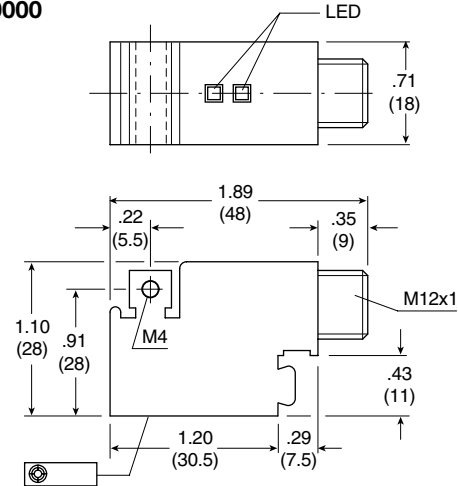


| Pin | Function                 |
|-----|--------------------------|
| 1   | Operating voltage (+VDC) |
| 4   | Output signal (N.O.)     |
| 3   | -VDC                     |
| 2   | Not used                 |

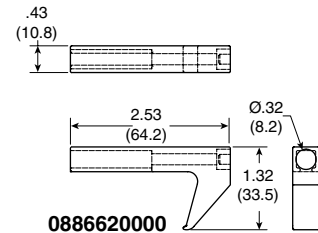


| Description         | Part number       |
|---------------------|-------------------|
| Weld immune sensor  | <b>0886600000</b> |
| Tie rod bracket kit | <b>0886620000</b> |

**0886600000**



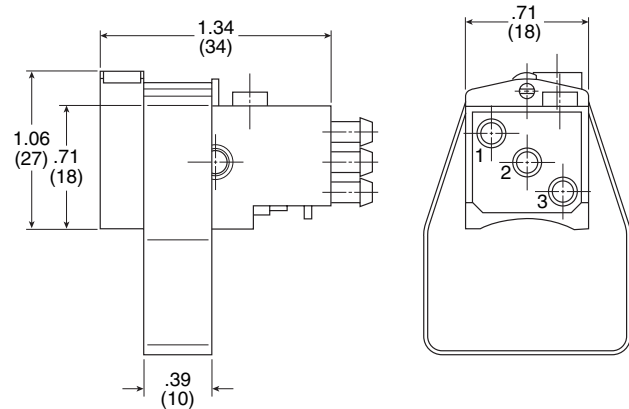
**0886620000**



**Air Piloted Switch**

| Features                  |  |
|---------------------------|--|
| Type                      | 3/2 valve - NC, 2-position / spring return 3-way                   |
| Applicable series         | AZ, AZV  |
| Construction materials    |  |
| Body                      | Macrolon, glass fiber  |
| Mounting bracket          | Aluminum, anodized   |
| Connection                | 3 - 3mm OD barbs   |
| Characteristics           |  |
| Operating temperature     | 14°F to 140°F (-10°C to +60°C)                                     |
| Operating pressure        | 30 PSI to 90 PSI (2 bar to 6 bar)                                  |
| Normal operating pressure | 90 PSI (6 bar)   |
| Flow                      | 0.04 Cv (40 l/min)   |
| Cycle rate                | 40 hz  |
| Switching accuracy        | ± 0.008" (0.2 mm) w/o air  |
| Filtration                | 40 micron  |
| Media                     | Filtered and regulated compressed air                              |
| Installation              | In any position  |
| Weight                    | Sensor 0.49 ozs (0.014 Kg)<br>Sensor & bracket 0.99 Ozs (0.028 Kg) |

| Description       | Part number    |
|-------------------|----------------|
| Sensor – Air type | <b>KZ 2364</b> |
| Mounting bracket  | <b>KZ 8255</b> |

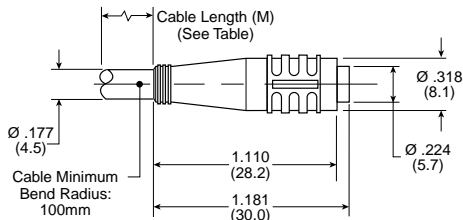


**8mm Cordset with Female Quick Connect**

A female connector is available for all sensors with the male 8mm quick connect option. The male plug will accept a snap-on or threaded connector. Cordset part numbers are listed below:

| Cable length | Threaded connector | Snap on connector |
|--------------|--------------------|-------------------|
| 5 meters     | <b>086620T005</b>  | <b>086620S005</b> |
| 2 meters     | <b>086620T002</b>  | <b>086620S002</b> |

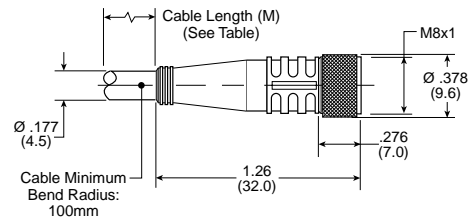
**Snap-On Straight Connector**



**Cordset Specifications**

Connector ..... Oil resistant polyurethane body material, PA 6 (Nylon) contact carrier, spacings to VDE 0110 Group C, (150 AC/DC)  
 Contacts .....Gold plated beryllium copper, machined from solid stock  
 Coupling Method..... Snap-Lock or chrome plated brass nut  
 Cord Construction ..... Oil resistant black PUR jacket, non-wicking, non-hygroscopic, 300V.  
 Cable end is stripped and tinned.  
 Conductors .....Extra high flex stranding, PVC insulation  
 Temperature ..... -40 to 194°F (-40 to 90°C)  
 Protection..... NEMA 1, 3, 4, 6P and IEC 1P67  
 Cable Length..... 6.56 ft (2m) or 16.4 ft (5m)

**Threaded Straight Connector**



**12mm Cordset with Female Quick Connect**

**M12 Straight connector**

| Cable length | Part number       |
|--------------|-------------------|
| 5 meters     | <b>9126487205</b> |
| 2 meters     | <b>9126487202</b> |

**M12 Right angle Connector**

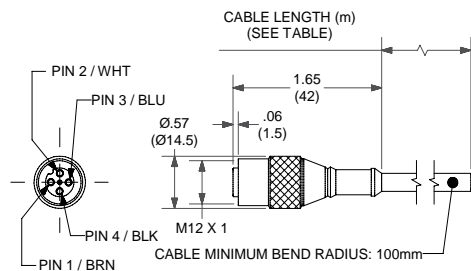
| Cable length | Part number       |
|--------------|-------------------|
| 5 meters     | <b>9126487205</b> |
| 2 meters     | <b>9126487202</b> |

A female connector is available for all sensors with the male 12mm quick connect option. The cordsets are available with a right angle or straight connector. Cordset part numbers are listed above.

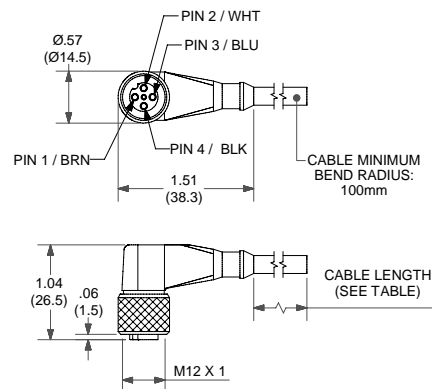
**Cordset Specifications**

Connector ..... Polyvinylchloride (PVC) body material, PVC contact carrier, spacing to VDE 0110 Group C, (250VAC / 300VDC)  
 Contacts ..... Gold Plated Copper Tin (CuSn), stamped from stock.  
 Coupling Method..... Threaded nut: Chrome plated brass.  
 Cord Construction ..... PVC non-wicking, non-hygroscopic, 250VAC / 300VDC. Cable end is stripped.  
 Conductors ..... Extra high flex stranding with PVC insulation  
 Temperature ..... -13°F to 158°F (-25°C to 70°C)  
 Protection..... NEMA 1, 3, 4, 6P and IEC 1P67  
 Cable Length..... 6.56 ft (2m) or 16.4 ft (5m)

**Straight Connector**



**Right Angle Connector**



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**NAMUR Intrinsically Safe Sensors**



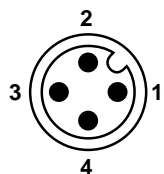
**For Tie Rod Style Cylinders**

| Sensor description  | Part number      |
|---|------------------|
| Fits 1-1/8" to 4" bore and 32-100mm bore (2m flying lead) | <b>089779001</b> |
| Fits 1-1/8" to 4" bore and 32-100mm bore (12mm connector) | <b>089779002</b> |
| Fits 5" to 6" bore and 125-160mm bore (2m flying lead)    | <b>089779003</b> |
| Fits 5" to 6" bore and 125-160mm bore (12mm connector)    | <b>089779004</b> |
| Fits 8" bore and 200mm bore (2m flying lead)              | <b>089779005</b> |
| Fits 8" bore and 200mm bore (12mm connector)              | <b>089779006</b> |

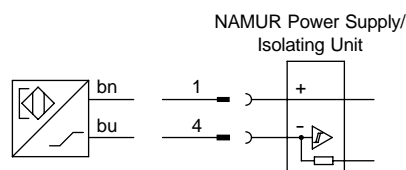
**Specifications**

|                                      |  |
|--------------------------------------|--|
| Electrical configuration.....        | NAMUR 2-wire                           |
| Output function .....                | NAMUR                                  |
| Supply voltage.....                  | 5-25 VDC                               |
| Response sensitivity .....           | ≤ 30 Gauss                             |
| Switching frequency .....            | 5 kHz                                  |
| Switching output .....               | Control current dependent on switching |
| Residual ripple.....                 | ≤ 5% of supply voltage                 |
| Power consumption, attenuated.....   | ≥ 2.5mA                                |
| Power consumption, unattenuated..... | ≤ 1mA                                  |
| Internal capacitance .....           | ≤ 15nF                                 |
| Internal inductance .....            | ≤ 25 μH                                |
| Cable resistance.....                | ≤ 50 Ohm                               |
| Hysteresis.....                      | ≤ 1mm                                  |
| Repeatability.....                   | ≤ 0.1mm                                |
| EMC.....                             | EN 60 947-5-6                          |
| Short circuit protected.....         | Yes                                    |
| Reverse polarity protected.....      | Yes                                    |
| Enclosure rating.....                | IP67                                   |
| Shock/vibration stress .....         | 30 g, 11ms, 10-55 Hz, 1mm              |
| Operating temperature .....          | -25°C to +70°C (-13°F to +158°F)       |
| Housing material.....                | Aluminum, plastic                      |
| Connector cable.....                 | PVC with flying leads (shown)          |
| Connector (option).....              | M12 connector                          |
| Classification .....                 | TÜV 99 ATEX 1398 II 2G EEx ib IIC T6   |

**Wiring connection**



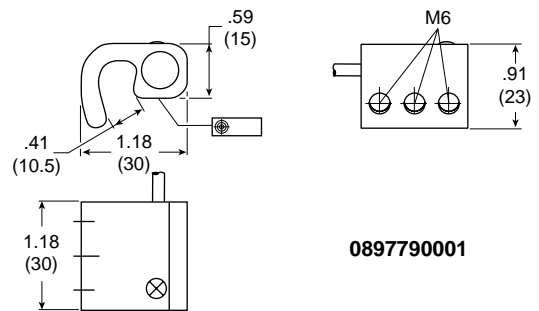
| Pin | Wire  | Function                 |
|-----|-------|--------------------------|
| 1   | Brown | Operating voltage (+VDC) |
| 4   | Blue  | -VDC                     |
| 2   |       | Not used                 |
| 3   |       | Not used                 |



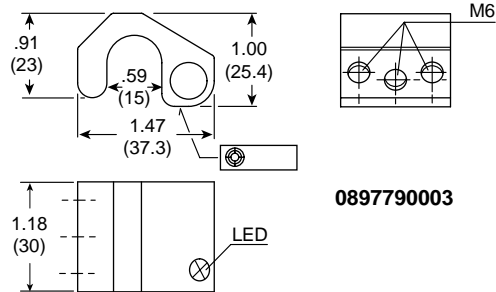
**Data for connecting power supplies or other approved isolating amplifiers:**

|                                   |         |
|-----------------------------------|---------|
| Short circuit current 1Kmax ..... | ≤ 30mA  |
| No load voltage .....             | ≤ 16VDC |
| Power loss .....                  | ≤ 75mW  |

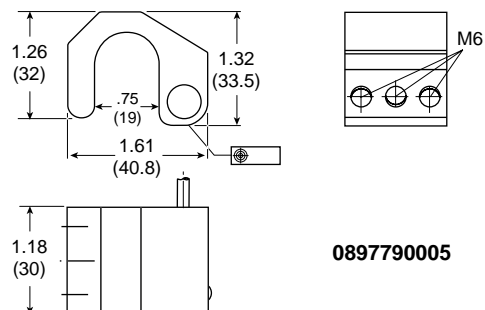
Note: Intrinsically safe solutions must include a NAMUR Power Supply



**0897790001**



**0897790003**



**0897790005**

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**NAMUR Intrinsically Safe Sensors**



**For Round Body Cylinders**

| Description                                       | Part number       |
|---|-------------------|
| NAMUR Sensor for round body cylinder              | <b>0897790007</b> |
| Bracket for 18-29mm (0.71"-1.14") outer diameter  | <b>0897800001</b> |
| Bracket for 28-39mm (1.10"-1.54") outer diameter  | <b>0897800002</b> |
| Bracket for 38-49mm (1.50"-1.93") outer diameter  | <b>0897800003</b> |
| Bracket for 48-59mm (1.89"-2.32") outer diameter  | <b>0897800004</b> |
| Bracket for 58-69mm (2.28"-2.72") outer diameter  | <b>0897800005</b> |
| Bracket for 68-79mm (2.68"-3.11") outer diameter  | <b>0897800006</b> |
| Bracket for 88-99mm (3.46"-3.90") outer diameter  | <b>0897800007</b> |
| Bracket for 98-109mm (3.86"-4.29") outer diameter | <b>0897800008</b> |

**Specifications**

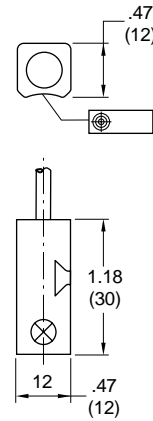
|                                      |  |
|--------------------------------------|--|
| Electrical configuration.....        | NAMUR 2-wire                           |
| Output function .....                | NAMUR                                  |
| Supply voltage.....                  | 5-25 VDC                               |
| Response sensitivity .....           | ≤ 30 Gauss                             |
| Switching frequency .....            | 5 kHz                                  |
| Switching output .....               | Control current dependent on switching |
| Residual ripple.....                 | ≤ 5% of supply voltage                 |
| Power consumption, attenuated.....   | ≥ 2.5mA                                |
| Power consumption, unattenuated..... | ≤ 1mA                                  |
| Internal capacitance .....           | ≤ 15nF                                 |
| Internal inductance .....            | ≤ 25 μH                                |
| Cable resistance.....                | ≤ 50 Ohm                               |
| Hysteresis.....                      | ≤ 1mm                                  |
| Repeatability.....                   | ≤ 0.1mm                                |
| EMC.....                             | EN 60 947-5-6                          |
| Short circuit protected.....         | Yes                                    |
| Reverse polarity protected.....      | Yes                                    |
| Enclosure rating.....                | IP67                                   |
| Shock/vibration stress .....         | 30 g, 11ms, 10-55 Hz, 1mm              |
| Operating temperature .....          | -25°C to +70°C (-13°F to +158°F)       |
| Housing material.....                | Aluminum, plastic                      |
| Connector cable.....                 | PVC with flying leads (shown)          |
| Classification .....                 | TÜV 99 ATEX 1398 II 2G EEx ib IIC T6   |

**Data for connecting power supplies or other approved isolating amplifiers:**

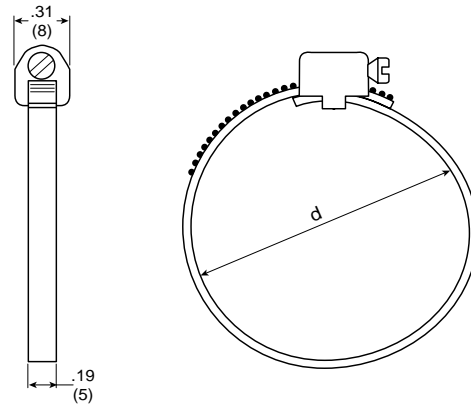
|                                   |         |
|-----------------------------------|---------|
| Short circuit current 1Kmax ..... | ≤ 30mA  |
| No load voltage .....             | ≤ 16VDC |
| Power loss .....                  | ≤ 75mW  |

Note: Intrinsically safe solutions must include a NAMUR Power Supply

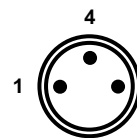
0897790007



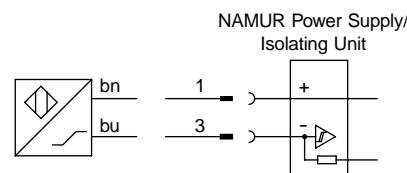
**Round Body Brackets**



**Wiring connection**



| Pin | Wire  | Function                 |
|-----|-------|--------------------------|
| 1   | Brown | Operating voltage (+VDC) |
| 3   | Blue  | -VDC                     |
| 4   |       | Not used                 |



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**NAMUR Sensor Power Supply**



**For All NAMUR Sensors**

| Supply voltage | Part number       |
|----------------|-------------------|
| 115VAC         | <b>0897810001</b> |
| 230VAC         | <b>0897810002</b> |
| 24VDC          | <b>0897810003</b> |

- Reliable DC-decoupling between input, output and supply voltage in accordance with VDE 0100 Part 410
- 2-channel with one relay output SPDT respectively
- Intrinsically safe inputs complying with [EEx 1a] IIC
- Housing with snap fastening for support rail DIN 46277

**Specifications**

Supply voltage..... 115 VAC (p/n 0897810001)  
 230 VAC (p/n 0897810002)  
 24 VDC (p/n 0897810003)

Mains frequency .....48-62 Hz

Switching frequency .....≤ 20 Hz

Power consumption per channel .....Approximately 1.5 VA  
 Approximately 0.7 W only for p/n 0897810003

Inputs .....2 sensors

No load voltage .....8.5 VDC

Short circuit current .....≥ 6mA

Permissible external capacitance..... ≤ 567nF

Permissible external inductance..... ≤ 5 mH

Switching outputs..... 1 relay per input: SPDT

Switching voltage ..... ≤ 250 VAC

Switching current.....≤ 5 A

Switching output ..... ≤ 100 VA

Permit.....PTB no. Ex-95.C.2003X

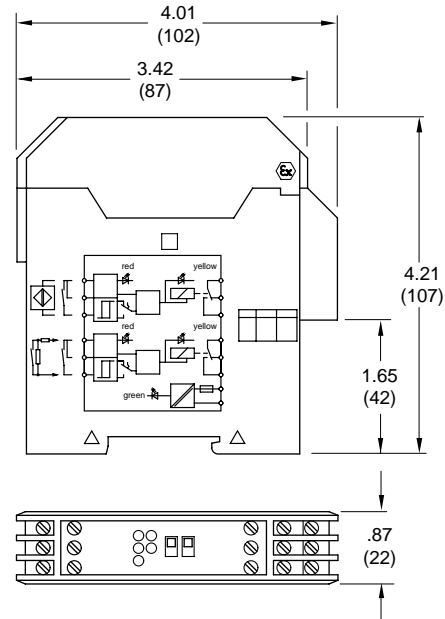
VDE protection class ..... I

Enclosure rating..... IP20

Operating temperature ..... -25°C to +60°C (-13°F to +140°F)

Approximate weight.....250g (8.8 oz.)

Housing material.....Plastic



**B**

**Electronic Sensors**  
**Actuator Products**

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**Guide**

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**Solid State /**  
**Reed Sensors**

**Weld Immune**  
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**Cordset /**  
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**Proximity**  
**Sensors**



**End-of-Stroke Proximity Sensors**

**Ordering information**

| Sensor type           | Inductive proximity |                   |                   | Non-contacting magnetically actuated |                   |
|-----------------------|---------------------|-------------------|-------------------|--------------------------------------|-------------------|
| Style                 | EPS-7               | EPS-5             | EPS-6             | CLS-1                                | CLS-4             |
| Sensor part number    | <b>148897****</b>   | <b>146617****</b> | <b>148896****</b> | <b>148275****</b>                    | <b>149109****</b> |
| 6' Cable              | <b>0853550006</b>   | <b>0853550006</b> | <b>0859170006</b> | <b>0853550006</b>                    | —                 |
| 12' Cable             | <b>0853550012</b>   | <b>0853550012</b> | <b>0859170012</b> | <b>0853550012</b>                    | —                 |
| 6' Cable, right angle | <b>0875470006</b>   | <b>0875470006</b> | —                 | <b>0875470006</b>                    | —                 |

\*\*\*\* Part number suffix: \*\*\*\* 4-digit suffix indicates probe length: 0125=1.25", 0206=2.06", 0288=2.875", 0456=4.562"

**Specifications**

| Style                    | EPS-7   | EPS-5                                      | EPS-6   | CLS-1  | CLS-4   |
|--------------------------|---|--|---|--|---|
| Code designator          | H   | R  | D   | F  | B   |
| Sensor type              | Inductive proximity   | Inductive proximity                        | Inductive Proximity   | Non-contacting magnetically actuated   | Non-contacting magnetically actuated  |
| Description              | Economical, General Purpose, 2 wire device, primarily for AC applications, not suitable for 24 VDC applications. Use EPS-5 only for automotive industry customers who specify them. |  | Economical, General Purpose, 3 wire, DC sensor, dual output: sinking and sourcing | Functional replacement for AB (Mechanical) Limit Switches in many applications, or where customer needs NC contacts, zero leakage, zero voltage drop, higher or lower load current than EPS-style. | Functional replacement for AB (Mechanical) Limit Switches in many High Temperature applications, or where customer needs NC contacts, zero leakage, zero voltage drop, higher or lower load current than EPS-style. |
| Supply voltage           | 20 to 250 VAC/DC  | 20 to 230 VAC/DC                           | 10 to 30 VDC  | 24 to 240 VAC/DC   | 24 to 240 VAC/DC  |
| Load current, min        | 8 mA  | 5 mA                                       | NA  | NA   | NA  |
| Load current, max        | 300 mA  | 500 mA                                     | 200 mA  | 4 AMPS @ 120 VAC<br>3 AMPS @ 24 VDC  | 4 AMPS @ 120 VAC<br>3 AMPS @ 24 VDC   |
| Leakage current:         | 1.7 mA, max.  | 1.7 mA, max.                               | 10 micro amps max.  | —  | —   |
| Voltage drop             | 7 V, max.   | 10 V, max                                  | 2 VDC max.  | NA   | NA  |
| Operating temperature    | -14° to 158° F  | -4° to 158° F                              | -14° to 158° F  | -40°F to 221° F  | -40° F to 400° F  |
| Connection               | 3-pin mini  | 3-pin mini                                 | 5-pin mini  | 3-pin mini   | 144" PTFE coated flying leads with 1/2" conduit hub   |
| Enclosure rating         | IEC IP67  | NEMA 4, 6, 12, 13                          | IEC IP67  | NEMA 1, 2, 3, 4, 4x, 5, 6, 6P, 11, 12, 12K, 13   | NEMA 1, 2, 3, 4, 4x, 5  |
| Led indication           | Yes   | Yes  | Yes   | No   | No  |
| Short circuit protection | Yes   | Yes  | Yes   | No   | No  |
| Weld field immunity      | Yes   | Yes  | Yes   | Yes  | Yes   |
| Output                   | 2 wire, Normally Open with leakage current  | 2 wire, Normally Open with leakage current | Dual output: DC Sinking and DC Sourcing, user selectable via wiring               | SPDT (Single pole double throw), Normally Open/Normally Closed, Form C   | SPDT (Single pole double throw), Normally Open/ Normally Closed, Form C   |
| Approvals / marks        | CE, UL, CSA   | UL   | CE, UL, CSA   | UL or CSA  | UL or CSA   |
| Make / break location    | 0.125" from end of stroke, typical. Tolerance is 0/-0.125"  |  |   |  |   |
| Wiring instructions      | Pin 1: AC ground (Green)  | Pin 1: AC ground (Green)                   | Pin 1: +10 to 30 VDC (White)  | Pin 1: Common (Green)  | Common: (Black)   |
|                          | Pin 2: Output (Black)   | Pin 2: Output (Black)                      | Pin 2: Sourcing output (Red)  | Pin 2: Normally Closed (Black)   | Normally Open: (Blue)   |
|                          | Pin 3: AC line (White)  | Pin 3: AC line (White)                     | Pin 3: Grounded (not connected or required)                                       | Pin 3: Normally Open (White)   | Normally Closed: (Red)  |
|                          |   |  | Pin 4: Sinking output (Orange)  |  |   |
|                          |   |  | Pin 5: DC common (Black)  |  |   |

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**Electronic Sensors**  
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**Series and Parallel Wiring**

When Parker EPS-5, 6 or 7 proximity sensors are used as inputs to programmable controllers, the preferred practice is to connect each sensor to a separate input channel of the PC. Series or parallel operations may then be accomplished by the internal PC programming.

Parker EPS-5, 6 or 7 sensors may be hard wired for series operation, but the voltage drop through the sensors (see specifications) must not reduce the available voltage below what is needed to actuate the load.

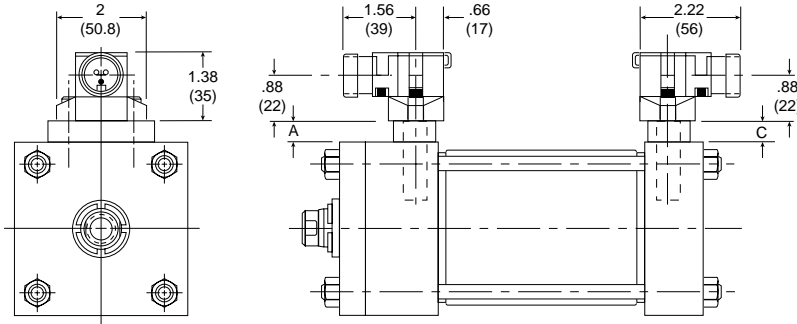
Parker EPS-5, 6 or 7 sensors may also be hard wired for parallel operation. However, the leakage current of each sensor will pass through the load. The total of all leakage currents must not exceed the current required to actuate the load. In most cases, the use of two or more EPS-5, 6 or 7 sensors in parallel will require the use of a bypass (shunt) resistor.

**EPS-5**  
**Automotive Applications**

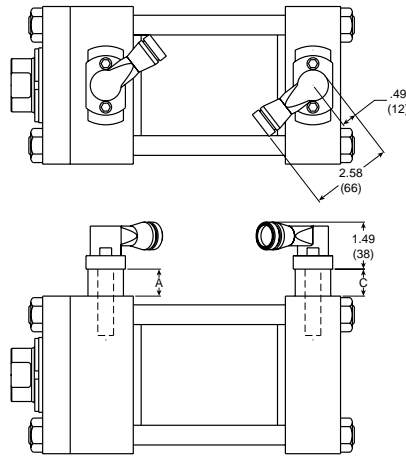
(Meets some Automotive Manufacturer's Specifications)

| Series              | A max. | C max. |
|---------------------|--------|--------|
| 2A,<br>4MA,<br>4MAJ | 1.55"  | 1.30"  |

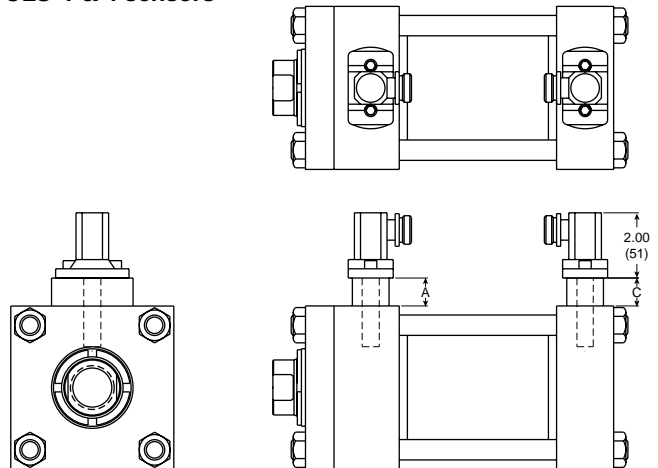
For exact dimensions, see Bulletin 0840-G-E1



**EPS-7 & EPS-6 sensors**

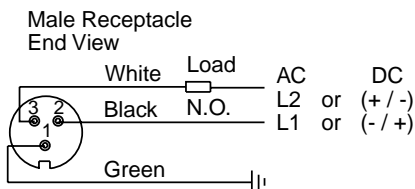


**CLS-1 & 4 sensors**

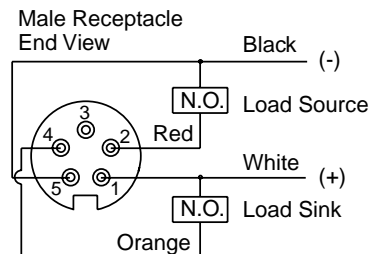


**Connector pin numbering**

**3-pin mini**



**5-pin mini**



**How to Specify EPS Sensors**

Parker EPS proximity sensors may be ordered on 2A, 2AN, 4MA and 4MAJ Series cylinders as follows:

- 1) Complete the basic cylinder model number.
- 2) Place an "S" in the model number to denote sensors and/or special features.
- 3) Mounting styles D, DB, JB, or HB should be used with caution because of possible mounting interferences. Consult bulletin 0840-G-E1 for additional information.
- 4) Special modifications to cylinders other than sensors must have a written description.

- 5) Specify letter prefix "H" for EPS-7, "D" for EPS-6, "R" for EPS-5, "F" for CLS-1, or "B" for CLS-4, then fill in the four fields specifying port location, sensor orientation and actuation point for both head and cap. If only one sensor is used, place "XXXX" in the unused fields.

Example = H13CGG-XXXX denotes a sensor on the head end only, EPS-7

Example = BXXXX-42BGG denotes a sensor on the cap end only, CLS-4

**Head end**

| R                         | 1             | 3               | A                                      | GG   |
|---------------------------|---------------|-----------------|--|--|
| Specify:                  | Port Location | Sensor Location | Sensor Orientation                     | Actuation Point                              |
| R = EPS-5                 | See Figure 1. | See Figure 1.   | See Figure 2 for EPS-7 and EPS-6 only. | GG = End of Stroke                           |
| H = EPS-7                 |               |                 |  | See Bulletin 0840-G-E1 for stroke remaining. |
| D = EPS-6                 |               |                 |  |  |
| F = CLS-1                 |               |                 |  |  |
| B = CLS-4                 |               |                 |  |  |
| N = Prep for sensors only |               |                 |  |  |

**Cap end**

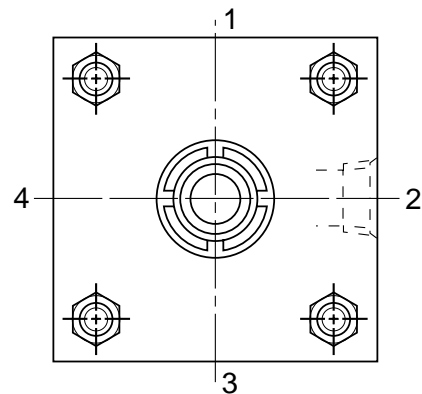
| 4             | 2               | B                                      | GG   |
|---------------|-----------------|--|--|
| Port Location | Sensor Location | Sensor Orientation                     | Actuation Point                              |
| See Figure 1. | See Figure 1.   | See Figure 2 for EPS-7 and EPS-6 only. | GG = End of Stroke                           |
|               |                 |  | See Bulletin 0840-G-E1 for stroke remaining. |

Note: All specified sensor and port locations are as seen from rod end of cylinder.

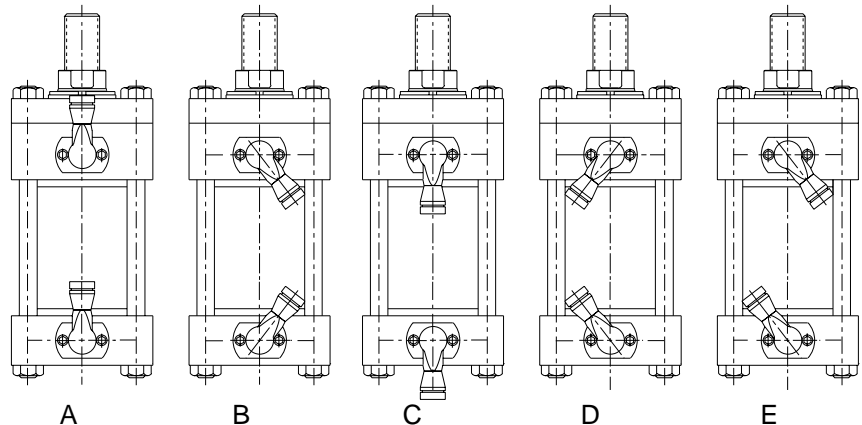
\*EPS-5 sensors will be oriented so that the connectors face each other.

\*\*Consult the Wadsworth, Ohio facility for this option with 4MA and 4MAJ Series cylinders.

**Figure 1**



**Figure 2**



**Example:**

4.00 CJ4MAUS14AC 12.000  
 S = H13CGG-13CGG

**B**  
**Electronic Sensors**  
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Solid State / Reed Sensors

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Weld Immune Sensors

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Cordset / Connect Block

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NAMUR Sensors

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Proximity Sensors



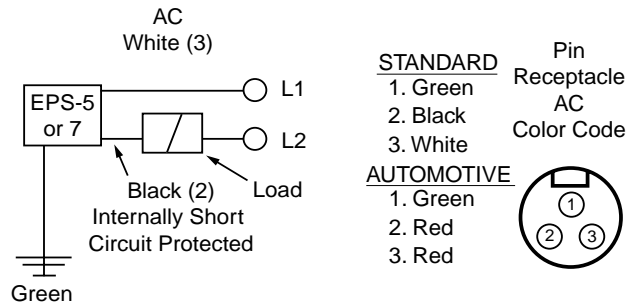
**EPS-5 & EPS-7**

**Connectors**

The male quick disconnect on the Parker EPS-5 or 7 is a Brad Harrison 40909 connector.

Female connects must be purchased with one of the following cable lengths.

| Cable length | Part number      |                   |
|--------------|------------------|-------------------|
|              | Automotive       | Standard          |
| 3'           | <b>085356003</b> | <b>0853550003</b> |
| 6'           | <b>085356006</b> | <b>0853550006</b> |
| 9'           | <b>085356009</b> | —                 |
| 12'          | <b>085356012</b> | <b>0853550012</b> |



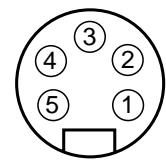
**EPS-6**

**Connectors**

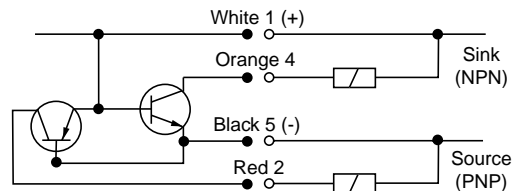
The male quick disconnect on the Parker EPS-6 is a Brad Harrison 41310 connector.

**Plug Pin and Cable Identification**

- 1) +10 to 30 VDC (White)
- 2) Source (Red)
- 3) Grounded not connected nor required
- 4) Sink (Orange)
- 5) Common (Black)



| Cable length | Part number       |
|--------------|-------------------|
| 3            | <b>0859170003</b> |
| 6            | <b>0859170006</b> |
| 12           | <b>0859170012</b> |



| LED Function              | "Ready" | "Target" |
|---------------------------|---------|----------|
| Power Applied (No Target) | ON      | OFF      |
| Target Present            | OFF     | ON       |
| Short Circuit Condition   | FLASH   | FLASH    |

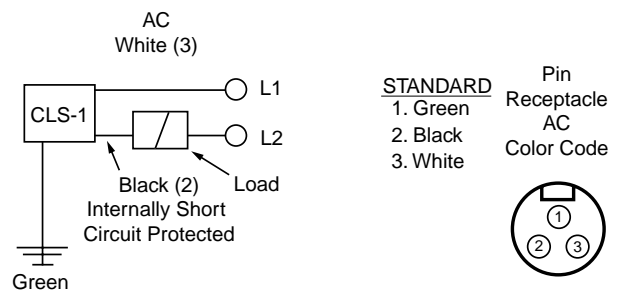
**CLS**

**Connectors**

The male quick disconnect on the Parker CLS-1 is a Brad Harrison 40909 connector.

Female connects must be purchased with one of the following cable lengths.

| Cable length | Part number       |
|--------------|-------------------|
| 3'           | <b>0853550003</b> |
| 6'           | <b>0853550006</b> |
| 9'           | —                 |
| 12'          | <b>0853550012</b> |



The connection for the CLS-4 are 144" PTFE insulated flying leads with 1/2" conduit hub. 3-wire: Common (black), Normally open (blue), and Normally closed (red).

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Proximity  
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**PTR and HP Series Proximity Sensors**

The inductive type proximity sensor provides end of rotation indication. The non-contact probe senses the presence of the ferrous cushion spear and has no springs, plungers, cams or dynamic seals that can wear out or go out of adjustment. The sensor is solid state and meets NEMA 3, 4, & 13 specifications. For ease of wiring, the connector housing is rotatable through 360°. To rotate, lift the cover latch, position, and release.

A standard proximity sensor controls 20-230 VAC/DC loads from 5 to 500 mA. The low 1.7 mA off-state leakage current can allow use for direct PLC input. The standard short circuit protection (SCP) protects the sensor from a short in the load or line upon sensing such a condition (5 amp or greater current) by assuming a non-conductive mode. The fault condition must be corrected and the power removed to reset the sensor preventing automatic restarts.

The low voltage DC sensor is also available for use with 10-30 VDC. This sensor is in a non-rotatable housing, but does incorporate the short circuit protection.

Both sensors are equipped with two LEDs, "Ready" and "Target". The "Ready" LED is lit when power is applied and the cushion spear is not present. The "Target" LED will light and the "Ready" LED will go out when the sensor is closed, indicating the presence of the cushion spear. Both LEDs flashing indicates a short circuit condition.

**Notes:**

1. Available with or without cushions.
2. Not available with stroke adjusters.
3. Pressure rating: 3000 PSIG
4. Operating temperature: -4°F to 150°F
5. Specify sensor type, orientation and voltage when ordering.
6. The low voltage DC sensor is available in non-rotatable style only, consult representative for further information.

|          |                                   |
|----------|-----------------------------------|
| <b>B</b> | <b>Electronic Sensors</b>         |
|          | <b>Actuator Products</b>          |
|          | <b>Selection Guide</b>            |
|          | <b>Drop-in Sensors</b>            |
|          | <b>Solid State / Reed Sensors</b> |
|          | <b>Weld Immune Sensors</b>        |
|          | <b>Cordset / Connect Block</b>    |
|          | <b>NAMUR Sensors</b>              |
|          | <b>Proximity Sensors</b>          |

**Inductive Proximity Sensors – 8mm Barrel Type**

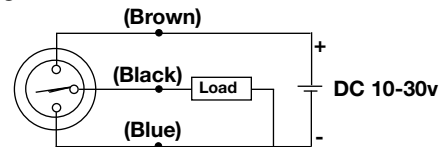
Proximity sensors are normally ordered with the unit as part of the model number. Use these part numbers for replacement parts only.

**Ordering information**

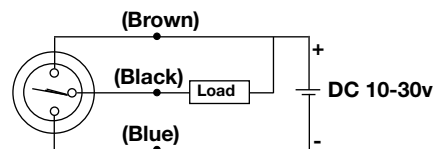
| Series | PNP            |              | NPN              |              |
|--------|----------------|--------------|------------------|--------------|
|        | Quick* connect | Flying leads | Quick ** connect | Flying leads |
| HB     | B8830-P        | 913090000    | B8830-N          | 913090100    |
| P5L    | B8830-P        | 913090000    | B8830-N          | 913090100    |
| WR     | B8830-P        | 913090000    | B8830-N          | 913090100    |

\* Order cordset B8757-P separately.  
 \*\* Order cordset B8757-N separately.

**PNP wiring connection**



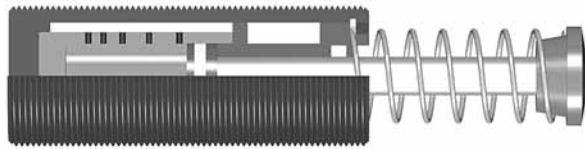
**NPN wiring connection**



**Parker Shock Absorbers**

The use of one piece / closed end bodies and inner pressure chambers provides extremely strong construction, which can withstand much higher internal pressures and overload forces without mechanical damage.

The closed end / one piece bodies and inner pressure chambers, reduces the chance of sudden failure, or machine damage in the event of an overload.



**B**

**Shock Absorbers  
 Actuator Products**

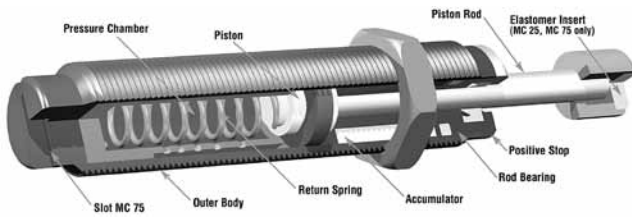
**Shock  
 Absorbers**

**Specifications**

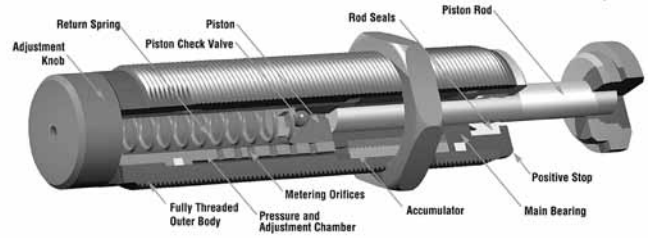
|  | Oil type   | Materials   | Mechanical stop  | Lock nut |
|--|--|---|--|----------|
| <b>MC 9 - MC 75</b>                        | Silicone   | Steel body: Black oxide finish.<br>Piston rod: Hardened stainless steel.  |  | Included |
| <b>MC 150 - MC 600</b>                     | Silicone   | Steel body: Black oxide finish.<br>Piston rod: Hardened stainless steel.<br>Rolling seal: EPDM*                           | Must be provided 0.02 to 0.04 inch (0.5 to 1 mm) before end of stroke.                           | Included |
| <b>SC 190 - SC 925</b>                     | #5   | Steel body: Black oxide finish.<br>Piston rod: Hardened stainless steel.  | Integral mechanical stop built into front of units.  | Included |
| <b>SC 300 - SC 650</b>                     | #5   | Steel body: Black oxide finish.<br>Piston rod: Hardened stainless steel.  | Integral mechanical stop built into front of units.  | Included |
| <b>MA 35 - MA 900</b>                      | MA 35: #5<br>MA 150: Silicone<br>MA 225, 600, 900: ATF | Steel body: Black oxide finish.<br>Piston rod: Hardened stainless steel.  | Adjustment screw for optimum deceleration.   | Included |
| <b>MC 33 - MC 64<br/>Self-Compensating</b> | ATF  | Steel body: Black oxide finish.<br>Piston rod: Hardened, high tensile steel, chrome plated.                               |  | Included |
| <b>MC 33 - MC 64<br/>Adjustable</b>        | ATF  | Rod end button: Hardened steel with black oxide finish.<br>Return spring: Zinc plated                                     | Turn front stop collar or rear adjuster against the scale marked 0 to 9 for optimum deceleration | Included |
| <b>1-1/2" Bore Series</b>                  | American 46  | Steel body: Black oxide finish.<br>Piston rod: Hardened, high tensile steel, chrome plated.<br>Return spring: Zinc plated | Must be provided .09 inch (2.3 mm) before end of stroke.   |          |
| <b>CA 2 - CA 4<br/>Self-Compensating</b>   | ATF  | Steel body: Black oxide finish.<br>Piston rod: Hardened, high tensile steel, chrome plated.                               | Must be provided .09 inch (2.3 mm) before end of stroke.   |          |
| <b>A 2 - A 3<br/>Adjustable</b>            | ATF  | Return spring: Zinc plated  | Must be provided .09 inch (2.3 mm) before end of stroke.   |          |

\* Seal not compatible with petroleum based fluids) If unit to be used in contact with such fluids specify neoprene rolling seal. Consider the SC2 Series as an alternative.

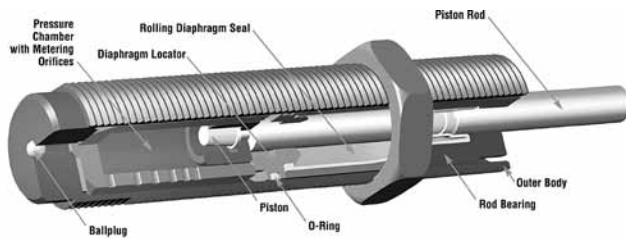
**Miniature shock absorbers  
 MC 9 to MC 75  
 Self-compensating**



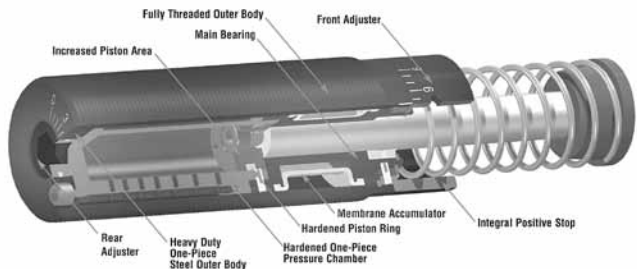
**MA series 225-900 shock absorbers  
 (Miniature adjustable)  
 Adjustable**



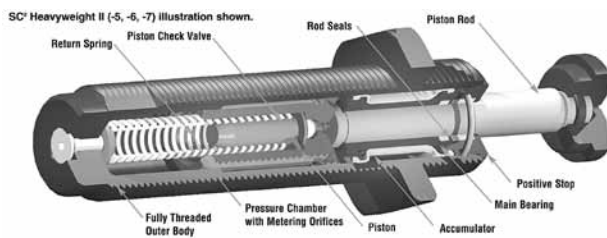
**Miniature shock absorbers  
 MC 150, MC 225 and MC 600  
 Self-Compensating**



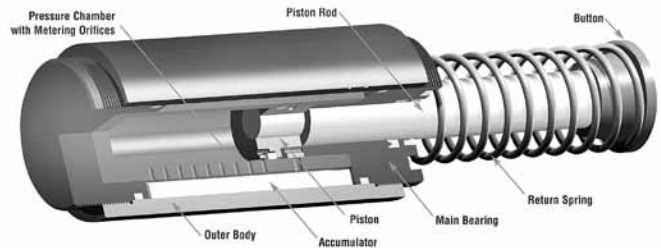
**Magnum series MA and ML 33 to 64  
 Adjustable**



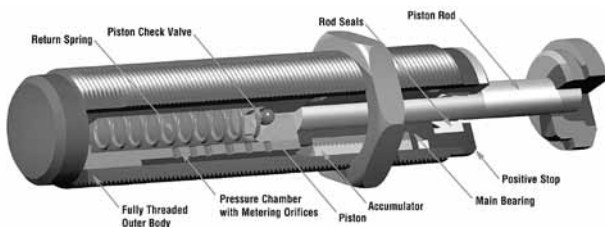
**Heavyweight shock absorbers  
 SC 300 and SC 650  
 Soft Contact and Self-Compensating**



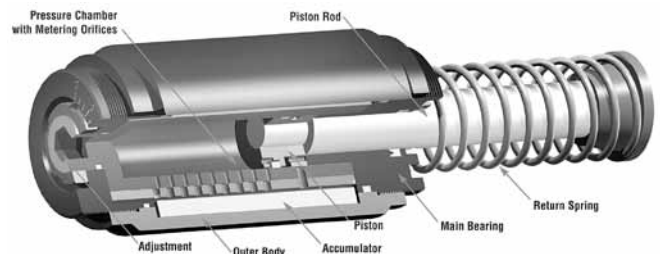
**Heavy industrial shock absorbers  
 CA to CA 4  
 Self-Compensating**



**Miniature shock absorbers  
 SC 190 to SC 925  
 Soft Contact and Self-Compensating**



**Heavy industrial shock absorbers  
 A2 to A3  
 Adjustable**



**B** Shock Absorbers Actuator Products Shock Absorbers



**Miniature Shock Absorbers MC 9 to MC 75 - Self-Compensating**

Miniature Shock Absorbers are self-contained hydraulic units. The MC 9 to MC 75 model range has a very short overall length and low return force. Its small size allows for high energy absorption in confined spaces, while the wide effective weight ranges accommodate a variety of load conditions. With threaded outer bodies and multiple accessories, MC models can be mounted in numerous configurations.



**Technical data**

Impact velocity range:  
 MC 9: 0.5 to 6 ft/sec (0.15 to 1.8 m/sec)  
 MC 10: 0.5 to 5 ft/sec (0.15 to 1.5 m/sec)  
 MC 25: 0.5 to 8 ft/sec (0.15 to 2.4 m/sec)  
 MC 75: 0.5 to 12 ft/sec (0.15 to 3.66 m/sec)

Operating temperature:  
 MC 9 and MC 10: 14° to 158°F (-10° to 70°C)  
 MC 25: 32° to 150°F (0° to 66°C)  
 MC 75: 32° to 150°F (0° to 66°C)

**Ordering information – Miniature MC series, self compensating**

|           |              |                    |                  |                              |
|-----------|--------------|--------------------|------------------|------------------------------|
| <b>MC</b> | <b>75</b>    | <b></b>            | <b>-1</b>        | <b></b>                      |
| MC series | Model number | Mounting thread    | Effective weight | Button options               |
|           | 9            | MC9                | MC9              | MC9 & MC10                   |
|           | 10           | M M6 x 1.0 metric  | -1 Light         | Standard, no button          |
|           | 25           | MC10               | -2 Medium        | -B Delrin button             |
|           | 75           | M M8 x 1.0 metric  | MC10             | MC25 & MC75                  |
|           |              | E M8 x 0.75 metric | L Light range    | Standard, with button        |
|           |              | MC25               | H Heavy range    | -NB *No button, short rod    |
|           |              | Standard (UNEF)    | MC25             | -880 No button, standard rod |
|           |              | M Metric           | L Light range    |                              |
|           |              | MC75               | Standard range   |                              |
|           |              | Standard (UNEF)    | H Heavy range    |                              |
|           |              | M Metric           | MC75             |                              |
|           |              |                    | -1 Light         |                              |
|           |              |                    | -2 Medium        |                              |
|           |              |                    | -3 Heavy         |                              |

\* Consult factory for dimensional details.

| Model number | Stroke inches<br>1 inch = 25.4 mm | E3 max. energy per cycle, inch lbs<br>1 in lb = .11 Nm | We effective weight lbs, 1 lb = .45 kg | E4 max. energy per hour, in lbs/hour<br>1 in lb/hour = .11 Nm/hour |          |                    |
|--------------|-----------------------------------|--|--|--|----------|--------------------|
|              |                                   |  |  | Self-contained   | A/O tank | A/O Re-circulating |
| MC 9-1       | 0.20                              | 9  | 1.35-7.0                               | 18,000   | N/A      | N/A                |
| MC 9-2       | 0.20                              | 9  | 1.75-9.0                               | 18,000   | N/A      | N/A                |
| MC 10L       | 0.20                              | 4  | 0.75-6.0                               | 35,000   | N/A      | N/A                |
| MC 10H       | 0.20                              | 7  | 1.5-11                                 | 35,000   | N/A      | N/A                |
| MC 25L       | 0.25                              | 20   | 1.5-5                                  | 120,000  | N/A      | N/A                |
| MC 25        | 0.25                              | 20   | 4-12                                   | 120,000  | N/A      | N/A                |
| MC 25H       | 0.25                              | 20   | 10-30                                  | 120,000  | N/A      | N/A                |
| MC 75-1      | 0.40                              | 75   | 0.5-2.5                                | 250,000  | N/A      | N/A                |
| MC 75-2      | 0.40                              | 75   | 2-14                                   | 250,000  | N/A      | N/A                |
| MC 75-3      | 0.40                              | 75   | 6-80                                   | 250,000  | N/A      | N/A                |

**Miniature Shock Absorbers MC 150 to MC 600 - Self-Compensating**

**Miniature Shock Absorbers**

MC 150 to MC 600 model range, feature a hermetically sealed rolling diaphragm seal system that provides the highest possible cycle lifetime and an extremely low rod return force. These models can be directly mounted into the end cover of pneumatic cylinders to provide superior damping compared to normal cylinder cushions. Use of the optional stop collar is recommended to provide a positive mechanical stop. By adding the optional side load adapter (metric threaded models only), it is possible to accept side loads up to 25° from the axis.



**Technical data**

Impact velocity range: 0.26 to 19.7 ft/sec (0.08 to 6 m/sec)  
 Operating temperature: 32° to 150°F (0° to 66°C)

**Note: MC 150 to MC 600 models may be mounted into pressure chambers of pneumatic actuators.**

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**Ordering information – Miniature MC series, self compensating**

|           |              |                           |                             |                         |
|-----------|--------------|---------------------------|-----------------------------|-------------------------|
| <b>MC</b> | <b>225</b>   | □                         | <b>-1</b>                   | □                       |
| MC series | Model number | Mounting thread           | Effective weight            | Button options          |
|           | 150          | - Standard (UNF)          | <b>MC150, MC225, MC600</b>  | Standard, no button     |
|           | 255          | <b>M</b> Metric           | Standard range              | <b>-B</b> Delrin button |
|           | 600          | <b>ME*</b> Fine metric    | <b>H</b> Heavy range        | <b>-BS</b> Steel button |
|           |              | <b>ML**</b> Course metric | <b>H2</b> Extra heavy range |                         |

\*MC 150 only \*\*MC 600 only

| Model number | Stroke inches<br>1 inch = 25.4 mm | E3 max. energy per cycle, inch lbs<br>1 in lb = .11 Nm | We effective weight<br>lbs, 1 lb = .45 kg | E4 max. energy per hour, in lbs/hour<br>1 in lb/hour = .11 Nm/hour |          |                    |
|--------------|-----------------------------------|--|---|--|----------|--------------------|
|              |                                   |  |   | Self-contained   | A/O tank | A/O Re-circulating |
| MC 150       | 0.50                              | 150  | 2-22                                      | 300,000  |          |                    |
| MC 150H      | 0.50                              | 150  | 20-200                                    | 300,000  | N/A      | N/A                |
| MC 150H2     | 0.50                              | 150  | 150-450                                   | 300,000  |          |                    |
| MC 225       | 0.50                              | 225  | 5-55                                      | 400,000  |          |                    |
| MC 225H      | 0.50                              | 225  | 50-500                                    | 400,000  | N/A      | N/A                |
| MC 225H2     | 0.50                              | 225  | 400-2,000                                 | 400,000  |          |                    |
| MC 600       | 1.00                              | 600  | 20-300                                    | 600,000  |          |                    |
| MC 600H      | 1.00                              | 600  | 250-2,500                                 | 600,000  | N/A      | N/A                |
| MC 600H2     | 1.00                              | 600  | 880-5,000                                 | 600,000  |          |                    |



**SC<sup>2</sup> Series SC 190 to SC 925 - Soft Contact and Self-Compensating**

**SC<sup>2</sup> Series Miniature Shock Absorbers**

provide dual performance benefits. They offer **soft contact deceleration** where initial impact forces are very low, with the advantages of **self-compensation** to react to changing energy conditions, without adjustment. They have long stroke lengths, **SC<sup>2</sup> 925 with 1.58 inch (40 mm) superstroke**, to provide smooth deceleration and low reaction forces.



**Technical data**

Impact velocity range: 0.5 to 12 ft/sec (0.15 to 3.66 m/sec)  
 Operating temperature: 32° to 150°F (0° to 66°C)

**Note: Integral mechanical stop built into front of units.**

**Ordering information – Miniature SC<sup>2</sup> series, soft contact and self compensating**

|   |  |  |   |   |
|---|--|--|---|---|
| <b>SC</b>   | <b>300</b>   | □  | <b>-1</b>   | □   |
| SC <sup>2</sup> series<br>Soft Contact<br>Self Compensating | Model number<br><b>190</b><br><b>300</b><br><b>650</b><br><b>925</b> | Mounting thread<br>– Standard (UNF)<br><b>M</b> Metric | Effective weight<br><b>-1</b> Ultra light<br><b>-2</b> Light<br><b>-3</b> Medium<br><b>-4</b> Heavy | Button options<br>Standard with button<br><b>-NB</b> No button, short rod<br><b>-BS</b> No button, standard rod |

| Model number | Stroke inches<br>1 inch = 25.4 mm | E3 max. energy per cycle, inch lbs<br>1 in lb = .11 Nm | We effective weight lbs, 1 lb = .45 kg | E4 max. energy per hour, in lbs/hour<br>1 in lb/hour = .11 Nm/hour |          |                    |
|--------------|-----------------------------------|--|--|--|----------|--------------------|
|              |                                   |  |  | Self-contained   | A/O tank | A/O Re-circulating |
| SC 190-1     | 0.63                              | 225  | 3-15                                   | 300,000  |          |                    |
| SC 190-2     | 0.63                              | 225  | 8-40                                   | 300,000  |          |                    |
| SC 190-3     | 0.63                              | 225  | 20-100                                 | 300,000  | N/A      | N/A                |
| SC 190-4     | 0.63                              | 225  | 50-225                                 | 300,000  |          |                    |
| SC 300-1     | 0.75                              | 300  | 3-18                                   | 400,000  |          |                    |
| SC 300-2     | 0.75                              | 300  | 10-60                                  | 400,000  |          |                    |
| SC 300-3     | 0.75                              | 300  | 30-180                                 | 400,000  | N/A      | N/A                |
| SC 300-4     | 0.75                              | 300  | 70-450                                 | 400,000  |          |                    |
| SC 650-1     | 1.00                              | 650  | 17-100                                 | 600,000  |          |                    |
| SC 650-2     | 1.00                              | 650  | 50-300                                 | 600,000  |          |                    |
| SC 650-3     | 1.00                              | 650  | 150-900                                | 600,000  | N/A      | N/A                |
| SC 650-4     | 1.00                              | 650  | 450-2,600                              | 600,000  |          |                    |
| SC 925-1     | 1.58                              | 975  | 30-200                                 | 800,000  |          |                    |
| SC 925-2     | 1.58                              | 975  | 90-600                                 | 800,000  |          |                    |
| SC 925-3     | 1.58                              | 975  | 250-1,600                              | 800,000  | N/A      | N/A                |
| SC 925-4     | 1.58                              | 975  | 750-4,600                              | 800,000  |          |                    |

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**SC<sup>2</sup> Heavyweight Series SC 300 to SC 650 - Soft Contact and Self-Compensating**

**SC<sup>2</sup> 300 and SC<sup>2</sup> 650 Heavyweight Series Shock Absorbers deliver up to 950% of the effective weight capacity and 280% of the energy absorption capability** of standard models. These durable units are ideal for decelerating heavy weights moving at low velocities. The Heavyweight Series design combines the piston and the inner tube into a single component, the piston tube. It acts as both the pressure creating and pressure controlling device.



| Technical data         |                                      |
|------------------------|--------------------------------------|
| Impact velocity range: | 0.3 to 12 ft/sec (0.9 to 3.66 m/sec) |
| Operating temperature: | 32° to 150°F (0° to 66°C)            |

**Note: Integral mechanical stop built into front of units.**

**Ordering information – SC<sup>2</sup> series, soft contact and self compensating**

|   |  |  |   |  |
|---|--|--|---|--|
| <b>SC</b>   | <b>300</b>                               | □  | <b>-1</b>   | □  |
| SC <sup>2</sup> series<br>Soft Contact<br>Self Compensating | Model number<br><b>300</b><br><b>650</b> | Mounting thread<br>– Standard (UNF)<br><b>M</b> Metric | Effective weight<br><b>-5</b> Heavy<br><b>-6</b> Heavy plus<br><b>-7</b> Heavy duty<br><b>-8</b> Extra heavy<br><b>-9</b> Ultra heavy | Button options<br>Standard with button<br><b>-NB</b> No button, short rod<br><b>-880</b> No button, standard rod |

| Model number | Stroke inches<br>1 inch = 25.4 mm | E3 max. energy per cycle, inch lbs<br>1 in lb = .11 Nm | We effective weight<br>lbs, 1 lb = .45 kg | E4 max. energy per hour, in lbs/hour<br>1 in lb/hour = .11 Nm/hour |          |                    |
|--------------|-----------------------------------|--|---|--|----------|--------------------|
|              |                                   |  |   | Self-contained   | A/O tank | A/O Re-circulating |
| SC 300-5     | 0.59                              | 650  | 25-100                                    | 400,000  |          |                    |
| SC 300-6     | 0.59                              | 650  | 75-300                                    | 400,000  |          |                    |
| SC 300-7     | 0.59                              | 650  | 200-400                                   | 400,000  | N/A      | N/A                |
| SC 300-8     | 0.59                              | 620  | 300-1,500                                 | 400,000  |          |                    |
| SC 300-9     | 0.59                              | 620  | 700-4,300                                 | 400,000  |          |                    |
| SC 650-5     | 0.91                              | 1,860  | 50-250                                    | 600,000  |          |                    |
| SC 650-6     | 0.91                              | 1,860  | 200-800                                   | 600,000  |          |                    |
| SC 650-7     | 0.91                              | 1,860  | 700-2,400                                 | 600,000  | N/A      | N/A                |
| SC 650-8     | 0.91                              | 1,860  | 1,700-5,800                               | 600,000  |          |                    |
| SC 650-9     | 0.91                              | 1,860  | 4,000-14,000                              | 600,000  |          |                    |

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**Miniature Shock Absorbers MA 35 to MA 900 - Adjustable**

**MA Series miniature shock absorbers** offer a compact design with true linear deceleration, and are adjustable over a wide range of conditions.

If your preference is a fully adjustable shock absorber rather than a self-compensating model on your application, then the MA Series provides a directly interchangeable alternative.



**Technical data**

Impact velocity range:  
 MA35 3.3 ft/sec (1.0 m/sec)  
 MA150, 225, 600, 900 0.5 to 12 ft/sec (0.15 to 3.66 m/sec)  
 Operating temperature: 32° to 150°F (0° to 66°C)

**Ordering information – MA series, adjustable**

|  |  |   |   |
|--|--|---|---|
| <b>MA</b>                              | <b>225</b>                                     | <b>-</b>  | <b>□</b>  |
| MA series<br>MA – Miniature Adjustable | Model number<br>35<br>150<br>225<br>600<br>900 | Mounting thread<br>- Standard (UNF)<br>M Metric<br>ME Fine metric (MA 150 Only) | Button options<br><b>MA35</b><br>Standard with button<br>-NB No button, short rod<br><b>MA150</b><br>Standard, no button<br>-B Nylon button<br>-BS Steel button<br><b>MA 225-900</b><br>Standard steel button<br>-NB No button, short rod<br>-880 No button, standard rod |

| Model number | Stroke inches<br>1 inch = 25.4 mm | E3 max energy per cycle, inch lbs<br>1 in lb = .11 Nm | We effective weight lbs, 1 lb = .45 kg | E4 max energy per hour, in lbs/hour<br>1 in lb/hour = .11 Nm/hour |                        |                        |
|--------------|-----------------------------------|---|--|---|------------------------|------------------------|
|              |                                   |   |  | Self-contained  | A/O tank               | A/O Re-circulating     |
| MA 35        | 0.40                              | 35  | 13-125                                 | 53,000  |                        |                        |
| MA 150       | 0.50                              | 150   | 2-200                                  | 300,000   | N/A                    | N/A                    |
| MA 225       | 0.75                              | 225   | 5-500                                  | 400,000   |                        |                        |
| MA 600       | 1.00                              | 600   | 20-3,000                               | 600,000   |                        |                        |
| MA 900       | 1.58                              | 900   | 30-4,500                               | 800,000   | 1,100,000<br>1,200,000 | 1,500,000<br>1,600,000 |

**Magnum Series MC 33 to MC 64 - Self-Compensating**

The **Magnum Series** offer you the capability to mount shock absorbers that contain the highest energy capacity ratings in the industry. **Up to 150% of the energy per cycle** of previous models in the same package size, means increased safety factors in a wider range of applications.

**Up to 390% of the effective weight capacity** of previous models, may allow a smaller, lower priced shock absorber to be mounted, to meet your application requirements.



**Technical data**

Impact velocity range:  
 MC Models: 0.5 to 16.5 ft/sec (0.15 to 5 m/sec)  
 Operating temperature: 10° to 150°F (-12° to 66°C)

**Ordering information – MC series, self compensating**

| <b>MC</b>   | <b>3325</b>  | <b>-</b> | <b>1</b> | <b>C</b>   |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
|---|--|----------|----------|--|-----|----------------------------------|-----|-------------------------------------|-----|--|--|--------------|--|--|------|------|------|------|------|-------|------|------|-------|------|--|--|---|-----------------|--|---|----------------|---|--------|---|------------------|--|----|-------------|----|--------------|----|-------------|----|---------------|---|------------------|--|--|----------------|--|---------------------|--|---------------------|--|----------------|----|----------------|----|-------------------|----|-----------|----|---------------------|
| <table border="1"> <tr><th colspan="2">Return method and accumulator style</th></tr> <tr><td>MC</td><td>Self-contained spring return, internal accumulator</td></tr> <tr><td>MCA</td><td>Air return, external accumulator</td></tr> <tr><td>MCS</td><td>Spring return, external accumulator</td></tr> <tr><td>MCN</td><td>Self return (clevis), internal accumulator</td></tr> </table> | Return method and accumulator style                |          | MC       | Self-contained spring return, internal accumulator | MCA | Air return, external accumulator | MCS | Spring return, external accumulator | MCN | Self return (clevis), internal accumulator | <table border="1"> <tr><th colspan="3">Model number</th></tr> <tr><td>3325</td><td>4525</td><td>6450</td></tr> <tr><td>3350</td><td>4550</td><td>64100</td></tr> <tr><td>3625</td><td>4575</td><td>64150</td></tr> <tr><td>3650</td><td></td><td></td></tr> </table> | Model number |  |  | 3325 | 4525 | 6450 | 3350 | 4550 | 64100 | 3625 | 4575 | 64150 | 3650 |  |  | <table border="1"> <tr><th colspan="2">Mounting thread</th></tr> <tr><td>-</td><td>Standard (UNF)</td></tr> <tr><td>M</td><td>Metric</td></tr> </table> | Mounting thread |  | - | Standard (UNF) | M | Metric | <table border="1"> <tr><th colspan="2">Effective weight</th></tr> <tr><td>-1</td><td>Light range</td></tr> <tr><td>-2</td><td>Medium range</td></tr> <tr><td>-3</td><td>Heavy range</td></tr> <tr><td>-4</td><td>Heavier range</td></tr> </table> | Effective weight |  | -1 | Light range | -2 | Medium range | -3 | Heavy range | -4 | Heavier range | <table border="1"> <tr><th colspan="2">Mounting options</th></tr> <tr><td></td><td>Standard mount</td></tr> <tr><td></td><td>Flanged stop collar</td></tr> <tr><td></td><td>Rectangular flange*</td></tr> <tr><td></td><td>Square flange*</td></tr> <tr><td>-C</td><td>Clevis mount**</td></tr> <tr><td>-S</td><td>Side-foot mount**</td></tr> <tr><td>-P</td><td>Side port</td></tr> <tr><td>-Z</td><td>Within air cylinder</td></tr> </table> | Mounting options |  |  | Standard mount |  | Flanged stop collar |  | Rectangular flange* |  | Square flange* | -C | Clevis mount** | -S | Side-foot mount** | -P | Side port | -Z | Within air cylinder |
| Return method and accumulator style   |  |          |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
| MC  | Self-contained spring return, internal accumulator |          |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
| MCA   | Air return, external accumulator                   |          |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
| MCS   | Spring return, external accumulator                |          |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
| MCN   | Self return (clevis), internal accumulator         |          |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
| Model number  |  |          |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
| 3325  | 4525   | 6450     |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
| 3350  | 4550   | 64100    |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
| 3625  | 4575   | 64150    |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
| 3650  |  |          |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
| Mounting thread   |  |          |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
| -   | Standard (UNF)                                     |          |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
| M   | Metric   |          |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
| Effective weight  |  |          |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
| -1  | Light range  |          |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
| -2  | Medium range                                       |          |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
| -3  | Heavy range  |          |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
| -4  | Heavier range                                      |          |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
| Mounting options  |  |          |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
|   | Standard mount                                     |          |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
|   | Flanged stop collar                                |          |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
|   | Rectangular flange*                                |          |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
|   | Square flange*                                     |          |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
| -C  | Clevis mount**                                     |          |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
| -S  | Side-foot mount**                                  |          |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
| -P  | Side port  |          |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |
| -Z  | Within air cylinder                                |          |          |  |     |                                  |     |                                     |     |  |  |              |  |  |      |      |      |      |      |       |      |      |       |      |  |  |   |                 |  |   |                |   |        |   |                  |  |    |             |    |              |    |             |    |               |   |                  |  |  |                |  |                     |  |                     |  |                |    |                |    |                   |    |           |    |                     |

\* Welded versions available upon request.  
 \*\* Not available on MC 3625 and 3650 models.

**Self-Compensating Models**

| Model number | Stroke inches<br>1 inch = 25.4 mm | E3 max. energy per cycle, inch lbs<br>1 in lb = .11 Nm | We effective weight lbs, 1 lb = .45 kg | E4 max. energy per hour, in lbs/hour<br>1 in lb/hour = .11 Nm/hour |           |                    |
|--------------|-----------------------------------|--|--|--|-----------|--------------------|
|              |                                   |  |  | Self-contained   | A/O tank  | A/O Re-circulating |
| MC 3325-1    | 0.91                              | 1,350  | 20-80                                  | 670,000  | 1,100,000 | 1,500,000          |
| MC 3325-2    |                                   |  | 68-272                                 |  |           |                    |
| MC 3325-3    |                                   |  | 230-920                                |  |           |                    |
| MC 3325-4    |                                   |  | 780-3,120                              |  |           |                    |
| MC 3350-1    | 1.91                              | 2,700  | 40-160                                 | 760,000  | 1,200,000 | 1,600,000          |
| MC 3350-2    |                                   |  | 136-544                                |  |           |                    |
| MC 3350-3    |                                   |  | 460-1,840                              |  |           |                    |
| MC 3350-4    |                                   |  | 1,560-6,240                            |  |           |                    |
| MC 3625-1    | 0.91                              | 1,350  | 20-80                                  | 670,000  | 1,100,000 | 1,500,000          |
| MC 3625-2    |                                   |  | 68-272                                 |  |           |                    |
| MC 3625-3    |                                   |  | 230-920                                |  |           |                    |
| MC 3625-4    |                                   |  | 780-3,120                              |  |           |                    |
| MC 3650-1    | 1.91                              | 2,700  | 40-160                                 | 760,000  | 1,200,000 | 1,600,000          |
| MC 3650-2    |                                   |  | 136-544                                |  |           |                    |
| MC 3650-3    |                                   |  | 460-1,840                              |  |           |                    |
| MC 3650-4    |                                   |  | 1,560-6,240                            |  |           |                    |
| MC 4525-1    | 0.91                              | 3,000  | 50-200                                 | 950,000  | 1,400,000 | 1,700,000          |
| MC 4525-2    |                                   |  | 170-680                                |  |           |                    |
| MC 4525-3    |                                   |  | 575-2,300                              |  |           |                    |
| MC 4525-4    |                                   |  | 1,950-7,800                            |  |           |                    |
| MC 4550-1    | 1.91                              | 6,000  | 100-400                                | 1,000,000  | 1,700,000 | 2,200,000          |
| MC 4550-2    |                                   |  | 340-1,360                              |  |           |                    |
| MC 4550-3    |                                   |  | 1,150-4,600                            |  |           |                    |
| MC 4550-4    |                                   |  | 3,900-15,600                           |  |           |                    |
| MC 4575-1    | 2.91                              | 9,000  | 150-600                                | 1,300,000  | 2,000,000 | 2,500,000          |
| MC 4575-2    |                                   |  | 510-2,040                              |  |           |                    |
| MC 4575-3    |                                   |  | 1,730-6,920                            |  |           |                    |
| MC 4575-4    |                                   |  | 5,850-23,400                           |  |           |                    |
| MC 6450-1    | 1.91                              | 15,000   | 300-1,200                              | 1,300,000  | 2,600,000 | 3,400,000          |
| MC 6450-2    |                                   |  | 1,020-4,080                            |  |           |                    |
| MC 6450-3    |                                   |  | 3,460-13,840                           |  |           |                    |
| MC 6450-4    |                                   |  | 11,700-46,800                          |  |           |                    |
| MC 64100-1   | 3.91                              | 30,000   | 600-2,400                              | 1,700,000  | 3,400,000 | 4,400,000          |
| MC 64100-2   |                                   |  | 2,040-8,160                            |  |           |                    |
| MC 64100-3   |                                   |  | 6,920-27,680                           |  |           |                    |
| MC 64100-4   |                                   |  | 23,400-93,600                          |  |           |                    |
| MC 64150-1   | 5.91                              | 45,000   | 900-3,600                              | 2,200,000  | 4,400,000 | 5,700,000          |
| MC 64150-2   |                                   |  | 3,060-12,240                           |  |           |                    |
| MC 64150-3   |                                   |  | 10,380-41,520                          |  |           |                    |
| MC 64150-4   |                                   |  | 35,100-140,400                         |  |           |                    |

**B**  
Shock Absorbers  
Actuator Products  
Shock Absorbers



**Magnum Series MA & ML 33 to 64 - Adjustable**

Magnum Series adjustable shock absorbers feature the latest seal technology, a hardened piston ring, pressure chamber and outer body for increased operating life. Additionally, these rugged units offer the unique feature of front or rear adjustment along with a fully threaded outer body for ease of installation.

Along with the self-compensating models, the adjustable range offers unprecedented increases in energy and effective weight capacity.



| Technical data                                     |   |
|--|---|
| Impact velocity range:                             |   |
| MA Models  | 0.5 to 16.5 ft/sec (0.15 to 5 m/sec)    |
| ML Models  | 0.06 to 1.5 ft/sec (0.02 to 0.46 m/sec) |
| Operating temperature: 10° to 150°F (-12° to 66°C) |   |

**Ordering information – MA & ML (low velocity) series, adjustable**

| MA   |   | 3325                |      |       | □                      |                | 1                       |               | C                       |                     |
|--|---|---------------------|------|-------|------------------------|----------------|-------------------------|---------------|-------------------------|---------------------|
| <b>Return method and accumulator style</b> |   | <b>Model number</b> |      |       | <b>Mounting thread</b> |                | <b>Effective weight</b> |               | <b>Mounting options</b> |                     |
| MA   | Self-contained spring return, internal accumulator  | 3325                | 4525 | 6450  | -                      | Standard (UNF) | -1                      | Light range   |                         | Standard mount      |
| MAA  | Air return, external accumulator                    | 3350                | 4550 | 64100 | M                      | Metric         | -2                      | Medium range  |                         | Flanged stop collar |
| MAS  | Spring return, external accumulator                 | 3625                | 4575 | 64150 |                        |                | -3                      | Heavy range   |                         | Rectangular flange* |
| MAN  | Self return (clevis), internal accumulator          | 3650                |      |       |                        |                | -4                      | Heavier range |                         | Square flange*      |
| ML   | Self-contained spring return, internal accumulator* |                     |      |       |                        |                |                         |               | -C                      | Clevis mount**      |
| MLA  | Air return, external accumulator*                   |                     |      |       |                        |                |                         |               | -S                      | Side-foot mount**   |
| MLS  | Spring return, external accumulator*                |                     |      |       |                        |                |                         |               | -P                      | Side port           |
| MLN  | Self return (clevis), internal accumulator*         |                     |      |       |                        |                |                         |               | -Z                      | Within air cylinder |

\* Low velocity

\* Welded versions available upon request.

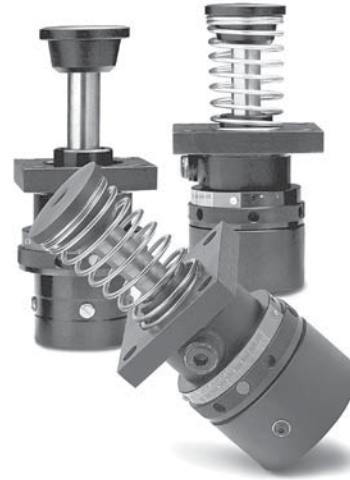
\*\* Not available on ML 3625 and 3650 models.

| Model number | Stroke inches<br>1 inch = 25.4 mm | E3 max energy<br>per cycle, inch lbs<br>1 in lb = .11 Nm | We<br>effective weight<br>lbs, 1 lb = .45 kg | E4 max energy per hour, in lbs/hour<br>1 in lb/hour = .11 Nm/hour |           |                    |
|--------------|-----------------------------------|--|--|---|-----------|--------------------|
|              |                                   |  |  | Self-contained  | A/O tank  | A/O Re-circulating |
| MA 3325      | 0.91                              | 1,500  | 20-3,800                                     | 670,000   | 1,100,000 | 1,500,000          |
| MA 3350      | 1.91                              | 3,000  | 28-5,400                                     | 760,000   | 1,200,000 | 1,600,000          |
| MA 3625      | 0.91                              | 1,500  | 20-3,800                                     | 670,000   | 1,100,000 | 1,500,000          |
| MA 3650      | 1.91                              | 3,000  | 28-5,400                                     | 760,000   | 1,200,000 | 1,600,000          |
| MA 4525      | 0.91                              | 3,450  | 95-22,000                                    | 950,000   | 1,400,000 | 1,700,000          |
| MA 4550      | 1.91                              | 6,900  | 150-32,000                                   | 1,000,000   | 1,700,000 | 2,200,000          |
| MA 4575      | 2.91                              | 10,350   | 155-33,000                                   | 1,300,000   | 2,000,000 | 2,500,000          |
| MA 6450      | 1.91                              | 18,000   | 480-110,000                                  | 1,300,000   | 2,600,000 | 3,400,000          |
| MA 64100     | 3.91                              | 36,000   | 600-115,000                                  | 1,700,000   | 3,400,000 | 4,400,000          |
| MA 64150     | 5.91                              | 54,000   | 730-175,000                                  | 2,200,000   | 4,400,000 | 5,700,000          |
| ML 3325      | 0.91                              | 1,500  | .05-1.5                                      | 670,000   | 1,100,000 | 1,500,000          |
| ML 3350      | 1.91                              | 3,000  | .05-1.5                                      | 760,000   | 1,200,000 | 1,600,000          |
| ML 3625      | 0.91                              | 1,500  | .05-1.5                                      | 670,000   | 1,100,000 | 1,500,000          |
| ML 3650      | 1.91                              | 3,000  | .05-1.5                                      | 760,000   | 1,200,000 | 1,600,000          |
| ML 4525      | 0.91                              | 3,450  | .05-1.5                                      | 950,000   | 1,400,000 | 1,700,000          |
| ML 4550      | 1.91                              | 6,900  | .05-1.5                                      | 1,000,000   | 1,700,000 | 2,200,000          |
| ML 6425      | 0.91                              | 9,000  | .05-1.5                                      | 1,100,000   | 2,200,000 | 2,900,000          |
| ML 6450      | 1.91                              | 18,000   | .05-1.5                                      | 1,300,000   | 2,600,000 | 3,400,000          |



**1-1/2" Bore Series - Adjustable**

**1-1/2" bore series shock absorbers** are designed for the toughest environments. These durable adjustable models provide outstanding deceleration over a wide range of effective weight conditions. Large energy capacities stop heavy loads set into motion by high propelling forces, without damage.



**Technical data**

Impact velocity range: 0.5 to 15 ft/sec (0.15 to 4.5 m/sec)  
 Operating temperature: 10° to 150°F (-12° to 66°C)

**Ordering information – 1-1/2" bore series, adjustable**

|  |                  |                      |                                     |
|--|------------------|----------------------|-------------------------------------|
| <b>A</b>   | <b>1-1/2</b>     | <b>6-1/2</b>         | <b>F</b>                            |
| <b>Return method and accumulator style</b>           | <b>Bore size</b> | <b>Stroke length</b> | <b>Mounting style</b>               |
| <b>A</b> Spring return, internal accumulator         | <b>1-1/2</b>     | <b>2</b>             | <b>-F</b> Front flange              |
| <b>AA</b> Air return, external accumulator           |                  | <b>3-1/2</b>         | <b>-R</b> Rear flange               |
| <b>SA</b> Spring return, external accumulator        |                  | <b>5</b>             | <b>-RF</b> Front rectangular flange |
| <b>NA</b> Self return (clevis), internal accumulator |                  | <b>6-1/2</b>         | <b>-RR</b> Rear rectangular flange  |
|  |                  |                      | <b>-S</b> Side foot mount           |
|  |                  |                      | <b>-C</b> Clevis mount              |

| Model number | Stroke inches<br>1 inch = 25.4 mm | E3 max energy per cycle, inch lbs<br>1 in lb = .11 Nm | We effective weight lbs, 1 lb = .45 kg | E4 max energy per hour, in lbs/hour<br>1 in lb/hour = .11 Nm/hour |            |                    |
|--------------|-----------------------------------|---|--|---|------------|--------------------|
|              |                                   |   |  | Self-contained  | A/O tank   | A/O Re-circulating |
| 1-1/2x2      | 2.00                              | 16,000  | 430-70,000                             | 3,200,000   | 4,000,000  | 5,200,000          |
| 1-1/2x3-1/2  | 3.50                              | 28,000  | 480-80,000                             | 5,600,000   | 7,000,000  | 9,100,000          |
| 1-1/2x5      | 5.00                              | 40,000  | 500-90,000                             | 8,000,000   | 10,000,000 | 13,000,000         |
| 1-1/2x6-1/2  | 6.50                              | 52,000  | 680-100,000                            | 10,400,000  | 13,000,000 | 17,000,000         |

**B**  
 Shock Absorbers  
 Actuator Products  
 Shock Absorbers

**Heavy Industrial Shock Absorbers CA 2 to CA 3 - Self-Compensating**

**CA 2" & CA 3" Bore Series** of self-compensating shock absorbers are designed for extremely heavy duty applications and provide smooth deceleration under changing conditions. High energy capacities combined with wide effective weight ranges qualify these units to perform in the most demanding environments.



**Technical data**

|                        |                                    |
|------------------------|------------------------------------|
| Impact velocity range: | 1 to 16.5 ft/sec (0.30 to 5 m/sec) |
| Operating temperature: | 10° to 150°F (-12° to 66°C)        |

**Ordering information – CA 2 & CA 3 series, self-compensating**

|   |                  |          |                      |                                     |          |                         |
|---|------------------|----------|----------------------|-------------------------------------|----------|-------------------------|
| <b>CA</b>   | <b>2</b>         | <b>x</b> | <b>8</b>             | <b>R</b>                            | <b>-</b> | <b>3</b>                |
| <b>Return method and accumulator style</b>            | <b>Bore size</b> |          | <b>Stroke length</b> | <b>Mounting style</b>               |          | <b>Effective weight</b> |
| <b>CA</b> Spring return, internal accumulator         | <b>2</b>         |          | <b>2</b>             | <b>-F</b> Front flange              |          | <b>-1</b> Light         |
| <b>CAA</b> Air return, external accumulator           | <b>3</b>         |          | <b>4</b>             | <b>-R</b> Rear flange               |          | <b>-2</b> Medium light  |
| <b>CSA</b> Spring return, external accumulator        |                  |          | <b>5</b>             | <b>-RF</b> Front rectangular flange |          | <b>-3</b> Medium heavy  |
| <b>CNA</b> Self return (clevis), internal accumulator |                  |          | <b>6</b>             | <b>-RR</b> Rear rectangular flange  |          | <b>-4</b> Heavy         |
|   |                  |          | <b>8</b>             | <b>-S</b> Side foot mount           |          |                         |
|   |                  |          | <b>10</b>            | <b>-C</b> Clevis mount              |          |                         |
|   |                  |          | <b>12</b>            |                                     |          |                         |

| Model number                                     | Stroke inches<br>1 inch = 25.4 mm | E3 max energy per cycle, inch lbs<br>1 in lb = .11 Nm | We effective weight lbs, 1 lb = .45 kg                               | E4 max energy per hour, in lbs/hour<br>1 in lb/hour = .11 Nm/hour |            |                    |
|--|-----------------------------------|---|--|---|------------|--------------------|
|  |                                   |   |  | Self-contained  | A/O tank   | A/O Re-circulating |
| CA 2x2-1<br>CA 2x2-2<br>CA 2x2-3<br>CA 2x2-4     | 2.00                              | 32,000  | 1,600-4,800<br>4,000-12,000<br>10,000-30,000<br>25,000-75,000        | 9,600,000   | 12,000,000 | 15,600,000         |
| CA 2x4-1<br>CA 2x4-2<br>CA 2x4-3<br>CA 2x4-4     | 4.00                              | 64,000  | 3,200-9,600<br>8,000-24,000<br>20,000-60,000<br>50,000-150,000       | 12,000,000  | 15,000,000 | 19,500,000         |
| CA 2x6-1<br>CA 2x6-2<br>CA 2x6-3<br>CA 2x6-4     | 6.00                              | 96,000  | 4,800-14,400<br>12,000-36,000<br>30,000-90,000<br>75,000-225,000     | 14,400,000  | 18,000,000 | 23,500,000         |
| CA 2x8-1<br>CA 2x8-2<br>CA 2x8-3<br>CA 2x8-4     | 8.00                              | 128,000   | 6,400-19,200<br>16,000-48,000<br>40,000-120,000<br>100,000-300,000   | 16,800,000  | 21,000,000 | 27,000,000         |
| CA 2x10-1<br>CA 2x10-2<br>CA 2x10-3<br>CA 2x10-4 | 10.00                             | 160,000   | 8,000-24,000<br>20,000-60,000<br>50,000-150,000<br>125,000-375,000   | 19,200,000  | 24,000,000 | 31,000,000         |
| CA 3x5-1<br>CA 3x5-2<br>CA 3x5-3<br>CA 3x5-4     | 5.00                              | 125,000   | 6,400-19,200<br>16,000-48,000<br>40,000-120,000<br>100,000-300,000   | 20,000,000  | 25,000,000 | 32,500,000         |
| CA 3x8-1<br>CA 3x8-2<br>CA 3x8-3<br>CA 3x8-4     | 8.00                              | 200,000   | 10,240-30,720<br>25,600-76,800<br>64,000-192,000<br>160,000-480,000  | 32,000,000  | 40,000,000 | 52,000,000         |
| CA 3x12-1<br>CA 3x12-2<br>CA 3x12-3<br>CA 3x12-4 | 12.00                             | 300,000   | 15,360-46,080<br>38,400-115,200<br>96,000-288,000<br>240,000-720,000 | 48,000,000  | 60,000,000 | 78,000,000         |





**Heavy Industrial Shock Absorbers CA 4 - Self-Compensating**

**CA 4" Bore Series** of self-compensating shock absorbers are designed for extremely heavy duty applications and provide smooth deceleration under changing conditions. High energy capacities combined with wide effective weight ranges qualify these units to perform in the most demanding environments.



**Technical data**

Impact velocity range: 1 to 16.5 ft/sec (0.30 to 5 m/sec)  
 Operating temperature: 10° to 150°F (-12° to 66°C)

**Ordering information – CA 4 series, self-compensating**

| <b>CA</b>  | <b>4</b>                                   | <b>x</b> | <b>8</b>  | <b>R</b>                            | <b>-</b>   | <b>5</b>                         |            |                                     |            |  |   |           |   |  |  |               |   |   |    |  |                |  |           |              |           |             |            |               |            |                |             |                         |           |                 |           |              |  |  |                  |  |           |       |           |        |           |       |
|--|--|----------|-----------|-------------------------------------|------------|----------------------------------|------------|-------------------------------------|------------|--|---|-----------|---|--|--|---------------|---|---|----|--|----------------|--|-----------|--------------|-----------|-------------|------------|---------------|------------|----------------|-------------|-------------------------|-----------|-----------------|-----------|--------------|--|--|------------------|--|-----------|-------|-----------|--------|-----------|-------|
| <table border="1"> <thead> <tr> <th colspan="2">Return method and accumulator style</th> </tr> </thead> <tbody> <tr> <td><b>CA</b></td> <td>Spring return, internal accumulator</td> </tr> <tr> <td><b>CAA</b></td> <td>Air return, external accumulator</td> </tr> <tr> <td><b>CSA</b></td> <td>Spring return, external accumulator</td> </tr> <tr> <td><b>CNA</b></td> <td>Self return (clevis), internal accumulator</td> </tr> </tbody> </table> | Return method and accumulator style        |          | <b>CA</b> | Spring return, internal accumulator | <b>CAA</b> | Air return, external accumulator | <b>CSA</b> | Spring return, external accumulator | <b>CNA</b> | Self return (clevis), internal accumulator | <table border="1"> <thead> <tr> <th>Bore size</th> </tr> </thead> <tbody> <tr> <td>4</td> </tr> </tbody> </table> | Bore size | 4 |  | <table border="1"> <thead> <tr> <th>Stroke length</th> </tr> </thead> <tbody> <tr> <td>6</td> </tr> <tr> <td>8</td> </tr> <tr> <td>16</td> </tr> </tbody> </table> | Stroke length | 6 | 8 | 16 | <table border="1"> <thead> <tr> <th colspan="2">Mounting style</th> </tr> </thead> <tbody> <tr> <td><b>-F</b></td> <td>Front flange</td> </tr> <tr> <td><b>-R</b></td> <td>Rear flange</td> </tr> <tr> <td><b>-RP</b></td> <td>Rear standard</td> </tr> <tr> <td><b>-FP</b></td> <td>Front standard</td> </tr> <tr> <td><b>-FRP</b></td> <td>Front and rear standard</td> </tr> <tr> <td><b>-S</b></td> <td>Side foot mount</td> </tr> <tr> <td><b>-C</b></td> <td>Clevis mount</td> </tr> </tbody> </table> | Mounting style |  | <b>-F</b> | Front flange | <b>-R</b> | Rear flange | <b>-RP</b> | Rear standard | <b>-FP</b> | Front standard | <b>-FRP</b> | Front and rear standard | <b>-S</b> | Side foot mount | <b>-C</b> | Clevis mount |  | <table border="1"> <thead> <tr> <th colspan="2">Effective weight</th> </tr> </thead> <tbody> <tr> <td><b>-3</b></td> <td>Light</td> </tr> <tr> <td><b>-5</b></td> <td>Medium</td> </tr> <tr> <td><b>-7</b></td> <td>Heavy</td> </tr> </tbody> </table> | Effective weight |  | <b>-3</b> | Light | <b>-5</b> | Medium | <b>-7</b> | Heavy |
| Return method and accumulator style  |  |          |           |                                     |            |                                  |            |                                     |            |  |   |           |   |  |  |               |   |   |    |  |                |  |           |              |           |             |            |               |            |                |             |                         |           |                 |           |              |  |  |                  |  |           |       |           |        |           |       |
| <b>CA</b>  | Spring return, internal accumulator        |          |           |                                     |            |                                  |            |                                     |            |  |   |           |   |  |  |               |   |   |    |  |                |  |           |              |           |             |            |               |            |                |             |                         |           |                 |           |              |  |  |                  |  |           |       |           |        |           |       |
| <b>CAA</b>   | Air return, external accumulator           |          |           |                                     |            |                                  |            |                                     |            |  |   |           |   |  |  |               |   |   |    |  |                |  |           |              |           |             |            |               |            |                |             |                         |           |                 |           |              |  |  |                  |  |           |       |           |        |           |       |
| <b>CSA</b>   | Spring return, external accumulator        |          |           |                                     |            |                                  |            |                                     |            |  |   |           |   |  |  |               |   |   |    |  |                |  |           |              |           |             |            |               |            |                |             |                         |           |                 |           |              |  |  |                  |  |           |       |           |        |           |       |
| <b>CNA</b>   | Self return (clevis), internal accumulator |          |           |                                     |            |                                  |            |                                     |            |  |   |           |   |  |  |               |   |   |    |  |                |  |           |              |           |             |            |               |            |                |             |                         |           |                 |           |              |  |  |                  |  |           |       |           |        |           |       |
| Bore size  |  |          |           |                                     |            |                                  |            |                                     |            |  |   |           |   |  |  |               |   |   |    |  |                |  |           |              |           |             |            |               |            |                |             |                         |           |                 |           |              |  |  |                  |  |           |       |           |        |           |       |
| 4  |  |          |           |                                     |            |                                  |            |                                     |            |  |   |           |   |  |  |               |   |   |    |  |                |  |           |              |           |             |            |               |            |                |             |                         |           |                 |           |              |  |  |                  |  |           |       |           |        |           |       |
| Stroke length  |  |          |           |                                     |            |                                  |            |                                     |            |  |   |           |   |  |  |               |   |   |    |  |                |  |           |              |           |             |            |               |            |                |             |                         |           |                 |           |              |  |  |                  |  |           |       |           |        |           |       |
| 6  |  |          |           |                                     |            |                                  |            |                                     |            |  |   |           |   |  |  |               |   |   |    |  |                |  |           |              |           |             |            |               |            |                |             |                         |           |                 |           |              |  |  |                  |  |           |       |           |        |           |       |
| 8  |  |          |           |                                     |            |                                  |            |                                     |            |  |   |           |   |  |  |               |   |   |    |  |                |  |           |              |           |             |            |               |            |                |             |                         |           |                 |           |              |  |  |                  |  |           |       |           |        |           |       |
| 16   |  |          |           |                                     |            |                                  |            |                                     |            |  |   |           |   |  |  |               |   |   |    |  |                |  |           |              |           |             |            |               |            |                |             |                         |           |                 |           |              |  |  |                  |  |           |       |           |        |           |       |
| Mounting style   |  |          |           |                                     |            |                                  |            |                                     |            |  |   |           |   |  |  |               |   |   |    |  |                |  |           |              |           |             |            |               |            |                |             |                         |           |                 |           |              |  |  |                  |  |           |       |           |        |           |       |
| <b>-F</b>  | Front flange                               |          |           |                                     |            |                                  |            |                                     |            |  |   |           |   |  |  |               |   |   |    |  |                |  |           |              |           |             |            |               |            |                |             |                         |           |                 |           |              |  |  |                  |  |           |       |           |        |           |       |
| <b>-R</b>  | Rear flange                                |          |           |                                     |            |                                  |            |                                     |            |  |   |           |   |  |  |               |   |   |    |  |                |  |           |              |           |             |            |               |            |                |             |                         |           |                 |           |              |  |  |                  |  |           |       |           |        |           |       |
| <b>-RP</b>   | Rear standard                              |          |           |                                     |            |                                  |            |                                     |            |  |   |           |   |  |  |               |   |   |    |  |                |  |           |              |           |             |            |               |            |                |             |                         |           |                 |           |              |  |  |                  |  |           |       |           |        |           |       |
| <b>-FP</b>   | Front standard                             |          |           |                                     |            |                                  |            |                                     |            |  |   |           |   |  |  |               |   |   |    |  |                |  |           |              |           |             |            |               |            |                |             |                         |           |                 |           |              |  |  |                  |  |           |       |           |        |           |       |
| <b>-FRP</b>  | Front and rear standard                    |          |           |                                     |            |                                  |            |                                     |            |  |   |           |   |  |  |               |   |   |    |  |                |  |           |              |           |             |            |               |            |                |             |                         |           |                 |           |              |  |  |                  |  |           |       |           |        |           |       |
| <b>-S</b>  | Side foot mount                            |          |           |                                     |            |                                  |            |                                     |            |  |   |           |   |  |  |               |   |   |    |  |                |  |           |              |           |             |            |               |            |                |             |                         |           |                 |           |              |  |  |                  |  |           |       |           |        |           |       |
| <b>-C</b>  | Clevis mount                               |          |           |                                     |            |                                  |            |                                     |            |  |   |           |   |  |  |               |   |   |    |  |                |  |           |              |           |             |            |               |            |                |             |                         |           |                 |           |              |  |  |                  |  |           |       |           |        |           |       |
| Effective weight   |  |          |           |                                     |            |                                  |            |                                     |            |  |   |           |   |  |  |               |   |   |    |  |                |  |           |              |           |             |            |               |            |                |             |                         |           |                 |           |              |  |  |                  |  |           |       |           |        |           |       |
| <b>-3</b>  | Light                                      |          |           |                                     |            |                                  |            |                                     |            |  |   |           |   |  |  |               |   |   |    |  |                |  |           |              |           |             |            |               |            |                |             |                         |           |                 |           |              |  |  |                  |  |           |       |           |        |           |       |
| <b>-5</b>  | Medium                                     |          |           |                                     |            |                                  |            |                                     |            |  |   |           |   |  |  |               |   |   |    |  |                |  |           |              |           |             |            |               |            |                |             |                         |           |                 |           |              |  |  |                  |  |           |       |           |        |           |       |
| <b>-7</b>  | Heavy                                      |          |           |                                     |            |                                  |            |                                     |            |  |   |           |   |  |  |               |   |   |    |  |                |  |           |              |           |             |            |               |            |                |             |                         |           |                 |           |              |  |  |                  |  |           |       |           |        |           |       |

| Model number | Stroke inches<br>1 inch = 25.4 mm | E3 max energy per cycle,<br>inch lbs<br>1 in lb = .11 Nm | We effective weight<br>lbs, 1 lb = .45 kg | E4 max energy per hour, in lbs/hour<br>1 in lb/hour = .11 Nm/hour |            |                    |
|--------------|-----------------------------------|--|---|---|------------|--------------------|
|              |                                   |  |   | Self-contained  | A/O tank   | A/O Re-circulating |
| CA 4x6-3     | 6.00                              | 420,000  | 8,000-19,000                              | 27,000,000  | 45,000,000 | 58,000,000         |
| CA 4x6-5     | 6.00                              | 420,000  | 19,000-41,000                             | 27,000,000  | 45,000,000 | 58,000,000         |
| CA 4x6-7     | 6.00                              | 420,000  | 41,000-94,000                             | 27,000,000  | 45,000,000 | 58,000,000         |
| CA 4x8-3     | 8.00                              | 560,000  | 11,000-25,000                             | 30,000,000  | 50,000,000 | 65,000,000         |
| CA 4x8-5     | 8.00                              | 560,000  | 25,000-55,000                             | 30,000,000  | 50,000,000 | 65,000,000         |
| CA 4x8-7     | 8.00                              | 560,000  | 55,000-125,000                            | 30,000,000  | 50,000,000 | 65,000,000         |
| CA 4x16-3    | 16.00                             | 1,120,000  | 22,000-50,000                             | 50,000,000  | 85,000,000 | 110,000,000        |
| CA 4x16-5    | 16.00                             | 1,120,000  | 50,000-110,000                            | 50,000,000  | 85,000,000 | 110,000,000        |
| CA 4x16-7    | 16.00                             | 1,120,000  | 110,000-250,000                           | 50,000,000  | 85,000,000 | 110,000,000        |

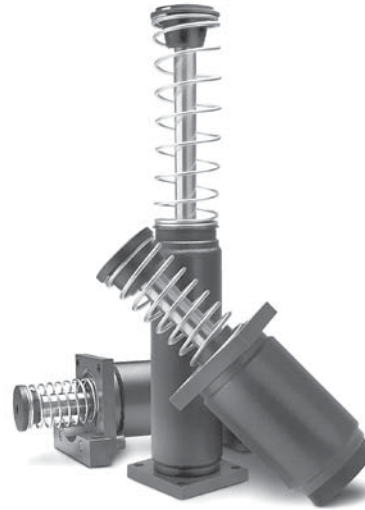
**B**  
 Shock Absorbers  
 Actuator Products  
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**Heavy Industrial Shock Absorbers A 2 and A 3 - Adjustable**

**A2 and A3 Series adjustable shock absorbers** are capable of decelerating heavy duty loads. These reliable units replace the former 2" and 3" large bore adjustable shock absorbers.

Features include a considerably reduced outer diameter, internal accumulator and threaded mounting brackets, easily adaptable to the front or rear of the outer body.



**Technical data**

Impact velocity range: 0.33 to 16.5 ft/sec (0.1 to 5 m/sec)  
 Operating temperature: 10° to 150°F (-12° to 66°C)

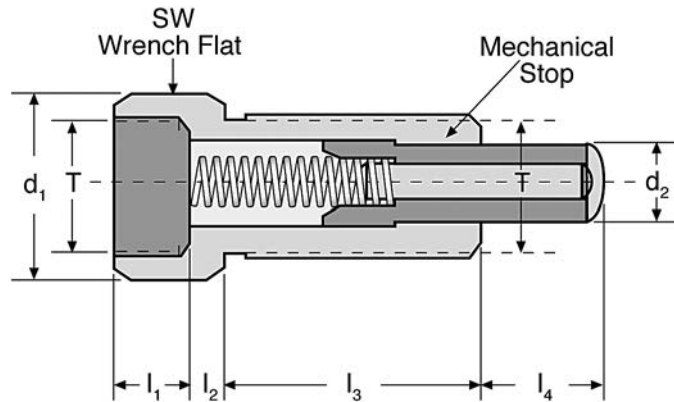
**Ordering information – A 2 & A 3 series, adjustable**

|  |  |                  |                      |          |                                     |          |
|--|--|------------------|----------------------|----------|-------------------------------------|----------|
| <b>A</b>                                   |  | <b>2</b>         | <b>x</b>             | <b>8</b> | <b>-</b>                            | <b>R</b> |
| <b>Return method and accumulator style</b> |  | <b>Bore size</b> | <b>Stroke length</b> |          | <b>Mounting style</b>               |          |
| <b>A</b>                                   | Spring return, internal accumulator        | <b>2</b>         | <b>2</b>             |          | <b>-F</b> Front flange              |          |
| <b>AA</b>                                  | Air return, external accumulator           | <b>3</b>         | <b>4</b>             |          | <b>-R</b> Rear flange               |          |
| <b>SA</b>                                  | Spring return, external accumulator        |                  | <b>5</b>             |          | <b>-RF</b> Front rectangular flange |          |
| <b>NA</b>                                  | Self return (clevis), internal accumulator |                  | <b>6</b>             |          | <b>-RR</b> Rear rectangular flange  |          |
|  |  |                  |                      |          | <b>-S</b> Side foot mount           |          |
|  |  |                  |                      |          | <b>-C</b> Clevis mount              |          |

Note: A no button option is available on the 3" Bore only as a special.

| Model number  | Stroke inches<br>1 inch = 25.4 mm | E3 max energy<br>per cycle, inch lbs<br>1 in lb = .11 Nm | We<br>effective weight<br>lbs, 1 lb = .45 kg | E4 max energy per hour, in lbs/hour<br>1 in lb/hour = .11 Nm/hour |            |                    |
|---------------|-----------------------------------|--|--|---|------------|--------------------|
|               |                                   |  |  | Self-contained  | A/O tank   | A/O Re-circulating |
| <b>A 2x2</b>  | 2.00                              | 32,000   | 560-170,000                                  | 9,600,000   | 12,000,000 | 15,600,000         |
| <b>A 2x4</b>  | 4.00                              | 80,000   | 510-160,000                                  | 12,000,000  | 15,000,000 | 19,500,000         |
| <b>A 2x6</b>  | 6.00                              | 120,000  | 570-190,000                                  | 14,400,000  | 18,000,000 | 23,500,000         |
| <b>A 2x8</b>  | 8.00                              | 170,000  | 580-200,000                                  | 16,800,000  | 21,000,000 | 27,000,000         |
| <b>A 2x10</b> | 10.00                             | 210,000  | 720-250,000                                  | 19,200,000  | 24,000,000 | 31,000,000         |
| <b>A 3x5</b>  | 5.00                              | 140,000  | 1,050-340,000                                | 20,000,000  | 25,000,000 | 32,500,000         |
| <b>A 3x8</b>  | 8.00                              | 250,000  | 1,200-400,000                                | 32,000,000  | 40,000,000 | 52,000,000         |
| <b>A 3x12</b> | 12.00                             | 390,000  | 1,350-450,000                                | 48,000,000  | 60,000,000 | 78,000,000         |

**Miniature Shock Absorber Side Load Adapters**



**Dimensions** Inches (Millimeters)

| MC, MVC Series model | SCSeries model      | MA Series model     | Side load adapter | T         | d1           | d2           | l1           | l2          | l3           | l4             | SW           | Maximum side load (α) |
|----------------------|---------------------|---------------------|-------------------|-----------|--------------|--------------|--------------|-------------|--------------|----------------|--------------|-----------------------|
| <b>MC 150M</b>       | N/A                 | <b>MA 150M</b>      | <b>250-0558</b>   | M14 x 1.5 | 0.70<br>(18) | 0.35<br>(9)  | 0.31<br>(8)  | 0.15<br>(4) | 0.78<br>(20) | 0.49<br>(12.5) | 0.62<br>(16) | 25°                   |
| <b>MC 225M</b>       | N/A                 | <b>N/A</b>          | <b>250-0559</b>   | M20 x 1.5 | 0.94<br>(24) | 0.47<br>(12) | 0.39<br>(10) | 0.15<br>(4) | 0.78<br>(20) | 0.49<br>(12.5) | 0.86<br>(22) | 25°                   |
| <b>MC 600M</b>       | N/A                 | <b>N/A</b>          | <b>250-0560</b>   | M25 x 1.5 | 1.18<br>(30) | 0.62<br>(16) | 0.39<br>(10) | 0.23<br>(6) | 1.50<br>(38) | 0.98<br>(25)   | 1.06<br>(27) | 25°                   |
| <b>N/A</b>           | <b>SC190M-880*</b>  | <b>N/A</b>          | <b>250-0080</b>   | M14 x 1.5 | 0.70<br>(18) | 0.35<br>(9)  | 0.39<br>(10) | 0.15<br>(4) | 1.02<br>(26) | 0.62<br>(16)   | 0.62<br>(16) | 25°                   |
| <b>MVC 225M-880*</b> | <b>SC 300M-880*</b> | <b>MA 225M-880*</b> | <b>250-0081</b>   | M20 x 1.5 | 0.94<br>(24) | 0.47<br>(12) | 0.39<br>(10) | 0.15<br>(4) | 1.25<br>(32) | 0.75<br>(19)   | 0.86<br>(22) | 25°                   |
| <b>MVC 600M-880*</b> | <b>SC 650M-880*</b> | <b>MA 600M-880*</b> | <b>250-0082</b>   | M25 x 1.5 | 1.18<br>(30) | 0.62<br>(16) | 0.39<br>(10) | 0.23<br>(6) | 1.50<br>(38) | 0.98<br>(25)   | 1.06<br>(27) | 25°                   |

**Note:** Side load not to exceed 5". Maximum side load depends on application, shock absorber model, and stroke length.  
**Note:** The side load adapter can only be installed on select metric shock absorbers without rod end button.

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**Magnum Series Group Accessories**

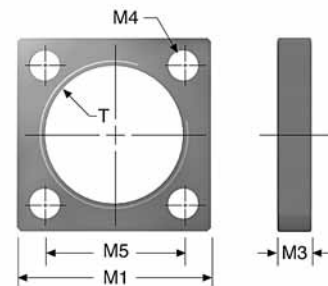
**Square and Rectangular Flanges Inches (Millimeters)**

| Used with                  | Square flange | Rect flange | T            | M1          | M2          | M3          | M4          | M5          | M6          |
|----------------------------|---------------|-------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|
| MA 33<br>ML 33<br>MC 33    |               | 250-0016    | 1-1/4-12 UNF | 1.50 (38.1) | 2.00 (50.8) | 0.38 (9.5)  | .219 (5.6)  | 1.12 (28.4) | 1.62 (41.2) |
| MA 33M<br>ML 33M<br>MC 33M | N/A           | 250-0293    | M33x1.5      | 1.62 (41.1) | 2.12 (53.8) | 0.38 (9.5)  | .278 (7.1)  | 1.10 (28.0) | 1.65 (42.0) |
| MA 36<br>ML 36<br>MC 36    |               | 250-0633    | 1-3/8-12 UNF | 1.75 (44.4) | 2.00 (50.8) | 0.38 (9.5)  | .219 (5.6)  | 1.12 (28.4) | 1.62 (41.2) |
| MA 36M<br>ML 36M<br>MC 36M | N/A           | N/A         | N/A          | N/A         | N/A         | N/A         | N/A         | N/A         | N/A         |
| MA 45<br>ML 45<br>MC 45    | 250-0023      | 250-0024    | 1-3/4-12 UN  | 2.25 (57.2) | 3.00 (76.2) | 0.50 (12.7) | 0.34 (8.7)  | 1.62 (41.2) | 2.38 (60.5) |
| MA 45M<br>ML 45M<br>MC 45M | 250-0298      | 250-0299    | M45x1.5      | 2.25 (57.2) | 3.00 (76.2) | 0.50 (12.7) | 0.35 (8.8)  | 1.62 (41.2) | 2.38 (60.5) |
| MA 64<br>ML 64<br>MC 64    | 250-0028      | N/A         | 2-1/2-12 UN  | 3.50 (88.9) | N/A         | 0.62 (15.9) | 0.41 (10.4) | 2.75 (69.6) | N/A         |
| MA 64M<br>ML 64M<br>MC 64M | 250-0302      | N/A         | M64x2        | 3.50 (88.9) | N/A         | 0.62 (15.9) | 0.41 (10.4) | 2.75 (69.6) | N/A         |

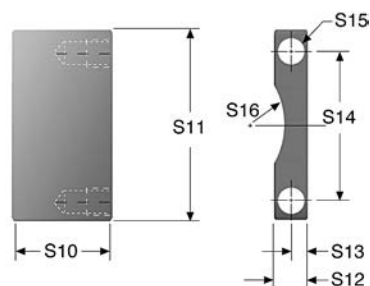
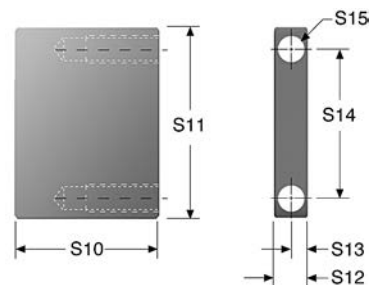
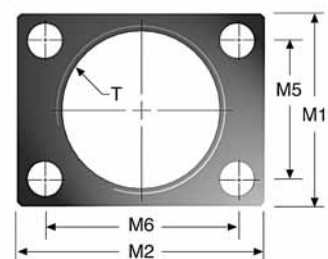
**Stop Bars Inches (Millimeters)**

| Used with  | Part #   | S10         | S11         | S12         | S13        | S14         | S15         | S16         |
|--|----------|-------------|-------------|-------------|------------|-------------|-------------|-------------|
| MA 33<br>ML 33<br>MC 33  | 250-0426 | 1.28 (32.5) | 1.50 (38.1) | 0.38 (9.7)  | 0.19 (4.8) | 1.12 (28.4) | 10-32 UNF   | N/A         |
| MA 33M<br>ML 33M<br>MC 33M   | 250-0427 | 1.28 (32.5) | 1.50 (38.1) | 0.38 (9.7)  | 0.19 (4.8) | 1.12 (28.4) | M5x0.8      | N/A         |
| MA 36<br>ML 36<br>MC 36  | 250-0426 | 1.28 (32.5) | 1.50 (38.1) | 0.38 (9.7)  | 0.19 (4.8) | 1.12 (28.4) | 10-32 UNF   | N/A         |
| MA 36M<br>ML 36M<br>MC 36M   | N/A      | N/A         | N/A         | N/A         | N/A        | N/A         | N/A         | N/A         |
| MA 45<br>ML 45<br>MC 45  | 250-0428 | 1.03 (26.2) | 2.25 (57.2) | 0.63 (16.0) | 0.31 (7.9) | 1.62 (41.3) | 5/16-24 UNF | N/A         |
| MA 45M<br>ML 45M<br>MC 45M   | 250-0639 | 1.03 (26.2) | 2.25 (57.2) | 0.63 (16.0) | 0.31 (7.9) | 1.62 (41.3) | M8x1.25     | N/A         |
| MA 6450<br>MA 64100<br>ML 6425<br>ML 6450<br>MC 6450<br>MC 64100       | 250-0430 | 1.44 (36.5) | 3.50 (88.9) | 0.50 (12.7) | 0.25 (6.4) | 2.75 (69.8) | 3/8-24 UNF  | 1.37 (34.8) |
| MA 6450M<br>MA 64100M<br>ML 6425M<br>ML 6450M<br>MC 6450M<br>MC 64100M | 250-0640 | 1.44 (36.5) | 3.50 (88.9) | 0.50 (12.7) | 0.25 (6.4) | 2.75 (69.8) | M10x1.5     | 1.37 (34.8) |
| MA 64150<br>MC 64150   | 250-0432 | 2.31 (57.7) | 3.50 (88.9) | 0.50 (12.7) | 0.25 (6.4) | 2.75 (69.8) | 3/8-24 UNF  | 1.37 (34.8) |
| MA 64150M<br>MC 64150M   | 250-0641 | 2.31 (57.7) | 3.50 (88.9) | 0.50 (12.7) | 0.25 (6.4) | 2.75 (69.8) | M10x1.5     | 1.37 (34.8) |
| MAA 64150<br>MCA 64150   | 250-0435 | 2.18 (55.4) | 3.50 (88.9) | 0.50 (12.7) | 0.25 (6.4) | 2.75 (69.8) | 3/8-24 UNF  | 1.37 (34.8) |
| MAA 64150M<br>MCA 64150M   | 250-0649 | 2.18 (55.4) | 3.50 (88.9) | 0.50 (12.7) | 0.25 (6.4) | 2.75 (69.8) | M10x1.5     | 1.37 (34.8) |

**Square Flange**



**Rectangular Flange**



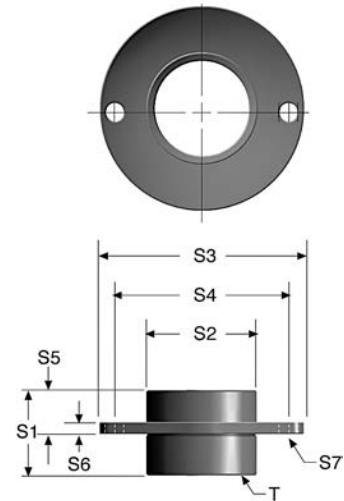
Hard metric stop bars available upon request.

Stop bars come in pairs, two bars per package.

**Magnum Series Group Accessories**

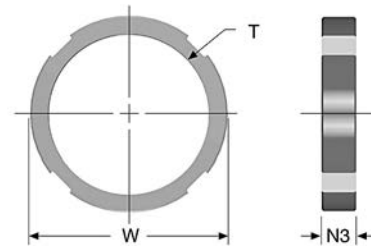
**Flanged Stop Collars In Inches (Millimeters)**

| Used With   | Part #   | T               | S1             | S2             | S3              | S4             | S5             | S6            | S7              |
|---|----------|-----------------|----------------|----------------|-----------------|----------------|----------------|---------------|-----------------|
| MA 33<br>ML 33<br>MC 33                                   | 250-0070 | 1-1/4-12<br>UNF | 2.00<br>(50.8) | 1.50<br>(38.1) | 2.50<br>(63.5)  | 2.00<br>(50.8) | 0.88<br>(22.4) | 0.25<br>(6.4) | 0.282<br>(7.16) |
| MA 33M<br>ML 33M<br>MC 33M                                | 250-0071 | M33x1.5         | 2.00<br>(50.8) | 1.50<br>(38.1) | 2.50<br>(63.5)  | 2.00<br>(50.8) | 0.88<br>(22.4) | 0.25<br>(6.4) | 0.282<br>(7.16) |
| MA 36<br>ML 36<br>MC 36<br>MA 36M<br>ML 36M<br>MC 36M     | N/A      | N/A             | N/A            | N/A            | N/A             | N/A            | N/A            | N/A           | N/A             |
| MA 45<br>ML 45<br>MC 45                                   | 250-0072 | 1-3/4-12<br>UN  | 1.85<br>(47.0) | 2.25<br>(57.2) | 3.25<br>(82.6)  | 2.75<br>(69.6) | 0.88<br>(22.4) | 0.25<br>(6.4) | 0.282<br>(7.16) |
| MA 45M<br>ML 45M<br>MC 45M                                | 250-0073 | M45x1.5         | 1.85<br>(47.0) | 2.25<br>(57.2) | 3.25<br>(82.6)  | 2.75<br>(69.9) | 0.88<br>(22.4) | 0.25<br>(6.4) | 0.282<br>(7.16) |
| MA 6450<br>ML 64100<br>MC 6450<br>MC 64100                | 250-0074 | 2-1/2-12<br>UN  | 2.25<br>(57.2) | 3.00<br>(76.2) | 4.25<br>(108.0) | 3.50<br>(88.9) | 1.00<br>(25.4) | 0.38<br>(9.7) | 0.282<br>(7.16) |
| MA 6450M<br>ML 6425M<br>ML 6450M<br>MC 6450M<br>MC 64100M | 250-0075 | M64x2           | 2.25<br>(57.2) | 3.00<br>(76.2) | 4.25<br>(108.0) | 3.50<br>(88.9) | 1.00<br>(25.4) | 0.38<br>(9.7) | 0.282<br>(7.16) |
| MA 64150<br>MC 64150                                      | 250-0076 | 2-1/2-12<br>UN  | 3.13<br>(79.4) | 3.00<br>(76.2) | 4.25<br>(108.0) | 3.50<br>(88.9) | 1.00<br>(25.4) | 0.38<br>(9.7) | 0.282<br>(7.16) |
| MA 64150M<br>MC 64150M                                    | 250-0077 | M64x2           | 3.13<br>(79.4) | 3.00<br>(76.2) | 4.25<br>(108.0) | 3.50<br>(88.9) | 1.00<br>(25.4) | 0.38<br>(9.7) | 0.282<br>(7.16) |

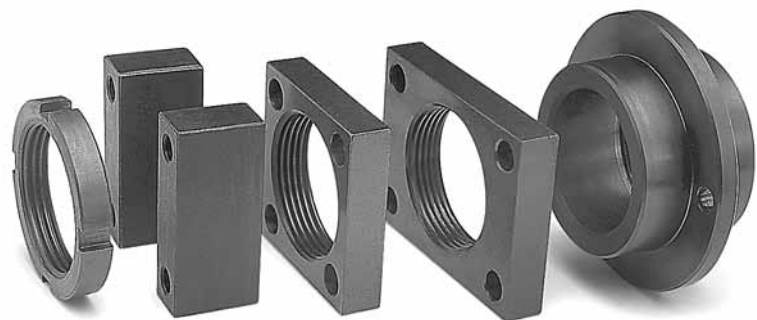


**Lock Nuts Inches (Millimeters)**

| Used With                  | Part #   | T               | W              | N3            |
|----------------------------|----------|-----------------|----------------|---------------|
| MA 33<br>ML 33<br>MC 33    | 250-0038 | 1-1/4-12<br>UN  | 1.50<br>(38.1) | 0.25<br>(6.4) |
| MA 33M<br>ML 33M<br>MC 33M | 250-0292 | M33x1.5         | 1.56<br>(39.6) | 0.25<br>(6.4) |
| MA 36<br>ML 36<br>MC 36    | 250-0631 | 1-3/8-12<br>UNF | 1.75<br>(44.5) | 0.25<br>(6.4) |
| MA 36M<br>ML 36M<br>MC 36M | 250-0537 | M36x1.5         | 1.75<br>(44.5) | 0.25<br>(6.4) |
| MA 45<br>ML 45<br>MC 45    | 250-0041 | 1-3/4-12<br>UN  | 2.25<br>(57.2) | 0.37<br>(9.4) |
| MA 45M<br>ML 45M<br>MC 45M | 250-0297 | M45x1.5         | 2.25<br>(57.2) | 0.37<br>(9.4) |
| MA 64<br>ML 64<br>MC 64    | 250-0042 | 2-1/2-12<br>UN  | 3.00<br>(76.2) | 0.37<br>(9.4) |
| MA 64M<br>ML 64M<br>MC 64M | 250-0301 | M64x2           | 3.00<br>(76.2) | 0.37<br>(9.4) |



One lock nut included with each shock absorber where appropriate.



**B** Shock Absorbers Actuator Products Shock Absorbers

**Side-Foot Mount Assembly**



**Side-Foot Mount Assembly**

| Used With                  | Part #   | Used With                      | Part #   |
|----------------------------|----------|--------------------------------|----------|
| MA 33<br>ML 33<br>MC 33    | 250-0015 | MA 6450<br>MA 64100<br>ML 6425 | 250-0300 |
| MA 33M<br>ML 33M<br>MC 33M |          | ML 6450<br>MC 6450<br>MC 64100 |          |
| MA 36<br>ML 36<br>MC 36    |          | N/A                            |          |
| MA 36M<br>ML 36M<br>MC 36M | N/A      |                                |          |
| MA 45<br>ML 45<br>MC 45    | 250-0025 | MA 64150<br>MC 64150           | 250-0030 |
| MA 45M<br>ML 45M<br>MC 45M |          | MA 64150M<br>MC 64150M         | 250-0304 |

**Clevis Mount Assembly**



**Clevis Mount Assembly**

| Used With  | Part #   | Used With  | Part #               |          |
|--|----------|--|----------------------|----------|
| MA 33<br>ML 33<br>MC 33<br>MAS<br>MLS<br>MCS                   | 250-0225 | ML 6425<br>ML 6425M                                  | 250-0625<br>250-0626 |          |
| MA 33M<br>ML 33M<br>MC 33M<br>MAS 33M<br>MLS 33M<br>MCS 33M    |          | MA 6450<br>ML 6450<br>MC 6450                        | 250-0625             |          |
|  |          | MA 6450M<br>ML 6450M<br>MC 6450M                     | 250-0626             |          |
|  |          | MA 64100<br>MC 64100                                 | 250-0625             |          |
|  |          | MA 64100M<br>MC 64100M                               | 250-0626             |          |
| MAN 33<br>MLN 33<br>MCN 33<br>MAA 33<br>MLA 33<br>MCA 33       | 250-0018 | MAN 64150<br>MCN 64150<br>MAA 64150<br>MCA 64150     | 250-0625             |          |
| MAN 33M<br>MLN 33M<br>MCN 33M<br>MAA 33M<br>MLA 33M<br>MCA 33M |          | MAN 64150M<br>MCN 64150M<br>MAA 64150M<br>MCA 64150M |                      | 250-0626 |
|  |          | MA 64150<br>MCA 64150<br>MAS 64150<br>MCS 64150      |                      | 250-0627 |
| MA 45<br>ML 45<br>MC 45  | 250-0324 | MA 64150M<br>MCA 64150M<br>MAS 64150M<br>MCS 64150M  | 250-0628             |          |
| MA 45M<br>ML 45M<br>MC 45M                                     |          |  |                      |          |

**B**

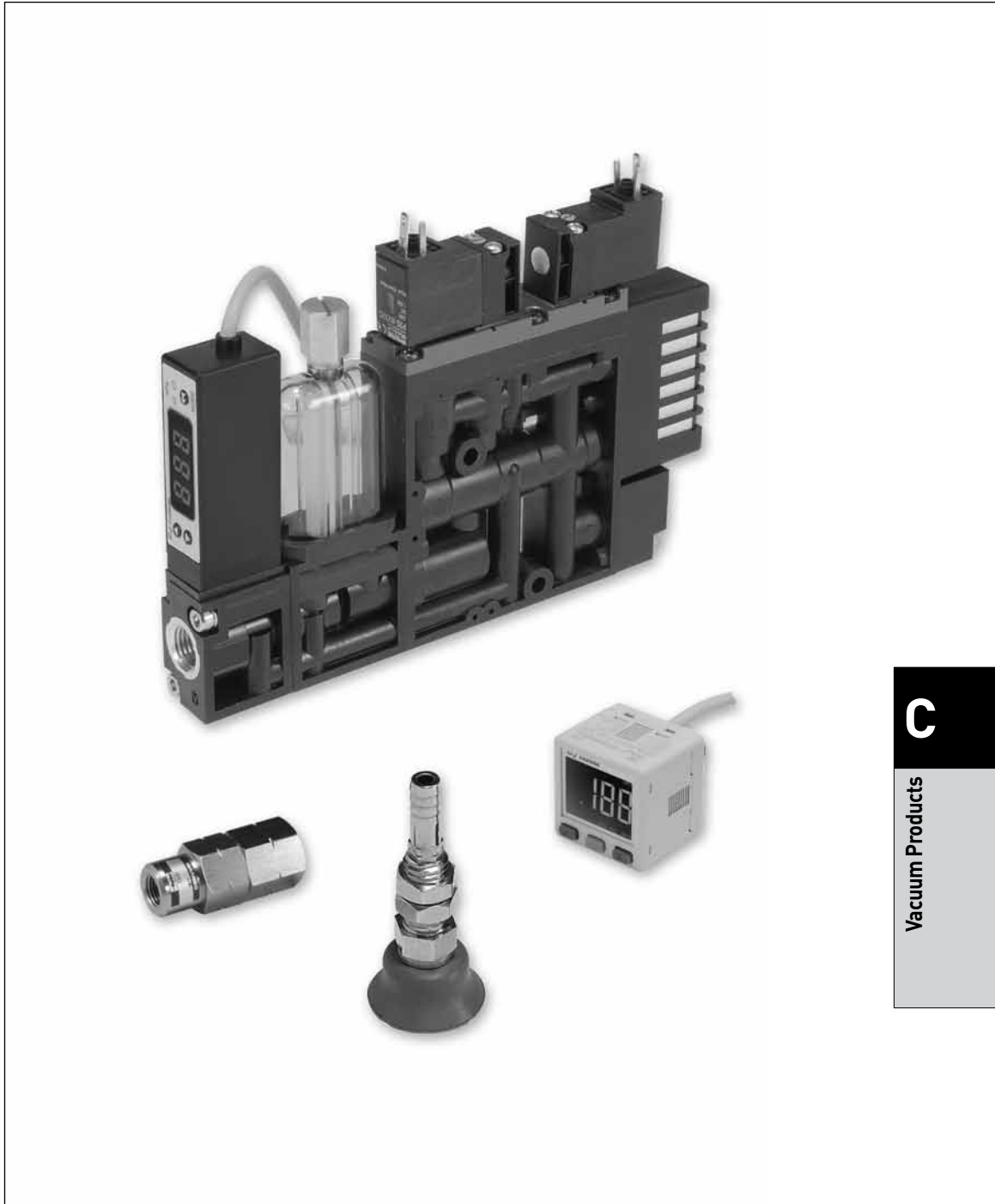
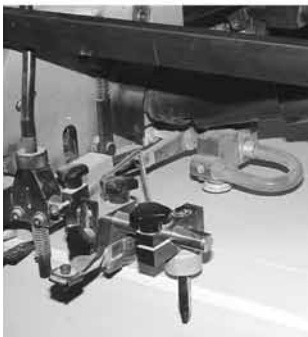
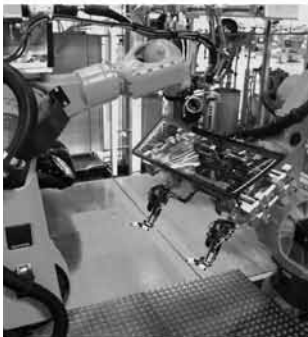
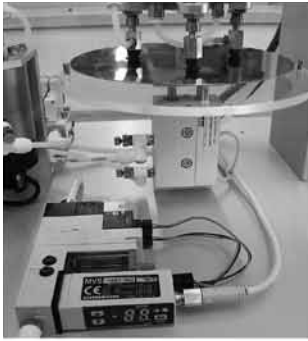
Shock Absorbers  
 Actuator Products

Shock  
 Absorbers

**B**

Shock Absorbers  
Actuator Products

Shock  
Absorbers



**C**  
Vacuum Products

# Vacuum Products



## Vacuum Cups

### PFG Flat Cups



- Precision molded single lip flat cup for smooth or slightly curved surfaces.
- Low profile design makes flat pads ideal for fast response.
- Cup Sizes: 1.5mm to 200mm

C4

### PBG Bellows Cups



- Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, curved surfaces, and flexible products
- Cup sizes: 10mm to 150mm

C17

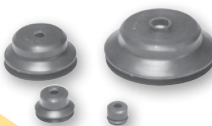
### P5V-CFS Flat Cups



- Precision molded double lip flat cup for slightly curved surfaces
- Double lip for additional security. If outside lip bends and loses its seal, the inner lip remains sealed.
- Outer ribs prevent the cup lip from being cut
- Cup Sizes: 50mm to 150mm

C29

### PJG Short Bellows Cups



- Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, curved surfaces, and slightly flexible products
- Shorter stroke provides fast response
- Cup sizes: 6mm to 80mm

C30

### PCG Multiple Bellows Cups



- Versatile bellows cup design provides a flexible sealing lip for products with irregular, smooth, or curved surfaces
- 2-1/2 bellows design minimizes contact pressure applied to products
- Cup sizes: 5mm to 90mm

C42

### PUGB Flat Swivel Cups



- 30° swivel single lip flat cup for smooth surfaces, slightly curved surfaces, and flexible products
- Rigid stem or level compensator provides good stability for horizontal lift
- Cup Sizes: 60mm to 100mm

C50

## Vacuum Generators

### MCA, CV, CV-CK Inline Generators



- MCA: Light weight vacuum generator
- CV: Basic aluminum body vacuum generator
- CV-CK: Basic aluminum body vacuum generator with mechanical switch for part present confirmation

C54

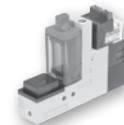
### CHF Inline Generators



- CHF- High Flow Series is a multistage vacuum generator
- Intended for high flow vacuum applications
- Ideal for porous applications
- Standard with flow thru exhaust mufflers to reduce clogging in dirty environments

C56

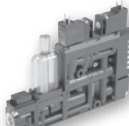
### MC22 Integrated Generators



- Compact vacuum generator includes vacuum and blow-off solenoids and vacuum filters
- Optional check valve and MPS-23 pressure sensor
- Air-economizing function with MVS-201 pressure sensor
- Inline version can be mounted on manifolds up to 8 stations

C58

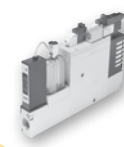
### MC72 Integrated Generators



- Light weight vacuum generator includes vacuum and blow-off solenoids.
- Includes check valve, vacuum filter and optional MPS-23 pressure sensor
- Air-economizing function with MVS-201 pressure sensor
- Inline version can be mounted on manifolds up to 5 stations

C61

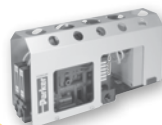
### CEK Integrated Generators



- Air-economizing functions with emergency stop logic that maintains degree of vacuum with loss of output power
- Includes vacuum and blow-off solenoids, check valve, vacuum filter and optional MPS-23 pressure sensor
- Inline versions can be mounted in manifolds up to 5 stations

C64

### CVXCEK Integrated Generators




- Basic 2 station CEK generator manifold with additional electrical capabilities
- Integrates MPS-23 sensor for on board air-economizing programming
- M12 electrical wiring package with optional 18-pin single connection

C67



## Vacuum Generator Accessories


### MPS-23 Integrated Generator Sensors



- 0 to -30 inHg, -14.7 to 72.5 PSIG
- Output type: (2) NPN / PNP
- Media: air, non-corrosive gas
- IP65
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

**C69**


### MVS-201 Integrated Generator Sensors



- 0 to -30 inHg, -14.7 to 72.5 PSIG
- Output type: (2) NPN / PNP
- Media: air, non-corrosive gas
- IP65
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

**C71**


### FSV Metered Flow Sensing Valve



- Pick and place randomly placed products
- Minimize vacuum loss when cup seal is lost
- Direct mounting to cups
- 1/8 to G3/8 connection
- Integrated bronze filter

**C73**


### CH01 One Way Check Valve



- Poppet design
- Low leakage
- Low cracking pressure

**C74**


### VF & VFL Vacuum Filters



- Filters the vacuum system to protect the components from damaging particles absorbed from the environment
- Elements easily replaced

**C75**


### VFP Vacuum Filters



- Provides easy monitoring, economy and safety
- 10 micron porous plastic element prolongs element life
- Shatterproof and airtight
- Replaceable filter element

**C76**

### Convum Vacuum Silencers




- Pressure up to 128 PSIG
- Temperature 41°F to 132°F (5°C to 55.5°C)
- Silencing effect 20 dB

**C77**

## Pressure Sensors / Cables


### MPS-33 Pressure Sensors



- 0 to -30 inHg, 0 to 145 PSIG
- Output type: (2) PNP or (1) NPN with analog
- Media: air, non-corrosive gas
- IP50
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

**C78**


### MPS-34 Pressure Sensors



- 0 to -30 inHg, 0 to 145 PSIG
- Output type: (2) PNP or (1) NPN with analog
- Media: air, non-corrosive gas
- IP50
- Hysteresis output mode: variable, 100% F.S.
- Output setting: push button
- LED display (Red)

**C80**


### SCP01 Pressure Sensor



- Stainless steel body
- Compact construction
- Shock and vibration proof
- Resistant to pressure spikes
- Accuracy +/- 0.5% FS

**C82**


### SCPSD Pressure Sensors



- CV-CK is a Venturi Generator with adjustable open contact mechanical switch for vacuum confirmation.
- Great for low cost vacuum confirmation.

**C83**

### Cables



- M8, M12 male / female connector
- Length: 2m or 5m
- Cover: PVC or PUR
- Connection type: swivel straight or angled
- IP67 swivel connector

**C85**

Exceptional for any smooth flat or surface that will benefit from stability and fast response of the cup design. This is a multi-versatile and multi-industry cup. Typical applications could be chip mounting, electrical components, semiconductor chips, glass, injection mold, sheet metal, press transfer, fixtures, woodworking.

**Features**

- Precision molded single lip flat cup for smooth or slightly curved surfaces.
- Universal flat design for most smooth surface applications
- Stable vertical / horizontal lift
- Strong low profile design for fast response needed for short cycles
- 5mm to 200mm diameters
- Bottom cleats on 60 to 200mm diameters



**Styles**

- PFTM series male thread connector
- PFTF series female thread connector
- PFTK series barbed bulkhead
- PFYK series 90° barbed adapter
- PFTYS series bulkhead level compensator

**Specifications**

| Cup material               | Nitrile       | Nitrile ESD*     | Silicon       | Silicon ESD*    | Urethane     |
|----------------------------|---------------|------------------|---------------|-----------------|--------------|
| Material code              | NBR           | NBRE             | SI            | SIE             | U            |
| Operating temperature (°C) | -20° to +120° | 0° to +60°       | -60° to +250° | -10° to +130°   | -20° to +75° |
| Color                      | Black         | Black / Blue Dot | White         | Black / Red Dot | Blue         |
| Hardness, shore A (°Sh)    | 55 ±5         | 70 ±5            | 55 ±5         | 55 ±5           | 55 ±5        |
| Electrical resistance (Ωm) | —             | 800 to 1000      | —             | 5 to 15         | —            |

\* ESD: Electric Static Dissipative Material

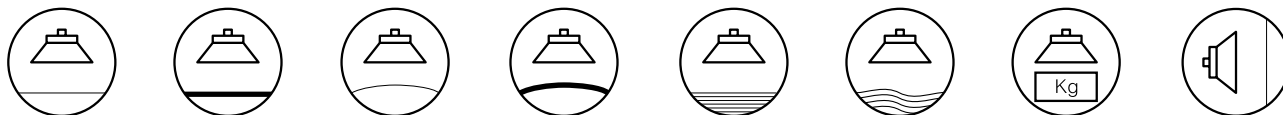
**How to order**

Cups assemblies and replacement cups are specified by cup diameter and material. Standard nitrile and silicon are listed on the following pages. To specify an alternative material, replace the cup material with alternative cup material code.

**Example:** To specify a cup assembly with urethane (U), replace (NBR) with (U) in the part number. PFTM-20B-NBR-G1 becomes PFTM-20B-U-G1. Inquire with factory for availability.

**Application guide**

**Flat - Smooth surface**



Ø 120/200 only

|                            |                           |                                      |                                     |                      |                           |                    |               |
|----------------------------|---------------------------|--------------------------------------|-------------------------------------|----------------------|---------------------------|--------------------|---------------|
| Flat surface, thin section | Flat surface, any section | Slightly bowed surface, thin section | Slightly bowed surface, any section | Metal sheet handling | Corrugated sheet handling | High lifting force | Vertical lift |
|----------------------------|---------------------------|--------------------------------------|-------------------------------------|----------------------|---------------------------|--------------------|---------------|

**C**  
**Vacuum Cups**  
**Vacuum Products**  
**PFG Series**  
**PBG Series**  
**PSV-CFS Series**  
**PJG Series**  
**PCG Series**  
**PUGB Series**

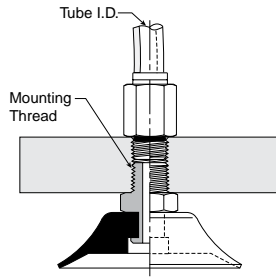


**PFTM Series Male Thread Connector**

Simple male connection for low profile positions secured to a plate or bracket. NPT, G, metric threads.  
 Fitting material: aluminum.

**Installation**

**Note:**  
 When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



| Cup diameter (mm) | Vacuum port | Complete assembly Nitrile (NBR) | Replacement cup Nitrile (NBR) | Complete assembly Silicon (SI) | Replacement cup Silicon (SI) | Replacement cup fitting |
|-------------------|-------------|---------------------------------|-------------------------------|--------------------------------|------------------------------|-------------------------|
| 5                 | M5          | PFTM-5A-NBR-M5                  | PFG-5A-NBR                    | PFTM-5A-SI-M5                  | PFG-5A-SI                    | FTM-5A-M5H              |
| 5                 | 1/8 BSPP    | PFTM-5A-NBR-G1                  | PFG-5A-NBR                    | PFTM-5A-SI-G1                  | PFG-5A-SI                    | FTM-5A-G1               |
| 6                 | M5          | PFTM-6A-NBR-M5                  | PFG-6A-NBR                    | PFTM-6A-SI-M5                  | PFG-6A-SI                    | FTM-5A-M5H              |
| 6                 | 1/8 BSPP    | PFTM-6A-NBR-G1                  | PFG-6A-NBR                    | PFTM-6A-SI-G1                  | PFG-6A-SI                    | FTM-5A-G1               |
| 8                 | M5          | PFTM-8A-NBR-M5                  | PFG-8A-NBR                    | PFTM-8A-SI-M5                  | PFG-8A-SI                    | FTM-5A-M5H              |
| 8                 | 1/8 BSPP    | PFTM-8A-NBR-G1                  | PFG-8A-NBR                    | PFTM-8A-SI-G1                  | PFG-8A-SI                    | FTM-5A-G1               |
| 10                | M5          | PFTM-10A-NBR-M5                 | PFG-10A-NBR                   | PFTM-10A-SI-M5                 | PFG-10A-SI                   | FTM-5A-M5H              |
| 10                | 1/8 BSPP    | PFTM-10A-NBR-G1                 | PFG-10A-NBR                   | PFTM-10A-SI-G1                 | PFG-10A-SI                   | FTM-5A-G1               |
| 15                | M5          | PFTM-15A-NBR-M5                 | PFG-15A-NBR                   | PFTM-15A-SI-M5                 | PFG-15A-SI                   | FTM-5A-M5H              |
| 15                | 1/8 BSPP    | PFTM-15A-NBR-G1                 | PFG-15A-NBR                   | PFTM-15A-SI-G1                 | PFG-15A-SI                   | FTM-5A-G1               |
| 20                | 1/8 BSPP    | PFTM-20B-NBR-G1                 | PFG-20B-NBR                   | PFTM-20B-SI-G1                 | PFG-20B-SI                   | FTM-20B-G1H             |
| 20                | 1/4 BSPP    | PFTM-20B-NBR-G2                 | PFG-20B-NBR                   | PFTM-20B-SI-G2                 | PFG-20B-SI                   | FTM-20B-G2              |
| 20                | M10         | PFTM-20B-NBR-M10                | PFG-20B-NBR                   | PFTM-20B-SI-M10                | PFG-20B-SI                   | FTM-20B-M10             |
| 20                | 1/8 NPT     | PFTM-20B-NBR-N1                 | PFG-20B-NBR                   | PFTM-20B-SI-N1                 | PFG-20B-SI                   | FTM-20B-N1              |
| 30                | 1/8 BSPP    | PFTM-30-NBR-G1                  | PFG-30-NBR                    | PFTM-30-SI-G1                  | PFG-30-SI                    | FTM-20B-G1H             |
| 30                | 1/4 BSPP    | PFTM-30-NBR-G2                  | PFG-30-NBR                    | PFTM-30-SI-G2                  | PFG-30-SI                    | FTM-20B-G2              |
| 30                | M10         | PFTM-30-NBR-M10                 | PFG-30-NBR                    | PFTM-30-SI-M10                 | PFG-30-SI                    | FTM-20B-M10             |
| 30                | 1/8 NPT     | PFTM-30-NBR-N1                  | PFG-30-NBR                    | PFTM-30-SI-N1                  | PFG-30-SI                    | FTM-20B-N1              |
| 40                | 1/8 BSPP    | PFTM-40-NBR-G1                  | PFG-40-NBR                    | PFTM-40-SI-G1                  | PFG-40-SI                    | FTM-20B-G1H             |
| 40                | 1/4 BSPP    | PFTM-40-NBR-G2                  | PFG-40-NBR                    | PFTM-40-SI-G2                  | PFG-40-SI                    | FTM-20B-G2              |
| 40                | M10         | PFTM-40-NBR-M10                 | PFG-40-NBR                    | PFTM-40-SI-M10                 | PFG-40-SI                    | FTM-20B-M10             |
| 40                | 1/8 NPT     | PFTM-40-NBR-N1                  | PFG-40-NBR                    | PFTM-40-SI-N1                  | PFG-40-SI                    | FTM-20B-N1              |
| 50                | 1/8 BSPP    | PFTM-50-NBR-G1                  | PFG-50-NBR                    | PFTM-50-SI-G1                  | PFG-50-SI                    | FTM-50-G1H              |
| 50                | 1/4 BSPP    | PFTM-50-NBR-G2                  | PFG-50-NBR                    | PFTM-50-SI-G2                  | PFG-50-SI                    | FTM-50-G2               |
| 50                | 1/8 NPT     | PFTM-50-NBR-N1                  | PFG-50-NBR                    | PFTM-50-SI-N1                  | PFG-50-SI                    | FTM-50-N1               |
| 60                | 1/4 BSPP    | PFTM-60-NBR-G2                  | PFG-60-NBR                    | PFTM-60-SI-G2                  | PFG-60-SI                    | FTM-60-G2               |
| 60                | M10         | PFTM-60-NBR-M10                 | PFG-60-NBR                    | PFTM-60-SI-M10                 | PFG-60-SI                    | FTM-60-M10              |
| 60                | 1/4 NPT     | PFTM-60-NBR-N2                  | PFG-60-NBR                    | PFTM-60-SI-N2                  | PFG-60-SI                    | FTM-60-N2               |
| 80                | 1/4 BSPP    | PFTM-80-NBR-G2                  | PFG-80-NBR                    | PFTM-80-SI-G2                  | PFG-80-SI                    | FTM-60-G2               |
| 80                | M10         | PFTM-80-NBR-M10                 | PFG-80-NBR                    | PFTM-80-SI-M10                 | PFG-80-SI                    | FTM-60-M10              |
| 80                | 1/4 NPT     | PFTM-80-NBR-N2                  | PFG-80-NBR                    | PFTM-80-SI-N2                  | PFG-80-SI                    | FTM-60-N2               |
| 95                | 1/4 BSPP    | PFTM-95-NBR-G2                  | PFG-95-NBR                    | PFTM-95-SI-G2                  | PFG-95-SI                    | FTM-60-G2               |
| 95                | M10         | PFTM-95-NBR-M10                 | PFG-95-NBR                    | PFTM-95-SI-M10                 | PFG-95-SI                    | FTM-60-M10              |
| 95                | 1/4 NPT     | PFTM-95-NBR-N2                  | PFG-95-NBR                    | PFTM-95-SI-N2                  | PFG-95-SI                    | FTM-60-N2               |

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 Vacuum Cups  
 Vacuum Products  
 PFG Series  
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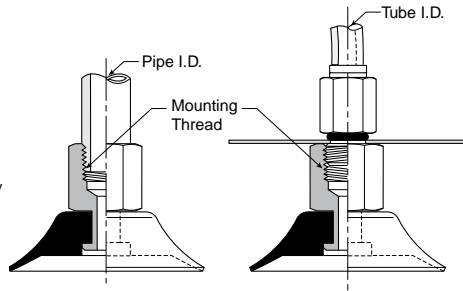


**PFTF Series Female Thread Connector**

Simple female connection for low profile positions secured to a plate or bracket. NPSF, G threads. Fitting material: aluminum.

**Installation**

**Note:**  
 When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



| Cup diameter (mm) | Vacuum port | Complete assembly Nitrile (NBR) | Replacement cup Nitrile (NBR) | Complete assembly Silicon (SI) | Replacement cup Silicon (SI) | Replacement cup fitting |
|-------------------|-------------|---------------------------------|-------------------------------|--------------------------------|------------------------------|-------------------------|
| 5                 | M5          | <b>PFTF-5A-NBR-M5</b>           | PFG-5A-NBR                    | PFTF-5A-SI-M5                  | PFG-5A-SI                    | FTF-5A-M5               |
| 5                 | 1/8 BSPP    | <b>PFTF-5A-NBR-G1</b>           | PFG-5A-NBR                    | PFTF-5A-SI-G1                  | PFG-5A-SI                    | FTF-5A-G1               |
| 6                 | M5          | <b>PFTF-6A-NBR-M5</b>           | PFG-6A-NBR                    | PFTF-6A-SI-M5                  | PFG-6A-SI                    | FTF-5A-M5               |
| 6                 | 1/8 BSPP    | <b>PFTF-6A-NBR-G1</b>           | PFG-6A-NBR                    | PFTF-6A-SI-G1                  | PFG-6A-SI                    | FTF-5A-G1               |
| 8                 | M5          | <b>PFTF-8A-NBR-M5</b>           | PFG-8A-NBR                    | PFTF-8A-SI-M5                  | PFG-8A-SI                    | FTF-5A-M5               |
| 8                 | 1/8 BSPP    | <b>PFTF-8A-NBR-G1</b>           | PFG-8A-NBR                    | PFTF-8A-SI-G1                  | PFG-8A-SI                    | FTF-5A-G1               |
| 10                | 1/8 BSPP    | <b>PFTF-10A-NBR-G1</b>          | PFG-10A-NBR                   | PFTF-10A-SI-G1                 | PFG-10A-SI                   | FTF-5A-G1               |
| 10                | M5          | <b>PFTF-10A-NBR-M5</b>          | PFG-10A-NBR                   | PFTF-10A-SI-M5                 | PFG-10A-SI                   | FTF-5A-M5               |
| 15                | 1/8 BSPP    | <b>PFTF-15A-NBR-G1</b>          | PFG-15A-NBR                   | PFTF-15A-SI-G1                 | PFG-15A-SI                   | FTF-5A-G1               |
| 15                | M5          | <b>PFTF-15A-NBR-M5</b>          | PFG-15A-NBR                   | PFTF-15A-SI-M5                 | PFG-15A-SI                   | FTF-5A-M5               |
| 20                | 1/8 BSPP    | <b>PFTF-20B-NBR-G1</b>          | PFG-20B-NBR                   | PFTF-20B-SI-G1                 | PFG-20B-SI                   | FTF-20B-G1              |
| 30                | 1/8 BSPP    | <b>PFTF-30-NBR-G1</b>           | PFG-30-NBR                    | PFTF-30-SI-G1                  | PFG-30-SI                    | FTF-20B-G1              |
| 30                | 1/4 BSPP    | <b>PFTF-30-NBR-G2</b>           | PFG-30-NBR                    | PFTF-30-SI-G2                  | PFG-30-SI                    | FTF-20B-G2              |
| 40                | 1/8 BSPP    | <b>PFTF-40-NBR-G1</b>           | PFG-40-NBR                    | PFTF-40-SI-G1                  | PFG-40-SI                    | FTF-20B-G1              |
| 40                | 1/4 BSPP    | <b>PFTF-40-NBR-G2</b>           | PFG-40-NBR                    | PFTF-40-SI-G2                  | PFG-40-SI                    | FTF-20B-G2              |
| 50                | 1/8 BSPP    | <b>PFTF-50-NBR-G1</b>           | PFG-50-NBR                    | PFTF-50-SI-G1                  | PFG-50-SI                    | FTF-50-G1               |
| 50                | 1/4 BSPP    | <b>PFTF-50-NBR-G2</b>           | PFG-50-NBR                    | PFTF-50-SI-G2                  | PFG-50-SI                    | FTF-50-G2               |
| 60                | 1/4 BSPP    | <b>PFTF-60-NBR-G2</b>           | PFG-60-NBR                    | PFTF-60-SI-G2                  | PFG-60-SI                    | FTF-60-G2               |
| 60                | 1/4 NPT     | <b>PFTF-60-NBR-N2</b>           | PFG-60-NBR                    | PFTF-60-SI-N2                  | PFG-60-SI                    | FTF-60-N2               |
| 80                | 1/4 BSPP    | <b>PFTF-80-NBR-G2</b>           | PFG-80-NBR                    | PFTF-80-SI-G2                  | PFG-80-SI                    | FTF-60-G2               |
| 80                | 1/4 NPT     | <b>PFTF-80-NBR-N2</b>           | PFG-80-NBR                    | PFTF-80-SI-N2                  | PFG-80-SI                    | FTF-60-N2               |
| 95                | 1/4 NPT     | <b>PFTF-95-NBR-N2</b>           | PFG-95-NBR                    | PFTF-95-SI-N2                  | PFG-95-SI                    | FTF-60-N2               |
| 95                | 1/4 BSPP    | <b>PFTF-95-NBR-G2</b>           | PFG-95-NBR                    | PFTF-95-SI-G2                  | PFG-95-SI                    | FTF-60-G2               |
| 120               | 1/2 BSPP    | <b>PFTF-120-NBR-G4</b>          | PFG-120-NBR                   | PFTF-120-SI-G4                 | PFG-120-SI                   | FTF-120-G4              |
| 120               | 1/2 NPT     | <b>PFTF-120-NBR-N4</b>          | PFG-120-NBR                   | PFTF-120-SI-N4                 | PFG-120-SI                   | FTF-120-N4              |
| 150               | 1/2 NPT     | <b>PFTF-150-NBR-G4</b>          | PFG-150-NBR                   | PFTF-150-SI-G4                 | PFG-150-SI                   | FTF-120-G4              |
| 150               | 1/2 NPT     | <b>PFTF-150-NBR-N4</b>          | PFG-150-NBR                   | PFTF-150-SI-N4                 | PFG-150-SI                   | FTF-120-N4              |
| 200               | 1/2 BSPP    | <b>PFTF-200-NBR-G4</b>          | PFG-200-NBR                   | PFTF-200-SI-G4                 | PFG-200-SI                   | FTF-120-G4              |
| 200               | 1/2 NPT     | <b>PFTF-200-NBR-N4</b>          | PFG-200-NBR                   | PFTF-200-SI-N4                 | PFG-200-SI                   | FTF-120-N4              |

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 PFG Series  
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 PCG Series  
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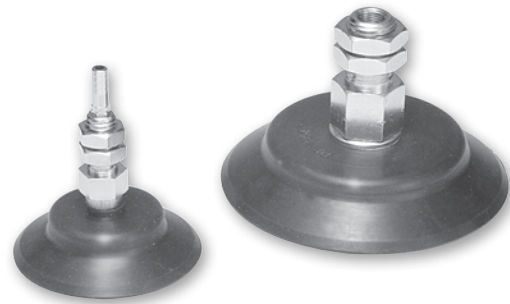
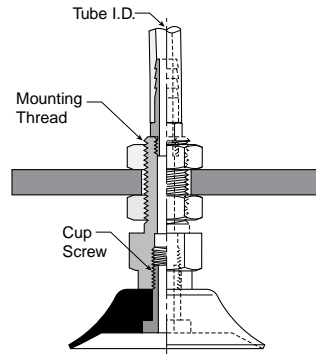


**PFTK Series Barbed Bulkhead**

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting material: nickel plated brass.

**Installation**

**Note:**  
 When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



| Cup diameter (mm) | Vacuum port | Complete assembly Nitrile (NBR) | Replacement cup Nitrile (NBR) | Complete assembly Silicon (SI) | Replacement cup Silicon (SI) | Replacement cup fitting |
|-------------------|-------------|---------------------------------|-------------------------------|--------------------------------|------------------------------|-------------------------|
| 5                 | Barb        | <b>PFTK-5A-NBR</b>              | <b>PFG-5A-NBR</b>             | <b>PFTK-5A-SI</b>              | <b>PFG-5A-SI</b>             | <b>FTK-5A</b>           |
| 6                 | Barb        | <b>PFTK-6A-NBR</b>              | <b>PFG-6A-NBR</b>             | <b>PFTK-6A-SI</b>              | <b>PFG-6A-SI</b>             | <b>FTK-5A</b>           |
| 8                 | Barb        | <b>PFTK-8A-NBR</b>              | <b>PFG-8A-NBR</b>             | <b>PFTK-8A-SI</b>              | <b>PFG-8A-SI</b>             | <b>FTK-5A</b>           |
| 10                | Barb        | <b>PFTK-10A-NBR</b>             | <b>PFG-10A-NBR</b>            | <b>PFTK-10A-SI</b>             | <b>PFG-10A-SI</b>            | <b>FTK-5A</b>           |
| 15                | Barb        | <b>PFTK-15-NBR</b>              | <b>PFG-15-NBR</b>             | <b>PFTK-15-SI</b>              | <b>PFG-15-SI</b>             | <b>FTK-15</b>           |
| 20                | Barb        | <b>PFTK-20-NBR</b>              | <b>PFG-20-NBR</b>             | <b>PFTK-20-SI</b>              | <b>PFG-20-SI</b>             | <b>FTK-20</b>           |
| 30                | Barb        | <b>PFTK-30-NBR</b>              | <b>PFG-30-NBR</b>             | <b>PFTK-30-SI</b>              | <b>PFG-30-SI</b>             | <b>FTK-25</b>           |
| 40                | Barb        | <b>PFTK-40-NBR</b>              | <b>PFG-40-NBR</b>             | <b>PFTK-40-SI</b>              | <b>PFG-40-SI</b>             | <b>FTK-25</b>           |
| 50                | Barb        | <b>PFTK-50-NBR</b>              | <b>PFG-50-NBR</b>             | <b>PFTK-50-SI</b>              | <b>PFG-50-SI</b>             | <b>FTK-50</b>           |
| 60                | 1/8 BSPP    | <b>PFTK-60-NBR-G1</b>           | <b>PFG-60-NBR</b>             | <b>PFTK-60-SI-G1</b>           | <b>PFG-60-SI</b>             | <b>FTK-60-G1</b>        |
| 60                | 1/8 NPT     | <b>PFTK-60-NBR-N1</b>           | <b>PFG-60-NBR</b>             | <b>PFTK-60-SI-N1</b>           | <b>PFG-60-SI</b>             | <b>FTK-60-N1</b>        |
| 80                | 1/8 BSPP    | <b>PFTK-80-NBR-G1</b>           | <b>PFG-80-NBR</b>             | <b>PFTK-80-SI-G1</b>           | <b>PFG-80-SI</b>             | <b>FTK-60-G1</b>        |
| 80                | 1/8 NPT     | <b>PFTK-80-NBR-N1</b>           | <b>PFG-80-NBR</b>             | <b>PFTK-80-SI-N1</b>           | <b>PFG-80-SI</b>             | <b>FTK-60-N1</b>        |
| 95                | 1/8 BSPP    | <b>PFTK-95-NBR-G1</b>           | <b>PFG-95-NBR</b>             | <b>PFTK-95-SI-G1</b>           | <b>PFG-95-SI</b>             | <b>FTK-60-G1</b>        |
| 95                | 1/8 NPT     | <b>PFTK-95-NBR-N1</b>           | <b>PFG-95-NBR</b>             | <b>PFTK-95-SI-N1</b>           | <b>PFG-95-SI</b>             | <b>FTK-60-N1</b>        |

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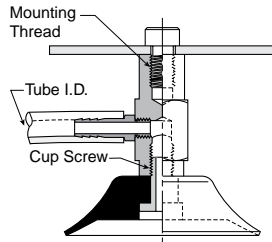
**PFYK Series 90° Barbed Adapter**

Side stem connectors allow you to secure the stem with a bolt thru a plate or "L" bracket to allow the tube connection from the side port. Fitting material: plated brass.

**Installation**

**Note:**

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



| Cup diameter (mm) | Vacuum port | Complete assembly Nitrile (NBR) | Replacement cup Nitrile (NBR) | Complete assembly Silicon (SI) | Replacement cup Silicon (SI) | Replacement cup fitting |
|-------------------|-------------|---------------------------------|-------------------------------|--------------------------------|------------------------------|-------------------------|
| 5                 | Barb        | PFYK-5A-NBR                     | PFG-5A-NBR                    | PFYK-5A-SI                     | PFG-5A-SI                    | FYK-5A                  |
| 6                 | Barb        | PFYK-6A-NBR                     | PFG-6A-NBR                    | PFYK-6A-SI                     | PFG-6A-SI                    | FYK-5A                  |
| 8                 | Barb        | PFYK-8A-NBR                     | PFG-8A-NBR                    | PFYK-8A-SI-M5                  | PFG-8A-SI                    | FYK-5A                  |
| 10                | Barb        | PFYK-10A-NBR                    | PFG-10A-NBR                   | PFYK-10A-SI                    | PFG-10A-SI                   | FYK-5A                  |
| 15                | Barb        | PFYK-15-NBR                     | PFG-15-NBR                    | PFYK-15-SI                     | PFG-15-SI                    | FYK-15                  |
| 20                | Barb        | PFYK-20-NBR                     | PFG-20-NBR                    | PFYK-20-SI                     | PFG-20-SI                    | FYK-20                  |
| 30                | Barb        | PFYK-30-NBR                     | PFG-30-NBR                    | PFYK-30-SI                     | PFG-30-SI                    | FYK-25                  |
| 40                | Barb        | PFYK-40-NBR                     | PFG-40-NBR                    | PFYK-40-SI                     | PFG-40-SI                    | FYK-25                  |
| 50                | Barb        | PFYK-50-NBR                     | PFG-50-NBR                    | PFYK-50-SI                     | PFG-50-SI                    | FYK-50                  |
| 60                | 1/8 BSPP    | PFYK-60-NBR-G1                  | PFG-60-NBR                    | PFYK-60-SI-G1                  | PFG-60-SI                    | FYK-60-G1               |
| 60                | 1/8 NPT     | PFYK-60-NBR-N1                  | PFG-60-NBR                    | PFYK-60-SI-N1                  | PFG-60-SI                    | FYK-60-N1               |
| 80                | 1/8 BSPP    | PFYK-80-NBR-G1                  | PFG-80-NBR                    | PFYK-80-SI-G1                  | PFG-80-SI                    | FYK-60-G1               |
| 80                | 1/8 NPT     | PFYK-80-NBR-N1                  | PFG-80-NBR                    | PFYK-80-SI-N1                  | PFG-80-SI                    | FYK-60-N1               |
| 95                | 1/8 BSPP    | PFYK-95-NBR-G1                  | PFG-95-NBR                    | PFYK-95-SI-G1                  | PFG-95-SI                    | FYK-60-G1               |
| 95                | 1/8 NPT     | PFYK-95-NBR-N1                  | PFG-95-NBR                    | PFYK-95-SI-N1                  | PFG-95-SI                    | FYK-60-N1               |
| 120               | 1/8 BSPP    | PFYK-120-NBR-G1                 | PFG-120-NBR                   | PFYK-120-SI-G1                 | PFG-120-SI                   | FYK-120-G1              |
| 120               | 1/8 NPT     | PFYK-120-NBR-N1                 | PFG-120-NBR                   | PFYK-120-SI-N1                 | PFG-120-SI                   | FYK-120-N1              |
| 150               | 1/8 BSPP    | PFYK-150-NBR-G1                 | PFG-150-NBR                   | PFYK-150-SI-G1                 | PFG-150-SI                   | FYK-120-G1              |
| 150               | 1/8 NPT     | PFYK-150-NBR-N1                 | PFG-150-NBR                   | PFYK-150-SI-N1                 | PFG-150-SI                   | FYK-120-N1              |
| 200               | 1/8 BSPP    | PFYK-200-NBR-G1                 | PFG-200-NBR                   | PFYK-200-SI-G1                 | PFG-200-SI                   | FYK-120-G1              |
| 200               | 1/8 NPT     | PFYK-200-NBR-N1                 | PFG-200-NBR                   | PFYK-200-SI-N1                 | PFG-200-SI                   | FYK-120-N1              |

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 Vacuum Cups  
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 PFG Series  
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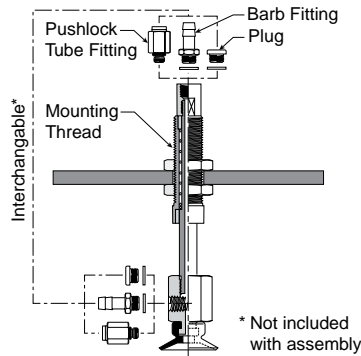


**PFTYS Series Bulkhead Level Compensator**

303 stainless steel construction secured with jam nuts. Spring biased compensators can absorb impacts of down-strokes and adjust for different levels of pick up points. 303 stainless corrosion resistant materials with drymet bushings increases the strength and life.

**Installation**

**Note:**  
 When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



| Cup dia. (mm) | Vacuum port | Stroke (mm) | Spring compression Force lbf (N) |            | Cup material Nitrile assembly (NBR) | Replacement cup Nitrile (NBR) | Cup material Silicon assembly (SI) | Replacement cup Silicon (SI) | Level Compensator P/N |
|---------------|-------------|-------------|----------------------------------|------------|-------------------------------------|-------------------------------|------------------------------------|------------------------------|-----------------------|
|               |             |             | 0%                               | 100%       |                                     |                               |                                    |                              |                       |
| 5             | M5          | 10          | .14 (.61)                        | .26 (1.17) | PFTYS5A10NBRM5                      | PFG-5A-NBR                    | PFTYS5A10SIM5                      | PFG-5A-SI                    | TYS-5A-10             |
| 5             | M5          | 15          | .15 (.64)                        | .26 (1.17) | PFTYS5A15NBRM5                      | PFG-5A-NBR                    | PFTYS5A15SIM5                      | PFG-5A-SI                    | TYS-5A-15             |
| 6             | M5          | 10          | .14 (.61)                        | .26 (1.17) | PFTYS6A10NBRM5                      | PFG-6A-NBR                    | PFTYS6A10SIM5                      | PFG-6A-SI                    | TYS-5A-10             |
| 6             | M5          | 15          | .15 (.64)                        | .26 (1.17) | PFTYS6A15NBRM5                      | PFG-6A-NBR                    | PFTYS6A15SIM5                      | PFG-6A-SI                    | TYS-5A-15             |
| 8             | M5          | 10          | .14 (.61)                        | .26 (1.17) | PFTYS8A10NBRM5                      | PFG-8A-NBR                    | PFTYS8A10SIM5                      | PFG-8A-SI                    | TYS-5A-10             |
| 8             | M5          | 15          | .15 (.64)                        | .26 (1.17) | PFTYS8A15NBRM5                      | PFG-8A-NBR                    | PFTYS8A15SIM5                      | PFG-8A-SI                    | TYS-5A-15             |
| 10            | M5          | 10          | .11 (.49)                        | .13 (.59)  | PFTYS10A10NBRM5                     | PFG-10A-NBR                   | PFTYS10A10SIM5                     | PFG-10A-SI                   | TYS-5A-10             |
| 10            | M5          | 15          | .11 (.49)                        | .13 (.59)  | PFTYS10A15NBRM5                     | PFG-10A-NBR                   | PFTYS10A15SIM5                     | PFG-10A-SI                   | TYS-5A-15             |
| 15            | M5          | 10          | .11 (.49)                        | .13 (.59)  | PFTYS15A10NBRM5                     | PFG-15A-NBR                   | PFTYS15A10SIM5                     | PFG-15A-SI                   | TYS-5A-10             |
| 15            | M5          | 15          | .11 (.49)                        | .13 (.59)  | PFTYS15A15NBRM5                     | PFG-15A-NBR                   | PFTYS15A15SIM5                     | PFG-15A-SI                   | TYS-5A-15             |
| 20            | M5          | 15          | .56 (2.5)                        | .79 (3.4)  | PFTYS20B15NBRM5                     | PFG-20B-NBR                   | PFTYS20B15SIM5                     | PFG-20B-SI                   | TYS-20B-15            |
| 20            | M5          | 30          | .56 (2.5)                        | 1.2 (4.9)  | PFTYS20B30NBRM5                     | PFG-20B-NBR                   | PFTYS20B30SIM5                     | PFG-20B-SI                   | TYS-20B-30            |
| 30            | M5          | 15          | .56 (2.5)                        | .79 (3.4)  | PFTYS3015NBRM5                      | PFG-30-NBR                    | PFTYS3015SIM5                      | PFG-30-SI                    | TYS-20B-15            |
| 30            | M5          | 30          | .56 (2.5)                        | 1.2 (4.9)  | PFTYS3030NBRM5                      | PFG-30-NBR                    | PFTYS3030SIM5                      | PFG-30-SI                    | TYS-20B-30            |
| 40            | M5          | 15          | .56 (2.5)                        | .79 (3.4)  | PFTYS4015NBRM5                      | PFG-40-NBR                    | PFTYS4015SIM5                      | PFG-40-SI                    | TYS-20B-15            |
| 40            | M5          | 30          | .56 (2.5)                        | 1.2 (4.9)  | PFTYS4030NBRM5                      | PFG-40-NBR                    | PFTYS4030SIM5                      | PFG-40-SI                    | TYS-20B-30            |
| 50            | M5          | 15          | .56 (2.5)                        | 1.2 (4.9)  | PFTYS5015NBRM5                      | PFG-50-NBR                    | PFTYS5015SIM5                      | PFG-50-SI                    | TYS-50-15             |
| 50            | M5          | 30          | .67 (2.9)                        | 1.4 (5.9)  | PFTYS5030NBRM5                      | PFG-50-NBR                    | PFTYS5030SIM5                      | PFG-50-SI                    | TYS-50-30             |
| 60            | 1/8 NPT     | 30          | 1.6 (6.8)                        | 3.6 (15.6) | PFTYS6030NBRN1                      | PFG-60-NBR                    | PFTYS6030SIN1                      | PFG-60-SI                    | TYS-60-30             |
| 60            | 1/8 NPT     | 50          | 1.9 (8.3)                        | 4.5 (19.6) | PFTYS6050NBRN1                      | PFG-60-NBR                    | PFTYS6050SIN1                      | PFG-60-SI                    | TYS-60-50             |
| 80            | 1/8 NPT     | 30          | 1.6 (6.8)                        | 3.6 (15.6) | PFTYS8030NBRN1                      | PFG-80-NBR                    | PFTYS8030SIN1                      | PFG-80-SI                    | TYS-60-30             |
| 80            | 1/8 NPT     | 50          | 1.9 (8.3)                        | 4.5 (19.6) | PFTYS8050NBRN1                      | PFG-80-NBR                    | PFTYS8050SIN1                      | PFG-80-SI                    | TYS-60-50             |
| 95            | 1/8 NPT     | 30          | 1.6 (6.8)                        | 3.6 (15.6) | PFTYS9530NBRN1                      | PFG-95-NBR                    | PFTYS9530SIN1                      | PFG-95-SI                    | TYS-60-30             |
| 95            | 1/8 NPT     | 50          | 1.9 (8.3)                        | 4.5 (19.6) | PFTYS9550NBRN1                      | PFG-95-NBR                    | PFTYS9550SIN1                      | PFG-95-SI                    | TYS-60-50             |
| 120           | 1/4 NPT     | 20          | 3.6 (15.6)                       | 6.8 (29)   | PFTYS12020NBRN2                     | PFG-120-NBR                   | PFTYS12020SIN2                     | PFG-120-SI                   | TYS-120-20            |
| 120           | 1/4 NPT     | 70          | 3.4 (14.7)                       | 6.8 (29)   | PFTYS12070NBRN2                     | PFG-120-NBR                   | PFTYS12070SIN2                     | PFG-120-SI                   | TYS-120-70            |
| 150           | 1/4 NPT     | 20          | 3.6 (15.6)                       | 6.8 (29)   | PFTYS15020NBRN2                     | PFG-150-NBR                   | PFTYS15020SIN2                     | PFG-150-SI                   | TYS-120-20            |
| 150           | 1/4 NPT     | 70          | 3.4 (14.7)                       | 6.8 (29)   | PFTYS15070NBRN2                     | PFG-150-NBR                   | PFTYS15070SIN2                     | PFG-150-SI                   | TYS-120-70            |
| 200           | 1/4 NPT     | 20          | 3.6 (15.6)                       | 6.8 (29)   | PFTYS20020NBRN2                     | PFG-200-NBR                   | PFTYS20020SIN2                     | PFG-200-SI                   | TYS-120-20            |
| 200           | 1/4 NPT     | 70          | 3.4 (14.7)                       | 6.8 (29)   | PFTYS20070NBRN2                     | PFG-200-NBR                   | PFTYS20070SIN2                     | PFG-200-SI                   | TYS-120-70            |

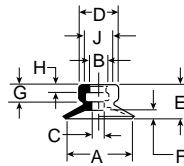
☐ Most popular.

**C**  
 Vacuum Cups  
 Vacuum Products  
 PFG Series  
 PBG Series  
 P5V-CFS Series  
 PJG Series  
 PCG Series  
 PUGB Series

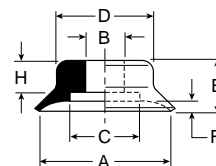


**PFG Series Replacement Cup Dimensions**

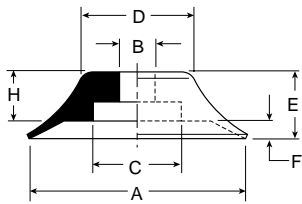
**PFG-5A  
PFG-15A**



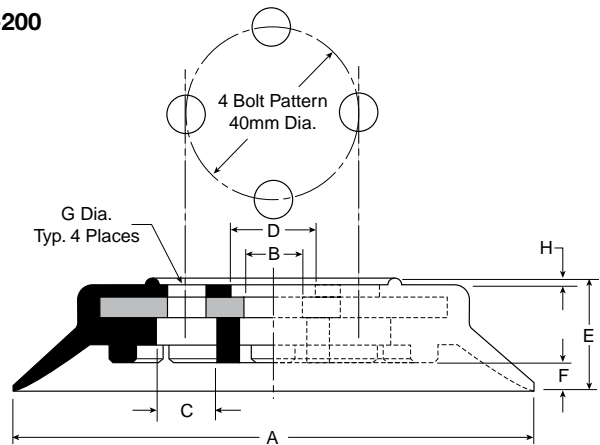
**PFG-15 thru  
PFG-40**



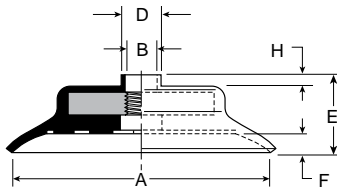
**PFG-50**



**PFG-120 thru  
PFG-200**



**PFG-60 thru  
PFG-95**



| Model number | ØA         | ØB        | ØC        | ØD         | E           | F         | G          | H          | ØJ      |
|--------------|------------|-----------|-----------|------------|-------------|-----------|------------|------------|---------|
| PFG-5A-*     | .20 (5)    | .16 (4)   | .06 (1.4) | .30 (7.5)  | .26 (6.5)   | .03 (.8)  | .16 (4)    | .08 (2)    | .24 (6) |
| PFG-6A-*     | .24 (6)    | .16 (4)   | .08 (2)   | .30 (7.5)  | .26 (6.5)   | .03 (.8)  | .16 (4)    | .08 (2)    | .24 (6) |
| PFG-8A-*     | .31 (8)    | .16 (4)   | .08 (2)   | .31 (8)    | .28 (7)     | .05 (1.2) | .16 (4)    | .08 (2)    | .24 (6) |
| PFG-10A-*    | .39 (10)   | .16 (4)   | .08 (2)   | .33 (8.5)  | .30 (7.5)   | .06 (1.5) | .16 (4)    | .08 (2)    | .24 (6) |
| PFG-15-*     | .59 (15)   | —         | .31 (7.8) | .47 (12)   | .31 (8)     | .07 (1.9) | —          | —          | —       |
| PFG-15A-*    | .59 (15)   | .16 (4)   | .08 (2)   | .35 (9)    | .31 (8)     | .08 (2)   | .16 (4)    | .08 (2)    | .24 (6) |
| PFG-20-*     | .79 (20)   | .18 (4.6) | .43 (11)  | .59 (15)   | .39 (10)    | .09 (2.3) | —          | .18 (4.5)  | —       |
| PFG-20B-*    | .79 (20)   | .24 (6)   | .43 (11)  | .59 (15)   | .49 (12.5)  | .09 (2.3) | —          | .28 (7)    | —       |
| PFG-30-*     | 1.18 (30)  | .24 (6)   | .43 (11)  | .55 (14)   | .47 (12)    | .08 (2)   | —          | .28 (7)    | —       |
| PFG-40-*     | 1.57 (40)  | .24 (6)   | .43 (11)  | .94 (24)   | .55 (14)    | .16 (4)   | —          | .28 (7)    | —       |
| PFG-50-*     | 1.97 (50)  | .31 (8)   | .79 (20)  | 1.06 (27)  | .59 (15)    | .14 (3.5) | —          | .28 (7)    | —       |
| PFG-60-*     | 2.36 (60)  | M10x1.25  | —         | .79 (12.5) | .73 (18.5)  | .20 (5)   | —          | .10 (2.5)  | —       |
| PFG-80-*     | 3.15 (80)  | M10x1.25  | —         | .79 (12.5) | .81 (20.5)  | .24 (6)   | —          | .10 (2.5)  | —       |
| PFG-95-*     | 3.74 (95)  | M10x1.25  | —         | .79 (12.5) | .83 (21)    | .24 (6)   | —          | .10 (2.5)  | —       |
| PFG-120-*    | 4.72 (120) | .55 (14)  | .55 (14)  | .79 (20)   | 1.00 (25.5) | .24 (6)   | 4xØ8.7xØ40 | .059 (1.5) | —       |
| PFG-150-*    | 5.91 (150) | .51 (13)  | .55 (14)  | .79 (20)   | 1.28 (32.5) | .35 (9)   | 4xØ8.7xØ40 | .059 (1.5) | —       |
| PFG-200-*    | 7.87 (200) | .51 (13)  | .47 (12)  | .79 (20)   | 1.48 (37.5) | .51 (13)  | 4xØ8.7xØ40 | .059 (1.5) | —       |

Inches (mm)  
\* Cup material

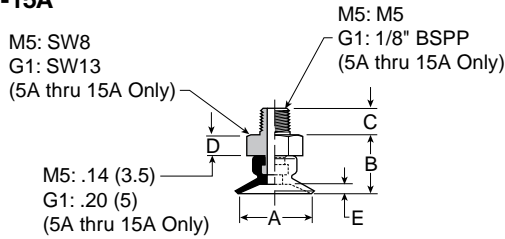
**C**  
Vacuum Cups  
Vacuum Products  
Series  
PFG  
Series  
PBG  
Series  
PSV-CFS  
Series  
PJG  
Series  
PCG  
Series  
PUGB  
Series



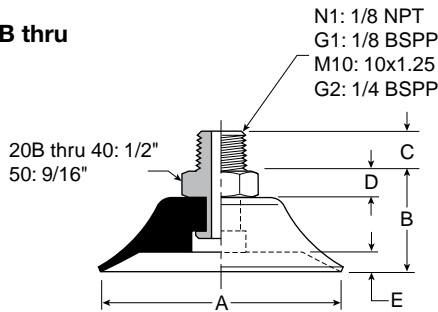


**Dimensions**

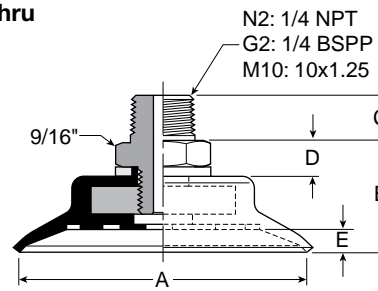
**PFTM-5A thru  
PFTM-15A**



**PFTM-20B thru  
PFTM-50**



**PFTM-60 thru  
PFTM-95**



| Model number | ØA        | B           | C (M3) | C (M5)    | C (N1 / G1) | C (M10 / G2) | C (N2)   | D        | E         |
|--------------|-----------|-------------|--------|-----------|-------------|--------------|----------|----------|-----------|
| PFTM-5A-*†   | .20 (5)   | .39 (10)    | —      | .18 (4.5) | .31 (8)     | —            | —        | See Dwg. | .31 (8)   |
| PFTM-6A-*†   | .24 (6)   | .39 (10)    | —      | .18 (4.5) | .31 (8)     | —            | —        | See Dwg. | .31 (8)   |
| PFTM-8A-*†   | .31 (8)   | .41 (10.5)  | —      | .18 (4.5) | .31 (8)     | —            | —        | See Dwg. | .05 (1.2) |
| PFTM-10A-*†  | .39 (10)  | .43 (11)    | —      | .18 (4.5) | .31 (8)     | —            | —        | See Dwg. | .06 (1.5) |
| PFTM-15A-*†  | .59 (15)  | .45 (11.5)  | —      | .18 (4.5) | .31 (8)     | —            | —        | See Dwg. | .08 (2)   |
| PFTM-20B-*†  | .79 (20)  | .69 (17.5)  | —      | —         | .31 (8)     | .39 (10)     | —        | .20 (5)  | .10 (2.5) |
| PFTM-30-*†   | 1.18 (30) | .67 (17)    | —      | —         | .31 (8)     | .39 (10)     | —        | .20 (5)  | .08 (2)   |
| PFTM-40-*†   | 1.57 (40) | .75 (19)    | —      | —         | .31 (8)     | .39 (10)     | —        | .20 (5)  | .14 (3.5) |
| PFTM-50-*†   | 1.97 (50) | .79 (20)    | —      | —         | .31 (8)     | .39 (10)     | —        | .20 (5)  | .16 (4)   |
| PFTM-60-*†   | 2.36 (60) | .90 (23)    | —      | —         | —           | .39 (10)     | .59 (15) | .28 (7)  | .20 (5)   |
| PFTM-80-*†   | 3.15 (80) | .98 (25)    | —      | —         | —           | .39 (10)     | .59 (15) | .28 (7)  | .24 (6)   |
| PFTM-95-*†   | 3.74 (95) | 1.00 (25.5) | —      | —         | —           | .39 (10)     | .59 (15) | .28 (7)  | .24 (6)   |

Inches (mm)  
\* Cup material  
† Thread size

**C**

Vacuum Cups  
Vacuum Products

PFG Series

PBG Series

P5V-CFS Series

PVG Series

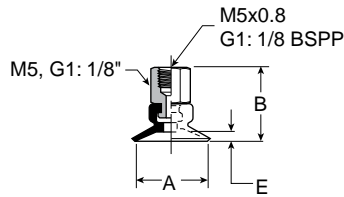
PCG Series

PUGB Series

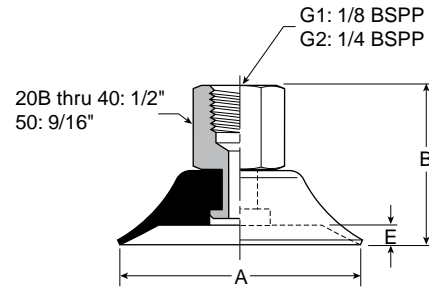


**Dimensions**

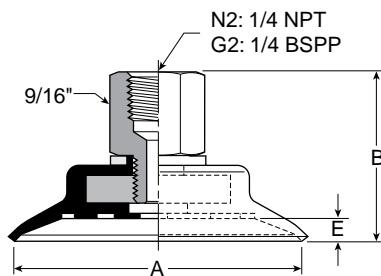
**PFTF-5A thru  
PFTF-15A**



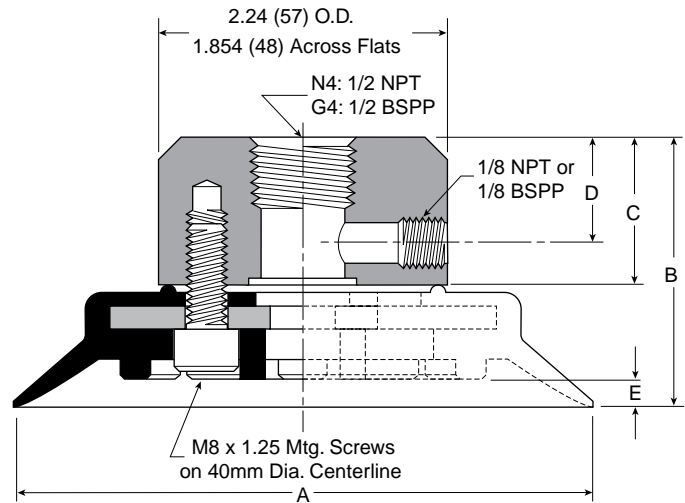
**PFTF-20B thru  
PFTF-50**



**PFTF-60 thru  
PFTF-95**



**PFTF-120 thru  
PFTF-200**



| Model number | ØA         | B           | B (M5)     | C        | D        | E         |
|--------------|------------|-------------|------------|----------|----------|-----------|
| PFTF-5A-*†   | .20 (5)    | .57 (14.5)  | .81 (20.5) | —        | —        | .03 (.8)  |
| PFTF-6A-*†   | .24 (6)    | .57 (14.5)  | .81 (20.5) | —        | —        | .03 (.8)  |
| PFTF-8A-*†   | .31 (8)    | .59 (15)    | .83 (21)   | —        | —        | .05 (1.2) |
| PFTF-10A-*†  | .39 (10)   | .57 (14.5)  | .81 (20.5) | —        | —        | .06 (1.5) |
| PFTF-15A-*†  | .59 (15)   | .63 (16)    | .87 (22)   | —        | —        | .08 (2)   |
| PFTF-20B-*†  | .79 (20)   | 1.04 (26.5) | —          | —        | —        | .10 (2.5) |
| PFTF-30-*†   | 1.18 (30)  | 1.02 (26)   | —          | —        | —        | .08 (2)   |
| PFTF-40-*†   | 1.57 (40)  | 1.10 (28)   | —          | —        | —        | .16 (4)   |
| PFTF-50-*†   | 1.97 (50)  | 1.14 (29)   | —          | —        | —        | .16 (4)   |
| PFTF-60-*†   | 2.36 (60)  | 1.40 (35.5) | —          | —        | —        | .20 (5)   |
| PFTF-80-*†   | 3.15 (80)  | 1.48 (37.5) | —          | —        | —        | .24 (6)   |
| PFTF-95-*†   | 3.74 (95)  | 1.50 (38)   | —          | —        | —        | .24 (6)   |
| PFTF-120-*†  | 4.72 (120) | 1.83 (46.5) | —          | .94 (24) | .51 (13) | .24 (6)   |
| PFTF-150-*†  | 5.91 (150) | 2.11 (53.5) | —          | .94 (24) | .51 (13) | .35 (9)   |
| PFTF-200-*†  | 7.87 (200) | 2.30 (58.5) | —          | .94 (24) | .51 (13) | .51 (13)  |

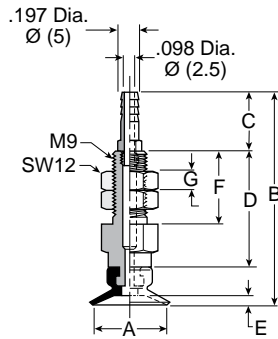
Inches (mm)  
\* Cup material  
† Thread size

**C**  
**Vacuum Cups**  
**Vacuum Products**  
**Series**  
**PF6**  
**Series**  
**PB6**  
**Series**  
**PSV-CFS**  
**Series**  
**PI6**  
**Series**  
**PC6**  
**Series**  
**PUGB**  
**Series**

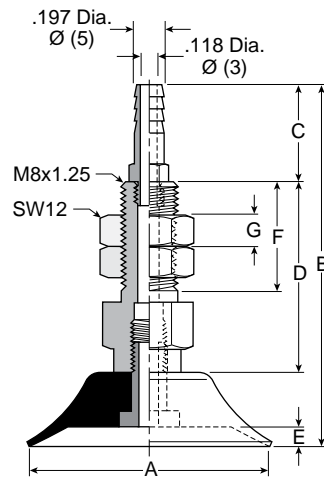


**Dimensions**

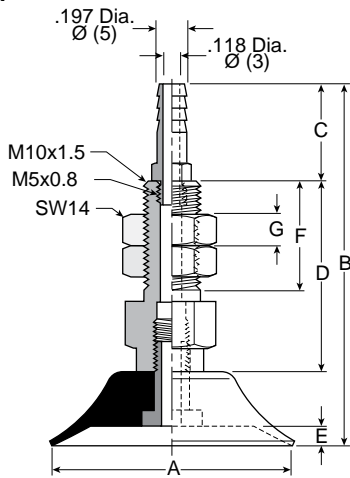
**PFTK-5A thru  
PFTK-10A**



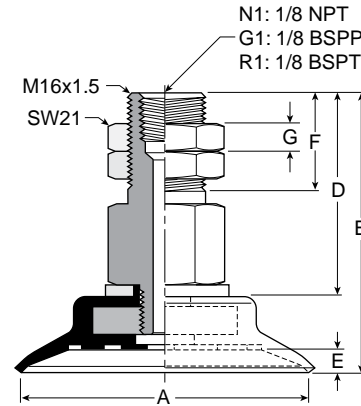
**PFTK-15 thru  
PFTK-20**



**PFTK-30 thru  
PFTK-50**



**PFTK-60 thru  
PFTK-95**



| Model number | ØA        | B           | C        | D           | E         | F          | G       | Wt oz. (g) |
|--------------|-----------|-------------|----------|-------------|-----------|------------|---------|------------|
| PFTK-5A-*    | .20 (5)   | 1.20 (30.5) | .39 (10) | .55 (14)    | .03 (.8)  | .61 (15.5) | .12 (3) | .39 (11)   |
| PFTK-6A-*    | .24 (6)   | 1.20 (30.5) | .39 (10) | .55 (14)    | .03 (.8)  | .61 (15.5) | .12 (3) | .39 (11)   |
| PFTK-8A-*    | .31 (8)   | 1.22 (31)   | .39 (10) | .55 (14)    | .05 (1.2) | .61 (15.5) | .12 (3) | .39 (11)   |
| PFTK-10A-*   | .39 (10)  | 1.81 (46)   | .63 (16) | .88 (22.5)  | .06 (1.5) | .61 (15.5) | .12 (3) | .53 (15)   |
| PFTK-15-*    | .59 (15)  | 1.81 (46)   | .63 (16) | .86 (22)    | .07 (1.9) | .59 (15)   | .12 (3) | .71 (20)   |
| PFTK-20-*    | .79 (20)  | 1.89 (48)   | .63 (16) | .86 (22)    | .09 (2.3) | .59 (15)   | .20 (5) | .71 (20)   |
| PFTK-30-*    | 1.18 (30) | 2.36 (60)   | .63 (16) | 1.26 (32)   | .08 (2)   | .71 (20)   | .20 (5) | 1.41 (40)  |
| PFTK-40-*    | 1.57 (40) | 2.44 (62)   | .63 (16) | 1.26 (32)   | .14 (3.5) | .71 (20)   | .20 (5) | 1.41 (40)  |
| PFTK-50-*    | 1.97 (50) | 2.48 (63)   | .63 (16) | 1.26 (32)   | .16 (4)   | .71 (20)   | .20 (5) | 1.77 (50)  |
| PFTK-60-*,†  | 2.36 (60) | 2.30 (58.5) | —        | 1.67 (42.5) | .20 (5)   | .79 (20)   | .24 (6) | 4.59 (130) |
| PFTK-80-*,†  | 3.15 (80) | 2.38 (60.5) | —        | 1.67 (42.5) | .24 (6)   | .79 (20)   | .24 (6) | 6.00 (170) |
| PFTK-95-*,†  | 3.74 (95) | 2.40 (61)   | —        | 1.67 (42.5) | .24 (6)   | .79 (20)   | .24 (6) | 7.77 (220) |

Inches (mm)  
\* Cup material  
† Vacuum port

**C**  
Vacuum Cups  
Vacuum Products

PFG  
Series

PBG  
Series

P5V-CFS  
Series

PJG  
Series

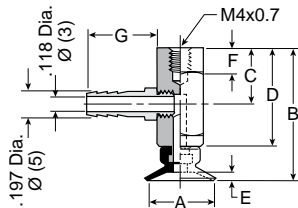
PCG  
Series

PUGB  
Series

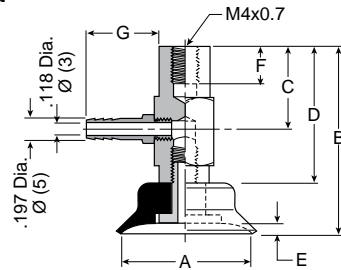


**Dimensions**

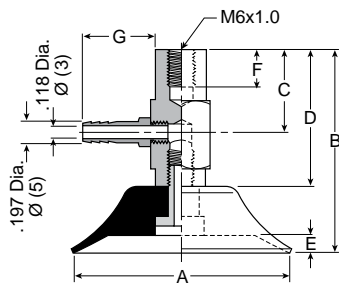
**PFYK-5A thru  
 PFYK-10A**



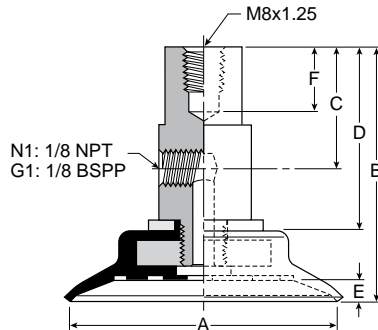
**PFYK-15 thru  
 PFYK-20**



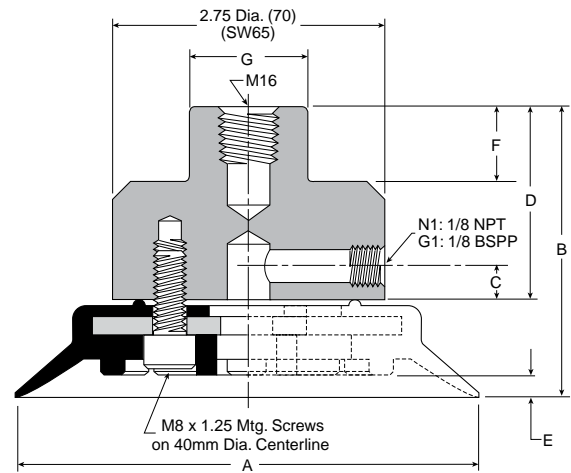
**PFYK-30 thru  
 PFYK-50**



**PFYK-60 thru  
 PFYK-95**



**PFYK-120 thru  
 PFYK-200**



| Model number | ØA         | B           | C         | D          | E         | F        | G              | Wt oz (g)   |
|--------------|------------|-------------|-----------|------------|-----------|----------|----------------|-------------|
| PFYK-5A-*    | .20 (5)    | 1.14 (29)   | .51 (13)  | .89 (22.5) | .03 (.8)  | .24 (6)  | .63 (16)       | .56 (16)    |
| PFYK-6A-*    | .24 (6)    | 1.14 (29)   | .51 (13)  | .89 (22.5) | .03 (.8)  | .24 (6)  | .63 (16)       | .56 (16)    |
| PFYK-8A-*    | .31 (8)    | 1.16 (29.5) | .51 (13)  | .89 (22.5) | .05 (1.2) | .24 (6)  | .63 (16)       | .56 (16)    |
| PFYK-10A-*   | .39 (10)   | 1.18 (30)   | .51 (13)  | .89 (22.5) | .06 (1.5) | .24 (6)  | .63 (16)       | .56 (16)    |
| PFYK-15-*    | .59 (15)   | 1.18 (30)   | .55 (14)  | .87 (22)   | .07 (1.9) | .24 (6)  | .63 (16)       | .71 (20)    |
| PFYK-20-*    | .79 (20)   | 1.26 (32)   | .55 (14)  | .87 (22)   | .09 (2.3) | .24 (6)  | .63 (16)       | .71 (20)    |
| PFYK-30-*    | 1.18 (30)  | 1.73 (44)   | .79 (20)  | 1.26 (32)  | .08 (2)   | .31 (8)  | .63 (16)       | 1.41 (40)   |
| PFYK-40-*    | 1.57 (40)  | 1.81 (46)   | .79 (20)  | 1.26 (32)  | .14 (3.5) | .31 (8)  | .63 (16)       | 1.77 (50)   |
| PFYK-50-*    | 1.97 (50)  | 1.85 (47)   | .79 (20)  | 1.26 (32)  | .16 (4)   | .31 (8)  | .63 (16)       | 1.94 (55)   |
| PFYK-60-*-†  | 2.36 (60)  | 2.30 (58.5) | 1.10 (28) | 1.57 (40)  | .20 (5)   | .43 (11) | —              | 4.24 (120)  |
| PFYK-80-*-†  | 3.15 (80)  | 2.38 (60.5) | 1.10 (28) | 1.57 (40)  | .24 (6)   | .43 (11) | —              | 5.65 (160)  |
| PFYK-95-*-†  | 3.74 (95)  | 2.40 (61)   | 1.10 (28) | 1.57 (40)  | .24 (6)   | .43 (11) | —              | 7.42 (210)  |
| PFYK-120-*-† | 4.72 (120) | 2.94 (75.5) | .47 (12)  | 1.97 (50)  | .24 (6)   | .79 (20) | 1.18 Dia. (30) | 22.6 (640)  |
| PFYK-150-*-† | 5.91 (150) | 3.25 (82.5) | .47 (12)  | 1.97 (50)  | .35 (9)   | .79 (20) | 1.18 Dia. (30) | 32.1 (910)  |
| PFYK-200-*-† | 7.87 (200) | 3.44 (87.5) | .47 (12)  | 1.97 (50)  | .51 (13)  | .79 (20) | 1.18 Dia. (30) | 42.4 (1200) |

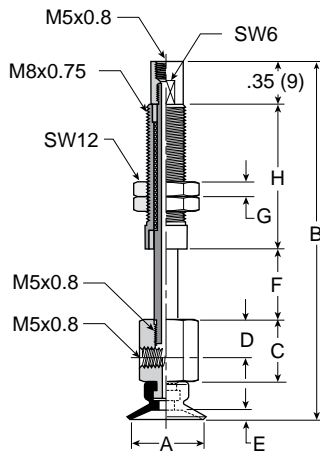
Inches (mm)  
 \* Cup material  
 † Vacuum port

**C**  
 Vacuum Cups  
 Vacuum Products  
 Series  
 PFG  
 Series  
 PBG  
 Series  
 PSV-CFS  
 Series  
 PIG  
 Series  
 PCG  
 Series  
 PUGB

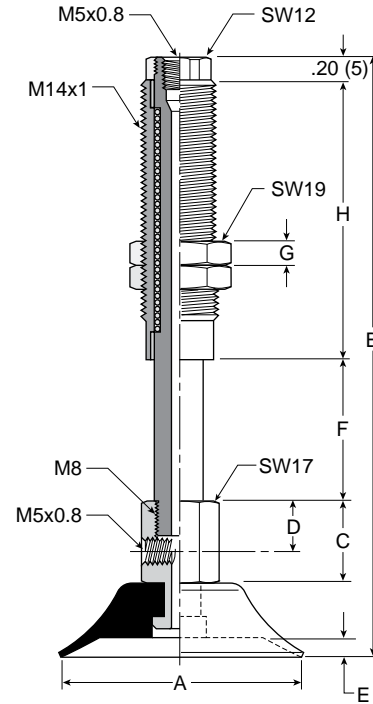


**Dimensions**

**PFTYS5A thru  
PFTYS15A**



**PFTYS20B thru  
PFTYS50**



| Model number | ØA        | B            | C        | D        | E         | F         | G       | H           | Wt oz (g)  |
|--------------|-----------|--------------|----------|----------|-----------|-----------|---------|-------------|------------|
| PFTYS5A10**  | .20 (5)   | 2.42 (61.5)  | .51 (13) | .31 (8)  | .03 (.8)  | .39 (10)  | .12 (3) | .91 (23)    | .65 (18.5) |
| PFTYS5A15**  | .20 (5)   | 2.91 (74)    | .51 (13) | .31 (8)  | .03 (.8)  | .59 (15)  | .12 (3) | 1.20 (30.5) | .74 (21)   |
| PFTYS6A10**  | .24 (6)   | 2.42 (61.5)  | .51 (13) | .31 (8)  | .03 (.8)  | .39 (10)  | .12 (3) | .91 (23)    | .65 (18.5) |
| PFTYS6A15**  | .24 (6)   | 2.91 (74)    | .51 (13) | .31 (8)  | .03 (.8)  | .59 (15)  | .12 (3) | 1.20 (30.5) | .74 (21)   |
| PFTYS8A10**  | .31 (8)   | 2.44 (62)    | .51 (13) | .31 (8)  | .05 (1.2) | .39 (10)  | .12 (3) | .91 (23)    | .65 (18.5) |
| PFTYS8A15**  | .31 (8)   | 2.93 (74.5)  | .51 (13) | .31 (8)  | .05 (1.2) | .59 (15)  | .12 (3) | 1.20 (30.5) | .74 (21)   |
| PFTYS10A10** | .39 (10)  | 2.48 (63)    | .51 (13) | .31 (8)  | .06 (1.5) | .39 (10)  | .12 (3) | .91 (23)    | .65 (18.5) |
| PFTYS10A15** | .39 (10)  | 2.95 (75)    | .51 (13) | .31 (8)  | .06 (1.5) | .59 (15)  | .12 (3) | 1.20 (30.5) | .74 (21)   |
| PFTYS15A10** | .59 (15)  | 2.50 (63.5)  | .51 (13) | .31 (8)  | .08 (2)   | .39 (10)  | .12 (3) | .91 (23)    | .65 (18.5) |
| PFTYS15A15** | .59 (15)  | 2.97 (75.5)  | .51 (13) | .31 (8)  | .08 (2)   | .59 (15)  | .12 (3) | 1.20 (30.5) | .74 (21)   |
| PFTYS20B15** | .79 (20)  | 3.37 (85.5)  | .67 (17) | .39 (10) | .09 (2.3) | .59 (15)  | .20 (5) | 1.42 (36)   | 2.5 (71)   |
| PFTYS20B30** | .79 (20)  | 4.82 (122.5) | .67 (17) | .39 (10) | .09 (2.3) | 1.18 (30) | .20 (5) | 2.28 (58)   | 3.4 (96)   |
| PFTYS3015**  | 1.18 (30) | 3.35 (85)    | .67 (17) | .39 (10) | .08 (2)   | .59 (15)  | .20 (5) | 1.42 (36)   | 2.5 (72)   |
| PFTYS3030**  | 1.18 (30) | 4.80 (122)   | .67 (17) | .39 (10) | .08 (2)   | 1.18 (30) | .20 (5) | 2.28 (58)   | 3.5 (97)   |
| PFTYS4015**  | 1.57 (40) | 3.43 (87)    | .67 (17) | .39 (10) | .14 (3.5) | .59 (15)  | .20 (5) | 1.42 (36)   | 2.7 (76)   |
| PFTYS4030**  | 1.57 (40) | 4.88 (124)   | .67 (17) | .39 (10) | .14 (3.5) | 1.18 (30) | .20 (5) | 2.28 (58)   | 3.6 (101)  |
| PFTYS5015**  | 1.97 (50) | 3.46 (88)    | .67 (17) | .39 (10) | .16 (4)   | .59 (15)  | .20 (5) | 1.42 (36)   | 3.0 (85)   |
| PFTYS5030**  | 1.97 (50) | 4.92 (125)   | .67 (17) | .39 (10) | .16 (4)   | 1.18 (30) | .20 (5) | 2.28 (58)   | 3.9 (110)  |

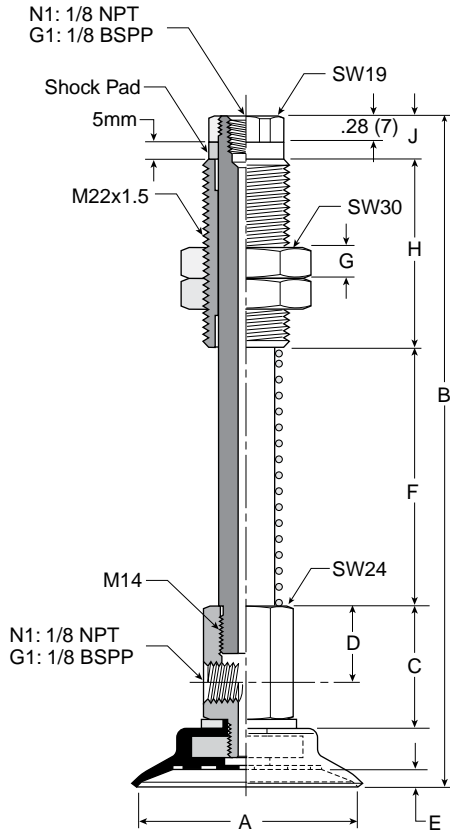
Inches (mm)  
\* Cup material  
† Vacuum port

**C**  
Vacuum Cups  
Vacuum Products  
PFG Series  
PBG Series  
P5V-CFS Series  
PJP Series  
PCG Series  
PUGB Series

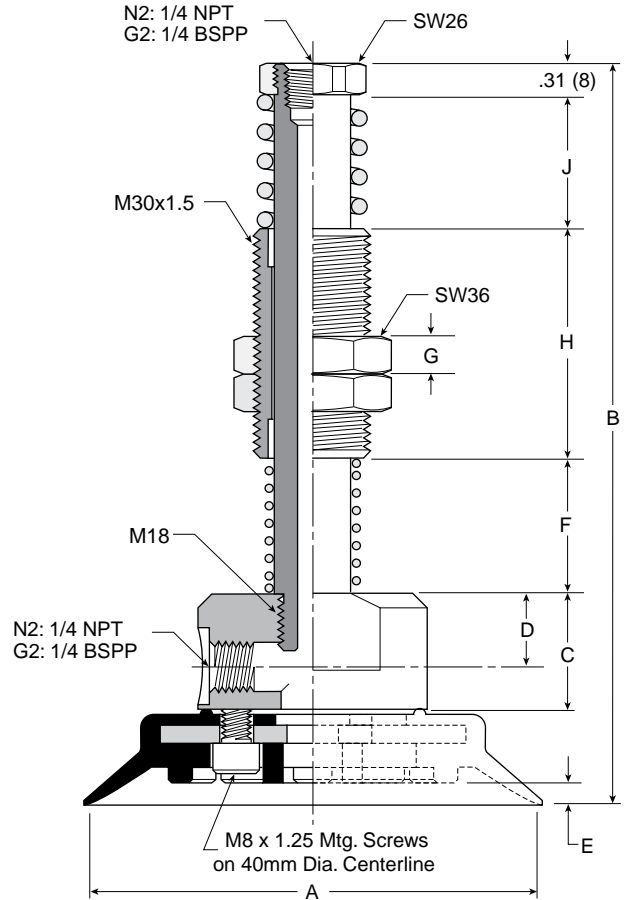


**Dimensions**

**PFTYS60 thru  
PFTYS95**



**PFTYS120 thru  
PFTYS200**



**C**  
 Vacuum Cups  
 Vacuum Products  
 PFG Series  
 PBG Series  
 PSV-CFS Series  
 PJG Series  
 PCG Series  
 PUGB Series

| Model number | ØA         | B           | C           | D        | E        | F          | G        | H         | J         | Wt oz (g)   |
|--------------|------------|-------------|-------------|----------|----------|------------|----------|-----------|-----------|-------------|
| PFTYS6030**  | 2.36 (60)  | 6.02 (153)  | 1.28 (32.5) | .78 (20) | .20 (5)  | 1.77 (45)  | .39 (10) | 1.97 (50) | .47 (12)  | 9.7 (282)   |
| PFTYS6050**  | 2.36 (60)  | 7.01 (178)  | 1.28 (32.5) | .78 (20) | .20 (5)  | 2.76 (70)  | .39 (10) | 1.97 (50) | .47 (12)  | 11.2 (316)  |
| PFTYS8030**  | 3.15 (80)  | 6.10 (155)  | 1.28 (32.5) | .78 (20) | .24 (6)  | 1.77 (45)  | .39 (10) | 1.97 (50) | .47 (12)  | 11 (310)    |
| PFTYS8050**  | 3.15 (80)  | 7.09 (180)  | 1.28 (32.5) | .78 (20) | .24 (6)  | 2.76 (70)  | .39 (10) | 1.97 (50) | .47 (12)  | 12.2 (344)  |
| PFTYS9530**  | 3.74 (95)  | 6.12 (156)  | 1.28 (32.5) | .78 (20) | .24 (6)  | 1.77 (45)  | .39 (10) | 1.97 (50) | .47 (12)  | 12.4 (350)  |
| PFTYS9550**  | 3.74 (95)  | 7.11 (181)  | 1.28 (32.5) | .78 (20) | .24 (6)  | 2.76 (70)  | .39 (10) | 1.97 (50) | .47 (12)  | 13.6 (384)  |
| PFTYS12020** | 4.72 (120) | 7.56 (192)  | 1.28 (32.5) | .71 (18) | .24 (6)  | 1.38 (35)  | .39 (10) | 2.36 (60) | 1.38 (35) | 41.2 (1165) |
| PFTYS12070** | 4.72 (120) | 10.12 (257) | 1.28 (32.5) | .71 (18) | .24 (6)  | 3.94 (100) | .39 (10) | 2.36 (60) | 1.38 (35) | 44 (1246)   |
| PFTYS15020** | 5.91 (150) | 7.83 (199)  | 1.28 (32.5) | .71 (18) | .35 (9)  | 1.38 (35)  | .39 (10) | 2.36 (60) | 1.38 (35) | 49 (1389)   |
| PFTYS15070** | 5.91 (150) | 10.39 (264) | 1.28 (32.5) | .71 (18) | .35 (9)  | 3.94 (100) | .39 (10) | 2.36 (60) | 1.38 (35) | 52 (1471)   |
| PFTYS20020** | 7.87 (200) | 8.03 (204)  | 1.28 (32.5) | .71 (18) | .51 (13) | 1.38 (35)  | .39 (10) | 2.36 (60) | 1.38 (35) | 62 (1755)   |
| PFTYS20070** | 7.87 (200) | 10.59 (269) | 1.28 (32.5) | .71 (18) | .51 (13) | 3.94 (100) | .39 (10) | 2.36 (60) | 1.38 (35) | 64.9 (1836) |

Inches (mm)  
 \* Cup material  
 † Vacuum port



These cups are for curved, corrugated, lightly textured surfaces and flexible product. Under vacuum, the bellow cup will collapse on contact and lift the product for a short distance. This inherent performance facilitates lifting and destack operations by breaking the vacuum between stacked product. The bellow style adds level compensation for applications that have inconsistent stack heights or uneven surfaces. The inclusive 30-degree rotation of the bellow helps maintain the vacuum seal when lifting sheet products that flex. Because of it's shape however the bellows suction cup is not very well suitable for applications involving lifting vertical surfaces.



**Features**

- Bellows design for level compensation within restricted clearances
- Sheet separation for flexible and stacked products
- Soft seal lip for flexible products
- 10mm to 150mm diameters

**Styles**

- PBTM series male thread connector
- PBTB series female thread connector
- PBTB series barbed bulkhead
- PBYK series 90° barbed adapter
- PBTYS series bulkhead level compensator

**Specifications**

| Cup material               | Nitrile       | Silicon       | Urethane     |
|----------------------------|---------------|---------------|--------------|
| Material code              | NBR           | SI            | U            |
| Operating temperature (°C) | -20° to +120° | -60° to +250° | -20° to +75° |
| Color                      | Black         | White         | Blue         |
| Hardness, shore A (°Sh)    | 55 ±5         | 55 ±5         | 55 ±5        |

**How to order**

Cups assemblies and replacement cups are specified by cup diameter and material. Standard nitrile and silicon are listed on the following pages. To specify an alternative material, replace the cup material with alternative cup material code.

**Example:** To specify a cup assembly with urethane (U), replace (NBR) with (U) in the part number. PBTM-20B-NBR-G1 becomes PBTM-20B-U-G1. Inquire with factory for availability.

**Application guide**

**Bellows**



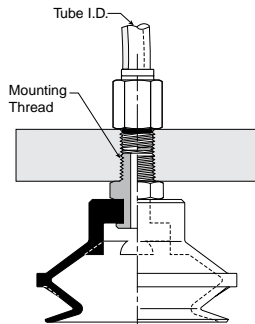
|                            |                           |                                      |                                     |                             |                            |                                   |                                   |                           |                       |                      |
|----------------------------|---------------------------|--------------------------------------|-------------------------------------|-----------------------------|----------------------------|-----------------------------------|-----------------------------------|---------------------------|-----------------------|----------------------|
| Flat surface, thin section | Flat surface, any section | Slightly bowed surface, thin section | Slightly bowed surface, any section | Bowed surface, thin section | Bowed surface, any section | Soft porous material, any section | Differences in heights and levels | Corrugated sheet handling | Not for vertical lift | Metal sheet handling |
|----------------------------|---------------------------|--------------------------------------|-------------------------------------|-----------------------------|----------------------------|-----------------------------------|-----------------------------------|---------------------------|-----------------------|----------------------|

**PBTM Series Male Thread Connector**

Simple male connection for low profile positions secured to a plate or bracket. NPT, G, metric threads.  
 Fitting material: aluminum.

**Installation**

**Note:**  
 When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



| Cup diameter (mm) | Vacuum port | Complete assembly Nitrile (NBR) | Replacement cup Nitrile (NBR) | Complete assembly Silicon (SI) | Replacement cup Silicon (SI) | Replacement cup fitting |
|-------------------|-------------|---------------------------------|-------------------------------|--------------------------------|------------------------------|-------------------------|
| 10                | M5          | <b>PBTM-10A-NBR-M5</b>          | PBG-10A-NBR                   | PBTM-10A-SI-M5                 | PBG-10A-SI                   | FTM-5A-M5H              |
| 10                | 1/8 BSPP    | <b>PBTM-10A-NBR-G1</b>          | PBG-10A-NBR                   | PBTM-10A-SI-G1                 | PBG-10A-SI                   | FTM-5A-G1               |
| 15                | M5          | <b>PBTM-15A-NBR-M5</b>          | PBG-15A-NBR                   | PBTM-15A-SI-M5                 | PBG-15A-SI                   | FTM-5A-M5H              |
| 15                | 1/8 BSPP    | <b>PBTM-15A-NBR-G1</b>          | PBG-15A-NBR                   | PBTM-15A-SI-G1                 | PBG-15A-SI                   | FTM-5A-G1               |
| 20                | 1/8 BSPP    | <b>PBTM-20B-NBR-G1</b>          | PBG-20B-NBR                   | PBTM-20B-SI-G1                 | PBG-20B-SI                   | FTM-20B-G1H             |
| 20                | 1/4 BSPP    | <b>PBTM-20B-NBR-G2</b>          | PBG-20B-NBR                   | PBTM-20B-SI-G2                 | PBG-20B-SI                   | FTM-20B-G2              |
| 20                | M10         | <b>PBTM-20B-NBR-M10</b>         | PBG-20B-NBR                   | PBTM-20B-SI-M10                | PBG-20B-SI                   | FTM-20B-M10             |
| 20                | 1/8 NPT     | <b>PBTM-20B-NBR-N1</b>          | PBG-20B-NBR                   | PBTM-20B-SI-N1                 | PBG-20B-SI                   | FTM-20B-N1              |
| 30                | 1/8 BSPP    | <b>PBTM-30-NBR-G1</b>           | PBG-30-NBR                    | PBTM-30-SI-G1                  | PBG-30-SI                    | FTM-20B-G1H             |
| 30                | 1/4 BSPP    | <b>PBTM-30-NBR-G2</b>           | PBG-30-NBR                    | PBTM-30-SI-G2                  | PBG-30-SI                    | FTM-20B-G2              |
| 30                | M10         | <b>PBTM-30-NBR-M10</b>          | PBG-30-NBR                    | PBTM-30-SI-M10                 | PBG-30-SI                    | FTM-20B-M10             |
| 30                | 1/8 NPT     | <b>PBTM-30-NBR-N1</b>           | PBG-30-NBR                    | PBTM-30-SI-N1                  | PBG-30-SI                    | FTM-20B-N1              |
| 40                | 1/8 BSPP    | <b>PBTM-40-NBR-G1</b>           | PBG-40-NBR                    | PBTM-40-SI-G1                  | PBG-40-SI                    | FTM-20B-G1H             |
| 40                | 1/4 BSPP    | <b>PBTM-40-NBR-G2</b>           | PBG-40-NBR                    | PBTM-40-SI-G2                  | PBG-40-SI                    | FTM-20B-G2              |
| 40                | M10         | <b>PBTM-40-NBR-M10</b>          | PBG-40-NBR                    | PBTM-40-SI-M10                 | PBG-40-SI                    | FTM-20B-M10             |
| 40                | 1/8 NPT     | <b>PBTM-40-NBR-N1</b>           | PBG-40-NBR                    | PBTM-40-SI-N1                  | PBG-40-SI                    | FTM-20B-N1              |
| 50                | 1/8 BSPP    | <b>PBTM-50-NBR-G1</b>           | PBG-50-NBR                    | PBTM-50-SI-G1                  | PBG-50-SI                    | FTM-50-G1H              |
| 50                | 1/4 BSPP    | <b>PBTM-50-NBR-G2</b>           | PBG-50-NBR                    | PBTM-50-SI-G2                  | PBG-50-SI                    | FTM-50-G2               |
| 50                | 1/8 NPT     | <b>PBTM-50-NBR-N1</b>           | PBG-50-NBR                    | PBTM-50-SI-N1                  | PBG-50-SI                    | FTM-50-N1               |
| 75                | 1/4 BSPP    | <b>PBTM-75-NBR-G2</b>           | PBG-75-NBR                    | PBTM-75-SI-G2                  | PBG-75-SI                    | FTM-60-G2               |
| 75                | M10         | <b>PBTM-75-NBR-M10</b>          | PBG-75-NBR                    | PBTM-75-SI-M10                 | PBG-75-SI                    | FTM-60-M10              |
| 75                | 1/4 NPT     | <b>PBTM-75-NBR-N2</b>           | PBG-75-NBR                    | PBTM-75-SI-N2                  | PBG-75-SI                    | FTM-60-N2               |

Most popular.





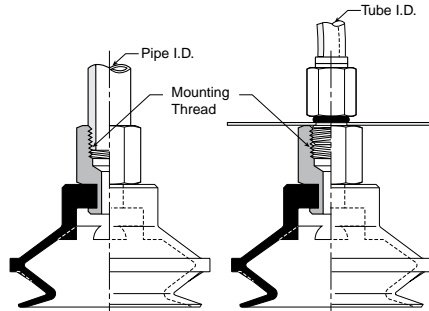
### PBTF Series Female Thread Connector

Simple female connection for low profile positions secured to a plate or bracket. NPSF, G threads.  
 Fitting material: aluminum.

#### Installation

**Note:**

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



| Cup diameter (mm) | Vacuum port | Complete assembly Nitrile (NBR) | Replacement cup Nitrile (NBR) | Replacement cup Silicon (SI) | Replacement cup fitting |
|-------------------|-------------|---------------------------------|-------------------------------|------------------------------|-------------------------|
| 10                | 1/8 BSPP    | <b>PBTF-10A-NBR-G1</b>          | PBG-10A-NBR                   | PBG-10A-SI                   | FTF-5A-G1               |
| 10                | M5          | <b>PBTF-10A-NBR-M5</b>          | PBG-10A-NBR                   | PBG-10A-SI                   | FTF-5A-M5               |
| 15                | 1/8 BSPP    | <b>PBTF-15A-NBR-G1</b>          | PBG-15A-NBR                   | PBG-15A-SI                   | FTF-5A-G1               |
| 15                | M5          | <b>PBTF-15A-NBR-M5</b>          | PBG-15A-NBR                   | PBG-15A-SI                   | FTF-5A-M5               |
| 20                | 1/8 BSPP    | <b>PBTF-20B-NBR-G1</b>          | PBG-20B-NBR                   | PBG-20B-SI                   | FTF-20B-G1              |
| 30                | 1/8 BSPP    | <b>PBTF-30-NBR-G1</b>           | PBG-30-NBR                    | PBG-30-SI                    | FTF-20B-G1              |
| 30                | 1/4 BSPP    | <b>PBTF-30-NBR-G2</b>           | PBG-30-NBR                    | PBG-30-SI                    | FTF-20B-G2              |
| 40                | 1/8 BSPP    | <b>PBTF-40-NBR-G1</b>           | PBG-40-NBR                    | PBG-40-SI                    | FTF-20B-G1              |
| 40                | 1/4 BSPP    | <b>PBTF-40-NBR-G2</b>           | PBG-40-NBR                    | PBG-40-SI                    | FTF-20B-G2              |
| 50                | 1/8 BSPP    | <b>PBTF-50-NBR-G1</b>           | PBG-50-NBR                    | PBG-50-SI                    | FTF-50-G1               |
| 50                | 1/4 BSPP    | <b>PBTF-50-NBR-G2</b>           | PBG-50-NBR                    | PBG-50-SI                    | FTF-50-G2               |
| 75                | 1/4 BSPP    | <b>PBTF-75-NBR-G2</b>           | PBG-75-NBR                    | PBG-75-SI                    | FTF-60-G2               |
| 75                | 1/4 NPT     | <b>PBTF-75-NBR-N2</b>           | PBG-75-NBR                    | PBG-75-SI                    | FTF-60-N2               |
| 110               | 1/2 BSPP    | <b>PBTF-110-NBR-G4</b>          | PBG-110-NBR                   | PBG-110-SI                   | FTF-120-G4              |
| 110               | 1/2 NPT     | <b>PBTF-110-NBR-N4</b>          | PBG-110-NBR                   | PBG-110-SI                   | FTF-120-N4              |
| 150               | 1/2 BSPP    | <b>PBTF-150-NBR-G4</b>          | PBG-150-NBR                   | PBG-150-SI                   | FTF-120-G4              |
| 150               | 1/2 NPT     | <b>PBTF-150-NBR-N4</b>          | PBG-150-NBR                   | PBG-150-SI                   | FTF-120-N4              |

Most popular.



Vacuum Cups  
 Vacuum Products

PFG Series

PBG Series

P5V-CFS Series

PJG Series

PCG Series

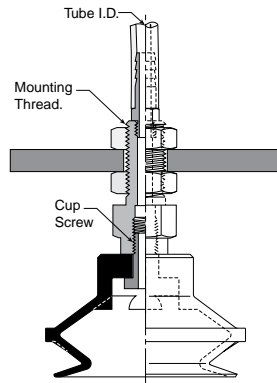
PUGB Series

**PBTK Series Barbed Bulkhead**

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting material: nickel plated brass.

**Installation**

**Note:**  
 When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



| Cup diameter (mm) | Vacuum port | Complete assembly Nitrile (NBR) | Replacement cup Nitrile (NBR) | Complete assembly Silicon (SI) | Replacement cup Silicon (SI) | Replacement cup fitting |
|-------------------|-------------|---------------------------------|-------------------------------|--------------------------------|------------------------------|-------------------------|
| 10                | Barb        | <b>PBTK-10A-NBR</b>             | <b>PBG-10A-NBR</b>            | <b>PBTK-10A-SI</b>             | <b>PBG-10A-SI</b>            | <b>FTK-5A</b>           |
| 15                | Barb        | <b>PBTK-15A-NBR</b>             | <b>PBG-15A-NBR</b>            | <b>PBTK-15A-SI</b>             | <b>PBG-15-SI</b>             | <b>FTK-5A</b>           |
| 20                | Barb        | <b>PBTK-20-NBR</b>              | <b>PBG-20-NBR</b>             | <b>PBTK-20-SI</b>              | <b>PBG-20-SI</b>             | <b>FTK-20</b>           |
| 30                | Barb        | <b>PBTK-30-NBR</b>              | <b>PBG-30-NBR</b>             | <b>PBTK-30-SI</b>              | <b>PBG-30-SI</b>             | <b>FTK-25</b>           |
| 40                | Barb        | <b>PBTK-40-NBR</b>              | <b>PBG-40-NBR</b>             | <b>PBTK-40-SI</b>              | <b>PBG-40-SI</b>             | <b>FTK-25</b>           |
| 50                | Barb        | <b>PBTK-50-NBR</b>              | <b>PBG-50-NBR</b>             | <b>PBTK-50-SI</b>              | <b>PBG-50-SI</b>             | <b>FTK-50</b>           |
| 75                | 1/8 BSPP    | <b>PBTK-75-NBR-G1</b>           | <b>PBG-75-NBR</b>             | <b>PBTK-75-SI-G1</b>           | <b>PBG-75-SI</b>             | <b>FTK-60-G1</b>        |
| 75                | 1/8 NPT     | <b>PBTK-75-NBR-N1</b>           | <b>PBG-75-NBR</b>             | <b>PBTK-75-SI-N1</b>           | <b>PBG-75-SI</b>             | <b>FTK-60-N1</b>        |

Most popular.

**C**  
 Vacuum Cups  
 Vacuum Products  
 PFG Series  
 PBG Series  
 PSV-CFS Series  
 PJG Series  
 PCG Series  
 PUGB Series



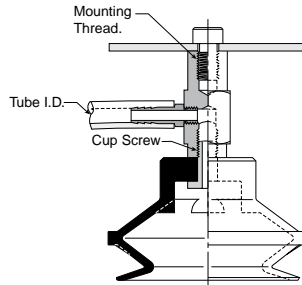
**PBYK Series 90° Barbed Adapter**

Side stem connectors allow you to secure the stem with a bolt through a plate or "L" bracket to allow the tube connection from the side port. Fitting material: nickel plated brass.

**Installation**

**Note:**

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



| Cup diameter (mm) | Vacuum port | Complete assembly Nitrile (NBR) | Replacement cup Nitrile (NBR) | Complete assembly Silicon (SI) | Replacement cup Silicon (SI) | Replacement cup fitting |
|-------------------|-------------|---------------------------------|-------------------------------|--------------------------------|------------------------------|-------------------------|
| 10                | Barb        | <b>PBYK-10A-NBR</b>             | <b>PBG-10A-NBR</b>            | <b>PBYK-10A-SI</b>             | <b>PBG-10A-SI</b>            | <b>FYK-5A</b>           |
| 15                | Barb        | <b>PBYK-15A-NBR</b>             | <b>PBG-15A-NBR</b>            | <b>PBYK-15A-SI</b>             | <b>PBG-15A-SI</b>            | <b>FYK-15</b>           |
| 20                | Barb        | <b>PBYK-20-NBR</b>              | <b>PBG-20-NBR</b>             | <b>PBYK-20-SI</b>              | <b>PBG-20-SI</b>             | <b>FYK-20</b>           |
| 30                | Barb        | <b>PBYK-30-NBR</b>              | <b>PBG-30-NBR</b>             | <b>PBYK-30-SI</b>              | <b>PBG-30-SI</b>             | <b>FYK-25</b>           |
| 40                | Barb        | <b>PBYK-40-NBR</b>              | <b>PBG-40-NBR</b>             | <b>PBYK-40-SI</b>              | <b>PBG-40-SI</b>             | <b>FYK-25</b>           |
| 50                | Barb        | <b>PBYK-50-NBR</b>              | <b>PBG-50-NBR</b>             | <b>PBYK-50-SI</b>              | <b>PBG-50-SI</b>             | <b>FYK-50</b>           |
| 75                | 1/8 BSPP    | <b>PBYK-75-NBR-G1</b>           | <b>PBG-75-NBR</b>             | <b>PBYK-75-SI-G1</b>           | <b>PBG-75-SI</b>             | <b>FYK-60-G1</b>        |
| 75                | 1/8 NPT     | <b>PBYK-75-NBR-N1</b>           | <b>PBG-75-NBR</b>             | <b>PBYK-75-SI-N1</b>           | <b>PBG-75-SI</b>             | <b>FYK-60-N1</b>        |
| 110               | 1/8 BSPP    | <b>PBYK-110-NBR-G1</b>          | <b>PBG-110-NBR</b>            | <b>PBYK-110-SI-G1</b>          | <b>PBG-110-SI</b>            | <b>FYK-120-G1</b>       |
| 110               | 1/8 NPT     | <b>PBYK-110-NBR-N1</b>          | <b>PBG-110-NBR</b>            | <b>PBYK-110-SI-N1</b>          | <b>PBG-110-SI</b>            | <b>FYK-120-N1</b>       |
| 150               | 1/8 BSPP    | <b>PBYK-150-NBR-G1</b>          | <b>PBG-150-NBR</b>            | <b>PBYK-150-SI-G1</b>          | <b>PBG-150-SI</b>            | <b>FYK-120-G1</b>       |
| 150               | 1/8 NPT     | <b>PBYK-150-NBR-N1</b>          | <b>PBG-150-NBR</b>            | <b>PBYK-150-SI-N1</b>          | <b>PBG-150-SI</b>            | <b>FYK-120-N1</b>       |

Most popular.



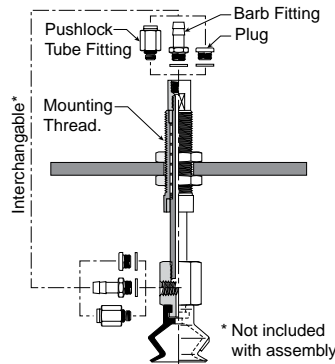
**PBTYS Series Bulkhead Level Compensator**

303 stainless steel construction secured with jam nuts. Spring biased compensators can absorb impacts of down-strokes and adjust for different levels of pick up points. 303 stainless corrosion resistant materials with drymet bushings increases the strength and life.

**Installation**

**Note:**

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage. Shown are interchangeable connectors & plugs for port connections.



| Cup dia. (mm) | Vacuum port | Stroke (mm) | Spring compression Force lbf (N) |            | Cup material Nitrile assembly (NBR) | Replacement cup Nitrile (NBR) | Cup material Silicon assembly (SI) | Replacement cup Silicon (SI) | Level Compensator P/N |
|---------------|-------------|-------------|----------------------------------|------------|-------------------------------------|-------------------------------|------------------------------------|------------------------------|-----------------------|
|               |             |             | 0%                               | 100%       |                                     |                               |                                    |                              |                       |
| 10            | M5          | 10          | .11 (.49)                        | .13 (.59)  | PBTYS10A10NBRM5                     | PBG-10A-NBR                   | PBTYS10A10SIM5                     | PBG-10A-SI                   | TYS-5A-10             |
| 10            | M5          | 15          | .11 (.49)                        | .13 (.59)  | PBTYS10A15NBRM5                     | PBG-10A-NBR                   | PBTYS10A15SIM5                     | PBG-10A-SI                   | TYS-5A-15             |
| 15            | M5          | 10          | .11 (.49)                        | .13 (.59)  | PBTYS15A10NBRM5                     | PBG-15A-NBR                   | PBTYS15A10SIM5                     | PBG-15A-SI                   | TYS-5A-10             |
| 15            | M5          | 15          | .11 (.49)                        | .13 (.59)  | PBTYS15A15NBRM5                     | PBG-15A-NBR                   | PBTYS15A15SIM5                     | PBG-15A-SI                   | TYS-5A-15             |
| 20            | M5          | 15          | .56 (2.5)                        | .79 (3.4)  | PBTYS20B15NBRM5                     | PBG-20B-NBR                   | PBTYS20B15SIM5                     | PBG-20B-SI                   | TYS-20B-15            |
| 20            | M5          | 30          | .56 (2.5)                        | 1.2 (4.9)  | PBTYS20B30NBRM5                     | PBG-20B-NBR                   | PBTYS20B30SIM5                     | PBG-20B-SI                   | TYS-20B-30            |
| 30            | M5          | 15          | .56 (2.5)                        | .79 (3.4)  | PBTYS3015NBRM5                      | PBG-30-NBR                    | PBTYS3015SIM5                      | PBG-30-SI                    | TYS-20B-15            |
| 30            | M5          | 30          | .56 (2.5)                        | 1.2 (4.9)  | PBTYS3030NBRM5                      | PBG-30-NBR                    | PBTYS3030SIM5                      | PBG-30-SI                    | TYS-20B-30            |
| 40            | M5          | 15          | .56 (2.5)                        | .79 (3.4)  | PBTYS4015NBRM5                      | PBG-40-NBR                    | PBTYS4015SIM5                      | PBG-40-SI                    | TYS-20B-15            |
| 40            | M5          | 30          | .56 (2.5)                        | 1.2 (4.9)  | PBTYS4030NBRM5                      | PBG-40-NBR                    | PBTYS4030SIM5                      | PBG-40-SI                    | TYS-20B-30            |
| 50            | M5          | 15          | .56 (2.5)                        | 1.2 (4.9)  | PBTYS5015NBRM5                      | PBG-50-NBR                    | PBTYS5015SIM5                      | PBG-50-SI                    | TYS-50-15             |
| 50            | M5          | 30          | .67 (2.9)                        | 1.4 (5.9)  | PBTYS5030NBRM5                      | PBG-50-NBR                    | PBTYS5030SIM5                      | PBG-50-SI                    | TYS-50-30             |
| 75            | 1/8 NPT     | 30          | 1.6 (6.8)                        | 3.6 (15.6) | PBTYS7530NBRN1                      | PBG-75-NBR                    | PBTYS7530SIN1                      | PBG-75-SI                    | TYS-60-30             |
| 75            | 1/8 NPT     | 50          | 1.9 (8.3)                        | 4.5 (19.6) | PBTYS7550NBRN1                      | PBG-75-NBR                    | PBTYS7550SIN1                      | PBG-75-SI                    | TYS-60-50             |
| 110           | 1/4 NPT     | 20          | 3.6 (15.6)                       | 6.8 (29)   | PBTYS12020NBRN2                     | PBG-110-NBR                   | PBTYS11020SIN2                     | PBG-110-SI                   | TYS-120-20            |
| 110           | 1/4 NPT     | 70          | 3.4 (14.7)                       | 6.8 (29)   | PBTYS12070NBRN2                     | PBG-110-NBR                   | PBTYS11070SIN2                     | PBG-110-SI                   | TYS-120-70            |
| 150           | 1/4 NPT     | 20          | 3.6 (15.6)                       | 6.8 (29)   | PBTYS15020NBRN2                     | PBG-150-NBR                   | PBTYS15020SIN2                     | PBG-150-SI                   | TYS-120-20            |
| 150           | 1/4 NPT     | 70          | 3.4 (14.7)                       | 6.8 (29)   | PBTYS15070NBRN2                     | PBG-150-NBR                   | PBTYS15070SIN2                     | PBG-150-SI                   | TYS-120-70            |

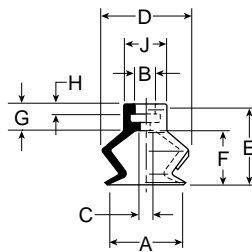
Most popular.



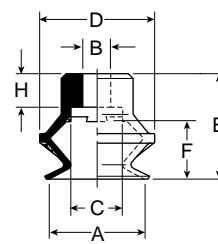
**C**  
 Vacuum Cups  
 Vacuum Products  
 PFG Series  
 PBG Series  
 PSV-CFS Series  
 PJG Series  
 PCG Series  
 PUGB Series

**PBG Series Replacement Cup Dimensions**

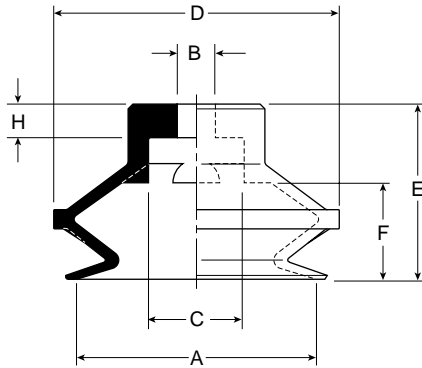
**PBG-10A and  
 PBG-20B**



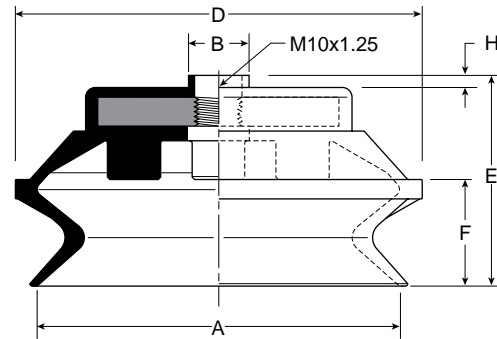
**PBG-20 thru  
 PBG-40**



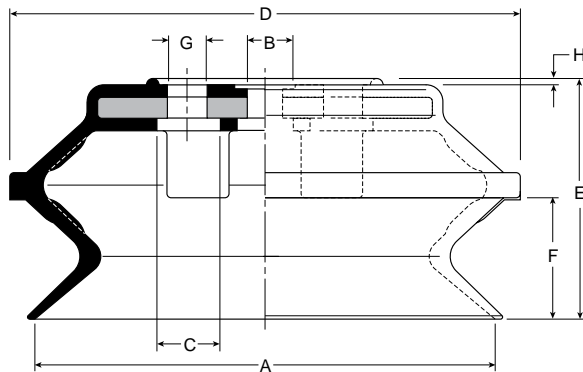
**PBG-50**



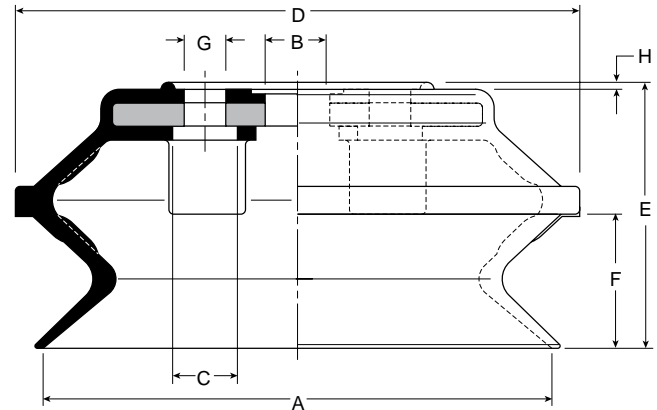
**PBG-75**



**PBG-110**



**PBG-150**



| Model number | ØA         | ØB         | ØC         | ØD          | E           | F          | G        | H          | ØJ      |
|--------------|------------|------------|------------|-------------|-------------|------------|----------|------------|---------|
| PBG-10A-*    | .42 (10.6) | .16 (4)    | .08 (2)    | .49 (12.4)  | .53 (13.5)  | .30 (7.5)  | .24 (6)  | .08 (2)    | .24 (6) |
| PBG-15A-*    | .59 (15)   | .16 (4)    | .16 (4)    | .67 (17)    | .63 (16)    | .39 (10)   | .24 (6)  | .08 (2)    | .24 (6) |
| PBG-20B-*    | .79 (20)   | .24 (6)    | .43 (10.8) | .94 (24)    | .87 (22)    | .47 (12)   | —        | .28 (7)    | —       |
| PBG-20-*     | .79 (20)   | .18 (4.6)  | .43 (10.8) | .94 (24)    | .77 (19.5)  | .47 (12)   | —        | .18 (4.5)  | —       |
| PBG-30-*     | 1.18 (30)  | .23 (5.8)  | .43 (10.8) | 1.42 (36)   | 1.20 (30.5) | .67 (17)   | —        | .28 (7)    | —       |
| PBG-40-*     | 1.57 (40)  | .23 (5.8)  | .43 (10.8) | 1.81 (46)   | 1.20 (30.5) | .61 (15.5) | —        | .28 (7)    | —       |
| PBG-50-*     | 1.97(50)   | .31 (7.8)  | .78 (19.8) | 2.34 (59.5) | 1.44 (36.5) | .79 (20)   | —        | .28 (7)    | —       |
| PBG-75-*     | 2.95 (75)  | .49 (12.5) | —          | 3.31 (84)   | 1.71 (43.5) | .87 (22)   | —        | .10 (2.5)  | —       |
| PBG-110-*    | 4.33 (110) | .55 (14)   | .55 (14)   | 4.80 (122)  | 2.26 (57.5) | 1.14 (29)  | —        | .059 (1.5) | —       |
| PBG-150-*    | 5.91 (150) | .79 (20)   | .55 (14)   | 6.57 (167)  | 3.01 (76.5) | 1.50 (38)  | 4xØ9xØ40 | .059 (1.5) | —       |

Inches (mm)  
 \* Cup material

**C**

Vacuum Cups  
 Vacuum Products

PFG  
 Series

PBG  
 Series

P5V-CFS  
 Series

PJG  
 Series

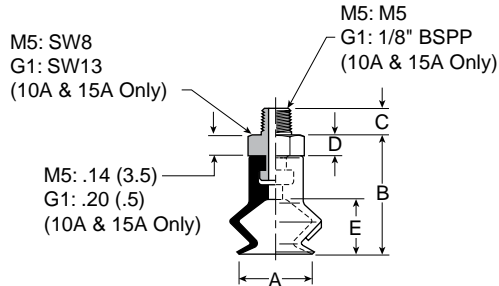
PCG  
 Series

PUGB  
 Series

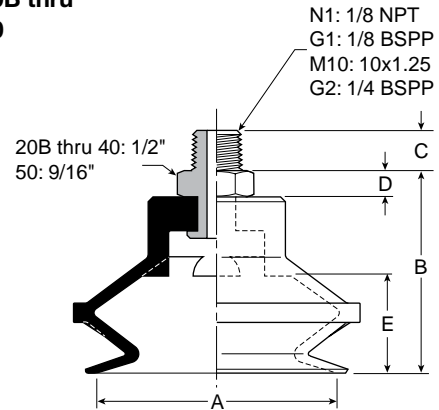


**Dimensions**

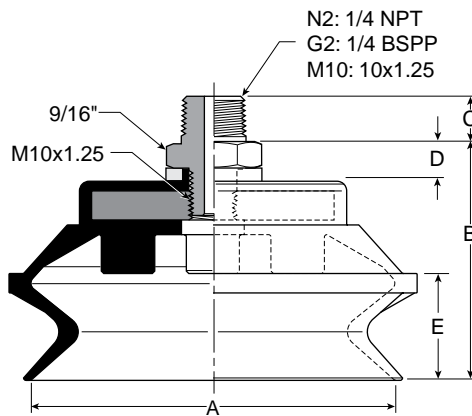
**PBTM-10A thru  
PBTM-15**



**PBTM-20B thru  
PBTM-50**



**PBTM-75**



| Model number | ØA        | B           | C (M5)    | C (N1 / G1) | C (M10 / G2) | C (N2)   | D        | E          |
|--------------|-----------|-------------|-----------|-------------|--------------|----------|----------|------------|
| PBTM-10A-*†  | .39 (10)  | .67 (17)    | .18 (4.5) | .31 (8)     | —            | —        | See Dwg. | .30 (7.5)  |
| PBTM-15A-*†  | .59 (15)  | .77 (19.5)  | .18 (4.5) | .31 (8)     | —            | —        | See Dwg. | .39 (10)   |
| PBTM-20B-*†  | .79 (20)  | 1.06 (27)   | —         | .31 (8)     | .39 (10)     | —        | .20 (5)  | .47 (12)   |
| PBTM-30-*†   | 1.18 (30) | 1.40 (35.5) | —         | .31 (8)     | .39 (10)     | —        | .20 (5)  | .67 (17)   |
| PBTM-40-*†   | 1.57 (40) | 1.40 (35.5) | —         | .31 (8)     | .39 (10)     | —        | .20 (5)  | .61 (15.5) |
| PBTM-50-*†   | 1.97 (50) | 1.63 (41.5) | —         | .31 (8)     | .39 (10)     | —        | .20 (5)  | .79 (20)   |
| PBTM-75-*†   | 3.74 (95) | 1.99 (50.5) | —         | —           | .39 (10)     | .59 (15) | .28 (7)  | .87 (22)   |

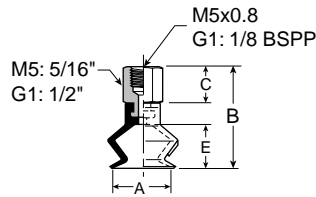
Inches (mm)  
\* Cup material  
† Thread size

**C**  
**Vacuum Cups**  
**Vacuum Products**  
**PF6 Series**  
**PB6 Series**  
**PSV-CFS Series**  
**PI6 Series**  
**PC6 Series**  
**PUGB Series**

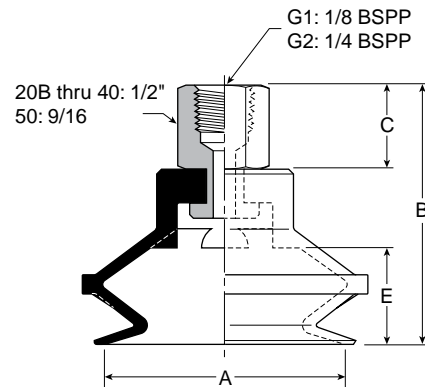


**Dimensions**

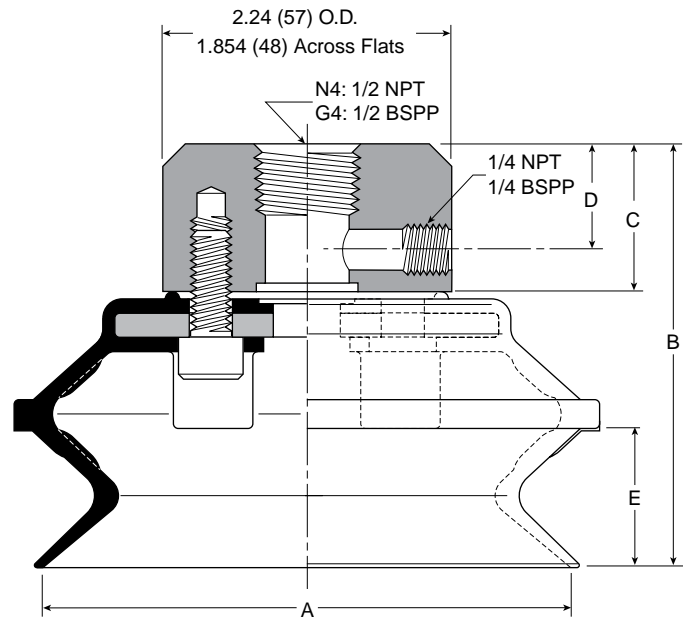
**PBTF-10A thru  
 PBTF-15A**



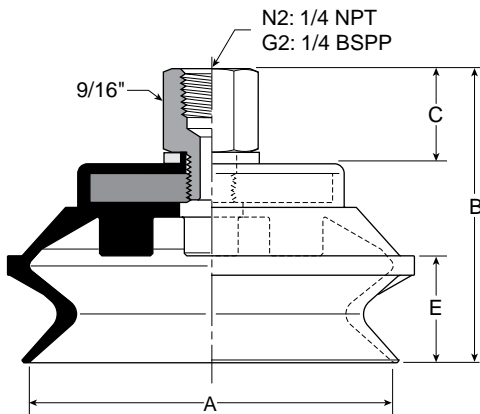
**PBTF-20B thru  
 PBTF 50**



**PBTF-110 thru  
 PBTF-150**



**PBTF-75**



| Model number | ØA         | B           | B (M5)      | C          | C (M5)   | D        | E          |
|--------------|------------|-------------|-------------|------------|----------|----------|------------|
| PBTF-10A-*†  | .39 (10)   | .85 (21.5)  | 1.08 (27.5) | .31 (8)    | .55 (14) | —        | .30 (7.5)  |
| PBTF-15A-*†  | .59 (15)   | .94 (24)    | 1.18 (30)   | .31 (8)    | .55 (14) | —        | .39 (10)   |
| PBTF-20B-*†  | .79 (20)   | 1.42 (36)   | —           | .55 (14)   | —        | —        | .47 (12)   |
| PBTF-30-*†   | 1.18 (30)  | 1.75 (44.5) | —           | .55 (14)   | —        | —        | .70 (17)   |
| PBTF-40-*†   | 1.57 (40)  | 1.75 (44.5) | —           | .55 (14)   | —        | —        | .61 (15.5) |
| PBTF-50-*†   | 1.97 (50)  | 1.99 (50.5) | —           | .55 (14)   | —        | —        | .79 (20)   |
| PBTF-75-*†   | 3.74 (95)  | 2.38 (60.5) | —           | .77 (19.5) | —        | —        | .87 (22)   |
| PBTF-110-*†  | 4.72 (120) | 3.07 (78)   | —           | .94 (24)   | —        | .51 (13) | 1.14 (29)  |
| PBTF-150-*†  | 5.91 (150) | 3.82 (97)   | —           | .94 (24)   | —        | .51 (13) | 1.50 (38)  |

Inches (mm)  
 \* Cup material  
 † Thread size

**C**

Vacuum Cups  
 Vacuum Products

PFG Series

PBG Series

P5V-CFS Series

PJG Series

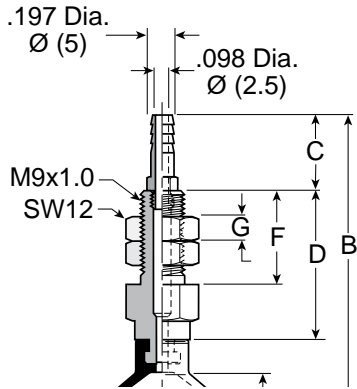
PCG Series

PUGB Series

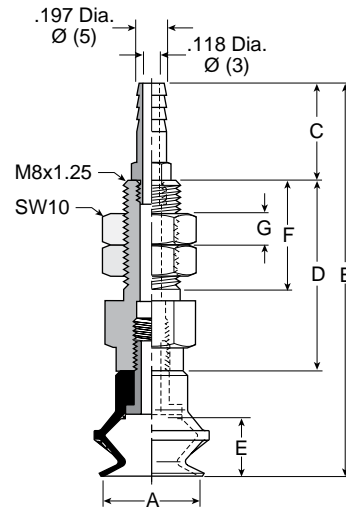


**Dimensions**

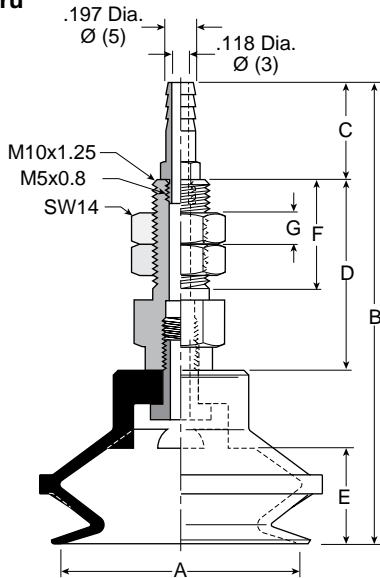
**PBTK-10A thru  
 PBTK-15A**



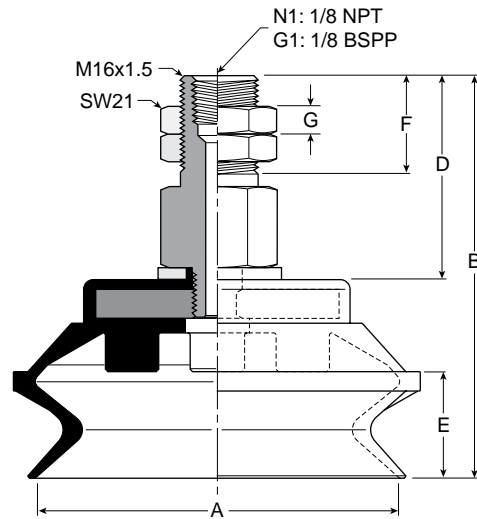
**PBTK-20**



**PBTK-30 thru  
 PBTK-50**



**PBTK-75**



| Model number | ØA        | B           | C        | D           | E          | F        | G          | Wt oz (g) |
|--------------|-----------|-------------|----------|-------------|------------|----------|------------|-----------|
| PBTK-10A-*   | .39 (10)  | 2.05 (52)   | .39 (10) | .89 (22.5)  | .30 (7.5)  | .24 (6)  | .61 (15.5) | .5 (15)   |
| PBTK-15A-*   | .59 (15)  | 2.15 (54.5) | .39 (10) | .89 (22.5)  | .39 (10)   | .24 (6)  | .61 (15.5) | .5 (15)   |
| PBTK-20-*    | .79 (20)  | 2.26 (57.5) | .63 (16) | .87 (22)    | .47 (12)   | .24 (6)  | .59 (15)   | .7 (21)   |
| PBTK-30-*    | 1.18 (30) | 3.09 (78.5) | .63 (16) | 1.26 (32)   | .67 (17)   | .24 (6)  | .79 (20)   | 1.6 (45)  |
| PBTK-40-*    | 1.57 (40) | 3.09 (78.5) | .63 (16) | 1.26 (32)   | .61 (15.5) | .24 (6)  | .79 (20)   | 1.7 (48)  |
| PBTK-50-*    | 1.97 (50) | 3.33 (84.5) | .63 (16) | 1.26 (32)   | .79 (20)   | .24 (6)  | .79 (20)   | 2.2 (62)  |
| PBTK-75-*-†  | 3.74 (95) | 3.29 (83.5) | —        | 1.67 (42.5) | .87 (22)   | .43 (11) | —          | 6.5 (186) |

Inches (mm)  
 \* Cup material  
 † Vacuum port

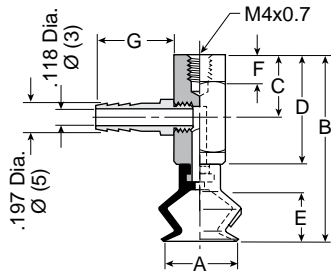
**C**  
 Vacuum Cups  
 Vacuum Products  
 PFG Series  
 PBG Series  
 PSV-CFS Series  
 PJG Series  
 PCG Series  
 PUGB Series



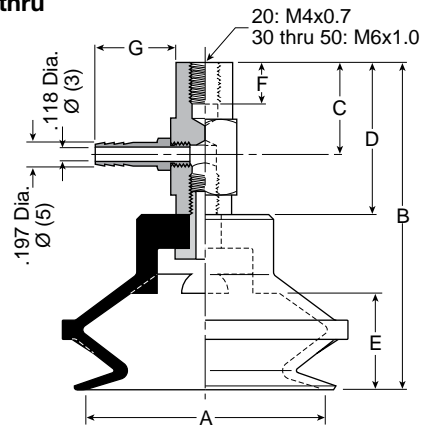


**Dimensions**

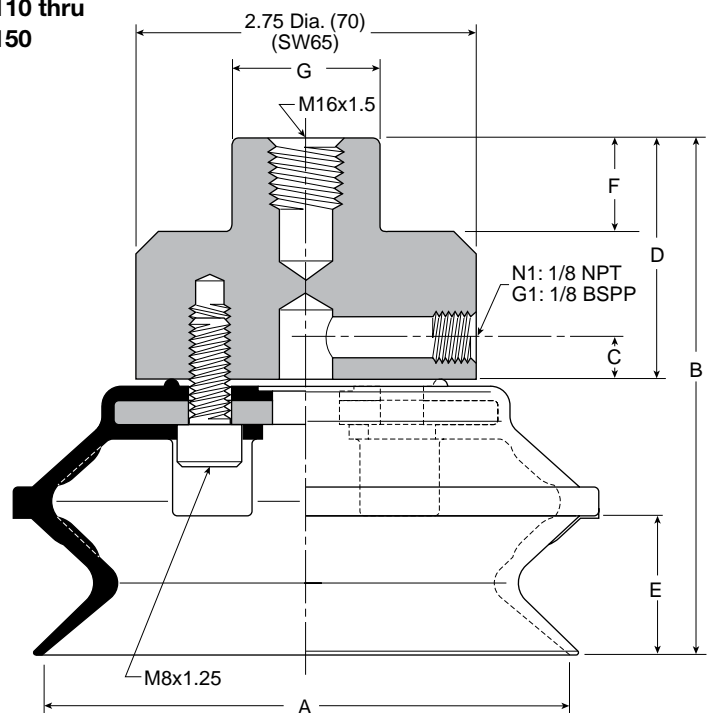
**PBYK-10A thru  
PBYK-15A**



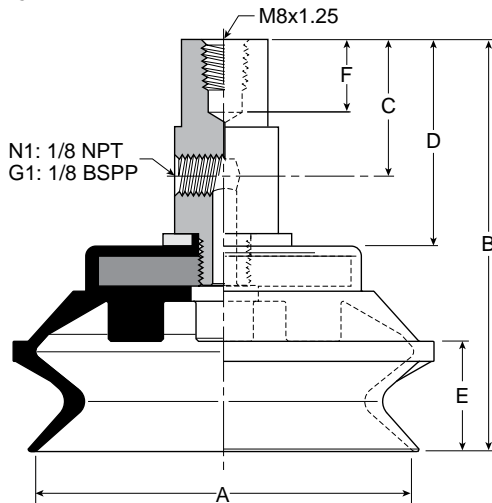
**PBYK-20 thru  
PBYK-50**



**PBYK-110 thru  
PBYK-150**



**PBYK-75**



| Model number | ØA         | B           | C         | D           | E          | F        | G              | Wt oz (g)   |
|--------------|------------|-------------|-----------|-------------|------------|----------|----------------|-------------|
| PBYK-10A-*   | .39 (10)   | 1.42 (36)   | .51 (13)  | .89 (22.5)  | .29 (7.5)  | .24 (6)  | .63 (16)       | .6 (16)     |
| PBYK-15A-*   | .59 (15)   | 1.52 (38.5) | .51 (13)  | .89 (22.5)  | .39 (10)   | .24 (6)  | .63 (16)       | .6 (16)     |
| PBYK-20-*    | .79 (20)   | 1.63 (41.5) | .55 (14)  | .87 (22)    | .47 (12)   | .24 (6)  | .63 (16)       | .7 (21)     |
| PBYK-30-*    | 1.18 (30)  | 2.46 (62.5) | .79 (20)  | 1.26 (32)   | .67 (17)   | .24 (6)  | .63 (16)       | 1.6 (45)    |
| PBYK-40-*    | 1.57 (40)  | 2.46 (62.5) | .79 (20)  | 1.26 (32)   | .61 (15.5) | .24 (6)  | .63 (16)       | 2.0 (58)    |
| PBYK-50-*    | 1.97 (50)  | 2.70 (68.5) | .79 (20)  | 1.26 (32)   | .78 (20)   | .24 (6)  | .63 (16)       | 2.4 (67)    |
| PBYK-75-*,†  | 3.74 (95)  | 3.29 (83.5) | 1.10 (28) | 1.67 (42.5) | .86 (22)   | .43 (11) | —              | 6.9 (176)   |
| PBYK-110-*,† | 4.72 (120) | 4.17 (106)  | .47 (12)  | 1.97 (50)   | 1.14 (29)  | .79 (20) | 1.18 Dia. (30) | 26.4 (670)  |
| PBYK-150-*,† | 5.91 (150) | 4.92 (125)  | .47 (12)  | 1.97 (50)   | 1.50 (38)  | .79 (20) | 1.18 Dia. (30) | 46.5 (1180) |

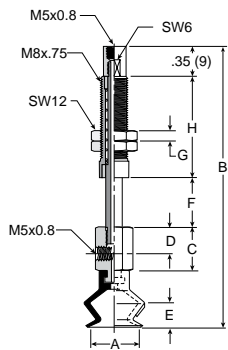
Inches (mm)  
\* Cup material  
† Vacuum port

**C**  
Vacuum Cups  
Vacuum Products  
PFG Series  
PBG Series  
P5V-CFS Series  
PJG Series  
PCG Series  
PUGB Series

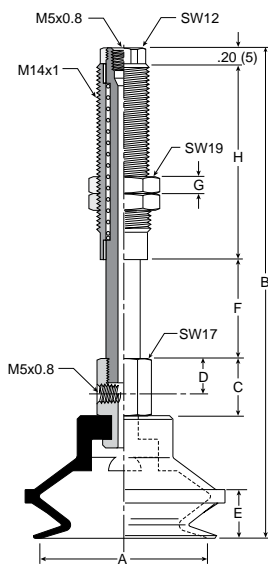


**Dimensions**

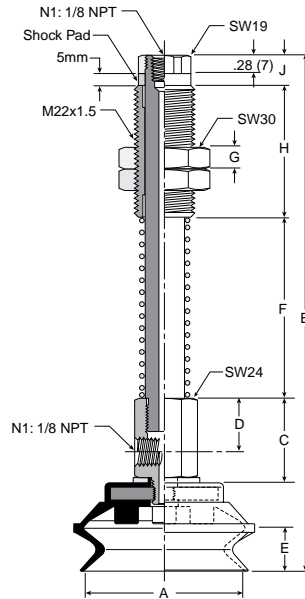
**PBTYS10A thru  
PBTYS15A1**



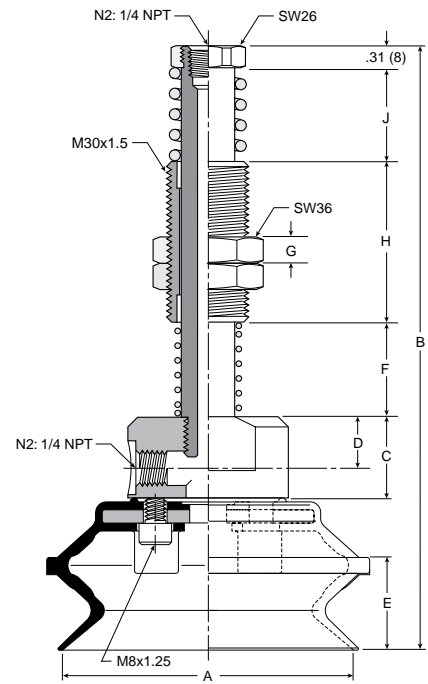
**PBTYS20B thru  
PBTYS50**



**PBTYS75**



**PBTYS110 thru  
PBTYS150**



| Model number  | ØA         | B            | C           | D        | E          | F          | G        | H           | J         | Wt oz (g)  |
|---------------|------------|--------------|-------------|----------|------------|------------|----------|-------------|-----------|------------|
| PBTYS10A10*   | .39 (10)   | 2.70 (68.5)  | .51 (13)    | .31 (8)  | .30 (7.5)  | .39 (10)   | .12 (3)  | .91 (23)    | —         | .65 (18.5) |
| PBTYS10A15*   | .39 (10)   | 3.19 (81)    | .51 (13)    | .31 (8)  | .30 (7.5)  | .59 (15)   | .12 (3)  | 1.20 (30.5) | —         | .7 (21)    |
| PBTYS15A10*   | .59 (15)   | 2.80 (71)    | .51 (13)    | .31 (8)  | .39 (10)   | .39 (10)   | .12 (3)  | .91 (23)    | —         | .65 (18.5) |
| PBTYS15A15*   | .59 (15)   | 3.29 (83.5)  | .51 (13)    | .31 (8)  | .39 (10)   | .59 (15)   | .12 (3)  | 1.20 (30.5) | —         | .7 (21)    |
| PBTYS20B15*   | .79 (20)   | 3.90 (99)    | .67 (17)    | .39 (10) | .47 (12)   | .59 (15)   | .20 (5)  | 1.42 (36)   | —         | 2.5 (72)   |
| PBTYS20B30*   | .79 (20)   | 5.36 (136)   | .67 (17)    | .39 (10) | .47 (12)   | 1.18 (30)  | .20 (5)  | 2.28 (58)   | —         | 3.4 (97)   |
| PBTYS3015**†  | 1.18 (30)  | 4.07 (103.5) | .67 (17)    | .39 (10) | .67 (17)   | .59 (15)   | .20 (5)  | 1.42 (36)   | —         | 3.4 (97)   |
| PBTYS3030**†  | 1.18 (30)  | 5.53 (140.5) | .67 (17)    | .39 (10) | .67 (17)   | 1.18 (30)  | .20 (5)  | 2.28 (58)   | —         | 3.6 (102)  |
| PBTYS4015**†  | 1.57 (40)  | 4.07 (103.5) | .67 (17)    | .39 (10) | .61 (15.5) | .59 (15)   | .20 (5)  | 1.42 (36)   | —         | 2.9 (83)   |
| PBTYS4030**†  | 1.57 (40)  | 5.53 (140.5) | .67 (17)    | .39 (10) | .61 (15.5) | 1.18 (30)  | .20 (5)  | 2.28 (58)   | —         | 3.8 (108)  |
| PBTYS5015**†  | 1.97 (50)  | 4.31 (109.5) | .67 (17)    | .39 (10) | .78 (20)   | .59 (15)   | .20 (5)  | 1.42 (36)   | —         | 3.4 (97)   |
| PBTYS5030**†  | 1.97 (50)  | 5.77 (146.5) | .67 (17)    | .39 (10) | .78 (20)   | 1.18 (30)  | .20 (5)  | 2.28 (58)   | —         | 4.3 (122)  |
| PBTYS7530**†  | 2.95 (75)  | 7.01 (178)   | 1.28 (32.5) | .78 (20) | .87 (22)   | 1.77 (45)  | .39 (10) | 1.97 (50)   | .47 (12)  | 12 (339)   |
| PBTYS7550**†  | 2.95 (75)  | 7.99 (203)   | 1.28 (32.5) | .78 (20) | .87 (22)   | 2.76 (70)  | .39 (10) | 1.97 (50)   | .47 (12)  | 13 (373)   |
| PBTYS11020**† | 4.33 (110) | 8.82 (224)   | 1.18 (30)   | .71 (18) | 1.14 (29)  | 1.38 (35)  | .39 (10) | 2.36 (60)   | 1.38 (35) | 42 (1194)  |
| PBTYS11070**† | 4.33 (110) | 11.38 (289)  | 1.18 (30)   | .71 (18) | 1.14 (29)  | 3.94 (100) | .39 (10) | 2.36 (60)   | 1.38 (35) | 45 (1276)  |
| PBTYS15020**† | 5.91 (150) | 9.57 (243)   | 1.18 (30)   | .71 (18) | 1.50 (38)  | 1.38 (35)  | .39 (10) | 2.36 (60)   | 1.38 (35) | 60 (1704)  |
| PBTYS15070**† | 5.91 (150) | 12.13 (308)  | 1.18 (30)   | .71 (18) | 1.50 (38)  | 3.94 (100) | .39 (10) | 2.36 (60)   | 1.38 (35) | 63 (1786)  |

Inches (mm)  
\* Cup material  
† Vacuum port

**C**  
**Vacuum Cups**  
**Vacuum Products**  
**Series**  
**PF6**  
**Series**  
**PB6**  
**Series**  
**PSV-CFS**  
**Series**  
**PJ6**  
**Series**  
**PC6**  
**Series**  
**PUGB**  
**Series**



**Features**

- Double sealing lips for flexible sheet handling
- Vacuum cup grooves on underside increase holding area
- Resists acceleration and deceleration shear forces
- Strong low profile for fast response
- Metal insert fitting for stable vertical and horizontal lifts

**Applications**

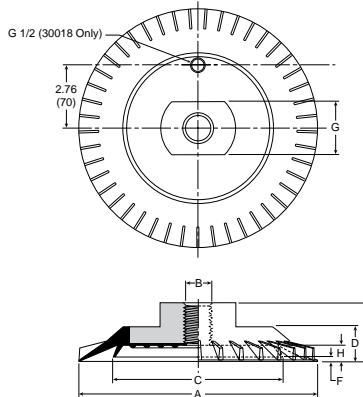
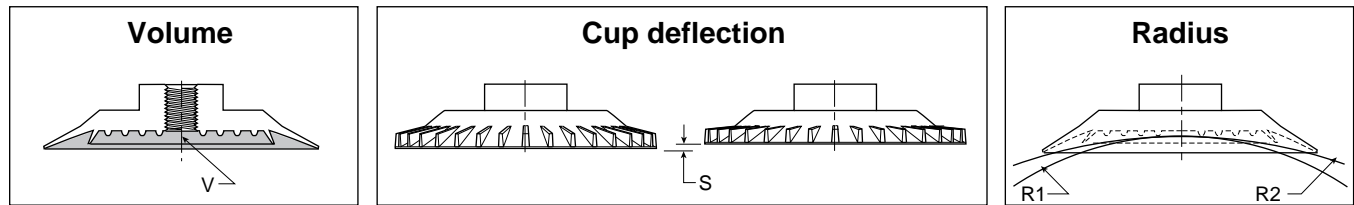
These suction cups are ideal for applications where the product may flex when being lifted. All cups have a double sealing lip and cleats to increase holding capacity. The top of the cup has a ribbed outer lip to prevent it from rolling over the surface to be lifted.

Dual sealing lips provide 2 seals for vacuum. As the product flexes, the outer lip seal may break, but the inner lip seal will hold the degree of vacuum for continued lifting capacity. In these types of applications, sizing should be done on the inner diameter cup dimension.



| Cup diameter (mm) | Vacuum port | Complete assembly Nitrile (NBR) | Area*** cm <sup>2</sup> | Cup volume (V) liters | Deflection (S) (mm) | Radius R (mm) |            |
|-------------------|-------------|---------------------------------|-------------------------|-----------------------|---------------------|---------------|------------|
|                   |             |                                 |                         |                       |                     | R1*           | R2**       |
| 50                | 1/8 BSPP    | <b>P5V-CFS05011N</b>            | 19.6                    | .001                  | .16 (4)             | 3.86 (98)     | 3.15 (80)  |
| 100               | 3/8 BSPP    | <b>P5V-CFS10013N</b>            | 78.5                    | .0667                 | .30 (8)             | 10.00 (254)   | 6.34 (161) |
| 150               | 1/2 BSPP    | <b>P5V-CFS15014N</b>            | 176.7                   | .2083                 | .43 (11)            | 12.17 (309)   | 9.92 (252) |

\* Minimum permissible radius for lifting using inner lip.  
 \*\* Minimum permissible radius for lifting using outer lip.  
 \*\*\* Area based on Outer Cup Diameter



**Dimensions**

| Model number       | ØA         | B    | ØC         | D         | E         | F           | G         | H           |
|--------------------|------------|------|------------|-----------|-----------|-------------|-----------|-------------|
| <b>P5V-CFS50*</b>  | 1.97 (50)  | G1/8 | 1.38 (35)  | 0.43 (11) | 0.71 (18) | 0.087 (2.2) | 0.51 (13) | 0.146 (3.7) |
| <b>P5V-CFS100*</b> | 3.94 (100) | G3/8 | 2.83 (72)  | 0.71 (18) | 1.10 (28) | 0.197 (5)   | 0.87 (22) | 0.295 (7.5) |
| <b>P5V-CFS150*</b> | 5.91 (150) | G1/2 | 4.17 (106) | 1.02 (26) | 1.65 (42) | 0.276 (7)   | 1.06 (27) | 0.43 (11)   |

Inches (mm)  
 \* Cup material

  Most popular.

C

Vacuum Cups  
Vacuum Products

PFG Series

PBG Series

P5V-CFS Series

PJG Series

PCG Series

PUGB Series

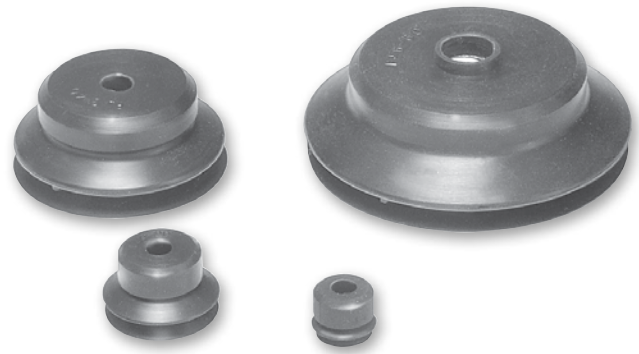


Versatile bellow cup design provides increased sealing lip and level compensation for products with irregular, smooth, curved surfaces, or flexible sheets.

The short stroke bellow suction cup has an extra thin sealing edge and shorter stroke versus the traditional bellows for faster response. The cups are good for corrugated and smooth surfaces.

**Features**

- Short bellows for fast response
- More lip seal contact for corrugated, textured surfaces
- Soft sealing lip
- 6mm to 80mm



**Styles**

- PJTM series male thread connector
- PJTF series female thread connector
- PJTK series barbed bulkhead
- PJYK series 90° barbed adapter
- PJTYS series bulkhead level compensator

**Specifications**

| Cup material               | Nitrile       | Nitrile ESD*     | Silicon       | Silicon ESD*    |
|----------------------------|---------------|------------------|---------------|-----------------|
| Material code              | NBR           | NBRE             | SI            | SIE             |
| Operating temperature (°C) | -20° to +120° | 0° to +60°       | -60° to +250° | -10° to +130°   |
| Color                      | Black         | Black / Blue Dot | White         | Black / Red Dot |
| Hardness, shore A (°Sh)    | 55 ±5         | 70 ±5            | 55 ±5         | 55 ±5           |
| Electrical resistance (Ωm) | —             | 800 to 1000      | —             | 5 to 15         |

\* ESD: Electric Static Dissipative Material

**How to order**

Cups assemblies and replacement cups are specified by cup diameter and material. Standard nitrile and silicon are listed on the following pages. To specify an alternative material, replace the cup material with alternative cup material code.

**Example:** To specify a cup assembly with silicon ESD (SIE), replace (NBR) with (SIE) in the part number. PJTM-20B-NBR-G1 becomes PJTM-20B-SIE-G1. Inquire with factory for availability.

**Application guide**

**Short Bellows**



|                            |                           |                                      |                                     |                             |                                    |                                   |                      |                           |                       |
|----------------------------|---------------------------|--------------------------------------|-------------------------------------|-----------------------------|------------------------------------|-----------------------------------|----------------------|---------------------------|-----------------------|
| Flat surface, thin section | Flat surface, any section | Slightly bowed surface, thin section | Slightly bowed surface, any section | Bowed surface, thin section | Soft porous material, thin section | Soft porous material, any section | Metal sheet handling | Corrugated sheet handling | Not for vertical lift |
|----------------------------|---------------------------|--------------------------------------|-------------------------------------|-----------------------------|------------------------------------|-----------------------------------|----------------------|---------------------------|-----------------------|

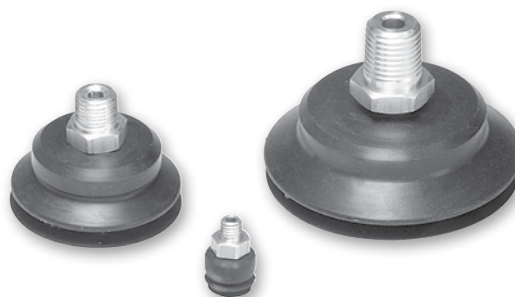
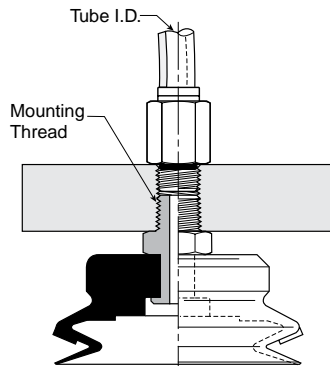
**PJTM Series Male Thread Connector**

Simple male connection for low profile positions secured to a plate or bracket. NPT, G, metric threads.  
 Fitting material: aluminum.

**Installation**

**Note:**

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



| Cup diameter (mm) | Vacuum port | Complete assembly Nitrile (NBR) | Replacement cup Nitrile (NBR) | Complete assembly Silicon (SI) | Replacement cup Silicon (SI) | Replacement cup fitting |
|-------------------|-------------|---------------------------------|-------------------------------|--------------------------------|------------------------------|-------------------------|
| 6                 | M5          | PJTM-6-NBR-M5                   | PJG-6-NBR                     | PJTM-6-SI-M5                   | PJG-6-SI                     | FTM-5A-M5H              |
| 6                 | 1/8 BSPP    | PJTM-6-NBR-G1                   | PJG-6-NBR                     | PJTM-6-SI-G1                   | PJG-6-SI                     | FTM-5A-G1               |
| 8                 | M5          | PJTM-8-NBR-M5                   | PJG-8-NBR                     | PJTM-8-SI-M5                   | PJG-8-SI                     | FTM-5A-M5H              |
| 8                 | 1/8 BSPP    | PJTM-8-NBR-G1                   | PJG-8-NBR                     | PJTM-8-SI-G1                   | PJG-8-SI                     | FTM-5A-G1               |
| 10                | M5          | PJTM-10-NBR-M5                  | PJG-10-NBR                    | PJTM-10-SI-M5                  | PJG-10-SI                    | TN-PF-15-M5             |
| 15                | M5          | PJTM-15-NBR-M5                  | PJG-15-NBR                    | PJTM-15-SI-M5                  | PJG-15-SI                    | TN-PF-15-M5             |
| 20                | M5          | PJTM-20-NBR-M5                  | PJG-20-NBR                    | PJTM-20-SI-M5                  | PJG-20-SI                    | TN-PF-20-M5             |
| 30                | 1/8 BSPP    | PJTM-30-NBR-G1                  | PJG-30-NBR                    | PJTM-30-SI-G1                  | PJG-30-SI                    | FTM-20B-G1H             |
| 30                | 1/4 BSPP    | PJTM-30-NBR-G2                  | PJG-30-NBR                    | PJTM-30-SI-G2                  | PJG-30-SI                    | FTM-20B-G2              |
| 30                | M10         | PJTM-30-NBR-M10                 | PJG-30-NBR                    | PJTM-30-SI-M10                 | PJG-30-SI                    | FTM-20B-M10             |
| 30                | 1/8 NPT     | PJTM-30-NBR-N1                  | PJG-30-NBR                    | PJTM-30-SI-N1                  | PJG-30-SI                    | FTM-20B-N1              |
| 40                | 1/8 BSPP    | PJTM-40-NBR-G1                  | PJG-40-NBR                    | PJTM-40-SI-G1                  | PJG-40-SI                    | FTM-20B-G1H             |
| 40                | 1/4 BSPP    | PJTM-40-NBR-G2                  | PJG-40-NBR                    | PJTM-40-SI-G2                  | PJG-40-SI                    | FTM-20B-G2              |
| 40                | M10         | PJTM-40-NBR-M10                 | PJG-40-NBR                    | PJTM-40-SI-M10                 | PJG-40-SI                    | FTM-20B-M10             |
| 40                | 1/8 NPT     | PJTM-40-NBR-N1                  | PJG-40-NBR                    | PJTM-40-SI-N1                  | PJG-40-SI                    | FTM-20B-N1              |
| 50                | 1/8 BSPP    | PJTM-50-NBR-G1                  | PJG-50-NBR                    | PJTM-50-SI-G1                  | PJG-50-SI                    | FTM-50-G1H              |
| 50                | 1/4 BSPP    | PJTM-50-NBR-G2                  | PJG-50-NBR                    | PJTM-50-SI-G2                  | PJG-50-SI                    | FTM-50-G2               |
| 50                | 1/8 NPT     | PJTM-50-NBR-N1                  | PJG-50-NBR                    | PJTM-50-SI-N1                  | PJG-50-SI                    | FTM-50-N1               |
| 60                | 1/4 BSPP    | PJTM-60-NBR-G2                  | PJG-60-NBR                    | PJTM-60-SI-G2                  | PJG-60-SI                    | FTM-60-G2               |
| 60                | M10         | PJTM-60-NBR-M10                 | PJG-60-NBR                    | PJTM-60-SI-M10                 | PJG-60-SI                    | FTM-60-M10              |
| 60                | 1/4 NPT     | PJTM-60-NBR-N2                  | PJG-60-NBR                    | PJTM-60-SI-N2                  | PJG-60-SI                    | FTM-60-N2               |
| 80                | 1/4 BSPP    | PJTM-80-NBR-G2                  | PJG-80-NBR                    | PJTM-80-SI-G2                  | PJG-80-SI                    | FTM-60-G2               |
| 80                | M10         | PJTM-80-NBR-M10                 | PJG-80-NBR                    | PJTM-80-SI-M10                 | PJG-80-SI                    | FTM-60-M10              |
| 80                | 1/4 NPT     | PJTM-80-NBR-N2                  | PJG-80-NBR                    | PJTM-80-SI-N2                  | PJG-80-SI                    | FTM-60-N2               |

Most popular.



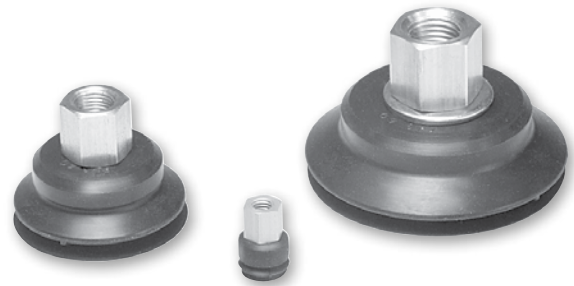
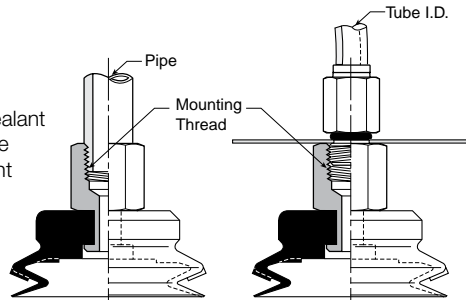
**C**  
 Vacuum Cups  
 Vacuum Products  
 PFG Series  
 PBG Series  
 P5V-CFS Series  
 PJG Series  
 PCG Series  
 PUGB Series

**PJTF Series Female Thread Connector**

Simple female connection for low profile positions secured to a plate or bracket. NPSF, G threads.  
 Fitting material: aluminum.

**Installation**

**Note:**  
 When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



| Cup diameter (mm) | Vacuum port | Complete assembly Nitrile (NBR) | Replacement cup Nitrile (NBR) | Complete assembly Silicon (SI) | Replacement cup Silicon (SI) | Replacement cup fitting |
|-------------------|-------------|---------------------------------|-------------------------------|--------------------------------|------------------------------|-------------------------|
| 6                 | M5          | <b>PJTF-6-NBR-M5</b>            | PJG-6-NBR                     | PJTF-6-SI-M5                   | PJG-6-SI                     | FTF-5A-M5               |
| 6                 | 1/8 BSPP    | <b>PJTF-6-NBR-G1</b>            | PJG-6-NBR                     | PJTF-6-SI-G1                   | PJG-6-SI                     | FTF-5A-G1               |
| 8                 | M5          | <b>PJTF-8-NBR-M5</b>            | PJG-8-NBR                     | PJTF--8-SI-M5                  | PJG-8-SI                     | FTF-5A-M5               |
| 8                 | 1/8 BSPP    | <b>PJTF-8-NBR-G1</b>            | PJG-8-NBR                     | PJTF--8-SI-G1                  | PJG-8-SI                     | FTF-5A-G1               |
| 10                | M5          | <b>PJTF-10-NBR-M5</b>           | PJG-10-NBR                    | PJTF-10-SI-M5                  | PJG-10-SI                    | FTF-5A-M5               |
| 10                | 1/8 BSPP    | <b>PJTF-10-NBR-G1</b>           | PJG-10-NBR                    | PJTF-10-SI-G1                  | PJG-10-SI                    | FTF-5A-G1               |
| 15                | M5          | <b>PJTF-15-NBR-M5</b>           | PJG-15-NBR                    | PJTF-15-SI-M5                  | PJG-15-SI                    | FTF-5A-M5               |
| 15                | 1/8 BSPP    | <b>PJTF-15-NBR-G1</b>           | PJG-15-NBR                    | PJTF-15-SI-G1                  | PJG-15-SI                    | FTF-5A-G1               |
| 30                | 1/8 BSPP    | <b>PJTF-30-NBR-G1</b>           | PJG-30-NBR                    | PJTF-30-SI-G1                  | PJG-30-SI                    | FTF-20B-G1              |
| 30                | 1/4 BSPP    | <b>PJTF-30-NBR-G2</b>           | PJG-30-NBR                    | PJTF-30-SI-G2                  | PJG-30-SI                    | FTF-20B-G2              |
| 40                | 1/8 BSPP    | <b>PJTF-40-NBR-G1</b>           | PJG-40-NBR                    | PJTF-40-SI-G1                  | PJG-40-SI                    | FTF-20B-G1              |
| 40                | 1/4 BSPP    | <b>PJTF-40-NBR-G2</b>           | PJG-40-NBR                    | PJTF-40-SI-G2                  | PJG-40-SI                    | FTF-20B-G2              |
| 50                | 1/8 BSPP    | <b>PJTF-50-NBR-G1</b>           | PJG-50-NBR                    | PJTF-50-SI-G1                  | PJG-50-SI                    | FTF-50-G1               |
| 50                | 1/4 BSPP    | <b>PJTF-50-NBR-G2</b>           | PJG-50-NBR                    | PJTF-50-SI-G2                  | PJG-50-SI                    | FTF-50-G2               |
| 60                | 1/4 BSPP    | <b>PJTF-60-NBR-G2</b>           | PJG-60-NBR                    | PJTF-60-SI-G2                  | PJG-60-SI                    | FTF-60-G2               |
| 60                | 1/4 NPT     | <b>PJTF-60-NBR-N2</b>           | PJG-60-NBR                    | PJTF-60-SI-N2                  | PJG-60-SI                    | FTF-60-N2               |
| 80                | 1/4 BSPP    | <b>PJTF-80-NBR-G2</b>           | PJG-80-NBR                    | PJTF-80-SI-G2                  | PJG-80-SI                    | FTF-60-G2               |
| 80                | 1/4 NPT     | <b>PJTF-80-NBR-N2</b>           | PJG-80-NBR                    | PJTF-80-SI-N2                  | PJG-80-SI                    | FTF-60-N2               |

☐ Most popular.

- C Vacuum Cups
- Vacuum Products
- PF Series
- PBG Series
- PSV-CFS Series
- PJG Series
- PCG Series
- PUGB Series



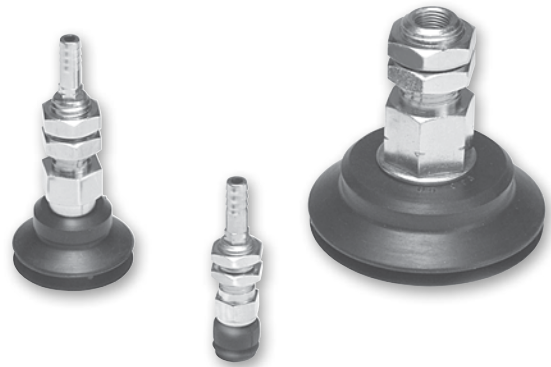
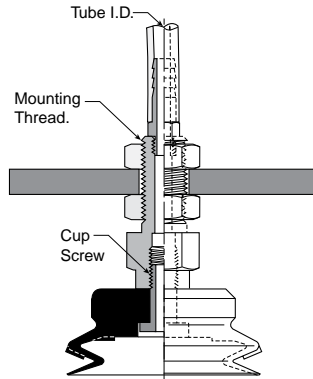
**PJTK Series Barbed Bulkhead**

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting materials: nickel plated brass.

**Installation**

**Note:**

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



| Cup diameter (mm) | Vacuum port | Complete assembly Nitrile (NBR) | Replacement cup Nitrile (NBR) | Complete assembly Silicon (SI) | Replacement cup Silicon (SI) | Replacement cup fitting |
|-------------------|-------------|---------------------------------|-------------------------------|--------------------------------|------------------------------|-------------------------|
| 6                 | Barb        | <b>PJTK-6-NBR</b>               | <b>PJG-6-NBR</b>              | <b>PJTK-6-SI</b>               | <b>PJG-6-SI</b>              | <b>FTK-5A</b>           |
| 8                 | Barb        | <b>PJTK-8-NBR</b>               | <b>PJG-8-NBR</b>              | <b>PJTK-8-SI</b>               | <b>PJG-8-SI</b>              | <b>FTK-5A</b>           |
| 10                | Barb        | <b>PJTK-10-NBR</b>              | <b>PJG-10-NBR</b>             | <b>PJTK-10-SI</b>              | <b>PJG-10-SI</b>             | <b>FTK-15</b>           |
| 15                | Barb        | <b>PJTK-15-NBR</b>              | <b>PJG-15-NBR</b>             | <b>PJTK-15-SI</b>              | <b>PJG-15-SI</b>             | <b>FTK-15</b>           |
| 20                | Barb        | <b>PJTK-20-NBR</b>              | <b>PJG-20-NBR</b>             | <b>PJTK-20-SI</b>              | <b>PJG-20-SI</b>             | <b>FTK-20</b>           |
| 30                | Barb        | <b>PJTK-30-NBR</b>              | <b>PJG-30-NBR</b>             | <b>PJTK-30-SI</b>              | <b>PJG-30-SI</b>             | <b>FTK-25</b>           |
| 40                | Barb        | <b>PJTK-40-NBR</b>              | <b>PJG-40-NBR</b>             | <b>PJTK-40-SI</b>              | <b>PJG-40-SI</b>             | <b>FTK-25</b>           |
| 50                | Barb        | <b>PJTK-50-NBR</b>              | <b>PJG-50-NBR</b>             | <b>PJTK-50-SI</b>              | <b>PJG-50-SI</b>             | <b>FTK-50</b>           |
| 60                | 1/8 BSPP    | <b>PJTK-60-NBR-G1</b>           | <b>PJG-60-NBR</b>             | <b>PJTK-60-SI-G1</b>           | <b>PJG-60-SI</b>             | <b>FTK-60-G1</b>        |
| 60                | 1/8 NPT     | <b>PJTK-60-NBR-N1</b>           | <b>PJG-60-NBR</b>             | <b>PJTK-60-SI-N1</b>           | <b>PJG-60-SI</b>             | <b>FTK-60-N1</b>        |
| 80                | 1/8 BSPP    | <b>PJTK-80-NBR-G1</b>           | <b>PJG-80-NBR</b>             | <b>PJTK-80-SI-G1</b>           | <b>PJG-80-SI</b>             | <b>FTK-60-G1</b>        |
| 80                | 1/8 NPT     | <b>PJTK-80-NBR-N1</b>           | <b>PJG-80-NBR</b>             | <b>PJTK-80-SI-N1</b>           | <b>PJG-80-SI</b>             | <b>FTK-60-N1</b>        |

Most popular.





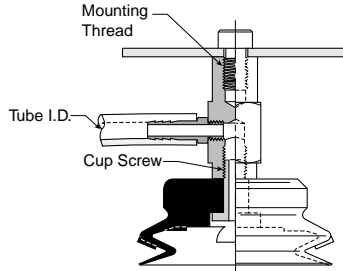
**PJYK Series 90° Barbed Adapter**

Side stem connectors allow you to secure the stem with a bolt through a plate or "L" bracket to allow the tube connection from the side port. Fitting materials: nickel plated brass.

**Installation**

**Note:**

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



| Cup diameter (mm) | Vacuum port | Complete assembly Nitrile (NBR) | Replacement cup Nitrile (NBR) | Complete assembly Silicon (SI) | Replacement cup Silicon (SI) | Replacement cup fitting |
|-------------------|-------------|---------------------------------|-------------------------------|--------------------------------|------------------------------|-------------------------|
| 6                 | Barb        | <b>PJYK-6-NBR</b>               | PJG-6-NBR                     | <b>PJYK-6-SI</b>               | PJG-6-SI                     | FYK-5A                  |
| 8                 | Barb        | <b>PJYK-8-NBR</b>               | PJG-8-NBR                     | <b>PJYK-8-SI</b>               | PJG-8-SI                     | FYK-5A                  |
| 10                | Barb        | <b>PJYK-10-NBR</b>              | PJG-10-NBR                    | <b>PJYK-10-SI</b>              | PJG-10-SI                    | FYK-15                  |
| 15                | Barb        | <b>PJYK-15-NBR</b>              | PJG-15-NBR                    | <b>PJYK-15-SI</b>              | PJG-15-SI                    | FYK-15                  |
| 20                | Barb        | <b>PJYK-20-NBR</b>              | PJG-20-NBR                    | <b>PJYK-20-SI</b>              | PJG-20-SI                    | FYK-20                  |
| 30                | Barb        | <b>PJYK-30-NBR</b>              | PJG-30-NBR                    | <b>PJYK-30-SI</b>              | PJG-30-SI                    | FYK-25                  |
| 40                | Barb        | <b>PJYK-40-NBR</b>              | PJG-40-NBR                    | <b>PJYK-40-SI</b>              | PJG-40-SI                    | FYK-25                  |
| 50                | Barb        | <b>PJYK-50-NBR</b>              | PJG-50-NBR                    | <b>PJYK-50-SI</b>              | PJG-50-SI                    | FYK-50                  |
| 60                | 1/8 BSPP    | <b>PJYK-60-NBR-G1</b>           | PJG-60-NBR                    | <b>PJYK-60-SI-G1</b>           | PJG-60-SI                    | FYK-60-G1               |
| 60                | 1/8 NPT     | <b>PJYK-60-NBR-N1</b>           | PJG-60-NBR                    | <b>PJYK-60-SI-N1</b>           | PJG-60-SI                    | FYK-60-N1               |
| 80                | 1/8 BSPP    | <b>PJYK-80-NBR-G1</b>           | PJG-80-NBR                    | <b>PJYK-80-SI-G1</b>           | PJG-80-SI                    | FYK-60-G1               |
| 80                | 1/8 NPT     | <b>PJYK-80-NBR-N1</b>           | PJG-80-NBR                    | <b>PJYK-80-SI-N1</b>           | PJG-80-SI                    | FYK-60-N1               |

Most popular.

- C**
- Vacuum Cups  
Vacuum Products
- PFG Series
- PBG Series
- PSV-CFS Series
- PJG Series
- PCG Series
- PUGB Series





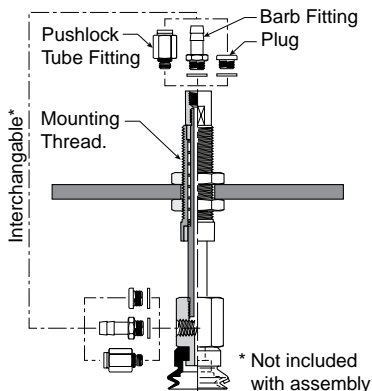
**PJTYS Series Bulkhead Level Compensator**

303 stainless steel construction secured with jam nuts. Spring biased compensators can absorb impacts of down-strokes and adjust for different levels of pick up points. 303 stainless corrosion resistant materials with drymet bushings increases the strength and life.

**Installation**

**Note:**

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage. Shown are interchangeable connectors & plugs for port connections.



| Cup dia. (mm) | Vacuum port | Stroke (mm) | Spring compression Force lbf (N) |            | Cup material Nitrile assembly (NBR) | Replacement cup Nitrile (NBR) | Cup material Silicon assembly (SI) | Replacement cup Silicon (SI) | Level Compensator P/N |
|---------------|-------------|-------------|----------------------------------|------------|-------------------------------------|-------------------------------|------------------------------------|------------------------------|-----------------------|
|               |             |             | 0%                               | 100%       |                                     |                               |                                    |                              |                       |
| 10            | M5          | 10          | .56 (2.5)                        | 1.2 (4.9)  | PJTYS1010NBRM5                      | PJG-10-NBR                    | PJTYS1010SIM5                      | PJG-10-SI                    | JTYS-10-10            |
| 10            | M5          | 15          | .67 (2.5)                        | 1.4 (5.9)  | PJTYS1015NBRM5                      | PJG-10-NBR                    | PJTYS1015SIM5                      | PJG-10-SI                    | JTYS-10-15            |
| 15            | M5          | 10          | .56 (2.5)                        | 1.2 (4.9)  | PJTYS15A10NBRM5                     | PJG-15A-NBR                   | PJTYS15A10SIM5                     | PJG-15A-SI                   | JTYS-10-10            |
| 15            | M5          | 15          | .67 (2.5)                        | 1.4 (5.9)  | PJTYS15A15NBRM5                     | PJG-15A-NBR                   | PJTYS15A15SIM5                     | PJG-15A-SI                   | JTYS-10-15            |
| 30            | M5          | 15          | .56 (2.5)                        | .79 (3.4)  | PJTYS3015NBRM5                      | PJG-30-NBR                    | PJTYS3015SIM5                      | PJG-30-SI                    | TYS-20B-15            |
| 30            | M5          | 30          | .67 (2.9)                        | 1.4 (5.9)  | PJTYS3030NBRM5                      | PJG-30-NBR                    | PJTYS3030SIM5                      | PJG-30-SI                    | TYS-20B-30            |
| 40            | M5          | 15          | .56 (2.5)                        | .79 (3.4)  | PJTYS4015NBRM5                      | PJG-40-NBR                    | PJTYS4015SIM5                      | PJG-40-SI                    | TYS-20B-15            |
| 40            | M5          | 30          | .67 (2.9)                        | 1.4 (5.9)  | PJTYS4030NBRM5                      | PJG-40-NBR                    | PJTYS4030SIM5                      | PJG-40-SI                    | TYS-20B-30            |
| 50            | M5          | 15          | .56 (.25)                        | 1.2 (4.9)  | PJTYS5015NBRM5                      | PJG-50-NBR                    | PJTYS5015SIM5                      | PJG-50-SI                    | TYS-50-15             |
| 50            | M5          | 30          | .67 (2.9)                        | 1.4 (5.9)  | PJTYS5030NBRM5                      | PJG-50-NBR                    | PJTYS5030SIM5                      | PJG-50-SI                    | TYS-50-30             |
| 60            | 1/8 NPT     | 30          | 1.6 (6.8)                        | 3.6 (15.6) | PJTYS6030NBRN1                      | PJG-60-NBR                    | PJTYS6030SIN1                      | PJG-60-SI                    | TYS-60-30             |
| 60            | 1/8 NPT     | 50          | 1.9 (8.3)                        | 4.5 (19.6) | PJTYS6050NBRN1                      | PJG-60-NBR                    | PJTYS6050SIN1                      | PJG-60-SI                    | TYS-60-50             |
| 80            | 1/8 NPT     | 30          | 1.6 (6.8)                        | 3.6 (15.6) | PJTYS8030NBRN1                      | PJG-80-NBR                    | PJTYS8030SIN1                      | PJG-80-SI                    | TYS-60-30             |
| 80            | 1/8 NPT     | 50          | 1.9 (8.3)                        | 4.5 (19.6) | PJTYS8050NBRN1                      | PJG-80-NBR                    | PJTYS8050SIN1                      | PJG-80-SI                    | TYS-60-50             |

☐ Most popular.



**C**

Vacuum Cups  
Vacuum Products

PFG Series

PBG Series

P5V-CFS Series

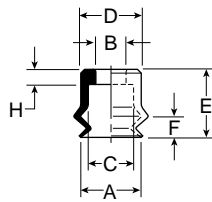
PJG Series

PCG Series

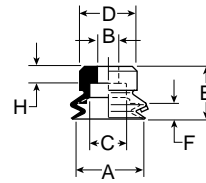
PUGB Series

**PJG Series Replacement Cup Dimensions**

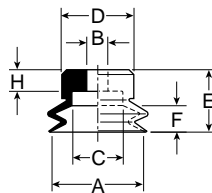
**PJG-6 and  
 PJG-8**



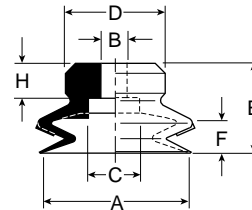
**PJG-10 and  
 PJG-15**



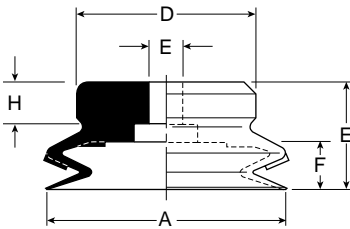
**PJG-20**



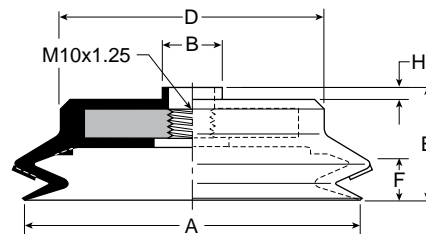
**PJG-30 thru  
 PJG-40**



**PJG-50**



**PJG-60 thru  
 PJG-80**



**C**  
 Vacuum Cups  
 Vacuum Products

Series  
 PFG  
 PBG  
 PSV-CFS  
 PJG  
 PCG  
 PUGB

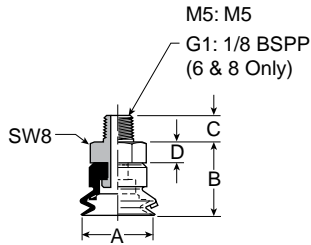
| Model number | ØA        | ØB         | ØC         | ØD        | E          | F         | H         |
|--------------|-----------|------------|------------|-----------|------------|-----------|-----------|
| PJG-6-*      | .24 (6)   | .16 (4)    | .24 (6)    | .30 (7.5) | .35 (9)    | .17 (4.2) | .08 (2)   |
| PJG-8-*      | .31 (8)   | .16 (4)    | .24 (6)    | .31 (8)   | .35 (9)    | .16 (4)   | .08 (2)   |
| PJG-10-*     | .39 (10)  | .18 (4.6)  | .31 (7.8)  | .43 (11)  | .37 (9.5)  | .12 (3)   | .14 (3.5) |
| PJG-15-*     | .59 (15)  | .18 (4.6)  | .31 (7.8)  | .47 (12)  | .43 (11)   | .13 (3.3) | .14 (3.5) |
| PJG-20-*     | .79 (20)  | .18 (4.6)  | .43 (10.8) | .59 (15)  | .51 (13)   | .22 (5.5) | .18 (4.5) |
| PJG-30-*     | 1.18 (30) | .23 (5.8)  | .43 (10.8) | .78 (20)  | .71 (18)   | .28 (7)   | .28 (7)   |
| PJG-35-*     | 1.38 (35) | .23 (5.8)  | .43 (10.8) | .98 (25)  | .71 (18)   | .28 (7)   | .28 (7)   |
| PJG-40-*     | 1.57 (40) | .23 (5.8)  | .43 (10.8) | 1.18 (30) | .71 (18)   | .28 (7.2) | .28 (7)   |
| PJG-50-*     | 1.97 (50) | .31 (7.8)  | .78 (19.8) | 1.57 (40) | .79 (20)   | .35 (9)   | .28 (7)   |
| PJG-60-*     | 2.36 (60) | .49 (12.5) | —          | 1.77 (45) | .89 (22.5) | .31 (8)   | .10 (2.5) |
| PJG-70-*     | 2.75 (70) | .49 (12.5) | —          | 2.17 (55) | .93 (23.5) | .37 (9.5) | .10 (2.5) |
| PJG-80-*     | 3.15 (80) | .49 (12.5) | —          | 2.68 (68) | .93 (23.5) | .37 (9.5) | .10 (2.5) |

Inches (mm)  
 \* Cup material

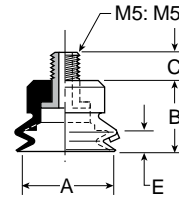


**Dimensions**

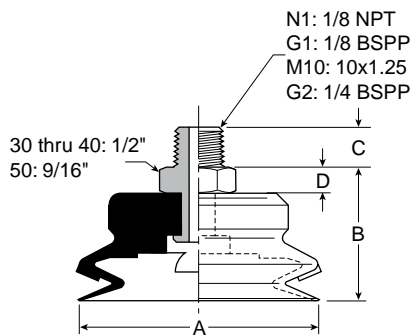
**PJTM-6 and  
 PJTM-8**



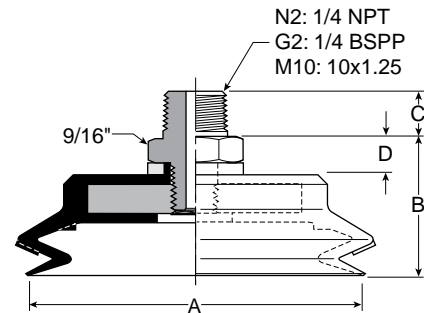
**PJTM-10 thru  
 PJTM-20**



**PJTM-30 thru  
 PJTM-50**



**PJTM-60 thru  
 PJTM-80**



| Model number | ØA        | B          | C (M5)    | C (N1 / G1) | C (M10 / G2) | C (N2)   | D         |
|--------------|-----------|------------|-----------|-------------|--------------|----------|-----------|
| PJTM-6-*†    | .24 (6)   | .49 (12.5) | .18 (4.5) | .31 (8)     | —            | —        | .14 (3.5) |
| PJTM-8-*†    | .31 (8)   | .49 (12.5) | .18 (4.5) | .31 (8)     | —            | —        | .14 (3.5) |
| PJTM-10-*†   | .39 (10)  | .37 (9.5)  | .20 (5)   | —           | —            | —        | —         |
| PJTM-15-*†   | .59 (15)  | .43 (11)   | .20 (5)   | —           | —            | —        | —         |
| PJTM-20-*†   | .79 (20)  | .51 (13)   | .20 (5)   | —           | —            | —        | —         |
| PJTM-30-*†   | 1.18 (30) | .91 (23)   | —         | .31 (8)     | .39 (10)     | —        | .20 (5)   |
| PJTM-40-*†   | 1.57 (40) | .91 (23)   | —         | .31 (8)     | .39 (10)     | —        | .20 (5)   |
| PJTM-50-*†   | 1.97 (50) | .98 (25)   | —         | .31 (8)     | .39 (10)     | —        | .20 (5)   |
| PJTM-60-*†   | 2.36 (60) | 1.06 (27)  | —         | —           | .39 (10)     | .59 (15) | .28 (7)   |
| PJTM-80-*†   | 3.15 (80) | 1.10 (28)  | —         | —           | .39 (10)     | .59 (15) | .28 (7)   |

Inches (mm)  
 \* Cup material  
 † Thread size

**C**

Vacuum Cups  
 Vacuum Products

PFG Series

PBG Series

P5V-CFS Series

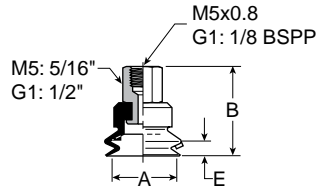
PJG Series

PCG Series

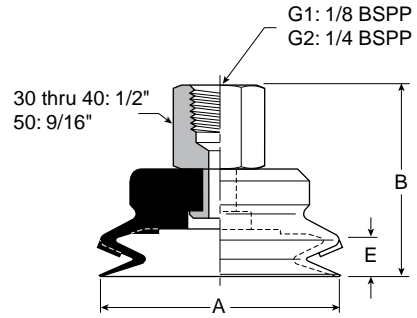
PUGB Series

**Dimensions**

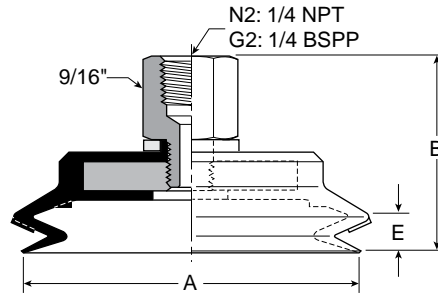
**PJTF-6 and  
 PJTF-8**



**PJTF-30 thru  
 PJTF-50**



**PJTF-60 thru  
 PJTF-80**



| Model number | ØA        | B           | B (M5)   | E         |
|--------------|-----------|-------------|----------|-----------|
| PJTF-6-*†    | .24 (6)   | .79 (20)    | .55 (14) | .16 (4)   |
| PJTF-8-*†    | .31 (8)   | .79 (20)    | .55 (14) | .16 (4)   |
| PJTF-10-*†   | .39 (10)  | .79 (20)    | .55 (14) | .12 (3)   |
| PJTF-15-*†   | .59 (15)  | .79 (20)    | .55 (14) | .13 (3.3) |
| PJTF-30-*†   | 1.18 (30) | 1.25 (32)   | —        | .28 (7)   |
| PJTF-40-*†   | 1.57 (40) | 1.25(32)    | —        | .28 (7.2) |
| PJTF-50-*†   | 1.97 (50) | 1.34 (34)   | —        | .35 (9)   |
| PJTF-60-*†   | 2.36 (60) | 1.56 (39.5) | —        | .31 (8)   |
| PJTF-80-*†   | 3.15 (80) | 1.59 (40.5) | —        | .37 (9.5) |

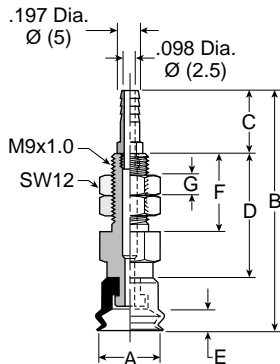
Inches (mm)  
 \* Cup material  
 † Thread size

**C**  
 Vacuum Cups  
 Vacuum Products

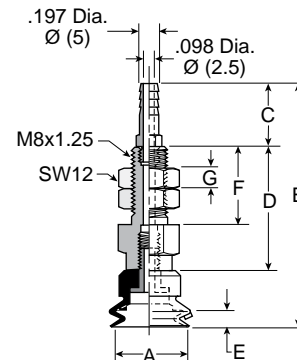
Series  
 PFG  
 PBG  
 PSV-CFS  
 PJG  
 PCG  
 PUGB

**Dimensions**

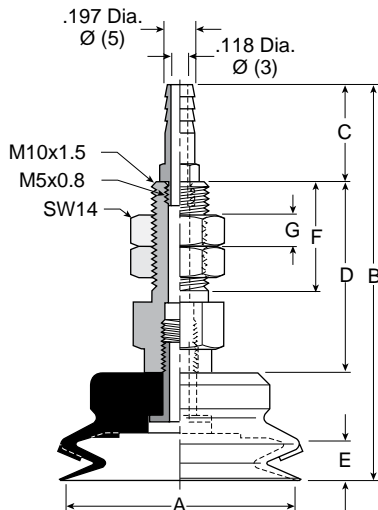
**PJTK-6 and  
 PJTK-8**



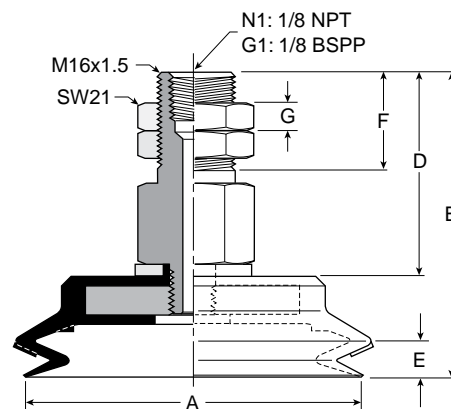
**PJTK-10 thru  
 PJTK-20**



**PJTK-30 thru  
 PJTK-50**



**PJTK-60 thru  
 PJTK-80**



| Model number | ØA        | B           | C        | D           | E         | F        | G       | Wt oz (g) |
|--------------|-----------|-------------|----------|-------------|-----------|----------|---------|-----------|
| PJTK-6-*     | .24 (6)   | 1.30 (33)   | .39 (10) | .55 (14)    | .17 (4.2) | .47 (12) | .12 (3) | .4 (11)   |
| PJTK-8-*     | .31 (8)   | 1.30 (33)   | .39 (10) | .55 (14)    | .16 (4)   | .47 (12) | .12 (3) | .4 (11)   |
| PJTK-10-*    | .39 (10)  | 1.87 (47.5) | .63 (16) | .87 (22)    | .12 (3)   | .59 (15) | .12 (3) | .5 (14)   |
| PJTK-15-*    | .59 (15)  | 1.93 (49)   | .63 (16) | .87 (22)    | .13 (3.3) | .59 (15) | .12 (3) | .5 (15)   |
| PJTK-20-*    | .79 (20)  | 2.01 (51)   | .63 (16) | .87 (22)    | .22 (5.5) | .59 (15) | .20 (5) | .6 (17)   |
| PJTK-30-*    | 1.18 (30) | 2.60 (66)   | .63 (16) | 1.26 (32)   | .28 (7)   | .79 (20) | .20 (5) | 1.5 (42)  |
| PJTK-40-*    | 1.57 (40) | 2.60 (66)   | .63 (16) | 1.26 (32)   | .28 (7.2) | .79 (20) | .20 (5) | 1.6 (44)  |
| PJTK-50-*    | 1.97 (50) | 2.68 (68)   | .63 (16) | 1.26 (32)   | .35 (9)   | .79 (20) | .20 (5) | 25.0 (58) |
| PJTK-60-*-†  | 2.36 (60) | 2.46 (62.5) | —        | 1.67 (42.5) | .31 (8)   | .79 (20) | .24 (6) | 5.1 (144) |
| PJTK-80-*-†  | 3.15 (80) | 2.50 (63.5) | —        | 1.67 (42.5) | .37 (9.5) | .79 (20) | .24 (6) | 6.7 (190) |

Inches (mm)  
 \* Cup material  
 † Vacuum port

**C**

Vacuum Cups  
 Vacuum Products

PFG Series

PBG Series

P5V-CFS Series

PJG Series

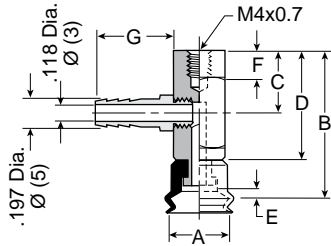
PCG Series

PUGB Series

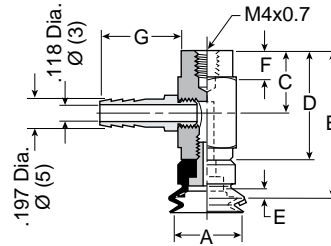


**Dimensions**

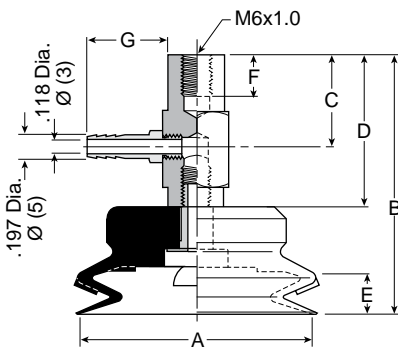
**PJK-6 and  
PJK-8**



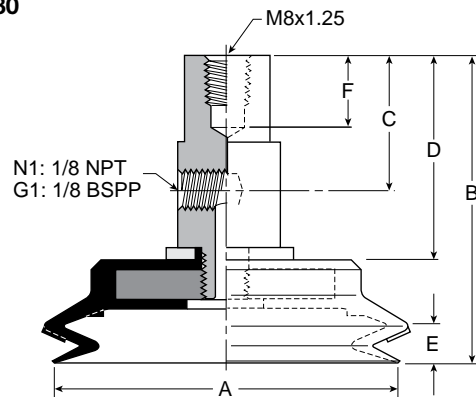
**PJK-10 thru  
PJK-20**



**PJK-25 thru  
PJK-50**



**PJK-60 thru  
PJK-80**



| Model number | ØA        | B           | C         | D           | E         | F        | G        | Wt oz (g) |
|--------------|-----------|-------------|-----------|-------------|-----------|----------|----------|-----------|
| PJK-6-*      | .24 (6)   | 1.24 (31.5) | .51 (13)  | .89 (22.5)  | .17 (4.2) | .24 (6)  | .63 (16) | .56 (16)  |
| PJK-8-*      | .31 (8)   | 1.24 (31.5) | .51 (13)  | .89 (22.5)  | .17 (4.2) | .24 (6)  | .63 (16) | .56 (16)  |
| PJK-10-*     | .39 (10)  | 1.24 (31.5) | .55 (14)  | .87 (22)    | .12 (3)   | .24 (6)  | .63 (16) | .59 (17)  |
| PJK-15-*     | .59 (15)  | 1.30 (33)   | .55 (14)  | .87 (22)    | .13 (3.3) | .24 (6)  | .63 (16) | .63 (18)  |
| PJK-20-*     | .79 (20)  | 1.38 (35)   | .55 (14)  | .87 (22)    | .22 (5.5) | .24 (6)  | .63 (16) | .7 (20)   |
| PJK-30-*     | 1.18 (30) | 1.97 (50)   | .79 (20)  | 1.26 (32)   | .28 (7)   | .31 (8)  | .63 (16) | 1.6 (46)  |
| PJK-40-*     | 1.57 (40) | 1.97 (50)   | .79 (20)  | 1.26 (32)   | .28 (7.2) | .31 (8)  | .63 (16) | 1.7 (48)  |
| PJK-50-*     | 1.97 (50) | 2.05 (52)   | .79 (20)  | 1.26 (32)   | .35 (9)   | .31 (8)  | .63 (16) | 2.2 (62)  |
| PJK-60-*-†   | 2.36 (60) | 2.46 (62.5) | 1.10 (28) | 1.67 (42.5) | .31 (8)   | .43 (11) | —        | 4.9 (139) |
| PJK-80-*-†   | 3.15 (80) | 2.50 (63.5) | 1.10 (28) | 1.67 (42.5) | .37 (9.5) | .43 (11) | —        | 6.5 (185) |

Inches (mm)  
\* Cup material  
† Vacuum port

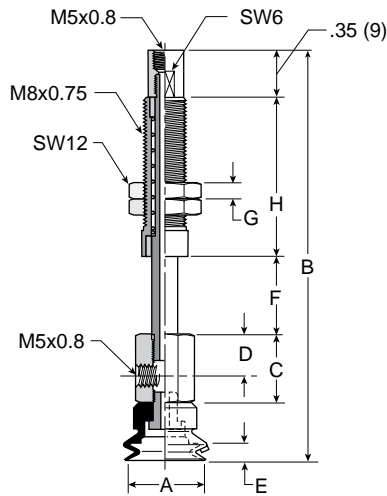
**C**  
**Vacuum Cups**  
**Vacuum Products**

Series  
**PF**G  
**PB**G  
**PSV-CFS**  
**PJ**G  
**PC**G  
**PUG**B

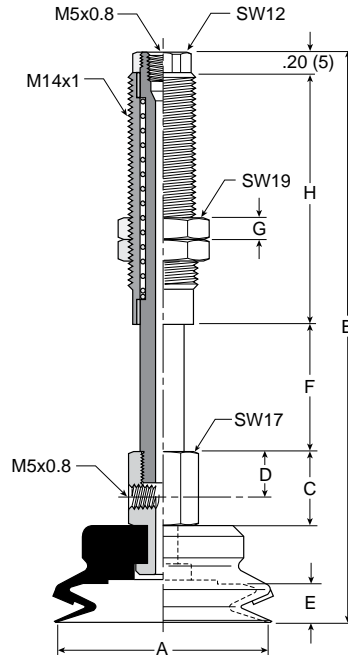


**Dimensions**

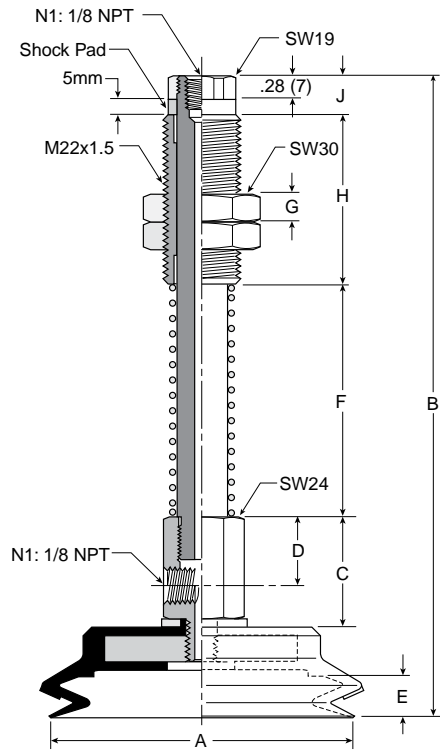
**PJTYS10 thru  
PJTYS20**



**PJTYS30 thru  
PJTYS50**



**PJTYS60 thru  
PJTYS80**



| Model number | ØA        | B           | C         | D        | E         | F         | G        | H           | J        | Wt oz (g)   |
|--------------|-----------|-------------|-----------|----------|-----------|-----------|----------|-------------|----------|-------------|
| PJTYS1010*†  | .39 (10)  | 2.52 (64)   | .51 (13)  | .31 (8)  | .12 (3)   | .39 (10)  | .20 (5)  | .91 (23)    | —        | 1.1 (31)    |
| PJTYS1015*†  | .39 (10)  | 3.01 (76.5) | .51 (13)  | .31 (8)  | .12 (3)   | .59 (15)  | .20 (5)  | 1.20 (30.5) | —        | 1.2 (33.5)  |
| PJTYS1510*†  | .59 (15)  | 2.60 (66)   | .51 (13)  | .31 (8)  | .13 (3.3) | .39 (10)  | .20 (5)  | .91 (23)    | —        | 1.1 (32)    |
| PJTYS1515*†  | .59 (15)  | 3.07 (78)   | .51 (13)  | .31 (8)  | .13 (3.3) | .59 (15)  | .20 (5)  | 1.20 (30.5) | —        | 1.3 (34.5)  |
| PJTYS2010*†  | .79 (20)  | 2.83 (72)   | .51 (13)  | .31 (8)  | .22 (5.5) | .39 (10)  | .20 (5)  | .91 (23)    | —        | 1.1 (32)    |
| PJTYS2015*†  | .79 (20)  | 4.29 (109)  | .51 (13)  | .31 (8)  | .22 (5.5) | .59 (15)  | .20 (5)  | 1.20 (30.5) | —        | 1.3 (34.5)  |
| PJTYS3015*†  | 1.18 (30) | 3.58 (91)   | .67 (17)  | .39 (10) | .28 (7)   | .59 (15)  | .20 (5)  | 1.42 (36)   | —        | 2.6 (74)    |
| PJTYS3030*†  | 1.18 (30) | 5.04 (128)  | .67 (17)  | .39 (10) | .28 (7)   | 1.18 (30) | .20 (5)  | 2.28 (58)   | —        | 3.5 (99)    |
| PJTYS3515*†  | 1.38 (35) | 3.58 (91)   | .67 (17)  | .39 (10) | .28 (7)   | .59 (15)  | .20 (5)  | 1.42 (36)   | —        | 2.7 (76.5)  |
| PJTYS3530*†  | 1.38 (35) | 5.04 (128)  | .67 (17)  | .39 (10) | .28 (7)   | 1.18 (30) | .20 (5)  | 2.28 (58)   | —        | 3.6 (101.5) |
| PJTYS4015*†  | 1.57 (40) | 3.58 (91)   | .67 (17)  | .39 (10) | .28 (7.2) | .59 (15)  | .20 (5)  | 1.42 (36)   | —        | 2.8 (78.5)  |
| PJTYS4030*†  | 1.57 (40) | 5.04 (128)  | .67 (17)  | .39 (10) | .28 (7.2) | 1.18 (30) | .20 (5)  | 2.28 (58)   | —        | 3.7 (103.5) |
| PJTYS5015*†  | 1.97 (50) | 3.66 (93)   | .67 (17)  | .39 (10) | .35 (9)   | .59 (15)  | .20 (5)  | 1.42 (36)   | —        | 3.3 (94)    |
| PJTYS5030*†  | 1.97 (50) | 5.12 (130)  | .67 (17)  | .39 (10) | .35 (9)   | 1.18 (30) | .20 (5)  | 2.28 (58)   | —        | 4.2 (119)   |
| PJTYS6030*†  | 2.36 (60) | 6.18 (157)  | 1.18 (30) | .79 (20) | .31 (8)   | 1.18 (45) | .39 (10) | 1.97 (50)   | .47 (12) | 10.4 (294)  |
| PJTYS6050*†  | 2.36 (60) | 7.17 (182)  | 1.18 (30) | .79 (20) | .31 (8)   | 2.76 (70) | .39 (10) | 1.97 (50)   | .47 (12) | 11.6 (328)  |
| PJTYS8030*†  | 3.15 (80) | 6.22 (158)  | 1.18 (30) | .79 (20) | .37 (9.5) | 1.18 (45) | .39 (10) | 1.97 (50)   | .47 (12) | 11.9 (338)  |
| PJTYS8050*†  | 3.15 (80) | 7.20 (183)  | 1.18 (30) | .79 (20) | .37 (9.5) | 2.76 (70) | .39 (10) | 1.97 (50)   | .47 (12) | 13.1 (372)  |

Inches (mm)  
\* Cup material  
† Vacuum port

**C**

Vacuum Cups  
Vacuum Products

PFG Series

PBG Series

P5V-CFS Series

PJG Series

PCG Series

PUGB Series



2-1/2 bellows design minimizes contact pressure applied to the product. The soft seal lip and touch allows the cup to conform to the product's surface to make a vacuum seal.

These multiple bellow cups are designed for applications that require additional level compensation, more flexibility, or minimum back pressure for a "soft touch". The multiple bellow has a soft sealing edge good for a variety of sensitive applications; such as food packaging, CD / DVD, medical packaging, and highly irregular curved surfaces. Cups can also be used to assist with sheet separation in destack operations.



**Features**

- Soft touch
- Extra level compensation
- Flexible sealing lip for irregular curved surfaces
- 5mm to 90mm in diameter

**Styles**

- PCTM series male thread connector
- PCTF series female thread Connector
- PCTK series barbed bulkhead

**Specifications**

| Cup material               | Nitrile       | Nitrile ESD*     | Silicon       | Silicon ESD*    | Urethane     |
|----------------------------|---------------|------------------|---------------|-----------------|--------------|
| Material code              | NBR           | NBRE             | SI            | SIE             | U            |
| Operating temperature (°C) | -20° to +120° | 0° to +60°       | -60° to +250° | -10° to +130°   | -20° to +75° |
| Color                      | Black         | Black / Blue Dot | White         | Black / Red Dot | Blue         |
| Hardness, shore A (°Sh)    | 55 ±5         | 70 ±5            | 55 ±5         | 55 ±5           | 55 ±5        |
| Electrical resistance (Ωm) | —             | 800 to 1000      | —             | 5 to 15         | —            |

\* ESD: Electric Static Dissipative Material

**How to order**

Cups assemblies and replacement cups are specified by cup diameter and material. Standard nitrile and silicon are listed on the following pages. To specify an alternative material, replace the cup material with alternative cup material code.

**Example:** To specify a cup assembly with urethane (U), replace (NBR) with (U) in the part number. PCTM-20B-NBR-G1 becomes PCTM-20B-U-G1. Inquire with factory for availability.

**Application guide**

**2-1/2 Bellows**

|                           |                             |                                     |                            |               |                      |                           |                                   |                       |
|---------------------------|-----------------------------|-------------------------------------|----------------------------|---------------|----------------------|---------------------------|-----------------------------------|-----------------------|
|                           |                             |                                     |                            |               |                      |                           |                                   |                       |
| Flat surface, any section | Bowed surface, thin section | Slightly bowed surface, any section | Bowed surface, any section | Soft material | Metal sheet handling | Corrugated sheet handling | Differences in heights and levels | Not for vertical lift |



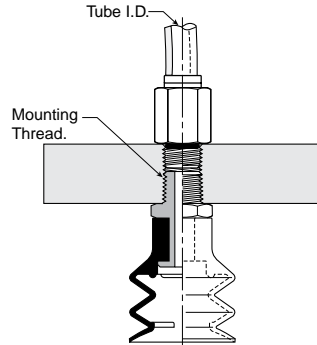
**PCTM Series Male Thread Connector**

Simple male connection for low profile positions secured to a plate or bracket. NPT, G, metric threads.  
 Fitting material: aluminum.

**Installation**

**Note:**

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



| Cup diameter (mm) | Vacuum port | Complete assembly Nitrile (NBR) | Replacement cup Nitrile (NBR) | Complete assembly Silicon (SI) | Replacement cup Silicon (SI) | Replacement cup fitting |
|-------------------|-------------|---------------------------------|-------------------------------|--------------------------------|------------------------------|-------------------------|
| 5                 | M5          | <b>PCTM-5-NBR-M5</b>            | PCG-5-NBR                     | <b>PCTM-5-SI-M5</b>            | PCG-5-SI                     | FTM-5A-M5H              |
| 7                 | M5          | <b>PCTM-7-NBR-M5</b>            | PCG-7-NBR                     | <b>PCTM-7-SI-M5</b>            | PCG-7-SI                     | FTM-5A-M5H              |
| 10                | M5          | <b>PCTM-10-NBR-M5</b>           | PCG-10-NBR                    | <b>PCTM-10-SI-M5</b>           | PCG-10-SI                    | CTM-10-M5H              |
| 10                | G1          | <b>PCTM-10-NBR-G1</b>           | PCG-10-NBR                    | <b>PCTM-10-SI-G1</b>           | PCG-10-SI                    | CTM-10-G1H              |
| 15                | M5          | <b>PCTM-15-NBR-M5</b>           | PCG-15-NBR                    | <b>PCTM-15-SI-M5</b>           | PCG-15-SI                    | CTM-10-M5H              |
| 15                | G1          | <b>PCTM-15-NBR-G1</b>           | PCG-15-NBR                    | <b>PCTM-15-SI-G1</b>           | PCG-15-SI                    | CTM-10-G1H              |
| 20                | M5          | <b>PCTM-20-NBR-M5</b>           | PCG-20-NBR                    | <b>PCTM-20-SI-M5</b>           | PCG-20-SI                    | CTM-10-M5H              |
| 20                | G1          | <b>PCTM-20-NBR-G1</b>           | PCG-20-NBR                    | <b>PCTM-20-SI-G1</b>           | PCG-20-SI                    | CTM-10-G1H              |
| 30                | G1          | <b>PCTM-30-NBR-G1</b>           | PCG-30-NBR                    | <b>PCTM-30-SI-G1</b>           | PCG-30-SI                    | CTM-30-G1H              |
| 30                | G2          | <b>PCTM-30-NBR-G2</b>           | PCG-30-NBR                    | <b>PCTM-30-SI-G2</b>           | PCG-30-SI                    | CTM-30-G2               |
| 30                | N1          | <b>PCTM-30-NBR-N1</b>           | PCG-30-NBR                    | <b>PCTM-30-SI-N1</b>           | PCG-30-SI                    | CTM-30-N1               |
| 40                | G1          | <b>PCTM-40-NBR-G1</b>           | PCG-40-NBR                    | <b>PCTM-40-SI-G1</b>           | PCG-40-SI                    | CTM-30-G1H              |
| 40                | G2          | <b>PCTM-40-NBR-G2</b>           | PCG-40-NBR                    | <b>PCTM-40-SI-G2</b>           | PCG-40-SI                    | CTM-30-G2               |
| 40                | N1          | <b>PCTM-40-NBR-N1</b>           | PCG-40-NBR                    | <b>PCTM-40-SI-N1</b>           | PCG-40-SI                    | CTM-30-N1               |
| 60                | G1          | <b>PCTM-60-NBR-G1</b>           | PCG-60-NBR                    | <b>PCTM-60-SI-G1</b>           | PCG-60-SI                    | CTM-30-G1H              |
| 60                | N1          | <b>PCTM-60-NBR-N1</b>           | PCG-60-NBR                    | <b>PCTM-60-SI-N1</b>           | PCG-60-SI                    | CTM-30-N1               |
| 90                | G2          | <b>PCTM-90-NBR-G2</b>           | PCG-90-NBR                    | <b>PCTM-90-SI-G2</b>           | PCG-90-SI                    | CTM-90-G2               |
| 90                | N2          | <b>PCTM-90-NBR-N2</b>           | PCG-90-NBR                    | <b>PCTM-90-SI-N2</b>           | PCG-90-SI                    | CTM-90-N2               |

Most popular.

**C**  
 Vacuum Cups  
 Vacuum Products  
 PFG Series  
 PBG Series  
 P5V-CFS Series  
 PJG Series  
 PCG Series  
 PUGB Series



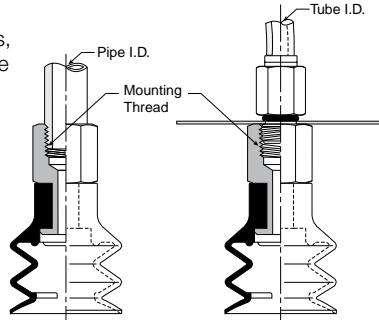
**PCTF Series Female Thread Connector**

Simple female connection for low profile positions secured to a plate or bracket. NPSF, G threads.  
 Fitting material: aluminum.

**Installation**

**Note:**

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



| Cup diameter (mm) | Vacuum port | Complete assembly Nitrile (NBR) | Replacement cup Nitrile (NBR) | Complete assembly Silicon (SI) | Replacement cup Silicon (SI) | Replacement cup fitting |
|-------------------|-------------|---------------------------------|-------------------------------|--------------------------------|------------------------------|-------------------------|
| 5                 | M5          | <b>PCTF-5-NBR-M5</b>            | <b>PCG-5-NBR</b>              | <b>PCTF-5-SI-M5</b>            | <b>PCG-5-SI</b>              | <b>FTF-5A-M5</b>        |
| 7                 | M5          | <b>PCTF-7-NBR-M5</b>            | <b>PCG-7-NBR</b>              | <b>PCTF-7-SI-M5</b>            | <b>PCG-7-SI</b>              | <b>FTF-5A-M5</b>        |
| 10                | 1/8 BSPP    | <b>PCTF-10-NBR-G1</b>           | <b>PCG-10-NBR</b>             | <b>PCTF-10-SI-G1</b>           | <b>PCG-10-SI</b>             | <b>CTF-10-G1</b>        |
| 15                | 1/8 BSPP    | <b>PCTF-15-NBR-G1</b>           | <b>PCG-15-NBR</b>             | <b>PCTF-15-SI-G1</b>           | <b>PCG-15-SI</b>             | <b>CTF-10-G1</b>        |
| 20                | 1/8 BSPP    | <b>PCTF-20-NBR-G1</b>           | <b>PCG-20-NBR</b>             | <b>PCTF-20-SI-G1</b>           | <b>PCG-20-SI</b>             | <b>CTF-10-G1</b>        |
| 30                | 1/8 BSPP    | <b>PCTF-30-NBR-G1</b>           | <b>PCG-30-NBR</b>             | <b>PCTF-30-SI-G1</b>           | <b>PCG-30-SI</b>             | <b>CTF-30-G1</b>        |
| 30                | 1/8 NPT     | <b>PCTF-30-NBR-N1</b>           | <b>PCG-30-NBR</b>             | <b>PCTF-30-SI-N1</b>           | <b>PCG-30-SI</b>             | <b>CTF-30-N1</b>        |
| 40                | 1/8 BSPP    | <b>PCTF-40-NBR-G1</b>           | <b>PCG-40-NBR</b>             | <b>PCTF-40-SI-G1</b>           | <b>PCG-40-SI</b>             | <b>CTF-30-G1</b>        |
| 40                | 1/8 NPT     | <b>PCTF-40-NBR-N1</b>           | <b>PCG-40-NBR</b>             | <b>PCTF-40-SI-N1</b>           | <b>PCG-40-SI</b>             | <b>CTF-30-N1</b>        |
| 60                | 1/8 NPT     | <b>PCTF-60-NBR-N1</b>           | <b>PCG-60-NBR</b>             | <b>PCTF-60-SI-N1</b>           | <b>PCG-60-SI</b>             | <b>CTF-30-G1</b>        |
| 60                | 1/4 NPT     | <b>PCTF-60-NBR-N1</b>           | <b>PCG-60-NBR</b>             | <b>PCTF-60-SI-N1</b>           | <b>PCG-60-SI</b>             | <b>CTF-30-N1</b>        |
| 90                | 1/4 BSPP    | <b>PCTF-90-NBR-G2</b>           | <b>PCG-90-NBR</b>             | <b>PCTF-90-SI-G2</b>           | <b>PCG-90-SI</b>             | <b>CTF-90-G2</b>        |
| 90                | 1/4 NPT     | <b>PCTF-90-NBR-N2</b>           | <b>PCG-90-NBR</b>             | <b>PCTF-90-SI-N2</b>           | <b>PCG-90-SI</b>             | <b>CTF-90-N2</b>        |

Most popular.

**C**  
 Vacuum Cups  
 Vacuum Products  
 PFG Series  
 PBG Series  
 PSV-CFS Series  
 PJG Series  
 PCG Series  
 PUGB Series

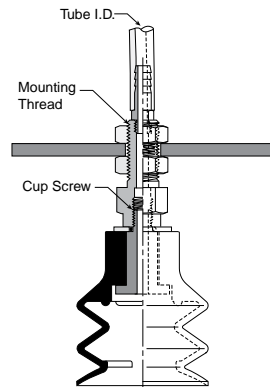


**PCTK Series Barbed Bulkhead**

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting material: Nickel plated brass.

**Installation**

**Note:**  
 When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



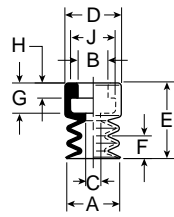
| Cup diameter (mm) | Vacuum port | Complete assembly Nitrile (NBR) | Replacement cup Nitrile (NBR) | Complete assembly Silicon (SI) | Replacement cup Silicon (SI) | Replacement cup fitting |
|-------------------|-------------|---------------------------------|-------------------------------|--------------------------------|------------------------------|-------------------------|
| 5                 | Barb        | <b>PCTK-5-NBR</b>               | PCG-5-NBR                     | PCTK-5-SI                      | PCG-5-SI                     | FTK-5A                  |
| 7                 | Barb        | <b>PCTK-7-NBR</b>               | PCG-7-NBR                     | PCTK-7-SI                      | PCG-7-SI                     | FTK-5A                  |
| 10                | Barb        | <b>PCTK-10-NBR</b>              | PCG-10-NBR                    | PCTK-10-SI                     | PCG-10-SI                    | CTK-10                  |
| 15                | Barb        | <b>PCTK-15-NBR</b>              | PCG-15-NBR                    | PCTK-15-SI                     | PCG-15-SI                    | CTK-10                  |
| 20                | Barb        | <b>PCTK-20-NBR</b>              | PCG-20-NBR                    | PCTK-20-SI                     | PCG-20-SI                    | CTK-10                  |
| 30                | Barb        | <b>PCTK-30-NBR</b>              | PCG-30-NBR                    | PCTK-30-SI                     | PCG-30-SI                    | CTK-30                  |
| 40                | Barb        | <b>PCTK-40-NBR</b>              | PCG-40-NBR                    | PCTK-40-SI                     | PCG-40-SI                    | CTK-30                  |
| 60                | Barb        | <b>PCTK-60-NBR</b>              | PCG-60-NBR                    | PCTK-60-SI                     | PCG-60-SI                    | CTK-30                  |
| 90                | NPT         | <b>PCTK-90-NBR-N1</b>           | PCG-90-NBR                    | PCTK-90-SI-N1                  | PCG-90-SI                    | CTK-90-N1               |
| 90                | BSPP        | <b>PCTK-90-NBR-G1</b>           | PCG-90-NBR                    | PCTK-90-SI-G1                  | PCG-90-SI                    | CTK-90-G1               |

Most popular.

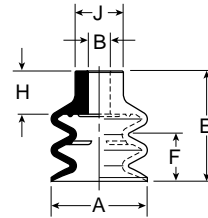


**PCG Series Replacement Cup Dimensions**

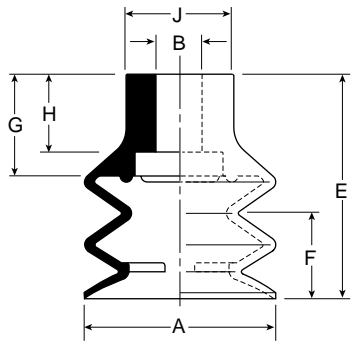
**PCG-5 and  
 PCG-7**



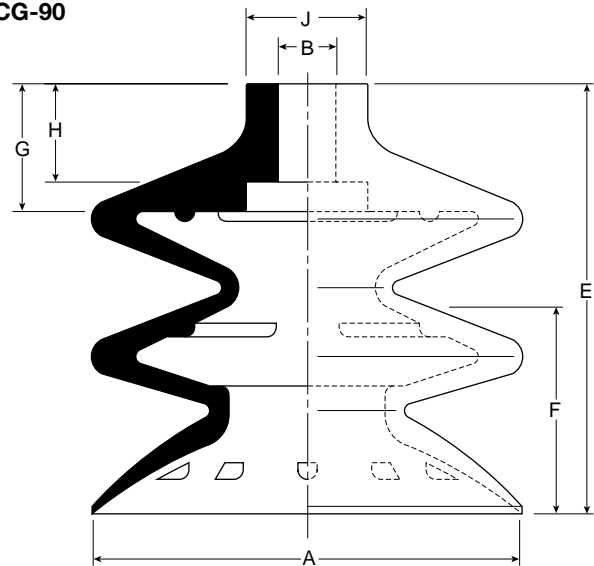
**PCG-10 thru  
 PCG-20**



**PCG-30 thru  
 PCG-60**



**PCG-90**



| Model number | ØA         | ØB       | ØC      | ØD        | E           | F          | G         | H        | J          |
|--------------|------------|----------|---------|-----------|-------------|------------|-----------|----------|------------|
| PCG-5-*      | .20 (5)    | .16 (4)  | .08 (2) | .30 (7.5) | .37 (9.5)   | .12 (3)    | .16 (4)   | .08 (2)  | .24 (6)    |
| PCG-7-*      | .28 (7)    | .16 (4)  | .08 (2) | .30 (7.5) | .39 (10)    | .12 (3)    | .16 (4)   | .08 (2)  | .24 (6)    |
| PCG-10-*     | .35 (9)    | .20 (5)  | —       | —         | .59 (15)    | .12 (3)    | .28 (7)   | —        | .35 (9)    |
| PCG-15-*     | .60 (15.2) | .20 (5)  | —       | —         | .90 (22)    | .39 (10)   | .35 (9)   | —        | .39 (10)   |
| PCG-20-*     | .79 (20)   | .20 (5)  | —       | —         | .91 (23)    | .39 (10)   | .35 (9)   | —        | .39 (10)   |
| PCG-30-*     | 1.26 (32)  | .31 (8)  | —       | —         | 1.48 (37.5) | .57 (14.5) | .67 (17)  | .51 (13) | .71 (18)   |
| PCG-40-*     | 1.65 (42)  | .31 (8)  | —       | —         | 1.81 (46)   | .87 (22)   | .67 (17)  | .51 (13) | .79 (20)   |
| PCG-60-*     | 2.44 (62)  | .31 (8)  | —       | —         | 2.17 (55)   | 1.06 (27)  | .71 (18)  | .51 (13) | .85 (21.5) |
| PCG-90-*     | 3.46 (88)  | .47 (12) | —       | —         | 3.44 (87.5) | 1.65 (42)  | 1.02 (26) | .79 (20) | .98 (25)   |

Inches (mm)  
 \* Cup material

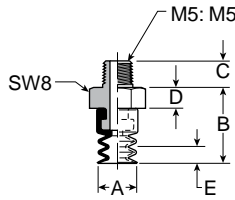
**C**  
 Vacuum Cups  
 Vacuum Products

Series  
 PFG  
 PBG  
 PSV-CFS  
 PJG  
 PCG  
 PUGB

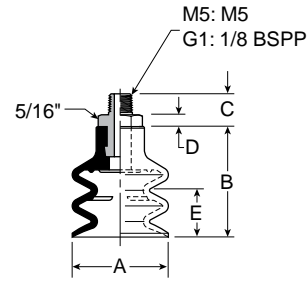


**Dimensions**

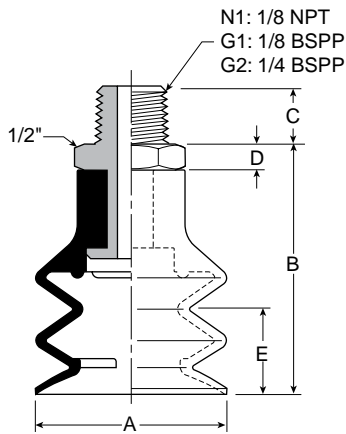
**PCTM-5 and  
PCTM-7**



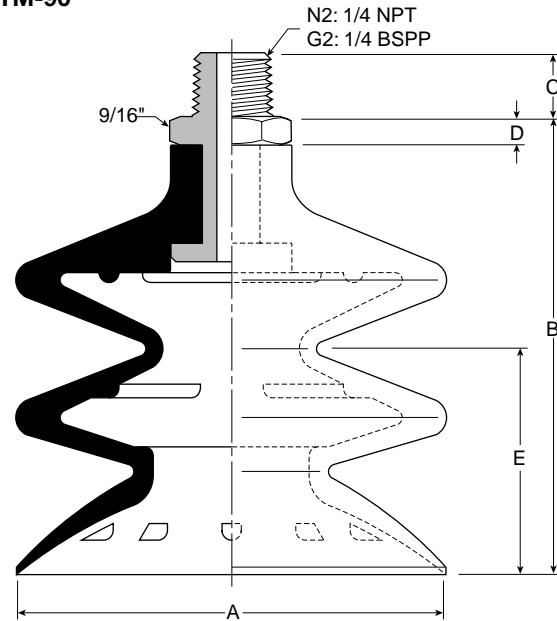
**PCTM-10 thru  
PCTM-20**



**PCTM-30 thru  
PCTM-60**



**PCTM-90**



| Model number | ØA         | B           | C (M5)    | C (N1 / G1) | C (M10 / G2) | C (N2)   | D         | E          |
|--------------|------------|-------------|-----------|-------------|--------------|----------|-----------|------------|
| PCTM-5-*-*†  | .20 (5)    | .51 (13)    | .18 (4.5) | —           | —            | —        | .14 (3.5) | .12 (3)    |
| PCTM-7-*-*†  | .28 (7)    | .53 (13.5)  | .18 (4.5) | —           | —            | —        | .14 (3.5) | .12 (3)    |
| PCTM-10-*-*† | .35 (9)    | .69 (17.5)  | .18 (4.5) | .31 (8)     | —            | —        | .10 (2.5) | .12 (3)    |
| PCTM-15-*-*† | .60 (15.2) | 1.04 (25.5) | .18 (4.5) | .31 (8)     | —            | —        | .10 (2.5) | .39 (10)   |
| PCTM-20-*-*† | .79 (20)   | 1.04 (25.5) | .18 (4.5) | .31 (8)     | —            | —        | .10 (2.5) | .39 (10)   |
| PCTM-30-*-*† | 1.26 (32)  | 1.67 (42.5) | —         | .31 (8)     | .39 (10)     | —        | .20 (5)   | .57 (14.5) |
| PCTM-40-*-*† | 1.65 (42)  | 2.01 (51)   | —         | .31 (8)     | .39 (10)     | —        | .20 (5)   | .87 (22)   |
| PCTM-60-*-*† | 2.44 (62)  | 2.36 (60)   | —         | .31 (8)     | .39 (10)     | —        | .20 (5)   | 1.06 (27)  |
| PCTM-90-*-*† | 3.46 (88)  | 3.64 (92.5) | —         | —           | .39 (10)     | .59 (15) | .20 (5)   | 1.65 (42)  |

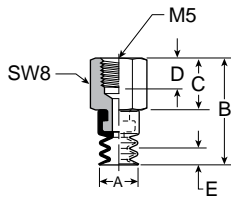
Inches (mm)  
\* Cup material  
† Thread size

**C**  
**Vacuum Cups**  
**Vacuum Products**

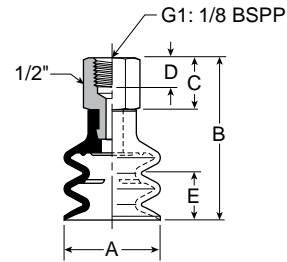
PFG Series  
PBG Series  
P5V-CFS Series  
PJG Series  
PCG Series  
PUGB Series

**Dimensions**

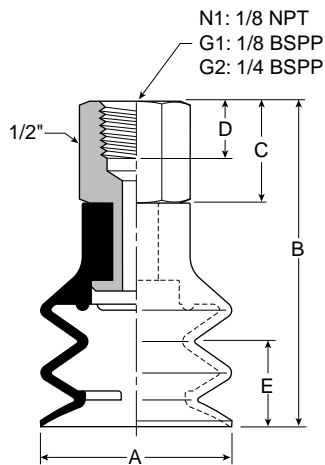
**PCTF-5 and PCTF-7**



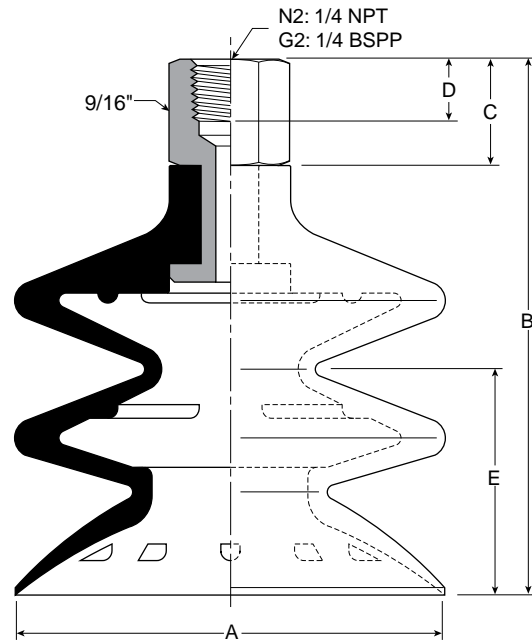
**PCTF-10 thru PCTF-20**



**PCTF-30 thru PCTF-60**



**PCTF-90**



| Model number | ØA         | B           | C          | D        | E          |
|--------------|------------|-------------|------------|----------|------------|
| PCTF-5*†     | .20 (5)    | .85 (21.5)  | .47 (12)   | .31 (8)  | .12 (3)    |
| PCTF-7*†     | .28 (7)    | .87 (22)    | .47 (12)   | .31 (8)  | .12 (3)    |
| PCTF-10*†    | .35 (9)    | 1.06 (27)   | .47 (12)   | .31 (8)  | .12 (3)    |
| PCTF-15*†    | .60 (15.2) | 1.38 (35)   | .47 (12)   | .31 (8)  | .39 (10)   |
| PCTF-20*†    | .79 (20)   | 1.38 (35)   | .47 (12)   | .31 (8)  | .39 (10)   |
| PCTF-30*†    | 1.26 (32)  | 2.03 (51.5) | .55 (14)   | .31 (8)  | .57 (14.5) |
| PCTF-40*†    | 1.65 (42)  | 2.36 (60)   | .55 (14)   | .31 (8)  | .87 (22)   |
| PCTF-60*†    | 2.44 (62)  | 2.72 (69)   | .55 (14)   | .31 (8)  | 1.06 (27)  |
| PCTF-90*†    | 3.46 (88)  | 4.13 (105)  | .69 (17.5) | .39 (10) | 1.65 (42)  |

Inches (mm)  
 \* Cup material  
 † Thread size

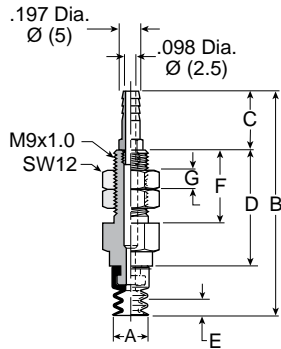
**C**  
 Vacuum Cups  
 Vacuum Products

Series  
 PFG  
 PBG  
 PSV-CFS  
 PJG  
 PCG  
 PUGB

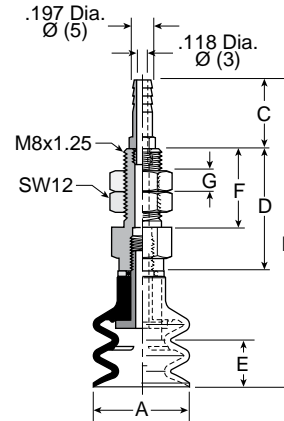


**Dimensions**

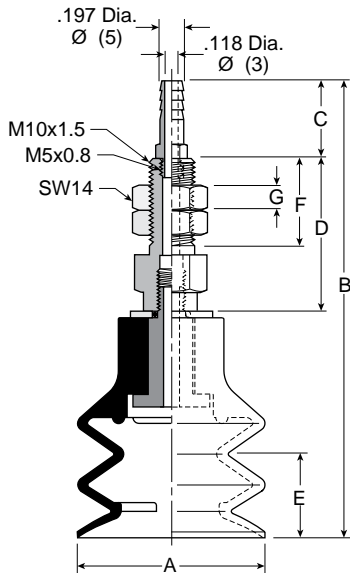
**PCTK-5 and PCTK-7**



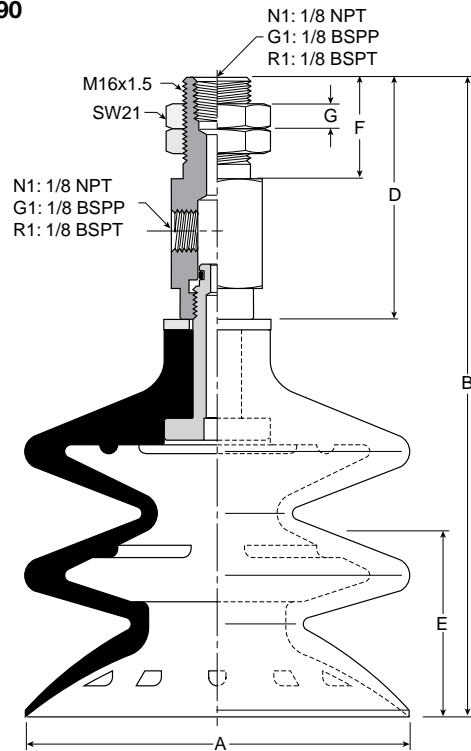
**PCTK-10 thru PCTK-20**



**PCTK-30 thru PCTK-60**



**PCTK-90**



| Model number | ØA         | B            | C        | D          | E          | F        | G       | Wt oz. (g)  |
|--------------|------------|--------------|----------|------------|------------|----------|---------|-------------|
| PCTK-5-*     | .20 (5)    | 1.32 (33.5)  | .39 (10) | .55 (14)   | .12 (3)    | .47 (12) | .12 (3) | .56 (11)    |
| PCTK-7-*     | .28 (7)    | 1.34 (34)    | .39 (10) | .55 (14)   | .12 (3)    | .47 (12) | .12 (3) | .56 (11)    |
| PCTK-10-*    | .35 (9)    | 2.21 (56.2)  | .63 (16) | .88 (22.5) | .12 (3)    | .59 (15) | .16 (4) | .78 (22)    |
| PCTK-15-*    | .60 (15.2) | 2.53 (64.2)  | .63 (16) | .86 (22)   | .39 (10)   | .59 (15) | .16 (4) | .78 (22)    |
| PCTK-20-*    | .79 (20)   | 2.53 (64.2)  | .63 (16) | .86 (22)   | .39 (10)   | .59 (15) | .16 (4) | .78 (22)    |
| PCTK-30-*    | 1.26 (32)  | 3.42 (86.8)  | .63 (16) | 1.26 (32)  | .57 (14.5) | .79 (20) | .20 (5) | 1.62 (46)   |
| PCTK-40-*    | 1.65 (42)  | 3.75 (95.3)  | .63 (16) | 1.26 (32)  | .86 (22)   | .79 (20) | .20 (5) | 1.94 (55)   |
| PCTK-60-*    | 2.44 (62)  | 4.11 (104.3) | .63 (16) | 1.26 (32)  | 1.06 (27)  | .79 (20) | .20 (5) | 3.00 (85)   |
| PCYK-90-*    | 3.46 (88)  | 5.70 (144.8) | .91 (23) | 2.17 (55)  | 1.65 (42)  | .43 (11) | —       | 10.58 (300) |

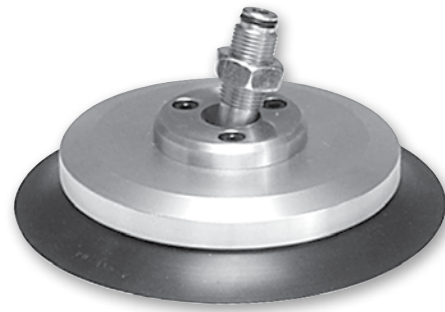
Inches (mm)  
 \* Cup material  
 † Vacuum port

**C**  
 Vacuum Cups  
 Vacuum Products  
 PFG Series  
 PBG Series  
 P5V-CFS Series  
 PJG Series  
 PCG Series  
 PUGB Series



30° inclusive swivel, single lip cup for smooth, slightly curved surfaces and flexible products. Rigid construction provides good stability against acceleration and deceleration forces during product transfer.

The single edge swivel cup is for smooth surfaces with slightly curved surfaces or flexible sheets with substantial weights. Typically, lift capacities and break away forces are higher for flat cups which may be necessary for good stability during lift and transfer. The position of the internal swivel joint minimizes moments during lift and transfer. The swivel joint compensates for load and angular misalignment instead of the cup material, prolonging cup life. Maintenance costs are minimized by replacing only the cup portion of the assembly.



**Features**

- Internal swivel joint design
- 30° Inclusive angle for flexible products
- Increased stability for horizontal lifts
- Lower maintenance costs
- 60mm to 100mm diameters

**Styles**

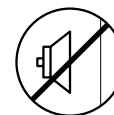
- PUTK series barbed bulkhead
- PUTYS series bulkhead level compensator

**Specifications**

| Suction cup material       | Nitrile (NBR) | Silicon (SI)  |
|----------------------------|---------------|---------------|
| Operating temperature (°C) | -20° to +120° | -60° to +250° |
| Color                      | Black         | White         |
| Hardness, shore A (°Sh)    | 55 ±5         | 55 ±5         |

**Application guide**

**Swivel Bellows**



Flat surface, thin section

Flat surface, any section

Slightly bowed surface, thin section

Slightly bowed surface, any section

Metal sheet handling

Not for vertical lift

C  
 Vacuum Cups  
 Vacuum Products  
 PFG Series  
 PBG Series  
 PSV-CFS Series  
 PJG Series  
 PCG Series  
 PUGB Series



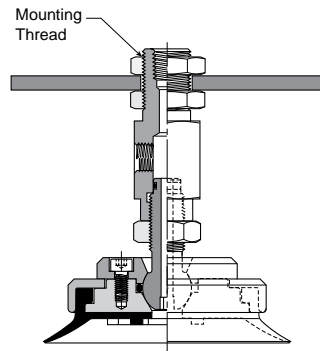
**PUTK Series Barbed Bulkhead**

Top stem connectors secured with jam nuts and allow tubing connections at the top side. Fitting material: nickel plated brass.

**Installation**

**Note:**

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage.



| Cup size | Vacum port | Cup material Nitrile assembly (NBR) | Replacement PUGB swivel with cup only | Replacement cup only (NBR) | Cup fitting      |
|----------|------------|-------------------------------------|---------------------------------------|----------------------------|------------------|
| 60       | 1/8 NPT    | <b>PUTK-60-NBR-N1</b>               | <b>PUGB-60-NBR</b>                    | <b>PUG-60-NBR</b>          | <b>UTK-60-N1</b> |
| 80       | 1/8 NPT    | <b>PUTK-80-NBR-N1</b>               | <b>PUGB-80-NBR</b>                    | <b>PUG-80-NBR</b>          | <b>UTK-60-N1</b> |
| 100      | 1/8 NPT    | <b>PUTK-100-NBR-N1</b>              | <b>PUGB-100-NBR</b>                   | <b>PUG-100-NBR</b>         | <b>UTK-60-N1</b> |

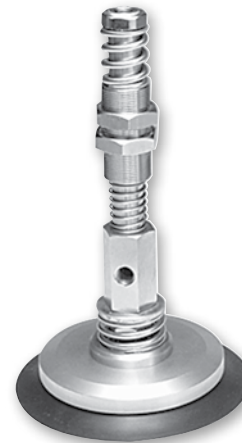
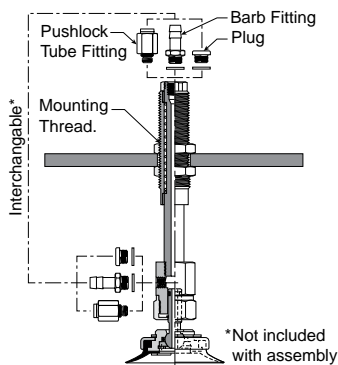
**PUTYS Series Bulkhead Level Compensator**

303 stainless steel construction secured with jam nuts. Spring biased compensators can absorb impacts of down-strokes and adjust for different levels of pick up points. 303 stainless corrosion resistant materials with drymet bushings increases the strength and life.

**Installation**

**Note:**

When installing cup assemblies, use a sealant material to secure the assembly and prevent vacuum leakage. Shown are interchangeable connectors & plugs for port connections.



| Cup diameter (mm) | Vacum port | Stroke (mm) | Spring compression Force lbf (N) |            | PUTYS assembly (NBR)   | Replacement PUGB swivel with cup only | Replacement cup only NBR | Level compensator P/N |
|-------------------|------------|-------------|----------------------------------|------------|------------------------|---------------------------------------|--------------------------|-----------------------|
|                   |            |             | 0%                               | 100%       |                        |                                       |                          |                       |
| 60                | 1/8 NPT    | 30          | 1.6 (6.8)                        | 3.6 (15.6) | <b>PUTYS6030NBRN1</b>  | <b>PUGB-60-NBR</b>                    | <b>PUG-60-NBR</b>        | <b>UTYS-60-30</b>     |
| 60                | 1/8 NPT    | 50          | 1.9 (8.3)                        | 4.5 (19.6) | <b>PUTYS6050NBRN1</b>  | <b>PUGB-60-NBR</b>                    | <b>PUG-60-NBR</b>        | <b>UTYS-60-50</b>     |
| 80                | 1/8 NPT    | 30          | 1.6 (6.8)                        | 3.6 (15.6) | <b>PUTYS8030NBRN1</b>  | <b>PUGB-80-NBR</b>                    | <b>PUG-80-NBR</b>        | <b>UTYS-60-30</b>     |
| 80                | 1/8 NPT    | 50          | 1.9 (8.3)                        | 4.5 (19.6) | <b>PUTYS8050NBRN1</b>  | <b>PUGB-80-NBR</b>                    | <b>PUG-80-NBR</b>        | <b>UTYS-60-50</b>     |
| 100               | 1/8 NPT    | 30          | 1.6 (6.8)                        | 3.6 (15.6) | <b>PUTYS10030NBRN1</b> | <b>PUGB-100-NBR</b>                   | <b>PUG-100-NBR</b>       | <b>UTYS-60-30</b>     |
| 100               | 1/8 NPT    | 50          | 1.9 (8.3)                        | 4.5 (19.6) | <b>PUTYS10050NBRN1</b> | <b>PUGB-100-NBR</b>                   | <b>PUG-100-NBR</b>       | <b>UTYS-60-50</b>     |

Most popular.

**C**

Vacuum Cups  
Vacuum Products

PFG Series

PBG Series

P5V-CFS Series

PVG Series

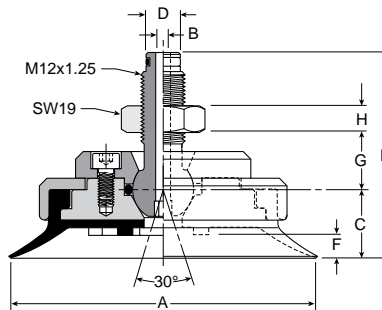
PCG Series

PUGB Series



**PUGB Series Barbed Bulkhead Dimensions**

**PUGB-60 thru  
PUGB-100**



| Model number | ØA         | ØB        | C        | ØD      | E         | F       | G        | H       |
|--------------|------------|-----------|----------|---------|-----------|---------|----------|---------|
| PUGB-60-*    | 2.36 (60)  | .15 (3.9) | .63 (16) | .35 (9) | 2.05 (52) | .20 (5) | .59 (15) | .28 (7) |
| PUGB-80-*    | 3.15 (80)  | .15 (3.9) | .71 (18) | .35 (9) | 2.13 (54) | .24 (6) | .59 (15) | .28 (7) |
| PUGB-100-*   | 3.94 (100) | .15 (3.9) | .71 (18) | .35 (9) | 2.13 (54) | .24 (6) | .59 (15) | .28 (7) |

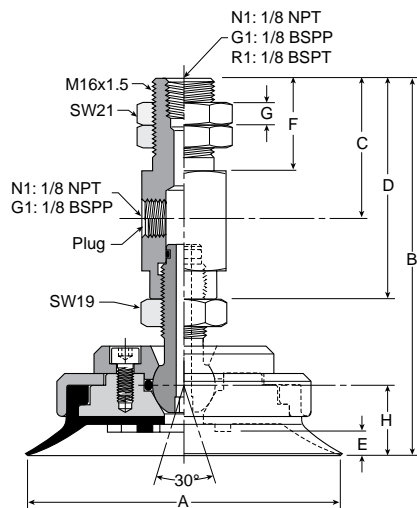
Inches (mm)  
\* Cup material

**C**

Vacuum Cups  
Vacuum Products

**PUTK Series Barbed Bulkhead Dimensions**

**PUTK-60 thru  
PUTK-100**



| Model number | ØA         | B         | C         | D         | E       | F        | G       | H        | Wt oz (g)  |
|--------------|------------|-----------|-----------|-----------|---------|----------|---------|----------|------------|
| PUTK-60-*    | 2.36 (60)  | 3.66 (93) | .63 (16)  | 1.89 (48) | .20 (5) | .91 (23) | .24 (6) | .63 (16) | 12.4 (352) |
| PUTK-80-*    | 3.15 (80)  | 3.74 (95) | 1.38 (35) | 2.16 (55) | .24 (6) | .91 (23) | .24 (6) | .71 (18) | 15.7 (444) |
| PUTK-100-*   | 3.94 (100) | 3.74 (95) | 1.38 (35) | 2.16 (55) | .24 (6) | .91 (23) | .24 (6) | .71 (18) | 20.0 (568) |

Inches (mm)  
\* Cup material

PFG  
Series

PBG  
Series

PSV-CFS  
Series

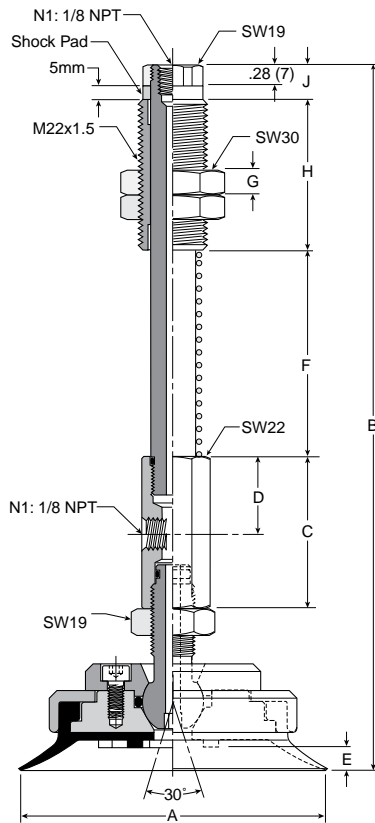
PJG  
Series

PCG  
Series

PUGB  
Series

**Dimensions**

**PUTYS60 thru  
 PUTYS100**



| Model number | ØA        | B          | C         | D        | E       | F         | G        | H         | J        | Wt oz (g)  |
|--------------|-----------|------------|-----------|----------|---------|-----------|----------|-----------|----------|------------|
| PUTYS6030*   | 2.36 (60) | 7.28 (185) | 1.57 (40) | .79 (20) | .20 (5) | 1.77 (45) | .39 (10) | 1.97 (50) | .47 (12) | 17.2 (487) |
| PUTYS6050*   | 2.36 (60) | 8.27 (210) | 1.57 (40) | .79 (20) | .20 (5) | 2.76 (70) | .39 (10) | 1.97 (50) | .47 (12) | 18.4 (521) |
| PUTYS8030*   | 3.15 (80) | 7.36 (187) | 1.57 (40) | .79 (20) | .24 (6) | 1.77 (45) | .39 (10) | 1.97 (50) | .47 (12) | 19.7 (559) |
| PUTYS8050*   | 3.15 (80) | 8.35 (212) | 1.57 (40) | .79 (20) | .24 (6) | 2.76 (70) | .39 (10) | 1.97 (50) | .47 (12) | 20.1 (595) |
| PUTYS10030*  | 1.18 (30) | 7.36 (187) | 1.57 (40) | .79 (20) | .24 (6) | 1.77 (45) | .39 (10) | 1.97 (50) | .47 (12) | 25.7 (729) |
| PUTYS10050*  | 1.18 (30) | 8.35 (212) | 1.57 (40) | .79 (20) | .24 (6) | 2.76 (70) | .39 (10) | 1.97 (50) | .47 (12) | 26.7 (756) |

Inches (mm)  
 \* Cup material

**C**

Vacuum Cups  
 Vacuum Products

PFG Series

PBG Series

P5V-CFS Series

PJG Series

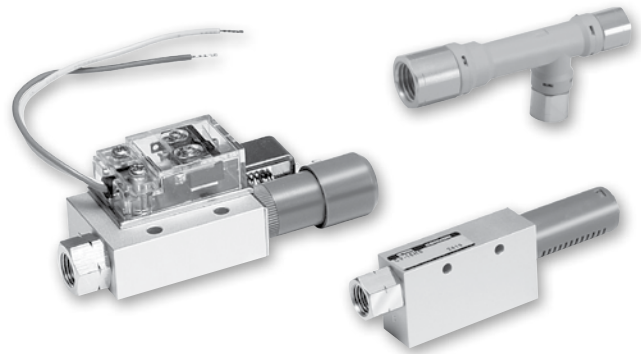
PCG Series

PUGB Series

Parker Inline Single Stage Vacuum Generators is a compact design offering multiple vacuum flow ranges in 3 styles. These Generators are meant to be mounted near the vacuum application for improved vacuum response time. A Normally Open or Normally Closed 3 way valve can be used to control the supply pressure to obtain up to a 27 Inhg degree of vacuum.

**Features**

- **MCA:**
  - light weight vacuum generator
  - vacuum flow rates to 1.26 SCFM
- **CV:**
  - basic aluminum body generator with exhaust muffler
  - vacuum flow rates to 12.36 SCFM
  - degree of vacuum to 27 inHg
- **CV-CK**
  - basic aluminum body generator with mechanical vacuum switch
  - vacuum flow rates to 5.85 SCFM
  - degree of vacuum to 27 inHg



| Operating information  |  |
|------------------------|--|
| Media:                 | Non-lubricated air, non-corrosive gases                                    |
| Operating pressure:    | 14 to 114 PSI  |
| Operating temperature: | 32° to 120°F (0°C to 49°C) (MCA, CV);<br>32 to 140°F (0°C to 60°C) (CV-CK) |
| CV-CK Switch:          |  |
| Hysteresis:            | 1.1 to 3.9 inHg  |
| Switch output:         | N.O., AC125V; 5A, AC250V: 3A, DC250V: 0.2A                                 |

**Material specifications**

|        |                                  |
|--------|----------------------------------|
| MCA    | Polycarbonate, Aluminum fittings |
| Body   | Aluminum (CV, CV-CK)             |
| Nozzle | Nickel plated brass (CV, CV-CK)  |

**MCA, CV, CV-CK Vacuum Generators**

| Symbol              | Port size |        |         | Max. vacuum flow SCFM | Air consumption SCFM | Max. degree of vacuum inHg | Part number          |                      |
|---------------------|-----------|--------|---------|-----------------------|----------------------|----------------------------|----------------------|----------------------|
|                     | Pressure  | Vacuum | Exhaust |                       |                      |                            | NPT                  | BSPP                 |
| <b>MCA Series</b>   |           |        |         |                       |                      |                            |                      |                      |
|                     | 1/8       | 1/8    | 1/4     | 1.68                  | 1.68                 | 24                         | <b>MCA10HSN1N1N2</b> | <b>MCA10HSG1G1N2</b> |
|                     | 1/8       | 1/8    | 1/4     | 2.81                  | 2.81                 | 24                         | <b>MCA13HSN1N1N2</b> | <b>MCA13HSG1G1G2</b> |
| <b>CV Series</b>    |           |        |         |                       |                      |                            |                      |                      |
|                     | 1/8       | 1/8    | Muffler | 0.21                  | 0.46                 | 27                         | <b>CV05HSN</b>       | <b>CV05HSG</b>       |
|                     | 1/8       | 1/8    | Muffler | 0.32                  | 0.46                 | 17                         | <b>CV05LSN</b>       | <b>CV05LSG</b>       |
|                     | 1/8       | 1/8    | Muffler | 0.95                  | 1.55                 | 27                         | <b>CV10HSN</b>       | <b>CV10HSG</b>       |
|                     | 1/8       | 1/8    | Muffler | 1.27                  | 1.55                 | 17                         | <b>CV10LSN</b>       | <b>CV10LSG</b>       |
|                     | 1/4       | 3/8    | Muffler | 2.22                  | 3.53                 | 27                         | <b>CV15HSN</b>       | <b>CV15HSG</b>       |
|                     | 1/4       | 3/8    | Muffler | 3.35                  | 3.53                 | 17                         | <b>CV15LSN</b>       | <b>CV15LSG</b>       |
|                     | 1/4       | 3/8    | Muffler | 3.88                  | 6.36                 | 27                         | <b>CV20HSN</b>       | <b>CV20HSG</b>       |
|                     | 1/4       | 1/2    | Muffler | 5.85                  | 6.36                 | 17                         | <b>CV20LSN</b>       | <b>CV20LSG</b>       |
|                     | 3/8       | 1/2    | Muffler | 5.65                  | 9.36                 | 27                         | <b>CV25HSN</b>       | <b>CV25HSG</b>       |
|                     | 3/8       | 1/2    | Muffler | 8.83                  | 9.36                 | 17                         | <b>CV25LSN</b>       | <b>CV25LSG</b>       |
| <b>CV-CK Series</b> |           |        |         |                       |                      |                            |                      |                      |
|                     | 1/8       | 1/8    | —       | 0.95                  | 1.55                 | 27                         | <b>CV10HSCKN</b>     | <b>CV10HSCKG</b>     |
|                     | 1/4       | 1/4    | —       | 2.22                  | 3.53                 | 27                         | <b>CV15HSCKN</b>     | <b>CV15HSCKG</b>     |
|                     | 1/4       | 3/8    | —       | 3.88                  | 6.36                 | 27                         | <b>CV20HSCKN</b>     | <b>CV20HSCKG</b>     |

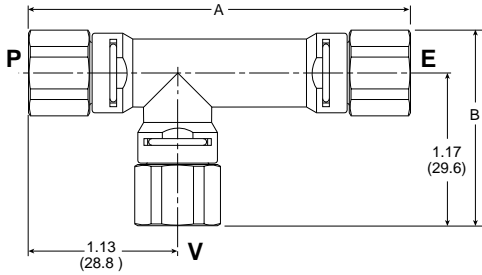
Most popular.

**C**  
 Vacuum Generators  
 Vacuum Products  
 MCA, CV, CV-CK Series  
 CHF Series  
 MC22 Series  
 MC72 Series  
 CEK Series  
 CVXCEK Series

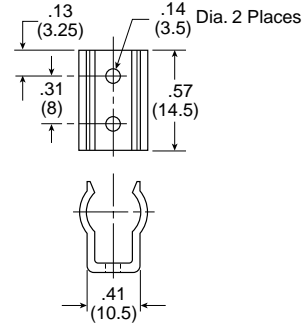


**Dimensions**

**MCA**



**MCA Mounting bracket: MCA-B**

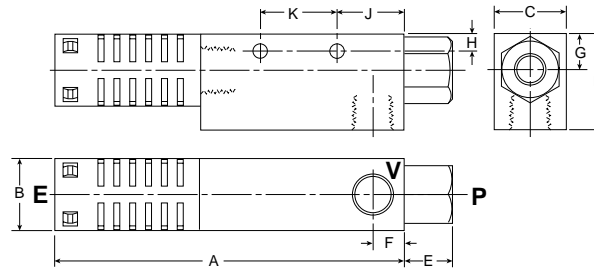


**MCA\*\*\*\*N1N1N2**

| Part number  | A         | B           |
|--------------|-----------|-------------|
| MCA10HS***** | 2.76 (70) | 1.16 (29.5) |
| MCA13HS***** | 2.76 (70) | 1.16 (29.5) |

Inches (mm)

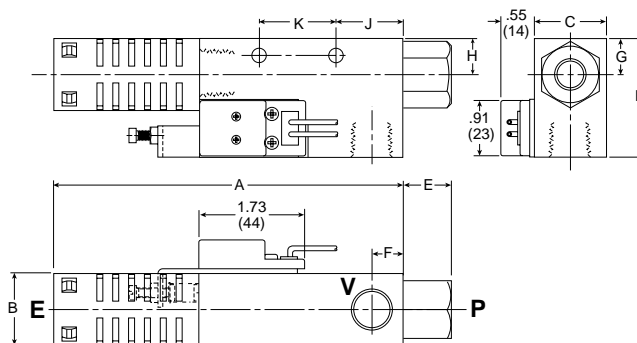
**CV**



| Part number | A            | B          | C         | D         | E        | F        | G        | H         | J         | K         |
|-------------|--------------|------------|-----------|-----------|----------|----------|----------|-----------|-----------|-----------|
| CV05HS/LS   | 3.19 (81)    | .73 (18.5) | .63 (16)  | 1.30 (33) | .39 (10) | .31 (8)  | .39 (10) | .18 (4.5) | .55 (14)  | .79 (20)  |
| CV10HS/LS   | 3.19 (81)    | .73 (18.5) | .63 (16)  | 1.30 (33) | .39 (10) | .31 (8)  | .39 (10) | .18 (4.5) | .55 (14)  | .79 (20)  |
| CV15HS/LS   | 4.27 (108.5) | .79 (20)   | .79 (20)  | 1.38 (35) | .59 (15) | .39 (10) | .43 (11) | .20 (5)   | .79 (20)  | .98 (25)  |
| CV20HS/LS   | 5.73 (145.5) | 1.18 (30)  | 1.18 (30) | 1.57 (40) | .79 (20) | .51 (13) | .59 (15) | .28 (7)   | 1.10 (28) | 1.26 (32) |
| CV25HS/LS   | 7.72 (196)   | 1.57 (40)  | 1.57 (40) | 2.36 (60) | .67 (17) | .63 (16) | .79 (20) | .22 (5.5) | .79 (20)  | 1.97 (50) |
| CV30AHS/ALS | 8.43 (214)   | 1.57 (40)  | 1.57 (40) | 2.36 (60) | .79 (20) | .79 (20) | .79 (20) | .22 (5.5) | 1.30 (33) | 1.97 (50) |

Inches (mm)

**CV-CK**



| Part number | A            | B          | C         | D         | E        | F        | G        | H         | J         | K         |
|-------------|--------------|------------|-----------|-----------|----------|----------|----------|-----------|-----------|-----------|
| CV10HS/LSCK | 3.19 (81)    | .73 (18.5) | .63 (16)  | 1.30 (33) | .39 (10) | .31 (8)  | .39 (10) | .18 (4.5) | 17 (4.2)  | .79 (20)  |
| CV15HS/LSCK | 4.27 (108.5) | .79 (20)   | .79 (20)  | 1.38 (35) | .59 (15) | .39 (10) | .43 (11) | .20 (5)   | .18 (4.5) | .98 (25)  |
| CV20HS/LSCK | 5.73 (145.5) | 1.18 (30)  | 1.18 (30) | 1.57 (40) | .79 (20) | .51 (13) | .59 (15) | .28 (7)   | .24 (6)   | 1.26 (32) |

Inches (mm)

**C**  
**Vacuum Generators**  
**Vacuum Products**  
**MCA, CV, CV-CK**  
**CHF Series**  
**MC22 Series**  
**MC72 Series**  
**CEK Series**  
**CVXCEK Series**



CHF- High Flow Series is a multistage vacuum generator. CHF unit is ideal for porous applications.

4 bolt mounting pattern with gauge opposite of vacuum and pressure inlet ports enables this generator to be panel mounted.

CHF Series comes standard with flow thru exhaust mufflers to reduce clogging in dirty environments. Additional Pneumatic Control Valve is required to create vacuum flow.



**Features**

- Classic multi-stage venturi
- Anodized aluminum body
- Aluminum body includes exhaust muffler
- Maximum vacuum level, 27.3 inHg
- Vacuum flow rates from 12.5 to 31.8 SCFM
- Mounting brackets included

**Specifications**

|                       |   |
|-----------------------|---|
| Media                 | Non-lubricated air, non-corrosive gases                       |
| Operating pressure    | 80 PSI  |
| Operating temperature | 32°F to 120°F   |
| Material              | Body: Aluminum<br>Nozzle & Diffuser: Polymer<br>Seals: BUNA N |

**CHF High Flow Vacuum Generators**

| Symbol | Port size |        |         | Max. vacuum flow SCFM | Air consumption SCFM | Max. degree of vacuum inHg | Part number NPT  |
|--------|-----------|--------|---------|-----------------------|----------------------|----------------------------|------------------|
|        | Pressure  | Vacuum | Exhaust |                       |                      |                            |                  |
|        | 1/4       | 3/8    | Muffler | 20.9                  | 6.5                  | 27                         | <b>CHF-20ZNE</b> |
|        | 1/4       | 3/8    | Muffler | 26.3                  | 9.6                  | 27                         | <b>CHF-30ZNE</b> |
|        | 1/4       | 3/8    | Muffler | 31.8                  | 14.0                 | 27                         | <b>CHF-40ZNE</b> |

**Accessories**

| Port size | Description  | Part number      |
|-----------|--|------------------|
| 3/8       | Filter with 10 micron element                            | <b>VFP2CFC01</b> |
| 1/2       |  | <b>VFP3CFC01</b> |
| 3/8       | Filter with 10 micron element and 2 replacement elements | <b>VFP2CFC03</b> |
| 1/2       |  | <b>VFP3CFC03</b> |

See Accessories Section for more options

**VFP Series filter**



**Replacement components**

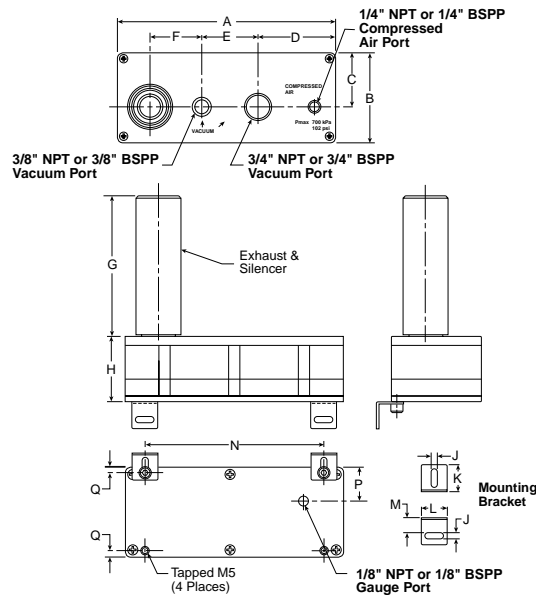
| Description  | Part number      |
|--|------------------|
| CHF- Repair kit                                      | <b>SFCHF90NN</b> |
| 0 to 30 inHg gauge                                   | <b>266298A</b>   |
| Bracket kit (Includes 4 brackets & 4 M5 x 15 screws) | <b>SFBW15</b>    |
| Silencer (flow thru)                                 | <b>SIS-001</b>   |

Most popular.

**C**  
 Vacuum Generators  
 Vacuum Products  
 MCA, CV, CV-CK  
 CHF Series  
 MC22 Series  
 MC72 Series  
 CEK Series  
 CVXCEK Series



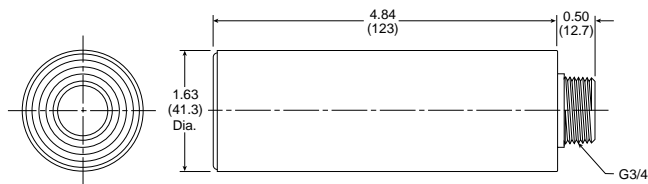
**Dimensions**



| Part number | A             | B            | C            | D            | E            | F            | G             | H            | J            | K           | L           | M           | N             | P            | Q          | Weight (grams) |
|-------------|---------------|--------------|--------------|--------------|--------------|--------------|---------------|--------------|--------------|-------------|-------------|-------------|---------------|--------------|------------|----------------|
| CHF-20      | 7.64<br>(194) | 3.15<br>(80) | 1.89<br>(48) | 2.72<br>(69) | 1.97<br>(50) | 1.81<br>(46) | 4.84<br>(123) | 1.69<br>(43) | .22<br>(5.5) | .94<br>(24) | .91<br>(23) | .51<br>(13) | 6.26<br>(159) | 1.26<br>(32) | .20<br>(5) | 875            |
| CHF-30      | 7.64<br>(194) | 3.15<br>(80) | 1.89<br>(48) | 2.72<br>(69) | 1.97<br>(50) | 1.81<br>(46) | 4.84<br>(123) | 1.69<br>(43) | .22<br>(5.5) | .94<br>(24) | .91<br>(23) | .51<br>(13) | 6.26<br>(159) | 1.26<br>(32) | .20<br>(5) | 885            |
| CHF-40      | 7.64<br>(194) | 3.15<br>(80) | 1.89<br>(48) | 2.72<br>(69) | 1.97<br>(50) | 1.81<br>(46) | 4.84<br>(123) | 2.28<br>(58) | .22<br>(5.5) | .94<br>(24) | .91<br>(23) | .51<br>(13) | 6.26<br>(159) | 1.26<br>(32) | .20<br>(5) | 965            |

Inches (mm)

**SIS-001 silencer dimensions**



**C**  
**Vacuum Generators**  
**Vacuum Products**

MCA, CV,  
CV-CK

CHF  
Series

MC22  
Series

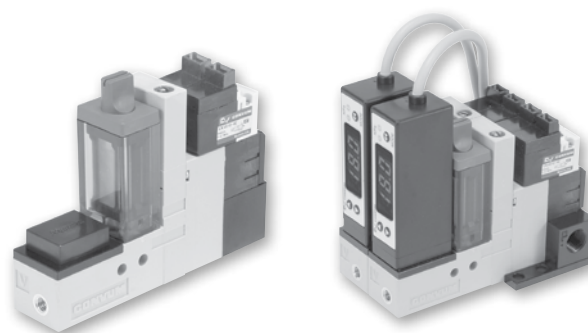
MC72  
Series

CEK  
Series

CYXCEK  
Series



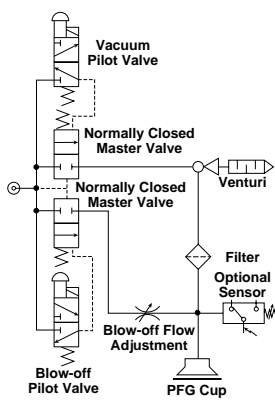
The MC22 is a complete package for factory automation. The MC22 has integrated vacuum generating and blow-off release pilot valves to minimize the response time to achieve vacuum. The small foot print and lightweight body allows the unit to be located close to the suction cup for maximum performance. The MC22 has additional features; regulating blow-off needle, 37 micron mesh filter, and a sensor platform for vacuum confirmation. The MC22 can be assembled into a maximum 8 station manifold. The unit can be ordered normally open or normally closed, with or without MPS-23 or MVS-201 pressure sensors.



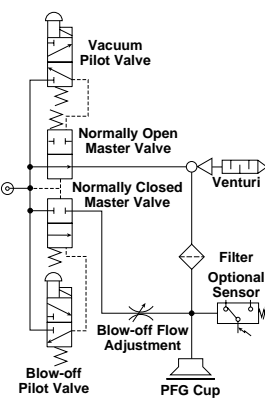
**Add-A-Fold Manifold**

**Features**

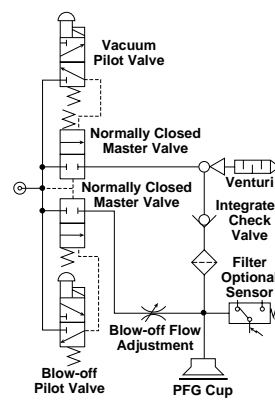
- Vacuum generating pilot valve
- Vacuum blow-off pilot valve
- Vacuum sensor - filter - silencer available
- Regulating blow-off adjustment
- Manifold system
- Short cycle times for high speed pick and place
- Vacuum flow rates to 1.55 SCFM



**MC22, Normally Closed Vacuum Valve**



**MC22, Normally Open Vacuum Valve**



**MC22, Normally Closed Vacuum Valve with Integrated Check Valve**

**Specifications**

|   |   |
|---|---|
| Media   | Non-lubricated compressed air, non-corrosive gases  |
| Operating pressure                                  | 21 to 84 PSI (1.5 to 6 kgf/cm <sup>2</sup> )  |
| Optimum operating pressure                          | 70 PSI (5 kgf/cm <sup>2</sup> )   |
| Humidity  | 35 to 85%   |
| Pressure port                                       | N: 1/8 NPT female, G: 1/8 BSPP female   |
| Vacuum port   | M5 female   |
| Operating temperature                               | 41 to 132°F (5 to 50°C)   |
| Material  | Aluminum, Polyamide, NBR  |
| <b>Vacuum generating and blow-off release pilot</b> |   |
| Type of control valve                               | Pilot valve, includes 300mm clip wire connector   |
| Manual operation                                    | Non-locking manual override   |
| Electrical connection                               | Clip type connector with LED and surge protection   |
| Power supply  | 24VDC ± 10%   |
| Power consumption                                   | 1W  |
| Pressure range                                      | 21 to 84 PSI (1.5 to 6 kgf/cm <sup>2</sup> )  |
| Pilot valve air supply                              | Normally closed   |
| Generator weight                                    | 4.1 oz. (117G) without sensor   |
| Manifold weight                                     | 2-Station: 1.4 oz. (40g), 3-Station: 2 oz. (54g), 4-Station: 2.4 oz. (68g),<br>5-Station: 2.8 oz. (82g) 6-Station: 3.4 oz. (96g), 7-Station: 3.8 oz. (110g),<br>8-Station: 4.4 oz. (124g) |

**Vacuum Generators**  
**Vacuum Products**  
**CV-CK**  
**Series**  
**CHF**  
**Series**  
**MC22**  
**Series**  
**MC72**  
**Series**  
**CEK**  
**Series**  
**CVXCEK**  
**Series**





**MC2 Unit Without Integrated Check Valve, Normally Closed Vacuum Valve**

| Port size |        |         | Max. vacuum flow SCFM | Max. degree of vacuum inHg | Sensor option    | Part number             |                         |
|-----------|--------|---------|-----------------------|----------------------------|------------------|-------------------------|-------------------------|
| Pressure  | Vacuum | Exhaust |                       |                            |                  | NPT                     | BSPP                    |
| 1/8       | M5     | Muffler | 1.55                  | 24                         | None             | <b>MC22S10HSZL4BLN</b>  | <b>MC22S10HSZL4BLG</b>  |
| 1/8       | M5     | Muffler | 1.55                  | 24                         | MPS-V23C-PC, PNP | <b>MC22S10HS42L4BLN</b> | <b>MC22S10HS42L4BLG</b> |
| 1/8       | M5     | Muffler | 1.55                  | 24                         | MVS-201-PCP, PNP | <b>MC22S10HS06L4BLN</b> | <b>MC22S10HS06L4BLG</b> |
| 1/8       | M5     | Muffler | 1.55                  | 24                         | MPS-V23C-NC, NPN | <b>MC22S10HS41L4BLN</b> | <b>MC22S10HS41L4BLG</b> |
| 1/8       | M5     | Muffler | 1.55                  | 24                         | MVS-201-NC, NPN  | <b>MC22S10HS01L4BLN</b> | <b>MC22S10HS01L4BLG</b> |

**MC2 Unit Without Integrated Check Valve, Normally Open Vacuum Valve**

| Port size |        |         | Max. vacuum flow SCFM | Max. degree of vacuum inHg | Sensor option    | Part number             |                         |
|-----------|--------|---------|-----------------------|----------------------------|------------------|-------------------------|-------------------------|
| Pressure  | Vacuum | Exhaust |                       |                            |                  | NPT                     | BSPP                    |
| 1/8       | M5     | Muffler | 1.55                  | 24                         | None             | <b>MC22S10HSZL4ALN</b>  | <b>MC22S10HSZL4ALG</b>  |
| 1/8       | M5     | Muffler | 1.55                  | 24                         | MPS-V23C-PC, PNP | <b>MC22S10HS42L4ALN</b> | <b>MC22S10HS42L4ALG</b> |
| 1/8       | M5     | Muffler | 1.55                  | 24                         | MPS-V23C-NC, NPN | <b>MC22S10HS41L4ALN</b> | <b>MC22S10HS41L4ALG</b> |

**MC2 Unit With Integrated Check Valve, Normally Closed Vacuum Valve**

| Port size |        |         | Max. vacuum flow SCFM | Max. degree of vacuum inHg | Sensor option    | Part number              |                          |
|-----------|--------|---------|-----------------------|----------------------------|------------------|--------------------------|--------------------------|
| Pressure  | Vacuum | Exhaust |                       |                            |                  | NPT                      | BSPP                     |
| 1/8       | M5     | Muffler | 1.55                  | 24                         | None             | <b>MC22S10HSZLC4BLN</b>  | <b>MC22S10HSZLC4BLG</b>  |
| 1/8       | M5     | Muffler | 1.55                  | 24                         | MPS-V23C-PC, PNP | <b>MC22S10HS42LC4BLN</b> | <b>MC22S10HS42LC4BLG</b> |
| 1/8       | M5     | Muffler | 1.55                  | 24                         | MVS-201-PCP, PNP | <b>MC22S10HS06LC4BLN</b> | <b>MC22S10HS06LC4BLG</b> |
| 1/8       | M5     | Muffler | 1.55                  | 24                         | MPS-V23C-NC, NPN | <b>MC22S10HS41LC4BLN</b> | <b>MC22S10HS41LC4BLG</b> |
| 1/8       | M5     | Muffler | 1.55                  | 24                         | MVS-201-NC, NPN  | <b>MC22S10HS01LC4BLN</b> | <b>MC22S10HS01LC4BLG</b> |

**Add-A-Fold assembly ordering information**



Station 1    Station 2

**Example 1:** Application requires a 2-Station MC22 manifold with NPT supply ports.

| Qty. | Part number           | Comment    |
|------|-----------------------|------------|
| 1    | AAMC2-M02N.....       | Add-A-Fold |
| 1    | MC22S10HS42L4BLN..... | Station #1 |
| 1    | MC22S10HS42L4BLN..... | Station #2 |

**Alternative Method**

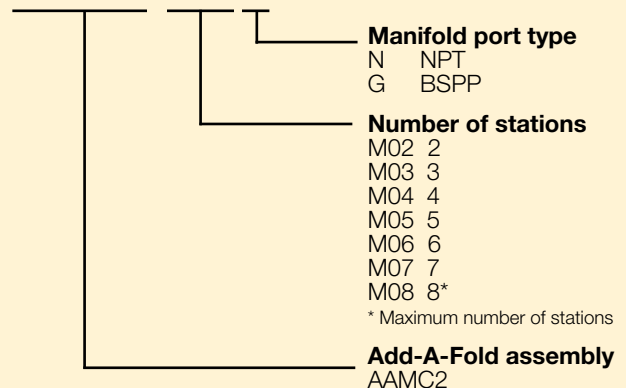
|   |                       |              |
|---|-----------------------|--------------|
| 1 | AAMC2-M02N.....       | Add-A-Fold   |
| 2 | MC22S10HS42L4BLN..... | Station #1-2 |

Most popular.

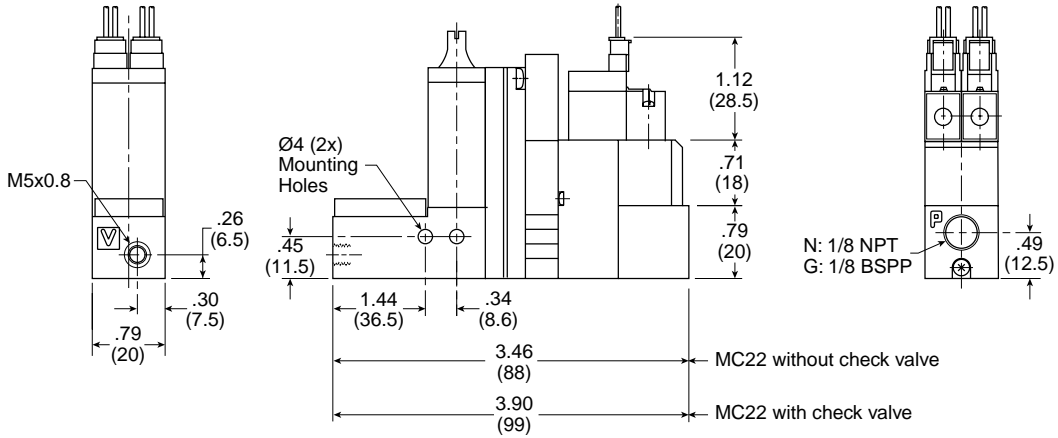
**How to order Add-A-Fold assemblies**

1. Manifold assemblies are multiple line item listings.
2. First line item must be the Add-A-Fold assembly part number.
3. Subsequent line items listed identify each station in the manifold starting with station number 1.
4. Station number 1 is the left most generator when looking at the manifold generator ports.
5. List either a part number of the MC22 Generator or a blank plate for each station of the manifold.
6. See model number index code for MC22 Generator number and MC22 accessories for blank plate part numbers.

**AAMC2-M08N**

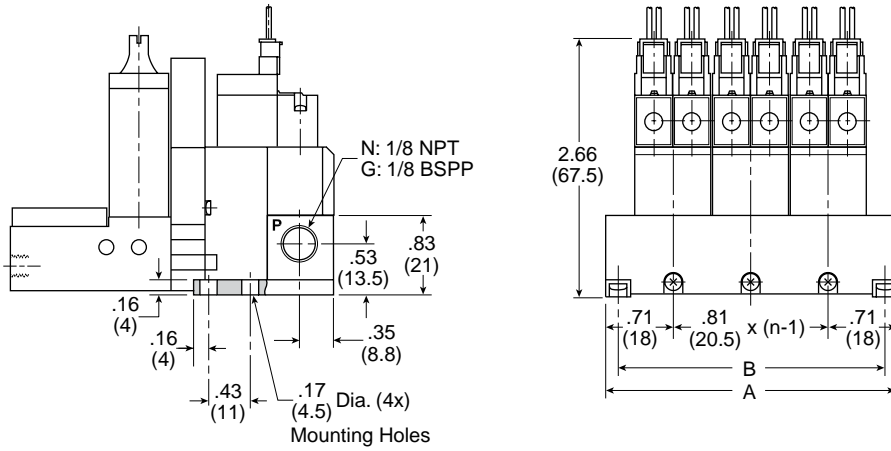


**Dimensions**



**Manifold**

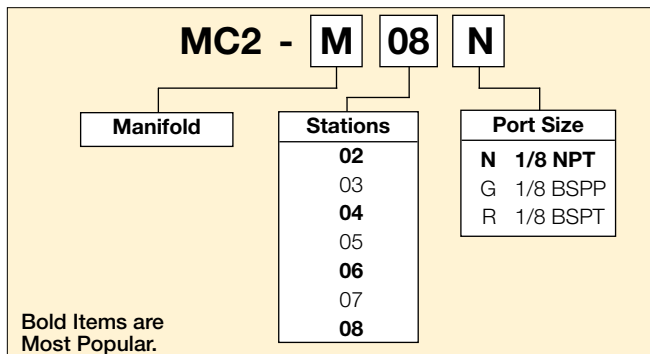
**3-Station manifold without check valve shown**



| n        | 2              | 3              | 4              | 5             | 6               | 7             | 8               |
|----------|----------------|----------------|----------------|---------------|-----------------|---------------|-----------------|
| <b>A</b> | 2.22<br>(56.5) | 3.03<br>(77)   | 3.84<br>(97.5) | 4.65<br>(118) | 5.45<br>(138.5) | 6.26<br>(159) | 7.07<br>(179.5) |
| <b>B</b> | 1.91<br>(48.5) | 2.72<br>(69.0) | 3.52<br>(89.5) | 4.33<br>(110) | 5.14<br>(130.5) | 5.95<br>(151) | 6.75<br>(171.5) |

Inches (mm)  
 n = Number of stations

**Manifold part number**



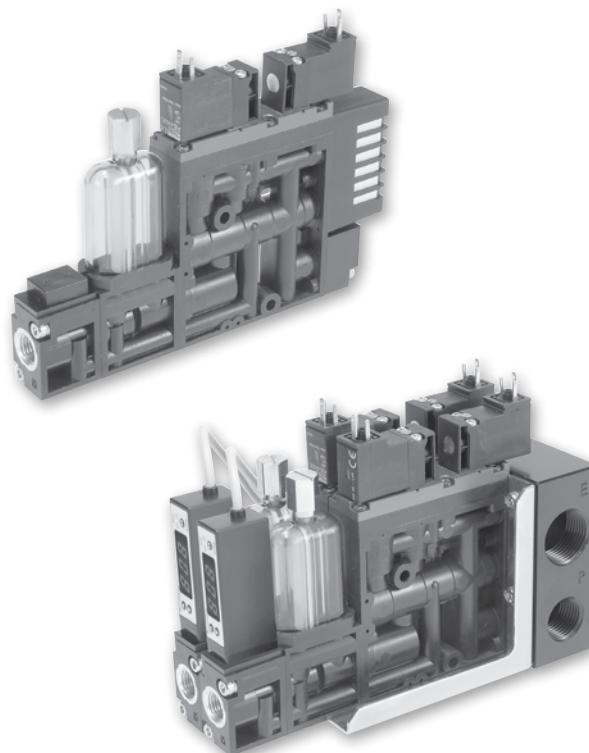
**C**  
 Vacuum Generators  
 Vacuum Products  
 MCA, CV,  
 CV-CK  
 Series  
 CHF  
 Series  
 MC22  
 Series  
 MC72  
 Series  
 CEK  
 Series  
 CVXCEK  
 Series



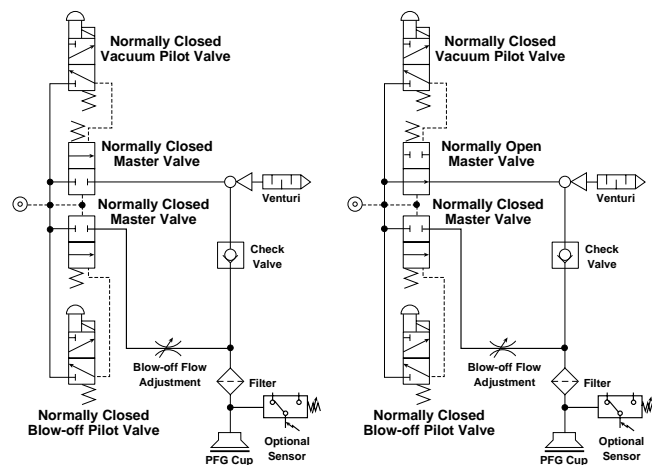
The MC72 Series vacuum generator provides a complete solution for factory automation. The MC72 is perfect for non-porous applications such as material handling, critical applications involving glass, or general transfer applications. The MC72 has integrated vacuum pilot and blow-off release pilot valves to minimize response times. The MC72 has additional features; regulating blow-off needle, 130 micron filter, optional check valve, and a sensor platform for vacuum confirmation. The MC72 can be assembled into a maximum 5 station manifold. The unit can be ordered normally open or normally closed.

### Features

- Vacuum generating pilot valve
- Vacuum release pilot valve option
- Vacuum sensor - filter - silencer available
- Regulating blow-off
- Check valve option
- Air-economizing controls
- Manifold system
- Vacuum flow rates from 2.1 to 5.5 SCFM
- 3-Pin, EN175301-803, 15mm, 8mm 3-Pin



Add-A-Fold assembly (Silencer included)



### Specifications

|                            |  |
|----------------------------|--|
| Media                      | Non-lubricated compressed air, non-corrosive gases   |
| Optimum operating pressure | 70 PSI (5 kgf/cm <sup>2</sup> )  |
| Humidity                   | 35 to 85%  |
| Pressure port              | N: 1/4 NPT female, G: 1/4 BSPP female  |
| Vacuum port                | N: 1/4 NPT female, G: 1/4 BSPP female  |
| Operating temperature      | 41 to 132°F (5 to 50°C)  |
| Material                   | Body (PA and PBT) with other internal components (Brass, Al.NBR, SUS, FKM), filter elements (PVF)        |
| Manual operation           | Non-locking manual override  |
| Electrical connection      | DIN connector with LED and surge protection, connectors included   |
| Power supply               | 24VDC ± 10%  |
| Power consumption          | 1.8W   |
| Operating pressure         | 70 PSI (5 kgf/cm <sup>2</sup> )  |
| Pilot valve air supply     | Normally closed  |
| Generator weight           | 12.0 oz. (340g)  |
| Manifold weight            | 2-Station: 24 oz. (680g), 3-Station: 31 oz. (880g), 4-Station: 38 oz. (1080g), 5-Station: 45 oz. (1280g) |



|                |                   |
|----------------|-------------------|
| C              | Vacuum Generators |
|                | Vacuum Products   |
| MCA, CV, CV-CK |                   |
| CHF Series     |                   |
| MC22 Series    |                   |
| MC72 Series    |                   |
| CEK Series     |                   |
| CVXCEK Series  |                   |

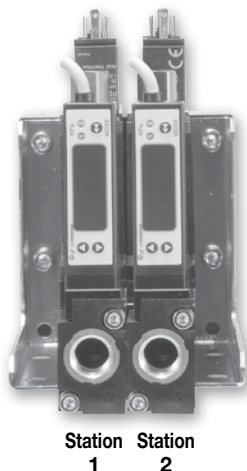
**MC72 Unit With Integrated Check Valve, Normally Closed Vacuum Valve**

| Port size |        |         | Max. vacuum flow<br>SCFM | Max. degree of vacuum<br>inHg | Sensor option    | Part number             |                         |
|-----------|--------|---------|--------------------------|-------------------------------|------------------|-------------------------|-------------------------|
| Pressure  | Vacuum | Exhaust |                          |                               |                  | NPT                     | BSPP                    |
| 1/4       | 1/4    | Muffler | 2.20                     | 24                            | No sensor        | <b>MC72S15HSZSC4BPN</b> | <b>MC72S15HSZSC4BPG</b> |
| 1/4       | 1/4    | Muffler | 2.20                     | 24                            | MPS-V23C-PC, PNP | <b>MC72S15HS42C4BPN</b> | <b>MC72S15HS42C4BPG</b> |
| 1/4       | 1/4    | Muffler | 2.20                     | 24                            | MVS-201-PCP, PNP | <b>MC72S15HS06C4BPN</b> | <b>MC72S15HS06C4BPG</b> |
| 1/4       | 1/4    | Muffler | 2.20                     | 24                            | MPS-V23C-NC, NPN | <b>MC72S15HS41C4BPN</b> | <b>MC72S15HS41C4BPG</b> |
| 1/4       | 1/4    | Muffler | 2.20                     | 24                            | MVS-201-NC, NPN  | <b>MC72S15HS01C4BPN</b> | <b>MC72S15HS01C4BPG</b> |
| 1/4       | 1/4    | Muffler | 3.67                     | 24                            | No sensor        | <b>MC72S20HSZSC4BPN</b> | <b>MC72S20HSZSC4BPG</b> |
| 1/4       | 1/4    | Muffler | 3.67                     | 24                            | MPS-V23C-PC, PNP | <b>MC72S20HS42C4BPN</b> | <b>MC72S20HS42C4BPG</b> |
| 1/4       | 1/4    | Muffler | 3.67                     | 24                            | MVS-201-PCP, PNP | <b>MC72S20HS06C4BPN</b> | <b>MC72S20HS06C4BPG</b> |
| 1/4       | 1/4    | Muffler | 3.67                     | 24                            | MPS-V23C-NC, NPN | <b>MC72S20HS41C4BPN</b> | <b>MC72S20HS41C4BPG</b> |
| 1/4       | 1/4    | Muffler | 3.67                     | 24                            | MVS-201-NC, NPN  | <b>MC72S20HS01C4BPN</b> | <b>MC72S20HS01C4BPG</b> |
| 1/4       | 1/4    | Muffler | 5.20                     | 24                            | No sensor        | <b>MC72S25HSZSC4BPN</b> | <b>MC72S25HSZSC4BPG</b> |
| 1/4       | 1/4    | Muffler | 5.20                     | 24                            | MPS-V23C-PC, PNP | <b>MC72S25HS42C4BPN</b> | <b>MC72S25HS42C4BPG</b> |
| 1/4       | 1/4    | Muffler | 5.20                     | 24                            | MVS-201-PCP, PNP | <b>MC72S25HS06C4BPN</b> | <b>MC72S25HS06C4BPG</b> |
| 1/4       | 1/4    | Muffler | 5.20                     | 24                            | MPS-V23C-NC, NPN | <b>MC72S25HS41C4BPN</b> | <b>MC72S25HS41C4BPG</b> |
| 1/4       | 1/4    | Muffler | 5.20                     | 24                            | MVS-201-NC, NPN  | <b>MC72S25HS01C4BPN</b> | <b>MC72S25HS01C4BPG</b> |

**MC72 Unit With Integrated Check Valve, Normally Open Vacuum Valve**

| Port size |        |         | Max. vacuum flow<br>SCFM | Max. degree of vacuum<br>inHg | Sensor option    | Part number             |                         |
|-----------|--------|---------|--------------------------|-------------------------------|------------------|-------------------------|-------------------------|
| Pressure  | Vacuum | Exhaust |                          |                               |                  | NPT                     | BSPP                    |
| 1/4       | 1/4    | Muffler | 2.20                     | 24                            | No sensor        | <b>MC72S15HSZSC4APN</b> | <b>MC72S15HSZSC4APG</b> |
| 1/4       | 1/4    | Muffler | 2.20                     | 24                            | MPS-V23C-PC, PNP | <b>MC72S15HS42C4APN</b> | <b>MC72S15HS42C4APG</b> |
| 1/4       | 1/4    | Muffler | 2.20                     | 24                            | MPS-V23C-NC, NPN | <b>MC72S15HS41C4APN</b> | <b>MC72S15HS41C4APG</b> |
| 1/4       | 1/4    | Muffler | 3.67                     | 24                            | No sensor        | <b>MC72S20HSZSC4APN</b> | <b>MC72S20HSZSC4APG</b> |
| 1/4       | 1/4    | Muffler | 3.67                     | 24                            | MPS-V23C-PC, PNP | <b>MC72S20HS42C4APN</b> | <b>MC72S20HS42C4APG</b> |
| 1/4       | 1/4    | Muffler | 3.67                     | 24                            | MPS-V23C-NC, NPN | <b>MC72S20HS41C4APN</b> | <b>MC72S20HS41C4APG</b> |
| 1/4       | 1/4    | Muffler | 5.20                     | 24                            | No sensor        | <b>MC72S25HSZSC4APN</b> | <b>MC72S25HSZSC4APG</b> |
| 1/4       | 1/4    | Muffler | 5.20                     | 24                            | MPS-V23C-PC, PNP | <b>MC72S25HS42C4APN</b> | <b>MC72S25HS42C4APG</b> |
| 1/4       | 1/4    | Muffler | 5.20                     | 24                            | MPS-V23C-NC, NPN | <b>MC72S25HS41C4APN</b> | <b>MC72S25HS41C4APG</b> |

**Add-A-Fold assembly ordering information**



**How to order Add-A-Fold assemblies**

1. Manifold assemblies are multiple line item listings.
2. First line item must be the Add-A-Fold assembly part number.
3. Subsequent line items listed identify each station in the manifold starting with station number 1.
4. Station number 1 is the left most generator when looking at the manifold generator ports.
5. List either a part number of the manifold type generator or a blank plate for each station of the manifold.
6. See model number index code for MC72 Generator number and accessories for blank plate part numbers.

Most popular.

**Example 1:** Shown above is a 2-Station MC72 manifold with sensors and NPT Ports.

| Qty. | Part number         | Comment    |
|------|---------------------|------------|
| 1    | AAMC72-M02N.....    | Add-A-Fold |
| 1    | MC72SHS42C4BPN..... | Station #1 |
| 1    | MC72SHS42C4BPN..... | Station #1 |

**Alternative Method**

|   |                     |              |
|---|---------------------|--------------|
| 1 | AAMC72-M02N.....    | Add-A-Fold   |
| 2 | MC72SHS42C4BPN..... | Station #1-2 |

### AAMC72-M02N

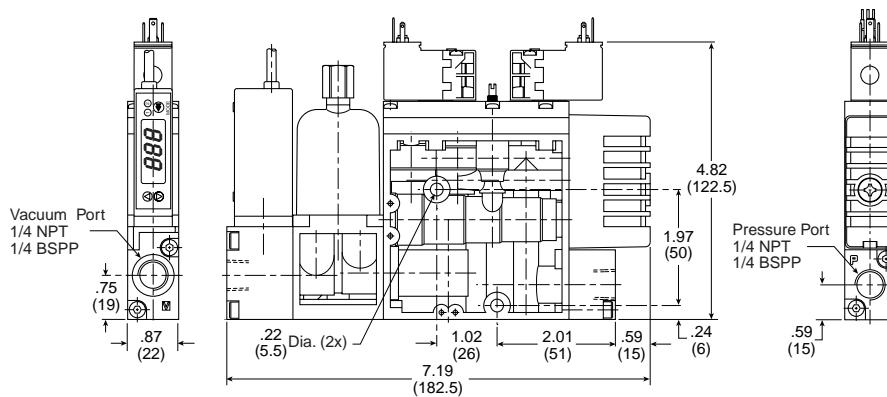
**Port type**  
N NPT  
G BSPP

**Number of stations**  
M02 2  
M03 3  
M04 4  
M05 5\*

\* Maximum number of stations

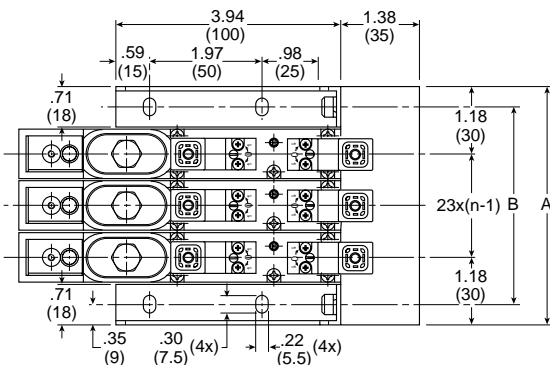
**Add-A-Fold assembly**  
AAMC72

**Dimensions**



**Manifold**

3-Station manifold shown



**Manifold part number**

## MC72 - M 05 N

**Manifold**

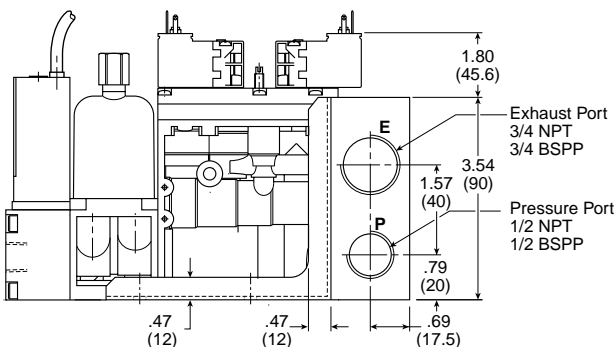
**Stations**

02  
03  
04  
05

**Port Size**

N 1/8 NPT  
G 1/8 BSPP  
R 1/8 BSPT

**Bold Items are Most Popular.**



| n | 2            | 3             | 4             | 5             |
|---|--------------|---------------|---------------|---------------|
| A | 3.27<br>(83) | 4.17<br>(106) | 5.08<br>(129) | 5.98<br>(152) |
| B | 2.56<br>(65) | 3.46<br>(88)  | 4.37<br>(111) | 5.28<br>(134) |

Inches (mm)  
n = Number of Stations



**C**

Vacuum Generators  
Vacuum Products

MCA, CV,  
CV-CK

CHF  
Series

MC22  
Series

MC72  
Series

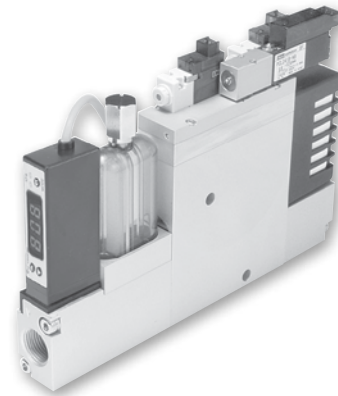
CEK  
Series

CVXCEK  
Series

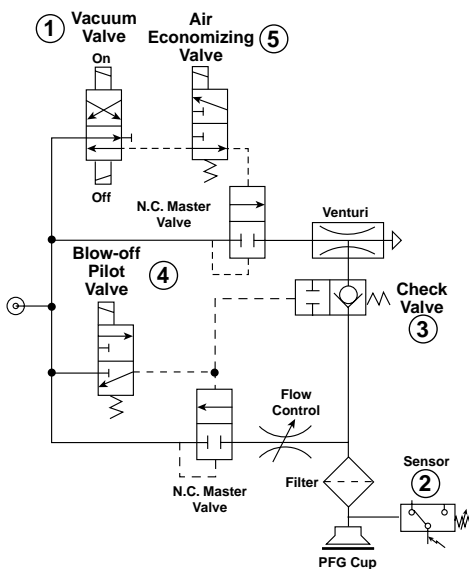
The CEK is a Normally Closed Vacuum On / Off valve that maintains the last state of air during an emergency stop or power loss. In addition to this, an air-economizing valve has been added to interrupt the air supply by connecting the output signal from the sensor to minimize air consumption.

This unit is ideal for non-porous applications that require fast response of large vacuum and blow-off release flow.

Typically, with a normally closed air circuit, the user controls vacuum with a command signal. During an Emergency Stop Event or power failure event, the vacuum command signal is lost, but, the Vacuum valve (1) remains in the current operating position due to the construction of the valve. The air-economizing valve (5), in a Normally Open configuration, passes the air supply from the Vacuum On / Off valve (1). The Sensor (2) output activates the air-economizing valve (5) closing the air supply to the Normally Closed master valve. The Check Valve (3) maintains the achieved vacuum level until the hysteresis value of the Sensor (2) is reached or when the Vacuum valve (1) has been returned to the closed position to stop the vacuum operation.



### Valve controlled emergency stop circuit



### Features

- Integrated double solenoid for last state
- Integrated vacuum pilot
- Integrated blow-off pilot
- Integrated filter, silencer
- Air economizing capabilities
- Manifolds for up to 5 units

### Model numbers

| Nozzle size | Maximum degree of vacuum | Sensor option | Valve option | Part number             |
|-------------|--------------------------|---------------|--------------|-------------------------|
| 1.5mm       | 27 inHg                  | No Sensor     | 24 VDC, PNP  | <b>CEK15HSZC24PBLN</b>  |
|             |                          | MPS-V23 (NPN) | 24 VDC, NPN  | CEK15HS41C24NBLN        |
|             |                          | MPS-V23 (PNP) | 24 VDC, PNP  | <b>CEK15HS42C24PBLN</b> |
| 2.0mm       | 27 inHg                  | No Sensor     | 24 VDC, PNP  | CEK20HSZC24PBLN         |
|             |                          | MPS-V23 (NPN) | 24 VDC, NPN  | CEK20HS41C24NBLN        |
|             |                          | MPS-V23 (PNP) | 24 VDC, PNP  | <b>CEK20HS42C24PBLN</b> |
| 2.7mm       | 27 inHg                  | No Sensor     | 24 VDC, PNP  | CEK27HSZC24PBLN         |
|             |                          | MPS-V23 (NPN) | 24 VDC, NPN  | CEK27HS41C24NBLN        |
|             |                          | MPS-V23 (PNP) | 24 VDC, PNP  | <b>CEK27HS42C24PBLN</b> |

Most popular.

**C**  
 Vacuum Generators  
 Vacuum Products  
 MCA, CV,  
 CV-CK  
 Series  
 CHF  
 Series  
 MC22  
 Series  
 MC72  
 Series  
 CEK  
 Series  
 CVXCEK  
 Series

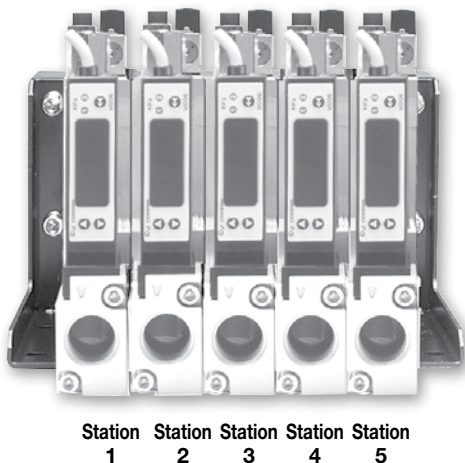




**Specifications**

|   |   |                                   |
|---|---|-----------------------------------|
| Media   | Non-lubricated compressed air, non-corrosive gases  |                                   |
| Operating pressure                                      | 70 PSI (5 kgf/cm <sup>2</sup> )   |                                   |
| Humidity  | 35 to 85%   |                                   |
| Pressure port   | N: 1/4 NPT female, G: 1/4 BSPP female   |                                   |
| Vacuum port   | N: 3/8 NPT female, G: 3/8 BSPP female   |                                   |
| Operating temperature                                   | 41 to 132°F (5 to 50°C)   |                                   |
| Material  | Aluminum, Brass, NBR  |                                   |
| <b>Air-economizing valve and blow-off release pilot</b> |   | <b>Emergency stop valve</b>       |
| Type of control valve                                   | Pilot valve   | Double solenoid                   |
| Manual operation  | Manual override   | Manual overrides                  |
| Electrical connection                                   | Clip connector with LED and surge   | Clip connector with LED and surge |
| Power supply  | 24VDC ± 10%   | 24VDC ± 10%                       |
| Power consumption                                       | 0.9W  | 0.9W                              |
| Operating pressure                                      | 70 PSI (5 kgf/cm <sup>2</sup> )   | 70 PSI (5 kgf/cm <sup>2</sup> )   |
| Air supply  | Normally closed   | Normally closed                   |
| Generator weight  | 26.3 oz. (750g)   |                                   |
| Manifold weight   | 2-Station: 24 oz. (680g), 3-Station: 31 oz. (880g), 4-Station: 38 oz. (1080g),<br>5-Station: 45 oz. (1280g) |                                   |

**Add-A-Fold assembly ordering information**

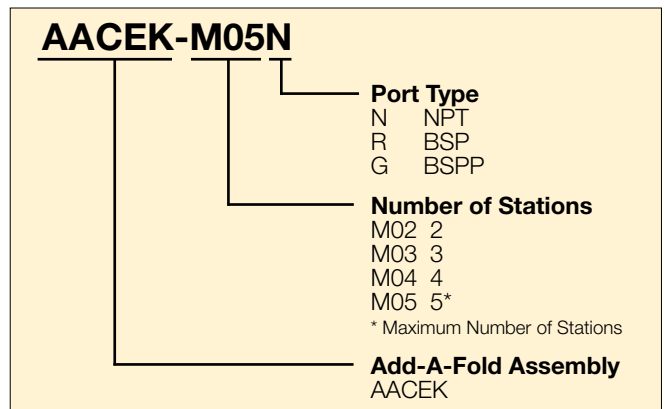


**Example 1:** Shown above is a 5-Station CVK manifold with sensors and NPT Ports.

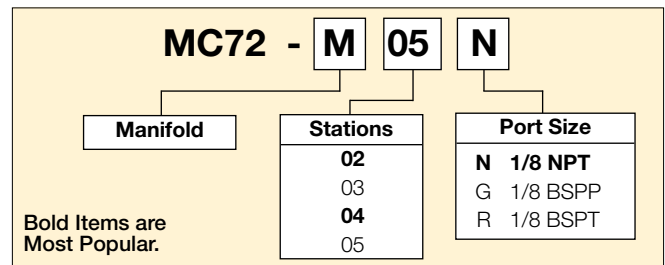
| Qty.                      | Part number             | Comment      |
|---------------------------|-------------------------|--------------|
| 1                         | AACEK-M04N.....         | Add-A-Fold   |
| 1                         | CEK215HS21C24NBLN ..... | Station #1   |
| 1                         | CEK215HS21C24NBLN ..... | Station #2   |
| 1                         | CEK220HS21C24NBLN ..... | Station #3   |
| 1                         | CEK220HS21C24NBLN ..... | Station #4   |
| 1                         | CEK227HS21C24NBLN ..... | Station #5   |
| <i>Alternative Method</i> |                         |              |
| 1                         | AACEK-M04N.....         | Add-A-Fold   |
| 2                         | CEK215HS21C24NBLN ..... | Station #1-2 |
| 2                         | CEK220HS21C24NBLN ..... | Station #3-4 |
| 1                         | CEK227HS21C24NBLN ..... | Station #5   |

**How to order Add-A-Fold assemblies**

1. Manifold assemblies are multiple line item listings.
2. First line item must be the Add-A-Fold assembly part number.
3. Subsequent line items listed identify each station in the manifold starting with station number 1.
4. Station number 1 is the left most generator when looking at the manifold generator ports.
5. List either a part number of the manifold type generator or a blank plate for each station of the manifold.
6. See model number index code for CEK Generator number and accessories for blank plate part numbers.



**Manifold part number**



**C**

Vacuum Generators  
Vacuum Products

MCA, CV,  
CV-CK

CHF  
Series

MC22  
Series

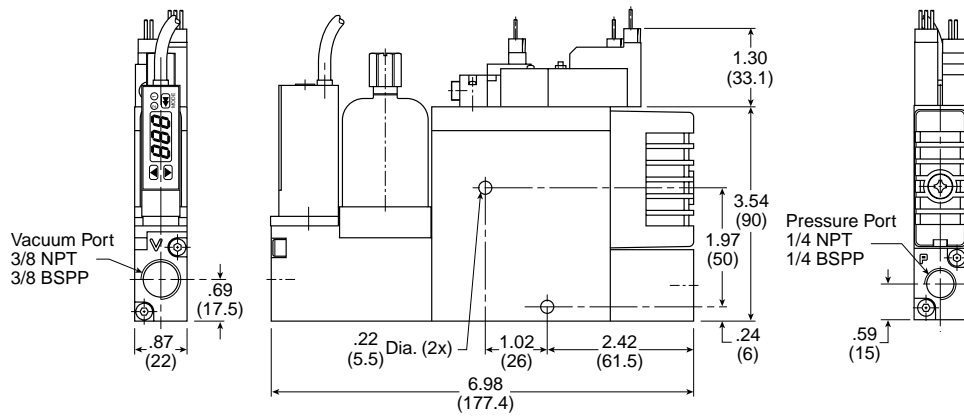
MC72  
Series

CEK  
Series

CVXCEK  
Series

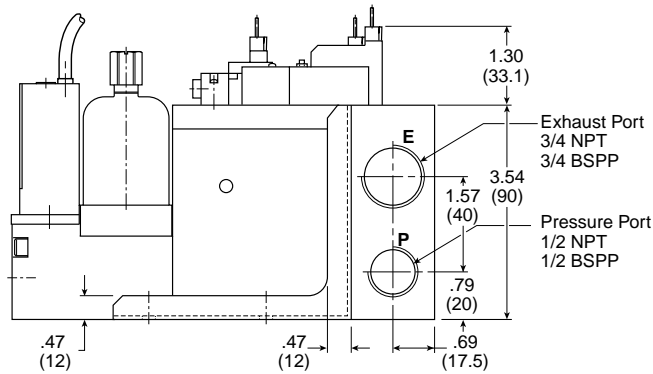
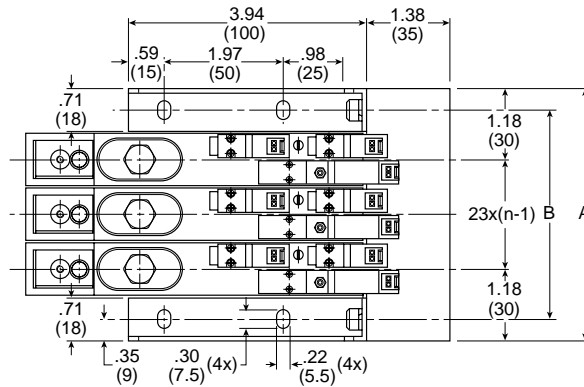


**Dimensions**



**Manifold**

3-Station manifold shown



| n | 2            | 3             | 4             | 5             |
|---|--------------|---------------|---------------|---------------|
| A | 3.27<br>(83) | 4.17<br>(106) | 5.08<br>(129) | 5.98<br>(152) |
| B | 2.56<br>(65) | 3.46<br>(88)  | 4.37<br>(111) | 5.28<br>(134) |

Inches (mm)  
 n = Number of stations

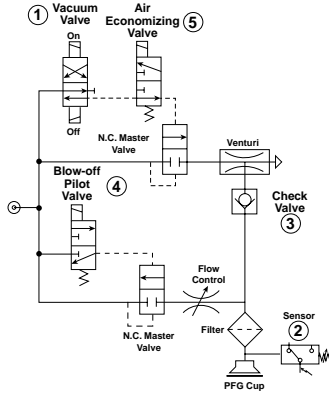
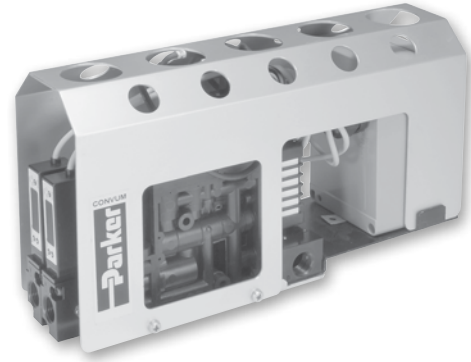
**C**  
 Vacuum Generators  
 Vacuum Products  
 MCA, CV,  
 CV-CK  
 Series  
 CHF  
 Series  
 MC22  
 Series  
 MC72  
 Series  
 CEK  
 Series  
 CVXCEK  
 Series





The CVXCEK vacuum generator creates vacuum and blow-off pressure in a vacuum system and has additional Air-economizing and emergency operating system functions.

Each CVXCEK unit consists of 2 independent vacuum generators labeled channel 1 and channel 2. Each vacuum generator has a vacuum ON / OFF solenoid pilot valve, blow-off solenoid pilot valve, Air-Economizing valve, blow-off needle control valve, pressure sensor, vacuum check valve, vacuum filter, and exhaust filter. Each Vacuum Generator is mounted to a 2-Station bar manifold with an optional electrical mounting kit. The pressure provided to inlet port of the bar manifold is common to both vacuum generators.



**Features**

- Integrated double solenoid for hold last state conditions
- Integrated vacuum pilot
- Integrated blow-off pilot
- Integrated filter, silencer
- Air economizing capabilities

**General operation of CVXCEK vacuum units**

A vacuum generator is a single stage Venturi that creates vacuum pressure using compressed air. In principle, compressed air is throttled as the air exits the nozzle and is discharged into the diffuser. This increased velocity of air lowers the pressure in the diffusion chamber. The volume of air within the closed vacuum system flows into the low-pressure area of the diffusion chamber and is exhausted thru the diffuser. This effect increases the vacuum level and evacuates most of the air within the closed vacuum. The vacuum generator will produce the specified degrees of vacuum as cataloged if the vacuum system is closed, inlet pressure is to design pressure, and there are no major restrictions in the exhaust flow.

Vacuum is created when the unit receives a momentary or maintained command vacuum "ON" signal, (high signal is sent

to Vacuum Pilot Valve (1). Once a preset vacuum degree (P-1) of the pressure sensor (2) is achieved, the Air-Economizing Valve is enabled to conserve compressed air. The vacuum level will be maintained by the Check Valve (3) until (P-2). At this point vacuum is turned back "ON" until the switch point (P-1) is achieved again. This cycle, which is called Air-economizing, will repeat until a blow-off signal is sent to the unit. When the Blow-off Pilot Valve (4) is activated to decay the vacuum pressure, the unit will release the part. Command vacuum "ON" should be turned "OFF" when command blow-off is turned "ON". The Emergency Stop operating system provides Air-Economizing or maximum degree of vacuum at the time of disruption of Input and Output Power.

**Model Number Index**

|  |   |   |  |  |   |
|--|---|---|--|--|---|
| <b>CVXCEK 27 D3 2 49 N B</b>               |   |   |  |  |   |
| <b>Nozzle Diameter</b><br>27 27HS 2.5mm    | <b>Electrical Enclosure</b><br>D1 M12, 110VAC<br><b>D3 M12, 24VDC, PNP</b><br>D4 M12, 110VAC, w/ Mtg. Plate<br>D6 M12, 24VDC, PNP w/ Mtg. Plate<br>N1 M18, 110VAC<br><b>N3 M18, 24VDC, PNP</b><br>N4 M18, 110VAC, w/ Mtg. Plate<br>N6 M18, 24VDC, PNP w/ Mtg. Plate | <b>Number of Channels</b><br>1 Generator w/ Blanking Plate<br><b>2 Generators</b> | <b>Voltage</b><br><b>49 24VDC</b><br>53 110VAC | <b>Engineering Level</b><br><b>B Current</b> | <b>Port Threads</b><br><b>N NPT</b><br>G BSPP |
| <p><b>Bold Items are Most popular.</b></p> |   |   |  |  |   |

|                                      |
|--------------------------------------|
| <b>C</b>                             |
| Vacuum Generators<br>Vacuum Products |
| MCA, CV,<br>CV-CK                    |
| CHF<br>Series                        |
| MC22<br>Series                       |
| MC72<br>Series                       |
| CEK<br>Series                        |
| CVXCEK<br>Series                     |



**Specifications**

|   |   |                         |                        |
|---|---|-------------------------|------------------------|
| Media   | Non-lubricated compressed air, non-corrosive gases  |                         |                        |
| Operating pressure                                      | 70 PSI  |                         |                        |
| Humidity  | 35 to 85%   |                         |                        |
| Pressure port   | N: 1/4 NPT female, G: 1/4 BSPP female   |                         |                        |
| Vacuum port   | N: 3/8 NPT female, G: 3/8 BSPP female   |                         |                        |
| Operating temperature                                   | 41 to 132°F (5 to 50°C)   |                         |                        |
| Material  | Body (PA and PBT) with other internal components (Brass, Al.NBR, SUS, FKM), filter elements (PVF) |                         |                        |
| <b>Air-economizing valve and blow-off release pilot</b> | <b>Vacuum pilot valve</b>   | <b>Sensors</b>          |                        |
| Type of control   | Single solenoid   | Double solenoid         | MPS-23 Pressure Sensor |
| Manual operation  | Manual override   | Manual overrides        | N/A                    |
| Electrical connection                                   | Clip connector  | Clip connector          | M8, 4-pin              |
| Power supply*   | 24VDC ± 10%   | 24VDC ± 10%             | 10.8 to 30VDC          |
| Solenoid power consumption                              | 0.6W with LED and surge   | 2.0W with LED and surge | 55mA                   |
| Operating pressure                                      | 70 PSI  | 70 PSI                  | -14.7 PSI to 72.5 PSI  |
| Air supply  | Normally closed   | Normally closed         | N/A                    |
| Manifold weight   | 1-Station: 49 oz. (1404g), 2-Station: 63 oz. (1787g)  |                         |                        |

\* 110VAC units use 24VDC solenoids and sensors.

**Performance**

| Series / nozzle diameter | Nozzle diameter (mm) | Vacuum degree at 70 PSI (inHg) | Vacuum flow per channel (SCFM) | Air consumption per channel (SCFM) |
|--------------------------|----------------------|--------------------------------|--------------------------------|------------------------------------|
| CVXCEK27                 | 2.5                  | 24                             | 5.20                           | 10.41                              |

**Evacuation time**

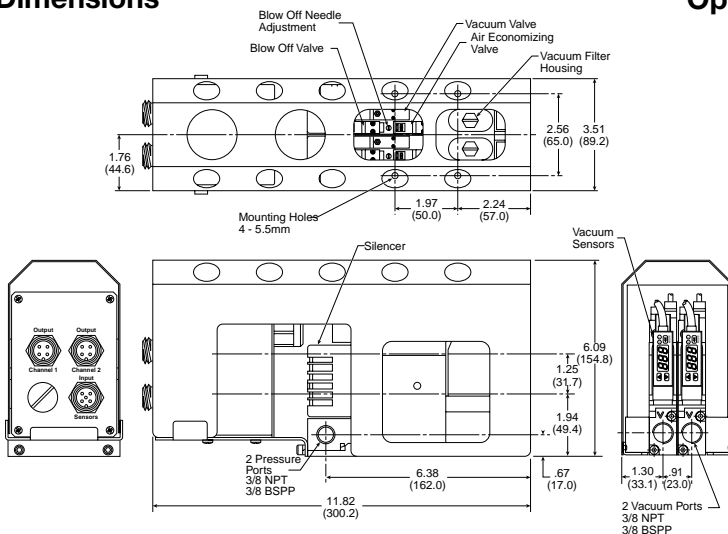
| Series / nozzle diameter | Air supply pressure PSI | Air consumption per channel SCFM | Evacuation time per channel in sec / ft <sup>3</sup> * to reach different vacuum levels (inHg) |      |      |      |     |       |       |       |    |
|--------------------------|-------------------------|----------------------------------|--|------|------|------|-----|-------|-------|-------|----|
|                          |                         |                                  | 3  | 6    | 9    | 12   | 15  | 18    | 21    | 24    | 27 |
| CVXCEK27                 | 70                      | 10.42                            | 0.66   | 2.19 | 3.29 | 6.14 | 9.3 | 14.55 | 23.21 | 46.13 | —  |

\* 1 ft<sup>3</sup> = 28.31 liters

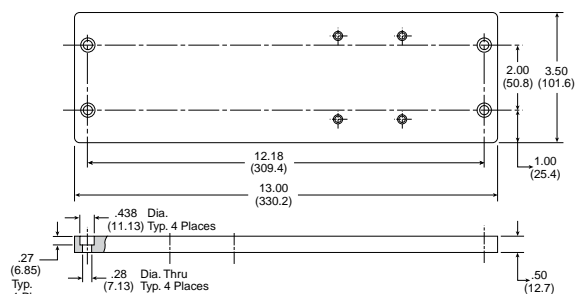
**Vacuum flow (SCFM)**

| Nozzle diameter | inHg |      |      |      |      |      |      |      |      |    |    |
|-----------------|------|------|------|------|------|------|------|------|------|----|----|
|                 | 0    | 3    | 6    | 9    | 12   | 15   | 18   | 21   | 24   | 27 | 30 |
| 25HS            | 5.20 | 4.61 | 4.01 | 3.41 | 2.82 | 2.22 | 1.63 | 1.04 | 0.46 | —  | —  |

**Dimensions**



**Optional mounting plate**

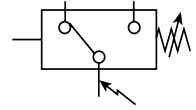


**C**  
 Vacuum Generators  
 Vacuum Products  
 MCA, CV, CV-CK Series  
 CHF Series  
 MC22 Series  
 MC72 Series  
 CEK Series  
 CVXCEK Series



**Features**

- Pressure range:  
 Vacuum pressure: 0 to -30 inHg
- Sensor output:  
 2 NPN or PNP open collector  
 Transistor output, 30VDC, 125mA
- Switch Point and Window Comparator Mode
- Selectable units of measure
- Output response time less than 2.0 milliseconds
- RoHS
- Air and non-corrosive gases
- Error message



**MPS-23 Sensor Only Ordering Numbers**

| Pressure range | Port thread   | Electrical output | Electrical connection | Part number        |
|----------------|---------------|-------------------|-----------------------|--------------------|
| 0-30 inHg      | Ejector mount | (2) PNP           | M8 on 1M cable, 4-pin | <b>MPS-V23C-PC</b> |
| 0-30 inHg      | Ejector mount | (2) NPN           | M8 on 1M cable, 4-pin | <b>MPS-V23C-NC</b> |

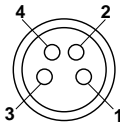
**MPS-23 Accessories**

|                          |                        |
|--------------------------|------------------------|
| M8, 4-pin, 2 meter cable | <b>CB-M8-4P-2M-PUR</b> |
| M8, 4-pin, 5 meter cable | <b>CB-M8-4P-5M-PUR</b> |

**Sensor pin out**

**Pin #**

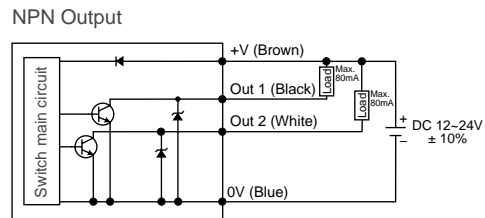
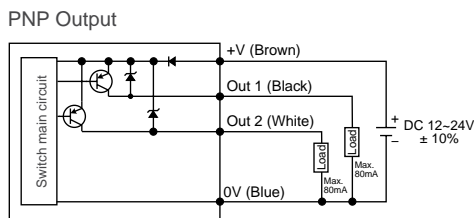
- 1 Brown: 24VDC
- 2 White: PNP/NPN Open Collector Output 2
- 3 Blue: 0VDC
- 4 Black: PNP/NPN Open Collector Output 1



**Programming options**

|                            |   |
|----------------------------|---|
| Outputs change N.O. / N.C. | ✓ |
| Units of measure change    | ✓ |
| Hysteresis mode            | ✓ |
| Window comparator mode     | ✓ |
| Auto teach mode            | ✓ |
| Output response time       | ✓ |
| Lockout option             | ✓ |
| Password lockout           | - |
| Max. value display         | ✓ |
| Min. value display         | ✓ |
| Zero reset                 | ✓ |
| Error output mode          | ✓ |

**Internal circuit for open collector and analog output wiring**



Most popular.

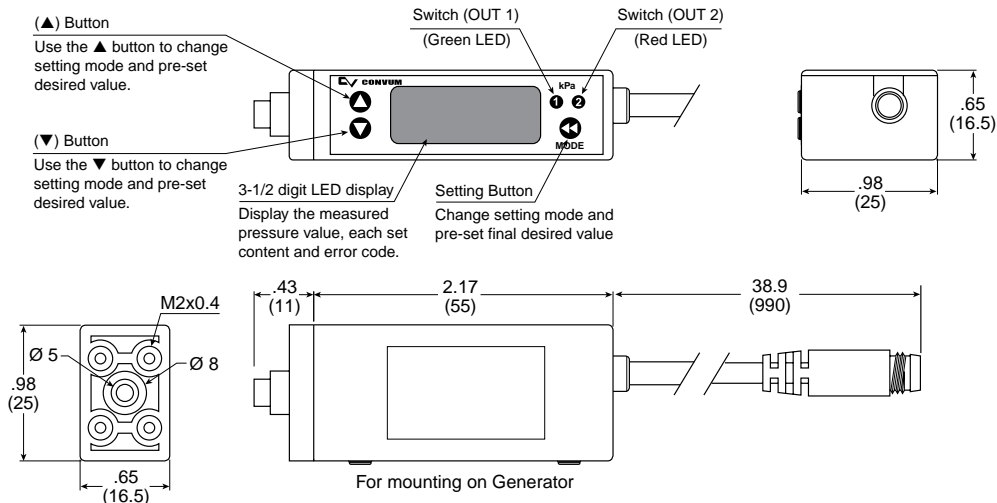


**Specifications**

|                       |   |
|-----------------------|---|
| Pressure range        | -101.3 - 0 kPa (-14.5 to 0 PSI)   |
| Proof pressure        | 0.3 Mpa (44 PSI)  |
|                       | 0.1, kPa  |
|                       | 0.001, kgf/cm <sup>2</sup>  |
|                       | 0.001, bar  |
| Display resolution,   | 0.01, PSI   |
| Units of measure      | 0.1, inHg   |
|                       | 1, mmHg   |
|                       | 0.1, mmH <sub>2</sub> O   |
| Media                 | Air & non-corrosive gases, incombustible gases                          |
| Pressure port         | Generator mount only  |
| Operating temperature | 32 to 122°F (0 to 50°C)   |
| Storage temperature   | -4 to 140°F (-20 to 60°C)   |
| Humidity              | 40 - 85% RH (no condensation)   |
| Electrical connection | <b>(C)</b> 4-pin, M8 connector on 1M lead wire                          |
| Power supply          | 12 to 24VDC ±10% or less, Ripple (Vp-p) 10% or less                     |
| Display               | 3 + 1/2 digit, 1 color, 7-segment RED LED                               |
| Display refresh       | .1 to 3.0 Seconds, Variable (factory set at 0.1)                        |
| Control output        | NPN (Sinking), PNP (Sourcing), Open collector, max 80mA, 2 output       |
| Switch output         | Output signal, NPN or PNP, Normally open or closed, LED indicator       |
| Output indicator      | Green LED (OUT1), Red LED (OUT2)  |
| Output modes          | Hysteresis or Window Comparator   |
| Response time         | ≤ 2.5ms (chattering-proof function: 24ms, 192ms, 786m selections)       |
| Repeatability         | ± 0.2% of F.S. ± 1 digit or less  |
| Thermal error         | ≤ ± 2% of F.S. or less at range of 32 to 122°F (0 to 50°C)              |
| General protection    | IP40, CE marked, EMC-EN61000-6-2: 2001                                  |
| Current consumption   | <55mA   |
| Vibration resistance  | 10 to 150Hz, Double amplitude 1.5mm, XYZ, 2 hrs.                        |
| Shock resistance      | 980 m/s <sup>2</sup> (about 10G), 3 times/each directions X, Y, Z       |
| Noise resistance      | Vp-p400V, 10 ms, 0.5µs noise simulator                                  |
| Material              | Housing: ABS (black) , Pressure port: Zinc die-cast, Diaphragm: Silicon |
| Mass                  | 2 oz. (65g) (including 1m cable)  |

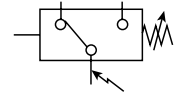
**Dimensions**

**Generator mount**



**C**  
 Generator Sensors  
 Vacuum Products  
 MPS-23 Series  
 MVS-201 Series

The MVS-201 is a winning combination with the MC2, CVR-2, and CVK vacuum generators. The MVS-201 automatically provides an output signal for the blow-off function without the need of an additional output from the PLC. Begin the vacuum cycle with an output signal from the PLC to the "201" sensor. The "201" sensor has one NPN or PNP output for vacuum confirmation and a control output that interfaces directly with the blow-off release pilot valve. With programmable time control features and a special chip driver, the sensor automatically activates the blow-off release when the NPN or PNP vacuum signal from the PLC is discontinued. This eliminates, THE PREVIOUSLY REQUIRED, PLC output to activate the blow-off release. This technology eliminates PLC output requirements by 50% and reduces installation to a simple 4 wire system by wiring the sensor only. There are 3 modes of operation for various applications. The output response time of the sensor is less than 2.5 msec. Peak limit prevention maintenance feature is automatically recorded internally.



**For use with MC22 / MC72 generators**

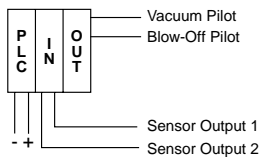
**Features**

- Time controlled sensor
- Intelligent simple 4-wire system
- Eliminate I/O for release valve
- 2 functions with one rung of code
- Automatic timer (0-9.9 Sec.) function by sensor control driver for vacuum generating and release valves
- Peak value preventative maintenance confirmation
- Response time less than 2 milliseconds

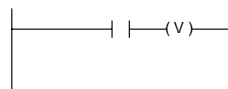
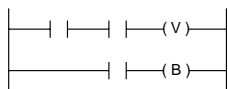
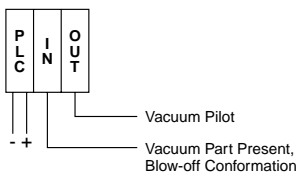
**Programming options**

|                                   |   |
|-----------------------------------|---|
| Outputs change N.O. / N.C.        | ✓ |
| Units of measure change           | ✓ |
| Hysteresis mode                   | ✓ |
| Lockout option                    | ✓ |
| Zero reset                        | ✓ |
| Energy savings mode               | ✓ |
| Air conservation / blow-off timer | ✓ |
| Vacuum timer option               | ✓ |
| Signal controlled vacuum          | ✓ |
| Blow-off activation timer         | ✓ |
| Blow-off timer                    | ✓ |
| Vacuum confirmation signal        | ✓ |
| Blow-off confirmation signal      | ✓ |
| Peak vacuum error message         | ✓ |
| Vacuum response error message     | ✓ |
| Blow-off time error message       | ✓ |

**Basic PLC System**



**PLC System with 201 Sensor**



**MVS-201 Ordering Numbers**

| Pressure range    | Output circuit | Input circuit | Electrical connector * | Part number        |
|-------------------|----------------|---------------|------------------------|--------------------|
| -14.7 to 72.5 PSI | PNP sourcing   | PNP sourcing  | 4 Pin, M8              | <b>MVS-201-PCP</b> |
|                   | NPN sinking    | NPN sinking   |                        | <b>MVS-201-NC</b>  |

\* Requires sensor to valve electrical connector

**Note:**

Output Circuit provides vacuum and blow-off confirmation signal (Input Signal to PLC).  
 Input Circuit controls vacuum solenoid valve (Output Signal from PLC).

**Sensor to valve electrical connector**

| Generator series | Sensor connection | Valve connection | Part number       |
|------------------|-------------------|------------------|-------------------|
| MC22             | 5 Pin Clip Type   | 2 with clip type | <b>MC22-C201G</b> |
| MC72             |                   | 2 wire leads     | <b>CVK-D201G</b>  |

Most popular.

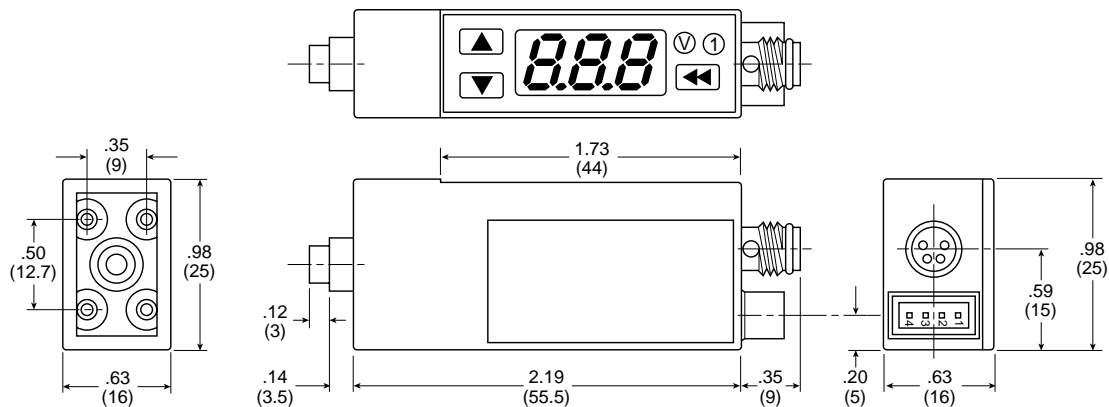


### Specifications

|                       |   |
|-----------------------|---|
| Pressure range        | Compound pressure: -14.7 to 72.5 PSI  |
|                       | bar: 0.01   |
| Display resolution,   | kPa: 1  |
| Units of measure      | kgf/cm <sup>2</sup> : 0.01  |
|                       | PSI: 0.1  |
| Media                 | Non-lubricated air and non-corrosive gases  |
| Proof pressure        | 116.0 PSI   |
| Operating temperature | 32 to 122°F (0 to 50°C)   |
| Storage temperature   | 14 to 140°F (-10 to 60°C)   |
| Humidity              | 35 to 85% RH  |
| Electrical connection | 4-pin, M8 connector   |
| Power supply          | 10.8 to 30VDC, Ripple Vp-p 10% Max., Reverse voltage protection                   |
| Display               | 3-Digit, 7-Segment LED  |
| Display frequency     | 5Hz   |
| Circuit               | NPN (Sinking), PNP (Sourcing) open collector transistor                           |
| Digital output        | Individually selectable N.O. or N.C., max 125mA, 30V, with overcurrent protection |
| Mode                  | OP1, OP2, OP3 hysteresis: 0 to 100% of switch point                               |
| Response time         | < 2ms   |
| Repeatability         | ± 0.3% F.S.   |
| Thermal error         | ±0.2% F.S. in temperature range: 32 to 122°F (0 to 50°C)                          |
| General protection    | IP40, CE marked, EMC-EN55011 Class B, EN50082-1                                   |
| Current consumption   | < 45mA, < 25mA when utilizing screen saver option                                 |
| Spike protection      | 350 Vp, 1, μs   |
| Dielectric strength   | 1000 VAC 1 min.   |
| Insulation resistance | > 100M ohms at 500VDC   |
| Vibration resistance  | 10 to 55Hz, 1.5mm, XYZ, 2 hrs.  |
| Shock resistance      | 10 G, XYZ   |
| Material              | Body: Polycarbonate   |
| Mass                  | 1.7 oz. (45g)   |

### Dimensions

#### M8, 4-pin



**C**  
 Generator Sensors  
 Vacuum Products  
 MPS-23 Series  
 MVS-201 Series

Maintaining an acceptable level of vacuum is critical to the performance of vacuum systems that have a single source vacuum generator with multiple cups. The Parker Flow Sensing Valve assists in maintaining an acceptable vacuum level if the vacuum cup does not make a proper seal. The valve will automatically close if the cup loses the seal with the product during a pick and place motion.

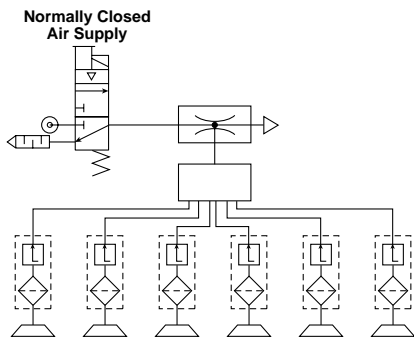
The Parker Flow Sensing Valve is a normally open valve that switches to a closed state when the vacuum flow rate from the cup side to the generator side is greater than the switching flow rate of the flow sensing valve. The Flow Sensing Valve “Checks” the vacuum flow. The vacuum flow rate of the generator must be more than the switching flow rate of the Flow Sensing Valve or it will not switch to a “Checked” position.

When using multiple Flow Sensing Valves per generator, the flow rate of the generator must be more than the combined switching flow rates of the flow valves and any other leak path. For example, a CV20-HSN has a maximum flow rate of 3.88 SCFM and a 1/8 Flow Sensing Valve has a switching flow rate of 0.28 SCFM. Therefore 13 Flow Sensing Valves can be connected in parallel to a CV20-HSN.

Once a Flow Sensing Valve is “Checked”, a small amount of by-pass flow occurs. This leakage allows a generator to be turned on prior to the cup being in place on a product and is the flow path used to evacuate the cup volume. The by-pass flow will decrease the maximum degree of vacuum in a system, and is considered a leak path when the cup is not sealed on a product. Blow off functions will still operate by forcing the Flow Sensing Valve to a full open position, allowing the part to be blown off.

**Features**

- Pick and place randomly placed products
- Minimize vacuum loss when cup seal is lost
- Direct mounting to cups
- 1/8 to G3/8 connection
- Integrated bronze filter



**FSV Series Ordering Information**

| Description | Part number   |
|-------------|---------------|
| 1/8" BSPP   | <b>FSV-G1</b> |
| 1/4" BSPP   | <b>FSV-G2</b> |
| 3/8" BSPP   | <b>FSV-G3</b> |

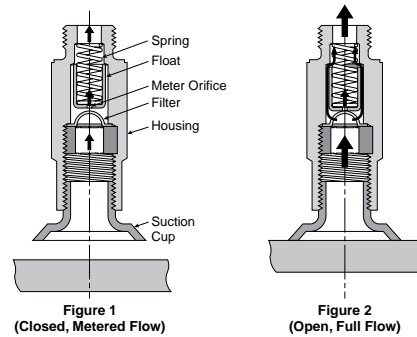
  Most popular.



**Operation**

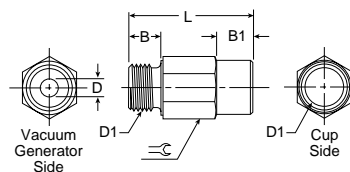
When the flow of air from the cup side to the generator side is greater than the switching flow rate of the valve, the float is drawn back against the spring and seals on the housing. In this state, flow passes through an orifice on the float. Vacuum flow is “Checked”. (See Figure 1).

When the cup comes in contact and seals on a product, flow is reduced and the spring forces the float towards the cup side inlet. This breaks the seal at the float and the full open state is restored. (See Figure 2).



**Specifications**

| Description         | FSV-G1                        | FSV-G2 | FSV-G3     |
|---------------------|-------------------------------|--------|------------|
| Switching flow rate | 0.28 SCFM                     |        | 0.875 SCFM |
| Nominal size        | 4mm                           |        |            |
| Housing material    | Anodized aluminum             |        |            |
| Filter material     | Al-Niro mesh                  |        |            |
| Temperature range   | 14°F to 140°F (-10°C to 60°C) |        |            |
| Maximum pressure    | 145 PSI                       |        | 115 PSI    |
| Media               | Atmospheric air               |        |            |
| Weight (grams)      | 0.009                         | 0.016  | 0.029      |



**Dimensions**

|               | B             | B1           | D           | D1   | L            | ⌀            |
|---------------|---------------|--------------|-------------|------|--------------|--------------|
| <b>FSV-G1</b> | 0.26<br>(6.5) | 0.43<br>(11) | 0.16<br>(4) | G    | 1.42<br>(36) | 0.51<br>(13) |
| <b>FSV-G2</b> | 0.33<br>(8.5) | 0.43<br>(11) | 0.16<br>(4) | G1/4 | 1.50<br>(38) | 0.67<br>(17) |
| <b>FSV-G3</b> | 0.47<br>(12)  | 0.51<br>(13) | 0.16<br>(4) | G3/8 | 1.65<br>(42) | 0.87<br>(22) |

inches (mm)

**C**  
 Generator Accessories  
 Vacuum Products  
 FSV Series  
 CH01 Series  
 VF & VL Filters  
 VFP Filters  
 Vacuum Silencers



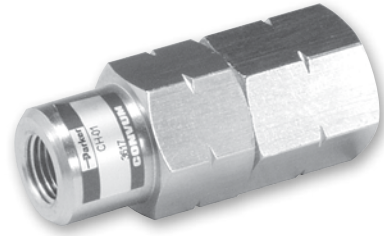


The CH Check valve is used to hold a degree of vacuum downstream from the check valve when the vacuum generator upstream from the check valve is turned off. A separate blow-off connection downstream from the CH check valve is required to destroy the vacuum pressure and blow off the part.

This check valve is an open or passing flow path when there is a differential pressure from the pad side to the generator side.

**Features**

- Poppet design
- Low leakage
- Low cracking pressure

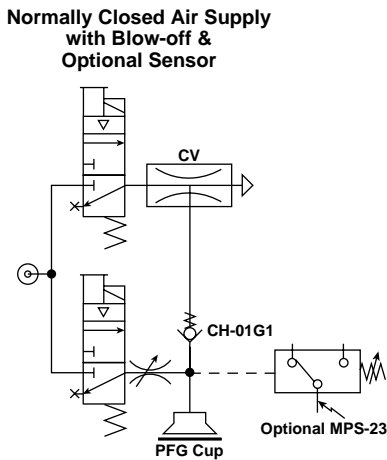


**Specifications**

|                   |   |
|-------------------|---|
| Temperature range | 32°F to 140°F (0° to 60°C)                |
| Operating vacuum  | -4.25 to -13.89 PSIG (-8.7 to -28.3 inHg) |
| Port size         | Pad side = 1/4", Generator side = 1/8"    |
| Leakage rate      | 0.2 PSI / minute (0.4 inHg / minute)      |
| Cracking pressure | 2.9 PSIG (5.9 inHg)                       |

**Material Specifications**

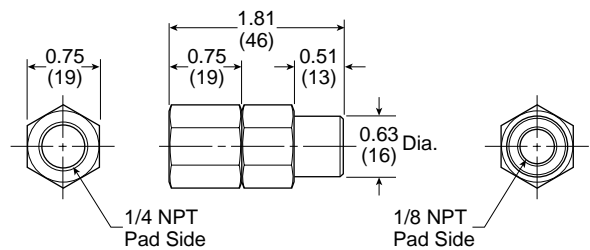
|                       |                  |
|-----------------------|------------------|
| Valve body / Fittings | Brass / Aluminum |
| Seals                 | BUNA             |
| Spring                | SUS              |



**CH01 Series Ordering Information**

| Description | Part number    |
|-------------|----------------|
| BSPP Ports  | <b>CH-01G1</b> |
| NPT Ports   | <b>CH-01N1</b> |

**Dimensions**



Most popular.



**C**  
 Generator Accessories  
 Vacuum Products  
 FSV Series  
 CH01 Series  
 VF & VL Filters  
 VFP Filters  
 Vacuum Silencers



Always filtrate the vacuum system to protect the components from damaging particles absorbed from the environment. Elements should be replaced periodically to prevent slower response and overall performance of the system.

**Specifications**

|                       |   |
|-----------------------|---|
| Media                 | Non-corrosive air   |
| Operating vacuum      | 0 to 28 inHg  |
| Maximum pressure      | 60 PSI  |
| Operating temperature | 32 to 140°F   |
| Filtration            | 120 µm (VF-2),<br>130 µm (VF-3, VF-5, VF-6, VFL-44, 66, 88) |



**VF & VL Series Ordering Information**

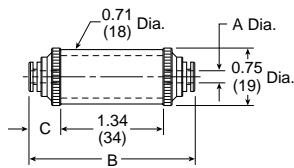
| Application      | Male connection | Replacement elements | Replacement cover, o-ring | Part number   |
|------------------|-----------------|----------------------|---------------------------|---------------|
| CV-05, CV-10     | G1/8"           | <b>VF-2E</b>         | —                         | <b>VF-2G</b>  |
| CV-05, CV-10     | G1/8"           | <b>VF-3E</b>         | <b>VF-3K</b>              | <b>VF-3G</b>  |
| CV-15, MCA-10/13 | G1/4"           | <b>VF-5E</b>         | <b>VF-3K</b>              | <b>VF-5G</b>  |
| CV-20/25/30      | G3/8"           | <b>VF-6E</b>         | <b>VF-3K</b>              | <b>VF-6G</b>  |
| General use      | 4mm - Tube      | <b>VFL-E</b>         | <b>VFL-44K</b>            | <b>VFL-44</b> |
| General use      | 6mm - Tube      | <b>VFL-E</b>         | <b>VFL-66K</b>            | <b>VFL-66</b> |
| General use      | 8mm - Tube      | <b>VFL-88E</b>       | <b>VFL-88K</b>            | <b>VFL-88</b> |

**Material Specifications**

| Part number | Material housing | Material element         | Weight (oz.) |
|-------------|------------------|--------------------------|--------------|
| VF-2G       | Aluminum         | Acrylic, Stainless steel | 1.54         |
| VF-3G       | Aluminum         | PC, Polyvinyl            | 3.10         |
| VF-5G       | Aluminum         | PC, Polyvinyl            | 5.15         |
| VF-6G       | Aluminum         | PC, Polyvinyl            | 8.25         |
| VFL-44      | Poly-carbonate   | PC, Polyvinyl            | 0.67         |
| VFL-66      | Poly-carbonate   | PC, Polyvinyl            | 0.74         |
| VFL-88      | Poly-carbonate   | PC, Polyvinyl            | 0.81         |

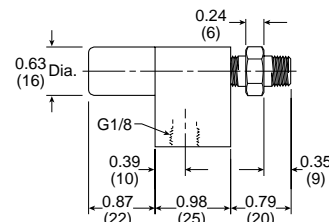
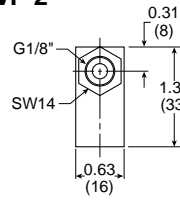
**Dimensions**

**VFL Series**

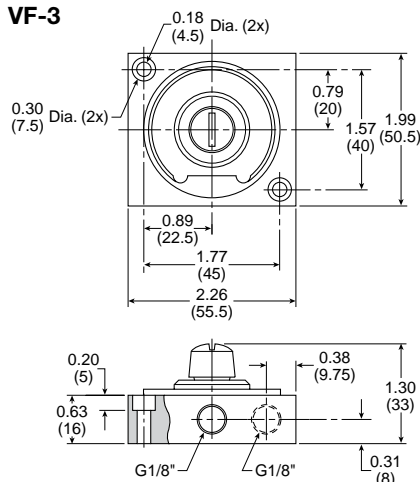


| Part number | A        | B         | C           |
|-------------|----------|-----------|-------------|
| VFL-44      | 0.16 (4) | 2.17 (55) | 0.41 (10.5) |
| VFL-66      | 0.24 (6) | 2.28 (58) | 0.47 (12)   |
| VFL-88      | 0.31 (8) | 2.44 (62) | 0.55 (14)   |

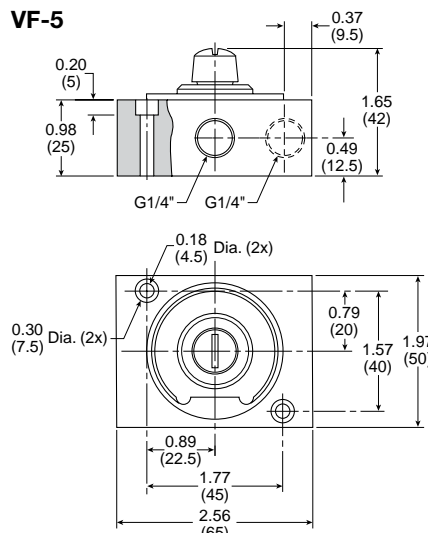
**VF-2**



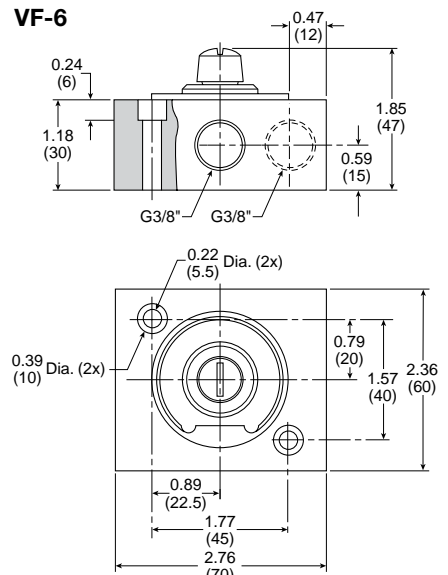
**VF-3**



**VF-5**



**VF-6**



Most popular.



Parker plastic in-line filters provide easy monitoring, economy and safety. These shatterproof filters are airtight and can withstand high pressures.

A 10 micron porous plastic element prolongs element life under the most adverse environmental conditions.

**Features**

- To filter dust and other small particles from the vacuum flow
- Reduces the risk of operation breakdown or stoppage in the vacuum pump
- Replaceable filter element
- Made in the U.S.A.



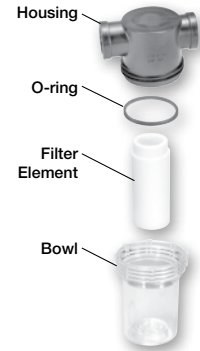
| Operating information |                               |
|-----------------------|-------------------------------|
| Media:                | Non-corrosive air             |
| Temperature range:    | -4°F to 176°F (-20°C to 80°C) |
| Operating vacuum:     | -14.5 to 0 PSI (0 to 28 inHg) |
| Maximum pressure:     | 150 PSI                       |
| Removal efficiency:   | 10 µm                         |

**Material specifications**

|                |                      |
|----------------|----------------------|
| Housing        | Polypropylene (PP)   |
| Bowl           | Polyamide nylon (PA) |
| Filter element | Polyethylene (PE)    |

**Replacement components**

| Description                      | Size          | Part number     |
|----------------------------------|---------------|-----------------|
| Clear Bowl Kit (Includes O-ring) | 1/8, 1/4, 3/8 | <b>PS577601</b> |
|                                  | 1/2, 3/4      | <b>PS577602</b> |
|                                  | 1, 1-1/2      | <b>PS577603</b> |
| BUNA O-ring                      | 1/8, 1/4, 3/8 | <b>PS577701</b> |
|                                  | 1/2, 3/4      | <b>PS577702</b> |
|                                  | 1, 1-1/2      | <b>PS577703</b> |
| Filter Element Kit*              | 1/8, 1/4      | <b>PS577801</b> |
|                                  | 3/8           | <b>PS577801</b> |
|                                  | 1/2, 3/4      | <b>PS577802</b> |
|                                  | 1             | <b>PS577803</b> |
|                                  | 1-1/2         | <b>PS577804</b> |



\* All Filter Elements are sold as a 3-pack.

**VFP Series Ordering information**

| Port size | Flow SCFM* | Weight (oz) | Internal Volume in <sup>3</sup> | Filter area in <sup>2</sup> | Basic filter with element |                  | Basic filter with 2 spare elements |                  |
|-----------|------------|-------------|---------------------------------|-----------------------------|---------------------------|------------------|------------------------------------|------------------|
|           |            |             |                                 |                             | NPT                       | BSPP             | NPT                                | BSPP             |
| 1/8       | 25         | 1.7         | 2.10                            | 4.9                         | <b>VFP0CFC01</b>          | <b>VFP0CFC11</b> | <b>VFP0CFC03</b>                   | <b>VFP0CFC13</b> |
| 1/4       | 35         | 1.98        | 2.4                             | 4.9                         | <b>VFP1CFC01</b>          | <b>VFP1CFC11</b> | <b>VFP1CFC03</b>                   | <b>VFP1CFC13</b> |
| 3/8       | 45         | 2.47        | 2.7                             | 4.9                         | <b>VFP2CFC01</b>          | <b>VFP2CFC11</b> | <b>VFP2CFC03</b>                   | <b>VFP2CFC13</b> |
| 1/2       | 130        | 6.61        | 11.9                            | 16.0                        | <b>VFP3CFC01</b>          | <b>VFP3CFC11</b> | <b>VFP3CFC03</b>                   | <b>VFP3CFC13</b> |
| 3/4       | 175        | 6.42        | 12.5                            | 16.0                        | <b>VFP4CFC01</b>          | <b>VFP4CFC11</b> | <b>VFP4CFC03</b>                   | <b>VFP4CFC13</b> |
| 1         | 290        | 15          | 30.2                            | 29.5                        | <b>VFP5CFC01</b>          | <b>VFP5CFC11</b> | <b>VFP5CFC03</b>                   | <b>VFP5CFC13</b> |
| 1-1/2     | 430        | 18.80       | 41.2                            | 35.0                        | <b>VFP6CFC01</b>          | <b>VFP6CFC11</b> | <b>VFP6CFC03</b>                   | <b>VFP6CFC13</b> |

\* 90 PSIG inlet and 5 PSIG pressure drop

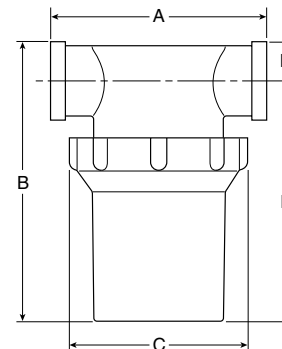
**Dimensions**

| Part number                            | A              | B              | C              | D              | E             |
|--|----------------|----------------|----------------|----------------|---------------|
| <b>VFP0CFC*1, VFP1CFC*1, VFP2CFC*1</b> | 3.1<br>(78.7)  | 2.4<br>(61)    | 1.9<br>(48.3)  | 2.0<br>(50.8)  | 0.4<br>(10.2) |
| <b>VFP3CFC*1</b>                       | 3.6<br>(91.4)  | 5.1<br>(129.5) | 2.9<br>(73.6)  | 4.4<br>(111.6) | 0.7<br>(17.8) |
| <b>VFP4CFC*1</b>                       | 3.6<br>(91.4)  | 5.1<br>(129.5) | 2.9<br>(73.6)  | 4.6<br>(116.9) | 0.5<br>(12.7) |
| <b>VFP5CFC*1</b>                       | 4.9<br>(124.5) | 6.4<br>(162.6) | 4.0<br>(101.6) | 5.6<br>(142.2) | 0.8<br>(20.3) |
| <b>VFP6CFC*1</b>                       | 5.2<br>(132.1) | 8.1<br>(209.9) | 4.0<br>(101.6) | 6.9<br>(175.3) | 1.2<br>(30.5) |

inches (mm)

\* 0 (NPT), 1 (BSPP)

☐ Most popular.



**C**  
 Generator Accessories  
 Vacuum Products  
 Series  
 FSV  
 CH01  
 Series  
 VF & VL  
 Filters  
 VFP  
 Filters  
 Vacuum  
 Silencers



Protect the environment against harmful noise levels with quality silencers.



**Silencer Ordering Information**

| For generator series | Male connection | Part number   |
|----------------------|-----------------|---------------|
| CV-05, CV-10         | G1/8"           | <b>MSS-01</b> |
| CV-05, CV-10         | G1/8"           | <b>MSS-02</b> |
| CV-15, MCA-10/13     | G1/4"           | <b>MSM-01</b> |
| CV-20                | G1/2"           | <b>MSL-02</b> |
| CV-25, CV-30         | G3/4"           | <b>MS6-01</b> |

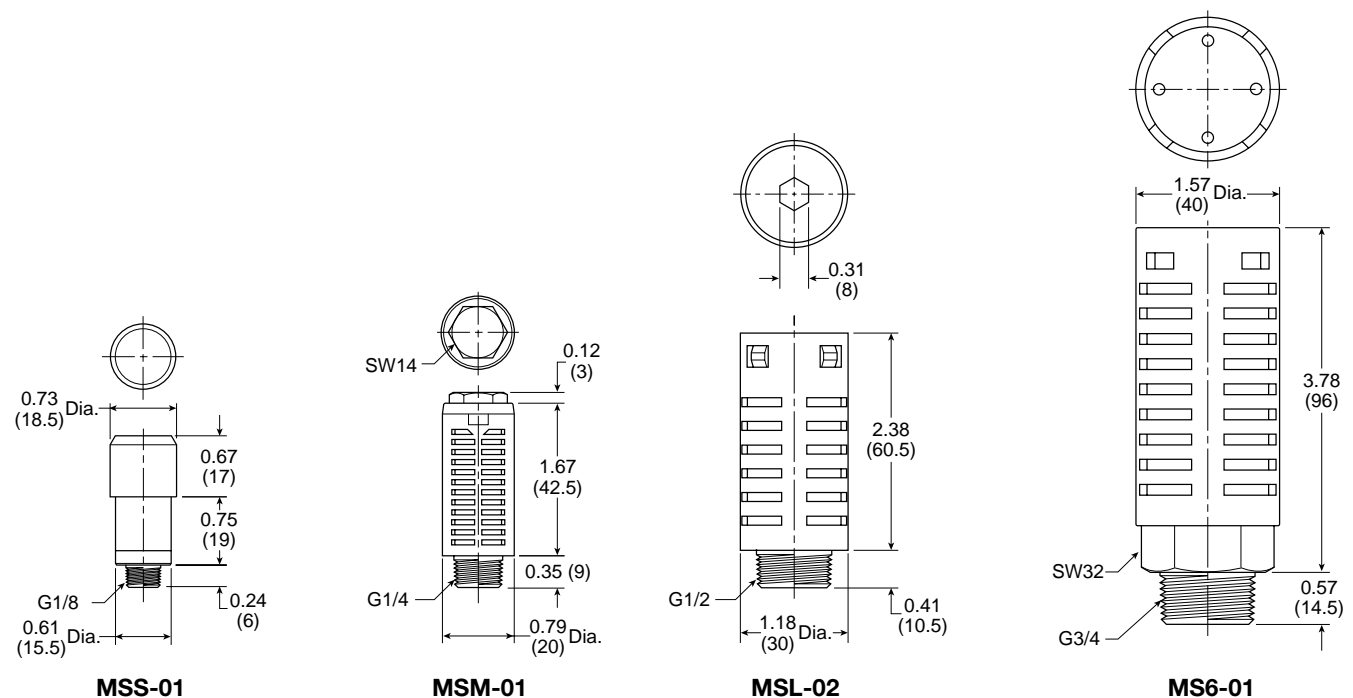
**Specifications**

|                       |                               |
|-----------------------|-------------------------------|
| Media                 | Non-corrosive air             |
| Maximum pressure      | 128 PSI                       |
| Operating temperature | 41°F to 132°F (5°C to 55.5°C) |
| Silencing effect      | 20 dB                         |

**Material Specifications**

| Part number   | Material housing | Material element | Media | Weight (oz.) |
|---------------|------------------|------------------|-------|--------------|
| <b>MSS-01</b> | Polyacetal       | Felt, Urethane   | Air   | 0.17         |
| <b>MSS-02</b> | Polyacetal       | Stainless steel  | Oil   | 0.17         |
| <b>MSM-01</b> | Polyurethane     | Felt             | Air   | 0.24         |
| <b>MSL-02</b> | Nylon            | Vinyl            | Air   | 0.88         |
| <b>MS6-01</b> | Nylon            | Polyvinyl Forma  | Air   | 2.01         |

**Dimensions**



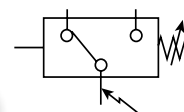
Most popular.

**C**  
 Generator Accessories  
 Vacuum Products  
 FSV Series  
 CH01 Series  
 VF & VL Filters  
 VFP Filters  
 Vacuum Silencers



**Features**

- Sensor output:  
 2 NPN or PNP open collector  
 Transistor output, 30VDC, 125mA with  
 Analog output, 1 to 5VDC
- Output response time less than 2.0 milliseconds
- RoHS
- Air and non-corrosive gases



**Programming options**

|                                 |   |
|---------------------------------|---|
| Outputs change N.O. / N.C.      | ✓ |
| Units of measure change         | ✓ |
| Hysteresis mode                 | ✓ |
| Window comparator mode          | ✓ |
| Auto teach mode                 | ✓ |
| Output response time            | ✓ |
| Lockout option                  | ✓ |
| Password lockout                | — |
| Max. value display              | ✓ |
| Min. value display              | ✓ |
| Zero reset                      | ✓ |
| Red / Green LED display options | — |
| Error output mode               | ✓ |

**MPS-33 Sensor Only Ordering Numbers**

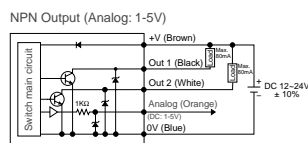
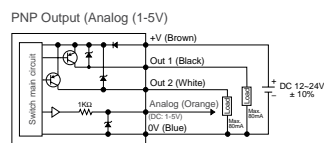
| Pressure range  | Electrical output       | Electrical connection | Part number          |                      |
|-----------------|-------------------------|-----------------------|----------------------|----------------------|
|                 |                         |                       | 1/8 NPSF Female      | 1/8 BSPP Female      |
| 0-30 inHg       | (2) PNP with (1) 1-5VDC | 2M 5 wire lead wire   | <b>MPS-V33N-PGAT</b> | <b>MPS-V33G-PGAT</b> |
| 0-30 inHg       | (2) NPN with (1) 1-5VDC | 2M 5 wire lead wire   | <b>MPS-V33N-NGAT</b> | <b>MPS-V33G-NGAT</b> |
| -14.5 to 72 PSI | (2) PNP with (1) 1-5VDC | 2M 5 wire lead wire   | <b>MPS-R33N-PGAT</b> | <b>MPS-R33G-PGAT</b> |
| -14.5 to 72 PSI | (2) NPN with (1) 1-5VDC | 2M 5 wire lead wire   | <b>MPS-R33N-NGAT</b> | <b>MPS-R33G-NGAT</b> |
| 0-145 PSI       | (2) PNP with (1) 1-5VDC | 2M 5 wire lead wire   | <b>MPS-P33N-PGAT</b> | <b>MPS-P33G-PGAT</b> |
| 0-145 PSI       | (2) NPN with (1) 1-5VDC | 2M 5 wire lead wire   | <b>MPS-P33N-NGAT</b> | <b>MPS-P33G-NGAT</b> |

**MPS-33 Accessories**

| Description  | Part Number      |
|--|------------------|
| Panel mounting bracket<br>Note : Add "H" in suffix of Sensor Only Part Number to include with sensor   | <b>MPS-ACCH8</b> |
| Surface mounting bracket<br>Note : Add "K" in suffix of Sensor Only Part Number to include with sensor | <b>MPS-ACCK8</b> |

**Example:** MPS-P33N-PGAT**K**, includes sensor MPS-P33N-PGA with bracket MPS-ACCK8

**Internal circuit for open collector and analog output wiring**



**Lead wiring**



Most popular.



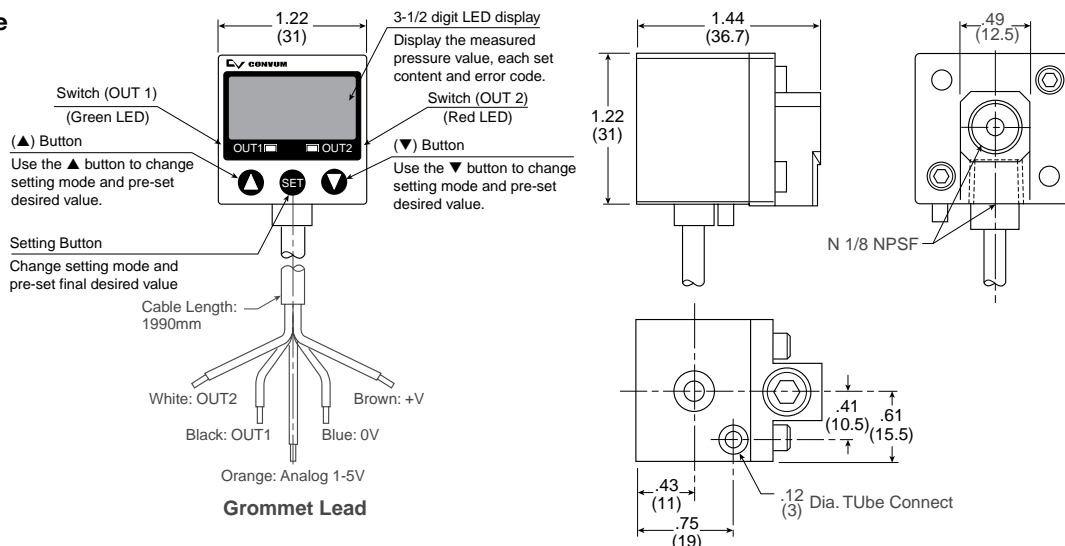
C  
 Pressure Sensors  
 Vacuum Products  
 MPS-33 Series  
 MPS-34 Series  
 SCP01 Series  
 SCP5D Series  
 Cables

**Specifications**

|   | <b>Vacuum (V)</b>  | <b>Compound (R)</b>       | <b>Positive (P)</b>         |
|---|--|---------------------------|-----------------------------|
| Pressure range                          | -101.3 - 0 kPa (-14.5 to 0 PSI)  | 0 - 500 kPa (0 to 72 PSI) | -0.1 - 1 Mpa (0 to 145 PSI) |
| Proof pressure                          | 0.3 Mpa (44 PSI)   | 0.8 Mpa (116 PSI)         | 1.5 Mpa (218 PSI)           |
| Display resolution,<br>Units of measure | 0.1, kPa   | 1, kPa                    | 0.001, Mpa                  |
|   | 0.001, kgf/cm <sup>2</sup>   | 0.01, kgf/cm <sup>2</sup> | 0.01, kgf/cm <sup>2</sup>   |
|   | 0.001, bar   | 0.01, bar                 | 0.01, bar                   |
|   | 0.01, PSI  | 0.1, PSI                  | 0.1, PSI                    |
|   | 0.1, inHg  | —                         | —                           |
|   | 1, mmHg  | —                         | —                           |
|   | 0.1, mmH <sub>2</sub> O  | —                         | —                           |
| Media                                   | Air & non-corrosive gases, incombustible gases                         |                           |                             |
| Pressure port                           | <b>(N)</b> 1/8" NPSF, <b>(G)</b> 1/8" BSPP female                      |                           |                             |
| Operating temperature                   | 32 to 122°F (0 to 50°C)  |                           |                             |
| Storage temperature                     | -4 to 140°F (-20 to 60°C)  |                           |                             |
| Humidity                                | 40 - 85% RH (no condensation)  |                           |                             |
| Electrical connection                   | <b>(G)</b> Grommet open lead, 5 wire (0.15mm <sup>2</sup> )            |                           |                             |
| Power supply                            | 12 to 24VDC ±10% or less, Ripple (Vp-p) 10% or less                    |                           |                             |
| Display                                 | 3 + 1/2 digit, 1 color, 7-segment RED LED                              |                           |                             |
| Display refresh                         | .1 to 3.0 Seconds, Variable (factory set at 0.1)                       |                           |                             |
| Control output                          | NPN (Sinking), PNP (Sourcing), Open collector, max 80mA, 2 output      |                           |                             |
| Analog output                           | 1 to 5VDC ≤ ±2.5% F.S. Linearity ≤1% of F.S.;                          |                           |                             |
| Switch output                           | Output signal, NPN or PNP, Normally open or closed, LED indicator      |                           |                             |
| Output indicator                        | Green LED (OUT1), Red LED (OUT2)                                       |                           |                             |
| Output modes                            | Hysteresis or Window Comparator  |                           |                             |
| Response time                           | ≤ 2.5ms (chattering-proof function: 24ms, 192ms, 786m selections)      |                           |                             |
| Repeatability                           | ± 0.2% of F.S. ± 1 digit or less                                       |                           |                             |
| Thermal error                           | ≤ ± 2% of F.S. or less at range of 32 to 122°F (0 to 50°C)             |                           |                             |
| General protection                      | IP65, CE marked, EMC-EN61000-6-2: 2001, with dust tube connection      |                           |                             |
| Current consumption                     | <55mA  |                           |                             |
| Vibration resistance                    | 10 to 150Hz, Double amplitude 1.5mm, XYZ, 2 hrs.                       |                           |                             |
| Shock resistance                        | 980 m/s <sup>2</sup> (about 10G), 3 times/each directions X, Y, Z      |                           |                             |
| Noise resistance                        | Vp-p400V, 10 ms, 0.5µs noise simulator                                 |                           |                             |
| Material                                | Housing: ABS (gray) , Pressure port: Zinc die-cast, Diaphragm: Silicon |                           |                             |
| Mass                                    | 3.3 oz. (105g) (including cable)                                       |                           |                             |

**Dimensions**

**1/8" Female**



**C**

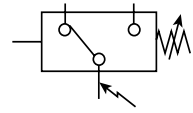
**Pressure Sensors**  
**Vacuum Products**

**MPS-33** Series  
**MPS-34** Series  
**SCP01** Series  
**SCP5D** Series  
**Cables**



**Features**

- Sensor output:  
 PNP Open collector  
 Transistor output, 30VDC, 125mA with  
 Analog output, 4 to 20mA
- Output response time less than 2.0 milliseconds
- RoHS
- Air and non-corrosive gases
- Sensor face includes icons to show sensor programming status



Red ↔ Green Display

**Programming options**

|                                 |   |
|---------------------------------|---|
| Outputs change N.O. / N.C.      | ✓ |
| Units of measure change         | ✓ |
| Hysteresis mode                 | ✓ |
| Window comparator mode          | ✓ |
| Auto teach mode                 | ✓ |
| Output response time            | ✓ |
| Lockout option                  | ✓ |
| Password lockout                | — |
| Max. value display              | ✓ |
| Min. value display              | ✓ |
| Zero reset                      | ✓ |
| Red / Green LED display options | ✓ |
| Error output mode               | ✓ |

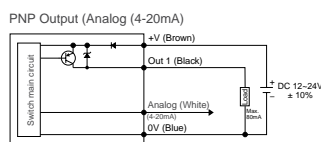
**MPS-34 Sensor Only Ordering Numbers**

| Pressure range | Electrical output       | Electrical connection | Part number         |                     |
|----------------|-------------------------|-----------------------|---------------------|---------------------|
|                |                         |                       | 1/8 NPSF male       | 1/8 BSPP male       |
| 0-30 inHg      | (1) PNP with (1) 4-20mA | M8, 4 Pin             | <b>MPS-V34N-PCI</b> | <b>MPS-V34G-PCI</b> |
| 0-145 PSI      | (1) PNP with (1) 4-20mA | M8, 4 Pin             | <b>MPS-P34N-PCI</b> | <b>MPS-P34G-PCI</b> |

**MPS-34 Accessories**

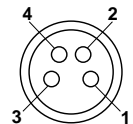
| Description  | Part number            |
|--|------------------------|
| Panel mounting bracket<br>Note : Add "H" in suffix of Sensor Only Part Number to include with sensor   | <b>MPS-ACCH9</b>       |
| Surface mounting bracket<br>Note : Add "K" in suffix of Sensor Only Part Number to include with sensor | <b>MPS-ACCK10</b>      |
| <b>Example: MPS-P34N-PCIK, includes sensor MPS-P34N-PCI with bracket MPS-ACCK10</b>                    |                        |
| M8, 4-pin, 2 meter cable   | <b>CB-M8-4P-2M-PUR</b> |
| M8, 4-pin, 5 meter cable   | <b>CB-M8-4P-5M-PUR</b> |

**Internal circuit for open collector and analog output wiring**



**Sensor pin out with analog output**

- Pin #**
- 1 Brown: 24VDC
  - 2 White: 4 to 20mA
  - 3 Blue: 0VDC
  - 4 Black: PNP Open Collector Output 1



☐ Most popular.



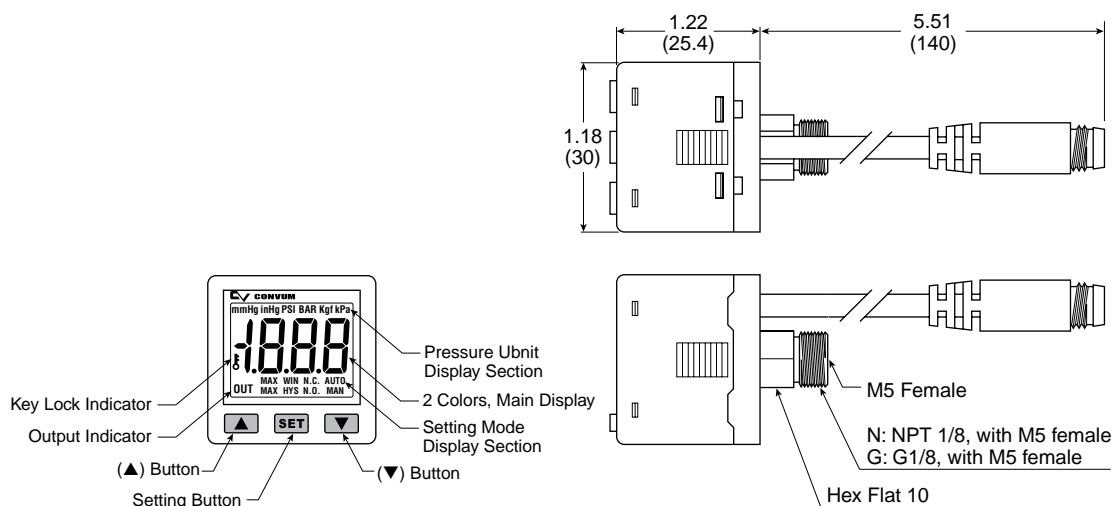
**C**  
 Pressure Sensors  
 Vacuum Products  
 MPS-33 Series  
 MPS-34 Series  
 SCP01 Series  
 SCP5D Series  
 Cables

**Specifications**

|   | Vacuum (V)   | Positive (P)                 |
|---|--|------------------------------|
| Pressure range                          | -101.3 to 0 kPa (-14.5 to 0 PSI)   | -0.1 to 1 Mpa (0 to 145 PSI) |
| Proof pressure                          | 0.3 Mpa (44PSI)  | 1.5 Mpa (218 PSI)            |
| Display resolution,<br>Units of measure | 0.1, kPa   | 1, kPa                       |
|   | 0.001, kgf/cm <sup>2</sup>   | 0.01, kgf/cm <sup>2</sup>    |
|   | 0.001, bar   | 0.01, bar                    |
|   | 0.01, PSI  | 0.1, PSI                     |
|   | 0.01, inHg   | -                            |
|   | 1, mmHg  | -                            |
| Media                                   | Air & non-corrosive gases  |                              |
| Pressure port                           | <b>(N)</b> 1/8" NPT male, <b>(G)</b> 1/8 BSPP male both with M5 female port  |                              |
| Operating temperature                   | 32 to 122°F (0 to 50°C)  |                              |
| Storage temperature                     | -4 to 140°F (-20 to 60°C)  |                              |
| Humidity                                | 35 to 85% RH (no condensation)   |                              |
| Electrical connection                   | <b>(C)</b> 4-pin, M8 connector on 150mm lead wire  |                              |
| Power supply                            | 12 to 24VDC ±10%, Ripple (P-P) 10% or less   |                              |
| Display                                 | 3 + 1/2 digit, 2 color, 7-segment RED / GREEN LED  |                              |
| Display refresh                         | Timing update : 0.1 ~ 3 sec. (Factory Set Unit: 0.1 sec.)  |                              |
| Switch output                           | Output signal, PNP, Normally open or closed, LED indicator, 125 mA max. output load  |                              |
| Output modes                            | Hysteresis or Window Comparator  |                              |
| Response time                           | ≤ 2.5ms (chattering-proof function: 24ms, 250ms, 500ms, 1000ms and 1500ms selections)  |                              |
| Repeatability                           | ± 0.2% of F.S. ± 1 digit   |                              |
| Output current                          | Output current 4 to 20mA; Linearity ±1.0% of F.S.; Maximum load impedance 300Ω at power supply of 12V; 600Ω at power supply of 12V; Minimum load impedance 50Ω |                              |
| Thermal error                           | 32 to 122°F (0 to 50°C) 25°C (77°C) + 2% of F.S. or less at range of 32 to 122°F (0 to 50°C)   |                              |
| General protection                      | IP40, CE marked, EMC-EN61000-6-2: 2001   |                              |
| Current consumption                     | 45mA (with no load)  |                              |
| Vibration resistance                    | 10 to 150Hz, Double amplitude 1.5mm, XYZ, 2 hrs.   |                              |
| Shock resistance                        | 980 m/s <sup>2</sup> (about 10G), 3 times/each directions X, Y, Z  |                              |
| Noise Resistance                        | Vp-p400V, 10 ms, 0.5μs noise simulator   |                              |
| Material                                | Housing: ABS (gray) , Pressure port: Zinc die-cast, Diaphragm: Silicon   |                              |
| Mass                                    | 1.45 oz. (45g) with M8 connector   |                              |

**Dimensions**

**1/8" Male**



**C**

**Pressure Sensors**  
**Vacuum Products**

**MPS-33**  
Series

**MPS-34**  
Series

**SCP01**  
Series

**SCP5D**  
Series

**Cables**



SCP01 Pressure Sensors are industrial pressure sensors offering long-term stability, resistance to interference and rugged construction. They are available in a wide range of standard and configured to order versions to meet your application needs.

These sensors are manufactured with the highest quality standards for reliable and repeatable measurements.



**Features:**

- Stainless steel body
- Compact construction
- Shock and vibration proof
- Resistant to pressure spikes
- Accuracy +/- 0.5% FS

**Applications include:**

- Test and measurement
- Hydraulic power units
- Power generation
- Mobile hydraulics

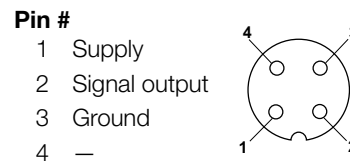
**SCP01 Ordering Numbers**

| Pressure range (psi) | Electrical output | Electrical connection | Part number<br>1/4 NPT male | Part number<br>7/16-20UNF-2A, male SAE-4 with o-ring |
|----------------------|-------------------|-----------------------|-----------------------------|--|
| -14.5 to 250         | 4 - 20 mA, 3 wire | M12 X 1, 4 pin        | <b>SCP01-0250P-25-07</b>    | <b>SCP01-0250P-27-07</b>                             |
| 0 to 1000            | 4 - 20 mA, 3 wire | M12 X 1, 4 pin        | <b>SCP01-1000P-25-07</b>    | <b>SCP01-1000P-27-07</b>                             |
| 0 to 3000            | 4 - 20 mA, 3 wire | M12 X 1, 4 pin        | <b>SCP01-3000P-25-07</b>    | <b>SCP01-3000P-27-07</b>                             |
| 0 to 5000            | 4 - 20 mA, 3 wire | M12 X 1, 4 pin        | <b>SCP01-5000P-25-07</b>    | <b>SCP01-5000P-27-07</b>                             |
| 0 to 9000            | 4 - 20 mA, 3 wire | M12 X 1, 4 pin        | <b>SCP01-9000P-25-07</b>    | N/A  |

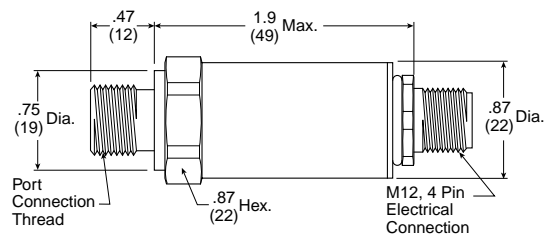
**Specifications**

|                         |  |
|-------------------------|--|
| Overload pressure       | 200% FS  |
| Burst pressure          | 250% FS  |
| Accuracy                | +/- 0.5% FS  |
| Protection class        | IP67   |
| Response time           | < 1ms  |
| Long term stability     | < 0.1% FS/a  |
| Load reversals          | > 20 M   |
| Electrical protection   | Short circuit, reverse polarity, overload protection |
| Supply voltage          | 9-30VDC  |
| Temperature range:      |  |
| Environmental           | -40°F to 185°F                                       |
| Media, storage          | -40°F to 257°F                                       |
| Compensated             | -4°F to 185°F  |
| Temperature coefficient | < +/- 0.3% FS/10K                                    |
| Vibration resistance    | Meets IEC 60068-2-29                                 |
| Shock resistance        | Meets IEC 60068 2-32                                 |
| EMI compatibility       | DIN EN 61000-6-3, DIN EN 61000-6-2                   |
| Material - housing      | 304 SS   |
| Material - fitting      | 630 SS   |
| Material - seal         | Fluorocarbon   |
| Sensing element         | Thin film (poly Si on SiO <sub>2</sub> )             |
| Pressure bore           | 0.024 in.  |
| Long term stability     | < 0.1% FS/a  |
| Load reversals          | > 20 M   |

**Sensor pin out with analog output**



**Dimensions**



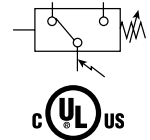
Most popular.





**Features**

- Stainless steel or ceramic diaphragms
- UL listed and CE marked
- Sensor outputs
  - 2 PNP Open collector transistor
  - Output, 30 VDC, 100mA
- Optional additional current, 4 to 20mA
- Output response time less than 5.0ms
- Polarity protected
- Short circuit protected
- 4 digit LED display
- Display head swivels 290°



**SCPSD-1000P-1727      SCPSD-600-14-15**

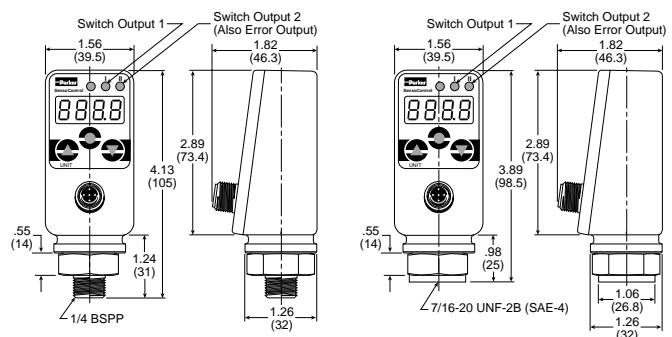
**SCPSD Ordering Numbers**

| Pressure range   | Port size              | Electrical output     | Electrical connection | Part number             |
|------------------|------------------------|-----------------------|-----------------------|-------------------------|
| -14.7 to 250 PSI | 7/16-20 UNF-2b (SAE-4) | ( 2 ) PNP             | M12, 4 Pin            | <b>SCPSD-0250P-0727</b> |
| -14.7 to 250 PSI | 7/16-20 UNF-2b (SAE-4) | ( 1 ) PNP with 4-20MA | M12, 4 Pin            | <b>SCPSD-0250P-1727</b> |
| 0 to 1000 PSI    | 7/16-20 UNF-2b (SAE-4) | ( 2 ) PNP with 4-20MA | M12, 5 Pin            | <b>SCPSD-1000P-1725</b> |
| 0 to 1000 PSI    | 7/16-20 UNF-2b (SAE-4) | ( 1 ) PNP with 4-20MA | M12, 4 Pin            | <b>SCPSD-1000P-1727</b> |
| 0 to 3000 PSI    | 7/16-20 UNF-2b (SAE-4) | ( 2 ) PNP             | M12, 4 Pin            | <b>SCPSD-3000P-0727</b> |
| 0 to 3000 PSI    | 7/16-20 UNF-2b (SAE-4) | ( 1 ) PNP with 4-20MA | M12, 4 Pin            | <b>SCPSD-3000P-1727</b> |
| 0 to 3000 PSI    | 7/16-20 UNF-2b (SAE-4) | ( 2 ) PNP with 4-20MA | M12, 5 Pin            | <b>SCPSD-3000P-1725</b> |
| 0 to 5000 PSI    | 7/16-20 UNF-2b (SAE-4) | ( 1 ) PNP with 4-20MA | M12, 4 Pin            | <b>SCPSD-5000P-1727</b> |
| 0 to 5000 PSI    | 7/16-20 UNF-2b (SAE-4) | ( 2 ) PNP with 4-20MA | M12, 5 Pin            | <b>SCPSD-5000P-1725</b> |
| 0 to 9000 PSI    | 7/16-20 UNF-2b (SAE-4) | ( 2 ) PNP             | M12, 4 Pin            | <b>SCPSD-9000P-0727</b> |
| 0 to 9000 PSI    | 7/16-20 UNF-2b (SAE-4) | ( 2 ) PNP with 4-20MA | M12, 4 Pin            | <b>SCPSD-9000P-1725</b> |
| -1 to 16 Bar     | 1/4 BSPP Male          | ( 2 ) PNP             | M12, 4 Pin            | <b>SCPSD-016-04-17</b>  |
| -1 to 16 Bar     | 1/4 BSPP Male          | ( 2 ) PNP with 4-20ma | M12, 5 Pin            | <b>SCPSD-016-14-15</b>  |
| 0 to 250 Bar     | 1/4 BSPP Male          | ( 2 ) PNP             | M12, 4 Pin            | <b>SCPSD-250-04-17</b>  |
| 0 to 250 Bar     | 1/4 BSPP Male          | ( 2 ) PNP with 4-20ma | M12, 5 Pin            | <b>SCPSD-250-14-15</b>  |
| 0 to 600 Bar     | 1/4 BSPP Male          | ( 2 ) PNP             | M12, 4 Pin            | <b>SCPSD-600-04-17</b>  |
| 0 to 600 Bar     | 1/4 BSPP Male          | ( 2 ) PNP with 4-20ma | M12, 5 Pin            | <b>SCPSD-600-14-15</b>  |

**Programming options**

|                                 |   |
|---------------------------------|---|
| Outputs change N.O. / N.C.      | ✓ |
| Units of measure change         | ✓ |
| Hysteresis mode                 | ✓ |
| Window comparator mode          | ✓ |
| Auto teach mode                 | — |
| Output response time            | ✓ |
| Lockout option                  | — |
| Password lockout                | ✓ |
| Max. value display              | — |
| Min. value display              | — |
| Zero reset                      | ✓ |
| Red / Green LED display options | — |
| Error output mode               | ✓ |
| Setting of decimal point        | ✓ |

**Dimensions**



☐ Most popular.



**C**

Pressure Sensors  
 Vacuum Products

MPS-33 Series

MPS-34 Series

SCP01 Series

SCPSD Series

Cables

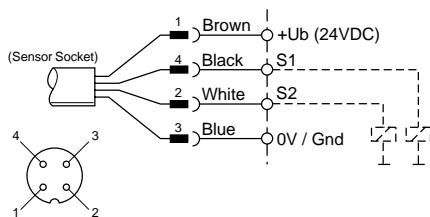
**Specifications**

|                              |  |            |           |                                      |           |           |            |            |
|------------------------------|--|------------|-----------|--------------------------------------|-----------|-----------|------------|------------|
| Pressure code                | 0250   | 016        | 1000      | 3000                                 | 5000      | 9000      | 250        | 600        |
| Measure range PSI, (bar)     | -14.7 to 250   | (-1 to 16) | 0 to 1000 | 0 to 3000                            | 0 to 5000 | 0 to 9000 | (0 to 250) | (0 to 600) |
| Overload pressure PSI, (bar) | 725  | (40)       | 2900      | 7250                                 | 11600     | 21750     | (500)      | (1200)     |
| Burst pressure PSI, (bar)    | 725  | (50)       | 11600     | 17400                                | 24650     | 31900     | (1200)     | (2200)     |
| Sensing element              | Ceramic  |            |           | Stainless steel                      |           |           |            |            |
| Parts in contact with media  | Stainless steel 1.4404   |            |           | Stainless steel 1.4404, 1.4542, NBR* |           |           |            |            |
|                              | Ceramic AL203, NBR*  |            |           |                                      |           |           |            |            |
|                              | *FPDM, EPDM special request                                      |            |           |                                      |           |           |            |            |
| Units of measure             | PSI, bar, MPA  |            |           |                                      |           |           |            |            |
| Switch cycles                | >100 million   |            |           |                                      |           |           |            |            |
| Output response time         | < 10ms   |            |           |                                      |           |           |            |            |
| Power supply                 | 15 to 30VDC, Class 2 power supply                                |            |           |                                      |           |           |            |            |
| Short circuit protection     | Yes, 2.4 amp / open collector output                             |            |           |                                      |           |           |            |            |
| Reverse polarity protection  | Yes  |            |           |                                      |           |           |            |            |
| Overload protection          | Yes  |            |           |                                      |           |           |            |            |
| Current consumption          | < 100mA  |            |           |                                      |           |           |            |            |
| Output circuit               | 2 PNP (Sourcing) open collector transistor                       |            |           |                                      |           |           |            |            |
| Analog output                | 0/4...20mA, Programmable, freely scaleable                       |            |           |                                      |           |           |            |            |
| Output functions             | Hysteresis, Window comparator                                    |            |           |                                      |           |           |            |            |
| Switching voltage            | -1.5VDC  |            |           |                                      |           |           |            |            |
| Maximum current output       | 1A with 2 open collector outputs, .5A per output                 |            |           |                                      |           |           |            |            |
| Accuracy                     | ± 0.5% F.S. Typ., ± 1% Max.                                      |            |           |                                      |           |           |            |            |
| Repeatability                | ± 0.25% F.S.   |            |           |                                      |           |           |            |            |
| Display accuracy             | ± 0.5% F.S. Typ., ± 1 Digit                                      |            |           |                                      |           |           |            |            |
| Thermal error max.           | ±0.03% F.S. at -4 to 185°F (-20 to 85°C)                         |            |           |                                      |           |           |            |            |
| Material                     | Pressure Die-cast zinc Z 410: Surface-finishing                  |            |           |                                      |           |           |            |            |
| Display material             | Polyester  |            |           |                                      |           |           |            |            |
| General protection           | IP 67, EN60529, UL, CE Marked, EMC-EN50082-2 Class B, EN 50081-2 |            |           |                                      |           |           |            |            |
| Temperature range of media   | -4 to 185°F (-20 to 85°C)  |            |           |                                      |           |           |            |            |
| Ambient temperature range    | -4 to 185°F (-20 to 85°C)  |            |           |                                      |           |           |            |            |
| Storage temperature          | -40 to 212°F (-40 to 100°C)                                      |            |           |                                      |           |           |            |            |
| Display                      | 4-Digit, 7-Segment LED, Red, 9mm height                          |            |           |                                      |           |           |            |            |
| Tightening torque            | 35Nm   |            |           |                                      |           |           |            |            |
| Vibration resistance         | 20G, 10 to 500Hz, IEC60068-2-6                                   |            |           |                                      |           |           |            |            |
| Shock resistance             | 50 G, XYZ, 11ms, IEC60068-2-29                                   |            |           |                                      |           |           |            |            |
| Mass                         | 10.6 oz. (300g)  |            |           |                                      |           |           |            |            |

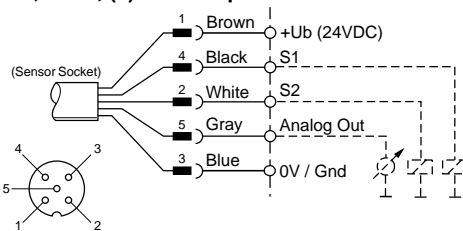
**C**  
**Pressure Sensors**  
**Vacuum Products**  
**MPS-33 Series**  
**MPS-34 Series**  
**SCP01 Series**  
**SCPSD Series**  
**Cables**

**Internal circuit**

**M12, 4-Pin, (2) PNP Outputs**

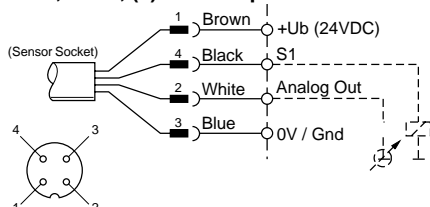


**M12, 5-Pin, (2) PNP Outputs with 4 to 20mA Analog**



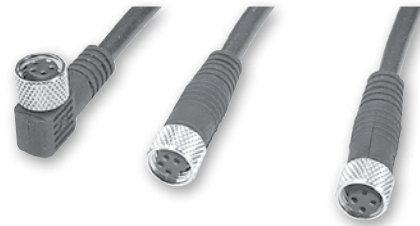
**Note:** M12, 5-pin Female Cable Connector will fit on both M12, 4-pin and 5-pin Male Sensor Connector.

**M12, 4-Pin, (1) PNP Output with 4 to 20mA Analog**



**Features**

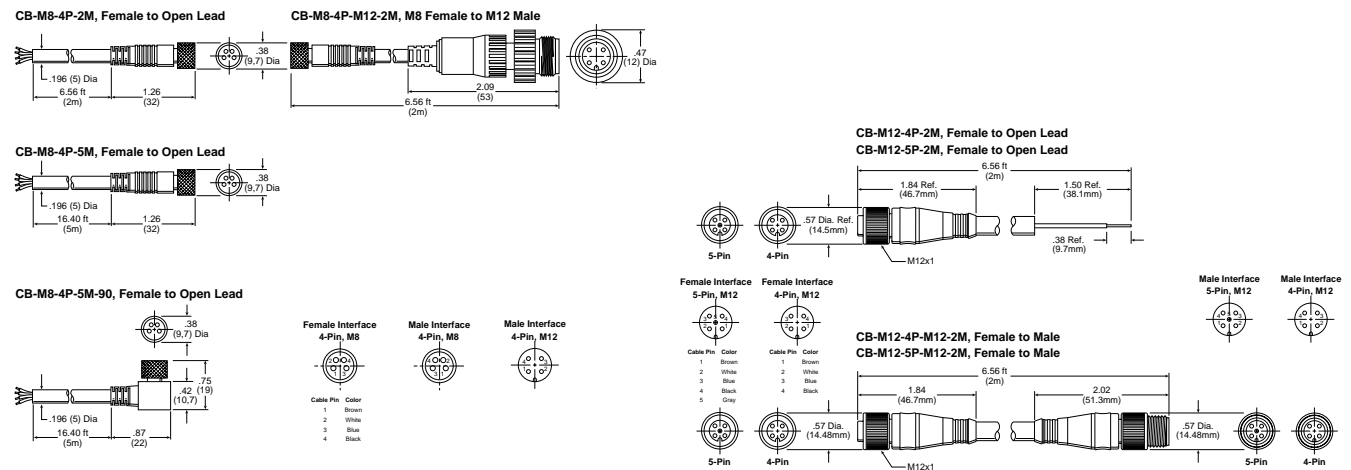
- M8, M12 male / female connector
- Length: 2m or 5m
- Cover: PVC or PUR
- Connection type: Swivel straight or angled
- IP67 swivel connector



**Common Part Numbers**

| Connector              | Contacts | Length | Cover | Part number               |
|------------------------|----------|--------|-------|---------------------------|
| M8 female              | 4        | 2m     | PUR   | <b>CB-M8-4P-2M-PUR</b>    |
| M8 female              | 4        | 5m     | PUR   | <b>CB-M8-4P-5M-PUR</b>    |
| M8 angled female       | 4        | 5m     | PUR   | <b>CB-M8-4P-5M-90-PUR</b> |
| M8 female to M12 male  | 4        | 2m     | PVC   | <b>CB-M8-4P-M12-2M</b>    |
| M12 female             | 4        | 2m     | PVC   | <b>CB-M12-4P-2M</b>       |
| M12 female             | 5        | 2m     | PVC   | <b>CB-M12-5P-2M</b>       |
| M12 female to M12 male | 4        | 2m     | PVC   | <b>CB-M12-4P-M12-2M</b>   |
| M12 female to M12 male | 5        | 2m     | PVC   | <b>CB-M12-5P-M12-2M</b>   |

**Dimensions**

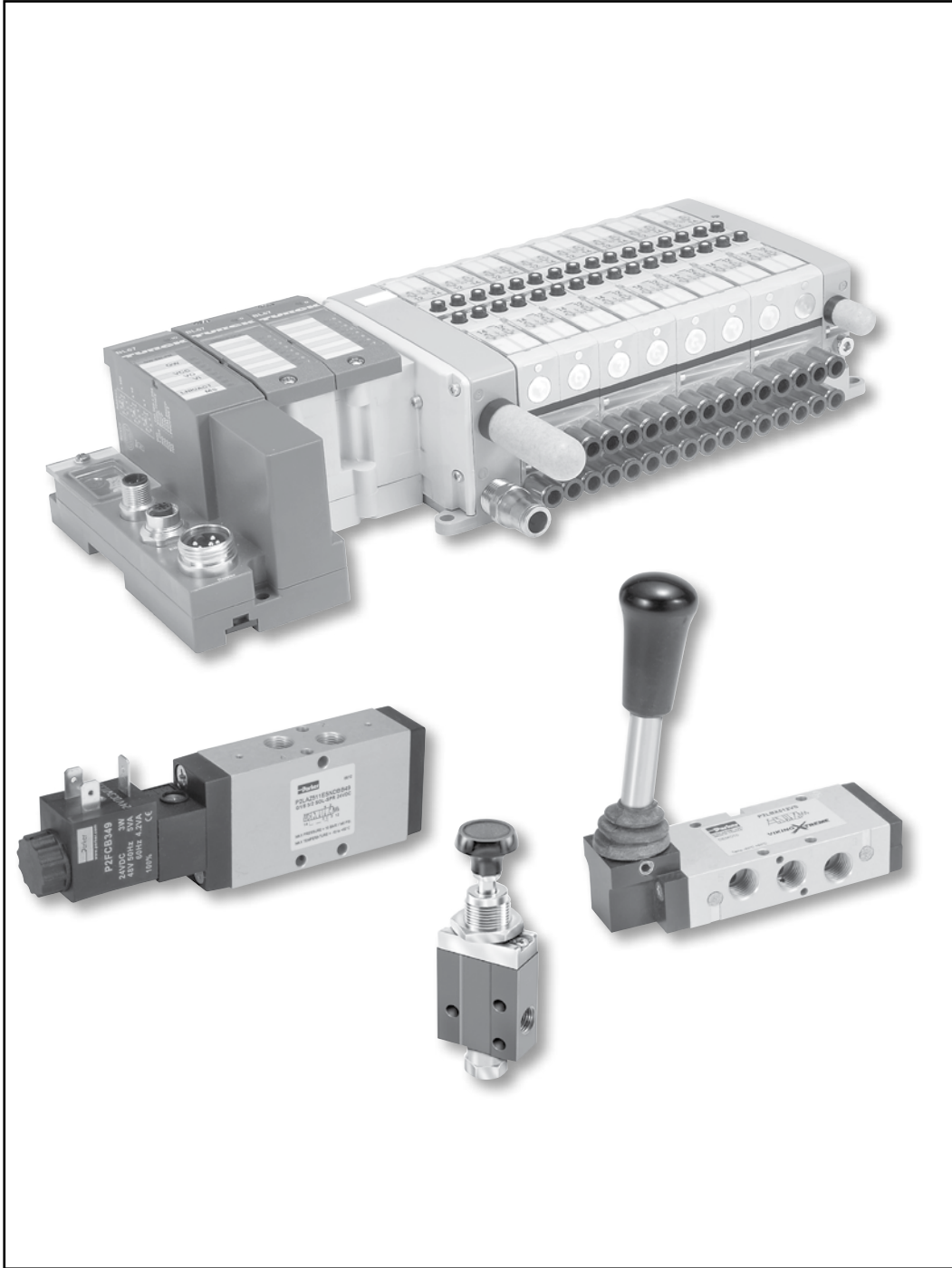
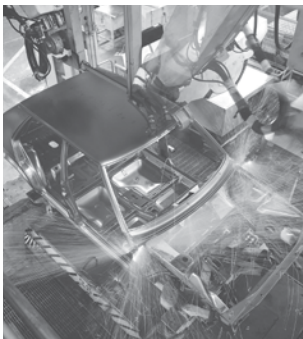
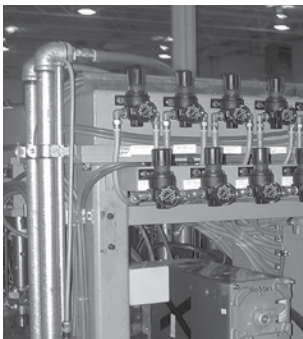
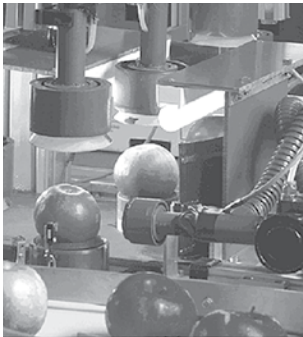


Most popular.



C

Vacuum Products



**D**  
Valve Products

# Valve Products

## Direct Acting Valves

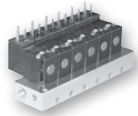
### XM Series - Direct Acting



D4

- Inline or stacking
- 1/8 inch ports
- Pressures 0 to 125 PSIG
- Temperatures 32°F to 125°F
- Flow - .15 Cv

### 15mm Series - Direct Acting



D8

- Subbase or manifold
- 1/8 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 140°F
- Flow - .033 to .05 Cv

## Inline Valves

### Viking Lite Series - Inline



D11

- Inline or bar manifold
- 1/8 through 3/8 inch ports
- Pressures 22 to 145 PSIG
- Temperatures 14°F to 122°F
- Flow - .6 to 2.5 Cv

### Viking Xtreme Series - Inline



D19

- Inline or bar manifold
- 1/8 through 1/2 inch ports
- Pressures VAC to 232 PSIG
- Temperatures -40°F to 140°F
- Flow - .7 to 2.7 Cv

### B Series - Inline



D43

- Inline, subbase or bar manifold
- 1/8 through 3/4 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 120°F
- Flow - .75 to 7.0 Cv

### ADEX Series - Inline



D68

- Inline, subbase or bar manifold
- M3, M5, 1/8 inch ports
- Pressures VAC to 100 PSIG
- Temperatures 32°F to 122°F
- Flow - .1 to .47 Cv

## Inline – continued

### N Series - Inline Poppet

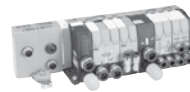


D78

- Inline mounted
- 3/8 through 1-1/2 inch ports
- Pressures 30 to 250 PSIG
- Temperatures 0°F to 200°F
- Flow - 3.6 to 29.9 Cv

## Subbase & Manifold Valves

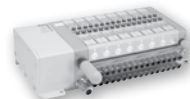
### Moduflex Series Valves



D89

- Inline or stacking
- 4mm tube, 1/4, 3/8 inch ports
- Pressures VAC to 120 PSIG
- Temperatures 5°F to 140°F
- Flow - .18 to .80 Cv

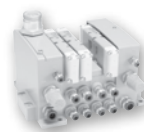
### Isys Micro Series



D113

- Subbase or manifold
- 4mm through 1/4 tube
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 120°F
- Flow - .35 Cv

### Isys ISO Series



D124

- Subbase or manifold
- 1/8 through 3/4 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 5°F to 120°F
- Flow - .55 to 6.0 Cv

### Fieldbus Series



D166

- Fieldbus interface for Isys and Moduflex valves
- Up to 256 inputs
- Up to 256 outputs
- Digital or analog

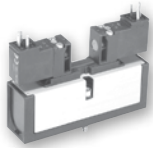
**D**

Pictorial Index  
 Valve Products



## Subbase & Manifold – continued

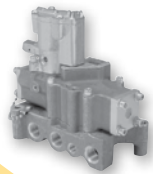
### DX ISOMAX Series



D185

- Subbase or manifold
- 1/8 through 3/4 inch ports
- Pressures VAC to 145 PSIG
- Temperatures 14°F to 140°F
- Flow - .55 to 4.15 Cv

### Valvair II Series

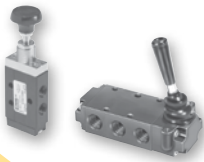


D198

- Subbase or manifold
- 3/8 through 1-1/2 inch ports
- Pressures VAC to 225 PSIG
- Temperatures 0°F to 200°F
- Flow - 1.9 to 12.0 Cv

## Manual / Mechanical Valves

### Directair 2 & 4



D208

- Manual / mechanical
- 1/8 and 1/4 inch ports
- Pressures VAC to 150 PSIG
- Temperatures 32°F to 175°F
- Flow - .20 to .84 Cv

### Viking Xtreme



D218

- Manual / mechanical
- 1/8, 1/4 and 3/8 inch ports
- Pressures:  
Type A & B - VAC to 232 PSIG  
Type C & D - VAC to 174 Psig
- Temperatures -40°F to 140°F
- Flow - .5 to 2.7 Cv

### 42 Series



D225

- Manual / mechanical
- 1/4 and 3/8 inch ports
- Pressures VAC to 150 PSIG
- Temperatures 0°F to 140°F
- Flow - 1.3 to 2.9 Cv

## Manual / Mechanical – continued

### M0 Series



D227

- Air Pilot, Manual / mechanical
- 1/4 and 1 inch ports
- Pressures VAC to 225 PSIG
- Temperatures -15°F to 200°F
- Flow - .5 to 1.25 Cv

### LV / EZ Lockout Valves



D231

- Port sizes 3/8 through 1-1/4 inch
- Max. supply pressure 300 PSIG
- Max. operating temperature 175°F
- Cv from 3.7 to 14

### Brass Poppet, Sliding Seal



D233

- 4-way, 3-position rotary disc, direct air operated valves
- Pressures 0 to 150 PSIG
- Temperatures 18°F to 200°F
- Flow - 2.5 to 6.2 Cv

## Valve Accessories

### Control Panel Products



D236

- A wide variety of push buttons and selector switches
- Visual indicators
- Foot pedal switches
- Modular pneumatic / electric push buttons

### Sensing / Limit Switches



D240

- Limit switches in a variety of sizes and configurations
- Pressure switches with many adjustable ranges
- Components designed specifically for pneumatic technology using pressure variation, air bleen or blocking for detection

XM series is a 1/8 inch ported, 3-way and 4-way, 2-position, spring return, normally open or normally closed, general purpose air valve.

**Ports**

- 1/8" NPT

**Mounting**

- Inline
- IEM bar manifold
- Subbase valve manifold

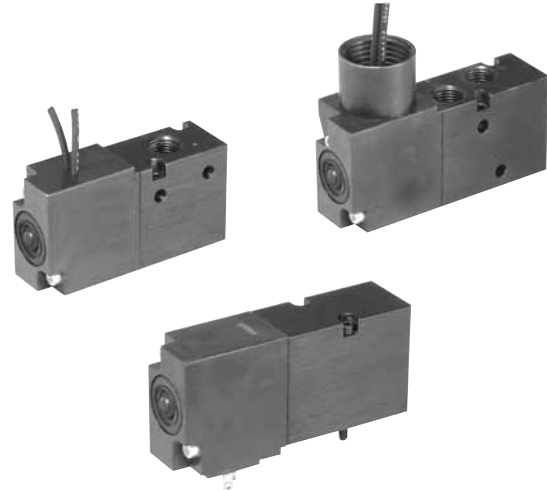
**Solenoids**

- Continuous duty rated
- 24" grommet
- 15mm 3-pin (9.4mm pin spacing)
- 1/2" conduit
- 12VDC to 240VAC

**Balanced poppet**

- 3-way N.O. & N.C.
- Diverter
- Selector
- Vacuum option

**ROHS compliant**



**Material specifications**

|                          |                                       |
|--------------------------|---------------------------------------|
| Body                     | Aluminum                              |
| Center post and armature | Stainless steel                       |
| Stem                     | Brass                                 |
| Spring                   | Stainless steel                       |
| Seals                    | Buna N                                |
| Center post sleeve       | Acetal                                |
| Coil                     | General purpose Class B, encapsulated |

**Performance information**

| Electrical |         |      |                               |                           |          | Flow    |  |
|------------|---------|------|-------------------------------|---------------------------|----------|---------|--|
| Code       | Voltage |      | Power consumption<br>(W / VA) | Holding current<br>(Amps) | Cv chart |         |  |
|            | AC      | DC   |                               |                           | 3-way    | 4-way   |  |
|            | 60Hz    | 50Hz |                               |                           |          |         |  |
| 42         | 24      | 22   | —                             | 4.8VA                     | .200     | .15 .15 |  |
| 45*        | —       | —    | 12                            | 4.5W                      | .375     | .15 .15 |  |
| 49*        | —       | —    | 24                            | 4.5W                      | .188     | .15 .15 |  |
| 53         | 120     | 110  | —                             | 4.32VA                    | .036     | .15 .15 |  |
| 57         | 240     | 220  | —                             | 4.32VA                    | .018     | .15 .15 |  |

\* Mobile voltage, +25/-30%  
 Note: Voltage tolerance: +10 / -15%  
 Cv tested per ANSI / (NFPA) T3.21.3

**Operating information**

|                               |                             |
|-------------------------------|-----------------------------|
| 3-way, N operating pressure:  | 0 to 125 PSIG               |
| 3-way, V* operating pressure: | 0.28" Hg to 125 PSIG        |
| 4-way, N operating pressure:  | 0.28" Hg to 125 PSIG        |
| Temperature range:            | 32°F to 125°F (0°C to 50°C) |

\* For vacuum service

**Response time**

| Code | Voltage | 0 Cu. in. test chamber |         | 12 Cu. in. test chamber |         |
|------|---------|------------------------|---------|-------------------------|---------|
|      |         | Fill                   | Exhaust | Fill                    | Exhaust |
| 49   | 24VDC   | .011                   | .007    | .240                    | .384    |
| 53   | 120VAC  | .011                   | .020    | .240                    | .384    |

Average Fill Time (Seconds): With 100 PSIG supply, time required to fill from 0-90 PSIG and exhaust from 100 PSIG to 10 PSIG is measured from instant of energizing, or de-energizing solenoid. Times shown are average.  
 Tested per ANSI / (NFPA) T3.21.8.

15mm Solenoid

XM Series

D







Direct Acting Valve Products

Most popular. For technical information see CD




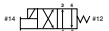



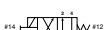


**3-way Inline Valves**

|   | Symbol  | Port size | Cv  | Voltage                          | Valve type | Weight   | Part number        |
|---|---|-----------|-----|----------------------------------|------------|----------|--------------------|
|  |  | 1/8"      | .15 | 24" Grommet, 24VDC               | Inline     | 4 oz     | <b>XM30NBG49A</b>  |
|   |   | 1/8"      | .15 | 24" Grommet, 120VAC              | Inline     | (.11 Kg) | <b>XM30NBG53A</b>  |
|  |  | 1/8"      | .15 | 3-Pin, 15mm, DIN 9.4mm, 24VDC    | Inline     | 4 oz     | <b>XM30NB49A</b>   |
|   |   | 1/8"      | .15 | 3-Pin, 15mm, DIN 9.4mm, 120VAC   | Inline     | (.11 Kg) | <b>XM30NB53A</b>   |
|  |  | 1/8"      | .15 | 1/2" Conduit / 24" leads, 24VDC  | Inline     | 5 oz     | <b>XM30NBH549A</b> |
|   |   | 1/8"      | .15 | 1/2" Conduit / 24" leads, 120VAC | Inline     | (.14 Kg) | <b>XM30NBH53A</b>  |


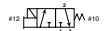

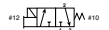
Note: All units with non-locking flush override. Can be used as N.O / N.C. / Diverter / Selector function.

**4-way Inline Valves**

|  | Symbol  | Port size | Cv  | Voltage                          | Valve type | Weight   | Part number       |
|--|---|-----------|-----|----------------------------------|------------|----------|-------------------|
|   |  | 1/8"      | .15 | 24" Grommet, 24VDC               | Inline     | 4.3 oz   | <b>XM40NBG49A</b> |
|  |   | 1/8"      | .15 | 24" Grommet, 120VAC              | Inline     | (.12 Kg) | <b>XM40NBG53A</b> |
|   |  | 1/8"      | .15 | 3-Pin, 15mm, DIN 9.4mm, 24VDC    | Inline     | 4.3 oz   | <b>XM40NB549A</b> |
|  |   | 1/8"      | .15 | 3-Pin, 15mm, DIN 9.4mm, 120VAC   | Inline     | (.12 Kg) | <b>XM40NB53A</b>  |
|  |  | 1/8"      | .15 | 1/2" Conduit / 24" leads, 24VDC  | Inline     | 5.3 oz   | <b>XM40NBH49A</b> |
|  |   | 1/8"      | .15 | 1/2" Conduit / 24" leads, 120VAC | Inline     | (.15 Kg) | <b>XM40NBH53A</b> |


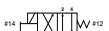

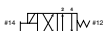
Note: All units with non-locking flush override.

**3-way Subbase Mount Valves**

|   | Symbol  | Port size | Cv  | Voltage                        | Valve type    | Weight   | Part number       |
|---|---|-----------|-----|--------------------------------|---------------|----------|-------------------|
|  |  | 1/8"      | .15 | 24" Grommet, 24VDC             | Subbase mount | 4 oz     | <b>XM3VNBG49A</b> |
|   |   | 1/8"      | .15 | 24" Grommet, 120VAC            | Subbase mount | (.11 Kg) | <b>XM3VNBG53A</b> |
|  |  | 1/8"      | .15 | 3-Pin, 15mm, DIN 9.4mm, 24VDC  | Subbase mount | 4 oz     | <b>XM3VNB549A</b> |
|   |   | 1/8"      | .15 | 3-Pin, 15mm, DIN 9.4mm, 120VAC | Subbase mount | (.11 Kg) | <b>XM3VNB53A</b>  |

Note: All units with non-locking flush override. Can be used as N.O / N.C. / Diverter / Selector function.

**4-way Subbase Mount Valves**

|   | Symbol  | Port size | Cv  | Voltage                        | Valve type    | Weight   | Part number       |
|---|---|-----------|-----|--------------------------------|---------------|----------|-------------------|
|  |  | 1/8"      | .15 | 24" Grommet, 24VDC             | Subbase mount | 4.3 oz   | <b>XM4VNBG49A</b> |
|   |   | 1/8"      | .15 | 24" Grommet, 120VAC            | Subbase mount | (.12 Kg) | <b>XM4VNBG53A</b> |
|  |  | 1/8"      | .15 | 3-Pin, 15mm, DIN 9.4mm, 24VDC  | Subbase mount | 4.3 oz   | <b>XM4VNB549A</b> |
|   |   | 1/8"      | .15 | 3-Pin, 15mm, DIN 9.4mm, 120VAC | Subbase mount | (.12 Kg) | <b>XM4VNB53A</b>  |

Note: All units with non-locking flush override.

15mm  
Solenoid

XM  
Series

**D**

Direct Acting  
Valve Products

**Manifold**



| Description            | Part number      |
|------------------------|------------------|
| IEM bar manifold (NPT) | <b>PSMXN##NP</b> |

## - stations 02 to 12 (04 Shown)

**Subbase**



| Description                | Part number      |
|----------------------------|------------------|
| Manifold subbase kit (NPT) | <b>PSXM530CP</b> |

**Plug-in Electrical Connectors - 9.4mm**



| Description  | Indication        | Voltage | Part number      |
|--------------|-------------------|---------|------------------|
| Unwired Plug | None              | N/A     | <b>PESC10</b>    |
|              | LED & Suppression | 12/24V  | <b>PESC2020B</b> |
|              |                   | 120VAC  | <b>PESC2001F</b> |



|                   |                   |        |                  |
|-------------------|-------------------|--------|------------------|
| Plug with 6" lead | None              | N/A    | <b>PESC12</b>    |
|                   | LED & Suppression | 12/24V | <b>PESC2220B</b> |
|                   |                   | 120VAC | <b>PESC2201F</b> |

**Accessories**



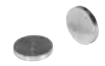
| Description         | Part number      |
|---------------------|------------------|
| End plate kit (NPT) | <b>PSXM1010P</b> |



| Description  | Part number      |
|--|------------------|
| Blanking plate kit                                       | <b>PSXM8310P</b> |
| Subbase Kit includes: (1) Plate, (3) Screws, (4) Gaskets |                  |
| Fits subbase or IEM type manifold.                       |                  |



| Description                     | Part number      |
|---------------------------------|------------------|
| Mounting Bracket - Inline valve | <b>PSXM8288P</b> |



| Description                       | Part number       |
|-----------------------------------|-------------------|
| Isolator plugs - Subbase manifold | <b>PSXM40900P</b> |



| Description                     | Part number      |
|---------------------------------|------------------|
| IEM valve / manifold o-ring kit | <b>PSXM2186P</b> |



| Description                       | Part number      |
|-----------------------------------|------------------|
| Subbase valve / manifold bolt kit | <b>PSXM8100P</b> |

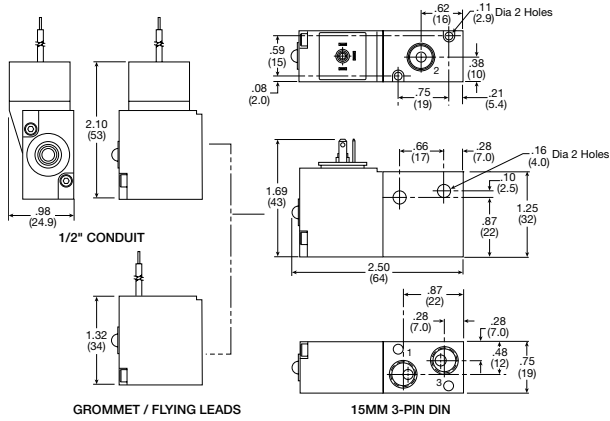
15mm Solenoid

XM Series

**D**

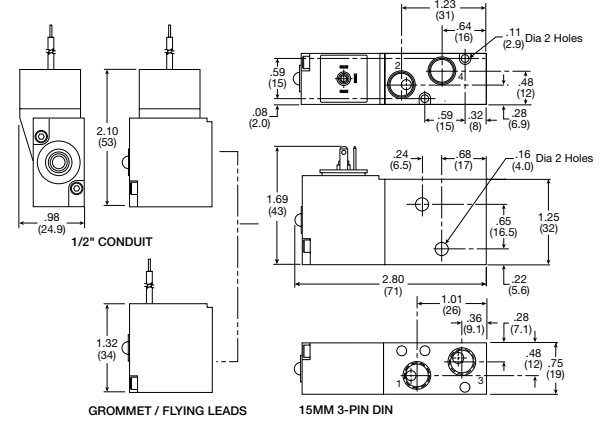
Direct Acting Valve Products

**XM 3-way Inline**



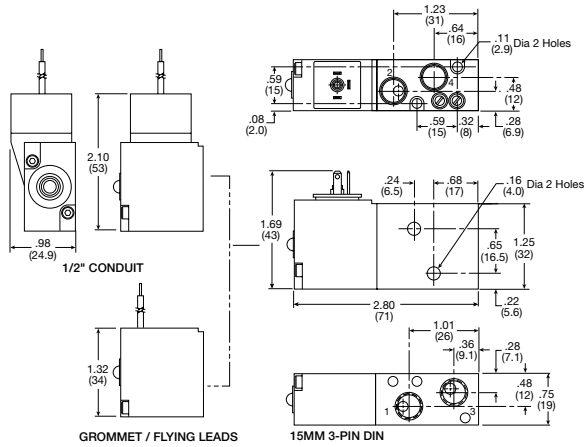
Inches (mm)  
 Note: 22 AWG black cross linked polyethylene insulated lead wire.

**XM 4-way Inline**



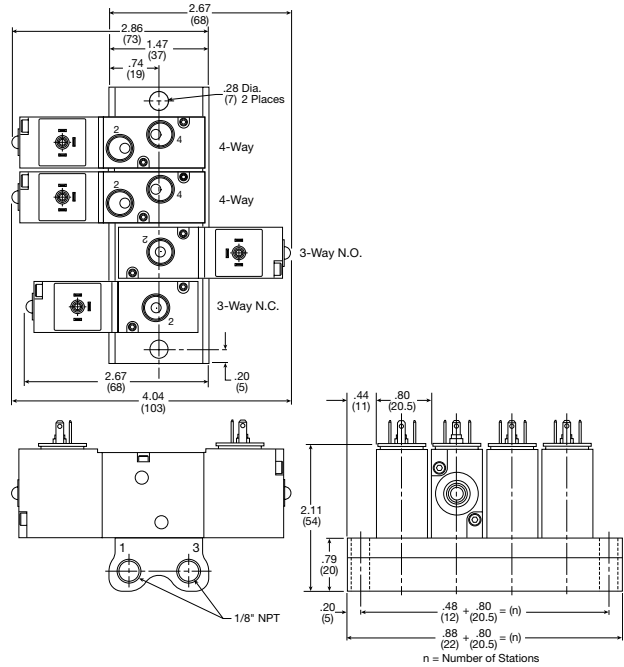
Inches (mm)  
 Note: 22 AWG black cross linked polyethylene insulated lead wire.

**XM 4-way Inline with Flow Controls**

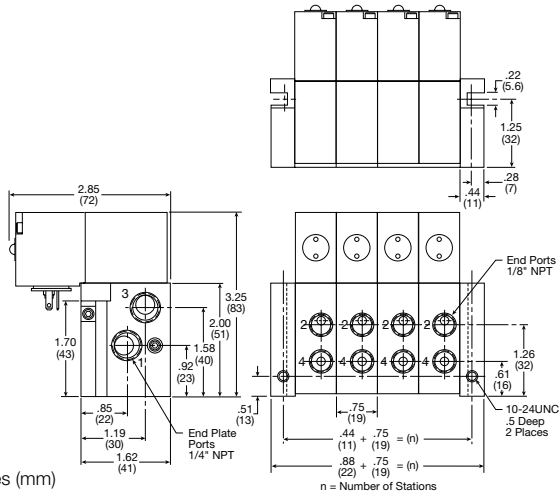


Inches (mm)  
 Note: 22 AWG black cross linked polyethylene insulated lead wire.

**XM IEM Manifold**



**XM IEM Subbase**



Inches (mm)

15mm Solenoid  
 XM Series  
 D  
 Direct Acting Valve Products



A compact 15mm, 3-way subbase or manifold mounted valve. Ideally suited for use in stationary or mobile equipment applications, where flow rates and low temperatures are a key consideration.

**Features**

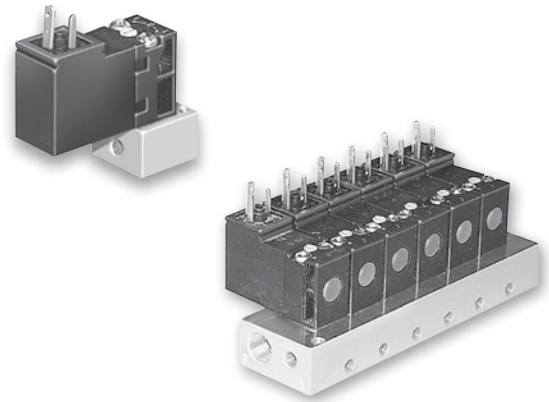
- Compact and simple design
- Utilizes 15mm solenoid operators
- Manifold allows mounting of normally open and normally closed operators simultaneously
- Up to 20 stations available

**Solenoids**

- 15mm low watt solenoids are UL certified and approved to be CE marked
- Wide range of voltages available

**Applications**

- Piloting for process control valves
  - pharmaceutical equipment
  - waste water treatment systems
  - food processing
  - chemical batching
- Industrial laundry equipment
- Paint spray & dyeing equipment
- Textile winding applications
- Vacuum and conveyor applications



**Operating information**

|   |                                       |
|---|---------------------------------------|
| Operating pressure:                               | Vacuum to 145 PSIG (Vacuum to 10 bar) |
| Operating temperature:                            |                                       |
| Standard Flow:                                    | 5°F to 140°F (-15°C to 60°C)          |
| High Flow:  | 5°F to 122°F (-15°C to 50°C)          |
| Mobile Applications<br>(47 & 48 Voltage Options): | -40°F to 158°F (-40°C to 70°C)        |
| Storage temperature:                              |                                       |
| All applications:                                 | -40°F to 158°F (-40°C to 70°C)        |

**Material specifications**

|                      |  |
|----------------------|--|
| Body                 | Glass filled polyamide                           |
| Internal metal parts | Steel  |
| Screws               | Steel  |
| Bottom plug          | Thermoplastic                                    |
| Poppet seals         | Nitrile for standard,<br>fluorocarbon for mobile |

**Technical data**

|                           |   |
|---------------------------|---|
| Electrical interface per: | Din 43650 Form C (EN175301-803C)  |
| Pneumatic interface per:  | AFNOR E 0652 110 N  |
| Protection:               | IP65 (Washdown)   |
| Air flow:                 | Standard flow 0.033 Cv (33 Lpm)<br>(1.2W) (1.6VA)   |
| Voltage tolerance:        | All voltages except 47 & 48: Rated<br>voltage +10% / -15% options 47 & 48:<br>Rated voltage +25% / -30% |

Most popular. For technical information see CD

15mm Solenoid  
 XM Series  
 D Direct Acting Valve Products

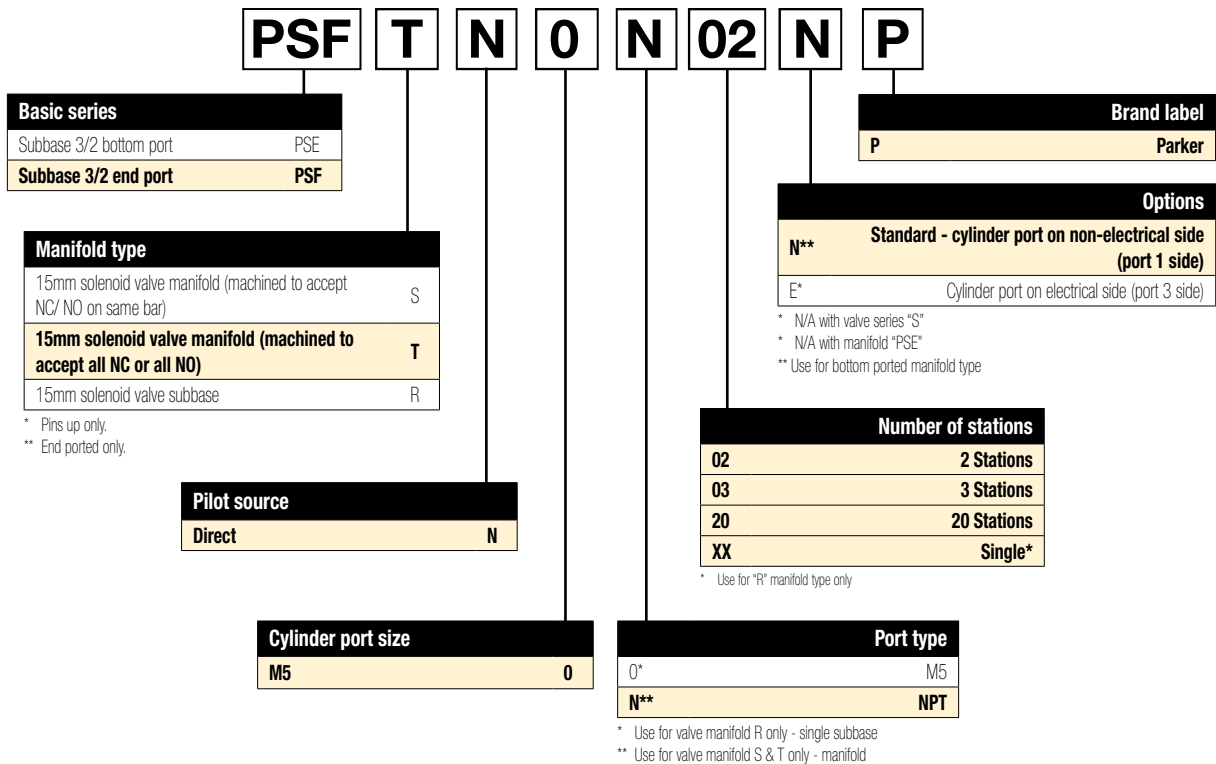


**NC (NNP) Solenoids / Kits**

|                     | ## Voltage (S = Standard, O = Optional, — = N/A) |               |               |                |                | Kit No.   |
|---------------------|--|---------------|---------------|----------------|----------------|---|
|                     | 42<br>(24VAC)                                    | 45<br>(12VDC) | 49<br>(24VDC) | 53<br>(120VAC) | 57<br>(230VAC) |   |
| * Override          |  |               |               |                |                |   |
| B (Non-lock, Flush) | O  | O             | S             | S              | O              | <b>PS2982*##P</b><br>Pins: UP<br>NC / NNP<br>1.2W / 1.6VA   |
| C (Lock, Flush)     | O  | O             | S             | S              | O              |   |
| D (Non-lock, Ext)   | —  | —             | O             | O              | —              |   |
| B (Non-lock, Flush) | O  | O             | S             | S              | —              | <b>PS3541*##P</b><br>Pins: DOWN<br>NC / NNP<br>1.8W / 2.4VA |
| C (Lock, Flush)     | O  | O             | S             | S              | —              |   |
| D (Non-lock, Ext)   | —  | —             | O             | O              | —              |   |
| E (Lock, Ext)       | —  | —             | O             | O              | —              |   |
| B (Non-lock, Flush) | O  | O             | O             | O              | O              | <b>PS3441*##P</b><br>Pins: DOWN<br>NC / NNP<br>1.2W / 1.6VA |
| C (Lock, Flush)     | O  | O             | O             | O              | O              |   |
| B (Non-lock, Flush) | O  | O             | S             | S              | —              | <b>PS3202*##P</b><br>Pins: UP<br>NO / NP<br>1.2W / 1.6VA    |

\* Override  
 ## Voltage

**Model Number Index**



15mm Solenoid  
 XM Series  
**D**  
 Direct Acting Valve Products

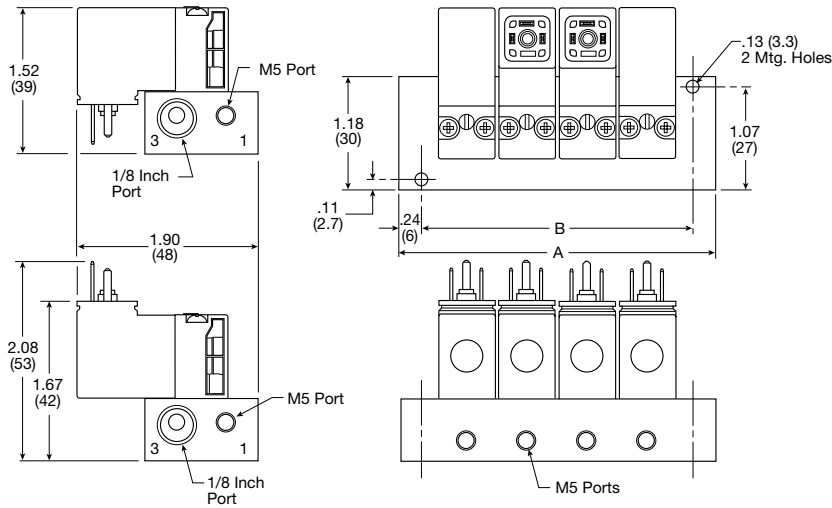
**BOLD OPTIONS ARE MOST POPULAR.**

**Examples:**  
 PSFTN0N16EP - End port manifold - Cyl ports and electrical on same side  
 PSESN0N10NP - Bottom port manifold - N/C and N/O can be interchanged  
 PSFTN0N10NP - End port manifold - Cyl ports and electrical are opposite



**Manifold Dimensions**

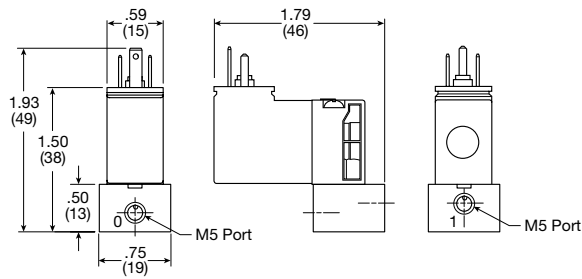
Special mounting considerations must be made for connector assembly clearance when mounting solenoid valves with pins down.



| Number of stations | Dim. A      | Dim. B      |
|--------------------|-------------|-------------|
| 2                  | 2.04 (52)   | 1.57 (40)   |
| 3                  | 2.68 (68)   | 2.20 (56)   |
| 4                  | 3.31 (84)   | 2.83 (72)   |
| 5                  | 3.94 (100)  | 3.46 (88)   |
| 6                  | 4.57 (116)  | 4.09 (104)  |
| 7                  | 5.20 (132)  | 4.72 (120)  |
| 8                  | 5.83 (148)  | 5.35 (136)  |
| 9                  | 6.46 (164)  | 5.98 (152)  |
| 10                 | 7.09 (180)  | 6.61 (168)  |
| 11                 | 7.72 (196)  | 7.24 (184)  |
| 12                 | 8.35 (212)  | 7.87 (200)  |
| 13                 | 8.98 (228)  | 8.50 (216)  |
| 14                 | 9.61 (244)  | 9.13 (232)  |
| 15                 | 10.23 (260) | 9.76 (248)  |
| 16                 | 10.87 (276) | 10.39 (264) |
| 17                 | 11.50 (292) | 11.02 (280) |
| 18                 | 12.13 (308) | 11.65 (296) |
| 19                 | 12.76 (324) | 12.28 (312) |
| 20                 | 13.39 (340) | 12.91 (328) |

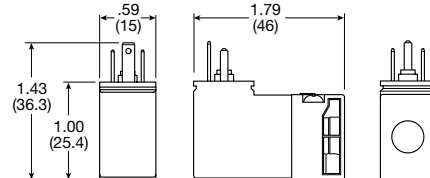
**Subbase Dimensions**

Pins up only.



**15mm Solenoid Dimensions**

Pins up only.



**Female Electrical Connectors**

**15mm 3-Pin DIN 43650C (Use with enclosure "5")**

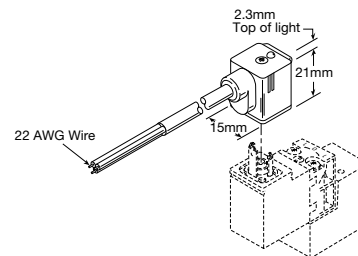
| Description                | Connector         | Connector with cord |
|----------------------------|-------------------|---------------------|
| Unlighted 18 Inches        | <b>PS2932BP</b>   | <b>PS2932HBP</b>    |
| Unlighted 6 Feet           | <b>PS2932BP</b>   | <b>PS2932JBP</b>    |
| Light - 12VAC or DC 6 Feet | <b>PS294675BP</b> | <b>PS2946J75BP*</b> |
| Light - 24VAC or DC 6 Feet | <b>PS294679BP</b> | <b>PS2946J79BP*</b> |
| Light - 110/120VAC 6 Feet  | <b>PS294683BP</b> | <b>PS2946J83BP*</b> |
| Light - 240/230VAC         | <b>PS294687BP</b> | <b>N/A</b>          |

\* LED with surge suppression.

**Note:** Max ø6.5mm cable size required for connector w/o 6' (2m) cord.  
 IP65 rated when properly installed.

**Engineering Data:**

- Conductors: 2 poles plus ground
- Cable range (Connector only): 4 to 6mm (0.16 to 0.24 Inch)
- Contact spacing: 8mm



**Molded 6' Cord Shown**



15mm Solenoid  
 XM Series  
 D Direct Acting Valve Products

The Viking Lite valve range is robust, versatile and combines a large flow capacity with short change-over times, designer may choose 1/8, 1/4 or 3/8 port sizes along with 24VDC and 120VAC voltage options. Viking Lite valves are fitted with dynamic bi-directional spool seals suitable for pressures up to 10 bar and ambient temperatures between -10°C to + 50°C. When in service, radial expansion of the spool seal occurs to maintain sealing contact with the valve bore. This sealing method reduces friction and produces a lower required pilot pressure. Valves do not require lubrication in operation but they can also be installed in systems that are lubricated.

**Ports**

- P2LAZ: 1/8 inch NPT & BSPP, Cv = 0.6
- P2LBZ: 1/4 inch NPT & BSPP, Cv = 1.5
- P2LCZ: 3/8 inch NPT & BSPP, Cv = 2.5

**Mounting**

- Inline
- IEM aluminum bar

**Solenoids**

2.5 watts  
 - 22mm, 3-pin (DIN 43650)  
 24VDC and 120VAC

• **Certification / approval**

- IP65 Rated, RoHS, CE

**Materials**

|                              |                                     |
|------------------------------|-------------------------------------|
| Valve body                   | Anodized aluminium                  |
| End covers                   | Anodized aluminium                  |
| Spool                        | Aluminium                           |
| Piston                       | Acetal plastic / Anodized aluminium |
| End cover sealings           | Nitrile rubber                      |
| End cover screws             | Zinc plated steel                   |
| Springs                      | Stainless steel                     |
| Mounting screws for solenoid | Stainless steel                     |
| Spool seals                  | Nitrile                             |

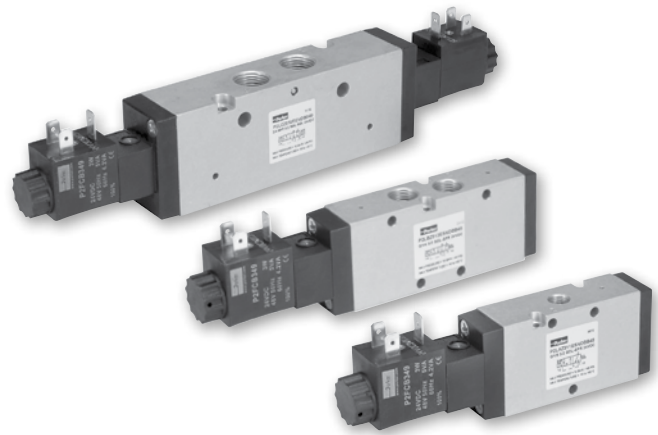
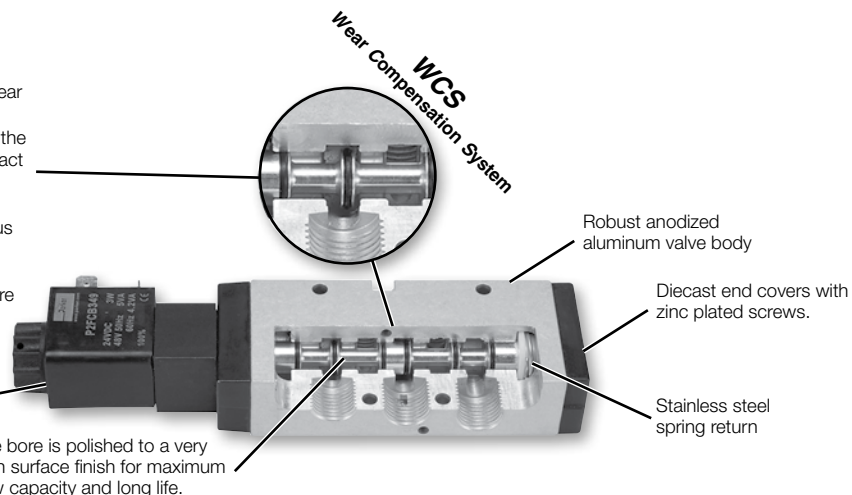
**Features**

**WCS**

- Maximum Performance
  - Low friction - fast response - less wear
- Long Cycle Life
  - Under pressure, radial expansion of the seal occurs to maintain sealing contact with the valve bore
- Non-Lube Service
  - No lubrication required for continuous valve shifting
- Bi-Directional Spool Seals
  - Common spool used for any pressure

- Solenoid operated, IP65, RoHS, CE
- 90° rotation

The bore is polished to a very high surface finish for maximum flow capacity and long life.



**Operating information**

Operating pressure: 145 PSIG (10 bar)  
 Minimum: See chart  
 Operating temperature: 14°F to 122°F (-10°C to 50°C)

**Minimum operating pressure, PSIG (bar)**

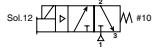
| Valve type - Internal pilot                | P2LAZ      | P2LBZ      | P2LCZ      |
|--|------------|------------|------------|
| Single solenoid - spring return            | 43.5 (3.0) | 43.5 (3.0) | 43.5 (3.0) |
| Double solenoid - 2-position               | 22 (1.5)   | 22 (1.5)   | 22 (1.5)   |
| Double solenoid - 3-position (APB, PC, CE) | 43.5 (3.0) | 43.5 (3.0) | 43.5 (3.0) |

**Recommended air quality for valves**

For best possible service life and trouble free operation, ISO 8573-1 quality class 3.4.3 should be used. This means 5µm filter (standard filter) dew point +3°C for indoor operation (a lower dew point should be selected for outdoor operation) and oil concentration 1.0 mg oil/m<sup>3</sup>, which is what a standard compressor with a standard filter gives.



**3/2 - 2 Position Single Solenoid**

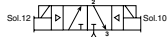


P2LAZ Shown

| Port size | Cv  | Response time (msec) | Weight lb (kg) | Voltage | Part number (NPT)       | Part number (BSPP)      |
|-----------|-----|----------------------|----------------|---------|-------------------------|-------------------------|
| 1/8       | 0.6 | 15 / 35              | 0.35 (0.16)    | 24VDC   | <b>P2LAZ391ESNDBB49</b> | <b>P2LAZ311ESNDBB49</b> |
|           |     |                      |                | 120VAC  | <b>P2LAZ391ESNDBB53</b> | <b>P2LAZ311ESNDBB53</b> |
| 1/4       | 1.5 | 18 / 45              | 0.35 (0.16)    | 24VDC   | <b>P2LBZ392ESNDBB49</b> | <b>P2LBZ312ESNDBB49</b> |
|           |     |                      |                | 120VAC  | <b>P2LBZ392ESNDBB53</b> | <b>P2LBZ312ESNDBB53</b> |
| 3/8       | 2.5 | 27 / 45              | 0.77 (0.35)    | 24VDC   | <b>P2LCZ393ESNDBB49</b> | <b>P2LCZ313ESNDBB49</b> |
|           |     |                      |                | 120VAC  | <b>P2LCZ393ESNDBB53</b> | <b>P2LCZ313ESNDBB53</b> |

N Series

**3/2 - 2 Position Double Solenoid**



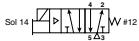
P2LAZ Shown

| Port size | Cv  | Response time (msec) | Weight lb (kg) | Voltage | Part number (NPT)       | Part number (BSPP)      |
|-----------|-----|----------------------|----------------|---------|-------------------------|-------------------------|
| 1/8       | 0.6 | 10 / 10              | 0.40 (0.18)    | 24VDC   | <b>P2LAZ391EENDBB49</b> | <b>P2LAZ311EENDBB49</b> |
|           |     |                      |                | 120VAC  | <b>P2LAZ391EENDBB53</b> | <b>P2LAZ311EENDBB53</b> |
| 1/4       | 1.5 | 12 / 12              | 0.40 (0.18)    | 24VDC   | <b>P2LBZ392EENDBB49</b> | <b>P2LBZ312EENDBB49</b> |
|           |     |                      |                | 120VAC  | <b>P2LBZ392EENDBB53</b> | <b>P2LBZ312EENDBB53</b> |
| 3/8       | 2.5 | 17 / 17              | 0.80 (0.36)    | 24VDC   | <b>P2LCZ393EENDBB49</b> | <b>P2LCZ313EENDBB49</b> |
|           |     |                      |                | 120VAC  | <b>P2LCZ393EENDBB53</b> | <b>P2LCZ313EENDBB53</b> |

ADEX Series

B Series

**5/2 - 2 Position Single Solenoid**



P2LAZ Shown

| Port size | Cv  | Response time (msec) | Weight lb (kg) | Voltage | Part number (NPT)       | Part number (BSPP)      |
|-----------|-----|----------------------|----------------|---------|-------------------------|-------------------------|
| 1/8       | 0.6 | 15 / 35              | .037 (0.17)    | 24VDC   | <b>P2LAZ591ESNDBB49</b> | <b>P2LAZ511ESNDBB49</b> |
|           |     |                      |                | 120VAC  | <b>P2LAZ591ESNDBB53</b> | <b>P2LAZ511ESNDBB53</b> |
| 1/4       | 1.5 | 18 / 45              | 0.44 (0.20)    | 24VDC   | <b>P2LBZ592ESNDBB49</b> | <b>P2LBZ512ESNDBB49</b> |
|           |     |                      |                | 120VAC  | <b>P2LBZ592ESNDBB53</b> | <b>P2LBZ512ESNDBB53</b> |
| 3/8       | 2.5 | 27 / 45              | 0.95 (0.43)    | 24VDC   | <b>P2LCZ593ESNDBB49</b> | <b>P2LCZ513ESNDBB49</b> |
|           |     |                      |                | 120VAC  | <b>P2LCZ593ESNDBB53</b> | <b>P2LCZ513ESNDBB53</b> |

Viking Xtreme Series

Viking Lite Series

**5/2 - 2 Position Double Solenoid**



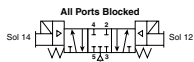
P2LAZ Shown

| Port size | Cv  | Response time (msec) | Weight lb (kg) | Voltage | Part number (NPT)       | Part number (BSPP)      |
|-----------|-----|----------------------|----------------|---------|-------------------------|-------------------------|
| 1/8       | 0.6 | 10 / 10              | .042 (0.19)    | 24VDC   | <b>P2LAZ591EENDBB49</b> | <b>P2LAZ511EENDBB49</b> |
|           |     |                      |                | 120VAC  | <b>P2LAZ591EENDBB53</b> | <b>P2LAZ511EENDBB53</b> |
| 1/4       | 1.5 | 12 / 12              | 0.46 (0.21)    | 24VDC   | <b>P2LBZ592EENDBB49</b> | <b>P2LBZ512EENDBB49</b> |
|           |     |                      |                | 120VAC  | <b>P2LBZ592EENDBB53</b> | <b>P2LBZ512EENDBB53</b> |
| 3/8       | 2.5 | 17 / 17              | 0.97 (0.44)    | 24VDC   | <b>P2LCZ593EENDBB49</b> | <b>P2LCZ513EENDBB49</b> |
|           |     |                      |                | 120VAC  | <b>P2LCZ593EENDBB53</b> | <b>P2LCZ513EENDBB53</b> |

D

Inline Valve Products

**5/3 - 3 Position, All Ports Blocked**



P2LAZ Shown

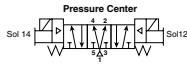
| Port size | Cv  | Response time (msec) | Weight lb (kg) | Voltage | Part number (NPT)       | Part number (BSPP)      |
|-----------|-----|----------------------|----------------|---------|-------------------------|-------------------------|
| 1/8       | 0.6 | 18 / 40              | 0.57 (0.26)    | 24VDC   | <b>P2LAZ691EENDBB49</b> | <b>P2LAZ611EENDBB49</b> |
|           |     |                      |                | 120VAC  | <b>P2LAZ691EENDBB53</b> | <b>P2LAZ611EENDBB53</b> |
| 1/4       | 1.5 | 22 / 55              | 0.62 (0.28)    | 24VDC   | <b>P2LBZ692EENDBB49</b> | <b>P2LBZ612EENDBB49</b> |
|           |     |                      |                | 120VAC  | <b>P2LBZ692EENDBB53</b> | <b>P2LBZ612EENDBB53</b> |
| 3/8       | 2.5 | 30 / 90              | 1.32 (0.60)    | 24VDC   | <b>P2LCZ693EENDBB49</b> | <b>P2LCZ613EENDBB49</b> |
|           |     |                      |                | 120VAC  | <b>P2LCZ693EENDBB53</b> | <b>P2LCZ613EENDBB53</b> |

Most popular. Notes: Response time: Actuate to 90% Pressure / Return to exhaust to 10% of Supply Pressure. (93 PS ( 6.3 bar) / temperature 68°F,+20°C)





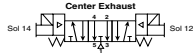
**5/3 - 3 Position, Pressure Center**



P2LAZ Shown

| Port size | Cv  | Response time (msec) | Weight lb (kg) | Voltage | Part number (NPT)       | Part number (BSPP)      |
|-----------|-----|----------------------|----------------|---------|-------------------------|-------------------------|
| 1/8       | 0.6 | 18 / 40              | 0.57 (0.26)    | 24VDC   | <b>P2LAZ791EENDBB49</b> | <b>P2LAZ711EENDBB49</b> |
|           |     |                      |                | 120VAC  | <b>P2LAZ791EENDBB53</b> | <b>P2LAZ711EENDBB53</b> |
| 1/4       | 1.5 | 22 / 55              | 0.62 (0.28)    | 24VDC   | <b>P2LBZ792EENDBB49</b> | <b>P2LBZ712EENDBB49</b> |
|           |     |                      |                | 120VAC  | <b>P2LBZ792EENDBB53</b> | <b>P2LBZ712EENDBB53</b> |
| 3/8       | 2.5 | 30 / 90              | 1.32 (0.60)    | 24VDC   | <b>P2LCZ793EENDBB49</b> | <b>P2LCZ713EENDBB49</b> |
|           |     |                      |                | 120VAC  | <b>P2LCZ793EENDBB53</b> | <b>P2LCZ713EENDBB53</b> |

**5/3 - 3 Position, Center Exhaust**



P2LAZ Shown

| Port size | Cv  | Response time (msec) | Weight lb (kg) | Voltage | Part number (NPT)       | Part number (BSPP)      |
|-----------|-----|----------------------|----------------|---------|-------------------------|-------------------------|
| 1/8       | 0.6 | 18 / 40              | 0.57 (0.26)    | 24VDC   | <b>P2LAZ891EENDBB49</b> | <b>P2LAZ811EENDBB49</b> |
|           |     |                      |                | 120VAC  | <b>P2LAZ891EENDBB53</b> | <b>P2LAZ811EENDBB53</b> |
| 1/4       | 1.5 | 22 / 55              | 0.62 (0.28)    | 24VDC   | <b>P2LBZ892EENDBB49</b> | <b>P2LBZ812EENDBB49</b> |
|           |     |                      |                | 120VAC  | <b>P2LBZ892EENDBB53</b> | <b>P2LBZ812EENDBB53</b> |
| 3/8       | 2.5 | 30 / 90              | 1.32 (0.60)    | 24VDC   | <b>P2LCZ893EENDBB49</b> | <b>P2LCZ813EENDBB49</b> |
|           |     |                      |                | 120VAC  | <b>P2LCZ893EENDBB53</b> | <b>P2LCZ813EENDBB53</b> |

**Notes:** Response time: Actuate to 90% Pressure / Return to exhaust to 10% of Supply Pressure. (93 PS ( 6.3 bar) / temperature 68°F,+20°C)

**Single & Double Solenoid Operated Valves**

P2LAZ591ESND CB49

**Valve size**

|      |   |
|------|---|
| 1/8" | A |
| 1/4" | B |
| 3/8" | C |

**Series**

|             |   |
|-------------|---|
| Viking Lite | Z |
|-------------|---|

**Valve type / function**

|  |   |
|--|---|
| <i>Internal pilot supply to solenoid</i> |   |
| 3/2 NC - 2-position                      | 3 |
| 5/2 2-position                           | 5 |
| 5/3 3-position, APB                      | 6 |
| 5/3 3-position, PC                       | 7 |
| 5/3 3-position, CE                       | 8 |

**Main port thread**

|                 |    |
|-----------------|----|
| G1/8 (P2LA)     | 11 |
| G1/4 (P2LB)     | 12 |
| G3/8 (P2LC)     | 13 |
| G1/2 (P2LD)     | 14 |
| 1/8" NPT (P2LA) | 91 |
| 1/4" NPT (P2LB) | 92 |
| 3/8" NPT (P2LC) | 93 |
| 1/2" NPT (P2LD) | 94 |

**12 End operator**

|    |                                |
|----|--------------------------------|
| E  | Double solenoid operated valve |
| S* | Single solenoid spring return  |

\* Not available with 3-position valves.

**Valve type**

|   |                                |
|---|--------------------------------|
| N | 14°F to 122°F ( -10°C to 50°C) |
|---|--------------------------------|

**Solenoid pilot type**

|   |                      |
|---|----------------------|
| D | Pilot exhaust vented |
|---|----------------------|

**Overrides**

|   |                     |
|---|---------------------|
| C | Extended - locking  |
| B | Flush - non-locking |

**Enclosures / lead length**

|   |  |
|---|--|
| B | 22mm rectangular 3-pin - type B industrial (male only) |
|---|--|

**Voltage / frequency**

|       |                 |
|-------|-----------------|
| 49    | 24VDC           |
| 53    | 120VAC          |
| Blank | Valve less coil |

Most popular.



**N Series**  
**ADEX Series**  
**B Series**  
**Viking Xtreme Series**  
**Viking Lite Series**  
**D Inline Valve Products**

**IEM Bar Manifold, Inline Valve Only\***



| Valve series  | Valve function | # of Stations | Weight lb (kg) | Manifold only (NPT) | Manifold only (BSPP) |
|---------------|----------------|---------------|----------------|---------------------|----------------------|
| P2LAZ / P2LBZ | 3-way          | 2             | 0.84 (0.38)    | <b>91213202SXZN</b> | <b>91213202SXZ</b>   |
| P2LAZ / P2LBZ | 3-way          | 4             | 1.41 (0.64)    | <b>91213204SXZN</b> | <b>91213204SXZ</b>   |
| P2LAZ / P2LBZ | 3-way          | 6             | 1.96 (0.89)    | <b>91213206SXZN</b> | <b>91213206SXZ</b>   |
| P2LAZ / P2LBZ | 3-way          | 8             | 2.54 (1.15)    | <b>91213208SXZN</b> | <b>91213208SXZ</b>   |
| P2LAZ / P2LBZ | 3-way          | 10            | 3.09 (1.40)    | <b>91213210SXZN</b> | <b>91213210SXZ</b>   |

Kits include: Manifold, valve hold down bolts, gaskets.

N Series



| Valve series | Valve function | # of Stations | Weight lb (kg) | Manifold only (NPT) | Manifold only (BSPP) |
|--------------|----------------|---------------|----------------|---------------------|----------------------|
| P2LAZ        | 4-way          | 2             | 0.68 (0.31)    | <b>9121658074N</b>  | <b>9121658074</b>    |
| P2LAZ        | 4-way          | 4             | 1.06 (0.48)    | <b>9121658075N</b>  | <b>9121658075</b>    |
| P2LAZ        | 4-way          | 6             | 1.39 (0.63)    | <b>9121658076N</b>  | <b>9121658076</b>    |
| P2LAZ        | 4-way          | 8             | 1.76 (0.80)    | <b>9121658077N</b>  | <b>9121658077</b>    |
| P2LAZ        | 4-way          | 10            | 2.16 (0.98)    | <b>9121658078N</b>  | <b>9121658078</b>    |

Kits include: Manifold, valve hold down bolts, gaskets.

ADEX Series



| Valve series | Valve function | # of Stations | Weight lb (kg) | Manifold only (NPT) | Manifold only (BSPP) |
|--------------|----------------|---------------|----------------|---------------------|----------------------|
| P2LBZ        | 4-way          | 2             | 1.53 (0.69)    | <b>9121594805XN</b> | <b>9121594805X</b>   |
| P2LBZ        | 4-way          | 4             | 2.49 (1.13)    | <b>9121594806XN</b> | <b>9121594806X</b>   |
| P2LBZ        | 4-way          | 6             | 3.44 (1.56)    | <b>9121594807XN</b> | <b>9121594807X</b>   |
| P2LBZ        | 4-way          | 8             | 4.41 (2.00)    | <b>9121594808XN</b> | <b>9121594808X</b>   |
| P2LBZ        | 4-way          | 10            | 5.40 (2.45)    | <b>9121594812XN</b> | <b>9121594812X</b>   |

Kits include: Manifold, valve hold down bolts, gaskets.

\* For odd number of stations, consider Viking Xtreme bar manifold.

B Series

**IEM Bar Manifold, Inline Valve Only**



| Valve series | Valve function | # of Stations                      | Manifold only (NPT) | Manifold only (BSPP) |
|--------------|----------------|------------------------------------|---------------------|----------------------|
| P2LCZ        | 4-way          | Use Viking Xtreme IEM bar manifold |                     |                      |

**Note:** P2LCZ 3-way has no IEM manifold

Viking Xtreme Series

**Manifold Accessories / Parts**

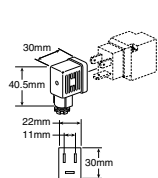


| Valve series    | Description                                  | Weight lb (kg) | Kit number         |
|-----------------|--|----------------|--------------------|
| P2LAZ / P2LBZ * | 3-way: Blanking kit with mounting screws (2) | 0.22 (0.10)    | <b>912132BPSXZ</b> |
| P2LAZ *         | 4-way: Blanking kit with mounting screws (2) | 0.11 (0.05)    | <b>9121658063</b>  |
| P2LBZ *         | 4-way: Blanking kit with mounting screws (2) | 0.04 (0.02)    | <b>9121594809X</b> |

\***Note:** O-ring for blanking kit included with manifold. For replacement o-rings or fastener bolts, use Viking Xtreme Kits.

Viking Lite Series

**22mm Rectangular 3-Pin – Type B Industrial (Use with Enclosure “B”)**



| Description       | Connector with 6' (2m) cord | Connector         |
|-------------------|-----------------------------|-------------------|
| Unlighted         | <b>PS2429JBP</b>            | <b>PS2429BP</b>   |
| Light – 24VDC     | <b>PS2430J79BP*</b>         | <b>PS243079BP</b> |
| Light – 120V/60Hz | <b>PS2430J83BP*</b>         | <b>PS243083BP</b> |

\* LED with surge suppression.

**Note:** Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

**Engineering data:**

conductors: 2 poles plus ground; cable range (connector only): 6 to 8mm (0.24 To 0.31 Inch); contact spacing: 11mm

Most popular.

**Valve Less Coil**

Remove the last 2 digits of the part number of the full valve for valve less coil



**Part number example :**  
**P2LBZ592ESNDBBB49**  
 valve with 24VDC solenoid  
**P2LBZ592ESNDBB** valve less coil

**Replacement Solenoid Coil**



| Description     | Part number     |
|-----------------|-----------------|
| 24VDC coil kit  | <b>P2FCB449</b> |
| 110VAC coil kit | <b>P2FCB453</b> |

**Replacement Solenoid Nut**



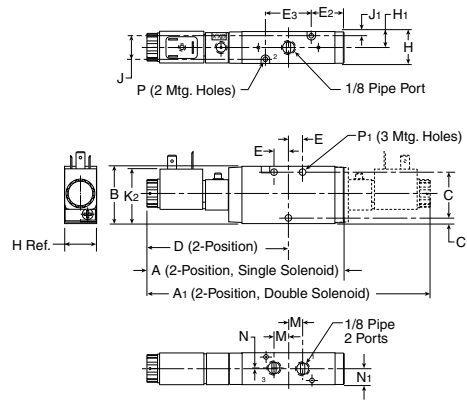
**Description** Solenoid diffuser nut  
**Part number** **PS1556**



**Description** Solenoid vented nut  
**Part number** **PS2892P**



**P2LAZ 3/2 Single & Double Operators – Solenoid**

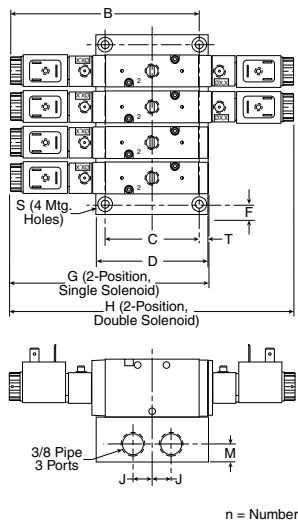


**P2LAZ 3/2 (solenoid)**

|                      |                      |                      |                      |                      |
|----------------------|----------------------|----------------------|----------------------|----------------------|
| <b>A</b>             | <b>A<sub>1</sub></b> | <b>B</b>             | <b>C</b>             | <b>C<sub>1</sub></b> |
| 5.35<br>(136)        | 7.68<br>(195)        | 1.57<br>(40)         | 1.26<br>(32)         | .16<br>(4)           |
| <b>D</b>             | <b>E</b>             | <b>E<sub>2</sub></b> | <b>E<sub>3</sub></b> | <b>H</b>             |
| 3.84<br>(97.5)       | .39<br>(10)          | .91<br>(23)          | 1.26<br>(32)         | .87<br>(22)          |
| <b>H<sub>1</sub></b> | <b>J</b>             | <b>J<sub>1</sub></b> | <b>K<sub>2</sub></b> | <b>M</b>             |
| .43<br>(11)          | .65<br>(16.5)        | .11<br>(2.75)        | 1.50<br>(38)         | .39<br>(10)          |
| <b>N</b>             | <b>N<sub>1</sub></b> | <b>P</b>             | <b>P<sub>1</sub></b> |                      |
| .02<br>(.5)          | .43<br>(11)          | ∅ .12<br>∅ (3.1)     | ∅ .17<br>∅ (4.3)     |                      |

Inches (mm)

**P2LAZ 3/2 Single & Double Operators – IEM Aluminum Bar Manifold**



|                         |             |
|-------------------------|-------------|
| <b>Number of valves</b> | <b>X</b>    |
| 2                       | 2.91 (74)   |
| 4                       | 4.80 (122)  |
| 6                       | 6.69 (170)  |
| 8                       | 8.58 (218)  |
| 10                      | 10.47 (266) |

Inches (mm)

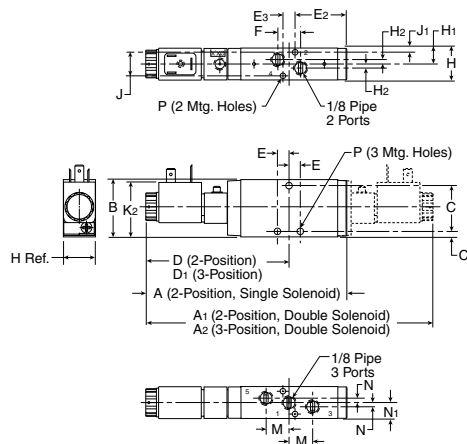
**P2LAZ 3/2  
IEM Aluminum bar manifold**

|                 |              |                |                  |               |
|-----------------|--------------|----------------|------------------|---------------|
| <b>B</b>        | <b>C</b>     | <b>D</b>       | <b>F</b>         | <b>G</b>      |
| 5.06<br>(128.5) | 2.44<br>(62) | 2.99<br>(76)   | .28<br>(7)       | 5.35<br>(136) |
| <b>H</b>        | <b>J</b>     | <b>K</b>       | <b>L</b>         | <b>M</b>      |
| 7.68<br>(195)   | .51<br>(13)  | 2.78<br>(70.5) | 1.20<br>(30.5)   | .47<br>(12)   |
| <b>P</b>        | <b>Q</b>     | <b>R</b>       | <b>S</b>         | <b>T</b>      |
| .94<br>(24)     | 1.42<br>(36) | 1.97<br>(50)   | ∅ .22<br>∅ (5.5) | .88<br>(7)    |

Inches (mm)

|                      |                     |
|----------------------|---------------------|
| <b>Manifold bolt</b> | <b>Torque value</b> |
| M3x40 SHCS           | 4 in.lb (0.45 Nm)   |

**P2LAZ 5/2 & 5/3 Single & Double Operators – Solenoid**

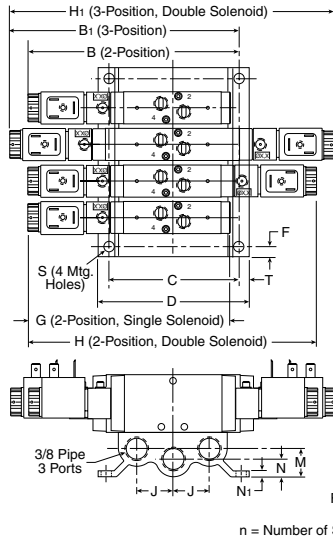


**P2LAZ 5/2 & 5/3 (solenoid)**

|                      |                      |                      |                      |                      |
|----------------------|----------------------|----------------------|----------------------|----------------------|
| <b>A</b>             | <b>A<sub>1</sub></b> | <b>A<sub>2</sub></b> | <b>B</b>             | <b>C</b>             |
| 5.47<br>(139)        | 7.76<br>(197)        | 8.70<br>(221)        | 1.57<br>(40)         | 1.30<br>(33)         |
| <b>C<sub>1</sub></b> | <b>D</b>             | <b>D<sub>1</sub></b> | <b>E</b>             | <b>E<sub>2</sub></b> |
| .14<br>(3.5)         | 3.88<br>(98.5)       | 4.35<br>(110.5)      | .31<br>(8)           | 1.86<br>(47.3)       |
| <b>E<sub>3</sub></b> | <b>F</b>             | <b>H</b>             | <b>H<sub>1</sub></b> | <b>H<sub>2</sub></b> |
| .33<br>(8.5)         | .63<br>(16)          | .87<br>(22)          | .43<br>(11)          | .12<br>(3)           |
| <b>J</b>             | <b>J<sub>1</sub></b> | <b>K<sub>2</sub></b> | <b>M</b>             | <b>N</b>             |
| .63<br>(16)          | .12<br>(3)           | 1.50<br>(38)         | .63<br>(16)          | .12<br>(3)           |
| <b>N<sub>1</sub></b> | <b>P</b>             |                      |                      |                      |
| .43<br>(11)          | ∅ .16<br>∅ (4.1)     |                      |                      |                      |

Inches (mm)

**P2LAZ 5/2 & 5/3 Single & Double Operators – IEM Aluminum Bar Manifold**



| Number of valves | X           |
|------------------|-------------|
| 2                | 3.07 (78)   |
| 4                | 4.96 (126)  |
| 6                | 6.85 (174)  |
| 8                | 8.74 (222)  |
| 10               | 10.63 (270) |

| Manifold bolt      | Torque value      |
|--------------------|-------------------|
| M4x45 Screw<br>MRX | 9 in.lb (0.75 Nm) |

**P2LAZ 5/2 & 5/3**  
**IEM Aluminum bar manifold**

| B               | B <sub>1</sub>  | C            | D             | F          |
|-----------------|-----------------|--------------|---------------|------------|
| 5.10<br>(149.5) | 6.36<br>(161.5) | 3.46<br>(88) | 4.02<br>(102) | .28<br>(7) |

| G             | H             | H <sub>1</sub> | J             | K            |
|---------------|---------------|----------------|---------------|--------------|
| 5.47<br>(139) | 7.76<br>(197) | 8.70<br>(221)  | .96<br>(24.5) | 2.76<br>(70) |

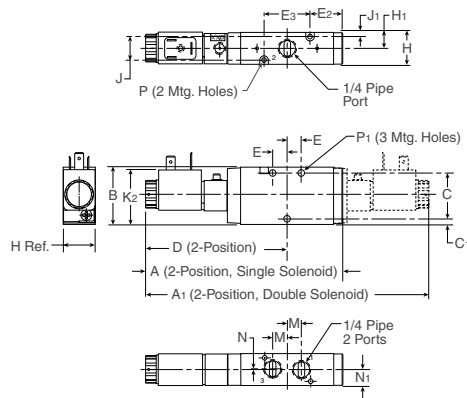
| L            | M           | N           | N <sub>1</sub> | P           |
|--------------|-------------|-------------|----------------|-------------|
| 1.18<br>(30) | .75<br>(19) | .47<br>(12) | .16<br>(4)     | .94<br>(24) |

| Q            | R            | S             | T          |
|--------------|--------------|---------------|------------|
| 1.57<br>(40) | 2.13<br>(54) | ∅.28<br>∅ (7) | .28<br>(7) |

Inches (mm)

**P2LBZ 3/2 Single & Double Operators – Solenoid**



**P2LBZ 3/2 (solenoid)**

| A             | A <sub>1</sub> | B            | C            | C <sub>1</sub> |
|---------------|----------------|--------------|--------------|----------------|
| 5.35<br>(136) | 7.68<br>(195)  | 1.57<br>(40) | 1.26<br>(32) | .16<br>(4)     |

| D              | E           | E <sub>2</sub> | E <sub>3</sub> | H           |
|----------------|-------------|----------------|----------------|-------------|
| 3.84<br>(97.5) | .39<br>(10) | .91<br>(23)    | 1.26<br>(32)   | .87<br>(22) |

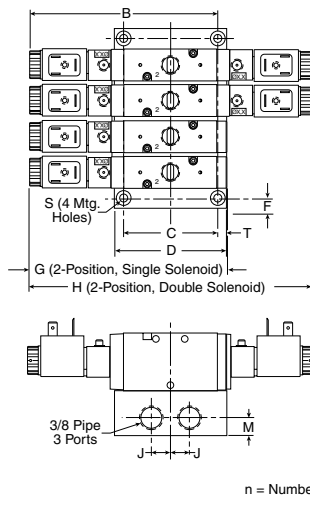
| H <sub>1</sub> | J             | J <sub>1</sub> | K <sub>2</sub> | M           |
|----------------|---------------|----------------|----------------|-------------|
| .43<br>(11)    | .65<br>(16.5) | .11<br>(2.75)  | 1.50<br>(38)   | .39<br>(10) |

| N           | N <sub>1</sub> | P               | P <sub>1</sub>  |
|-------------|----------------|-----------------|-----------------|
| .02<br>(.5) | .43<br>(11)    | ∅.12<br>∅ (3.1) | ∅.17<br>∅ (4.3) |

Inches (mm)

**P2LBZ 3/2 Single & Double Operators – IEM Aluminum Bar Manifold**



| Number of valves | X           |
|------------------|-------------|
| 2                | 2.91 (74)   |
| 4                | 4.80 (122)  |
| 6                | 6.69 (170)  |
| 8                | 8.58 (218)  |
| 10               | 10.47 (266) |

| Manifold bolt | Torque value      |
|---------------|-------------------|
| M3x40 SCHS    | 4 in.lb (0.45 Nm) |

**P2LBZ 3/2**  
**IEM Aluminum bar manifold**

| B               | C            | D            | F          | G             |
|-----------------|--------------|--------------|------------|---------------|
| 5.06<br>(128.5) | 2.44<br>(62) | 2.99<br>(76) | .28<br>(7) | 5.35<br>(136) |

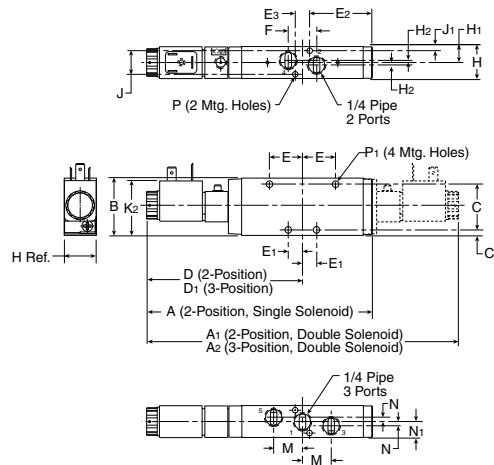
| H             | J           | K              | L              | M           |
|---------------|-------------|----------------|----------------|-------------|
| 7.68<br>(195) | .51<br>(13) | 2.78<br>(70.5) | 1.20<br>(30.5) | .47<br>(12) |

| P           | Q            | R            | S               | T          |
|-------------|--------------|--------------|-----------------|------------|
| .94<br>(24) | 1.42<br>(36) | 1.97<br>(50) | ∅.22<br>∅ (5.5) | .88<br>(7) |

Inches (mm)

**P2LBZ 5/2 & 5/3 Single & Double Operators – Solenoid**

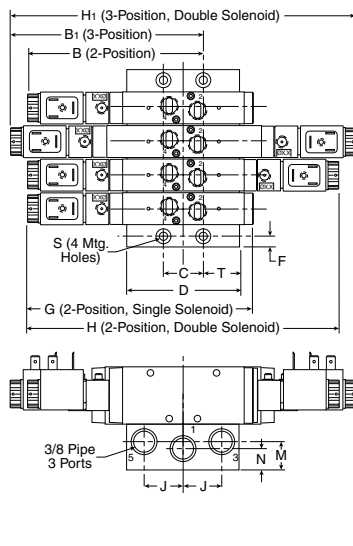


**P2LBZ 5/2 & 5/3 (solenoid)**

| A             | A1              | A2             | B              | C            |
|---------------|-----------------|----------------|----------------|--------------|
| 6.14<br>(156) | 8.46<br>(215)   | 9.29<br>(236)  | 1.57<br>(40)   | 1.26<br>(32) |
| C1            | D               | D1             | E              | E1           |
| .16<br>(4)    | 4.23<br>(107.5) | 4.65<br>(118)  | .91<br>(23)    | .39<br>(10)  |
| E2            | E3              | F              | H              | H1           |
| 1.14<br>(29)  | .39<br>(10)     | .79<br>(20)    | .87<br>(22)    | .43<br>(11)  |
| H2            | J               | J1             | K2             | M            |
| .06<br>(1.5)  | .65<br>(16.5)   | .11<br>(2.8)   | 1.50<br>(38)   | .79<br>(20)  |
| N             | N1              | P              | P1             |              |
| .08<br>(2)    | .43<br>(11)     | Ø .12<br>(3.1) | Ø .17<br>(4.3) |              |

Inches (mm)

**P2LBZ 5/2 & 5/3 Single & Double Operators – IEM Aluminum Bar Manifold**



| Number of valves | X           |
|------------------|-------------|
| 2                | 2.91 (74)   |
| 4                | 4.80 (122)  |
| 6                | 6.69 (170)  |
| 8                | 8.58 (218)  |
| 10               | 10.47 (266) |

Inches (mm)

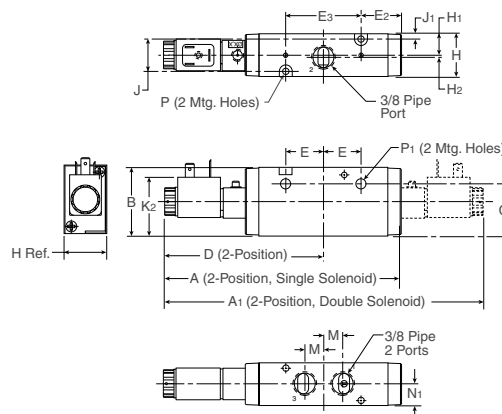
| Manifold bolt | Torque value      |
|---------------|-------------------|
| M3x40 SCHS    | 9 in.lb (0.75 Nm) |

**P2LBZ 5/2 & 5/3  
IEM Aluminum bar manifold**

| B               | B1             | C              | D            | F               |
|-----------------|----------------|----------------|--------------|-----------------|
| 4.43<br>(112.5) | 4.84<br>(123)  | 1.04<br>(26.5) | 2.99<br>(76) | .28<br>(7)      |
| G               | H              | H1             | J            | K               |
| 6.14<br>(156)   | 8.46<br>(215)  | 9.29<br>(236)  | 1.02<br>(26) | 2.781<br>(70.5) |
| L               | M              | N              | P            | Q               |
| 1.20<br>(30.5)  | .75<br>(19)    | .57<br>(14.5)  | .94<br>(24)  | 1.57<br>(40)    |
| R               | S              | T              |              |                 |
| 1.97<br>(50)    | Ø .22<br>(5.5) | .97<br>(25)    |              |                 |

Inches (mm)

**P2LCZ 3/2 Single & Double Operators – Solenoid**

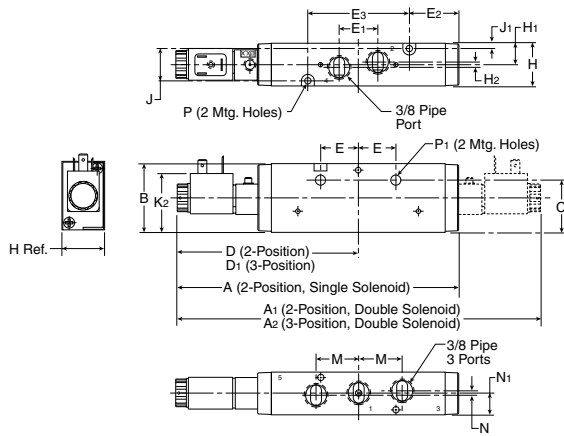


**P2LCZ 3/2 (solenoid)**

| A              | A1             | B              | C            | D             |
|----------------|----------------|----------------|--------------|---------------|
| 6.50<br>(165)  | 8.66<br>(220)  | 1.89<br>(48)   | 1.46<br>(37) | 4.33<br>(110) |
| E              | E2             | E3             | H            | H1            |
| 1.04<br>(26.5) | 1.10<br>(28)   | 2.09<br>(53)   | 1.18<br>(30) | .59<br>(15)   |
| H2             | J              | J1             | K2           | M             |
| .06<br>(1.55)  | .91<br>(23)    | .14<br>(3.5)   | 1.50<br>(38) | .53<br>(13.5) |
| N1             | P              | P1             |              |               |
| .59<br>(15)    | Ø .17<br>(4.4) | Ø .27<br>(6.9) |              |               |

Inches (mm)

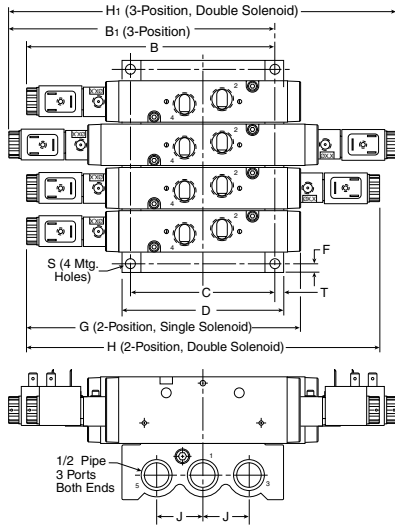
**P2LCZ 5/2 & 5/3 Single & Double Operators – Solenoid**



**P2LBZ 5/2 & 5/3 (solenoid)**

|                  |                  |                |              |                |
|------------------|------------------|----------------|--------------|----------------|
| <b>A</b>         | <b>A1</b>        | <b>A2</b>      | <b>B</b>     | <b>C</b>       |
| 7.68<br>(195)    | 9.88<br>(251)    | 10.70<br>(272) | 1.89<br>(48) | 1.46<br>(37)   |
| <b>D</b>         | <b>D1</b>        | <b>E</b>       | <b>E1</b>    | <b>E2</b>      |
| 4.94<br>(125.5)  | 5.35<br>(136)    | 1.04<br>(26.5) | 1.06<br>(27) | 1.71<br>(43.5) |
| <b>E3</b>        | <b>H</b>         | <b>H1</b>      | <b>H2</b>    | <b>J</b>       |
| 2.80<br>(71)     | 1.18<br>(30)     | .59<br>(15)    | .12<br>(.3)  | .91<br>(23)    |
| <b>J1</b>        | <b>K2</b>        | <b>M</b>       | <b>N</b>     | <b>N1</b>      |
| .14<br>(3.5)     | 1.50<br>(38)     | 1.18<br>(30)   | .08<br>(2)   | .59<br>(15)    |
| <b>P</b>         | <b>P1</b>        |                |              |                |
| Ø .17<br>Ø (4.4) | Ø .27<br>Ø (6.9) |                |              |                |
| Inches (mm)      |                  |                |              |                |

**P2LCZ 5/2 & 5/3 Single & Double Operators – IEM Aluminum Bar Manifold**



|                         |             |
|-------------------------|-------------|
| <b>Number of valves</b> | <b>X</b>    |
| 2                       | 3.29 (84)   |
| 4                       | 5.96 (152)  |
| 6                       | 8.44 (215)  |
| 8                       | 10.93 (278) |
| 10                      | 13.41 (341) |
| Inches (mm)             |             |

|                      |                     |
|----------------------|---------------------|
| <b>Manifold bolt</b> | <b>Torque value</b> |
| M4x50 SCHS           | 15 in.lb (2.0 Nm)   |

**P2LCZ 5/2 & 5/3**

**IEM Aluminum bar manifold**

|                |               |                  |               |                |
|----------------|---------------|------------------|---------------|----------------|
| <b>C</b>       | <b>D</b>      | <b>F</b>         | <b>G</b>      | <b>H</b>       |
| 3.97<br>(101)  | 4.41<br>(112) | .24<br>(6)       | 7.68<br>(195) | 9.88<br>(251)  |
| <b>H1</b>      | <b>J</b>      | <b>K</b>         | <b>L</b>      | <b>P</b>       |
| 10.70<br>(272) | 1.26<br>(32)  | 3.43<br>(87)     | 1.54<br>(39)  | 1.24<br>(31.5) |
| <b>Q</b>       | <b>R</b>      | <b>S</b>         | <b>T</b>      |                |
| 1.77<br>(45)   | 2.24<br>(57)  | Ø .26<br>Ø (6.5) | .24<br>(6)    |                |
| Inches (mm)    |               |                  |               |                |

N Series

ADEX Series

B Series

Viking Xtreme Series

Viking Lite Series

D

Inline Valve Products



The Viking Xtreme valve range is robust, versatile and combines high performance with compact installation dimensions. Large flow capacity, short change-over times and low change-over pressure are important characteristics of this valve range.

**Ports**

- P2LAX: 1/8 inch NPT & BSPP
- P2LBX: 1/4 inch NPT & BSPP
- P2LCX: 3/8 inch NPT & BSPP
- P2LDX: 1/2 inch NPT & BSPP

**Mounting**

- Inline
- IEM aluminum bar

**Solenoids**

2.5 watts to 7.3 watts

- Conduit
- Grommet
- 22mm & 30mm 3-pin (DIN 43650)

- 12VDC to 240VAC

**Certification / approval**

- IP65 Rated, RoHS, CE
- ATEX option available

**Mobile applications**

- Viking Xtreme tested to +5g shock and vibration
- Solenoids operate with wide voltage tolerance bands
- Corrosion resistant design
- Passed 500 hour salt spray test

**Material specifications**

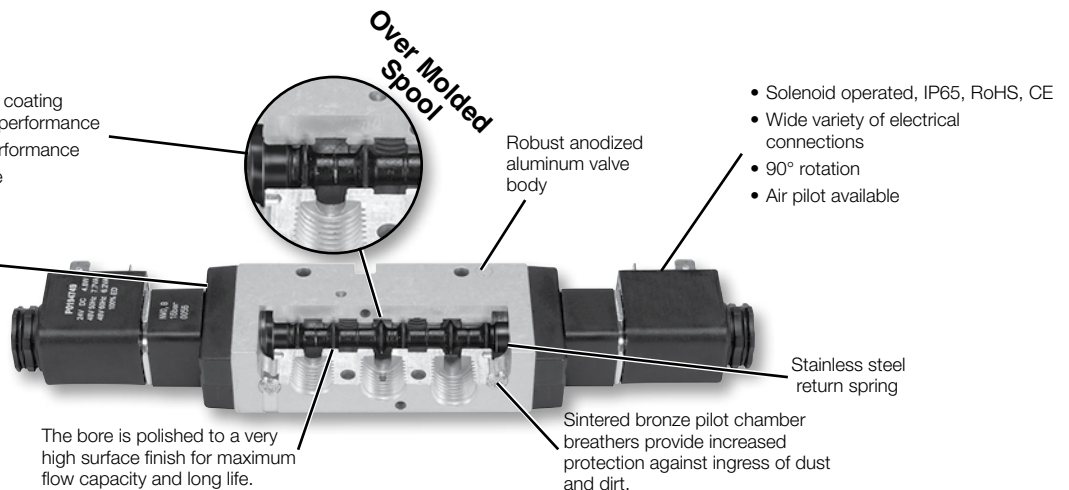
|           |                             |
|-----------|-----------------------------|
| Body      | Anodized aluminum           |
| End caps  | Anodized aluminum           |
| Coils     | Thermoplastic               |
| Fasteners | Stainless steel             |
| Spool     | Aluminum and nitrile rubber |
| Springs   | Stainless steel             |

**Features**

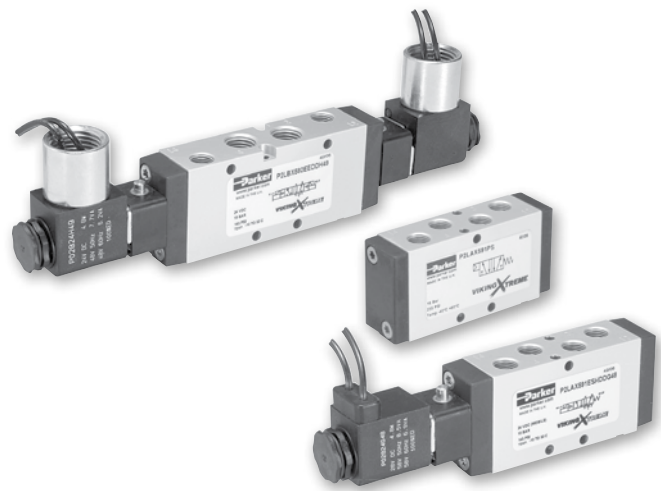
**Over Molded Spool**

- Aluminum spool with nitrile rubber coating ground to exact size for optimum performance
- Precision ground for maximum performance
- Wide operating temperature range
  - Low temperature to -40°

Diecast end covers with stainless steel screws to resist aggressive environments.



- Solenoid operated, IP65, RoHS, CE
- Wide variety of electrical connections
- 90° rotation
- Air pilot available



**Operating information**

Operating pressure:

- Normal: Vacuum to 145 PSIG (Vacuum to 10 bar)
- Xtreme: (P2LAX & P2LBX) Vacuum to 232 PSIG (Vacuum to 16 bar)
- (P2LCX & P2LDX) Vacuum to 174 PSIG (Vacuum to 12 bar)
- Minimum: See chart

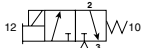


Operating temperature:

- Normal: 14°F to 122°F (-10°C to 50°C)
- Xtreme: -40°F to 140°F (-40°C to 60°C)

**Minimum operating pressure, PSIG (bar)**




| Valve type - Internal pilot                    | P2LAX    | P2LBX    | P2LCX    | P2LDX    |
|--|----------|----------|----------|----------|
| Single solenoid - spring return                | 46 (3.2) | 51 (3.5) | 51 (3.5) | 51 (3.5) |
| Single remote pilot - spring return            | 46 (3.2) | 51 (3.5) | 51 (3.5) | 51 (3.5) |
| Double solenoid - 2-position                   | 22 (1.5) | 22 (1.5) | 22 (1.5) | 22 (1.5) |
| Double remote pilot - 2-position               | 22 (1.5) | 22 (1.5) | 22 (1.5) | 22 (1.5) |
| Double solenoid - 3-position (APB, PC, CE)     | 51 (3.5) | 51 (3.5) | 51 (3.5) | 51 (3.5) |
| Double remote pilot - 3-position (APB, PC, CE) | 51 (3.5) | 51 (3.5) | 51 (3.5) | 51 (3.5) |

**Single Solenoid, 3-way, 2-position, Normal Operating Pressure / Temperature**

|  | Solenoid  | Port size (NPT)      | Cv    | Valve type | Response time (msec) | Weight lb (kg) | Voltage         | Part number  |
|--|---|----------------------|-------|------------|----------------------|----------------|-----------------|--|
|                 | <br>22mm DIN | 1/8"                 | 0.7   | P2LAX      | 18 / 40              | 0.84 (0.38)    | 24VDC<br>120VAC | <b>P2LAX391ESNDDDB49</b><br><b>P2LAX391ESNDDDB53</b> |
|  |   | 1/4"                 | 1.3   | P2LBX      | 18 / 45              | 0.84 (0.38)    | 24VDC<br>120VAC | <b>P2LBX392ESNDDDB49</b><br><b>P2LBX392ESNDDDB53</b> |
|  |   | 3/8"                 | 2.5   | P2LCX      | 25 / 75              | 1.72 (0.78)    | 24VDC<br>120VAC | <b>P2LCX393ESNDDDB49</b><br><b>P2LCX393ESNDDDB53</b> |
|  |   | 1/2"                 | 2.7   | P2LDX      | 25 / 75              | 1.72 (0.78)    | 24VDC<br>120VAC | <b>P2LDX394ESNDDDB49</b><br><b>P2LDX394ESNDDDB53</b> |
|  |   | P2LAX 22mm DIN Shown |       |            |                      |                |                 |  |
| <br>18" Grommet | 1/8"  | 0.7                  | P2LAX | 18 / 40    | 0.84 (0.38)          | 0.84 (0.38)    | 24VDC<br>120VAC | <b>P2LAX391ESNDDG49</b><br><b>P2LAX391ESNDDG53</b>   |
|  | 1/4"  | 1.3                  | P2LBX | 18 / 45    | 0.84 (0.38)          | 0.84 (0.38)    | 24VDC<br>120VAC | <b>P2LBX392ESNDDG49</b><br><b>P2LBX392ESNDDG53</b>   |
|  | 3/8"  | 2.5                  | P2LCX | 25 / 75    | 1.72 (0.78)          | 1.72 (0.78)    | 24VDC<br>120VAC | <b>P2LCX393ESNDDG49</b><br><b>P2LCX393ESNDDG53</b>   |
|  | 1/2"  | 2.7                  | P2LDX | 25 / 75    | 1.72 (0.78)          | 1.72 (0.78)    | 24VDC<br>120VAC | <b>P2LDX394ESNDDG49</b><br><b>P2LDX394ESNDDG53</b>   |
|  | P2LAX 18" Grommet Shown   |                      |       |            |                      |                |                 |  |

**Notes:** Above valves are rated for an Operating Temperature from 14°F to 122°F (-10°C to 50°C). See Model Code Matrix for additional options.  
 Response time: Actuate to 90% Pressure / Return to exhaust to 10% of Supply Pressure. (93 PS ( 6.3 bar) / temperature 68°F,+20°C)

**Single Solenoid, 4-way, 2-position, Normal Operating Pressure / Temperature**

|  | Solenoid  | Port size (NPT)      | Cv    | Valve type | Response time (msec) | Weight lb (kg) | Voltage         | Part number  |  |
|--|---|----------------------|-------|------------|----------------------|----------------|-----------------|--|--|
|                 | <br>22mm DIN | 1/8"                 | 0.7   | P2LAX      | 15 / 35              | 0.49 (0.22)    | 24VDC<br>120VAC | <b>P2LAX591ESNDDDB49</b><br><b>P2LAX591ESNDDDB53</b> |  |
|  |   | 1/4"                 | 1.3   | P2LBX      | 18 / 45              | 0.84 (0.38)    | 0.84 (0.38)     | 24VDC<br>120VAC                                      | <b>P2LBX592ESNDDDB49</b><br><b>P2LBX592ESNDDDB53</b> |
|  |   | 3/8"                 | 2.5   | P2LCX      | 27 / 75              | 1.68 (0.76)    | 1.68 (0.76)     | 24VDC<br>120VAC                                      | <b>P2LCX593ESNDDDB49</b><br><b>P2LCX593ESNDDDB53</b> |
|  |   | 1/2"                 | 2.7   | P2LDX      | 25 / 75              | 1.68 (0.76)    | 1.68 (0.76)     | 24VDC<br>120VAC                                      | <b>P2LDX594ESNDDDB49</b><br><b>P2LDX594ESNDDDB53</b> |
|  |   | P2LBX 22mm DIN Shown |       |            |                      |                |                 |  |  |
| <br>18" Grommet | 1/8"  | 0.7                  | P2LAX | 15 / 35    | 0.49 (0.22)          | 0.49 (0.22)    | 24VDC<br>120VAC | <b>P2LAX591ESNDDG49</b><br><b>P2LAX591ESNDDG53</b>   |  |
|  | 1/4"  | 1.3                  | P2LBX | 18 / 45    | 0.84 (0.38)          | 0.84 (0.38)    | 24VDC<br>120VAC | <b>P2LBX592ESNDDG49</b><br><b>P2LBX592ESNDDG53</b>   |  |
|  | 3/8"  | 2.5                  | P2LCX | 27 / 75    | 1.68 (0.76)          | 1.68 (0.76)    | 24VDC<br>120VAC | <b>P2LCX593ESNDDG49</b><br><b>P2LCX593ESNDDG53</b>   |  |
|  | 1/2"  | 2.7                  | P2LDX | 25 / 75    | 1.68 (0.76)          | 1.68 (0.76)    | 24VDC<br>120VAC | <b>P2LDX594ESNDDG49</b><br><b>P2LDX594ESNDDG53</b>   |  |
|  | P2LAX 18" Grommet Shown   |                      |       |            |                      |                |                 |  |  |




**Notes:** Above valves are rated for an Operating Temperature from 14°F to 122°F (-10°C to 50°C). See Model Code Matrix for additional options.  
 Response time: Actuate to 90% Pressure / Return to exhaust to 10% of Supply Pressure. (93 PS ( 6.3 bar) / temperature 68°F,+20°C)

 Most popular.








**Double Solenoid, 4-way, 2-position, Normal Operating Pressure / Temperature**

| Solenoid   | Port size (NPT) | Cv  | Valve type | Response time (msec) | Weight lb (kg) | Voltage         | Part number                            |
|--|-----------------|-----|------------|----------------------|----------------|-----------------|--|
| <br><br>22mm DIN<br>P2LBX 22mm DIN Shown | 1/8"            | 0.7 | P2LAX      | 10 / 10              | 0.60 (0.27)    | 24VDC<br>120VAC | P2LAX591EENDDDB49<br>P2LAX591EENDDDB53 |
|  | 1/4"            | 1.3 | P2LBX      | 12 / 12              | 0.93 (0.42)    | 24VDC<br>120VAC | P2LBX592EENDDDB49<br>P2LBX592EENDDDB53 |
|  | 3/8"            | 2.5 | P2LCX      | 17 / 17              | 1.78 (0.81)    | 24VDC<br>120VAC | P2LCX593EENDDDB49<br>P2LCX593EENDDDB53 |
|  | 1/2"            | 2.7 | P2LDX      | 17 / 17              | 1.78 (0.81)    | 24VDC<br>120VAC | P2LDX594EENDDDB49<br>P2LDX594EENDDDB53 |
|  | 1/8"            | 0.7 | P2LAX      | 10 / 10              | 0.60 (0.27)    | 24VDC<br>120VAC | P2LAX591EENDDG49<br>P2LAX591EENDDG53   |
|  | 1/4"            | 1.3 | P2LBX      | 12 / 12              | 0.93 (0.42)    | 24VDC<br>120VAC | P2LBX592EENDDG49<br>P2LBX592EENDDG53   |
| <br>18" Grommet<br>P2LAX 18" Grommet Shown  | 3/8"            | 2.5 | P2LCX      | 17 / 17              | 1.78 (0.81)    | 24VDC<br>120VAC | P2LCX593EENDDG49<br>P2LCX593EENDDG53   |
|  | 1/2"            | 2.7 | P2LDX      | 17 / 17              | 1.78 (0.81)    | 24VDC<br>120VAC | P2LDX594EENDDG49<br>P2LDX594EENDDG53   |

**Notes:** Above valves are rated for an Operating Temperature from 14°F to 122°F (-10°C to 50°C). See Model Code Matrix for additional options.  
 Response time: Actuate to 90% Pressure / Return to exhaust to 10% of Supply Pressure. (93 PS (6.3 bar) / temperature 68°F,+20°C)

**Double Solenoid, 4-way, 3-position All Ports Blocked, 3-position Center Exhaust, Normal Operating Pressure / Temperature**

| Solenoid  | Port size (NPT) | Cv  | Valve type | Response time (msec) | Weight lb (kg) | Voltage         | Part number                            |  |
|---|-----------------|-----|------------|----------------------|----------------|-----------------|--|--|
|   |                 |     |            |                      |                |                 | All ports blocked                      | Center exhaust                         |
| <br><br>22mm DIN<br>P2LBX 22mm DIN Shown | 1/8"            | 0.5 | P2LAX      | 18 / 40              | 0.62 (0.28)    | 24VDC<br>120VAC | P2LAX691EENDDDB49<br>P2LAX691EENDDDB53 | P2LAX891EENDDDB49<br>P2LAX891EENDDDB53 |
|   | 1/4"            | 0.9 | P2LBX      | 22 / 55              | 0.97 (0.44)    | 24VDC<br>120VAC | P2LBX692EENDDDB49<br>P2LBX692EENDDDB53 | P2LBX892EENDDDB49<br>P2LBX892EENDDDB53 |
|   | 3/8"            | 1.8 | P2LCX      | 30 / 90              | 2.45 (1.11)    | 24VDC<br>120VAC | P2LCX693EENDDDB49<br>P2LCX693EENDDDB53 | P2LCX893EENDDDB49<br>P2LCX893EENDDDB53 |
|   | 1/2"            | 1.9 | P2LDX      | 30 / 90              | 2.45 (1.11)    | 24VDC<br>120VAC | P2LDX694EENDDDB49<br>P2LDX694EENDDDB53 | P2LDX894EENDDDB49<br>P2LDX894EENDDDB53 |
| <br>18" Grommet<br>P2LBX 18" Grommet Shown   | 1/8"            | 0.5 | P2LAX      | 18 / 40              | 0.62 (0.28)    | 24VDC<br>120VAC | P2LAX691EENDDG49<br>P2LAX691EENDDG53   | P2LAX891EENDDG49<br>P2LAX891EENDDG53   |
|   | 1/4"            | 0.9 | P2LBX      | 22 / 55              | 0.97 (0.44)    | 24VDC<br>120VAC | P2LBX692EENDDG49<br>P2LBX692EENDDG53   | P2LBX892EENDDG49<br>P2LBX892EENDDG53   |
|   | 3/8"            | 1.8 | P2LCX      | 30 / 90              | 2.45 (1.11)    | 24VDC<br>120VAC | P2LCX693EENDDG49<br>P2LCX693EENDDG53   | P2LCX893EENDDG49<br>P2LCX893EENDDG53   |
|   | 1/2"            | 1.9 | P2LDX      | 30 / 90              | 2.45 (1.11)    | 24VDC<br>120VAC | P2LDX694EENDDG49<br>P2LDX694EENDDG53   | P2LDX894EENDDG49<br>P2LDX894EENDDG53   |

**Notes:** Above valves are rated for an Operating Temperature from 14°F to 122°F (-10°C to 50°C). See Model Code Matrix for additional options.  
 Response time: Actuate to 90% Pressure / Return to exhaust to 10% of Supply Pressure. (93 PS (6.3 bar) / temperature 68°F,+20°C)

Most popular.



N Series

ADEX Series

B Series

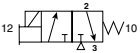



Viking Xtreme Series

Viking Lite Series

D





Inline Valve Products

**Single Solenoid, 3-way, 2-position, Xtreme Operating Pressure / Temperature**


|  | Solenoid   | Port size (NPT) | Cv   | Valve type | Response time (msec) | Weight lb (kg) | Voltage        | Part number                            |                                      |
|--|--|-----------------|------|------------|----------------------|----------------|----------------|--|--------------------------------------|
| <br><br>22mm DIN<br>P2LAX 22mm DIN Shown |  | 1/8"            | 0.7  | P2LAX      | 15 / 45              | 0.84 (0.38)    | 12VDC<br>24VDC | P2LAX391ESHDDDB47<br>P2LAX391ESHDDDB48 |                                      |
|  |  | 1/4"            | 1.3  | P2LBX      | 25 / 65              | 0.84 (0.38)    | 12VDC<br>24VDC | P2LBX392ESHDDDB47<br>P2LBX392ESHDDDB48 |                                      |
|  |  | 3/8"            | 2.5  | P2LCX      | 25 / 85              | 1.01 (0.46)    | 12VDC<br>24VDC | P2LCX393ESHDDDB47<br>P2LCX393ESHDDDB48 |                                      |
|  |  | 1/2"            | 2.7  | P2LDX      | 25 / 85              | 1.01 (0.46)    | 12VDC<br>24VDC | P2LDX394ESHDDDB47<br>P2LDX394ESHDDDB48 |                                      |
|  | <br><br>18" Grommet<br>P2LBX 18" Grommet Shown |                 | 1/8" | 0.7        | P2LAX                | 15 / 45        | 0.84 (0.38)    | 12VDC<br>24VDC                         | P2LAX391ESHDDG47<br>P2LAX391ESHDDG48 |
|  |  |                 | 1/4" | 1.3        | P2LBX                | 25 / 65        | 0.84 (0.38)    | 12VDC<br>24VDC                         | P2LBX392ESHDDG47<br>P2LBX392ESHDDG48 |
|  |  | 3/8"            | 2.5  | P2LCX      | 25 / 85              | 1.01 (0.46)    | 12VDC<br>24VDC | P2LCX393ESHDDG47<br>P2LCX393ESHDDG48   |                                      |
|  |  | 1/2"            | 2.7  | P2LDX      | 25 / 85              | 1.01 (0.46)    | 12VDC<br>24VDC | P2LDX394ESHDDG47<br>P2LDX394ESHDDG48   |                                      |

**Notes:** Above valves have Mobile Rate Coils and are rated for an Operating Temperature from -40°F to 140°F (-40°C to 60°C). See Model Code Matrix for additional options.  
 Response time: Actuate to 90% Pressure / Return to exhaust to 10% of Supply Pressure. (93 PS ( 6.3 bar) / temperature 68°F,+20°C)

**Single Solenoid, 4-way, 2-position, Xtreme Operating Pressure / Temperature**

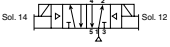


|  | Solenoid   | Port size (NPT) | Cv   | Valve type | Response time (msec) | Weight lb (kg) | Voltage        | Part number                            |                                      |
|--|--|-----------------|------|------------|----------------------|----------------|----------------|--|--------------------------------------|
| <br><br>22mm DIN<br>P2LAX 22mm DIN Shown |  | 1/8"            | 0.7  | P2LAX      | 15 / 45              | 0.84 (0.38)    | 12VDC<br>24VDC | P2LAX591ESHDDDB47<br>P2LAX591ESHDDDB48 |                                      |
|  |  | 1/4"            | 1.3  | P2LBX      | 20 / 55              | 0.84 (0.38)    | 12VDC<br>24VDC | P2LBX592ESHDDDB47<br>P2LBX592ESHDDDB48 |                                      |
|  |  | 3/8"            | 2.5  | P2LCX      | 25 / 85              | 1.01 (0.46)    | 12VDC<br>24VDC | P2LCX593ESHDDDB47<br>P2LCX593ESHDDDB48 |                                      |
|  |  | 1/2"            | 2.7  | P2LDX      | 25 / 85              | 1.01 (0.46)    | 12VDC<br>24VDC | P2LDX594ESHDDDB47<br>P2LDX594ESHDDDB48 |                                      |
|  | <br><br>18" Grommet<br>P2LAX 18" Grommet Shown |                 | 1/8" | 0.7        | P2LAX                | 15 / 45        | 0.84 (0.38)    | 12VDC<br>24VDC                         | P2LAX591ESHDDG47<br>P2LAX591ESHDDG48 |
|  |  |                 | 1/4" | 1.3        | P2LBX                | 25 / 65        | 0.84 (0.38)    | 12VDC<br>24VDC                         | P2LBX592ESHDDG47<br>P2LBX592ESHDDG48 |
|  |  | 3/8"            | 2.5  | P2LCX      | 28 / 85              | 1.01 (0.46)    | 12VDC<br>24VDC | P2LCX593ESHDDG47<br>P2LCX593ESHDDG48   |                                      |
|  |  | 1/2"            | 2.7  | P2LDX      | 25 / 85              | 1.01 (0.46)    | 12VDC<br>24VDC | P2LDX594ESHDDG47<br>P2LDX594ESHDDG48   |                                      |

**Notes:** Above valves have Mobile Rate Coils and are rated for an Operating Temperature from -40°F to 140°F (-40°C to 60°C). See Model Code Matrix for additional options.  
 Response time: Actuate to 90% Pressure / Return to exhaust to 10% of Supply Pressure. (93 PS ( 6.3 bar) / temperature 68°F,+20°C)

 Most popular.

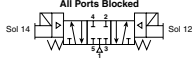
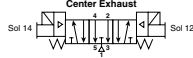



**Double Solenoid, 4-way, 2-position, Xtreme Operating Pressure / Temperature**

| Solenoid   | Port size (NPT) | Cv  | Valve type | Response time (msec) | Weight lb (kg) | Voltage        | Part number  |
|--|-----------------|-----|------------|----------------------|----------------|----------------|--|
| <br><br>22mm DIN<br>P2LBX 22mm DIN Shown | 1/8"            | 0.7 | P2LAX      | 11 / 11              | 0.60 (0.27)    | 12VDC<br>24VDC | <b>P2LAX591EEHDDDB47</b><br><b>P2LAX591EEHDDDB48</b> |
|  | 1/4"            | 1.3 | P2LBX      | 13 / 13              | 0.93 (0.42)    | 12VDC<br>24VDC | <b>P2LBX592EEHDDDB47</b><br><b>P2LBX592EEHDDDB48</b> |
|  | 3/8"            | 2.5 | P2LCX      | 18 / 18              | 1.06 (0.48)    | 12VDC<br>24VDC | <b>P2LCX593EEHDDDB47</b><br><b>P2LCX593EEHDDDB48</b> |
|  | 1/2"            | 2.7 | P2LDX      | 18 / 18              | 1.06 (0.48)    | 12VDC<br>24VDC | <b>P2LDX594EEHDDDB47</b><br><b>P2LDX594EEHDDDB48</b> |
| <br>18" Grommet<br>P2LAX 18" Grommet Shown  | 1/8"            | 0.7 | P2LAX      | 11 / 11              | 0.60 (0.27)    | 12VDC<br>24VDC | <b>P2LAX591EEHDDG47</b><br><b>P2LAX591EEHDDG48</b>   |
|  | 1/4"            | 1.3 | P2LBX      | 13 / 13              | 0.93 (0.42)    | 12VDC<br>24VDC | <b>P2LBX592EEHDDG47</b><br><b>P2LBX592EEHDDG48</b>   |
|  | 3/8"            | 2.5 | P2LCX      | 18 / 18              | 1.06 (0.48)    | 12VDC<br>24VDC | <b>P2LCX593EEHDDG47</b><br><b>P2LCX593EEHDDG48</b>   |
|  | 1/2"            | 2.7 | P2LDX      | 18 / 18              | 1.06 (0.48)    | 12VDC<br>24VDC | <b>P2LDX594EEHDDG47</b><br><b>P2LDX594EEHDDG48</b>   |

**Notes:** Above valves have Mobile Rate Coils and are rated for an Operating Temperature from -40°F to 140°F (-40°C to 60°C). See Model Code Matrix for additional options.  
 Response time: Actuate to 90% Pressure / Return to exhaust to 10% of Supply Pressure. (93 PS ( 6.3 bar) / temperature 68°F,+20°C)

**Double Solenoid, 4-way, 3-position All Ports Blocked, 3-position Center Exhaust, Xtreme Operating Pressure / Temperature**

| Solenoid  | Port size | Cv  | Valve type (NPT) | Response time (msec) | Weight lb (kg) | Voltage        | Part number  |  |
|---|-----------|-----|------------------|----------------------|----------------|----------------|--|--|
|   |           |     |                  |                      |                |                | All ports blocked                                    | Center exhaust                                       |
| <br><br>22mm DIN<br>P2LBX 22mm DIN Shown | 1/8"      | 0.5 | P2LAX            | 18 / 40              | 0.62 (0.28)    | 12VDC<br>24VDC | <b>P2LAX691EEHDDDB47</b><br><b>P2LAX691EEHDDDB48</b> | <b>P2LAX891EEHDDDB47</b><br><b>P2LAX891EEHDDDB48</b> |
|   | 1/4"      | 0.9 | P2LBX            | 22 / 55              | 0.97 (0.44)    | 12VDC<br>24VDC | <b>P2LBX692EEHDDDB47</b><br><b>P2LBX692EEHDDDB48</b> | <b>P2LBX892EEHDDDB47</b><br><b>P2LBX892EEHDDDB48</b> |
|   | 3/8"      | 1.8 | P2LCX            | 30 / 90              | 2.45 (1.11)    | 12VDC<br>24VDC | <b>P2LCX693EEHDDDB47</b><br><b>P2LCX693EEHDDDB48</b> | <b>P2LCX893EEHDDDB47</b><br><b>P2LCX893EEHDDDB48</b> |
|   | 1/2"      | 1.9 | P2LDX            | 30 / 90              | 2.45 (1.11)    | 12VDC<br>24VDC | <b>P2LDX694EEHDDDB47</b><br><b>P2LDX694EEHDDDB48</b> | <b>P2LDX894EEHDDDB47</b><br><b>P2LDX894EEHDDDB48</b> |
| <br>18" Grommet<br>P2LBX 18" Grommet Shown   | 1/8"      | 0.5 | P2LAX            | 18 / 40              | 0.62 (0.28)    | 12VDC<br>24VDC | <b>P2LAX691EEHDDG47</b><br><b>P2LAX691EEHDDG48</b>   | <b>P2LAX891EEHDDG47</b><br><b>P2LAX891EEHDDG48</b>   |
|   | 1/4"      | 0.9 | P2LBX            | 22 / 55              | 0.97 (0.44)    | 12VDC<br>24VDC | <b>P2LBX692EEHDDG47</b><br><b>P2LBX692EEHDDG48</b>   | <b>P2LBX892EEHDDG47</b><br><b>P2LBX892EEHDDG48</b>   |
|   | 3/8"      | 1.8 | P2LCX            | 30 / 90              | 2.45 (1.11)    | 12VDC<br>24VDC | <b>P2LCX693EEHDDG47</b><br><b>P2LCX693EEHDDG48</b>   | <b>P2LCX893EEHDDG47</b><br><b>P2LCX893EEHDDG48</b>   |
|   | 1/2"      | 1.9 | P2LDX            | 30 / 90              | 2.45 (1.11)    | 12VDC<br>24VDC | <b>P2LDX694EEHDDG47</b><br><b>P2LDX694EEHDDG48</b>   | <b>P2LDX894EEHDDG47</b><br><b>P2LDX894EEHDDG48</b>   |

**Notes:** Above valves have Mobile Rate Coils and are rated for an Operating Temperature from -40°F to 140°F (-40°C to 60°C). See Model Code Matrix for additional options.  
 Response time: Actuate to 90% Pressure / Return to exhaust to 10% of Supply Pressure. (93 PS ( 6.3 bar) / temperature 68°F,+20°C)

 Most popular.



N Series

ADEX Series

B Series

Viking Xtreme Series

Viking Lite Series

**D**

Inline Valve Products

**Single & Double Solenoid Operated Valves**

**P2L A X 5 91 E S H D D G 49**

N Series  
 ADEX Series  
 B Series  
 Viking Xtreme Series  
 Viking Lite Series  
 D Inline Valve Products

| Valve size |   |
|------------|---|
| 1/8"       | A |
| 1/4"       | B |
| 3/8"       | C |
| 1/2"       | D |

| Series        |   |
|---------------|---|
| Viking Xtreme | X |

| Voltage / frequency |                 |
|---------------------|-----------------|
| 42                  | 24VAC           |
| 45                  | 12VDC           |
| 47*                 | 12 VDC mobile   |
| 48*                 | 24 VDC mobile   |
| 49                  | 24VDC           |
| 53                  | 120VAC          |
| 57                  | 240VAC          |
| Blank               | Valve less coil |

\* Only available with enclosures "A", "B" & "G". Additional voltages are available upon request. Contact customer support for more information.

| Valve type / function   |  |   |
|---|--|---|
| <i>Internal pilot supply to solenoid*</i>                                 |  |   |
| 3/2 NC - 2-position   |  | 3 |
| 5/2 2-position  |  | 5 |
| 5/3 3-position, APB   |  | 6 |
| 5/3 3-position, PC  |  | 7 |
| 5/3 3-position, CE  |  | 8 |
| <i>External pilot supply to the solenoids through ports #12 &amp; #14</i> |  |   |
| 3/2 NC - 2-position   |  | L |
| 5/2 2-position  |  | N |
| 5/3 3-position, APB   |  | P |
| 5/3 3-position, PC  |  | Q |
| 5/3 3-position, CE  |  | R |

\* Size A & B solenoid valves can be field converted from internal to external pilot. See page 22 for details.

| Enclosures / lead length |  |
|--------------------------|--|
| A                        | 30mm square 3-pin – ISO 4400 Form A (male only)        |
| B                        | 22mm rectangular 3-pin – type B industrial (male only) |
| E*                       | Intrinsically safe, FM / CSA                           |
| F†                       | Hazardous duty, FM / CSA                               |
| G                        | Grommet - 18" leads                                    |
| H                        | 1/2" NPT conduit - 18" leads                           |
| N                        | Solenoid pilot operator less coil                      |

\* Only available with voltage code "49" & override option "A", valve type "N" Only.

† Valve Type "N" Only.

| Main port thread            |     |
|-----------------------------|-----|
| G1/8 (P2LA)                 | 11  |
| G1/4 (P2LB)                 | 12  |
| G1/4 (P2LB) NAMUR Mount     | 1N* |
| G3/8 (P2LC)                 | 13  |
| G1/2 (P2LD)                 | 14  |
| 1/8" NPT (P2LA)             | 91  |
| 1/4" NPT (P2LB)             | 92  |
| 1/4" NPT (P2LB) NAMUR Mount | 9N* |
| 3/8" NPT (P2LC)             | 93  |
| 1/2" NPT (P2LD)             | 94  |

\* NAMUR mount available for 5/2, 2-position only.

| Overrides |                      |
|-----------|----------------------|
| A         | No override          |
| C*        | Flush - locking      |
| D         | Extended non-locking |

\* Override for valve type N only.

| Solenoid pilot type |                           |
|---------------------|---------------------------|
| D                   | Pilot exhaust vented      |
| N                   | Tapped pilot exhaust (M5) |

| 12 End operator                |    |
|--------------------------------|----|
| Double solenoid operated valve | E  |
| Single solenoid spring return  | S* |

\* Not available with 3-position valves.

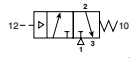
| Valve type |   |
|------------|---|
| N          | Normal vacuum to 145 PSIG (16 bar)<br>14°F to 122°F (-10°C to 50°C) |
| H*         | Xtreme vacuum to 232 PSIG (10 bar)<br>14°F to 122°F (-10°C to 50°C) |

\* P2LC and P2LD solenoid operated valves have a maximum pressure rating of 175 PSIG (12 bar)

Most popular.



**Single Remote Pilot, 3-way, 2-position, Xtreme Operating Pressure / Temperature**



P2LAX Shown

| Port size (NPT) | Cv  | Response time (msec) | Weight lb (kg) | Valve type | Part number       |
|-----------------|-----|----------------------|----------------|------------|-------------------|
| 1/8"            | 0.7 | 15 / 45              | 0.68 (0.31)    | P2LAX      | <b>P2LAX391PS</b> |
| 1/4"            | 1.3 | 25 / 65              | 0.68 (0.31)    | P2LBX      | <b>P2LBX392PS</b> |
| 3/8"            | 2.5 | 25 / 65              | 0.88 (0.40)    | P2LCX      | <b>P2LCX393PS</b> |
| 1/2"            | 2.7 | 25 / 65              | 0.88 (0.40)    | P2LDX      | <b>P2LDX394PS</b> |

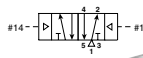
**Single Remote Pilot, 4-way, 2-position, Xtreme Operating Pressure / Temperature**



P2LAX Shown

| Port size (NPT) | Cv  | Response time (msec) | Weight lb (kg) | Valve type | Part number       |
|-----------------|-----|----------------------|----------------|------------|-------------------|
| 1/8"            | 0.7 | 15 / 45              | 0.33 (0.15)    | P2LAX      | <b>P2LAX591PS</b> |
| 1/4"            | 1.3 | 20 / 55              | 0.68 (0.31)    | P2LBX      | <b>P2LBX592PS</b> |
| 3/8"            | 2.5 | 25 / 85              | 0.90 (0.41)    | P2LCX      | <b>P2LCX593PS</b> |
| 1/2"            | 2.7 | 25 / 85              | 0.90 (0.41)    | P2LDX      | <b>P2LDX594PS</b> |

**Double Remote Pilot, 4-way, 2-position, Xtreme Operating Pressure / Temperature**



P2LAX Shown

| Port size (NPT) | Cv  | Response time (msec) | Weight lb (kg) | Valve type | Part number       |
|-----------------|-----|----------------------|----------------|------------|-------------------|
| 1/8"            | 0.7 | 11 / 11              | 0.33 (0.15)    | P2LAX      | <b>P2LAX591PP</b> |
| 1/4"            | 1.3 | 13 / 13              | 0.68 (0.31)    | P2LBX      | <b>P2LBX592PP</b> |
| 3/8"            | 2.5 | 18 / 18              | 0.90 (0.41)    | P2LCX      | <b>P2LCX593PP</b> |
| 1/2"            | 2.7 | 18 / 18              | 0.90 (0.41)    | P2LDX      | <b>P2LDX594PP</b> |

**Double Remote Pilot, 4-way, 3-position All Ports Blocked, 3-position Center Exhaust, Xtreme Operating Pressure / Temperature**



P2LAX Shown

| Port size (NPT) | Cv  | Response time (msec) | Weight lb (kg) | Valve type | Part number       |                   |
|-----------------|-----|----------------------|----------------|------------|-------------------|-------------------|
|                 |     |                      |                |            | All ports blocked | Center exhaust    |
| 1/8"            | 0.5 | 18 / 50              | 0.31 (0.14)    | P2LAX      | <b>P2LAX691PP</b> | <b>P2LAX891PP</b> |
| 1/4"            | 0.9 | 25 / 65              | 0.73 (0.33)    | P2LBX      | <b>P2LBX692PP</b> | <b>P2LBX892PP</b> |
| 3/8"            | 1.8 | 30 / 90              | 0.93 (0.42)    | P2LCX      | <b>P2LCX693PP</b> | <b>P2LCX893PP</b> |
| 1/2"            | 1.9 | 30 / 90              | 0.93 (0.42)    | P2LDX      | <b>P2LDX694PP</b> | <b>P2LDX894PP</b> |

**Notes:** Above valves are rated for an Operating Temperature from 14°F to 122°F (-10°C to 50°C). See Model Code Matrix for additional options.  
 Response time: Actuate to 90% Pressure / Return to exhaust to 10% of Supply Pressure. (93 PS ( 6.3 bar) / temperature 68°F,+20°C)

**Remote Air Pilot Operated Valves**

**P2L A X 5 91 PS**

| Valve size |    |
|------------|----|
| 1/8"       | A  |
| 1/4"       | B  |
| 3/8"       | C* |
| 1/2"       | D* |

\* P2LCX and P2LDX manual & remote air pilot valves have a maximum pressure rating of 175 PSIG (12 bar).

| Operators / return |                                    |
|--------------------|------------------------------------|
| PP                 | Double remote pilot                |
| PS*                | Single remote pilot, spring return |

\* Not available with 3-position valves.

| Main port thread |                 |
|------------------|-----------------|
| 11               | G1/8 (P2LA)     |
| 12               | G1/4 (P2LB)     |
| 13               | G3/8 (P2LC)     |
| 14               | G1/2 (P2LD)     |
| 91               | 1/8" NPT (P2LA) |
| 92               | 1/4" NPT (P2LB) |
| 93               | 3/8" NPT (P2LC) |
| 94               | 1/2" NPT (P2LD) |

Note: NAMUR Mount for P2LBX is available upon request.

| Valve type / function                    |   |
|--|---|
| <i>Internal pilot supply to solenoid</i> |   |
| 3/2 NC - 2-position                      | 3 |
| 5/2 2-position                           | 5 |
| 5/3 3-position, APB                      | 6 |
| 5/3 3-position, PC                       | 7 |
| 5/3 3-position, CE                       | 8 |

Most popular.



N Series

ADEX Series

B Series

Viking Xtreme Series

Viking Lite Series

D  
 Inline Valve Products

**ATEX Certified Single & Double Solenoid Operated Valves**

Vacuum to 145 PSIG (vacuum to 10 bar)  
 14°F to 122°F 22mm coils (enclosure option M)  
 -4°F to 122°F 30mm coils (enclosure option S)

**P2L A X 5 91 E S A D D M 49**

- Series N
- Series ADEX
- Series B
- Series Viking Xtreme
- Series Viking Lite
- D  
Inline Valve Products

| Valve size |   |
|------------|---|
| 1/8"       | A |
| 1/4"       | B |
| 3/8"       | C |
| 1/2"       | D |

| Valve type / function   |   |
|---|---|
| <i>Internal Pilot Supply to Solenoid</i>                              |   |
| 2-position valve  | 5 |
| 3-position valve APB  | 6 |
| 3-position valve PC   | 7 |
| 3-position valve CE   | 8 |
| <i>External Pilot Supply to Solenoids through Ports #12 &amp; #14</i> |   |
| 2-position valve  | N |
| 3-position valve APB  | P |
| 3-position valve PC   | Q |
| 3-position valve CE   | R |

| Main port thread |    |
|------------------|----|
| G1/8 (P2LA)      | 11 |
| G1/4 (P2LB)      | 12 |
| G3/8 (P2LC)      | 13 |
| G1/2 (P2LD)      | 14 |
| 1/8" NPT (P2LA)  | 91 |
| 1/4" NPT (P2LB)  | 92 |
| 3/8" NPT (P2LC)  | 93 |
| 1/2" NPT (P2LD)  | 94 |

| Voltage |       |
|---------|-------|
| 49      | 24VDC |

| Enclosures |                          |
|------------|--------------------------|
| M          | ATEX 8-22T EExm T4 135°C |
| S          | ATEX 8-30T EExm T6 85°C  |

| Overrides |                      |
|-----------|----------------------|
| D         | Extended non-locking |

| Solenoid pilot type |                           |
|---------------------|---------------------------|
| D                   | Vented pilot exhaust      |
| N                   | Tapped pilot exhaust (M5) |

| 12 end operator |                                |
|-----------------|--------------------------------|
| E               | Double solenoid operated valve |
| S               | Single solenoid spring return  |

**NOTE:** For ATEX certified remote air pilot valves, build the valve part number from the model number index for remote pilot and add "-EX" following the number.

Example: P2LAX591PS-EX

**Note:** all valves include a 3 meter sealed cable with assembly.



**ATEX Certified Solenoid Pilot Assemblies**

**P2F S 1 3 A 3 D M 49**

| Voltage |       |
|---------|-------|
| 49      | 24VDC |

| Enclosures |                          |
|------------|--------------------------|
| M          | ATEX 8-22T EExm T4 135°C |
| S          | ATEX 8-30T EExm T6 85°C  |

**Note:** all valves include a 3 meter sealed cable with assembly.



**IEM Bar Manifold, Viking Xtreme Solenoid / Remote Pilot Valves**



| Valve series  | Valve function | ## -Stations | Manifold only (NPT)  | Manifold only (BSPP) |
|---------------|----------------|--------------|----------------------|----------------------|
| P2LAX*        | 3-way          | 02 - 12      | <b>P2LAXMAXG##NP</b> | <b>P2LAXMAXG##GP</b> |
| P2LAX*        | 4-way          | 02 - 12      | <b>P2LAXMAXN##NP</b> | <b>P2LAXMAXN##GP</b> |
| P2LBX*        | 3-way          | 02 - 12      | <b>P2LBXMAXG##NP</b> | <b>P2LBXMAXG##GP</b> |
| P2LBX*        | 4-way          | 02 - 12      | <b>P2LBXMAXN##NP</b> | <b>P2LBXMAXN##GP</b> |
| P2LCX / P2LDX | 3-way / 4-way  | 02 - 12      | <b>P2LCXMAXN##NP</b> | <b>P2LCXMAXN##GP</b> |

Kits include: (1) manifold, valve hold down bolts and o-rings. Replace ## with number of valve stations.  
 \* 30mm solenoid coil option "A" not available on IEM bar manifold P2LAX or P2LBX.

**IEM Bar Manifold Add-A-Fold Assembly (Viking Xtreme Solenoid / Remote Pilot Valves Only)**



| Valve series  | Valve function | ## -Stations | Manifold only (NPT)    | Manifold only (BSPP)   |
|---------------|----------------|--------------|------------------------|------------------------|
| P2LAX*        | 3-way          | 02 - 12      | <b>AAPL2AXMAXG##NP</b> | <b>AAPL2AXMAXG##GP</b> |
| P2LAX*        | 4-way          | 02 - 12      | <b>AAPL2AXMAXN##NP</b> | <b>AAPL2AXMAXN##GP</b> |
| P2LBX*        | 3-way          | 02 - 12      | <b>AAPL2BXMAXG##NP</b> | <b>AAPL2BXMAXG##GP</b> |
| P2LBX*        | 4-way          | 02 - 12      | <b>AAPL2BXMAXN##NP</b> | <b>AAPL2BXMAXN##GP</b> |
| P2LCX / P2LDX | 3-way / 4-way  | 02 - 12      | <b>AAPL2CXMAXN##NP</b> | <b>AAPL2CXMAXN##GP</b> |

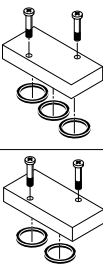
Kits include: (1) manifold, valve hold down bolts, o-rings and assembly. Replace ## with number of valve stations.  
 \* 30mm solenoid coil option "A" not available on IEM bar manifold P2LAX or P2LBX.

- How to Order: 1. List Add-A-Fold assembly part number as line item 1  
 2. List the desired valves series part number in subsequent line items after the Add-A-Fold Assembly part number to complete the ordering code. Include all valves and blanking kits required. The left most station is station # 1 looking at the #12 end of the manifold.

Example: B3, 4-way manifold with station #1 blanked off with valves assembled

| Line | Qty | Part number        | Comment   |
|------|-----|--------------------|---|
| 1    | 1   | AAPL2BXMAXN02NP    | Add-A-Fold Assembly, 2-station IEM bar manifold |
| 2    | 2   | P2LBX591ESNNDDDB49 | 4-way, Station 1, 2                             |

**Blanking Plate**



| Type            | Kit number         |
|-----------------|--------------------|
| P2LAX 4-way     | <b>P2LAXK20P</b>   |
| P2LBX 4-way     | <b>P2LBXK20P</b>   |
| P2LCX 3 & 4 way | <b>P2LCXK20P</b>   |
| P2LAX 3-way     | <b>912132BPSXZ</b> |
| P2LBX 3-way     | <b>912132BPSXZ</b> |

Kit includes: plate, screws, o-rings

**Manifold Bolts**

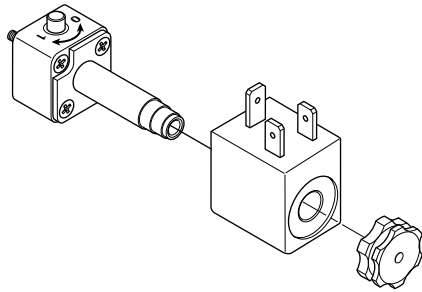
| Type  | Qty. | Kit number       |
|-------|------|------------------|
| P2LAX | 12   | <b>P2LAXK87P</b> |
| P2LBX | 12   | <b>P2LBXK87P</b> |
| P2LCX | 12   | <b>P2LCXK87P</b> |

**Manifold O-rings**

| Type  | Qty. | Kit number       |
|-------|------|------------------|
| P2LAX | 30   | <b>P2LAXK84P</b> |
| P2LBX | 18   | <b>P2LBXK84P</b> |
| P2LCX | 12   | <b>P2LCXK84P</b> |

Most popular.

**22mm Solenoid Pilot Operators & Coils**



**Manual override options**

The pilot operators can be supplied with locking or non-locking manual override. The standard manual override is the monostable (spring return) extended brass override. Alternatively the bistable (locking) override can be specified as an alternative for the Normal duty 10 bar option.

**Spares**

Solenoid operators are available as spares complete with mounting screws and seals. Coils and connectors should be ordered separately unless ATEX certified and intrinsically safe is needed. ATEX certified operators and coils must be ordered together.

**Transients**

Interrupting the current through the solenoid coil produces momentary voltage peaks which, under unfavorable conditions, can amount to several hundred times the rated operating voltage. Normally, these transients do not cause problems, but to achieve the maximum life of relays in the circuit (and particularly of transistors, thyristors and integrated circuits) it is desirable to provide protection by means of voltage-dependent resistors (varistors). All connectors / cable plugs with LEDs include this type of circuit protection.

**Materials**

**Pilot Valve**

|                             |                                 |
|-----------------------------|---------------------------------|
| Body .....                  | Polyamide                       |
| Armature tube:              |                                 |
| Normal pilot operator ..... | Brass                           |
| Xtreme pilot operator ..... | Stainless steel                 |
| Plunger & core.....         | Corrosion resistant CR-NI steel |
| Seals .....                 | FKM (viton™)                    |
| Screws.....                 | Stainless steel                 |
| <b>Coil</b>                 |                                 |
| Encapsulation material..... | Thermoplastic                   |

**ATEX**



ATEX is a European Directive (94/9/EC) valid for products to be used within an explosive atmosphere.

Both ATEX certified solenoid, remote pilot and manual operated valves, as well as complete solenoid pilot assemblies are available. For specific information regarding ATEX certification please visit [www.parker/pneumatics](http://www.parker/pneumatics).

|                       |               |
|-----------------------|---------------|
| Series                | N             |
| Series                | ADEX          |
| Series                | B             |
| Series                | Viking Xtreme |
| Series                | Viking Lite   |
|                       | D             |
| Inline Valve Products |               |

**22mm solenoid pilot options**

The P2FP13\*4\* (NC) 3/2 solenoid pilot operators are designed for piloting pneumatic control valves with compressed air or other inert gases.  
 The P2FP operator is available for Normal operating pressures up to 10 bar or the Xtreme maximum operating pressure of 16 bar and wide band voltage tolerances required for mobile applications.

**Corrosion resistant design**

The pilot valve body is manufactured in thermoplastic PA6 material and the core tube brass / stainless steel. The plunger / core is made from stainless steel and the valve seats from FKM.

**Solenoid pilot exhaust**

These operators all exhaust out of the top of the core tube which is tapped M5. The standard solenoid nut (Solenoid pilot type "D") fitted to the core tube is a diffuser nut which allows the exhaust to escape to atmosphere. This nut also minimizes ingress of dirt into the valve through this port. The alternative plastic knurled nut (Solenoid pilot type "N") can be specified (refer to part number system) if the exhaust air needs captured and piped away using the M5 tapped port.

**Mobile applications**

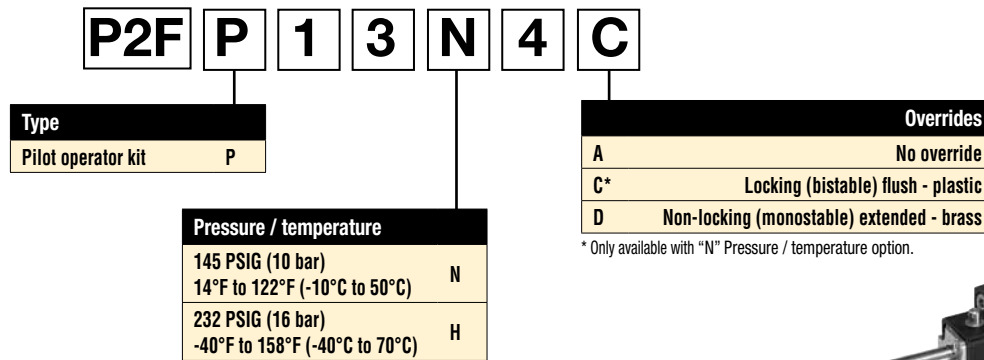
Viking Xtreme valves are tested to +5g shock and vibration. Solenoid operated valves are designed to operate with wide voltage tolerance bands within the ambient temperature ranges stated in the technical section.

**Coils**

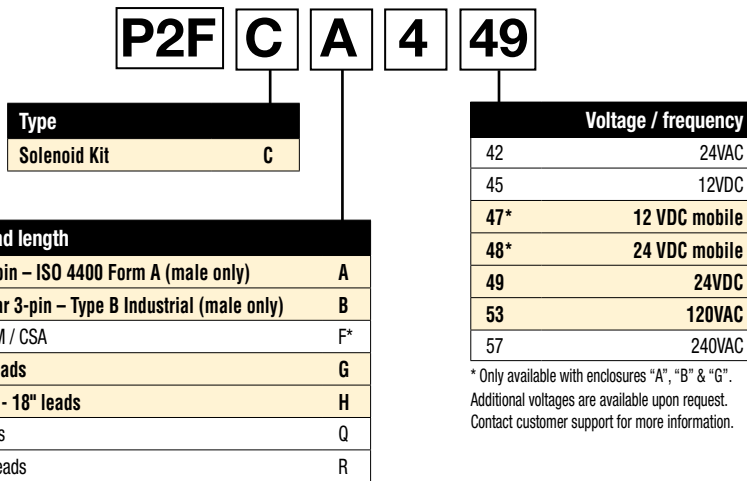
Coils are wound with enameled copper wire, having a temperature index of 180°C with class F insulation (155°C) and are encapsulated in Thermoplastic resin. When fitted with suitable connector and correct gasket, they give protection to IP65.



**Pilot Operator Kits**



**Solenoid Kits**



\* Only available with voltage codes "45", "49", "53" & "57". Not for use with the Xtreme version (-40°C to 70°C).

**Solenoid Enclosures**



**Solenoid Information (Solenoids are rated for continuous duty.)**

| Voltage Code | Enclosure "A" |         |    | Enclosure "B" to "R" |                |                   |                |
|--------------|---------------|---------|----|----------------------|----------------|-------------------|----------------|
|              | AC 60Hz       | DC 50Hz | DC | Power consumption    | Holding (amps) | Power consumption | Holding (amps) |
| 42           | 24            | 22      |    | 3.9VA                | .14            | 7.3VA             | .31            |
| 45           | —             | —       | 12 | 2.6W                 | .21            | 4.6W              | .37            |
| 47*          | —             | —       | 12 | 6.2W                 | .52            | 5.5W              | .46            |
| 48*          | —             | —       | 24 | 6.8W                 | .29            | 6.0W              | .25            |
| 49           | —             | —       | 24 | 2.7W                 | .11            | 4.8W              | .20            |
| 53           | 120           | 110     | —  | 4.1VA                | .04            | 6.3VA             | .05            |
| 57           | 240           | 230     | —  | 3.7VA                | .02            | 6.4VA             | .03            |

\* Mobile voltages. Solenoid voltage characteristics for all coils located on page 23.

**Replacement Solenoid Nut**

| Description           | Part number   | Description         | Part number    |
|-----------------------|---------------|---------------------|----------------|
| Solenoid diffuser nut | <b>PS1556</b> | Solenoid vented nut | <b>PS2892P</b> |

Most popular.



N Series  
 ADEX Series  
 B Series  
 Viking Xtreme Series  
 Viking Lite Series  
 D  
 Inline Valve Products

**Intrinsically safe solenoid valves (“E” option)**

**Hazardous location class:**

**Class I; Groups A, B, C & D**

**Class II; Groups E, F, & G**

**Class III; Div. I**

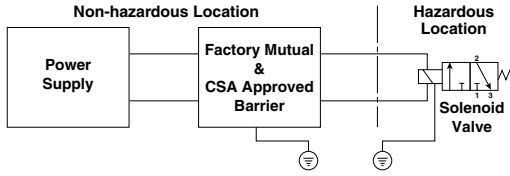
For use in low voltage (24VDC) Intrinsically Safe applications. **NO OTHER VOLTAGE IS APPROVED.**

Comes standard with non-lighted solenoid connector.

36mm Coil width.

**Must be connected to an FM approved Barrier.**

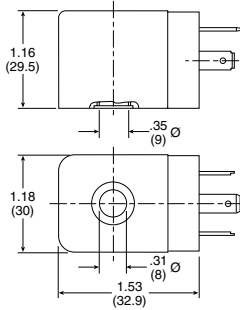
For dimensions, reference standard solenoid models. Maximum internally piloted valve pressure is 115 PSIG. Pressures to 145 PSIG can be used when external pilot is utilized and pilot pressure is limited to 115 PSIG.



**Intrinsically safe solenoid pilot assembly kits**

| Description | Part number         |
|-------------|---------------------|
| 24VDC       | <b>P2FS13N1AE49</b> |

Kit includes: coil, connector, o-ring & screws



**Hazardous duty solenoid valves (“F” option)**

**Hazardous location class:**

**Class I; Zone I EX, M, II & T4**

**Class I; Div. I, Groups A, B, C, & D**

**Class II & III; Div. I, Groups E, F, & G**

Comes standard with 1/2" conduit connection.

Voltage range = ±10%

Ambient temperature range = -20°C (-4°F) to 60°C (140°F)

Duty factor = 100%

IP65 Rated (with connected conduit connector)

**Notes:**

1. Maximum non-hazardous location voltage not to exceed 250V RMS.
2. Connect per Barrier Manufacturers instructions.
3. Factory Mutual requires connections per ISA RP 12.6 instructions.
4. CSA requires “Installation to be in accordance with the Canadian Electrical Code, Part I.”
5. The hazardous duty coils are wider in size than size A, B, C & D valves.  
If mounted on a manifold, the valves need to be staggered to fit.

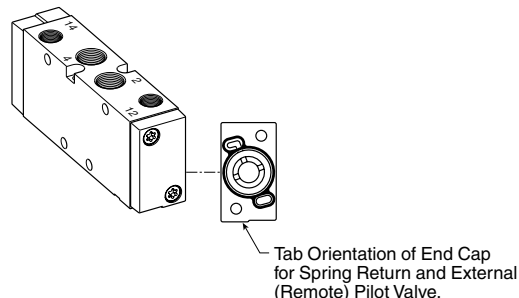
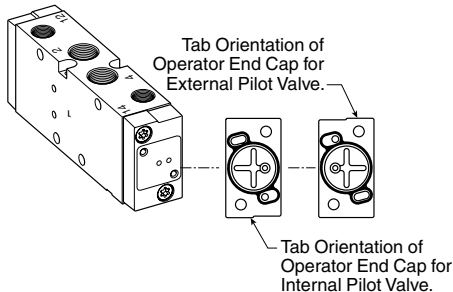


**Option F**  
**Hazardous Duty FM / CSA**

**Internal to external pilot conversion (size A & B only)**

To convert from Internal to External Pilot Valve, simply remove the (2) fasteners that attach the end cap to the valve body. Rotate the end cap 180° and attach back to the valve body. For single solenoid valves, only the 14-End needs to be rotated. For double solenoid valves, both ends must be converted for proper function.

The 12 & 14-Ports are always tapped no matter what Valve Type / Function is selected. For Internal Pilot Function, ports do NOT need to be plugged.



**Operating temperature**

- **Normal**.....14°F to 122°F (-10°C to 50°C)
- **Xtreme**..... -40°F to 158°F (-40°C to 70°C)

**Flow Rating**

| Valve size | Port size | 2-position | 3-position |
|------------|-----------|------------|------------|
| P2LAX      | 1/8"      | 0.7        | 0.5        |
| P2LBX      | 1/4"      | 1.3        | 0.9        |
| P2LCX      | 3/8"      | 2.5        | 1.8        |
| P2LDX      | 1/2"      | 2.7        | 1.9        |

**Operating pressure\***

**Maximum: Normal Valve Type.....145 PSIG (10 bar)**  
**Xtreme Valve Type.....232 PSIG (16 bar)**

**Minimum:**

| Valve type - internal pilot                       | Minimum PSIG (bar) |             |             |             |
|---|--------------------|-------------|-------------|-------------|
|   | P2LAX              | P2LBX       | P2LCX       | P2LDX       |
| Single solenoid - spring return                   | 46<br>(3.2)        | 51<br>(3.5) | 51<br>(3.5) | 51<br>(3.5) |
| Single remote pilot - spring return               | 46<br>(3.2)        | 51<br>(3.5) | 51<br>(3.5) | 51<br>(3.5) |
| Double solenoid - 2-position                      | 22<br>(1.5)        | 22<br>(1.5) | 22<br>(1.5) | 22<br>(1.5) |
| Double remote pilot - 2-position                  | 22<br>(1.5)        | 22<br>(1.5) | 22<br>(1.5) | 22<br>(1.5) |
| Double solenoid - 3-position<br>(APB, PC, CE)     | 51<br>(3.5)        | 51<br>(3.5) | 51<br>(3.5) | 51<br>(3.5) |
| Double remote pilot - 3-position<br>(APB, PC, CE) | 51<br>(3.5)        | 51<br>(3.5) | 51<br>(3.5) | 51<br>(3.5) |

| Valve type - External pilot | P2LAX  | P2LBX | P2LCX | P2LDX |
|-----------------------------|--------|-------|-------|-------|
| All Viking series           | Vacuum |       |       |       |

\* P2LC and P2LD solenoid operated valves have a maximum pressure rating of 175 PSIG (12 bar)

**Solenoid voltage characteristics**

**Non-mobile coils**

+10% / -10% for all coils with Normal and Xtreme Operators

**Mobile coils - normal pilot operator**

**22mm 12 & 24VDC - Mobile (47 & 48 voltage code)**

| Operating temperature        |                |                |                |
|------------------------------|----------------|----------------|----------------|
| Minimum inlet pressure (bar) | -10°C          | +10°C          | +50°C          |
|                              | 3              | +30 / -25% VDC | +30 / -20% VDC |
| 6                            | +30 / -30% VDC | +30 / -25% VDC | +25 / -20% VDC |
| 8                            | +30 / -30% VDC | +30 / -30% VDC | +25 / -25% VDC |
| 10                           | +30 / -30% VDC | +30 / -30% VDC | +25 / -30% VDC |

**30mm 12 & 24VDC - Mobile (47 & 48 voltage code)**

| Operating temperature        |                |                |                |
|------------------------------|----------------|----------------|----------------|
| Minimum inlet pressure (bar) | -10°C          | +10°C          | +50°C          |
|                              | 3              | +30 / -30% VDC | +30 / -30% VDC |
| 6                            | +30 / -30% VDC | +30 / -30% VDC | +25 / -30% VDC |
| 8                            | +30 / -30% VDC | +30 / -30% VDC | +25 / -30% VDC |
| 10                           | +30 / -30% VDC | +30 / -30% VDC | +25 / -30% VDC |

**Mobile coils - Xtreme pilot operator**

**22mm 12 & 24VDC - Mobile (47 & 48 voltage code)**

| Operating temperature        |                |                |                |                |
|------------------------------|----------------|----------------|----------------|----------------|
| Minimum inlet pressure (bar) | -40°C          | +10°C          | +50°C          | +70°C          |
|                              | 4              | +30 / -25% VDC | +30 / -25% VDC | +30 / -10% VDC |
| 8                            | +30 / -30% VDC | +30 / -25% VDC | +30 / -15% VDC | +20 / -15% VDC |
| 12                           | +30 / -30% VDC | +30 / -30% VDC | +30 / -15% VDC | +20 / -15% VDC |
| 16                           | +30 / -30% VDC | +30 / -30% VDC | +30 / -20% VDC | +20 / -20% VDC |

**30mm 12 & 24VDC - Mobile (47 & 48 voltage code)**

| Operating temperature        |                |                |                |                |
|------------------------------|----------------|----------------|----------------|----------------|
| Minimum inlet pressure (bar) | -40°C          | +10°C          | +50°C          | +70°C          |
|                              | 4              | +30 / -30% VDC | +30 / -30% VDC | +25 / -30% VDC |
| 8                            | +30 / -30% VDC | +30 / -30% VDC | +25 / -30% VDC | +15 / -30% VDC |
| 12                           | +30 / -30% VDC | +30 / -30% VDC | +25 / -30% VDC | +15 / -30% VDC |
| 16                           | +30 / -30% VDC | +30 / -30% VDC | +25 / -30% VDC | +15 / -30% VDC |

**Note:** All table ratings are based on 100% continuous duty and 5G shock vibration. At 50% continuous duty all ratings are +30% / -30% for all Temperatures and Pressures.

N Series

ADEX Series

B Series

Viking Xtreme Series

Viking Lite Series

D

Inline Valve Products

**Female Electrical Connectors / Accessories**

**30mm Square 3-Pin – ISO 4400, DIN 43650A  
 (Use with Enclosure “A”)**

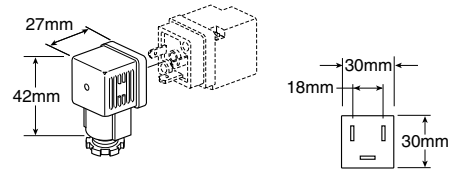
| Description                     | Connector with 6' (2m) cord | Connector         |
|---------------------------------|-----------------------------|-------------------|
| Unlighted                       | PS2028JCP                   | <b>PS2028BP</b>   |
| Light – 6-48V, 50/60Hz, 6-48VDC | PS2032J79CP*                | <b>PS203279BP</b> |
| Light – 120V/60Hz               | PS2032J83CP*                | <b>PS203283BP</b> |
| Light – 240V/60Hz               | N/A                         | <b>PS203283BP</b> |

\* LED with surge suppression.

**Note:** Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

**Engineering data:**

Conductors: 2 poles plus ground; cable range (connector only): 8 to 10mm (0.31 To 0.39 Inch); contact spacing: 18mm.



N Series

ADEX Series

B Series

Viking Xtreme Series

Viking Lite Series

D

Inline Valve Products

**22mm Rectangular 3-Pin – Type B Industrial  
 (Use with Enclosure “B”)**

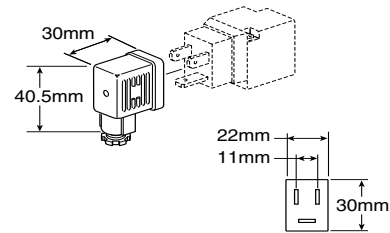
| Description            | Connector with 6' (2m) cord | Connector         |
|------------------------|-----------------------------|-------------------|
| Unlighted              | PS2429JBP                   | <b>PS2429BP</b>   |
| Light – 24V60Hz, 24VDC | PS2430J79BP*                | <b>PS243079BP</b> |
| Light – 120V/60Hz      | PS2430J83BP*                | <b>PS243083BP</b> |
| Light – 240V/60Hz      | N/A                         | PS243087BP        |

\* LED with surge suppression.

**Note:** Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

**Engineering data:**

Conductors: 2 poles plus ground; cable range (connector only): 6 to 8mm (0.24 To 0.31 Inch); contact spacing: 11mm.



**Exhaust Mufflers**

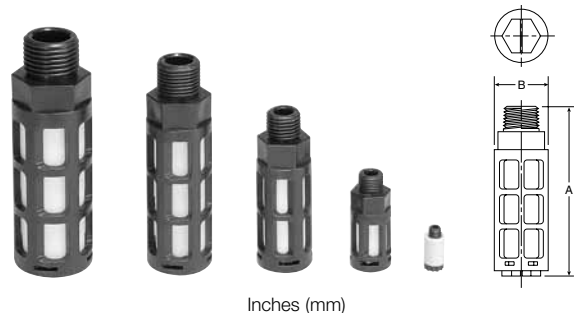
| Pipe thread | Part number     |
|-------------|-----------------|
| M5          | <b>P6M-PAC5</b> |
| 1/8" NPT    | <b>EM12</b>     |
| 1/4" NPT    | <b>EM25</b>     |
| 3/8" NPT    | <b>EM37</b>     |
| 1/2" NPT    | <b>EM50</b>     |

P6M - Plastic; EM - Sintered bronze



**Plastic Silencers**

| Thread size | A (mm)    | B (mm)    | Part number   |              |
|-------------|-----------|-----------|---------------|--------------|
|             |           |           | NPT           | BSPT         |
| M5          | .43 (11)  | .32 (8)   | <b>AS-5</b>   |              |
| 1/8"        | 1.57 (40) | .63 (16)  | <b>ASN-6</b>  | <b>AS-6</b>  |
| 1/4"        | 2.56 (65) | .83 (21)  | <b>ASN-8</b>  | <b>AS-8</b>  |
| 3/8"        | 3.35 (85) | .98 (25)  | <b>ASN-10</b> | <b>AS-10</b> |
| 1/2"        | 3.74 (95) | 1.18 (30) | <b>ASN-15</b> | <b>AS-15</b> |



Inches (mm)



**Exhaust Protector**

**Features**

- • 1/8 and 1/4 NPT male sizes
- • Fitted with a brass pipe adapter and a fluorocarbon membrane
- • Resistant to rust, clog, wash down and contamination

**Applications**

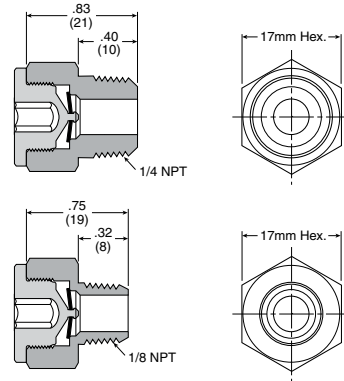
These protectors are intended for mobile applications, quick venting applications and alternative exhaust port breathers that require protection against clogging.

Ideal for valves exposed to harsh environmental conditions (which can cause a “caking up” in the exhaust pipe ports where the bronze mufflers or breather vents are installed).

Particularly suitable for time-sensitive applications such as axle-lift suspensions or pushers or tag axles.

**Flow data (SCFM)**

| Size | 60 PSIG Inlet | 90 PSIG Inlet | 125 PSIG Inlet | Part number   |
|------|---------------|---------------|----------------|---------------|
| 1/8" | 40.1          | 56.5          | 75.5           | <b>E90016</b> |
| 1/4" | 44.6          | 62.7          | 83.5           | <b>E90017</b> |



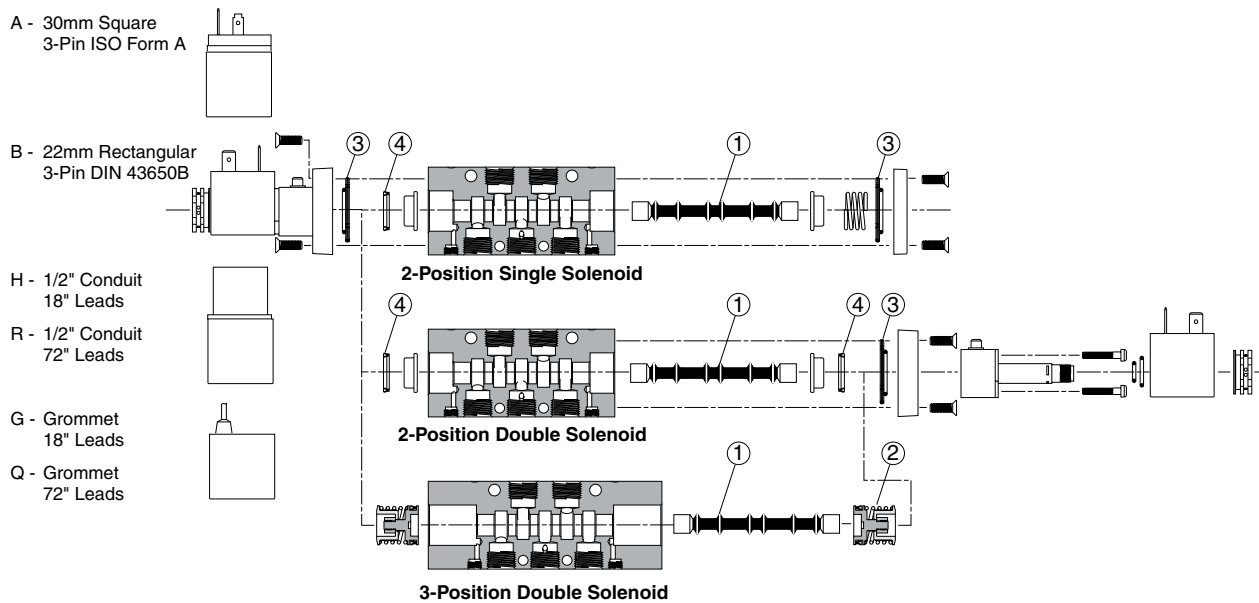
| <b>Operating information</b> |                                |
|------------------------------|--------------------------------|
| Operating pressure:          | 0 to 150 PSIG (0 to 10 bar)    |
| Operating temperature:       | -40°F to 140°F (-40°C to 60°C) |

**Material specifications**

|                     |              |
|---------------------|--------------|
| Body & pipe adapter | Brass        |
| Membrane            | Fluorocarbon |

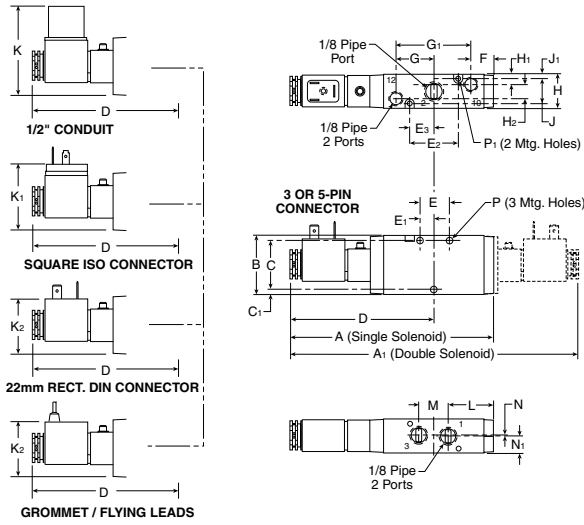
**Spool Service Kits**

| Description  | Includes items (qty.)      | Part number      |
|--|----------------------------|------------------|
| Size A, 4-way, 2-position, solenoid & air pilot valves | 1 (1), 3 (2), 4 (2)        | <b>P2LAXSK1</b>  |
| Size A, 4-way, 3-position, solenoid & air pilot valves | 1 (1), 2 (2), 3 (2), 4 (2) | <b>P2LAXSK2</b>  |
| Size A, 4-way, 2-position, manual valves               | Spool only (not shown)     | <b>P2LAXSK3</b>  |
| Size A, 4-way, 3-position, manual valves               | Spool only (not shown)     | <b>P2LAXSK4</b>  |
| Size B, 4-way, 2 & 3-position valves                   | 1 (1), 3 (2), 4 (2)        | <b>P2LBXSK1</b>  |
| Size C & Size D, 4-way, 2 & 3-position valves          | 1 (1), 3 (2), 4 (2)        | <b>P2LCDXSK1</b> |



N Series  
 ADEX Series  
 B Series  
 Viking Xtreme Series  
 Viking Lite Series  
 D Inline Valve Products

**P2LAX 3/2 Single & Double Operators – Solenoid**

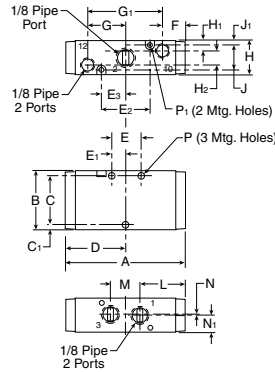


**P2LAX 3/2 (solenoid)**

| A                | A <sub>1</sub>   | B              | C              | C <sub>1</sub> |
|------------------|------------------|----------------|----------------|----------------|
| 5.35<br>(136)    | 7.60<br>(193)    | 1.57<br>(40)   | 1.26<br>(32)   | .16<br>(4)     |
| D                | E                | E <sub>1</sub> | E <sub>2</sub> | E <sub>3</sub> |
| 3.80<br>(97)     | .79<br>(20)      | .39<br>(10)    | 1.26<br>(32)   | .63<br>(16)    |
| F                | G                | G <sub>1</sub> | H              | H <sub>1</sub> |
| .55<br>(14)      | .98<br>(25)      | 1.97<br>(50)   | .87<br>(22)    | .26<br>(6.6)   |
| H <sub>2</sub>   | J                | J <sub>1</sub> | K              | K <sub>1</sub> |
| .35<br>(9)       | .65<br>(16.5)    | .11<br>(2.9)   | 2.36<br>(60)   | 1.61<br>(41)   |
| K <sub>2</sub>   | L                | M              | N              | N <sub>1</sub> |
| 1.50<br>(38)     | 1.14<br>(29)     | .79<br>(20)    | .02<br>(0.5)   | .42<br>(11)    |
| P                | P <sub>1</sub>   |                |                |                |
| ∅ .17<br>∅ (4.3) | ∅ .12<br>∅ (3.1) |                |                |                |

Inches (mm)

**P2LAX 3/2 Single & Double Operators – Remote Pilot**

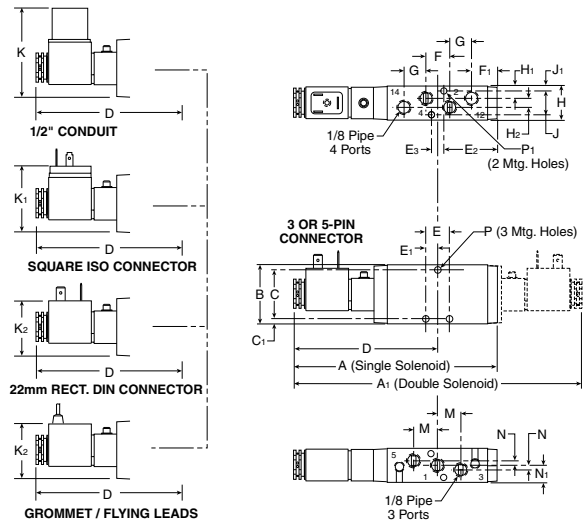


**P2LAX 3/2 (remote)**

| A              | B                | C                | C <sub>1</sub> | D              |
|----------------|------------------|------------------|----------------|----------------|
| 3.07<br>(78)   | 1.57<br>(40)     | 1.26<br>(32)     | .16<br>(4)     | 1.54<br>(39)   |
| E              | E <sub>1</sub>   | E <sub>2</sub>   | E <sub>3</sub> | F              |
| .79<br>(20)    | .39<br>(10)      | 1.26<br>(32)     | .63<br>(16)    | .55<br>(14)    |
| G              | G <sub>1</sub>   | H                | H <sub>1</sub> | H <sub>2</sub> |
| .98<br>(25)    | 1.97<br>(50)     | .87<br>(22)      | .26<br>(6.6)   | .35<br>(9)     |
| J              | J <sub>1</sub>   | L                | M              | N              |
| .65<br>(16.5)  | .11<br>(2.9)     | 1.14<br>(29)     | .79<br>(20)    | .02<br>(0.5)   |
| N <sub>1</sub> | P                | P <sub>1</sub>   |                |                |
| .42<br>(11)    | ∅ .17<br>∅ (4.3) | ∅ .12<br>∅ (3.1) |                |                |

Inches (mm)

**P2LAX 5/2 & 5/3 Single & Double Operators, 4-way**



**P2LAX 5/2 & 5/3 (solenoid)**

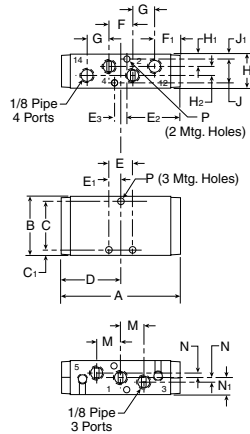
| A                | A <sub>1</sub> | B              | C              | C <sub>1</sub>   |
|------------------|----------------|----------------|----------------|------------------|
| 5.47<br>(139)    | 7.72<br>(196)  | 1.57<br>(40)   | 1.30<br>(33)   | .14<br>(3.5)     |
| D                | E              | E <sub>1</sub> | E <sub>2</sub> | E <sub>3</sub>   |
| 3.86<br>(98)     | .63<br>(16)    | .31<br>(8)     | 1.42<br>(36)   | .33<br>(8.5)     |
| F                | F <sub>1</sub> | G              | H              | H <sub>1</sub>   |
| .63<br>(16)      | .67<br>(17)    | .59<br>(15)    | .87<br>(22)    | .31<br>(8)       |
| H <sub>2</sub>   | J              | J <sub>1</sub> | K              | K <sub>1</sub>   |
| .24<br>(6)       | .63<br>(16)    | .12<br>(3.9)   | 2.36<br>(60)   | 1.61<br>(41)     |
| K <sub>2</sub>   | M              | N              | N <sub>1</sub> | P                |
| 1.50<br>(38)     | .63<br>(16)    | .12<br>(3)     | .43<br>(11)    | ∅ .17<br>∅ (4.3) |
| P <sub>1</sub>   |                |                |                |                  |
| ∅ .12<br>∅ (3.1) |                |                |                |                  |

Inches (mm)

N Series  
 ADEX Series  
 B Series  
 Viking Xtreme Series  
 Viking Lite Series  
 D Inline Valve Products



**P2LAX 5/2 & 5/3 Single & Double Operators – Remote Pilot**

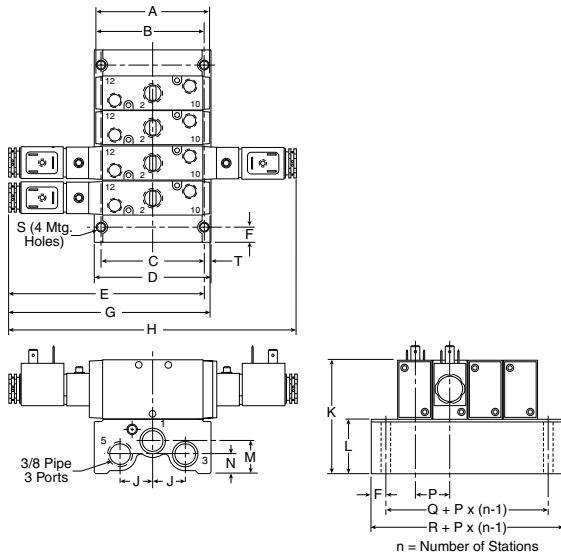


**P2LAX 5/2 & 5/3 (remote)**

| A                | B                | C              | C <sub>1</sub> | D              |
|------------------|------------------|----------------|----------------|----------------|
| 3.19<br>(81)     | 1.57<br>(40)     | 1.30<br>(33)   | .14<br>(3.5)   | 1.59<br>(40.5) |
| E                | E <sub>1</sub>   | E <sub>2</sub> | E <sub>3</sub> | F              |
| 1.47<br>(16)     | .31<br>(8)       | 1.42<br>(36)   | .33<br>(8.5)   | .63<br>(16)    |
| F <sub>1</sub>   | G                | H              | H <sub>1</sub> | H <sub>2</sub> |
| .67<br>(17)      | .59<br>(15)      | .87<br>(22)    | .31<br>(8)     | .24<br>(6)     |
| J                | J <sub>1</sub>   | M              | N              | N <sub>1</sub> |
| .63<br>(16)      | .12<br>(3)       | .63<br>(16)    | .12<br>(3)     | .43<br>(11)    |
| P                | P <sub>1</sub>   |                |                |                |
| Ø .17<br>Ø (4.3) | Ø .12<br>Ø (3.1) |                |                |                |

Inches (mm)

**P2LAX 3/2 Single & Double Operators – IEM Aluminum Bar Manifold**

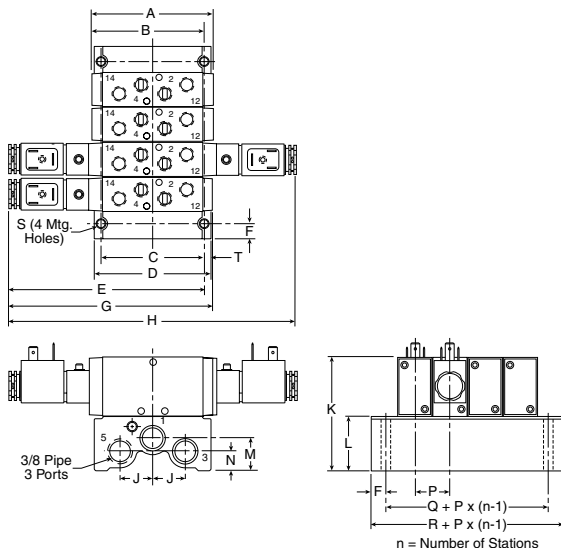


**P2LAX 3/2  
 IEM Aluminum bar manifold**

| A            | B                | C             | D             | E              |
|--------------|------------------|---------------|---------------|----------------|
| 3.07<br>(78) | 2.83<br>(72)     | 2.76<br>(70)  | 3.12<br>(79)  | 5.18<br>(132)  |
| F            | G                | H             | J             | K              |
| 41<br>(10.5) | 5.35<br>(136)    | 7.72<br>(193) | .87<br>(22)   | 3.11<br>(79)   |
| L            | M                | N             | P             | Q              |
| 1.54<br>(39) | .87<br>(22)      | .52<br>(13.2) | .93<br>(23.5) | 1.56<br>(39.5) |
| R            | S                | T             |               |                |
| 2.36<br>(60) | Ø .22<br>Ø (5.5) | .18<br>(4.5)  |               |                |

Inches (mm)

**P2LAX 5/2 & 5/3 Single & Double Operators – IEM Aluminum Bar Manifold**

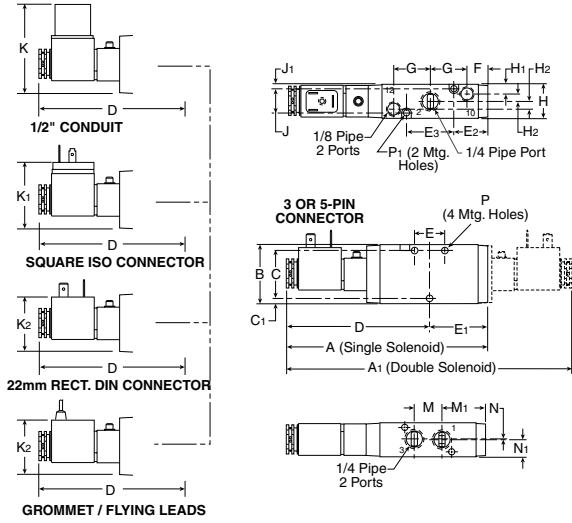


**P2LAX 5/2 & 5/3  
 IEM Aluminum bar manifold**

| A            | B             | C             | D             | E              |
|--------------|---------------|---------------|---------------|----------------|
| 3.19<br>(81) | 2.97<br>(76)  | 2.76<br>(70)  | 3.12<br>(79)  | 5.26<br>(134)  |
| F            | G             | H             | J             | K              |
| 41<br>(10.5) | 5.47<br>(139) | 7.72<br>(196) | .87<br>(22)   | 3.11<br>(79)   |
| L            | M             | N             | P             | Q              |
| 1.54<br>(39) | .87<br>(22)   | .52<br>(13.2) | .93<br>(23.5) | 1.56<br>(39.5) |
| R            | S             |               |               |                |



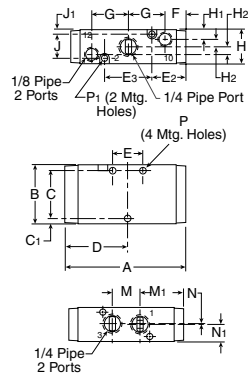
**P2LBX 3/2 Single & Double Operators – Solenoid**



**P2LBX 3/2 (solenoid)**

| A              | A <sub>1</sub>   | B              | C              | C <sub>1</sub> |
|----------------|------------------|----------------|----------------|----------------|
| 5.35<br>(136)  | 7.60<br>(193)    | 1.57<br>(40)   | 1.26<br>(32)   | .16<br>(4)     |
| D              | E                | E <sub>1</sub> | E <sub>2</sub> | E <sub>3</sub> |
| 3.80<br>(96.5) | .79<br>(20)      | 1.54<br>(39)   | .51<br>(13)    | 1.26<br>(32)   |
| F              | G                | H              | H <sub>1</sub> | H <sub>2</sub> |
| .55<br>(14)    | .98<br>(25)      | .87<br>(22)    | .26<br>(6.6)   | .18<br>(4.5)   |
| J              | J <sub>1</sub>   | K              | K <sub>1</sub> | K <sub>2</sub> |
| .65<br>(16.5)  | .11<br>(2.9)     | 2.36<br>(60)   | 1.61<br>(41)   | 1.50<br>(38)   |
| M              | M <sub>1</sub>   | N              | N <sub>1</sub> | P              |
| .79<br>(20)    | 1.14<br>(29)     | .02<br>(0.5)   | .42<br>(11)    | Ø .17<br>(4.3) |
| P <sub>1</sub> | Ø .12<br>Ø (3.1) |                |                |                |
| Inches (mm)    |                  |                |                |                |

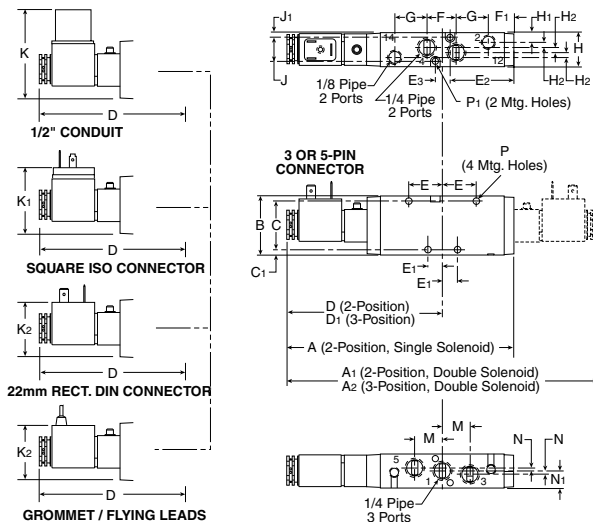
**P2LBX 3/2 Single & Double Operators – Remote Pilot**



**P2LBX 3/2 (remote)**

| A              | B                | C              | C <sub>1</sub> | D              |
|----------------|------------------|----------------|----------------|----------------|
| 3.08<br>(78)   | 1.57<br>(40)     | 1.26<br>(32)   | .16<br>(4)     | 1.54<br>(39)   |
| E              | E <sub>2</sub>   | E <sub>3</sub> | F              | G              |
| .79<br>(20)    | .51<br>(13)      | 1.26<br>(32)   | .55<br>(14)    | .98<br>(25)    |
| H              | H <sub>1</sub>   | H <sub>2</sub> | J              | J <sub>1</sub> |
| .87<br>(22)    | .26<br>(6.6)     | .18<br>(4.5)   | .65<br>(16.5)  | .11<br>(2.9)   |
| M              | M <sub>1</sub>   | N              | N <sub>1</sub> | P              |
| .79<br>(20)    | 1.14<br>(29)     | .02<br>(0.5)   | .42<br>(11)    | Ø .17<br>(4.3) |
| P <sub>1</sub> | Ø .12<br>Ø (3.1) |                |                |                |
| Inches (mm)    |                  |                |                |                |

**P2LBX 5/2 & 5/3 Single & Double Operators – Solenoid**



**P2LBX 5/2 & 5/3 (solenoid)**

| A              | A <sub>1</sub> | A <sub>2</sub> | B              | C              |
|----------------|----------------|----------------|----------------|----------------|
| 6.14<br>(156)  | 8.39<br>(213)  | 9.23<br>(235)  | 1.57<br>(40)   | 1.26<br>(32)   |
| C <sub>1</sub> | D              | D <sub>1</sub> | E              | E <sub>1</sub> |
| .16<br>(4)     | 4.21<br>(107)  | 4.64<br>(118)  | .91<br>(23)    | .39<br>(10)    |
| E <sub>2</sub> | E <sub>3</sub> | F              | F <sub>1</sub> | G              |
| 1.73<br>(44)   | .39<br>(10)    | .79<br>(20)    | .67<br>(17)    | .87<br>(22)    |
| H              | H <sub>1</sub> | H <sub>2</sub> | J              | J <sub>1</sub> |
| .87<br>(22)    | .26<br>(6.6)   | .12<br>(3)     | .65<br>(16.5)  | .12<br>(3)     |
| K              | K <sub>1</sub> | K <sub>2</sub> | M              | N              |
| 2.36<br>(60)   | 1.61<br>(41)   | 1.50<br>(38)   | .79<br>(20)    | .08<br>(2)     |
| N <sub>1</sub> | P              | P <sub>1</sub> |                |                |
| .43<br>(11)    | Ø .17<br>(4.3) | Ø .12<br>(3.1) |                |                |
| Inches (mm)    |                |                |                |                |

N Series

ADEX Series

B Series

Viking Xtreme Series

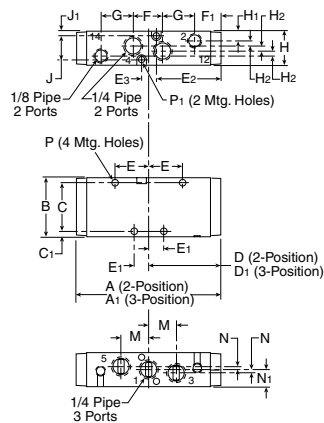
Viking Lite Series

D Inline Valve Products





**P2LBX 5/2 & 5/3 Single & Double Operators – Remote Pilot**

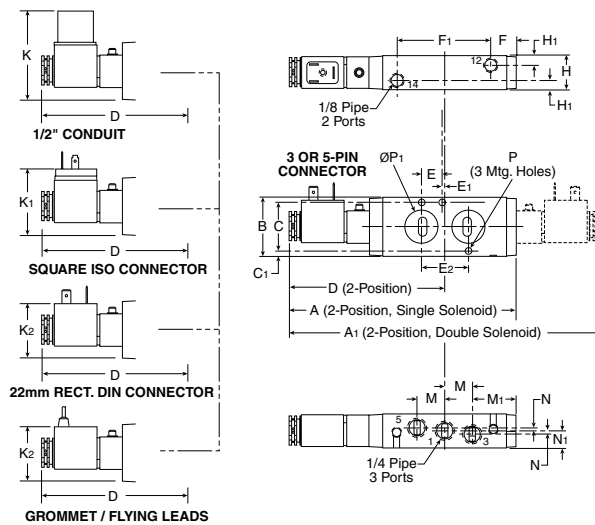


**P2LBX 5/2 & 5/3 (remote)**

| A             | A1            | B             | C                | C1               |
|---------------|---------------|---------------|------------------|------------------|
| 3.95<br>(100) | 4.61<br>(117) | 1.57<br>(40)  | 1.26<br>(32)     | .16<br>(4)       |
| D             | D1            | E             | E1               | E2               |
| 1.93<br>(49)  | 2.28<br>(58)  | .91<br>(23)   | .39<br>(10)      | 1.73<br>(44)     |
| E3            | F             | F1            | G                | H                |
| .39<br>(10)   | .79<br>(20)   | .67<br>(17)   | .87<br>(22)      | .8<br>(22)       |
| H1            | H2            | J             | J1               | K                |
| .26<br>(6.6)  | .12<br>(3)    | .65<br>(16.5) | .11<br>(2.8)     | 2.90<br>(74)     |
| M             | N             | N1            | P                | P1               |
| .79<br>(20)   | .08<br>(2)    | .43<br>(11)   | Ø .17<br>Ø (4.3) | Ø .12<br>Ø (3.1) |

Inches (mm)

**P2LBX 5/2 Single & Double Operators – Solenoid – NAMUR**



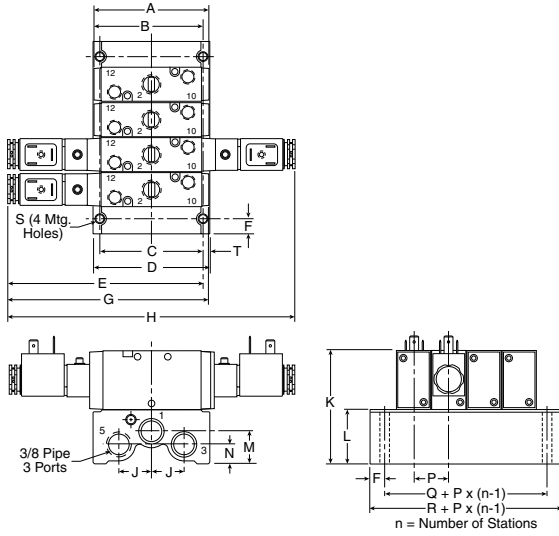
**P2LBX 5/2 (NAMUR)**

| A             | A1            | B                | C                 | C1           |
|---------------|---------------|------------------|-------------------|--------------|
| 6.15<br>(156) | 8.39<br>(213) | 1.57<br>(40)     | 1.26<br>(32)      | .16<br>(4)   |
| D             | E             | E1               | E2                | F            |
| 4.21<br>(107) | .47<br>(12)   | .08<br>(2)       | .94<br>(24)       | .67<br>(17)  |
| F1            | H             | H1               | M                 | M1           |
| 2.52<br>(64)  | .87<br>(22)   | .26<br>(6.6)     | .79<br>(20)       | 1.14<br>(29) |
| N             | N1            | P                | P1                |              |
| .08<br>(2)    | .43<br>(11)   | Ø .22<br>Ø (5.5) | Ø .76<br>Ø (19.4) |              |

Inches (mm)

**N Series**  
**ADEX Series**  
**B Series**  
**Viking Xtreme Series**  
**Viking Lite Series**  
**D Inline Valve Products**

**P2LBX 3/2 Single & Double Operators – IEM Aluminum Bar Manifold**

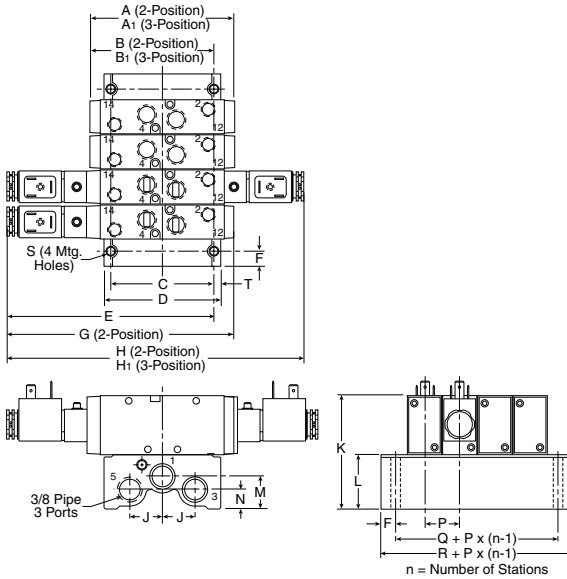


**P2LBX 3/2  
 IEM Aluminum bar manifold**

| A             | B              | C             | D             | E              |
|---------------|----------------|---------------|---------------|----------------|
| 3.86<br>(78)  | 2.91<br>(74)   | 2.76<br>(70)  | 3.12<br>(79)  | 5.17<br>(131)  |
| F             | G              | H             | J             | K              |
| .40<br>(10.2) | 5.33<br>(136)  | 7.6<br>(193)  | .87<br>(22)   | 3.11<br>(79)   |
| L             | M              | N             | P             | Q              |
| 1.47<br>(37)  | .87<br>(22)    | .52<br>(13.2) | .93<br>(23.5) | 1.56<br>(39.6) |
| R             | S              | T             |               |                |
| 2.36<br>(60)  | Ø .22<br>(5.5) | .18<br>(4.6)  |               |                |

Inches (mm)

**P2LBX 5/2 & 5/3 Single & Double Operators – IEM Aluminum Bar Manifold**



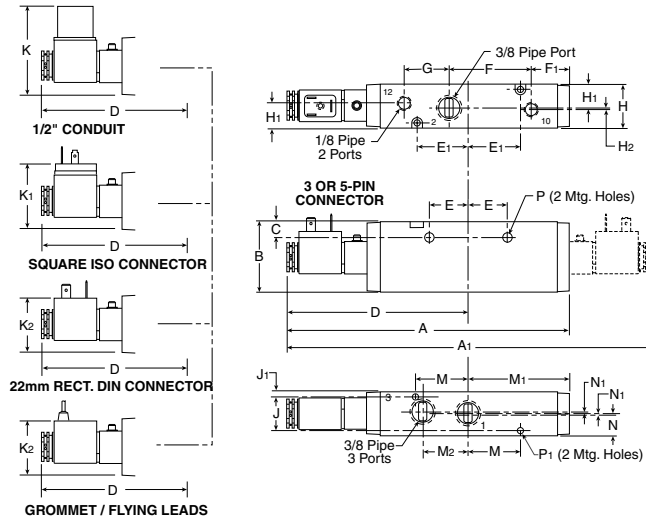
**P2LBX 5/2 & 5/3  
 IEM Aluminum bar manifold**

| A              | A <sub>1</sub> | B              | B <sub>1</sub> | C              |
|----------------|----------------|----------------|----------------|----------------|
| 3.86<br>(98)   | 4.70<br>(120)  | 3.42<br>(84)   | 3.73<br>(95)   | 2.76<br>(70)   |
| D              | E              | F              | G              | H              |
| 3.12<br>(79)   | 5.59<br>(142)  | .40<br>(10.2)  | 6.14<br>(156)  | 8.39<br>(213)  |
| H <sub>1</sub> | J              | K              | L              | M              |
| 9.23<br>(235)  | .87<br>(22)    | 3.11<br>(79)   | 1.47<br>(37)   | .87<br>(22)    |
| N              | P              | Q              | R              | S              |
| .52<br>(13.2)  | .93<br>(23.5)  | 1.56<br>(39.6) | 2.36<br>(60)   | Ø .22<br>(5.5) |
| T              |                |                |                |                |
| .18<br>(4.6)   |                |                |                |                |

Inches (mm)

- Series N
- Series ADEX
- Series B
- Series Viking Xtreme
- Series Viking Lite
- Series D
- Series Inline Valve Products

**P2LCX 3/2 Single & Double Operators – Solenoid**

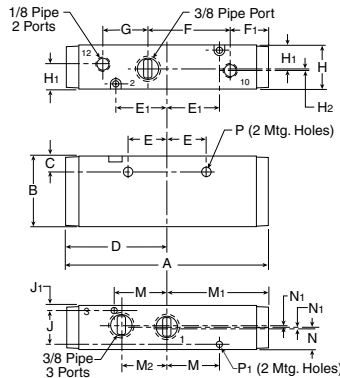


**P2LCX 3/2 (solenoid)**

| A               | A1             | B            | C                | D                |
|-----------------|----------------|--------------|------------------|------------------|
| 7.66<br>(194.5) | 9.80<br>(249)  | 1.89<br>(48) | .43<br>(11)      | 4.90<br>(124.5)  |
| E               | E1             | F            | F1               | G                |
| 1.04<br>(26.5)  | 1.40<br>(35.5) | 2.24<br>(57) | 1.02<br>(26)     | 1.22<br>(31)     |
| H               | H1             | H2           | J                | J1               |
| 1.18<br>(30)    | .67<br>(17)    | .02<br>(0.5) | .91<br>(23)      | .14<br>(3.5)     |
| K               | K1             | K2           | M                | M1               |
| 2.52<br>(64)    | 1.77<br>(45)   | 1.65<br>(42) | 1.40<br>(35.5)   | 2.76<br>(70)     |
| M2              | N              | N1           | P                | P1               |
| 1.18<br>(30)    | .55<br>(14)    | .04<br>(1)   | Ø .27<br>(Ø 6.9) | Ø .17<br>(Ø 4.4) |

Inches (mm)

**P2LCX 3/2 Single & Double Operators – Remote Pilot**



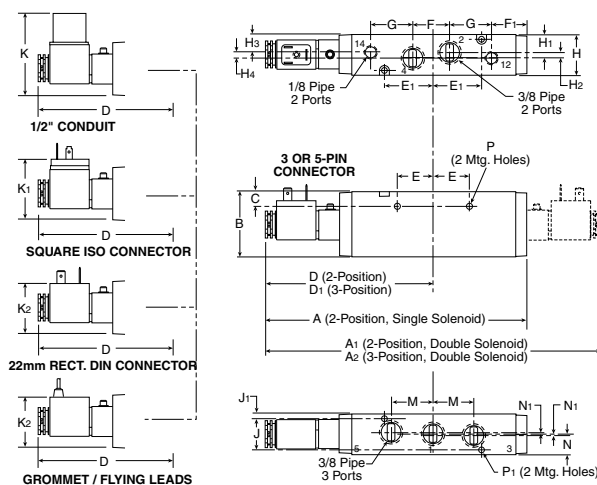
**P2LCX 3/2 (remote)**

| A              | B            | C            | D            | E                |
|----------------|--------------|--------------|--------------|------------------|
| 5.51<br>(140)  | 1.89<br>(48) | .43<br>(11)  | 2.76<br>(70) | 1.04<br>(26.5)   |
| E1             | F            | F1           | G            | H                |
| 1.40<br>(35.5) | 2.24<br>(57) | 1.02<br>(26) | 1.22<br>(31) | 1.18<br>(30)     |
| H1             | H2           | J            | J1           | M                |
| .67<br>(17)    | .02<br>(0.5) | .91<br>(23)  | .14<br>(3.5) | 1.40<br>(35.5)   |
| M1             | M2           | N            | N1           | P                |
| 2.76<br>(70)   | 1.18<br>(30) | .55<br>(14)  | .04<br>(1)   | Ø .27<br>(Ø 6.9) |

P1  
 Ø .17  
 Ø (4.4)

Inches (mm)

**P2LCX 5/2 & 5/3 Single & Double Operators – Solenoid**



**P2LCX 5/2 & 5/3 (solenoid)**

| A             | A1            | A2             | B              | C            |
|---------------|---------------|----------------|----------------|--------------|
| 7.68<br>(195) | 9.84<br>(250) | 10.71<br>(272) | 1.89<br>(48)   | .43<br>(11)  |
| D             | D1            | E              | E1             | F            |
| 4.92<br>(125) | 5.35<br>(136) | 1.04<br>(26.5) | 1.40<br>(35.5) | 1.06<br>(27) |
| F1            | G             | H              | H1             | H2           |
| 1.02<br>(26)  | 1.22<br>(31)  | 1.18<br>(30)   | .53<br>(13.5)  | .12<br>(3)   |
| H3            | H4            | J              | J1             | K            |
| .51<br>(13)   | .16<br>(4)    | .91<br>(23)    | .14<br>(3.5)   | 2.52<br>(64) |
| K1            | K2            | M              | N              | N1           |
| 1.77<br>(45)  | 1.65<br>(42)  | 1.18<br>(30)   | .55<br>(14)    | .04<br>(1)   |

P P1  
 Ø .27 Ø .17  
 Ø (6.9) Ø (4.4)

Inches (mm)



N Series

ADEX Series

B Series

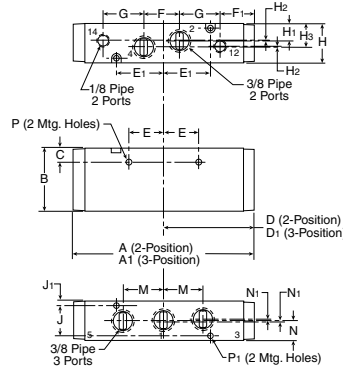
Viking Xtreme Series

Viking Lite Series

D

Inline Valve Products

**P2LCX 5/2 & 5/3 Single & Double Operators – Remote Pilot**

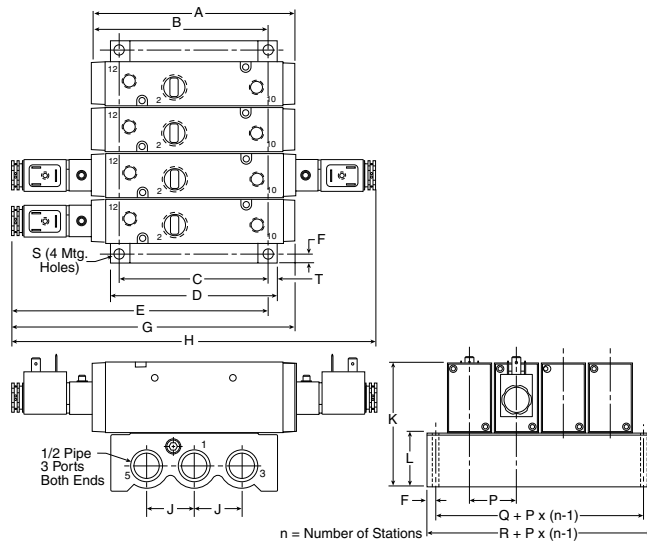


**P2LCX 5/2 & 5/3 (remote)**

| A                | A <sub>1</sub>   | B              | C              | D              |
|------------------|------------------|----------------|----------------|----------------|
| 5.51<br>(140)    | 6.38<br>(162)    | 1.89<br>(48)   | .43<br>(11)    | 2.76<br>(70)   |
| D <sub>1</sub>   | E                | E <sub>1</sub> | F              | F <sub>1</sub> |
| 3.18<br>(81)     | 1.04<br>(26.5)   | 1.40<br>(35.5) | 1.06<br>(27)   | 1.02<br>(26)   |
| G                | H                | H <sub>1</sub> | H <sub>2</sub> | H <sub>3</sub> |
| 1.22<br>(31)     | 1.18<br>(30)     | .51<br>(13)    | .02<br>(0.5)   | .12<br>(3)     |
| J                | J <sub>1</sub>   | M              | N              | N <sub>1</sub> |
| .91<br>(23)      | .14<br>(3.5)     | 1.18<br>(30)   | .55<br>(14)    | .04<br>(1)     |
| P                | P <sub>1</sub>   |                |                |                |
| Ø .27<br>Ø (6.9) | Ø .17<br>Ø (4.4) |                |                |                |

Inches (mm)

**P2LCX 3/2 Single & Double Operators – IEM Aluminum Bar Manifold**



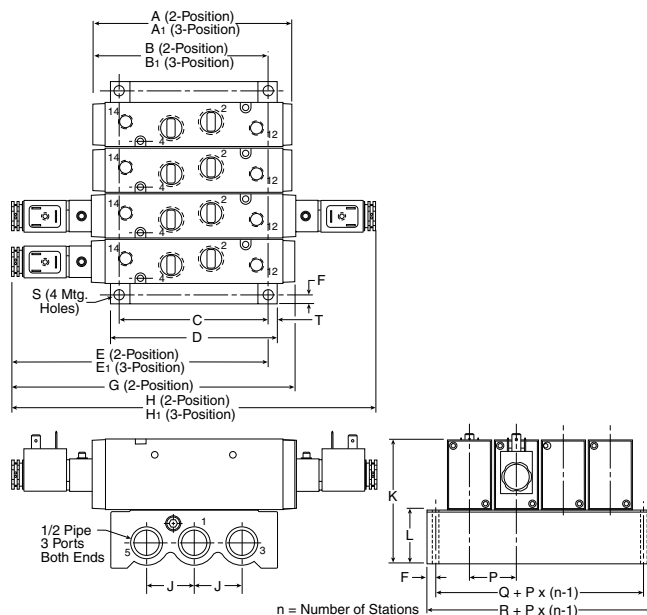
**P2LCX 3/2**

**IEM Aluminum bar manifold**

| A             | B               | C             | D             | E                |
|---------------|-----------------|---------------|---------------|------------------|
| 5.51<br>(140) | 4.96<br>(126)   | 3.94<br>(100) | 4.41<br>(112) | 7.11<br>(180.5)  |
| F             | G               | H             | J             | K                |
| .24<br>(6)    | 7.66<br>(194.5) | 9.80<br>(249) | 1.26<br>(32)  | 3.43<br>(87)     |
| L             | P               | Q             | R             | S                |
| 1.54<br>(39)  | 1.24<br>(31.5)  | 1.77<br>(45)  | 2.24<br>(57)  | Ø .26<br>Ø (6.5) |
| T             |                 |               |               |                  |
| .24<br>(6)    |                 |               |               |                  |

Inches (mm)

**P2LCX 5/2 & 5/3 Single & Double Operators – IEM Aluminum Bar Manifold**



**P2PCX 5/2 & 5/3**

**IEM Aluminum bar manifold**

| A              | A <sub>1</sub> | B              | B <sub>1</sub>   | C             |
|----------------|----------------|----------------|------------------|---------------|
| 5.51<br>(140)  | 6.38<br>(162)  | 4.72<br>(120)  | 5.16<br>(131)    | 3.94<br>(100) |
| D              | E              | E <sub>1</sub> | F                | G             |
| 4.41<br>(112)  | 6.89<br>(170)  | 7.13<br>(181)  | .24<br>(6)       | 7.68<br>(195) |
| H              | H <sub>1</sub> | J              | K                | L             |
| 9.84<br>(250)  | 10.71<br>(272) | 1.26<br>(32)   | 3.43<br>(87)     | 1.54<br>(39)  |
| P              | Q              | R              | S                | T             |
| 1.24<br>(31.5) | 1.77<br>(45)   | 2.24<br>(57)   | Ø .26<br>Ø (6.5) | .24<br>(6)    |

Inches (mm)

N Series

ADEX Series

B Series

Viking Xtreme Series

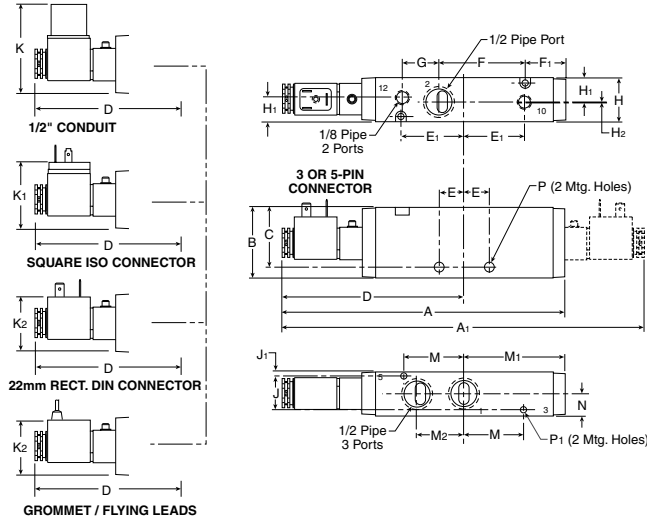
Viking Lite Series

D

Inline Valve Products



**P2LDX 3/2 Single & Double Operators – Solenoid**

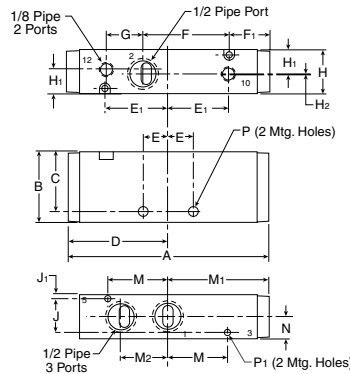


**P2LDX 3/2 (solenoid)**

| A               | A <sub>1</sub> | B              | C              | D               |
|-----------------|----------------|----------------|----------------|-----------------|
| 7.66<br>(194.5) | 9.80<br>(249)  | 1.89<br>(48)   | 1.59<br>(40.5) | 4.90<br>(124.5) |
| E               | E <sub>1</sub> | F              | F <sub>1</sub> | G               |
| .67<br>(17)     | 1.65<br>(42)   | 2.36<br>(60)   | 1.08<br>(27.5) | .98<br>(25)     |
| H               | H <sub>1</sub> | H <sub>2</sub> | J              | J <sub>1</sub>  |
| 1.18<br>(30)    | .67<br>(17)    | .02<br>(0.5)   | .91<br>(23)    | .14<br>(3.5)    |
| K               | K <sub>1</sub> | K <sub>2</sub> | M              | M <sub>1</sub>  |
| 2.52<br>(64)    | 1.77<br>(45)   | 1.65<br>(42)   | 1.65<br>(42)   | 2.76<br>(70)    |
| M <sub>2</sub>  | N              | P              | P <sub>1</sub> |                 |
| 1.30<br>(33)    | .59<br>(15)    | ∅ .26<br>(6.6) | ∅ .17<br>(4.4) |                 |

Inches (mm)

**P2LDX 3/2 Single & Double Operators – Remote Pilot**

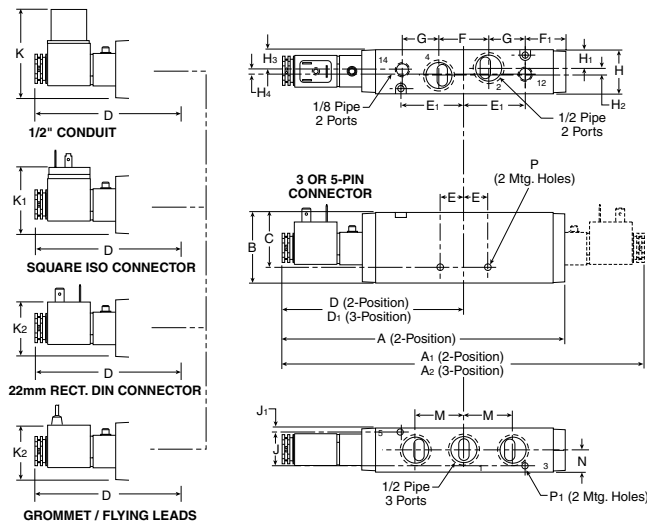


**P2LDX 3/2 (remote)**

| A              | B              | C              | D              | E              |
|----------------|----------------|----------------|----------------|----------------|
| 5.51<br>(140)  | 1.89<br>(48)   | 1.59<br>(40.5) | 2.76<br>(70)   | .67<br>(17)    |
| E <sub>1</sub> | F              | F <sub>1</sub> | G              | H              |
| 1.65<br>(42)   | 2.36<br>(60)   | 1.08<br>(27.5) | .98<br>(25)    | 1.18<br>(30)   |
| H <sub>1</sub> | H <sub>2</sub> | J              | J <sub>1</sub> | M              |
| .67<br>(17)    | .02<br>(0.5)   | .91<br>(23)    | .14<br>(3.5)   | 1.65<br>(42)   |
| M <sub>1</sub> | M <sub>2</sub> | N              | P              | P <sub>1</sub> |
| 2.76<br>(70)   | 1.30<br>(33)   | .59<br>(15)    | ∅ .26<br>(6.6) | ∅ .17<br>(4.4) |

Inches (mm)

**P2LDX 5/2 & 5/3 Single & Double Operators – Solenoid**



**P2LDX 5/2 & 5/3 (solenoid)**

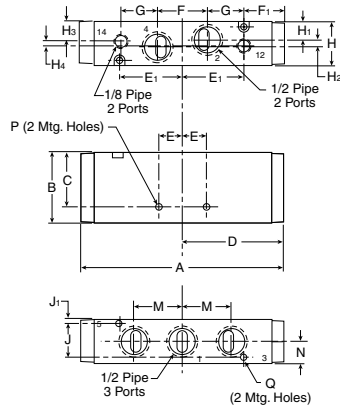
| A              | A <sub>1</sub> | A <sub>2</sub> | B              | C              |
|----------------|----------------|----------------|----------------|----------------|
| 7.67<br>(195)  | 9.84<br>(250)  | 10.7<br>(272)  | 1.89<br>(48)   | 1.59<br>(40.5) |
| D              | D <sub>1</sub> | E              | E <sub>1</sub> | F              |
| 4.92<br>(125)  | 5.79<br>(147)  | .67<br>(17)    | 1.65<br>(42)   | 1.34<br>(34)   |
| F <sub>1</sub> | G              | H              | H <sub>1</sub> | H <sub>2</sub> |
| 1.10<br>(28)   | .98<br>(25)    | 1.18<br>(30)   | .49<br>(12.5)  | .20<br>(5)     |
| H <sub>3</sub> | H <sub>4</sub> | J              | J <sub>1</sub> | K              |
| .51<br>(13)    | .16<br>(4)     | .91<br>(23)    | .14<br>(3.5)   | 2.52<br>(64)   |
| K <sub>1</sub> | K <sub>2</sub> | M              | N              | P              |
| 1.77<br>(45)   | 1.65<br>(42)   | 1.30<br>(33)   | .59<br>(15)    | ∅ .26<br>(6.6) |

P<sub>1</sub>  
 ∅ .17  
 ∅ (4.4)

Inches (mm)



**P2LDX 5/2 & 5/3 Single & Double Operators – Remote Pilot**

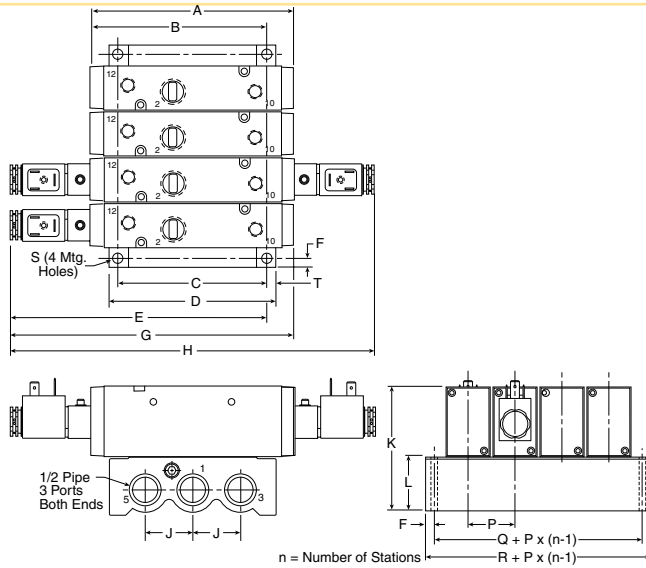


**P2LDX 5/2 & 05/3 (remote)**

| A             | B                | C              | D            | E                |
|---------------|------------------|----------------|--------------|------------------|
| 5.47<br>(139) | 1.89<br>(48)     | 1.59<br>(40.5) | 2.63<br>(67) | .67<br>(17)      |
| E1            | F                | F1             | G            | H                |
| 1.65<br>(42)  | 1.34<br>(34)     | 1.08<br>(27.5) | .98<br>(25)  | 1.18<br>(30)     |
| H1            | H2               | H3             | H4           | J                |
| .49<br>(12.5) | .20<br>(5)       | .51<br>(13)    | .16<br>(4)   | .91<br>(23)      |
| J1            | P                | M              | N            | Q                |
| .14<br>(3.5)  | Ø .26<br>Ø (6.6) | 1.29<br>(32.7) | .59<br>(15)  | Ø .17<br>Ø (4.4) |

Inches (mm)

**P2LDX 3/2 Single & Double Operators, – IEM Aluminum Bar Manifold**

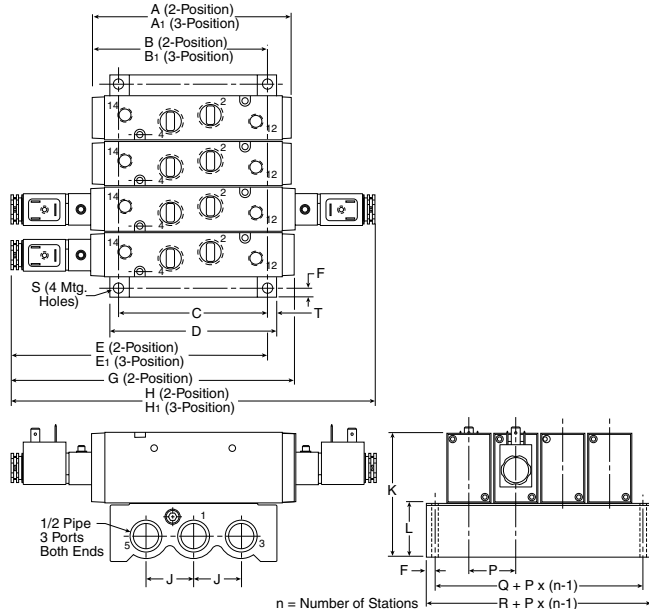


**P2LDX 3/2  
 IEM Aluminum bar manifold**

| A             | B               | C             | D             | E                |
|---------------|-----------------|---------------|---------------|------------------|
| 5.51<br>(140) | 4.96<br>(126)   | 3.94<br>(100) | 4.41<br>(112) | 7.11<br>(180.5)  |
| F             | G               | H             | J             | K                |
| .24<br>(6)    | 7.66<br>(194.5) | 9.80<br>(249) | 1.26<br>(32)  | 3.43<br>(87)     |
| L             | P               | Q             | R             | S                |
| 1.54<br>(39)  | 1.24<br>(31.5)  | 1.77<br>(45)  | 2.24<br>(57)  | Ø .26<br>Ø (6.5) |
| T             |                 |               |               |                  |
| .24<br>(6)    |                 |               |               |                  |

Inches (mm)

**P2LDX 5/2 & 5/3 Single & Double Operators – IEM Aluminum Bar Manifold**



**P2LDX 5/2 & 5/3  
 IEM Aluminum bar manifold**

| A              | A1             | B             | B1               | C             |
|----------------|----------------|---------------|------------------|---------------|
| 5.51<br>(140)  | 6.38<br>(162)  | 4.72<br>(120) | 5.16<br>(131)    | 3.94<br>(100) |
| D              | E              | E1            | F                | G             |
| 4.41<br>(112)  | 6.89<br>(170)  | 7.13<br>(181) | .24<br>(6)       | 7.68<br>(195) |
| H              | H1             | J             | K                | L             |
| 9.84<br>(250)  | 10.71<br>(272) | 1.26<br>(32)  | 3.43<br>(87)     | 1.54<br>(39)  |
| P              | Q              | R             | S                | T             |
| 1.24<br>(31.5) | 1.77<br>(45)   | 2.24<br>(57)  | Ø .26<br>Ø (6.5) | .24<br>(6)    |

Inches (mm)

N Series  
 ADEX Series  
 B Series  
 Viking Xtreme Series  
 Viking Lite Series  
 D Inline Valve Products



B Series, an exceptional performing industrial valve in a compact size with an enhanced flow range.

Available in solenoid pilot operated and remote air pilot models. The B series features Parker's proven WCS (Wear Compensating Seal) system ensuring long life and fast response, making it ideally suited for OEM applications.

**Ports**

- B3: 1/8, 1/4 inch
- B5: 1/4, 3/8 inch
- B6: 3/8 inch
- B7: 1/2 inch
- B8: 3/4 inch

**Mounting**

- Inline
- Subbase
- IEM stackable base
- IEM aluminum bar
- 5-port subbase aluminum bar

**Solenoids**

- 1.2 W – 15mm, 3-pin EN175301-803
- 2.5 to 7.3 watt - conduit, grommet, 22mm & 30mm, 3-pin DIN (433650)
- 12VDC to 240VAC
- Female DIN electrical connectors

**Certification / Approval**

- Approved to be CE marked
- IP65 rated
- CSA, C/US

**Minimum operating pressure**

| Operator / function | Internal pilot                                   | Minimum PSIG (kPa) |          |          |          |          |
|---------------------|--|--------------------|----------|----------|----------|----------|
|                     |  | B3                 | B5       | B6       | B7       | B8       |
| 1. G. H             | Single solenoid - air return                     |                    |          |          |          |          |
| 2. A. J. S          | Double solenoid                                  | 20 (138)           | 20 (138) | 20 (138) | 35 (241) | 35 (241) |
| 3. K. L             | Single remote pilot - air return                 |                    |          |          |          |          |
| 4. M                | Double remote pilot                              | Vacuum             |          |          |          |          |
| 5. 6. 7             | Double solenoid - APB, CE, PC                    | 30 (207)           | 30 (207) | 30 (207) | 45 (310) | 45 (310) |
| 8. 9. 0             | Double remote pilot - APB, CE, PC                | Vacuum             |          |          |          |          |
| E. V. W             | Single solenoid - air return / spring assist     | 35 (241)           | 35 (241) | 35 (241) | 35 (241) | 35 (241) |
| F. X. Y             | Single remote pilot - air return / spring assist |                    |          |          |          |          |
|                     | <b>External pilot*†</b>                          |                    |          |          |          |          |
| All                 | "B" series                                       | Vacuum             |          |          |          |          |

\* External Pilot Pressure / Remote Pilot Signal 35-145 PSIG (241-1000 kPa).

† Not Available with B3 Dual 3/2.

**CSA-NRTL/C operating pressure**

Note: For CSA-NRTL/C approved solenoid valves – insert an 'L' at the end of the valve part number.

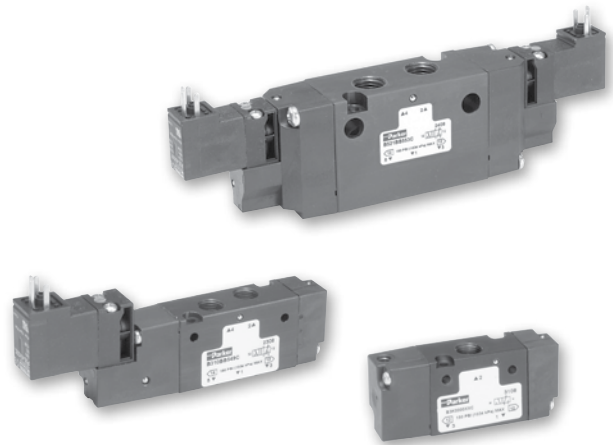
| Valve   | Maximum PSIG (kPa) |
|---------|--------------------|
| B3      | 120 (827)          |
| B5 & B6 | 145 (1000)*§       |
| B7 & B7 | 145 (1000)**       |

\* Enclosure Option E is CSA / FM approved at source. For certification of valve / solenoid assembly, consult factory.

† Not Available with Enclosure 5

§ Not available with Enclosures 0. 5 & X

Most popular. For technical information see CD



**Operating information**

|                        |                                       |
|------------------------|---------------------------------------|
| Operating pressure:    | Vacuum to 145 PSIG (Vacuum to 10 bar) |
| Minimum:               | See chart below                       |
| CSA-NRTL/C:            | See chart below                       |
| Operating temperature: | 5°F to 120°F (-15°C to 49°C)          |


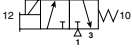
**Material specifications**

|          |                                  |
|----------|----------------------------------|
| Body     | Anodized aluminum                |
| End caps | Nylon polymer - 33% glass filled |
| Seals    | Nitrile                          |
| Solenoid | Polyamide                        |
| Spool    | Aluminum                         |

N Series  
 ADEX Series  
 B Series  
 Viking Xtreme Series  
 Viking Lite Series  
 D  
 Inline Valve Products





**Single Solenoid, 3-way, 2-position, NC**

| Symbol  | Port size   | Cv      | Voltage         | Valve type | Part number                            |
|---|---|---------|-----------------|------------|--|
|   | 1/8"  | 0.75 Cv | 120VAC<br>24VDC | B3 Inline  | <b>B3G0BB553C</b><br><b>B3G0BB549C</b> |
|   | 1/4"  | 1.4 Cv  | 120VAC<br>24VDC | B5 Inline  | <b>B5G1BB553C</b><br><b>B5G1BB549C</b> |
|   | 3/8"  | 1.4 Cv  | 120VAC<br>24VDC | B5 Inline  | <b>B5G2BB553C</b><br><b>B5G2BB549C</b> |
|   | 3/8"  | 2.7 Cv  | 120VAC<br>24VDC | B6 Inline  | <b>B6V2BB553A</b><br><b>B6V2BB549A</b> |
|   | 1/2"  | 5.9 Cv  | 120VAC<br>24VDC | B7 Inline  | <b>B7V3BB553A</b><br><b>B7V3BB549A</b> |
|   | 3/4"  | 7.0 Cv  | 120VAC<br>24VDC | B8 Inline  | <b>B8V4BB553A</b><br><b>B8V4BB549A</b> |
|   | B3 shown, 3-Pin DIN 43650C electrical connection. Non-locking flush override. |         |                 |            |  |

N Series

**Single Solenoid, 4-way, 2-position**

| Symbol  | Port size | Cv      | Voltage         | Valve type | Part number                            |
|---|-----------|---------|-----------------|------------|--|
|   | 1/8"      | 0.75 Cv | 120VAC<br>24VDC | B3 Inline  | <b>B310BB553C</b><br><b>B310BB549C</b> |
|   | 1/4"      | 1.4 Cv  | 120VAC<br>24VDC | B5 Inline  | <b>B511BB553C</b><br><b>B511BB549C</b> |
|   | 3/8"      | 1.4 Cv  | 120VAC<br>24VDC | B5 Inline  | <b>B512BB553C</b><br><b>B512BB549C</b> |
|   | 3/8"      | 2.7 Cv  | 120VAC<br>24VDC | B6 Inline  | <b>B612BB553A</b><br><b>B612BB549A</b> |
|   | 1/2"      | 5.9 Cv  | 120VAC<br>24VDC | B7 Inline  | <b>B713BB553A</b><br><b>B713BB549A</b> |
|   | 3/4"      | 7.0 Cv  | 120VAC<br>24VDC | B8 Inline  | <b>B814BB553A</b><br><b>B814BB549A</b> |
|   | Less base | 0.65 Cv | 120VAC<br>24VDC | B3 Subbase | <b>B31VBB553C</b><br><b>B31VBB549C</b> |
| B3 shown, 3-Pin DIN 43650C electrical connection. Non-locking flush override.   |           |         |                 |            |  |


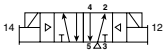
ADEX Series

B Series

Viking Xtreme Solenoid

Viking Lite Solenoid

**Double Solenoid, 4-way, 2-position**

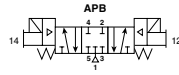
| Symbol  | Port size | Cv      | Voltage         | Valve type | Part number                            |
|---|-----------|---------|-----------------|------------|--|
|   | 1/8"      | 0.75 Cv | 120VAC<br>24VDC | B3 Inline  | <b>B320BB553C</b><br><b>B320BB549C</b> |
|   | 1/4"      | 1.4 Cv  | 120VAC<br>24VDC | B5 Inline  | <b>B521BB553C</b><br><b>B521BB549C</b> |
|   | 3/8"      | 1.4 Cv  | 120VAC<br>24VDC | B5 Inline  | <b>B522BB553C</b><br><b>B522BB549C</b> |
|   | 3/8"      | 2.7 Cv  | 120VAC<br>24VDC | B6 Inline  | <b>B622BB553A</b><br><b>B622BB549A</b> |
|   | 1/2"      | 5.9 Cv  | 120VAC<br>24VDC | B7 Inline  | <b>B723BB553A</b><br><b>B723BB549A</b> |
|   | 3/4"      | 7.0 Cv  | 120VAC<br>24VDC | B8 Inline  | <b>B824BB553A</b><br><b>B824BB549A</b> |
|   | Less base | 0.65 Cv | 120VAC<br>24VDC | B3 Subbase | <b>B32VBB553C</b><br><b>B32VBB549C</b> |
| B5 shown, 3-Pin DIN 43650C electrical connection. Non-locking flush override.   |           |         |                 |            |  |

D

Inline Valve Products



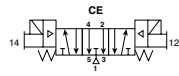
**Double Solenoid, 4-way, 3-position, APB**



B5 shown, 3-Pin DIN 43650C electrical connection. Non-locking flush override.

| Symbol | Port size | Cv      | Voltage         | Valve type | Part number                            |
|--------|-----------|---------|-----------------|------------|--|
|        | 1/8"      | 0.60 Cv | 120VAC<br>24VDC | B3 Inline  | <b>B350BB553C</b><br><b>B350BB549C</b> |
|        | 1/4"      | 1.1 Cv  | 120VAC<br>24VDC | B5 Inline  | <b>B551BB553C</b><br><b>B551BB549C</b> |
|        | 3/8"      | 1.1 Cv  | 120VAC<br>24VDC | B5 Inline  | <b>B552BB553C</b><br><b>B552BB549C</b> |
|        | 3/8"      | 2.1 Cv  | 120VAC<br>24VDC | B6 Inline  | <b>B652BB553A</b><br><b>B652BB549A</b> |
|        | 1/2"      | 5.7 Cv  | 120VAC<br>24VDC | B7 Inline  | <b>B753BB553A</b><br><b>B753BB549A</b> |
|        | 3/4"      | 6.6 Cv  | 120VAC<br>24VDC | B8 Inline  | <b>B854BB553A</b><br><b>B854BB549A</b> |
|        | Less base | 0.50 Cv | 120VAC<br>24VDC | B3 Subbase | <b>B35VBB553C</b><br><b>B35VBB549C</b> |

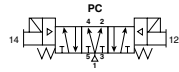
**Double Solenoid, 4-way, 3-position, CE**



B5 shown, 3-Pin DIN 43650C electrical connection. Non-locking flush override.

| Symbol | Port size | Cv      | Voltage         | Valve type | Part number                            |
|--------|-----------|---------|-----------------|------------|--|
|        | 1/8"      | 0.60 Cv | 120VAC<br>24VDC | B3 Inline  | <b>B360BB553C</b><br><b>B360BB549C</b> |
|        | 1/4"      | 1.1 Cv  | 120VAC<br>24VDC | B5 Inline  | <b>B561BB553C</b><br><b>B561BB549C</b> |
|        | 3/8"      | 1.1 Cv  | 120VAC<br>24VDC | B5 Inline  | <b>B562BB553C</b><br><b>B562BB549C</b> |
|        | 3/8"      | 2.1 Cv  | 120VAC<br>24VDC | B6 Inline  | <b>B662BB553A</b><br><b>B662BB549A</b> |
|        | 1/2"      | 5.7 Cv  | 120VAC<br>24VDC | B7 Inline  | <b>B763BB553A</b><br><b>B763BB549A</b> |
|        | 3/4"      | 6.6 Cv  | 120VAC<br>24VDC | B8 Inline  | <b>B864BB553A</b><br><b>B864BB549A</b> |
|        | Less base | 0.50 Cv | 120VAC<br>24VDC | B3 Subbase | <b>B36VBB553C</b><br><b>B36VBB549C</b> |

**Double Solenoid, 4-way, 3-position, PC**



B5 shown, 3-Pin DIN 43650C electrical connection. Non-locking flush override.

| Symbol | Port size | Cv      | Voltage         | Valve type | Part number                            |
|--------|-----------|---------|-----------------|------------|--|
|        | 1/8"      | 0.60 Cv | 120VAC<br>24VDC | B3 Inline  | <b>B370BB553C</b><br><b>B370BB549C</b> |
|        | 1/4"      | 1.1 Cv  | 120VAC<br>24VDC | B5 Inline  | <b>B571BB553C</b><br><b>B571BB549C</b> |
|        | 3/8"      | 1.1 Cv  | 120VAC<br>24VDC | B5 Inline  | <b>B572BB553C</b><br><b>B572BB549C</b> |
|        | 3/8"      | 2.1 Cv  | 120VAC<br>24VDC | B6 Inline  | <b>B672BB553A</b><br><b>B672BB549A</b> |
|        | 1/2"      | 5.7 Cv  | 120VAC<br>24VDC | B7 Inline  | <b>B773BB553A</b><br><b>B773BB549A</b> |
|        | 3/4"      | 6.6 Cv  | 120VAC<br>24VDC | B8 Inline  | <b>B874BB553A</b><br><b>B874BB549A</b> |
|        | Less base | 0.50 Cv | 120VAC<br>24VDC | B3 Subbase | <b>B37VBB553C</b><br><b>B37VBB549C</b> |

**N**  
Series  
  
**ADEX**  
Series  
  
**B**  
Series  
  
**Viking Xtreme**  
Series  
  
**Viking Lite**  
Series  
  
**D**  
Inline  
Valve Products

**Single Remote Pilot, 3-way, 2-position, NC**



| Symbol | Port size                       | Cv      | Valve type              | Part number       |
|--------|---------------------------------|---------|-------------------------|-------------------|
|        | 1/8"                            | 0.75 Cv | B3 Inline, remote pilot | <b>B3K0000XXC</b> |
|        | 1/4"                            | 1.4 Cv  | B5 Inline, remote pilot | <b>B5K1000XXC</b> |
|        | 3/8"                            | 1.4 Cv  | B5 Inline, remote pilot | <b>B5K2000XXC</b> |
|        | 3/8"                            | 2.7 Cv  | B6 Inline, remote pilot | <b>B6X2000XXA</b> |
|        | 1/2"                            | 5.9 Cv  | B7 Inline, remote pilot | <b>B7X3000XXA</b> |
|        | 3/4"                            | 7.0 Cv  | B8 Inline, remote pilot | <b>B8X4000XXA</b> |
|        | B3 Shown, M5 remote pilot ports |         |                         |                   |

**Single Remote Pilot, 4-way, 2-position**



| Symbol                          | Port size | Cv      | Valve type               | Part number       |
|---------------------------------|-----------|---------|--------------------------|-------------------|
|                                 | 1/8"      | 0.75 Cv | B3 Inline, remote pilot  | <b>B330000XXC</b> |
|                                 | 1/4"      | 1.4 Cv  | B5 Inline, remote pilot  | <b>B531000XXC</b> |
|                                 | 3/8"      | 1.4 Cv  | B5 Inline, remote pilot  | <b>B532000XXC</b> |
|                                 | 3/8"      | 2.7 Cv  | B6 Inline, remote pilot  | <b>B632000XXA</b> |
|                                 | 1/2"      | 5.9 Cv  | B7 Inline, remote pilot  | <b>B733000XXA</b> |
|                                 | 3/4"      | 7.0 Cv  | B8 Inline, remote pilot  | <b>B834000XXA</b> |
|                                 | Less base | 0.65 Cv | B3 Subbase, remote pilot | <b>B33V000XXC</b> |
| B5 Shown, M5 remote pilot ports |           |         |                          |                   |

**Double Remote Pilot, 4-way, 2-position**



| Symbol                          | Port size | Cv      | Valve type               | Part number       |
|---------------------------------|-----------|---------|--------------------------|-------------------|
|                                 | 1/8"      | 0.75 Cv | B3 Inline, remote pilot  | <b>B340000XXC</b> |
|                                 | 1/4"      | 1.4 Cv  | B5 Inline, remote pilot  | <b>B541000XXC</b> |
|                                 | 3/8"      | 1.4 Cv  | B5 Inline, remote pilot  | <b>B542000XXC</b> |
|                                 | 3/8"      | 2.7 Cv  | B6 Inline, remote pilot  | <b>B642000XXA</b> |
|                                 | 1/2"      | 5.9 Cv  | B7 Inline, remote pilot  | <b>B743000XXA</b> |
|                                 | 3/4"      | 7.0 Cv  | B8 Inline, remote pilot  | <b>B844000XXA</b> |
|                                 | Less base | 0.65 Cv | B3 Subbase, remote pilot | <b>B34V000XXC</b> |
| B5 Shown, M5 remote pilot ports |           |         |                          |                   |

**Double Remote Pilot, 4-way, 3-position, APB**



| Symbol                          | Port size | Cv      | Valve type               | Part number       |
|---------------------------------|-----------|---------|--------------------------|-------------------|
|                                 | 1/8"      | 0.60 Cv | B3 Inline, remote pilot  | <b>B380000XXC</b> |
|                                 | 1/4"      | 1.1 Cv  | B5 Inline, remote pilot  | <b>B581000XXC</b> |
|                                 | 3/8"      | 1.1 Cv  | B5 Inline, remote pilot  | <b>B582000XXC</b> |
|                                 | 3/8"      | 2.1 Cv  | B6 Inline, remote pilot  | <b>B682000XXA</b> |
|                                 | 1/2"      | 5.7 Cv  | B7 Inline, remote pilot  | <b>B783000XXA</b> |
|                                 | 3/4"      | 6.6 Cv  | B8 Inline, remote pilot  | <b>B884000XXA</b> |
|                                 | Less Base | 0.50 Cv | B3 Subbase, remote pilot | <b>B38V000XXC</b> |
| B5 Shown, M5 remote pilot ports |           |         |                          |                   |

**N** Series  
**ADEX** Series  
**B** Series  
**Viking Xtreme** Solenoid  
**Viking Lite** Solenoid  
**D** Inline Valve Products

**B3 Subbase Side Ported Subbase Manifold, Subbase Valves Only**



| Valve series | Valve function | ## – Stations | Manifold only (NPT) | Manifold only (BSPP) |
|--------------|----------------|---------------|---------------------|----------------------|
| B3           | 4-way          | 02 to 12      | <b>PSJ3B1N##NP</b>  | <b>PSJ3B1G##NP</b>   |

Kits include: (1) manifold, valve hold down bolts, gaskets. For external pilot valve option "X", external manifold galley must be pressurized. Replace ## with number of valve stations.

**B3 Subbase Side Ported Subbase Manifold Add-A-Fold Assembly**



| Valve series | Valve function | ## – Stations | Manifold assembly (NPT) | Manifold assembly (BSPP) |
|--------------|----------------|---------------|-------------------------|--------------------------|
| B3           | 4-way          | 02 to 12      | <b>AAPSJ3B1N##NP</b>    | <b>AAPSJ3B1G##GP</b>     |

Kits include: (1) manifold, valve hold down bolts, gaskets and assembly. For external pilot valve option "X", external manifold galley must be pressurized.

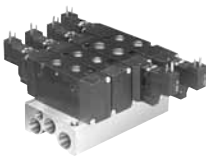
**IEM Bar Manifold, Inline Valves Only**



| Valve series | Valve function | ## – Stations | Manifold only (NPT) | Manifold only (BSPP) |
|--------------|----------------|---------------|---------------------|----------------------|
| B3           | 3-way          | 02 to 12      | <b>PSG3BXN##NP</b>  | <b>PSG3BXG##NP</b>   |
| B3           | 4-way          | 02 to 12      | <b>PSM3BXN##NP</b>  | <b>PSM3BXG##NP</b>   |
| B5           | 3-way          | 02 to 12      | <b>PSG5BXN##NP</b>  | <b>PSG5BXG##NP</b>   |
| B5           | 4-way          | 02 to 12      | <b>PSM5BXN##NP</b>  | <b>PSM5BXG##NP</b>   |
| B6           | 3-way          | 02 to 12      | <b>PSG6BXN##NP</b>  | <b>PSG6BXG##NP</b>   |
| B6           | 4-way          | 02 to 12      | <b>PSM6BXN##NP</b>  | <b>PSM6BXG##NP</b>   |
| B7, B8       | 4-way          | 02 to 12      | <b>PSM7BXN##NP</b>  | <b>PSM7BXG##NP</b>   |

Kits include: (1) manifold, valve hold down bolts, gaskets. For external pilot valve option "X", external manifold galley must be pressurized.

**IEM Bar Manifold Add-A-Fold Assembly**



| Valve series | Valve function | ## – Stations | Manifold assembly (NPT) | Manifold assembly (BSPP) |
|--------------|----------------|---------------|-------------------------|--------------------------|
| B3           | 3-way          | 02 to 12      | <b>AAPSG3BXN##NP</b>    | <b>AAPSG3BXG##NP</b>     |
| B3           | 4-way          | 02 to 12      | <b>AAPSM3BXN##NP</b>    | <b>AAPSM3BXG##NP</b>     |
| B5           | 3-way          | 02 to 12      | <b>AAPSG5BXN##NP</b>    | <b>AAPSG5BXG##NP</b>     |
| B5           | 4-way          | 02 to 12      | <b>AAPSM5BXN##NP</b>    | <b>AAPSM5BXG##NP</b>     |
| B6           | 3-way          | 02 to 12      | <b>AAPSG6BXN##NP</b>    | <b>AAPSG6BXG##NP</b>     |
| B6           | 4-way          | 02 to 12      | <b>AAPSM6BXN##NP</b>    | <b>AAPSM6BXG##NP</b>     |
| B7, B8       | 4-way          | 02 to 12      | <b>AAPSM7BXN##NP</b>    | <b>AAPSM7BXG##NP</b>     |

Kits include: (1) manifold, valve hold down bolts, gaskets and assembly. For external pilot valve option "X", external manifold galley must be pressurized.

**How to Order:** 1. List Add-A-Fold Assembly Part Number as line item 1

2. List the desired valves series part number in subsequent line items after the Add-A-Fold Assembly part number to complete the ordering code. Include all valves and blanking kits required. The left most station is station # 1 looking at the #12 end of the manifold.

**Example:** B3, 4-way manifold with station #1 blanked off with valves assembled

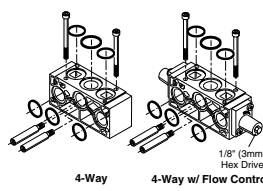
| Line | Qty | Part number   | Comment                 |
|------|-----|---------------|-------------------------|
| 1    | 1   | AAPSM3BXN03NP | Add-A-Fold Assembly     |
| 2    | 1   | PS2920P       | Blank Plate - station 1 |
| 3    | 2   | B3100BB549C   | 4-way B3 - station 2, 3 |

N Series  
 ADEX Series  
 B Series  
 Viking Xtreme Series  
 Viking Lite Series  
 D  
 Inline Valve Products

**IEM Stackable Manifolds**

- Individual Manifold Bases stack together to form lightweight custom length manifold system.
- Easy-to-connect male / female tie rods for modular assembly.
- Utilizes B3 and B5 4-way Inline Valves.
- Low-cost built-in Flow Controls with heavy-duty brass adjusting needles to control meter-out exhaust flow.
- Accessories include Isolator Plugs for pressure isolation and Universal Blanking Plates for auxiliary inlet and exhaust supply and future valve additions.

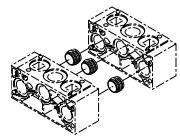
| Series | Type  | Kit number |              |
|--------|-------|------------|--------------|
|        |       | Standard   | Flow control |
| B3     | 4-way | PS2917P    | PS2918P      |
| B5     | 4-way | PS2817P    | PS2818P      |



Kit includes: (1) manifold base, (2) hold-down bolts, tie-rods, gaskets and o-rings.

**Isolator Plugs**

| Series | Description          | Kit number |
|--------|----------------------|------------|
| B3     | 4-way, IEM stackable | PS2919P    |
| B5     | 4-way, IEM stackable | PS2819P    |

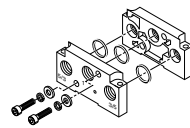


Used to isolate the #1, #3 or #5 gallery between two manifold bases. (IEM stackable only)

Kit includes: (3) plugs and (6) o-rings

**End Plate Kits**

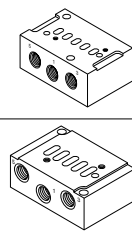
| Series | Type       | Kit number |
|--------|------------|------------|
| B3     | 4-way, NPT | PS2915P    |
| B5     | 4-way, NPT | PS2815P    |



Kit includes: right and left end plate, o-rings, socket head cap screws, flat washers and lockwashers.

**Single Subbase, Subbase Valves Only**

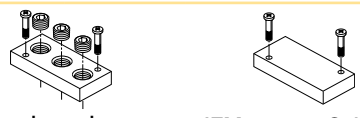
| Series | Type            | Kit number |
|--------|-----------------|------------|
| B3     | 4-way, 1/4" NPT | PS2934P    |
| B5     | 4-way, 3/8" NPT | PS2834P    |



Kit includes: (1) subbase.  
 (Hold down bolts & gasket are included with valve.)

**Blanking Plate**

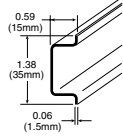
| Series | Type           | IEM universal |          | IEM Subbase |         |
|--------|----------------|---------------|----------|-------------|---------|
|        |                | NPT           | BSPG "G" | Blank       | Blank   |
| B3     | 3-way          | PS2966P       | PS2967P  | PS2968P     | —       |
|        | 4-way          | PS2920P       | PS2921P  | PS2969P     | PS2994P |
| B5     | 3-way          | PS2866P       | PS2867P  | PS2868P     | —       |
|        | 4-way          | PS2820P       | —        | PS2869P     | —       |
| B6     | 3-way<br>4-way | PS2620P       | —        | —           | —       |
| B7-B8  | 4-way          | PS2520P       | —        | PS2569P     | —       |



Kit includes: (1) plate, (2) screws, seal / gaskets

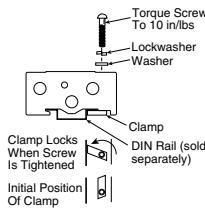
**DIN Rail**

| Valve type | Length | Part number |
|------------|--------|-------------|
| B3         | 6 Feet | AM1DE200    |



**DIN Rail Hardware Kit**

| Valve type | IEM bar                                | Part number |
|------------|--|-------------|
| B3         | (2) Screws,<br>(2) Nuts,<br>(2) Clamps | PS2991P     |



N Series  
 ADEX Series  
 B Series  
 Viking Xtreme Solenoid  
 Viking Lite Solenoid  
 D Inline Valve Products

**B3 Series**

**B3 1 0 B B 5 49 - C**

| Basic series |    |
|--------------|----|
| B3 series    | B3 |

| Engineering level |         |
|-------------------|---------|
| C                 | Current |

| Operator Function   |          |
|---|----------|
| <b>3-way</b>  |          |
| Single solenoid, 2-position NC - air return                     | <b>G</b> |
| Single solenoid, 2-position NO - air return                     | H        |
| Double solenoid, 2-position                                     | J        |
| Single remote pilot, 2-position NC - air return                 | <b>K</b> |
| Single remote pilot, 2-position NO - air return                 | L        |
| Double remote pilot, 2-position                                 | M        |
| Single solenoid, 2-position NC - air return / spring assist     | V        |
| Single solenoid, 2-position NO - air return / spring assist     | W        |
| Single remote pilot, 2-position NC - air return / spring assist | X        |
| Single remote pilot, 2-position NO - air return / spring assist | Y        |
| <b>4-way</b>  |          |
| Single solenoid, 2-position - air return                        | <b>1</b> |
| Double solenoid, 2-position                                     | <b>2</b> |
| Single remote pilot, 2-position - air return                    | <b>3</b> |
| Double remote pilot, 2-position                                 | <b>4</b> |
| Double solenoid, 3-position - APB                               | <b>5</b> |
| Double solenoid, 3-position - CE                                | 6        |
| Double solenoid, 3-position - PC                                | 7        |
| Double remote pilot, 3-position - APB                           | <b>8</b> |
| Double remote pilot, 3-position - CE                            | 9        |
| Double remote pilot, 3-position - PC                            | 0        |
| Single solenoid, 2-position - air return / spring assist        | E        |
| Single remote pilot, 2-position - air return / spring assist    | F        |

| Options |                                   |
|---------|-----------------------------------|
| Blank   | None                              |
| 02      | Solenoid rotated 180° - pins down |

|           | Voltage <sup>§</sup>                          |            |           |
|-----------|---|------------|-----------|
|           | AC  |            | DC        |
|           | 60Hz  | 50Hz       |           |
| 42        | 24  | 22         |           |
| 45        |   |            | 12        |
| <b>49</b> |   |            | <b>24</b> |
| <b>53</b> | <b>120</b>                                    | <b>110</b> |           |
| 57        | 240   | 230        |           |
| <b>XX</b> | Remote pilot - M5 or valve less 15mm solenoid |            |           |
| YY        | Remote pilot - 5/32" (4mm) tube               |            |           |

| Enclosure / lead length |  |
|-------------------------|--|
| 0                       | None, remote pilot valve                 |
| <b>5</b>                | <b>15mm 3-pin DIN 43650C (male only)</b> |
| X                       | Valve less 15mm solenoid                 |

| Overrides <sup>§</sup> |                                 |
|------------------------|---------------------------------|
| <b>0</b>               | <b>None, remote pilot valve</b> |
| <b>B</b>               | <b>Flush - non-locking</b>      |
| <b>C</b>               | <b>Flush - locking</b>          |
| D                      | Extended - non-locking          |
| E                      | Extended - locking              |
| X                      | Valve less 15mm solenoid        |

| Port size / thread type        |           |
|--------------------------------|-----------|
| <b>3-way</b>                   |           |
| 1/8" NPT inline                | 0*        |
| 1/8" BSPP "G" inline           | 5*        |
| <b>4-way</b>                   |           |
| <b>1/8" NPT inline</b>         | <b>0*</b> |
| 1/8" BSPP "G" inline           | 5*        |
| 1/4" NPT subbase               | H†        |
| 1/8" NPT face mount            | T**       |
| <b>Subbase valve less base</b> | <b>V‡</b> |

\* Available for use on IEM Manifolds.  
 \*\* 4-way only.  
 † Subbase valves available for 4-way valves only.

| Pilot source / pilot exhaust |                                    |
|------------------------------|------------------------------------|
| <b>0</b>                     | <b>None, remote pilot valve</b>    |
| <b>B†</b>                    | <b>Internal - port #1 / vented</b> |
| E*                           | Dual pressure - port #3 / vented   |
| K†                           | External - body / tapped M5        |
| X‡                           | External - manifold / vented       |

\* Not available for 3-way Valves.  
 † Not available for Remote Pilot Valves.  
 ‡ See Pilot Source Note below.

§ Enclosure '5'  
 - Override / Voltage Availability  
 S - Standard  
 O - Option

| Voltage code | Override code Standard |   |   |   |
|--------------|------------------------|---|---|---|
|              | B                      | C | D | E |
| 42           | O                      | O | - | - |
| 45           | O                      | O | - | - |
| 49           | S                      | S | O | O |
| 53           | S                      | S | O | O |
| 57           | O                      | O | - | - |
| Voltage code | "02" Option            |   |   |   |
|              | B                      | C | D | E |
| 42           | O                      | O | - | - |
| 45           | O                      | O | - | - |
| 49           | S                      | S | O | O |
| 53           | S                      | S | O | O |
| 57           | O                      | O | - | - |

N Series  
 ADEX Series  
 B Series  
 Viking Xtreme Series  
 Viking Lite Series  
**D**  
 Inline Valve Products

**Pilot Source 'X'**  
 External-Manifold / Vented

**INLINE & SUBBASE Valves -**  
 Only used IF an IEM or 5-Ported Subbase Aluminum Bar Manifold requires a common external pilot signal through the manifold for low pressure / vacuum applications OR when used with Sandwich Regulators.

Most popular. For technical information see CD



**B5 Series**

**B5 1 1 B B 5 49 - C**

**Basic series**  
 B5 series **B5**

**Engineering level**  
 Current **C**

| Operator function   |           |
|---|-----------|
| <b>3-way</b>  |           |
| Single solenoid, 2-position NC - air return                     | <b>G</b>  |
| Single solenoid, 2-position NO - air return                     | H         |
| Double solenoid, 2-position                                     | J         |
| <b>Single remote pilot, 2-position NC - air return</b>          | <b>K*</b> |
| Single remote pilot, 2-position NO - air return                 | L*        |
| Double remote pilot, 2-position                                 | M*        |
| Single solenoid, 2-position NC - air return / spring assist     | V         |
| Single solenoid, 2-position NO - air return / spring assist     | W         |
| Single remote pilot, 2-position NC - air return / spring assist | X*        |
| Single remote pilot, 2-position NO - air return / spring assist | Y*        |
| <b>4-way</b>  |           |
| Single solenoid, 2-position - air return                        | <b>1</b>  |
| Double solenoid, 2-position                                     | <b>2</b>  |
| Single remote pilot, 2-position - air return                    | <b>3*</b> |
| Double remote pilot, 2-position                                 | <b>4*</b> |
| Double solenoid, 3-position - APB                               | <b>5</b>  |
| Double solenoid, 3-position - CE                                | 6         |
| Double solenoid, 3-position - PC                                | 7         |
| Double remote pilot, 3-position - APB                           | <b>8*</b> |
| Double remote pilot, 3-position - CE                            | 9*        |
| Double remote pilot, 3-position - PC                            | 0*        |
| Single solenoid, 2-position - air return / spring assist        | E         |
| Single remote pilot, 2-position - air return / spring assist    | F*        |

\* Pilot source/pilot exhaust, override, and enclosure must be "0".

| Port Size / Thread Type       |           |
|-------------------------------|-----------|
| <b>3-way</b>                  |           |
| 1/4" NPT inline               | 1*        |
| <b>3/8" NPT inline</b>        | <b>2*</b> |
| 1/4" BSPP "G" inline          | 6*        |
| 3/8" BSPP "G" inline          | 7*        |
| <b>4-way</b>                  |           |
| 1/4" NPT inline               | 1*        |
| <b>3/8" NPT inline</b>        | <b>2*</b> |
| 1/4" BSPP "G" inline          | 6*        |
| 3/8" BSPP "G" inline          | 7*        |
| 3/8" NPT subbase              | J†        |
| 1/4" NPT NAMUR mount          | T††       |
| Subbase valve less base - NPT | V‡        |
| 1/4" BSPP "G" NAMUR mount     | W††       |

\* Available for use on IEM manifolds.  
 † 4-way only.  
 ‡ Available with pilot source "0", "A", and "B" only.

| Pilot Source / Pilot Exhaust                             |           |
|--|-----------|
| <b>Enclosures "0, 5 &amp; X"</b>                         |           |
| None, remote pilot valve                                 | 0         |
| Internal - port #1 / tapped M5                           | A†        |
| <b>Internal - port #1 / vented</b>                       | <b>B†</b> |
| Dual pressure - port #3 / vented                         | E*        |
| External - body / tapped M5                              | K†        |
| External - manifold / vented                             | X†        |
| <b>Enclosures "A, B, C, D, E, F, G, H, N, Q &amp; R"</b> |           |
| <b>Internal - port #1 / tapped M5</b>                    | <b>A†</b> |
| <b>Internal - port #1 / vented</b>                       | <b>B†</b> |
| Dual pressure - port #3 / tapped M5                      | D††       |
| External - body / tapped 1/8"                            | K†        |

\* Not available for 3-way valves.  
 † Not available for remote pilot valves.  
 ‡ See pilot source note below.

**Pilot Source 'X'**  
 External-Manifold / Vented or Tapped M5

**INLINE & SUBBASE Valves -**  
 Only used IF an IEM Aluminum Bar Manifold requires a common external pilot signal through the manifold for low pressure / vacuum applications.

| Overrides§                 |           |
|----------------------------|-----------|
| None. Remote pilot valve   | <b>0</b>  |
| No override                | A†        |
| <b>Flush - non-locking</b> | <b>B*</b> |
| <b>Flush - locking</b>     | <b>C</b>  |
| Extended - non-locking     | D         |
| Extended - locking         | E*        |
| Valve less 15mm solenoid   | X         |

\* Only available with encl. "5".  
 † Only available with encl. "E".

| Options      |                                   |
|--------------|-----------------------------------|
| <b>Blank</b> | <b>None</b>                       |
| 02           | Solenoid rotated 180° - pins down |
| MD††         | Manual detent                     |
| VO*          | Fluorocarbon seals                |

\* Not available with enclosure "0", "5", "X", "E" or "F".  
 †† Only available with operator function 1 & 3 and Enclosure "N", "X" or mobile voltages upon request.

|           | AC                                       |            | DC        |
|-----------|--|------------|-----------|
|           | 60Hz                                     | 50Hz       |           |
| 42        | 24                                       | 22         |           |
| 45        |  |            | 12        |
| <b>49</b> |  |            | <b>24</b> |
| <b>53</b> | <b>120</b>                               | <b>110</b> |           |
| 57        | 240                                      | 230        |           |
| <b>XX</b> | Remote pilot - M5 or valve less solenoid |            |           |
| YY        | Remote pilot - 5/32" (4mm) tube          |            |           |

| Enclosure / lead length |  |
|-------------------------|--|
| 0                       | None, remote pilot valve                               |
| <b>5</b>                | <b>15mm 3-pin DIN 43650C (male only)</b>               |
| A                       | 30mm square 3-pin - ISO 4400 form A (male only)        |
| B                       | 22mm rectangular 3-pin - type B industrial (male only) |
| C                       | 3-pin automotive - mini                                |
| D                       | 5-pin automotive - mini                                |
| E*                      | Intrinsically safe - 30mm 3-pin                        |
| F**                     | Hazardous duty 1/2" NPT conduit - 18" leads            |
| <b>G</b>                | <b>Grommet - 18" leads</b>                             |
| <b>H</b>                | <b>1/2" NPT conduit - 18" leads</b>                    |
| N                       | Valve less "A - R" coil                                |
| Q                       | Grommet - 72" leads                                    |
| R                       | 1/2" NPT conduit - 72" leads                           |
| X                       | Valve less 15mm solenoid                               |

\* 24 VDC & override "A" only.  
 \*\* 12 VDC, 24 VDC, 120 VAC or 240 VAC.

**Note:** for mobile voltages, contact the application team.

§ Enclosure '5' - Override / Voltage Availability

S - Standard  
 O - Option

| Voltage code | Override code Standard |   |   |   | Voltage code | Override code "02" Option |   |   |   |
|--------------|------------------------|---|---|---|--------------|---------------------------|---|---|---|
|              | B                      | C | D | E |              | B                         | C | D | E |
| 42           | O                      | O | - | - | 42           | O                         | O | - | - |
| 45           | O                      | O | - | - | 45           | O                         | O | - | - |
| <b>49</b>    | S                      | S | O | O | <b>49</b>    | S                         | S | O | O |
| <b>53</b>    | S                      | S | O | O | <b>53</b>    | S                         | S | O | O |
| 57           | O                      | O | - | - | 57           | O                         | O | - | - |

□ Most popular. For technical information see CD





**B6 Series**

**B6 1 2 B B 5 49 - A**

| Basic series |    |
|--------------|----|
| B6 series    | B6 |

| Engineering level |         |
|-------------------|---------|
| A                 | Current |

| Operator function   |   |
|---|---|
| <b>3-way</b>  |   |
| Single solenoid, 2-position NC - air return / spring assist     | V |
| Single solenoid, 2-position NO - air return / spring assist     | W |
| Single remote pilot, 2-position NC - air return / spring assist | X |
| Single remote pilot, 2-position NO - air return / spring assist | Y |
| <b>4-way</b>  |   |
| Single solenoid, 2-position - air return                        | 1 |
| Double solenoid, 2-position                                     | 2 |
| Single remote pilot, 2-position - air return                    | 3 |
| Double remote pilot, 2-position                                 | 4 |
| Double solenoid, 3-position - APB                               | 5 |
| Double solenoid, 3-position - CE                                | 6 |
| Double solenoid, 3-position - PC                                | 7 |
| Double remote pilot, 3-position - APB                           | 8 |
| Double remote pilot, 3-position - CE                            | 9 |
| Double remote pilot, 3-position - PC                            | 0 |
| Single solenoid, 2-position - air return / spring assist        | E |
| Single remote pilot, 2-position - air return / spring assist    | F |

| Options |                                   |
|---------|-----------------------------------|
| Blank   | None                              |
| 02      | Solenoid rotated 180° - pins down |
| 42*     | Series cylinder mount replacement |

\* Only available with port size "T" and "0", "A", "B", and "L" pilot source.

|    | Voltage <sup>§</sup>                          |      |    |
|----|---|------|----|
|    | AC  |      | DC |
|    | 60Hz  | 50Hz |    |
| 42 | 24  | 22   |    |
| 45 |   |      | 12 |
| 49 |   |      | 24 |
| 53 | 120   | 110  |    |
| 57 | 240   | 230  |    |
| XX | Remote pilot - M5 or valve less 15mm solenoid |      |    |
| YY | Remote pilot - 5/32" (4mm) tube               |      |    |

| Port size / thread type |    |
|-------------------------|----|
| <b>3-way / 4-way</b>    |    |
| 3/8" NPT inline         | 2* |
| 3/8" BSPP "G" inline    | 7* |
| 3/8" NPT NAMUR mount    | T† |

\* Available for use on IEM manifolds.

† 4-way only. Available with pilot source "0", "A", "B" and "L" only.

| Pilot source / pilot exhaust                             |           |
|--|-----------|
| <b>Enclosures "0, 5 &amp; X"</b>                         |           |
| None. Remote pilot valve                                 | 0         |
| Internal - Port #1 / tapped M5                           | A†        |
| <b>Internal - Port #1 / vented</b>                       | <b>B†</b> |
| Dual pressure - port #5 / vented                         | H         |
| External - Body / tapped M5                              | K†        |
| <b>Enclosures "A, B, C, D, E, F, G, H, N, Q &amp; R"</b> |           |
| Internal - Port #1 / tapped M5                           | A†        |
| <b>Internal - Port #1 / vented</b>                       | <b>B†</b> |
| External - Body / tapped 1/8"                            | K†        |

\* Not available for 3-way valves.

† Not available for remote pilot valves.

| Overrides <sup>§</sup>     |           |
|----------------------------|-----------|
| None, remote pilot valve   | 0         |
| No override                | A†        |
| <b>Flush - non-locking</b> | <b>B*</b> |
| <b>Flush - locking</b>     | <b>C</b>  |
| Extended - non-locking     | D         |
| Extended - locking         | E*        |
| Valve less 15mm solenoid   | X         |

\* Only available with enclosure "5".

† Only available with enclosure "E".

| Enclosure / lead length |  |
|-------------------------|--|
| 0                       | None, remote pilot valve                               |
| <b>5</b>                | <b>15mm 3-pin DIN 43650C (male only)</b>               |
| A                       | 30mm square 3-pin - ISO 4400 form A (male only)        |
| B                       | 22mm rectangular 3-pin - Type B industrial (male only) |
| E*                      | Intrinsically safe - 30mm 3-pin                        |
| F**                     | Hazardous duty 1/2" NPT conduit - 18" leads            |
| <b>G</b>                | <b>Grommet - 18" leads</b>                             |
| <b>H</b>                | <b>1/2" NPT conduit - 18" leads</b>                    |
| N                       | Valve less "A - R" coil                                |
| Q                       | Grommet - 72" leads                                    |
| R                       | 1/2" NPT conduit - 72" leads                           |
| X                       | Valve less 15mm solenoid                               |

\* 24 VDC & override "A" only.

\*\* 12 VDC, 24 VDC, 120 VAC or 240 VAC.

§ Enclosure '5' - Override / Voltage Availability

S - Standard

O - Option

| Voltage code | Override code Standard |   |   |   | Voltage code | Override code "02" Option |   |   |   |
|--------------|------------------------|---|---|---|--------------|---------------------------|---|---|---|
|              | B                      | C | D | E |              | B                         | C | D | E |
| 42           | O                      | O | - | - | 42           | O                         | O | - | - |
| 45           | O                      | O | - | - | 45           | O                         | O | - | - |
| 49           | S                      | S | O | O | 49           | S                         | S | O | O |
| 53           | S                      | S | O | O | 53           | S                         | S | O | O |
| 57           | O                      | O | - | - | 57           | O                         | O | - | - |

**INLINE Valves -**  
 Only used IF an IEM Aluminum Bar Manifold requires a common external pilot signal through the manifold for low pressure / vacuum applications.

Most popular. For technical information see CD



**B7 & B8 Series**

**B7 1 3 A B G 53 - A**

| Basic series |    |
|--------------|----|
| B7 series    | B7 |
| B8 series    | B8 |

| Engineering level |         |
|-------------------|---------|
| A                 | Current |

| Options |      |
|---------|------|
| Blank   | None |

| Operator function   |   |
|---|---|
| <b>3-way</b>  |   |
| Single solenoid, 2-position NC - air return / spring assist     | V |
| Single solenoid, 2-position NO - air return / spring assist     | W |
| Single remote pilot, 2-position NC - air return / spring assist | X |
| Single remote pilot, 2-position NO - air return / spring assist | Y |
| <b>4-way</b>  |   |
| Single solenoid, 2-position - air return                        | 1 |
| Double solenoid, 2-position                                     | 2 |
| Single remote pilot, 2-position - air return                    | 3 |
| Double remote pilot, 2-position                                 | 4 |
| Double solenoid, 3-position - APB                               | 5 |
| Double solenoid, 3-position - CE                                | 6 |
| Double solenoid, 3-position - PC                                | 7 |
| Double remote pilot, 3-position - APB                           | 8 |
| Double remote pilot, 3-position - CE                            | 9 |
| Double remote pilot, 3-position - PC                            | 0 |
| Single solenoid, 2-position - air return / spring assist        | E |
| Single remote pilot, 2-position - air return / spring assist    | F |

|    | Voltage <sup>§</sup>                     |      |    |
|----|--|------|----|
|    | AC                                       |      | DC |
|    | 60Hz                                     | 50Hz |    |
| 42 | 24                                       | 22   |    |
| 45 |  |      | 12 |
| 49 |  |      | 24 |
| 53 | 120                                      | 110  |    |
| 57 | 240                                      | 230  |    |
| XX | Remote pilot - M5 or valve less solenoid |      |    |
| YY | Remote pilot - 5/32" (4mm) tube          |      |    |

| Enclosure / lead length |  |
|-------------------------|--|
| 0                       | None, remote pilot valve                               |
| 5                       | 15mm 3-pin DIN 43650C (male only)                      |
| A                       | 30mm square 3-pin - ISO 4400 form A (male only)        |
| B                       | 22mm rectangular 3-pin - Type B industrial (male only) |
| E*                      | Intrinsically safe - 30mm 3-pin                        |
| F**                     | Hazardous duty 1/2" NPT conduit - 18" leads            |
| G                       | Grommet - 18" leads                                    |
| H                       | 1/2" NPT conduit - 18" leads                           |
| N                       | Valve less "A - R" coil                                |
| R                       | 1/2" NPT conduit - 72" leads                           |
| X                       | Valve less 15mm solenoid                               |

\* 24 VDC & Override "A" only.

\*\* 12 VDC, 24 VDC, 120 VAC or 240 VAC.

| Port size / thread type |    |
|-------------------------|----|
| <b>B7 series</b>        |    |
| 1/2" NPT inline         | 3* |
| 1/2" BSPP "G" inline    | 8* |
| <b>B8 series</b>        |    |
| 3/4" NPT inline         | 4* |
| 3/4" BSPP "G" inline    | 9* |

\* Available for use on IEM manifolds.

| Pilot source / pilot exhaust                             |    |
|--|----|
| <b>Enclosures "0, 5 &amp; X"</b>                         |    |
| None. Remote pilot valve                                 | 0  |
| Internal - Port #1 / tapped M5                           | A† |
| Internal - Port #1 / vented                              | B† |
| External - Body / tapped M5                              | K† |
| <b>Enclosures "A, B, C, D, E, F, G, H, N, Q &amp; R"</b> |    |
| Internal - Port #1 / tapped M5                           | A† |
| Internal - Port #1 / vented                              | B† |
| External - Body / tapped 1/8"                            | K† |

† Not available for remote pilot valves.

| Overrides <sup>§</sup>   |    |
|--------------------------|----|
| None, remote pilot valve | 0  |
| No override              | A† |
| Flush - non-locking      | B* |
| Flush - locking          | C  |
| Extended - non-locking   | D  |
| Extended - locking       | E* |
| Valve less 15mm solenoid | X  |

\* Only available with encl. "5".

† Only available with encl. "E".

§ Enclosure '5' - Override / Voltage Availability

S - Standard

O - Option

| Voltage code | Override code |   |   |   |
|--------------|---------------|---|---|---|
|              | B             | C | D | E |
| 42           | O             | O | - | - |
| 45           | O             | O | - | - |
| 49           | S             | S | O | O |
| 53           | S             | S | O | O |
| 57           | O             | O | - | - |

Series N

Series ADEX

Series B

Solenoid Viking Xtreme

Solenoid Viking Lite

D

Valve Products Inline

**INLINE Valves -**  
 Only used IF an IEM Aluminum Bar Manifold requires a common external pilot signal through the manifold for low pressure / vacuum applications.



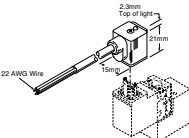


| Voltage |      | Enclosure "5"     |                |      | Voltage |      | Enclosure "A"     |                |                   | Enclosure "B" to "R" |      |  |
|---------|------|-------------------|----------------|------|---------|------|-------------------|----------------|-------------------|----------------------|------|--|
| AC      |      | Power consumption | Holding (Amps) | Code | AC      |      | Power consumption | Holding (Amps) | Power consumption | Holding (Amps)       | Code |  |
| 60Hz    | 50Hz |                   |                |      | 60Hz    | 50Hz |                   |                |                   |                      |      |  |
| 42      | 24   | 22                | 1.6VA          | .065 | 42      | 24   | 22                | 3.9VA          | .136              | 7.3VA                | .309 |  |
| 45      |      | 12                | 1.2W           | .098 | 45      |      | 12                | 2.6W           | .208              | 4.6W                 | .365 |  |
| 47*     |      | 12                | 0.91W          | .074 | 47*     |      | 12                | —              | —                 | 4.9W                 | .298 |  |
| 48*     |      | 24                | 0.91W          | .033 | 48*     |      | 24                | —              | —                 | 4.8W                 | .142 |  |
| 49      |      | 24                | 1.2W           | .049 | 49      |      | 24                | 2.7W           | .112              | 4.8W                 | .200 |  |
| 53      | 120  | 110               | 1.6W           | .013 | 53      | 120  | 110               | 4.1VA          | .033              | 6.3VA                | .047 |  |
| 57      | 240  | 230               | 1.6W           | .007 | 57      | 240  | 230               | 3.7VA          | .017              | 6.4VA                | .026 |  |

**Note:** For enclosure "5" with "02" Option, solenoid wattage is 1.8W (2.4VA). Response time is 10% faster. Voltage rated +10 / -15%.

\* 47 and 48 code are mobile voltages. voltage +25 / -30%.

### 15mm 3-Pin DIN 43650C



|                     | Cord length | Connector  | Connector with cord |
|---------------------|-------------|------------|---------------------|
| Unlighted           | 18 Inches   | PS2932BP   | PS2932HBP           |
| Unlighted           | 6 Feet      | PS2932BP   | PS2932JBP           |
| Light – 12VAC or DC | 6 Feet      | PS294675BP | PS2946J75BP*        |
| Light – 24VAC or DC | 6 Feet      | PS294679BP | PS2946J79BP*        |
| Light – 110/120VAC  | 6 Feet      | PS294683BP | PS2946J83BP*        |
| Light – 240/230VAC  |             | PS294687BP | N/A                 |

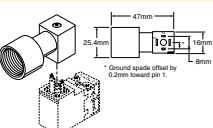
\* LED with surge suppression.

**Note:** Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

#### Engineering data:

Conductors: 2 poles plus ground  
 Cable range (connector only): 4 to 6mm (0.16 To 0.24 Inch)  
 Contact spacing: 8mm

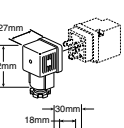
### 15mm 3-Pin DIN 43650C to 1/2" Conduit



| Description  | Connector |
|--|-----------|
| 1/2" NPTF conduit – Unlighted with 3' (1m) leads 20 AWG wire | PS2998P   |

**Note:** Rated up to 250VAC or VDC; 6 amps IP65 rated when properly installed.

### 30mm Square 3-Pin – ISO 4400, DIN 43650A (Use with Enclosure "A")



| Description                     | Connector with 6' (2m) cord | Connector  |
|---------------------------------|-----------------------------|------------|
| Unlighted                       | PS2028JCP                   | PS2028BP   |
| Light – 6-48V, 50/60Hz, 6-48VDC | PS2032J79CP*                | PS203279BP |
| Light – 120V/60Hz               | PS2032J83CP*                | PS203283BP |
| Light – 240V/60Hz               | N/A                         | PS203283BP |

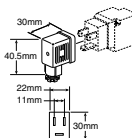
\* LED with surge suppression.

**Note:** Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

#### Engineering data:

Conductors: 2 poles plus ground; cable range (connector only): 8 to 10mm (0.31 To 0.39 Inch); contact spacing: 18mm

### 22mm Rectangular 3-Pin – Type B Industrial (Use with Enclosure "B")



| Description            | Connector with 6' (2m) cord | Connector  |
|------------------------|-----------------------------|------------|
| Unlighted              | PS2429JBP                   | PS2429BP   |
| Light – 24V60Hz, 24VDC | PS2430J79BP*                | PS243079BP |
| Light – 120V/60Hz      | PS2430J83BP*                | PS243083BP |
| Light – 240V/60Hz      | N/A                         | PS243087BP |

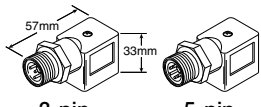
\* LED with surge suppression.

**Note:** Max ø6.5mm cable size required for connector w/o 6' (2m) cord. IP65 rated when properly installed.

#### Engineering Data:

Conductors: 2 Poles Plus Ground; Cable Range (Connector Only): 6 to 8mm (0.24 to 0.31 Inch); Contact Spacing: 11mm

### 3-Pin / 5-Pin Male Automotive Connectors (Use on 22mm Rectangular 3-Pin Solenoid)



| Description       | 3-pin      | 5-pin      |
|-------------------|------------|------------|
| Unlighted         | PS2893CP   | PS2893DP   |
| Lighted - Voltage | PS2893C##P | PS2893D##P |

## – 79 = 6 to 48VAC/VDC

83 = 100 to 240VAC/48 to 120 VDC

### Sandwich Regulators

- Use with B3 subbase valves on 5-ported subbase bar manifolds.
- Common port or dual port regulation control.
- Unregulated pressure supplied to valve pilot - use pilot source - 'X'.
- Easy adjust knob control.



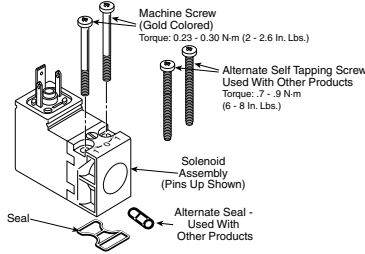
| Pressure range | Cv  | Common port with gauge * | Dual port without gauge |
|----------------|-----|--------------------------|-------------------------|
| 5-125 PSI      | .33 | PS2930166P               | PS2930233P              |

\* Gauge is 160 PSI. Gauge shipped unassembled. For different gauge mounting configuration, use brass adapters listed at bottom of page.

**Solenoid Kits – B3 ‘C’, B5 ‘C’, B6 ‘A’, B7 ‘A’, B8 ‘A’ 3-Pin, EN175301-803 (Former DIN 43650C), 15mm**



**Standard**



**“02” Option**

**PS2982\*##P – Enclosure ‘5’**

|          | ## Voltage |    |     |     |    |    |    |
|----------|------------|----|-----|-----|----|----|----|
| Override | 42         | 45 | 47* | 48* | 49 | 53 | 57 |
| B        | O          | O  | -   | -   | S  | S  | O  |
| C        | O          | O  | -   | -   | S  | S  | O  |
| D        | -          | -  | O   | O   | O  | O  | -  |
| E        | -          | -  | O   | O   | O  | O  | -  |

S - Standard; O - Option

\* Mobile voltage

Kit includes: Solenoid, (2) machine screws, (2) self threading screws, (1) gasket, (1) 3-cell gasket.

**PS3541 \*##P – Enclosure ‘5 with “02” Option**

|          | ## Voltage |    |    |    |    |
|----------|------------|----|----|----|----|
| Override | 42         | 45 | 49 | 53 | 57 |
| B        | O          | O  | S  | S  | O  |
| C        | O          | O  | S  | S  | O  |
| D        | -          | -  | O  | O  | -  |
| E        | -          | -  | O  | O  | -  |

Series N

Series ADEX

Series B

Viking Xtreme Solenoid

Viking Lite Solenoid

D

Inline Valve Products

**Solenoid Kits Alternate Enclosures**

**P2FC A 4 49**

| Enclosures / lead length                               |    |
|--|----|
| 30mm square 3-pin – ISO 4400 form A (male only)        | A  |
| 22mm rectangular 3-pin – type B industrial (male only) | B  |
| Hazardous duty, FM / CSA                               | F* |
| Grommet - 18" leads                                    | G  |
| 1/2" NPT conduit - 18" leads                           | H  |
| Grommet 72" leads                                      | Q  |
| 1/2" Conduit 72" leads                                 | R  |

| Voltage / frequency |               |
|---------------------|---------------|
| 42                  | 24VAC         |
| 45                  | 12VDC         |
| 47*                 | 12 VDC mobile |
| 48*                 | 24 VDC mobile |
| 49                  | 24VDC         |
| 53                  | 120VAC        |
| 57                  | 240VAC        |

\* Only available with enclosures "A", "B" & "G".

\* Only available with voltage codes "45", "49", "53" & "57".



**Option A & E**  
 30mm Square  
 3-pin ISO 4400, DIN 43650A



**Option B**  
 22mm Rectangular  
 3-pin DIN, Type B Industrial



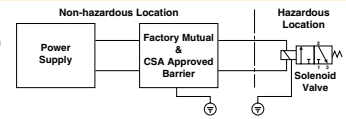
**Option G & Q**  
 Grommet, 18" or 72" Leads



**Option F, H & R**  
 1/2" Conduit, 18" or 72" Leads

**Intrinsically Safe Solenoid Valves (“E” Option)**

**Hazardous Location Class:**  
 Class I; Groups A, B, C & D  
 Class II; Groups E, F, & G  
 Class III; Div. I



For use in low voltage (24VDC) Intrinsically Safe applications.  
**NO OTHER VOLTAGE IS APPROVED.**

36mm coil width.  
 Comes standard with non-lighted solenoid connector.  
**Must be connected to an FM approved Barrier.**

For dimensions, reference standard solenoid models.  
 Maximum internally piloted valve pressure is 115 PSIG.  
 Pressures to 145 PSIG can be used when external pilot is utilized and pilot pressure is limited to 115 PSIG.

**Intrinsically Safe Solenoid Pilot Assembly Kits**

| Description | Part number         |
|-------------|---------------------|
| 24VDC       | <b>P2FS13N1AE49</b> |

**Hazardous Duty Solenoid Valves (“F” Option)**

**Hazardous Location Class:**  
 Class I; Zone I EX, M, II & T4  
 Class I; Div. I. Groups A, B, C, & D  
 Class II & III; Div. I. Groups E, F, & G

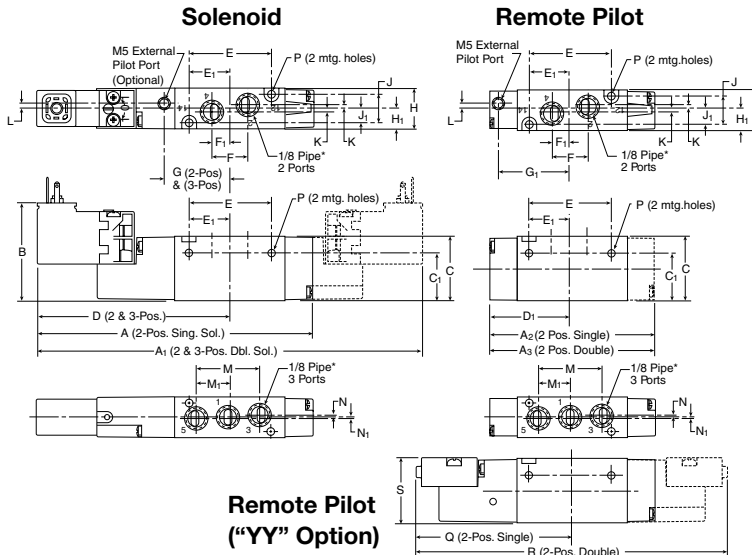


Comes standard with 1/2" conduit connection.  
 Voltage range = ± 10%  
 Ambient temperature range = -20°C (-4°F) to 60°C (140°F)  
 Duty factor = 100%  
 IP65 rated (with connected conduit connector)

**Notes:**

1. Maximum non-hazardous location voltage not to exceed 250V RMS.
2. Connect per Barrier Manufacturers instructions.
3. Factory Mutual requires connections per ISA RP 12.6 instructions.
4. CSA requires "Installation to be in accordance with the Canadian Electrical Code. Part I."
5. The hazardous duty coils are wider in size than both the B5 and the B6 valve.  
 If mounted on a manifold, the valves need to be staggered to fit.

**B3 Single & Double Operators – 4-way Inline**

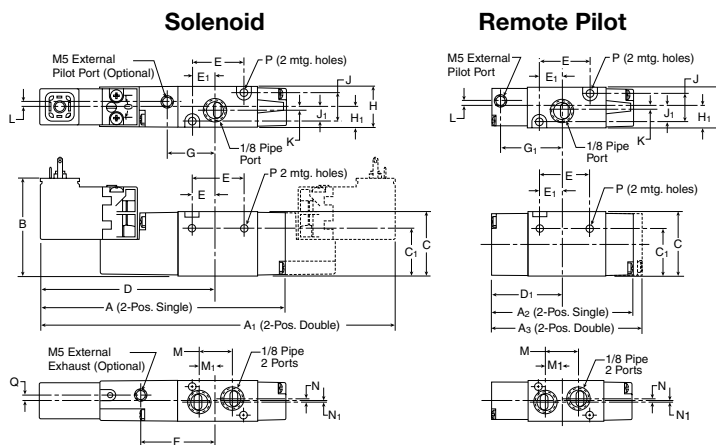


**B3 4-way Inline**

| A              | A1            | A2            | A3           | B            |
|----------------|---------------|---------------|--------------|--------------|
| 4.67<br>(119)  | 6.44<br>(164) | 3.12<br>(79)  | 3.33<br>(85) | 1.66<br>(42) |
| C              | C1            | D             | D1           | E            |
| 1.13<br>(39)   | .84<br>(21)   | 3.22<br>(82)  | 1.66<br>(42) | 1.47<br>(37) |
| E1             | F             | F1            | G            | G1           |
| .74<br>(19)    | .63<br>(16)   | .32<br>(8)    | 1.13<br>(29) | 1.50<br>(38) |
| H              | H1            | J             | J1           | K            |
| .71<br>(18)    | .36<br>(9)    | .51<br>(13)   | .26<br>(7)   | .06<br>(2)   |
| L              | M             | M1            | N            | N1           |
| .11<br>(3)     | 1.12<br>(28)  | .56<br>(14)   | .05<br>(1)   | .05<br>(1)   |
| P              | Q             | R             | S            |              |
| ∅ .13<br>(3.3) | 2.69<br>(68)  | 5.37<br>(136) | 1.16<br>(29) |              |

Inches (mm)

**B3 Single & Double Operators – 3-way Inline**

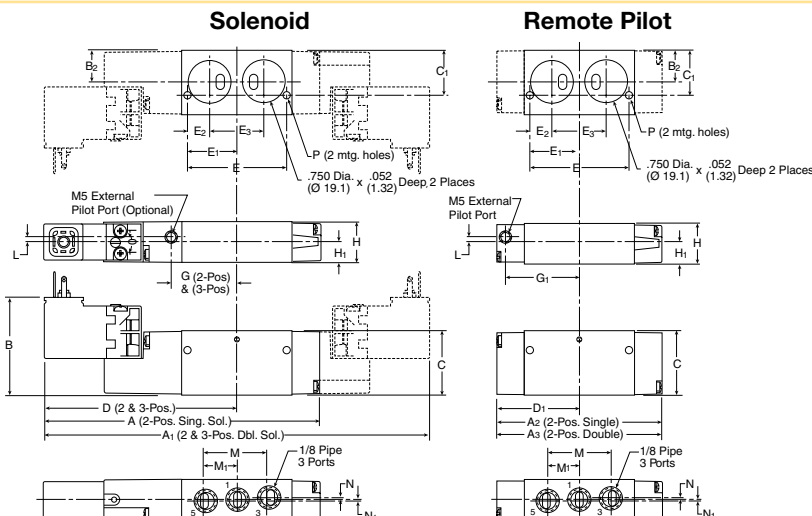


**B3 3-way Inline**

| A             | A1            | A2           | A3           | B              |
|---------------|---------------|--------------|--------------|----------------|
| 4.20<br>(107) | 5.96<br>(151) | 2.65<br>(67) | 2.86<br>(73) | 1.66<br>(42)   |
| C             | C1            | D            | D1           | E              |
| 1.13<br>(39)  | .84<br>(21)   | 2.93<br>(74) | 1.38<br>(35) | .98<br>(25)    |
| E1            | F             | G            | G1           | H              |
| .44<br>(11)   | 1.32<br>(34)  | .85<br>(22)  | 1.22<br>(31) | .71<br>(18)    |
| H1            | J             | J1           | K            | L              |
| .36<br>(9)    | .51<br>(13)   | .26<br>(7)   | .06<br>(2)   | .11<br>(3)     |
| M             | M1            | N            | N1           | P              |
| .63<br>(16)   | .27<br>(7)    | .12<br>(3)   | .06<br>(2)   | ∅ .13<br>(3.3) |
| Q             |               |              |              |                |
| .08<br>(2)    |               |              |              |                |

Inches (mm)

**B3 Single & Double Operators – 4-way Face Mount**



**B3 4-way Face Mount**

| A             | A1            | A2           | A3             | B            |
|---------------|---------------|--------------|----------------|--------------|
| 4.67<br>(119) | 6.44<br>(164) | 3.12<br>(79) | 3.33<br>(85)   | 1.66<br>(42) |
| B2            | C             | C1           | D              | D1           |
| .58<br>(15)   | 1.13<br>(29)  | .81<br>(21)  | 3.22<br>(82)   | 1.66<br>(42) |
| E             | E1            | E2           | E3             | G            |
| 1.74<br>(44)  | .87<br>(22)   | .39<br>(10)  | .95<br>(24)    | 1.13<br>(29) |
| G1            | H             | H1           | L              | M            |
| 1.50<br>(38)  | .71<br>(18)   | .36<br>(9)   | .11<br>(3)     | 1.12<br>(28) |
| M1            | N             | N1           | P              |              |
| .56<br>(14)   | .05<br>(1)    | .05<br>(1)   | ∅ .13<br>(3.3) |              |

Inches (mm)



N Series

ADEX Series

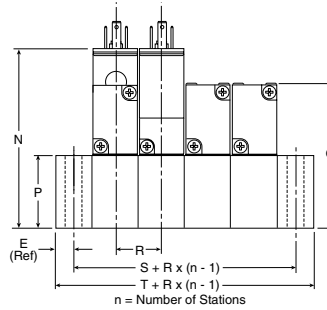
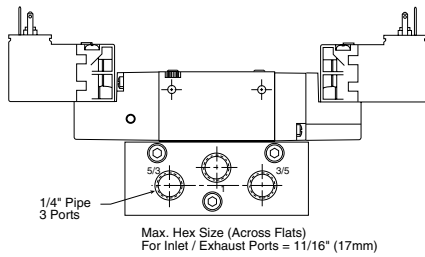
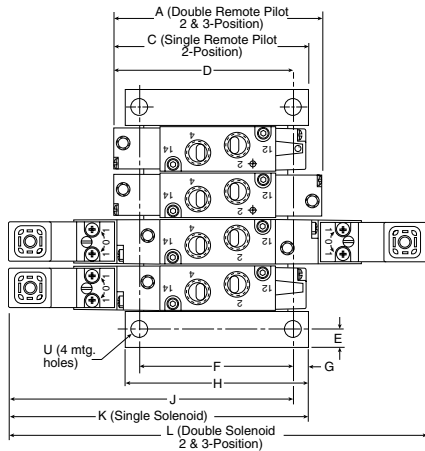
B Series

Viking Xtreme Series

Viking Lite Series

D Inline Valve Products

**B3 Single & Double Operators – 4-way IEM Stackable**



**B3 4-way IEM Stackable**

| A              | C              | D                | E                       | F               |
|----------------|----------------|------------------|-------------------------|-----------------|
| 3.33<br>(84.6) | 3.12<br>(79.2) | 2.91<br>(73.9)   | .30<br>(7.6)            | 2.49<br>(63.3)  |
| G              | H              | J                | K                       | L               |
| .25<br>(6.4)   | 3.00<br>(76.2) | 4.46<br>(113.3)  | 4.67<br>(118.6)         | 6.43<br>(163.3) |
| N              | P              | Q                | R                       |                 |
| 2.91<br>(73.9) | 1.25<br>(31.8) | 2.38<br>(60.5)   | .74 ±.01<br>(18.8) ± .3 |                 |
| S              | T              | U                |                         |                 |
| 1.34<br>(34.0) | 1.94<br>(49.3) | Ø .28<br>Ø (7.1) |                         |                 |

Inches (mm)

N Series

ADEX Series

B Series

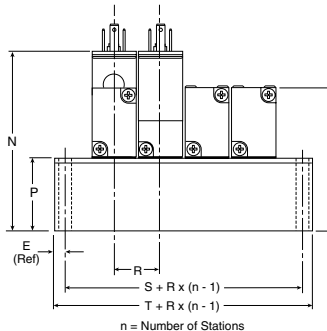
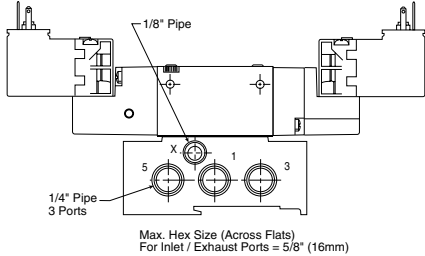
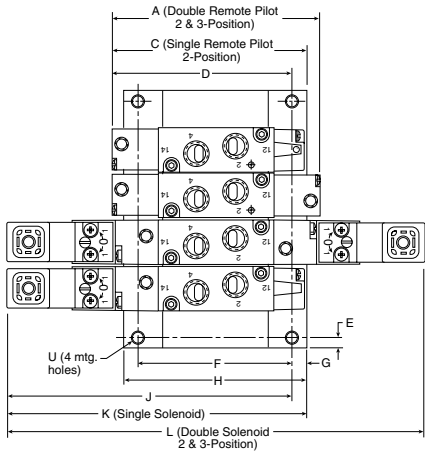
Viking Xtreme Solenoid

Viking Lite Solenoid

D

Inline Valve Products

**B3 Single & Double Operators – 4-way IEM Aluminum Bar**

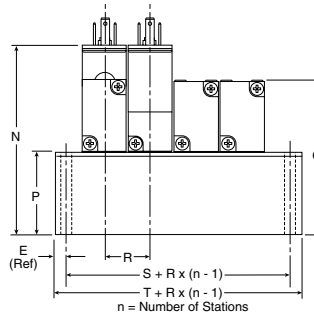
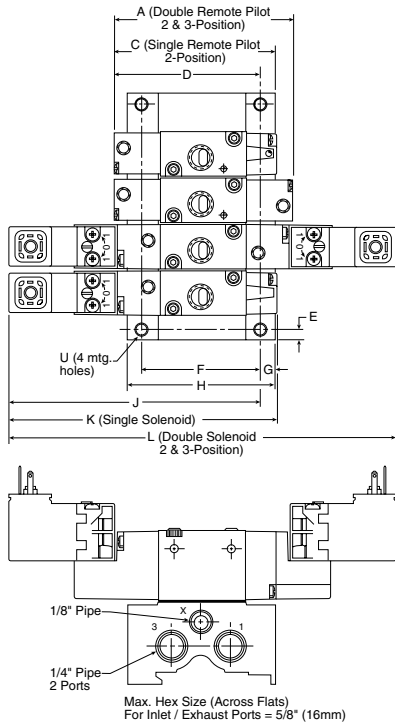


**B3 4-way IEM Aluminum Bar Manifold**

| A              | C                | D               | E               | F               |
|----------------|------------------|-----------------|-----------------|-----------------|
| 3.33<br>(84.6) | 3.17<br>(80.5)   | 2.94<br>(74.7)  | .25<br>(6.4)    | 2.54<br>(64.5)  |
| G              | H                | J               | K               | L               |
| .23<br>(5.9)   | 3.00<br>(76.2)   | 4.50<br>(114.2) | 4.73<br>(120.1) | 6.43<br>(163.3) |
| N              | P                | Q               | R               | S               |
| 2.94<br>(74.7) | 1.28<br>(32.5)   | 2.41<br>(61.2)  | .81<br>(20.5)   | 1.13<br>(28.8)  |
| T              | U                |                 |                 |                 |
| 1.64<br>(41.6) | Ø .23<br>Ø (5.8) |                 |                 |                 |

Inches (mm)

**B3 Single & Double Operators – 3-way IEM Aluminum Bar**

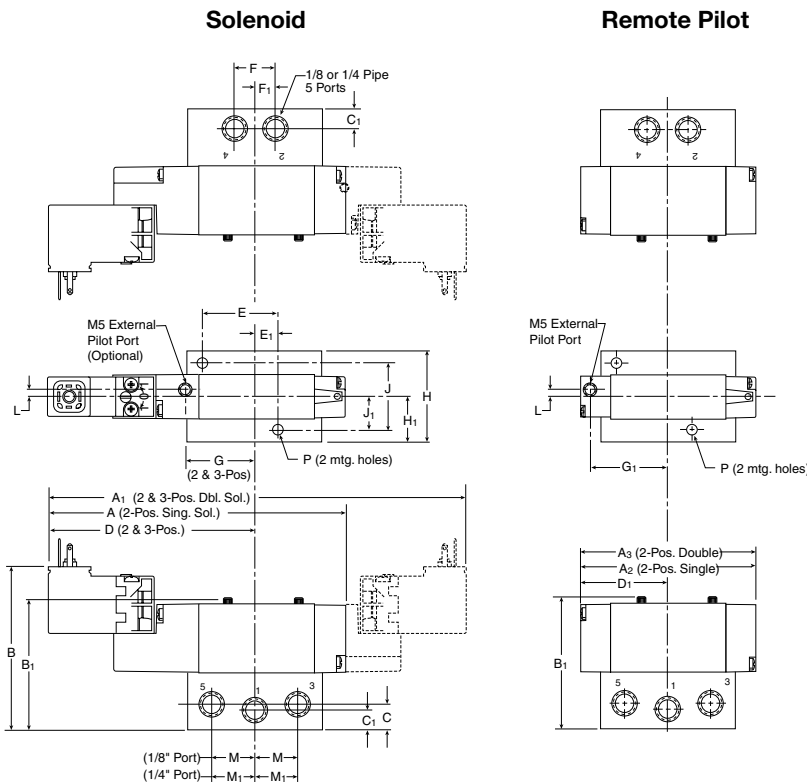


**B3 4-way IEM Aluminum Bar Manifold**

|                |                  |                |                 |                 |
|----------------|------------------|----------------|-----------------|-----------------|
| <b>A</b>       | <b>C</b>         | <b>D</b>       | <b>E</b>        | <b>F</b>        |
| 2.86<br>(72.6) | 2.65<br>(67.3)   | 2.33<br>(59.2) | .25<br>(6.4)    | 1.80<br>(45.7)  |
| <b>G</b>       | <b>H</b>         | <b>J</b>       | <b>K</b>        | <b>L</b>        |
| .23<br>(5.9)   | 2.25<br>(57.2)   | 3.88<br>(98.6) | 4.20<br>(106.7) | 5.96<br>(151.4) |
| <b>N</b>       | <b>P</b>         | <b>Q</b>       | <b>R</b>        | <b>S</b>        |
| 2.93<br>(74.5) | 1.27<br>(32.4)   | 2.40<br>(61.1) | .81<br>(20.5)   | 1.13<br>(28.8)  |
| <b>T</b>       | <b>U</b>         |                |                 |                 |
| 1.64<br>(41.6) | Ø .23<br>Ø (5.8) |                |                 |                 |

Inches (mm)

**B3 Single & Double Operators – 4-way Single Subbase**



**B3 4-way Single Subbase**

|                      |                      |                      |                      |                      |
|----------------------|----------------------|----------------------|----------------------|----------------------|
| <b>A</b>             | <b>A<sub>1</sub></b> | <b>A<sub>2</sub></b> | <b>A<sub>3</sub></b> | <b>B</b>             |
| 4.67<br>(119)        | 6.44<br>(164)        | 3.12<br>(79)         | 3.33<br>(85)         | 2.63<br>(67)         |
| <b>B<sub>1</sub></b> | <b>C</b>             | <b>C<sub>1</sub></b> | <b>D</b>             | <b>D<sub>1</sub></b> |
| 2.21<br>(56)         | .47<br>(12)          | .37<br>(9)           | 3.22<br>(82)         | 1.66<br>(42)         |
| <b>E</b>             | <b>E<sub>1</sub></b> | <b>F</b>             | <b>F<sub>1</sub></b> | <b>G</b>             |
| 1.25<br>(32)         | .38<br>(10)          | .69<br>(18)          | .34<br>(9)           | 1.13<br>(29)         |
| <b>G<sub>1</sub></b> | <b>H</b>             | <b>H<sub>1</sub></b> | <b>J</b>             | <b>J<sub>1</sub></b> |
| 1.50<br>(38)         | 1.50<br>(38)         | .75<br>(19)          | 1.12<br>(28)         | .56<br>(14)          |
| <b>L</b>             | <b>M</b>             | <b>M<sub>1</sub></b> | <b>P</b>             |                      |
| .11<br>(3)           | .71<br>(18)          | .76<br>(19)          | Ø .18<br>Ø (4)       |                      |

Inches (mm)



N Series

ADEX Series

B Series

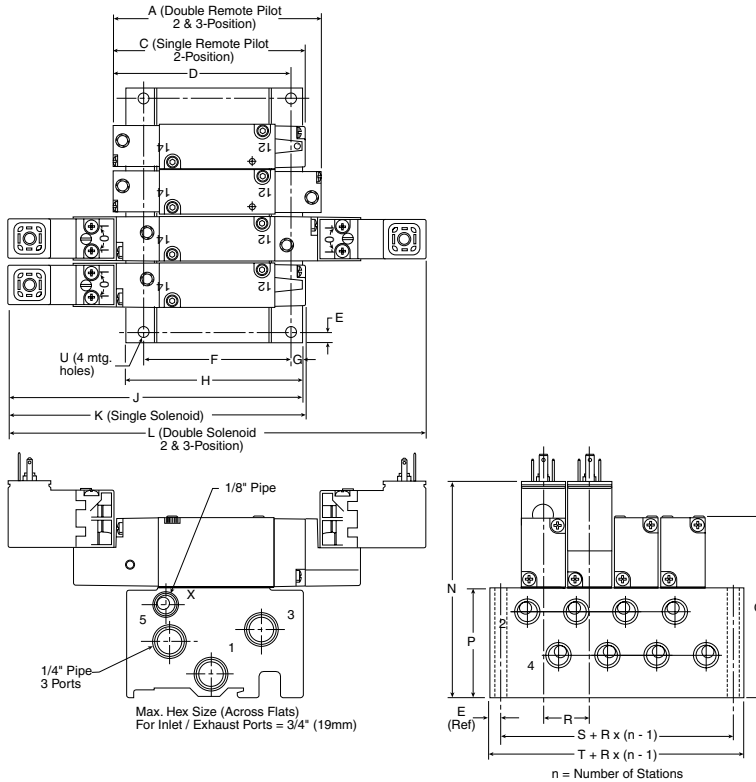
Viking Xtreme Series

Viking Lite Series

D

Inline Valve Products

**B3 Single & Double Operators – 5-port Subbase Bar Manifold**



**B3 5-port Subbase Bar Manifold**

| A              | C                | D               | E               | F               |
|----------------|------------------|-----------------|-----------------|-----------------|
| 3.33<br>(84.6) | 3.12<br>(79.2)   | 2.88<br>(73.2)  | .25<br>(6.3)    | 2.43<br>(61.7)  |
| G              | H                | J               | K               | L               |
| .22<br>(5.5)   | 2.93<br>(74.5)   | 4.66<br>(118.3) | 4.67<br>(118.6) | 6.43<br>(166.3) |
| N              | P                | Q               | R               | S               |
| 3.47<br>(88.2) | 1.81<br>(46.0)   | 2.94<br>(74.7)  | .81<br>(20.5)   | 1.39<br>(35.4)  |
| T              | U                |                 |                 |                 |
| 1.89<br>(48.0) | Ø .22<br>Ø (5.6) |                 |                 |                 |

Inches (mm)

N Series

ADEX Series

B Series

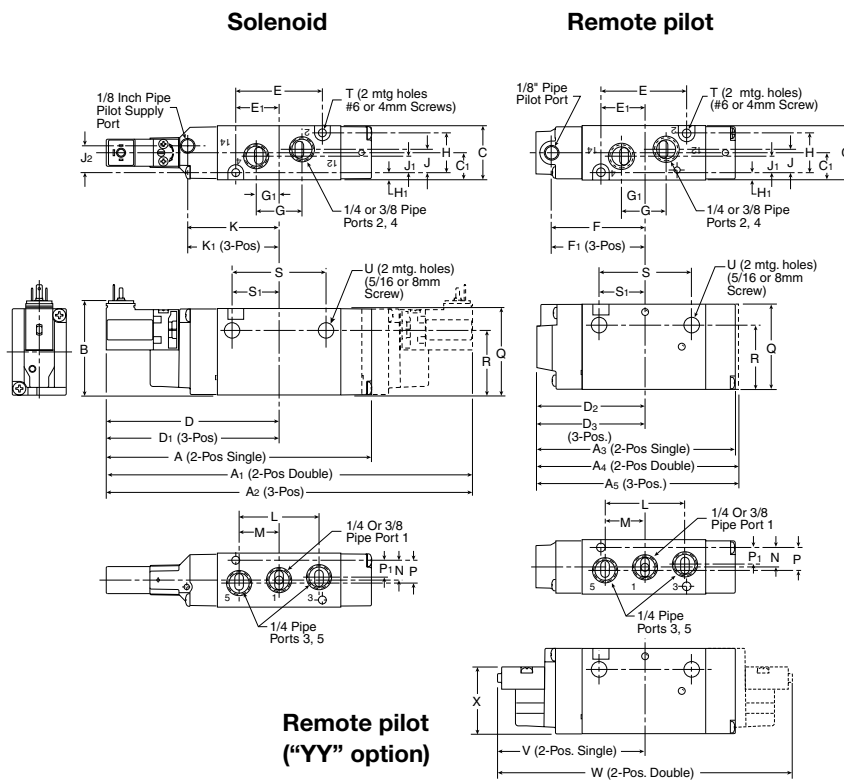
Viking Xtreme Solenoid

Viking Lite Solenoid

D

Inline Valve Products

**B5 Single & Double Operators – 4-way Inline**



**B5 4-way Inline**

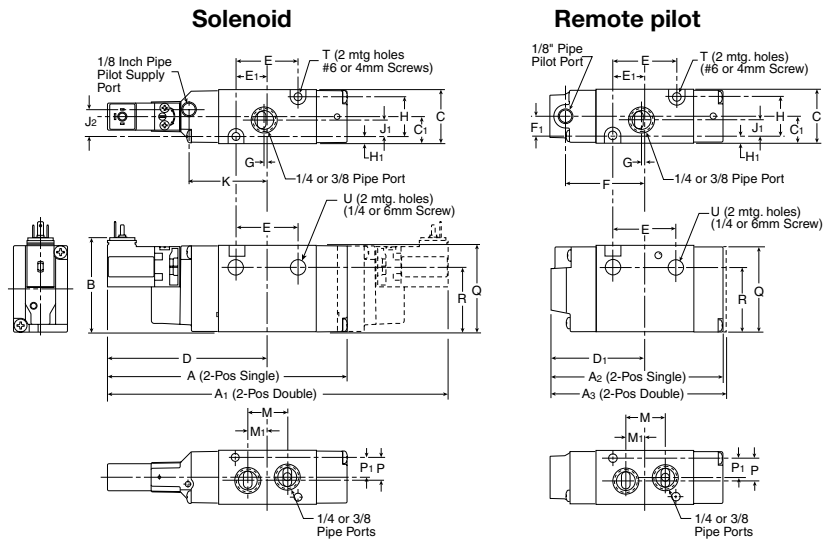
| A                 | A1             | A2            | A3            | A4            |
|-------------------|----------------|---------------|---------------|---------------|
| 5.78<br>(147)     | 7.51<br>(191)  | 8.45<br>(215) | 4.37<br>(110) | 4.70<br>(119) |
| A5                | B              | C             | C1            | D             |
| 5.64<br>(143)     | 2.06<br>(52)   | 1.18<br>(30)  | .59<br>(15)   | 3.76<br>(96)  |
| D1                | D2             | D3            | E             | E1            |
| 4.23<br>(107)     | 2.35<br>(60)   | 2.82<br>(72)  | 1.89<br>(48)  | .95<br>(24)   |
| F                 | F1             | G             | G1            | H             |
| 2.01<br>(51)      | 2.47<br>(63)   | 1.00<br>(25)  | .50<br>(13)   | .87<br>(22)   |
| H1                | J              | J1            | J             | K             |
| .16<br>(4)        | .51<br>(13)    | .36<br>(9)    | .58<br>(15)   | 2.00<br>(51)  |
| K1                | L              | M             | N             | P             |
| 2.47<br>(63)      | 1.75<br>(44)   | .88<br>(22)   | .43<br>(48)   | .50<br>(13)   |
| P1                | Q              | R             | S             | S1            |
| .37<br>(92)       | 1.89<br>(48)   | 1.41<br>(36)  | 2.05<br>(52)  | 1.03<br>(26)  |
| T                 | U              | V             | W             | X             |
| Ø .177<br>Ø (4.5) | Ø .34<br>Ø (9) | 3.24<br>(82)  | 6.48<br>(165) | 1.50<br>(383) |

Inches (mm)





**B5 Single & Double Operators – 3-way Inline**

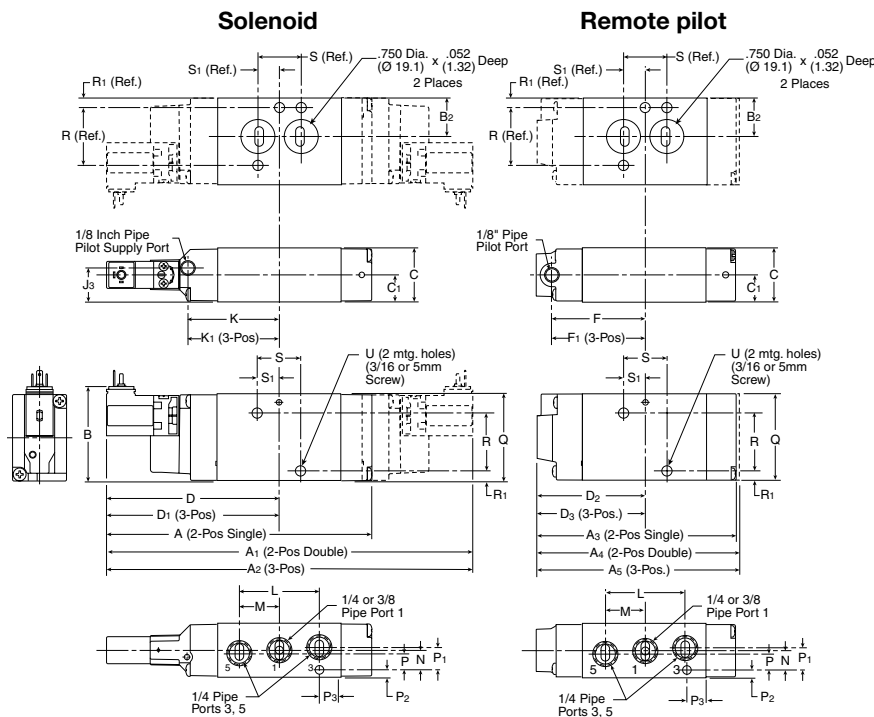


**B5 3-way Inline**

|                                     |                                       |                                      |                                       |                          |
|-------------------------------------|---------------------------------------|--------------------------------------|---------------------------------------|--------------------------|
| <b>A</b><br>5.29<br>(134)           | <b>A<sub>1</sub></b><br>7.03<br>(179) | <b>A<sub>2</sub></b><br>3.88<br>(99) | <b>A<sub>3</sub></b><br>4.21<br>(107) | <b>B</b><br>2.06<br>(52) |
| <b>C</b><br>1.18<br>(30)            | <b>C<sub>1</sub></b><br>.59<br>(15)   | <b>D</b><br>3.43<br>(87)             | <b>D<sub>1</sub></b><br>2.11<br>(54)  | <b>E</b><br>1.40<br>(36) |
| <b>E<sub>1</sub></b><br>.70<br>(18) | <b>F</b><br>1.77<br>(45)              | <b>F<sub>1</sub></b><br>.43<br>(11)  | <b>G</b><br>.06<br>(2)                | <b>H</b><br>.87<br>(22)  |
| <b>H<sub>1</sub></b><br>.16<br>(4)  | <b>J<sub>1</sub></b><br>.36<br>(9)    | <b>J<sub>2</sub></b><br>.58<br>(15)  | <b>K</b><br>1.67<br>(42)              | <b>M</b><br>.88<br>(22)  |
| <b>M<sub>1</sub></b><br>.44<br>(11) | <b>P</b><br>.50<br>(13)               | <b>P<sub>1</sub></b><br>.37<br>(9)   | <b>Q</b><br>1.89<br>(48)              | <b>R</b><br>1.41<br>(36) |
| <b>T</b><br>Ø .177<br>Ø (4.5)       |                                       | <b>U</b><br>Ø .26<br>Ø (6.6)         |                                       |                          |

Inches (mm)

**B5 Single & Double Operators – 4-way NAMUR Mount**

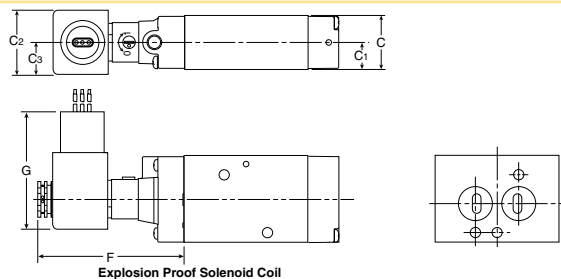


**B5 4-way NAMUR Mount**

|                                       |                                       |                                       |                                       |                                       |
|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| <b>A</b><br>5.78<br>(147)             | <b>A<sub>1</sub></b><br>7.51<br>(191) | <b>A<sub>2</sub></b><br>8.45<br>(215) | <b>A<sub>3</sub></b><br>4.37<br>(110) | <b>A<sub>4</sub></b><br>4.70<br>(119) |
| <b>A<sub>5</sub></b><br>5.64<br>(143) | <b>B</b><br>2.06<br>(52)              | <b>B<sub>2</sub></b><br>.84<br>(21)   | <b>C</b><br>1.18<br>(30)              | <b>C<sub>1</sub></b><br>.59<br>(15)   |
| <b>D</b><br>3.76<br>(96)              | <b>D<sub>1</sub></b><br>4.23<br>(107) | <b>D<sub>2</sub></b><br>2.35<br>(60)  | <b>D<sub>3</sub></b><br>2.82<br>(72)  | <b>F</b><br>2.01<br>(51)              |
| <b>F<sub>1</sub></b><br>2.47<br>(63)  | <b>J<sub>3</sub></b><br>.74<br>(19)   | <b>K</b><br>2.00<br>(51)              | <b>K<sub>1</sub></b><br>2.47<br>(63)  | <b>L</b><br>1.75<br>(44)              |
| <b>M</b><br>.88<br>(22)               | <b>N</b><br>.44<br>(11)               | <b>P</b><br>.37<br>(9.4)              | <b>P<sub>1</sub></b><br>.50<br>(13)   | <b>P<sub>2</sub></b><br>.16<br>(4)    |
| <b>P<sub>3</sub></b><br>.40<br>(10)   | <b>Q</b><br>1.89<br>(48)              | <b>R</b><br>1.26<br>(32)              | <b>R<sub>1</sub></b><br>.21<br>(5)    | <b>S</b><br>.94<br>(24)               |
| <b>S<sub>1</sub></b><br>.47<br>(12)   |                                       | <b>U</b><br>Ø .224<br>Ø (5.7)         |                                       |                                       |

Inches (mm)

**B5 Alternative Electrical Enclosure Option F**

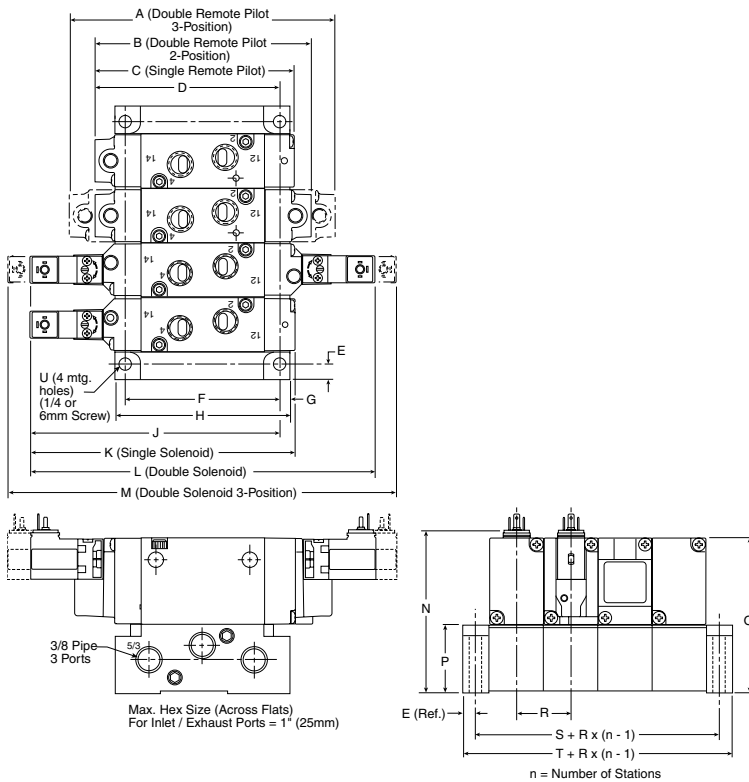


**B5 4-way NAMUR Mount with Option F Enclosure**

|                          |                                     |                                      |                                     |                          |
|--------------------------|-------------------------------------|--------------------------------------|-------------------------------------|--------------------------|
| <b>C</b><br>1.18<br>(30) | <b>C<sub>1</sub></b><br>.59<br>(15) | <b>C<sub>2</sub></b><br>1.42<br>(36) | <b>C<sub>3</sub></b><br>.71<br>(18) | <b>F</b><br>3.15<br>(80) |
| <b>G</b><br>2.60<br>(66) |                                     |                                      |                                     |                          |

Inches (mm)

**B5 Single & Double Operators – 4-way IEM Stackable**

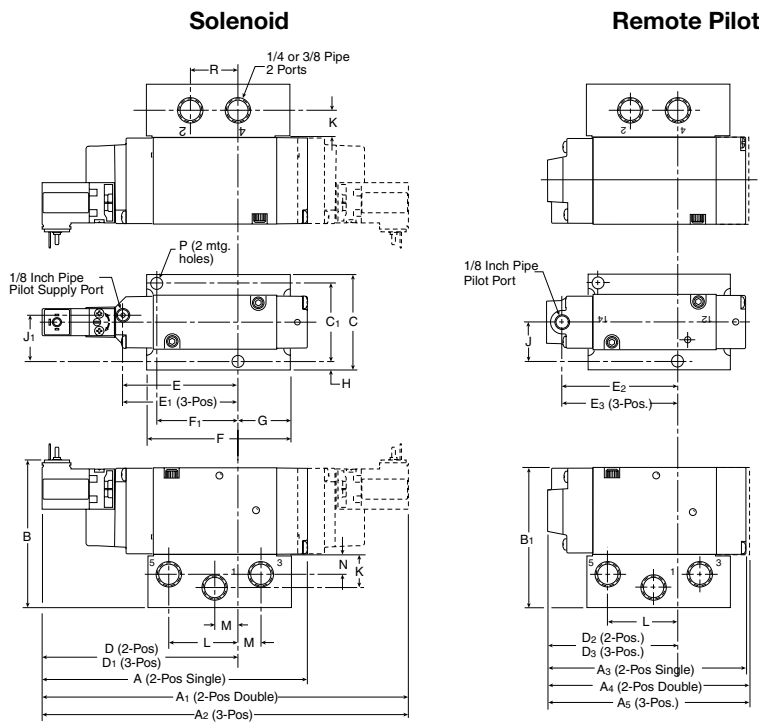


**B5 4-way IEM Stackable**

| A                           | B               | C               | D               | E               |
|-----------------------------|-----------------|-----------------|-----------------|-----------------|
| 5.64<br>(143.3)             | 4.70<br>(119.4) | 4.37<br>(110.0) | 4.29<br>(109.0) | .29<br>(7.4)    |
| F                           | G               | H               | J               | K               |
| 3.44<br>(87.4)              | .24<br>(6.1)    | 3.92<br>(99.6)  | 5.48<br>(139.2) | 5.78<br>(146.8) |
| L                           | M               | N               | P               | Q               |
| 7.52<br>(191.0)             | 8.46<br>(214.9) | 3.56<br>(90.4)  | 1.50<br>(38.1)  | 3.42<br>(86.9)  |
| R                           | S               | T               | U               |                 |
| 1.21 ± .01<br>(30.7) ± (.3) | 1.79<br>(45.5)  | 2.37<br>(60.2)  | Ø .28<br>(7.1)  |                 |

Inches (mm)

**B5 Single & Double Operators – 4-way Single Subbase**



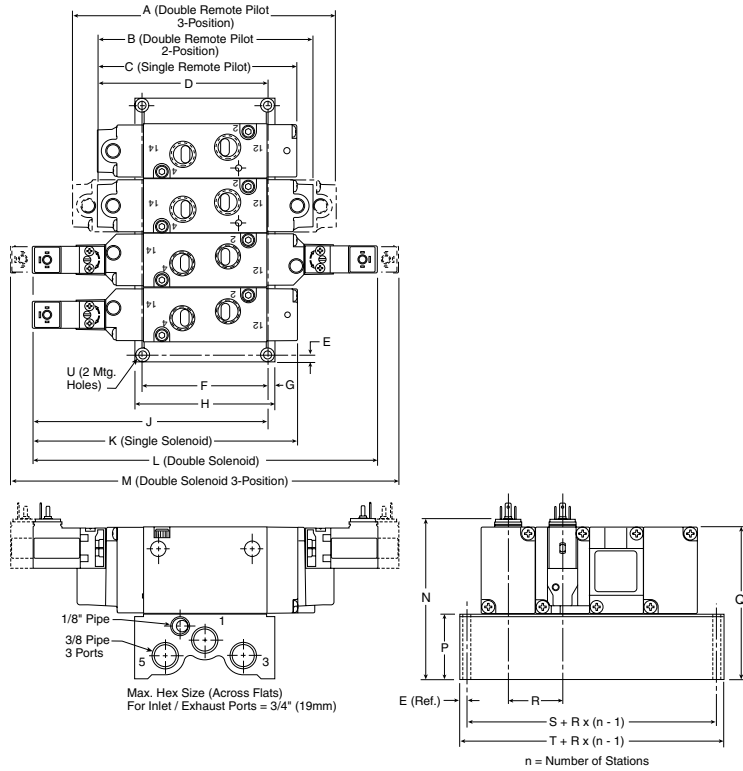
**B5 4-way Subbase**

| A              | A <sub>1</sub> | A <sub>2</sub> | A <sub>3</sub> | A <sub>4</sub> |
|----------------|----------------|----------------|----------------|----------------|
| 5.78<br>(147)  | 7.52<br>(191)  | 8.46<br>(215)  | 4.37<br>(110)  | 4.70<br>(119)  |
| A <sub>5</sub> | B              | B <sub>1</sub> | C              | C <sub>1</sub> |
| 5.64<br>(143)  | 3.21<br>(82)   | 3.03<br>(77)   | 2.12<br>(54)   | 1.69<br>(43)   |
| D              | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> | E              |
| 4.26<br>(108)  | 4.73<br>(120)  | 2.85<br>(72)   | 3.32<br>(40)   | 2.51<br>(65)   |
| E <sub>1</sub> | E <sub>2</sub> | E <sub>3</sub> | F              | F <sub>1</sub> |
| 2.98<br>(76)   | 2.60<br>(66)   | 3.07<br>(80)   | 2.90<br>(74)   | 1.69<br>(43)   |
| G              | H              | J              | J <sub>1</sub> | K              |
| .95<br>(24)    | .22<br>(5)     | .84<br>(21)    | .99<br>(25)    | .71<br>(18)    |
| L              | M              | N              | P              | R              |
| 1.50<br>(38)   | .50<br>(13)    | .46<br>(12)    | Ø .27<br>(7)   | 1.00<br>(25)   |

Inches (mm)



**B5 Single & Double Operators – 4-way IEM Aluminum Bar**

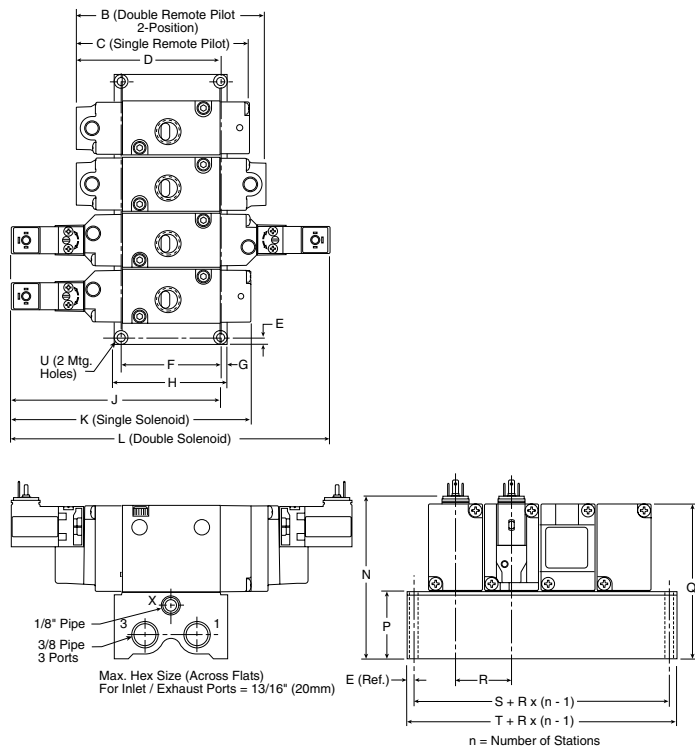


**B5 4-way IEM Aluminum Bar Manifold**

| A               | B               | C               | D                | E               |
|-----------------|-----------------|-----------------|------------------|-----------------|
| 5.64<br>(143.3) | 4.70<br>(119.4) | 4.37<br>(110.0) | 3.74<br>(95.0)   | .18<br>(4.6)    |
| F               | G               | H               | J                | K               |
| 2.78<br>(70.6)  | .17<br>(4.3)    | 3.12<br>(79.2)  | 5.15<br>(130.8)  | 5.78<br>(146.8) |
| L               | M               | N               | P                | Q               |
| 7.52<br>(191.0) | 8.46<br>(214.9) | 3.50<br>(89.0)  | 1.44<br>(36.6)   | 3.36<br>(85.3)  |
| R               | S               | T               | U                |                 |
| 1.26<br>(32.0)  | 1.78<br>(45.2)  | 2.14<br>(54.4)  | Ø .22<br>Ø (5.5) |                 |

Inches (mm)

**B5 Single & Double Operators – 3-way IEM Aluminum Bar**



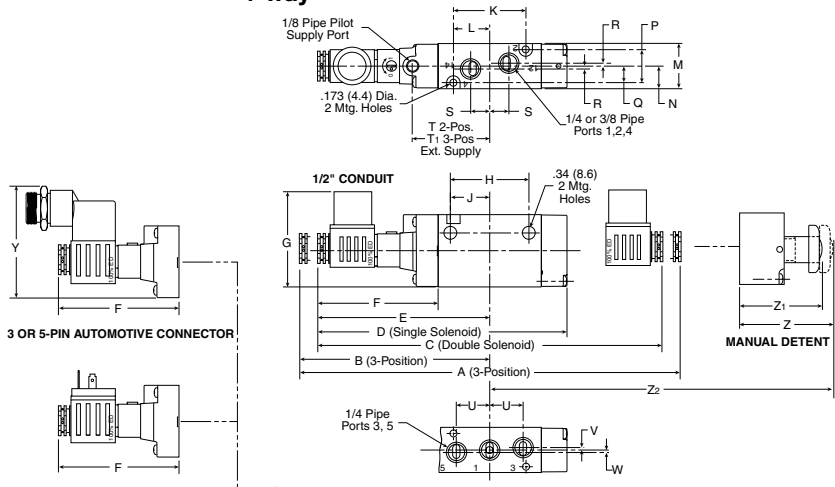
**B5 3-way IEM Aluminum Bar Manifold**

| B               | C                | D               | E               | F               |
|-----------------|------------------|-----------------|-----------------|-----------------|
| 4.21<br>(106.9) | 3.88<br>(98.6)   | 3.41<br>(86.6)  | .18<br>(4.6)    | 2.12<br>(53.8)  |
| G               | H                | J               | K               | L               |
| .17<br>(4.3)    | 2.46<br>(62.5)   | 4.82<br>(122.4) | 5.29<br>(134.4) | 7.03<br>(178.6) |
| N               | P                | Q               | R               | S               |
| 3.50<br>(89.0)  | 1.44<br>(36.6)   | 3.36<br>(85.3)  | 1.26<br>(32.0)  | 1.76<br>(44.7)  |
| T               | U                |                 |                 |                 |
| 2.12<br>(53.8)  | Ø .18<br>Ø (4.6) |                 |                 |                 |

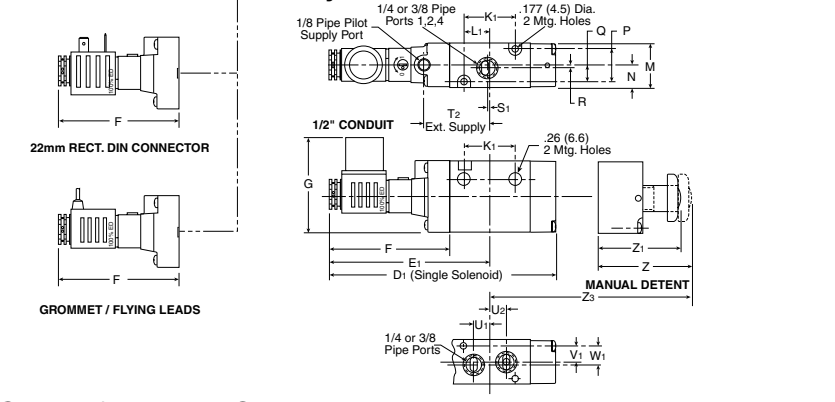
Inches (mm)

**B5 3 & 4-way Alternative Electrical Enclosures**

**4-way**



**3-way**



**B5 Alternative – Electrical Enclosures**

|                 |                 |                 |                 |                 |
|-----------------|-----------------|-----------------|-----------------|-----------------|
| <b>A</b>        | <b>A1</b>       | <b>B</b>        | <b>C</b>        | <b>D</b>        |
| 9.94<br>(252.5) | .872<br>(221.4) | 4.97<br>(126.2) | 9.00<br>(228.6) | 6.52<br>(165.6) |
| <b>D1</b>       | <b>E</b>        | <b>E1</b>       | <b>F</b>        | <b>G</b>        |
| 6.02<br>(152.9) | 4.50<br>(114.3) | 4.26<br>(108.1) | 3.15<br>(80.0)  | 2.47<br>(62.8)  |
| <b>H</b>        | <b>J</b>        | <b>K</b>        | <b>K1</b>       | <b>L</b>        |
| 2.05<br>(52.1)  | 1.03<br>(26.2)  | 1.89<br>(48.0)  | 1.40<br>(35.5)  | .95<br>(24.1)   |
| <b>L1</b>       | <b>M</b>        | <b>N</b>        | <b>P</b>        | <b>Q</b>        |
| .70<br>(17.8)   | 1.18<br>(30.0)  | .59<br>(15.0)   | .87<br>(22.1)   | .43<br>(10.9)   |
| <b>R</b>        | <b>S</b>        | <b>S1</b>       | <b>T</b>        | <b>T1</b>       |
| .08<br>(2.0)    | .50<br>(12.7)   | .06<br>(1.5)    | 2.01<br>(51.1)  | 2.47<br>(62.7)  |
| <b>T2</b>       | <b>U</b>        | <b>U1</b>       | <b>U2</b>       | <b>V</b>        |
| 1.76<br>(44.8)  | .87<br>(22.1)   | .43<br>(10.9)   | .45<br>(11.3)   | .06<br>(1.5)    |
| <b>V1</b>       | <b>W</b>        | <b>W1</b>       | <b>Y</b>        | <b>Z</b>        |
| .37<br>(9.3)    | .07<br>(1.8)    | .50<br>(13)     | 2.90<br>(73.6)  | 2.40<br>(60.9)  |
| <b>Z1</b>       | <b>Z2</b>       | <b>Z3</b>       |                 |                 |
| 2.12<br>(53.8)  | 3.75<br>(95.2)  | 4.17<br>(105.8) |                 |                 |

Inches (mm)

Series **N**

3 OR 5-PIN AUTOMOTIVE CONNECTOR

Series **ADEX**

SQUARE ISO CONNECTOR

Series **B**

22mm RECT. DIN CONNECTOR

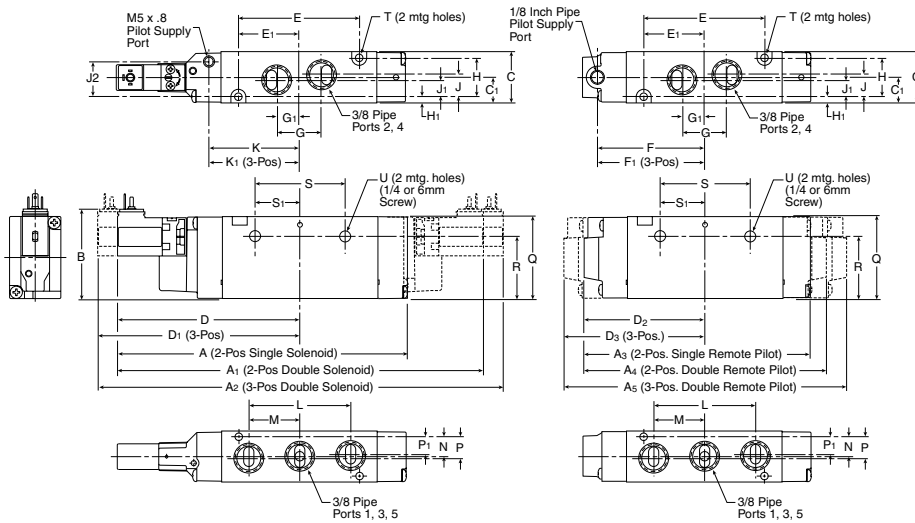
Series **Viking Xtreme Solenoid**

GROMMET / FLYING LEADS

**B6 Single & Double Operators – 4-way Inline**

**Solenoid**

**Remote pilot**



**B6 4-way Inline**

|                 |                 |                 |                 |                 |
|-----------------|-----------------|-----------------|-----------------|-----------------|
| <b>A</b>        | <b>A1</b>       | <b>A2</b>       | <b>A3</b>       | <b>A4</b>       |
| 6.67<br>(169.5) | 8.41<br>(213.7) | 9.35<br>(237.6) | 5.26<br>(133.7) | 5.59<br>(142.1) |
| <b>A5</b>       | <b>B</b>        | <b>C</b>        | <b>C1</b>       | <b>D</b>        |
| 6.54<br>(166)   | 2.06<br>(52)    | 1.18<br>(30.0)  | .59<br>(15)     | 4.21<br>(106.8) |
| <b>D1</b>       | <b>D2</b>       | <b>D3</b>       | <b>E</b>        | <b>E1</b>       |
| 4.68<br>(118.8) | 2.80<br>(71)    | 3.27<br>(83.0)  | 2.79<br>(70.8)  | 1.39<br>(35.4)  |
| <b>F</b>        | <b>F1</b>       | <b>G</b>        | <b>G1</b>       | <b>H</b>        |
| 2.45<br>(62.3)  | 2.92<br>(74.3)  | 1.03<br>(26.1)  | .51<br>(13.1)   | .91<br>(23)     |
| <b>H1</b>       | <b>J</b>        | <b>J1</b>       | <b>J2</b>       | <b>K</b>        |
| .14<br>(3.5)    | .51<br>(13.1)   | .39<br>(10)     | .81<br>(20.6)   | 2.09<br>(53)    |
| <b>K1</b>       | <b>L</b>        | <b>M</b>        | <b>N</b>        | <b>P</b>        |
| 2.56<br>(64.9)  | 2.34<br>(59.4)  | 1.17<br>(29.7)  | .45<br>(11.5)   | .49<br>(12.5)   |
| <b>P1</b>       | <b>Q</b>        | <b>R</b>        | <b>S</b>        | <b>S1</b>       |
| .41<br>(10.5)   | 1.89<br>(48)    | 1.45<br>(36.8)  | 2.09<br>(53)    | 1.04<br>(26.5)  |
| <b>T</b>        | <b>U</b>        |                 |                 |                 |
| Ø .17<br>(4.4)  | Ø .27<br>(6.9)  |                 |                 |                 |

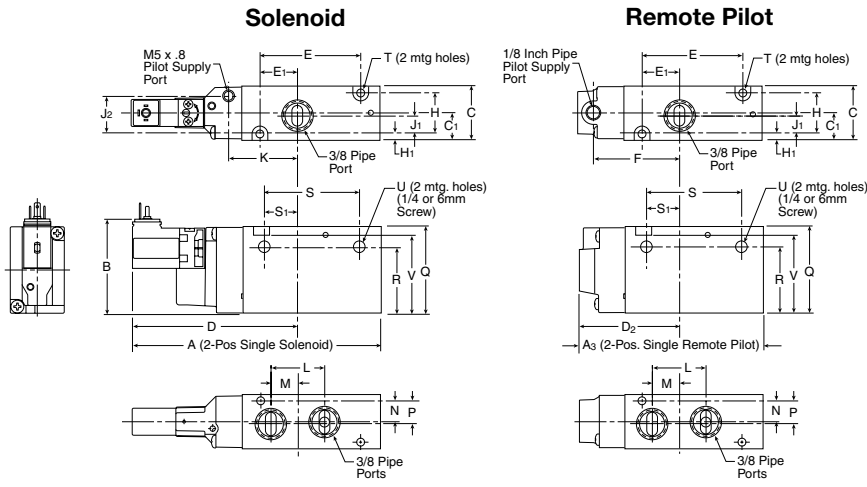
Inches (mm)

Series **Viking Lite Solenoid**

Series **D**

Series **Inline Valve Products**

**B6 Single Operators – 3-way Inline**

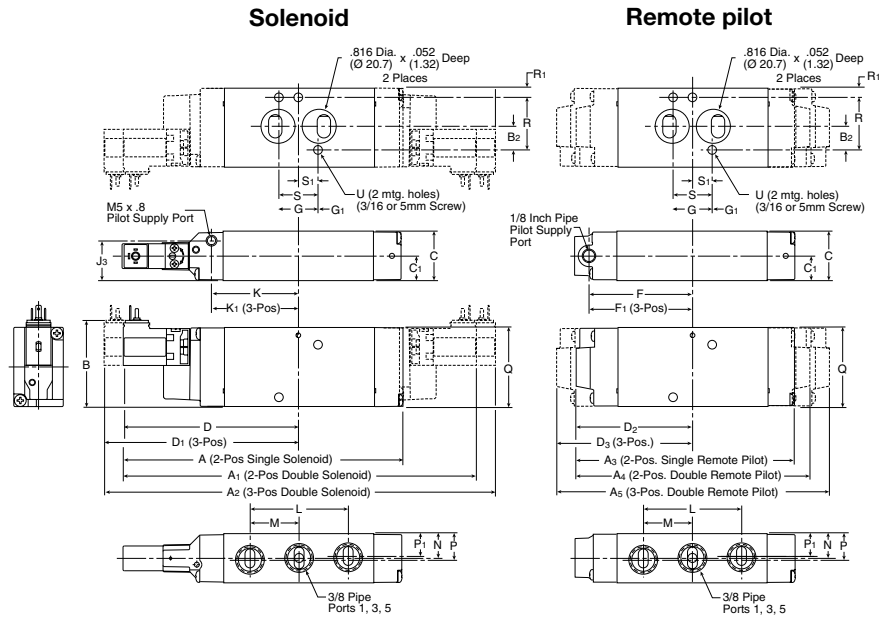


**B6 3-way Inline**

|                             |                              |                             |                              |                              |
|-----------------------------|------------------------------|-----------------------------|------------------------------|------------------------------|
| <b>A</b><br>5.42<br>(137.7) | <b>A3</b><br>4.01<br>(101.9) | <b>B</b><br>2.06<br>(52)    | <b>C</b><br>1.18<br>(30.0)   | <b>C1</b><br>.59<br>(15.0)   |
| <b>D</b><br>3.63<br>(92.1)  | <b>D2</b><br>2.22<br>(56.3)  | <b>E</b><br>2.19<br>(55.6)  | <b>E1</b><br>0.82<br>(20.7)  | <b>F</b><br>1.87<br>(47.6)   |
| <b>H</b><br>.91<br>(23.0)   | <b>H1</b><br>.14<br>(3.5)    | <b>J1</b><br>.39<br>(10.0)  | <b>J2</b><br>.81<br>(20.6)   | <b>K</b><br>1.51<br>(38.3)   |
| <b>L</b><br>1.17<br>(29.7)  | <b>M</b><br>.59<br>(15.0)    | <b>N</b><br>.45<br>(11.5)   | <b>P</b><br>.49<br>(12.5)    | <b>Q</b><br>1.89<br>(48.0)   |
| <b>R</b><br>1.45<br>(36.8)  | <b>S</b><br>2.09<br>(53.0)   | <b>S1</b><br>0.76<br>(19.4) | <b>T</b><br>Ø .17<br>Ø (4.4) | <b>U</b><br>Ø .27<br>Ø (6.9) |
| <b>V</b><br>1.69<br>(43.0)  |                              |                             |                              |                              |

Inches (mm)

**B6 Single & Double Operators – 4-way NAMUR Mount**

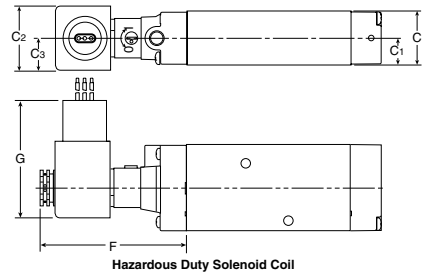


**B6 4-way NAMUR Mount**

|                              |                              |                              |                              |                              |
|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| <b>A</b><br>6.67<br>(169.5)  | <b>A1</b><br>8.41<br>(213.7) | <b>A2</b><br>9.35<br>(237.6) | <b>A3</b><br>5.26<br>(133.7) | <b>A4</b><br>5.59<br>(142.1) |
| <b>A5</b><br>6.54<br>(166.0) | <b>B</b><br>2.06<br>(52)     | <b>B2</b><br>.57<br>(14.4)   | <b>C</b><br>1.18<br>(30.0)   | <b>C1</b><br>.59<br>(15)     |
| <b>D</b><br>4.21<br>(106.8)  | <b>D1</b><br>4.68<br>(118.8) | <b>D2</b><br>2.80<br>(71.0)  | <b>D3</b><br>3.27<br>(83.0)  | <b>F</b><br>2.45<br>(62.3)   |
| <b>F1</b><br>2.92<br>(74.3)  | <b>G</b><br>.95<br>(24.2)    | <b>G1</b><br>.02<br>(0.53)   | <b>J3</b><br>.95<br>(24.1)   | <b>K</b><br>2.09<br>(53.0)   |
| <b>K1</b><br>2.56<br>(64.9)  | <b>L</b><br>2.34<br>(59.4)   | <b>M</b><br>1.17<br>(29.7)   | <b>N</b><br>.59<br>(15)      | <b>P</b><br>.63<br>(16)      |
| <b>P1</b><br>.55<br>(14)     | <b>Q</b><br>1.89<br>(48.0)   | <b>R</b><br>1.26<br>(32)     | <b>R1</b><br>.22<br>(5.5)    | <b>S</b><br>.94<br>(24)      |
| <b>S1</b><br>.47<br>(12)     | <b>T</b><br>Ø .17<br>Ø (4.4) | <b>U</b><br>Ø .27<br>Ø (6.9) |                              |                              |

Inches (mm)

**B6 Alternative Electrical Enclosure Option F**



**B6 4-way NAMUR Mount with Option F Enclosure**

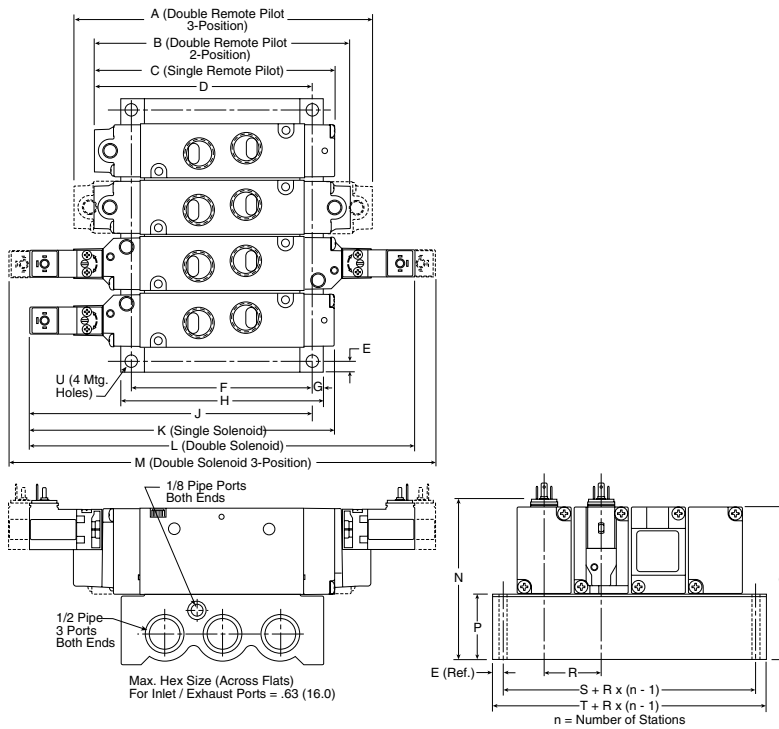
|                          |                          |                           |                          |                          |
|--------------------------|--------------------------|---------------------------|--------------------------|--------------------------|
| <b>C</b><br>1.18<br>(30) | <b>C1</b><br>.59<br>(15) | <b>C2</b><br>1.42<br>(36) | <b>C3</b><br>.71<br>(18) | <b>F</b><br>3.15<br>(80) |
| <b>G</b><br>2.60<br>(66) |                          |                           |                          |                          |

Inches (mm)



**N Series**  
**ADEX Series**  
**B Series**  
**Viking Xtreme Series**  
**Viking Lite Series**  
**D Inline Valve Products**

**B6 Single & Double Operators – 4-way IEM Aluminum Bar**

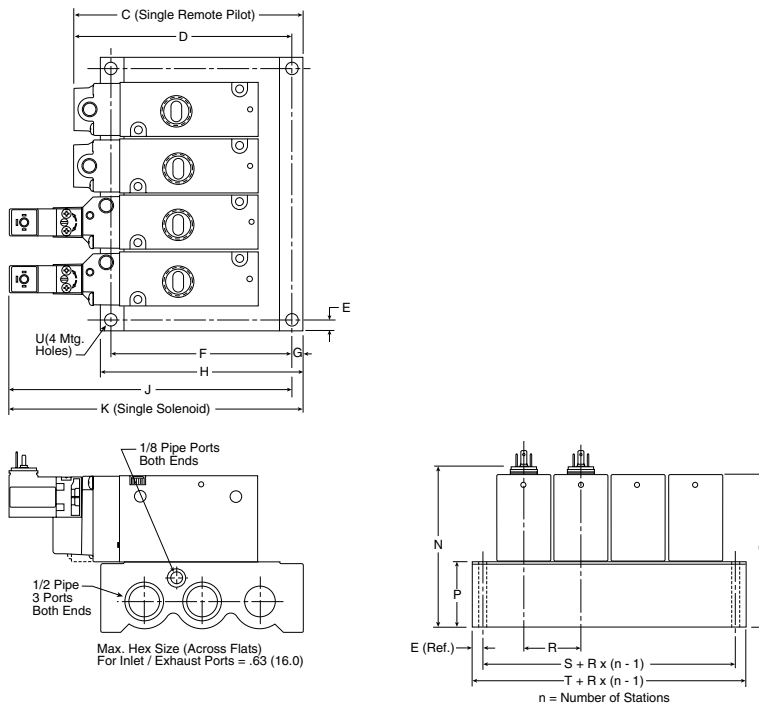


**B6 4-way IEM Aluminum Bar Manifold**

| A               | B               | C               | D                                    | E               |
|-----------------|-----------------|-----------------|--------------------------------------|-----------------|
| 6.54<br>(166.0) | 5.59<br>(142.1) | 5.26<br>(133.7) | 4.76<br>(121.0)                      | .24<br>(6.0)    |
| F               | G               | H               | J                                    | K               |
| 3.94<br>(100.0) | .24<br>(6.0)    | 4.41<br>(112.0) | 6.17<br>(156.8)                      | 6.67<br>(169.5) |
| L               | M               | N               | P                                    | Q               |
| 8.41<br>(213.7) | 9.35<br>(237.6) | 3.60<br>(91.3)  | 1.54<br>(39.0)                       | 3.43<br>(87.0)  |
| R               | S               | T               | U                                    |                 |
| 1.24<br>(31.5)  | 1.77<br>(45.0)  | 2.24<br>(57.0)  | $\emptyset .26$<br>$\emptyset (6.5)$ |                 |

Inches (mm)

**B6 Single Operators – 3-way IEM Aluminum Bar**

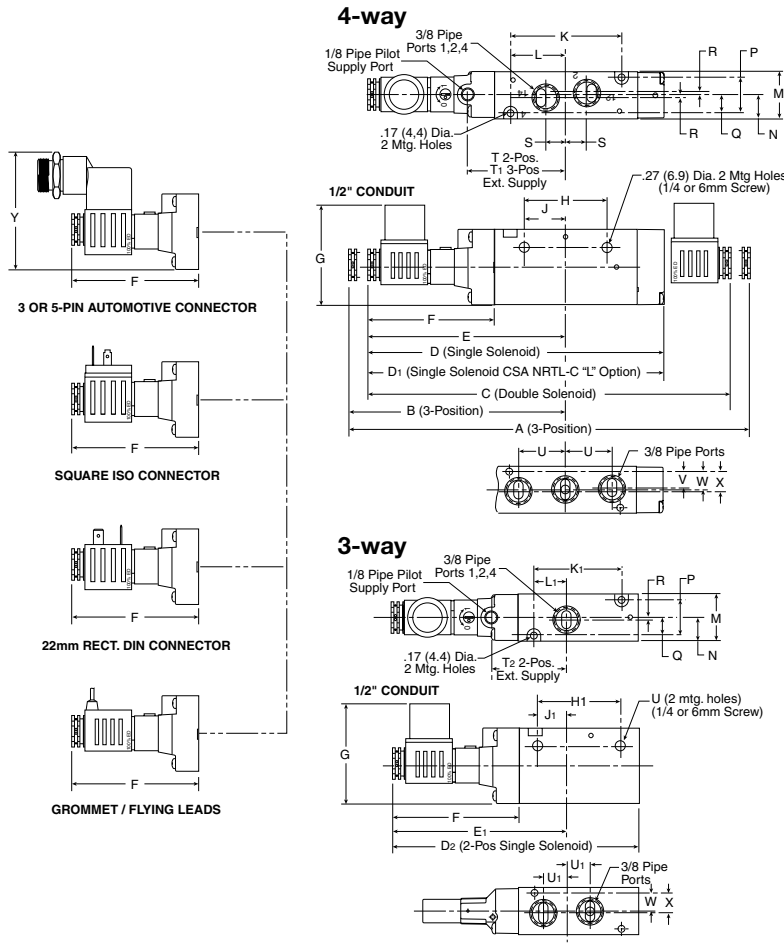


**B6 3-way IEM Aluminum Bar Manifold**

| C               | D               | E               | F               | G                                    |
|-----------------|-----------------|-----------------|-----------------|--------------------------------------|
| 5.00<br>(127.0) | 4.76<br>(121.0) | .24<br>(6.0)    | 3.94<br>(100.0) | .24<br>(6.0)                         |
| H               | J               | K               | N               | P                                    |
| 4.41<br>(112.0) | 6.17<br>(156.8) | 6.41<br>(162.8) | 3.60<br>(91.3)  | 1.54<br>(39.0)                       |
| Q               | R               | S               | T               | U                                    |
| 3.43<br>(87.0)  | 1.24<br>(31.5)  | 1.77<br>(45.0)  | 2.24<br>(57.0)  | $\emptyset .26$<br>$\emptyset (6.5)$ |

Inches (mm)

**B6 3 & 4-way Alternative Electrical Enclosures**

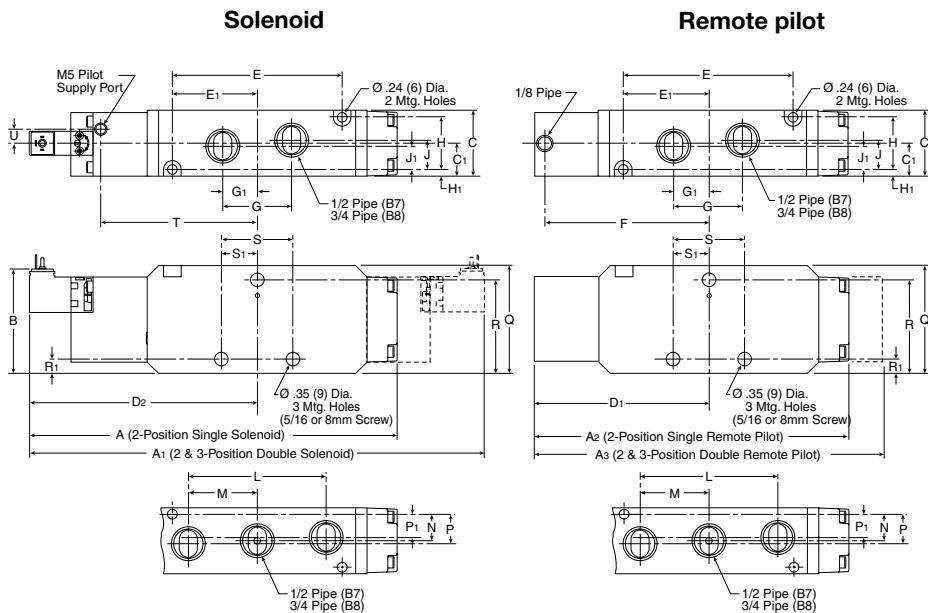


**B6 Alternative – Electrical Enclosures**

|                  |                 |                 |                 |                 |
|------------------|-----------------|-----------------|-----------------|-----------------|
| <b>A</b>         | <b>B</b>        | <b>C</b>        | <b>D</b>        | <b>D1</b>       |
| 10.84<br>(275.3) | 5.41<br>(137.5) | 9.89<br>(251.3) | 7.41<br>(188.2) | 7.74<br>(196.6) |
| <b>D2</b>        | <b>E</b>        | <b>E2</b>       | <b>F</b>        | <b>G</b>        |
| 6.17<br>(156.6)  | 4.94<br>(125.6) | 4.37<br>(111.0) | 3.15<br>(80.0)  | 2.47<br>(62.8)  |
| <b>H</b>         | <b>H1</b>       | <b>J</b>        | <b>J1</b>       | <b>K</b>        |
| 2.09<br>(53.0)   | 2.09<br>(53.0)  | 1.04<br>(26.5)  | 0.76<br>(19.4)  | 2.79<br>(70.8)  |
| <b>K1</b>        | <b>L</b>        | <b>L1</b>       | <b>M</b>        | <b>N</b>        |
| 2.19<br>(55.6)   | 1.39<br>(35.4)  | .82<br>(20.7)   | 1.18<br>(30.0)  | .59<br>(15.0)   |
| <b>P</b>         | <b>Q</b>        | <b>R</b>        | <b>S</b>        | <b>T</b>        |
| .91<br>(23.0)    | .45<br>(11.5)   | .06<br>(1.6)    | .51<br>(13.1)   | 2.45<br>(62.3)  |
| <b>T1</b>        | <b>T2</b>       | <b>U</b>        | <b>U1</b>       | <b>V</b>        |
| 2.93<br>(29.7)   | 1.89<br>(48.0)  | .59<br>(15.0)   | .59<br>(15.0)   | .41<br>(10.5)   |
| <b>W</b>         | <b>X</b>        | <b>Y</b>        |                 |                 |
| .45<br>(11.5)    | .49<br>(12.5)   | 2.90<br>(73.6)  |                 |                 |

Inches (mm)

**B7& B8 Single & Double Operators – 4-way Inline**



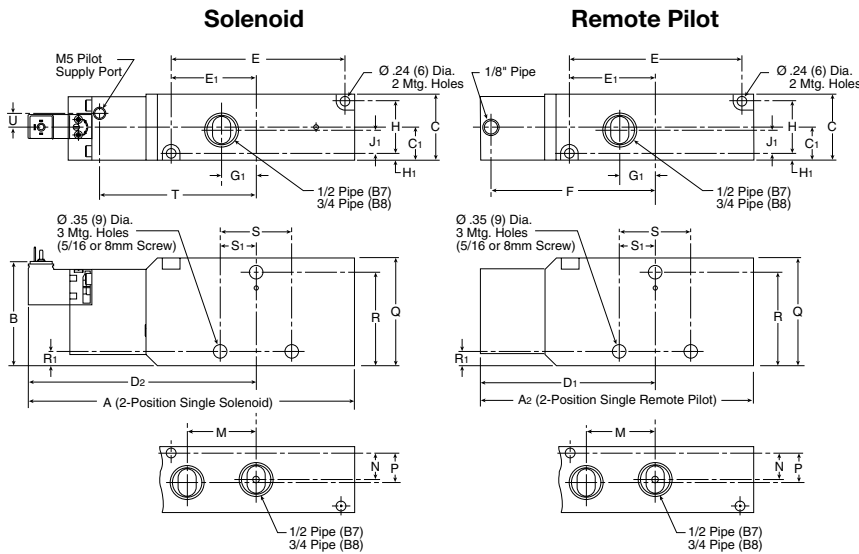
**B7 & B8 4-way Inline**

|               |                |               |               |               |
|---------------|----------------|---------------|---------------|---------------|
| <b>A</b>      | <b>A1</b>      | <b>A2</b>     | <b>A3</b>     | <b>B</b>      |
| 9.13<br>(232) | 11.29<br>(287) | 7.79<br>(198) | 8.62<br>(219) | 2.59<br>(66)  |
| <b>C</b>      | <b>C1</b>      | <b>D1</b>     | <b>D2</b>     | <b>E</b>      |
| 1.65<br>(42)  | .83<br>(21)    | 4.29<br>(109) | 5.63<br>(143) | 4.21<br>(107) |
| <b>E1</b>     | <b>F</b>       | <b>G</b>      | <b>G1</b>     | <b>H</b>      |
| 2.13<br>(54)  | 4.06<br>(103)  | 1.73<br>(44)  | .87<br>(22)   | 1.29<br>(33)  |
| <b>H1</b>     | <b>J</b>       | <b>J1</b>     | <b>L</b>      | <b>M</b>      |
| .16<br>(4)    | .75<br>(19)    | .59<br>(15)   | 3.39<br>(86)  | 1.69<br>(43)  |
| <b>N</b>      | <b>P</b>       | <b>P1</b>     | <b>Q</b>      | <b>R</b>      |
| .67<br>(17)   | .75<br>(19)    | .59<br>(15)   | 2.68<br>(68)  | 2.32<br>(59)  |
| <b>R1</b>     | <b>S</b>       | <b>S1</b>     | <b>T</b>      | <b>U</b>      |
| .35<br>(9)    | 1.81<br>(46)   | .90<br>(23)   | 3.94<br>(100) | .35<br>(9)    |

Inches (mm)



**B7 & B8 Single Operators – 3-way Inline**

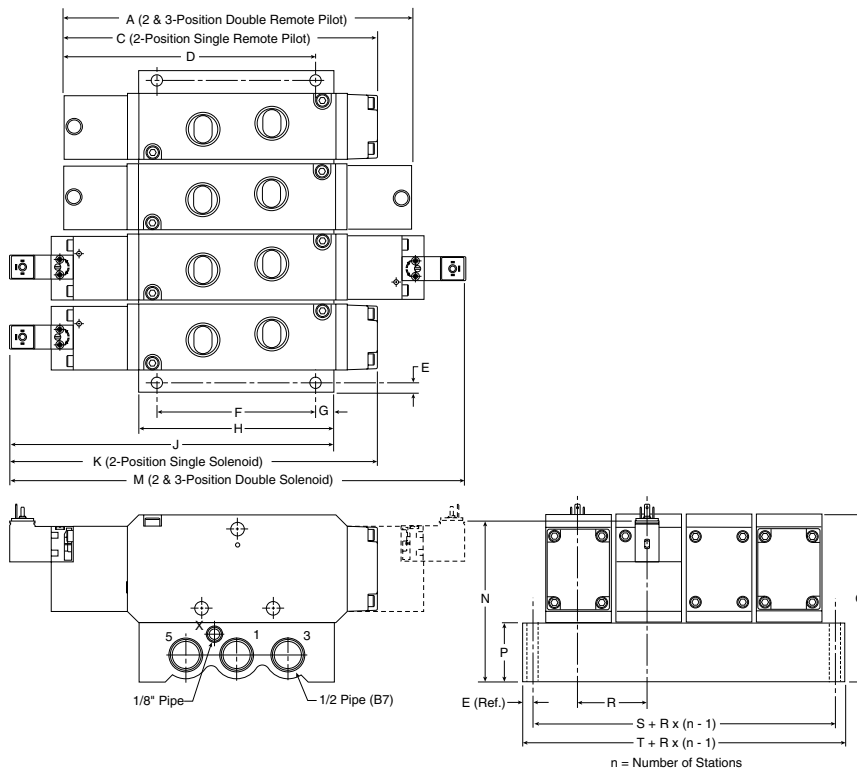


**B7 & B8 3-way Inline**

|                      |                      |                      |                      |                      |
|----------------------|----------------------|----------------------|----------------------|----------------------|
| <b>A</b>             | <b>A<sub>2</sub></b> | <b>B</b>             | <b>C</b>             | <b>C<sub>1</sub></b> |
| 7.99<br>(203)        | 6.65<br>(169)        | 2.59<br>(66)         | 1.65<br>(42)         | .83<br>(21)          |
| <b>D<sub>1</sub></b> | <b>D<sub>2</sub></b> | <b>E</b>             | <b>E<sub>1</sub></b> | <b>F</b>             |
| 4.29<br>(109)        | 5.63<br>(143)        | 4.21<br>(107)        | 2.13<br>(54)         | 4.06<br>(103)        |
| <b>G<sub>1</sub></b> | <b>H</b>             | <b>H<sub>1</sub></b> | <b>J<sub>1</sub></b> | <b>M</b>             |
| .86<br>(22)          | 1.29<br>(33)         | .16<br>(4)           | .59<br>(15)          | 1.69<br>(43)         |
| <b>N</b>             | <b>P</b>             | <b>Q</b>             | <b>R</b>             | <b>R<sub>1</sub></b> |
| .67<br>(17)          | .75<br>(19)          | 2.68<br>(68)         | 2.32<br>(59)         | .35<br>(9)           |
| <b>S</b>             | <b>S<sub>1</sub></b> | <b>T</b>             | <b>U</b>             |                      |
| 1.81<br>(46)         | .90<br>(23)          | 3.94<br>(100)        | .35<br>(9)           |                      |

Inches (mm)

**B7 & B8 Single & Double Operators – 4-way IEM Aluminum Bar**

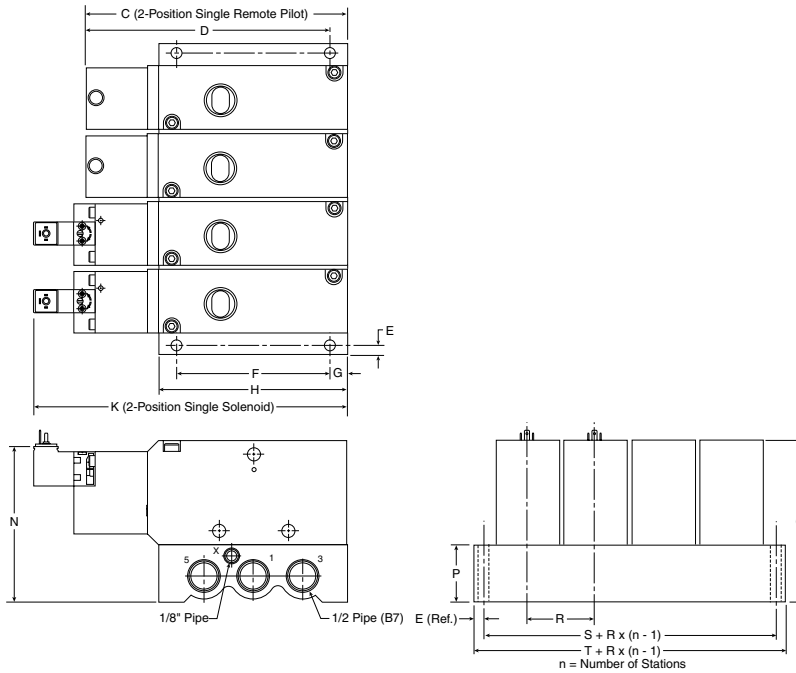


**B7 & B8 4-way IEM  
 Aluminum Bar Manifold**

|                 |                |                 |               |                |
|-----------------|----------------|-----------------|---------------|----------------|
| <b>A</b>        | <b>C</b>       | <b>D</b>        | <b>E</b>      | <b>F</b>       |
| 7.79<br>(198)   | 8.62<br>(219)  | 6.26<br>(159)   | .24<br>(6)    | 3.94<br>(100)  |
| <b>G</b>        | <b>H</b>       | <b>J</b>        | <b>K</b>      | <b>M</b>       |
| .45<br>(11.5)   | 4.84<br>(123)  | 8.07<br>(205)   | 9.13<br>(232) | 11.29<br>(287) |
| <b>N</b>        | <b>P</b>       | <b>Q</b>        | <b>R</b>      | <b>S</b>       |
| 4.00<br>(101.5) | 1.48<br>(37.5) | 4.15<br>(105.5) | 1.77<br>(45)  | 2.24<br>(57)   |
| <b>T</b>        |                |                 |               |                |
| 2.72<br>(69)    |                |                 |               |                |

Inches (mm)

**B7 & B8 Single Operators – 3-way IEM Aluminum Bar**

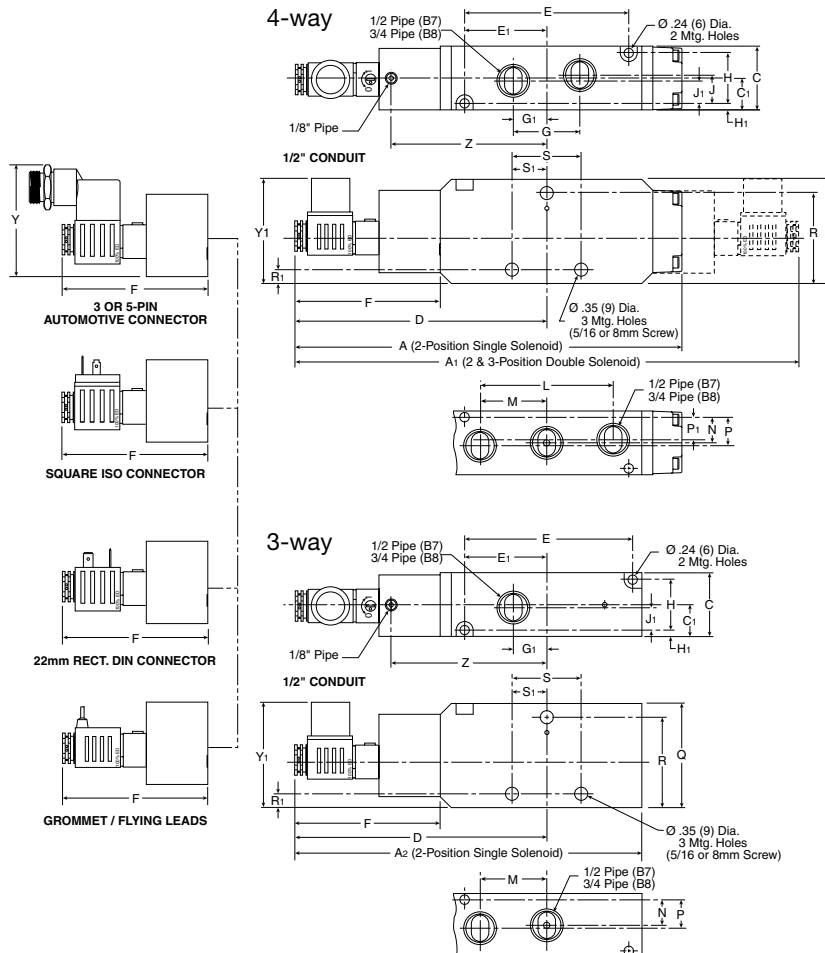


**B7 & B8 3-way IEM  
 Aluminum Bar Manifold**

| C             | D               | E               | F              | G               |
|---------------|-----------------|-----------------|----------------|-----------------|
| 6.65<br>(169) | 4.92<br>(124.9) | .24<br>(6)      | 3.94<br>(100)  | .45<br>(11.5)   |
| H             | K               | N               | P              | Q               |
| 4.84<br>(123) | 7.99<br>(203)   | 4.00<br>(101.5) | 1.48<br>(37.5) | 4.15<br>(105.5) |
| R             | S               | T               |                |                 |
| 1.77<br>(45)  | 2.24<br>(57)    | 2.72<br>(69)    |                |                 |

Inches (mm)

**B7 & B8 3 & 4-way Alternative Electrical Enclosures**



**B7 & B8 3 & 4-way Alternative  
 Electrical Enclosures**

| A              | A <sub>1</sub> | A <sub>2</sub> | C            | C <sub>1</sub> |
|----------------|----------------|----------------|--------------|----------------|
| 9.92<br>(252)  | 12.91<br>(328) | 8.78<br>(223)  | 1.65<br>(42) | .83<br>(21)    |
| D              | E              | E <sub>1</sub> | F            | G              |
| 6.46<br>(164)  | 4.21<br>(107)  | 2.13<br>(54)   | 3.74<br>(95) | 1.73<br>(44)   |
| G <sub>1</sub> | H              | H <sub>1</sub> | J            | J <sub>1</sub> |
| .86<br>(22)    | 1.29<br>(33)   | .16<br>(4)     | .75<br>(19)  | .59<br>(15)    |
| L              | M              | N              | P            | P <sub>1</sub> |
| 3.39<br>(86)   | 1.69<br>(43)   | .67<br>(17)    | .75<br>(19)  | .59<br>(15)    |
| Q              | R              | R <sub>1</sub> | S            | S <sub>1</sub> |
| 2.68<br>(68)   | 2.32<br>(59)   | .35<br>(9)     | 1.81<br>(46) | .90<br>(23)    |
| Y              | Y <sub>1</sub> | Z              |              |                |
| 2.87<br>(73)   | 2.71<br>(69)   | 3.98<br>(101)  |              |                |

Inches (mm)



ADEX Series are miniature low power consumption solenoid valves, ideal for powering small to mid-sized pneumatic actuators used in automation and process applications. ADEX's versatility is further enhanced through its three mounting styles and electronic connectivity options.

**Features**

- Compact body size
- Fast response < 10ms

**Ports**

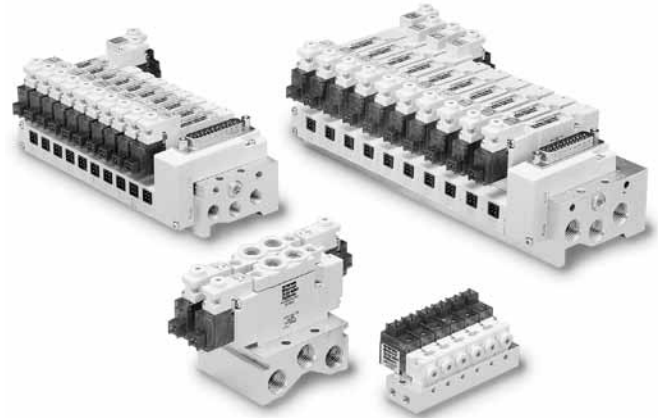
- A00S: M3 – .02 Cv
- A05: M5 – .18 Cv
- A12: 1/8 inch – .47 Cv

**Mounting**

- Inline
- Subbase mount

**Solenoids**

- 0.6 W
- 5VDC, 12VDC, 24VDC and 110/220VAC
- LED and surge suppression



**Operating information**

Maximum operating pressure\*:  
 A05 & A12 Vacuum to 100 PSIG (Vacuum to 6.8 bar)  
 A00S (NC) Vacuum to 100 PSIG (Vacuum to 6.8 bar)  
 A00S (NO) Vacuum to 70 PSIG (Vacuum to 4.8 bar)

Minimum operating pressure: See chart below

Operating temperature:  
 Intermittent Duty (AC & DC Voltage): 32°F to 122°F (0°C to 50°C)  
 Voltage Rated +10 / -10%

Continuous Duty (DC Voltage Only): 32°F to 104°F (0°C to 40°C)  
 Voltage Rated +0 / -10%

\* When using vacuum and pressure simultaneously on ports 1 & 3, normally closed valve, the maximum pressure is 85 PSIG (586 kPa).  
 When using vacuum and pressure simultaneously on ports 1 & 3, normally open valve, the maximum pressure is 58 PSIG (400 kPa).

**Material specifications**

|           |                             |
|-----------|-----------------------------|
| Body      | Anodized aluminum           |
| End caps  | Anodized aluminum           |
| Coils     | Thermoplastic               |
| Fasteners | Stainless steel             |
| Spool     | Aluminum and nitrile rubber |

**Minimum operating pressure**

| Description                  | Internal pilot               |        | External pilot |        |
|------------------------------|------------------------------|--------|----------------|--------|
|                              | PSIG                         | kPa    | PSIG           | kPa    |
| 4-way                        | Single Solenoid              | 22     | 152            | Vacuum |
|                              |                              |        |                | 36     |
|                              | Double Solenoid – 2-position | 15     | 104            | Vacuum |
| 36                           |                              |        |                | 248    |
| Double Solenoid – 3-position | 30                           | 207    | Vacuum         |        |
|                              |                              |        | 36             | 248    |
| 3-way                        | A00 Series                   | Vacuum |                |        |

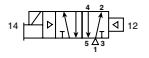

Most popular. For technical information see CD





N Series  
 ADEX Series  
 B Series  
 Viking Xtreme Solenoid  
 Viking Lite Solenoid  
 D Inline Valve Products



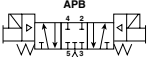
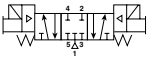
**Single Solenoid, 4-way, 2-position**

| Symbol  | Port size | Cv     | Voltage | Valve type  | Part number          |
|---|-----------|--------|---------|-------------|----------------------|
|  | M5        | .17 Cv | 24VDC   | A05 inline  | <b>A05RS251PM5MF</b> |
|   | M5        | .17 Cv | 12VDC   | A05 inline  | <b>A05RS252PM5MF</b> |
|   | 1/8"      | .47 Cv | 24VDC   | A12 inline  | <b>A12RS251PN1MF</b> |
|   | 1/8"      | .47 Cv | 12VDC   | A12 inline  | <b>A12RS252PN1MF</b> |
|  | Less base | .18 Cv | 24VDC   | A06 subbase | <b>A05PS251P</b>     |
|   | Less base | .18 Cv | 12VDC   | A06 subbase | <b>A05PS252P</b>     |
|   | Less base | .44 Cv | 24VDC   | A12 subbase | <b>A12PS251P</b>     |
|   | Less base | .44 Cv | 12VDC   | A12 subbase | <b>A12PS252P</b>     |

**Double Solenoid, 4-way, 2-position**

| Symbol  | Port size | Cv     | Voltage | Valve type  | Part number          |
|---|-----------|--------|---------|-------------|----------------------|
|  | M5        | .17 Cv | 24VDC   | A05 inline  | <b>A05RD251PM5MF</b> |
|   | M5        | .17 Cv | 12VDC   | A05 inline  | <b>A05RD252PM5MF</b> |
|   | 1/8"      | .47 Cv | 24VDC   | A12 inline  | <b>A12RD251PN1MF</b> |
|   | 1/8"      | .47 Cv | 12VDC   | A12 inline  | <b>A12RD252PN1MF</b> |
|  | Less base | .18 Cv | 24VDC   | A06 subbase | <b>A05PD251P</b>     |
|   | Less base | .18 Cv | 12VDC   | A06 subbase | <b>A05PD252P</b>     |
|   | Less base | .44 Cv | 24VDC   | A12 subbase | <b>A12PD251P</b>     |
|   | Less base | .44 Cv | 12VDC   | A12 subbase | <b>A12PD252P</b>     |

**Double Solenoid, 4-way, 3-position, APB**

| Symbol  | Port size | Cv     | Voltage | Valve type  | Part number          |
|---|-----------|--------|---------|-------------|----------------------|
|  | M5        | .16 Cv | 24VDC   | A05 inline  | <b>A05RD351PM5MF</b> |
|   | M5        | .16 Cv | 12VDC   | A05 inline  | <b>A05RD352PM5MF</b> |
|   | 1/8"      | .43 Cv | 24VDC   | A12 inline  | <b>A12RD351PN1MF</b> |
|   | 1/8"      | .43 Cv | 12VDC   | A12 inline  | <b>A12RD352PN1MF</b> |
|  | Less base | .16 Cv | 24VDC   | A06 subbase | <b>A05PD351P</b>     |
|   | Less base | .16 Cv | 12VDC   | A06 subbase | <b>A05PD352P</b>     |
|   | Less base | .40 Cv | 24VDC   | A12 subbase | <b>A12PD351P</b>     |
|   | Less base | .40 Cv | 12VDC   | A12 subbase | <b>A12PD352P</b>     |

Locking flush override. Mounting screws and gaskets included with valve.

**A00 Valve Only – Single Solenoid, 3-way, 2-position\***



A00SC231P Shown

\* Screwdriver-Operated, Locking Manual Override (LMOR).

|  |            |   |          |  |
|--|------------|---|----------|--|
| <b>A00S</b>  | <b>C23</b> | <b>—</b>  | <b>1</b> | <b>P</b>   |
| <b>Function</b><br>Single solenoid normally open 023<br>Single solenoid normally closed <b>C23</b> |            | <b>Connector Position</b><br>P With indicator light & surge suppression |          | <b>Voltage</b><br>1 24VDC<br>2 12VDC<br>4* 5VDC<br>8* 110/50 VAC<br>9 120/60 VAC |
| <b>Flow</b><br>Standard type Blank<br>Large flow type J  |            | * Special Order   |          |  |

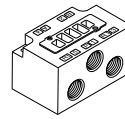
**A00 Valve Subbase**



| Valve type | All Ports | Part number    |
|------------|-----------|----------------|
| A00        | M3        | <b>A00SBM3</b> |

Mounting screws and gaskets included with valve.

**A05 & A12 Subbases**



A05PB

| Valve type | Port size     | Part number    |
|------------|---------------|----------------|
| A05        | 1/8" NPT      | <b>A05PBN1</b> |
|            | 1/8" BSPP "G" | <b>A05PBG1</b> |
| A12        | 1/4" NPT      | <b>A12PBN2</b> |
|            | 1/4" BSPP "G" | <b>A12PBG2</b> |

Kit Includes: (1) Subbase (Holddown bolts and gasket are included with valve)

**A00 Valve Manifold\***



MMFS6A00M3 Shown

\* Normally closed valves (A00SC23•P) and Normally open valves (A00S023•P) cannot be mounted on the same manifold simultaneously.

|                           |           |                  |           |
|---------------------------|-----------|------------------|-----------|
| <b>MMFS</b>               | <b>2</b>  | <b>A00</b>       | <b>M5</b> |
| <b>Number of stations</b> |           | <b>Port size</b> |           |
| <b>2 Stations</b>         | <b>2</b>  | <b>M3</b>        |           |
| <b>3 Stations</b>         | <b>3</b>  | <b>M5</b>        |           |
| <b>4 Stations</b>         | <b>4</b>  |                  |           |
| •                         | •         |                  |           |
| •                         | •         |                  |           |
| <b>20 Stations</b>        | <b>20</b> |                  |           |

**A05 Valve IEM Bar Manifold**



MMFU10A05F Shown

|                                      |                   |
|--------------------------------------|-------------------|
| 4-way, NPTF (Individual wiring type) | <b>MMFU##A05F</b> |
| 4-way, NPTF (Collective wiring type) | <b>MMCU##A05F</b> |

## – stations 2 to 20  
 ## – stations 2 to 12  
 (Even numbers only)

**A12 Valve IEM Bar Manifold**



MMFU10A12F Shown

|                                      |                   |
|--------------------------------------|-------------------|
| 4-way, NPTF (Individual wiring type) | <b>MMFU##A12F</b> |
| 4-way, NPTF (Collective wiring type) | <b>MMCU##A12F</b> |

## – stations 2 to 20  
 ## – stations 2 to 12  
 (Even numbers only)

**A05 Valve Subbase Bar Manifold (5-Ported)**



|                                    |                     |
|------------------------------------|---------------------|
| 4-way, M5 (Individual Wiring Type) | <b>MMFS##A05FM5</b> |
| 4-way, M5 (Collective Wiring Type) | <b>MMCS##A05FM5</b> |

## – stations 2 to 20  
 ## – stations 2 to 12  
 (Even numbers only)

**A12 Valve Subbase Bar Manifold (5-Ported)**



|   |                     |
|---|---------------------|
| 4-way, 1/8" NPTF (Individual Wiring Type) | <b>MMFS##A12FF1</b> |
| 4-way, 1/8" NPTF (Collective Wiring Type) | <b>MMCS##A12FF1</b> |

## – stations 2 to 20  
 ## – stations 2 to 12  
 (Even numbers only)

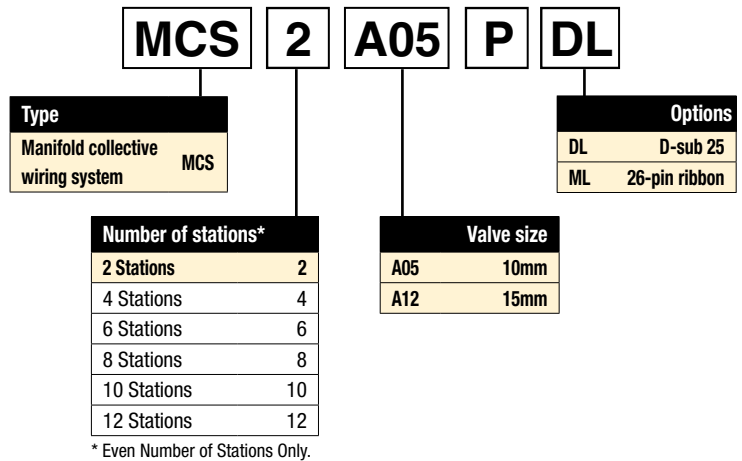
Series N  
 Series ADEX  
 Series B  
 Viking Xtreme Solenoid  
 Viking Lite Solenoid  
 D  
 Inline Valve Products



**Collective Wiring**



MCS10A05PDL Shown



**Individual Wired Connectors P / R Type**

| Size | Voltage | Length   | Part number       |
|------|---------|----------|-------------------|
| A00  | DC      | .5 meter | <b>A05PDCCL5</b>  |
|      |         | 1 meter  | <b>A05PDCCL10</b> |
|      |         | 3 meter  | <b>A05PDCCL30</b> |
| A05  | AC      | .5 meter | <b>A05PACCL5</b>  |
|      |         | 1 meter  | <b>A05PACCL10</b> |

A05PDCCL##

DC Voltage: Positive "+" (Red Wire)  
 Negative "-" (Black Wire)

AC Voltage: Both Wires are Blue (Polarity Neutral)

**Wired Connectors with Protective Cover - P / R Type**

| Size | Length  | Part number       |
|------|---------|-------------------|
| A00  | 1 meter | <b>A05PDCCB10</b> |
| A05  |         |                   |
| A12  |         |                   |

The cover is made of chloroprene rubber for electrical use, assuring excellent weather and insulation resistance. However, be careful not to place it under splash of cutting oil.

**Collective Wired Connectors P / R Type**

| Size       | Part number     | Part number    |     |
|------------|-----------------|----------------|-----|
|            |                 | PNP            | NPN |
| A05 Single | <b>A05PSCCM</b> | <b>A05PSCC</b> |     |
| A12 Double | <b>A05PDCCM</b> | <b>A05PDCC</b> |     |

A05PDCC

PNP = SOURCING = "Negative Common" = Yellow Wires  
 NPN = SINKING = "Positive Common" = Red Wires

**Cable with Female D-Sub, 25-Pin Connector**

| Description                            | Part number      |
|--|------------------|
| 25-Pin, D-Sub cable, 1 meter (3.3 ft.) | <b>DSS25FB1K</b> |

**Note:** For use with ADEX MCS system only.  
 Connection to control system is through 25 colored wires AWG 24. Includes (2) M2.5 mm screws.

N Series  
 ADEX Series  
 B Series  
 Viking Xtreme Series  
 Viking Lite Series  
 D  
 Inline Valve Products

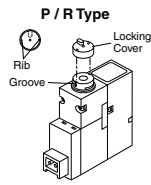
**Blanking Plate**

| Size | Type        | Part number    |
|------|-------------|----------------|
| A00  | Subbase     | <b>A00SBP</b>  |
| A05  | Body ported | <b>A05RGBP</b> |
|      | Subbase     | <b>A05PGBP</b> |
| A12  | Body ported | <b>A12RGBP</b> |
|      | Subbase     | <b>A12PGBP</b> |

A00SBP A05RGBP A05PGBP

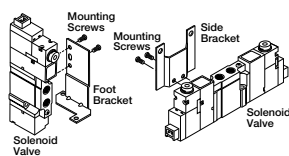
\* Outlet pin cover used with collective wiring system only.

**Extended Override Cover**



| Size | Orange:<br>for 14 side<br>solenoid | Green:<br>for 12 side<br>solenoid |
|------|------------------------------------|-----------------------------------|
| A00  | <b>A05PLA</b>                      | <b>A05PLB</b>                     |
| A05  |                                    |                                   |
| A12  |                                    |                                   |

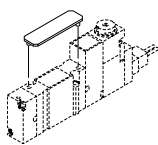
**Mounting Bracket**



| Size | Type | Part number   |
|------|------|---------------|
| A05  | Side | <b>A05RBS</b> |
|      | Foot | <b>A05RBF</b> |
| A12  | Side | <b>A12RBS</b> |
|      | Foot | <b>A12RBF</b> |

Kit Includes: (1) Bracket, (2) Screws

**Labeling Tag**



| Size | Description     | Part number  |
|------|-----------------|--------------|
| A05  | White Label Tag | <b>A05PN</b> |
| A12  |                 |              |

**Exhaust Mufflers**



| Pipe thread | Part number     |
|-------------|-----------------|
| M5          | <b>P6M-PAC5</b> |
| 1/8" NPT    | <b>EM12</b>     |
| 1/4" NPT    | <b>EM25</b>     |

P6M - Plastic; EM - Sintered Bronze

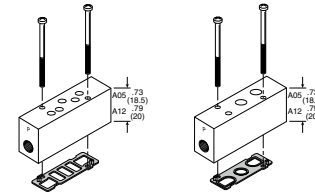
**Plastic Silencers**



| Thread size | Part number  |             |
|-------------|--------------|-------------|
|             | NPT          | BSPT        |
| M5          | <b>AS-5</b>  | N/A         |
| 1/8"        | <b>ASN-6</b> | <b>AS-6</b> |
| 1/4"        | <b>ASN-8</b> | <b>AS-8</b> |

**Individual Air Supply Spacer**

Mounts between valve and manifold. Supply from the manifold is blocked and only the valve mounted on the spacer receives the individual supply.



**A05PAISM5 A05RAISM5**

| Size | Type    | Port size | Internal pilot part number | External pilot* part number |
|------|---------|-----------|----------------------------|-----------------------------|
| A05  | Inline  | M5        | <b>A05RAISM5</b>           | <b>A05RAXISM5</b>           |
|      | Subbase | M5        | <b>A05PAISM5</b>           | <b>A05PAXISM5</b>           |
| A12  | Inline  | 1/8" NPT  | <b>A12RAISN1</b>           | <b>A12RAXISN1</b>           |
|      | Subbase | 1/8" NPT  | <b>A12PAISN1</b>           | <b>A12PAXISN1</b>           |

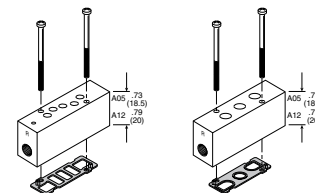
Can only be used on Collective wiring type manifolds.

\* Can only be used with External Piloted valve. External pilot is located on the X Port of the manifold

Kit Includes: (1) Spacer, (2) Screws, and (1) Gasket

**Individual Air Exhaust Spacer**

Mounts between valve and manifold. Exhaust from the manifold is blocked and only the valve mounted on the spacer has the individual exhaust.



**A05PAIEM5 A05RAIEM5**




| Size | Type    | Port size | Internal pilot part number | External pilot* part number |
|------|---------|-----------|----------------------------|-----------------------------|
| A05  | Inline  | M5        | <b>A05RAIEM5</b>           | <b>A05RAXIEM5</b>           |
|      | Subbase | M5        | <b>A05PAIEM5</b>           | <b>A05PAXIEM5</b>           |
| A12  | Inline  | 1/8" NPT  | <b>A12RAIEN1</b>           | <b>A12RAXIEN1</b>           |
|      | Subbase | 1/8" NPT  | <b>A12PAIEN1</b>           | <b>A12PAXIEN1</b>           |

Can only be used on Collective wiring type manifolds.

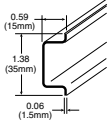
\* Can only be used with External Piloted valve. External pilot is located on the X Port of the manifold

Kit Includes: (1) Spacer, (2) Screws, and (1) Gasket

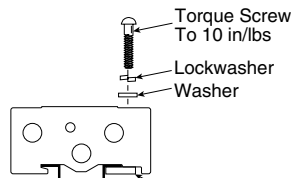
**M3 & M5 Fittings**

|   | Description     | Part number       |
|---|-----------------|-------------------|
|  | M5 Plug Fitting | <b>N220-1900J</b> |
|  | M3 to 3mm Barb  | <b>BC03M3</b>     |
|  | M3 to 4mm Barb  | <b>BC04M3</b>     |
|  | M5 to 3mm Barb  | <b>BC03M5</b>     |

**DIN Rail**

|   | Length | Part number     |
|---|--------|-----------------|
|  | 6 Feet | <b>AM1DE200</b> |

**DIN Rail Hardware Kit**



| Size | Type    | Dimensions |      |      | Part number     |
|------|---------|------------|------|------|-----------------|
|      |         | A          | B    | C    |                 |
| A05  | IEM     | 2.24       | 1.00 | .31  | <b>MFUA05DB</b> |
|      | Subbase | (57)       | (25) | (8)  | <b>MFSA05DB</b> |
| A12  | IEM     | 2.91       | 1.00 | .39  | <b>MFUA12DB</b> |
|      | Subbase | (74)       | (25) | (10) | <b>MFSA12DB</b> |

Kit includes: (2) Screws, (2) Clamps

**Replacement Cylinder Port Plate Kits**

| Size | Fitting       | Part number     |
|------|---------------|-----------------|
| A05  | M5            | <b>A05RABM5</b> |
| A12  | 1/8" NPT      | <b>A12RABN1</b> |
|      | 1/8" BSPP "G" | <b>A12RABG1</b> |

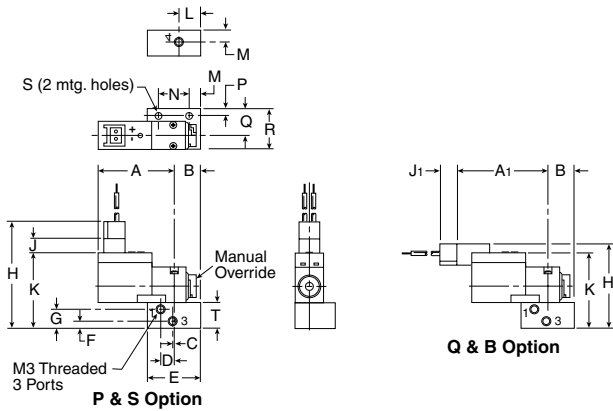
**Replacement Base Gasket Kits**

| Size | Type         | Gaskets       |              |
|------|--------------|---------------|--------------|
|      |              | Gasket only   | Screw        |
| A00  | Subbase      | <b>A00SG</b>  | <b>A00SS</b> |
|      | Body Ported  | <b>A05RG</b>  | <b>A05RS</b> |
| A05  | Subbase Int. | <b>A05PG</b>  | <b>A05PS</b> |
|      | Subbase Ext. | <b>A05PXG</b> | <b>A05PS</b> |
| A12  | Body Ported  | <b>A12RG</b>  | <b>A12RS</b> |
|      | Subbase Int. | <b>A12PG</b>  | <b>A12PS</b> |
|      | Subbase Ext. | <b>A12PXG</b> | <b>A12PS</b> |

These are spare parts, mounting screws and gaskets included with valves.

**N Series**  
**ADEX Series**  
**B Series**  
**Viking Xtreme Series**  
**Viking Lite Series**  
**D**  
**Inline Valve Products**

**A00 Subbase**

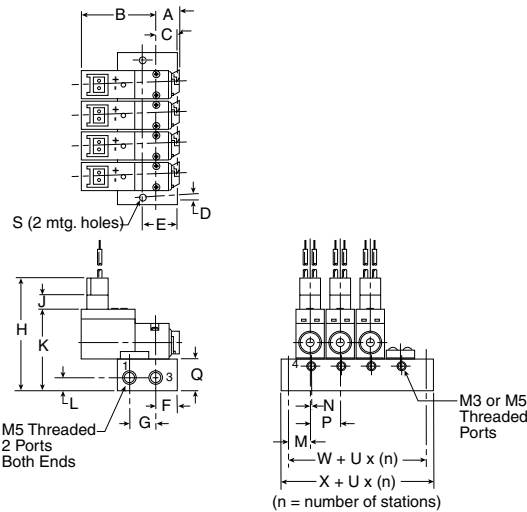


**A00 - Subbase**

| A            | A1           | B            | C            | D             |
|--------------|--------------|--------------|--------------|---------------|
| 1.00<br>(25) | 1.18<br>(30) | .41<br>(11)  | .015<br>(.4) | .17<br>(4)    |
| E            | F            | G            | H            | H1            |
| .79<br>(20)  | .12<br>(3)   | .28<br>(7)   | 1.54<br>(39) | 1.38<br>(34)  |
| J            | J1           | K            | L            | M             |
| .24<br>(6)   | .20<br>(5)   | 1.11<br>(28) | .32<br>(8)   | .18<br>(5)    |
| N            | P            | Q            | R            | S             |
| .47<br>(12)  | .10<br>(3)   | .39<br>(10)  | .59<br>(15)  | .106<br>(2.7) |
| T            | .38<br>(10)  |              |              |               |

Inches (mm)

**A00 Manifold**

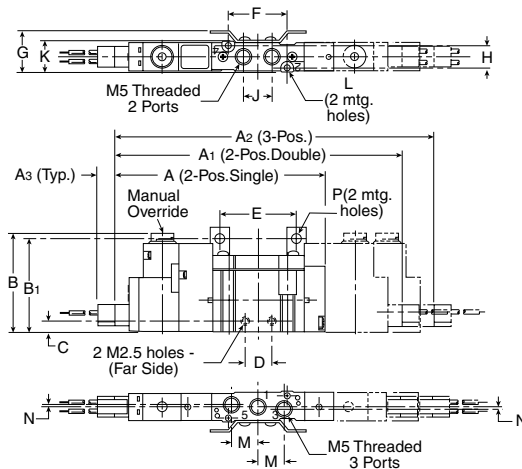


**A00 - Manifold**

| A             | B             | C             | D             | E            |
|---------------|---------------|---------------|---------------|--------------|
| .36<br>(9)    | 1.00<br>(25)  | .31<br>(8)    | .10<br>(3)    | .51<br>(13)  |
| F             | G             | H             | J             | K            |
| .31<br>(8)    | .39<br>(10)   | 1.63<br>(42)  | .20<br>(5)    | 1.22<br>(31) |
| L             | M             | N             | P             | Q            |
| .20<br>(5)    | .33<br>(9)    | .02<br>(.6)   | .41<br>(10.5) | .47<br>(12)  |
| S             | U             | X             | W             |              |
| .125<br>(3.2) | .41<br>(10.5) | .45<br>(11.5) | .26<br>(6.5)  |              |

Inches (mm)

**A05R Single & Double Operators – Inline**

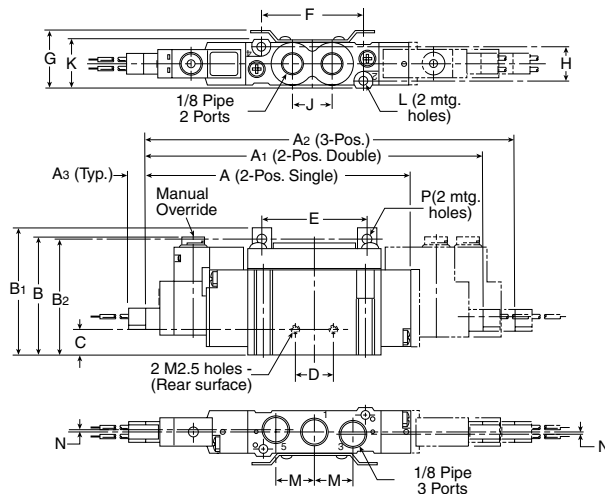


**A05R – Inline**

| A            | A1            | A2               | A3            | B                |
|--------------|---------------|------------------|---------------|------------------|
| 2.91<br>(74) | 3.94<br>(100) | 4.25<br>(108)    | .24<br>(6)    | 1.38<br>(35)     |
| B1           | C             | D                | E             | F                |
| 1.30<br>(33) | .16<br>(4)    | .38<br>(10)      | 1.06<br>(27)  | .83<br>(21)      |
| G            | H             | J                | K             | L                |
| .57<br>(15)  | .33<br>(9)    | .40<br>(10)      | .45<br>(11.4) | Ø .08<br>Ø (2.1) |
| M            | N             | P                |               |                  |
| .37<br>(10)  | .04<br>(1)    | Ø .14<br>Ø (3.5) |               |                  |

Inches (mm)

**A12R Single & Double Operators – Inline**

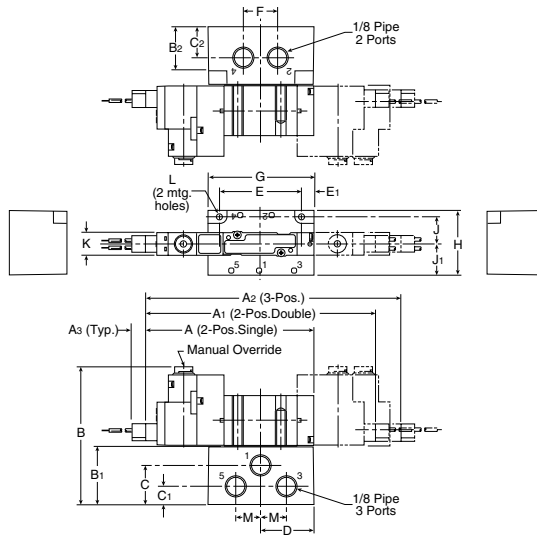


**A12R – Inline**

| A                | A1            | A2            | A3               | B            |
|------------------|---------------|---------------|------------------|--------------|
| 3.68<br>(94)     | 4.69<br>(119) | 5.12<br>(130) | .24<br>(6)       | 1.64<br>(42) |
| B1               | B2            | C             | D                | E            |
| 1.77<br>(45)     | 1.70<br>(43)  | .35<br>(9)    | .51<br>(13)      | 1.46<br>(37) |
| F                | G             | H             | J                | K            |
| 1.42<br>(36)     | .80<br>(20)   | .47<br>(12)   | .55<br>(14)      | .68<br>(17)  |
| L                | M             | N             | P                |              |
| Ø .12<br>Ø (3.1) | .55<br>(14)   | .03<br>(0.8)  | Ø .14<br>Ø (3.5) |              |

Inches (mm)

**A05P Single & Double Operators – Subbase**



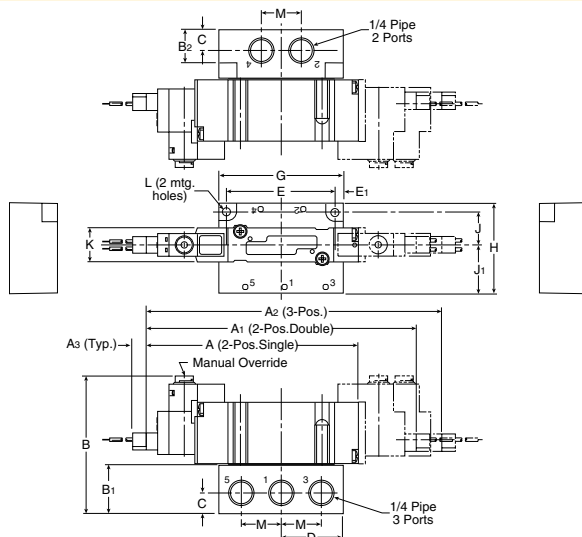
**A05P – Subbase**

| A            | A1            | A2            | A3          | B                |
|--------------|---------------|---------------|-------------|------------------|
| 2.91<br>(74) | 3.94<br>(100) | 4.25<br>(108) | .24<br>(6)  | 2.35<br>(60)     |
| B1           | B2            | C             | C1          | C2               |
| .96<br>(25)  | .75<br>(19)   | .65<br>(17)   | .30<br>(8)  | .53<br>(14)      |
| D            | E             | E1            | F           | G                |
| .89<br>(23)  | 1.38<br>(35)  | .20<br>(5)    | .57<br>(15) | 1.77<br>(45)     |
| H            | J             | J1            | K           | L                |
| .08<br>(28)  | .45<br>(11.5) | .51<br>(13)   | .39<br>(10) | Ø .13<br>Ø (3.2) |

M  
.45  
(12)

Inches (mm)

**A12P Single & Double Operators – Subbase**



**A12P – Subbase**

| A            | A1               | A2            | A3            | B            |
|--------------|------------------|---------------|---------------|--------------|
| 3.68<br>(94) | 4.69<br>(119)    | 5.12<br>(130) | .24<br>(6)    | 2.41<br>(61) |
| B1           | B2               | C             | D             | E            |
| .87<br>(22)  | .75<br>(19)      | .37<br>(10)   | 1.10<br>(28)  | 1.89<br>(48) |
| E1           | G                | H             | J             | J1           |
| .16<br>(4)   | 2.20<br>(56)     | 1.59<br>(41)  | .57<br>(14.5) | .87<br>(22)  |
| K            | L                | M             |               |              |
| .59<br>(15)  | Ø .17<br>Ø (4.3) | .71<br>(18)   |               |              |

Inches (mm)



**N**  
 Series  


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**ADEX**  
 Series  


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**B**  
 Series  


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**Viking Xtreme**  
 Series  

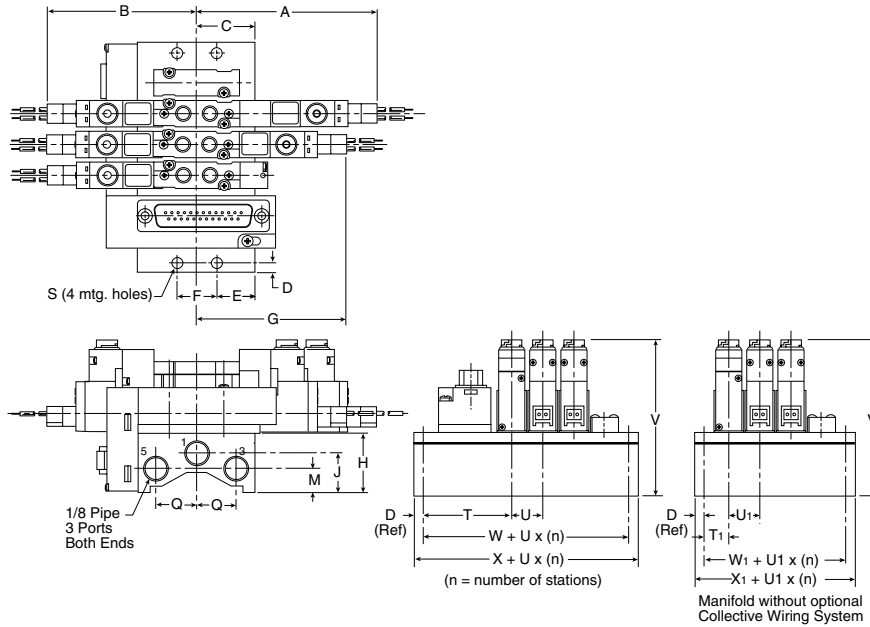

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**Viking Lite**  
 Series  


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**D**  
 Inline  
 Valve Products

**A05R Manifold – Valve Inline**

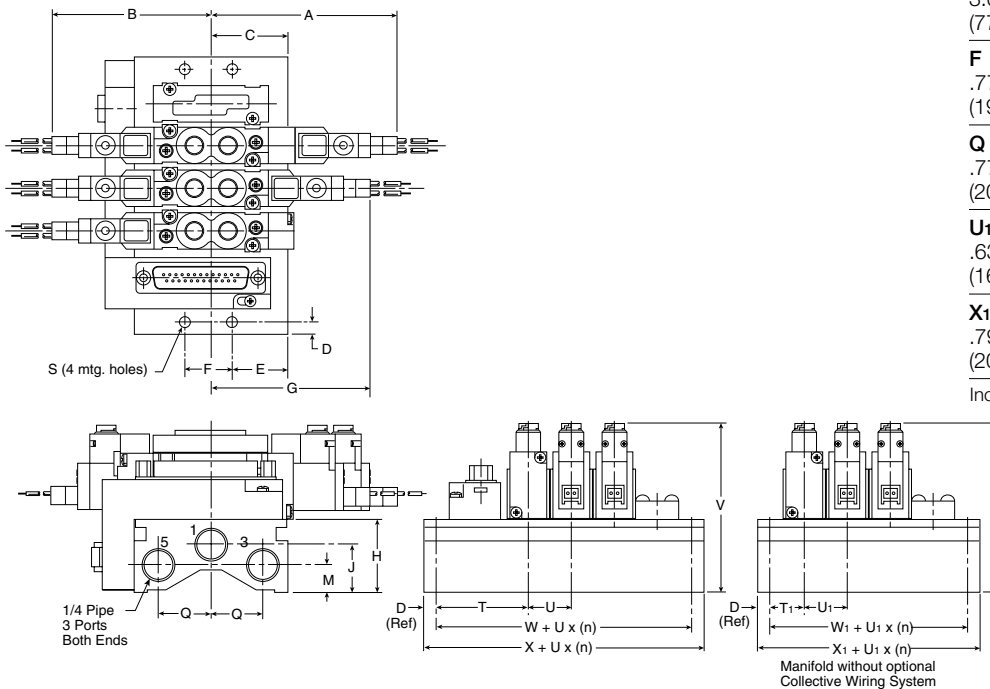


**A05R - Manifold, Valve Inline**

|                      |                  |              |                      |               |
|----------------------|------------------|--------------|----------------------|---------------|
| <b>A</b>             | <b>B</b>         | <b>C</b>     | <b>D</b>             | <b>E</b>      |
| 2.52<br>(64)         | 2.21<br>(56)     | .94<br>(24)  | .16<br>(4)           | .61<br>(16)   |
| <b>F</b>             | <b>G</b>         | <b>H</b>     | <b>J</b>             | <b>M</b>      |
| .63<br>(16)          | 2.21<br>(56)     | .94<br>(24)  | .61<br>(16)          | .37<br>(10)   |
| <b>Q</b>             | <b>S</b>         | <b>T</b>     | <b>T<sub>1</sub></b> | <b>U</b>      |
| .63<br>(16)          | ∅ .18<br>∅ (4.5) | 1.34<br>(34) | .51<br>(13)          | .49<br>(12.5) |
| <b>U<sub>1</sub></b> | <b>V</b>         | <b>W</b>     | <b>W<sub>1</sub></b> | <b>X</b>      |
| .41<br>(10.5)        | 2.32<br>(59)     | 1.36<br>(35) | .37<br>(9.5)         | .167<br>(43)  |
| <b>X<sub>1</sub></b> |                  |              |                      |               |
| .68<br>(17.5)        |                  |              |                      |               |

Inches (mm)

**A12R Manifold – Valve Inline**



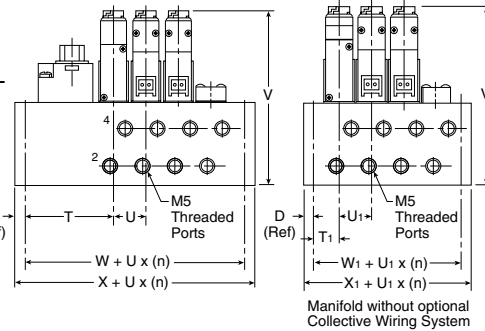
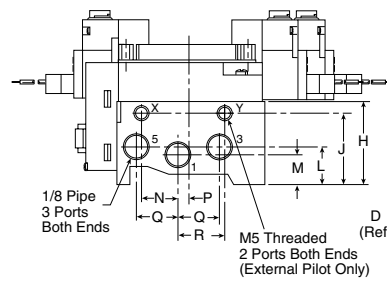
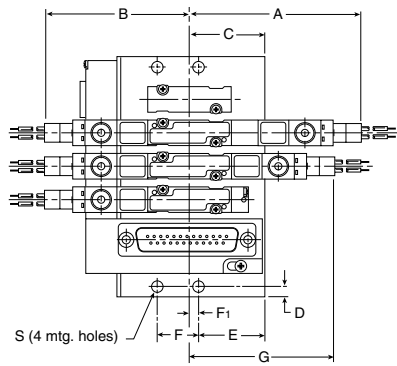
**A12R - Manifold, Valve Inline**

|                      |                  |              |                      |               |
|----------------------|------------------|--------------|----------------------|---------------|
| <b>A</b>             | <b>B</b>         | <b>C</b>     | <b>D</b>             | <b>E</b>      |
| 3.01<br>(77)         | 2.58<br>(66)     | 1.14<br>(29) | .20<br>(5)           | .76<br>(19)   |
| <b>F</b>             | <b>G</b>         | <b>H</b>     | <b>J</b>             | <b>M</b>      |
| .77<br>(19.6)        | 2.58<br>(66)     | 1.08<br>(28) | .71<br>(18)          | .41<br>(11)   |
| <b>Q</b>             | <b>S</b>         | <b>T</b>     | <b>T<sub>1</sub></b> | <b>U</b>      |
| .77<br>(20)          | ∅ .18<br>∅ (4.5) | 1.48<br>(38) | .51<br>(13)          | .69<br>(17.5) |
| <b>U<sub>1</sub></b> | <b>V</b>         | <b>W</b>     | <b>W<sub>1</sub></b> | <b>X</b>      |
| .63<br>(16)          | 2.74<br>(70)     | 1.34<br>(34) | .39<br>(10)          | 1.73<br>(44)  |
| <b>X<sub>1</sub></b> |                  |              |                      |               |
| .79<br>(20)          |                  |              |                      |               |

Inches (mm)



**A05P Manifold – Side Ports**

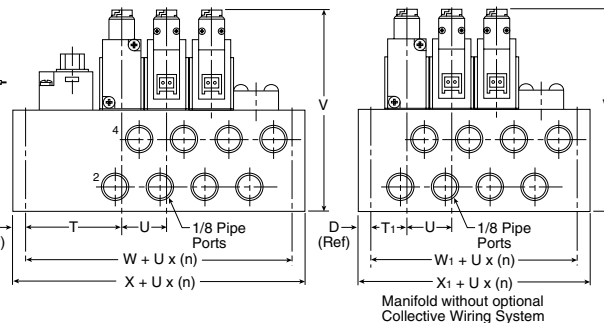
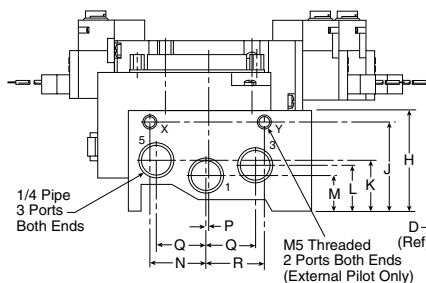
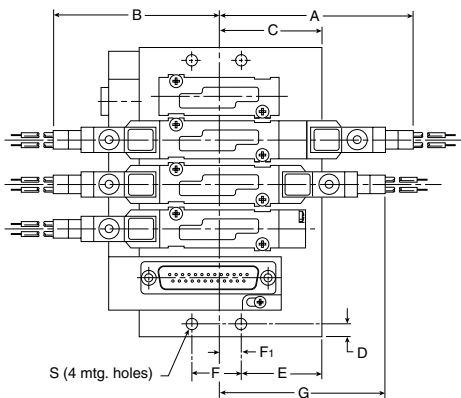


**A05P – Manifold, Side Ports**

|               |                  |              |              |               |
|---------------|------------------|--------------|--------------|---------------|
| <b>A</b>      | <b>B</b>         | <b>C</b>     | <b>D</b>     | <b>E</b>      |
| 2.52<br>(64)  | 2.21<br>(56)     | 1.12<br>(29) | .16<br>(4)   | 1.00<br>(26)  |
| <b>F</b>      | <b>F1</b>        | <b>G</b>     | <b>H</b>     | <b>J</b>      |
| .63<br>(16)   | .19<br>(5)       | 2.21<br>(56) | 1.26<br>(32) | 1.08<br>(28)  |
| <b>L</b>      | <b>M</b>         | <b>N</b>     | <b>P</b>     | <b>Q</b>      |
| .59<br>(15)   | .45<br>(11.5)    | .55<br>(14)  | .13<br>(3)   | .63<br>(16)   |
| <b>R</b>      | <b>S</b>         | <b>T</b>     | <b>T1</b>    | <b>U</b>      |
| .71<br>(18)   | ∅ .18<br>∅ (4.5) | 1.34<br>(34) | .39<br>(10)  | .49<br>(12.5) |
| <b>U1</b>     | <b>V</b>         | <b>W</b>     | <b>W1</b>    | <b>X</b>      |
| .41<br>(10.5) | 2.64<br>(67)     | 1.32<br>(34) | .37<br>(10)  | 1.65<br>(42)  |
| <b>X1</b>     |                  |              |              |               |
| .67<br>(18)   |                  |              |              |               |

Inches (mm)

**A12P Manifold – Side Ports**



**A12P – Manifold, Side Ports**

|              |              |               |              |              |                  |
|--------------|--------------|---------------|--------------|--------------|------------------|
| <b>A</b>     | <b>B</b>     | <b>C</b>      | <b>D</b>     | <b>E</b>     | <b>F</b>         |
| 3.01<br>(77) | 2.58<br>(66) | 1.59<br>(40)  | .20<br>(5)   | 1.25<br>(32) | .77<br>(20)      |
| <b>F</b>     | <b>G</b>     | <b>H</b>      | <b>J</b>     | <b>K</b>     | <b>L</b>         |
| .34<br>(9)   | 2.58<br>(66) | 1.57<br>(40)  | 1.38<br>(35) | .79<br>(20)  | .71<br>(18)      |
| <b>M</b>     | <b>N</b>     | <b>P</b>      | <b>Q</b>     | <b>R</b>     | <b>S</b>         |
| .55<br>(14)  | .87<br>(22)  | .04<br>(1)    | .77<br>(20)  | .91<br>(23)  | ∅ .18<br>∅ (4.5) |
| <b>T</b>     | <b>T1</b>    | <b>U</b>      | <b>V</b>     | <b>W</b>     | <b>W1</b>        |
| 1.48<br>(38) | .59<br>(13)  | .69<br>(17.5) | 3.09<br>(79) | 1.34<br>(34) | .33<br>(9)       |
| <b>X</b>     | <b>X1</b>    |               |              |              |                  |
| 1.73<br>(44) | .73<br>(19)  |               |              |              |                  |

Inches (mm)

For decades Parker Pneumatics and Heavy Industrial have been synonymous with durability and long life. High flow-speed N Series poppet valves have been operating in foundries, steel mills, and automotive casting & stamping plants without fail.

**Features**

- Continuous duty rated option
- Non-lube service
- Hi-flow, short stroke poppet
- Indicator lights available

**Specifications**

- 2-way NC
- 3-way NO & NC
- Selector function

**Ports**

- 3/8" Body – 3/8", 1/2" NPT
- 3/4" Body – 1/2", 3/4", 1" NPT
- 1-1/4" Body – 1", 1-1/4", 1-1/2" NPT
- BSPP "G" threads available

**Certification / approval**

- Approved to be CE marked (Standard L-Pilot & P-Pilot)
- NEMA 4 Option
- Hazardous Duty Option IP 65 Rating / NEMA 4

**Material specifications**

|                 |   |
|-----------------|---|
| Valve body      | Cast aluminum   |
| Poppet assembly | Aluminum and stainless steel                            |
| Pilot Valve     | Zinc, stainless steel, brass, copper, zinc plated steel |
| Seals           | Nitrile   |

**Lubrication**

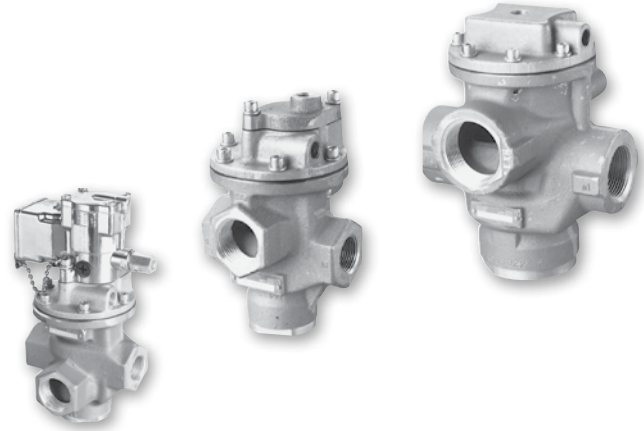
The high speed poppet valves are pre-lubricated to permit use with non-lubricated air. However, air should be lubricated to assure maximum seal life.

F442 lubricating oil is recommended. This oil is specially formulated to provide peak performance and maximum service life from air-operated equipment.

**Installation**

**CAUTION: DO NOT RESTRICT THE INLET TO POPPET VALVES**

Restriction of the inlet can starve the air supply to the pilot section of internally piloted poppet valves and result in slow shifting or failure of the valve to shift properly. Always connect the supply line directly to the inlet of the valve using the full pipe size of the valve inlet. Never use a quick coupling to connect a poppet valve to the air supply. On valves with a small inlet port, use of an upstream surge tank may be required at lower operating pressures to insure an adequate air supply and proper operation.



**Operating information**

Operating pressure:

**Solenoid valves - internal pilot**

| 3/8" Basic                | 3/4" Basic                                 |
|---------------------------|--|
| 20 to 140 PSIG (standard) | 25 to 140 PSIG (200 PSIG option available) |

**Solenoid valves - external supply**

| Air pressure thru valve (PSI) | External pilot pressure required (PSI)* |            |
|-------------------------------|---|------------|
|                               | 3/8" Basic                              | 3/4" Basic |
| 25 PSI                        | 35-200                                  | 35-200     |
| 50 PSI                        | 45-200                                  | 40-200     |
| 75 PSI                        | 55-200                                  | 50-200     |
| 100 PSI                       | 65-200                                  | 65-200     |

Vacuum up to 1" HG, less than a perfect vacuum.

\* With 200 PSI option. Do not exceed 140 PSI with standard pilots.

**Internal pilot - remote pilot valve**

| Air pressure thru valve (PSI) | Remote pilot pressure (PSI) |            |              |
|-------------------------------|-----------------------------|------------|--------------|
|                               | 3/8" Basic                  | 3/4" Basic | 1-1/4" Basic |
| 25 PSI                        | 30-250                      | 30-250     | 30-250       |
| 50 PSI                        | 50-250                      | 50-250     | 50-250       |
| 75 PSI                        | 70-250                      | 75-250     | 70-250       |
| 100 PSI                       | 95-250                      | 95-250     | 90-250       |
| 150 PSI                       | 140-250                     | 145-250    | 130-250      |
| 200 PSI                       | 175-250                     | 185-250    | 175-250      |
| 250 PSI                       | 215-250                     | 230-250    | 205-250      |

Operating temperature:

| Operator type    | Duty cycle*    | Minimum ambient temperature | Maximum ambient temperature |
|------------------|----------------|-----------------------------|-----------------------------|
| Standard service | Intermittent   | 0°F (-18°C)                 | 125°F (52°C)                |
| Solenoid         | Continuous     | 0°F (-18°C)                 | 100°F (38°C)                |
| Special service  | Intermittent   | 0°F (-18°C)                 | 125°F (52°C)                |
| Solenoid         | Continuous     | 0°F (-18°C)                 | 125°F (52°C)                |
| Remote pilot     | Not applicable | 0°F (-18°C)                 | 200°F (93°C)                |

\* Applications with pilot valves energized for ten (10) minutes or longer with a duty cycle greater than 70% are considered to be continuously energized.



$$\text{Duty cycle} = \frac{\text{Time energized}}{\text{Time energized} + \text{time off}} \times 100\% = \% \text{ Duty Cycle}$$

Most popular. For technical information see CD





N Series  
 ADEX Series  
 B Series  
 Viking Xtreme Solenoid  
 Viking Lite Solenoid  
 D Inline Valve Products

**Single Solenoid, Locking manual override, internal "P" pilot 140 PSI, standard service, junction box w/ light.**

| Body size   |      | Cv          | In / cyl ports | Exhaust port | Voltage | 2-way, 2-position normally closed | 3-way, 2-position normally closed | 3-way, 2-position normally open |                    |
|---|------|-------------|----------------|--------------|---------|-----------------------------------|-----------------------------------|---------------------------------|--------------------|
|   | 3/8" | 3.0 to 4.4  | 3/8"           | 1/2"         | 120VAC  | <b>N3153904553</b>                | <b>N3553904553</b>                | <b>N3753904553</b>              |                    |
|   |      |             |                |              | 24VDC   | <b>N3153904549</b>                | <b>N3553904549</b>                | <b>N3753904549</b>              |                    |
|   |      |             |                | 1/2"         | 1/2"    | 120VAC                            | <b>N3154904553</b>                | <b>N3554904553</b>              | <b>N3754904553</b> |
|   |      |             |                |              |         | 24VDC                             | <b>N3154904549</b>                | <b>N3554904549</b>              | <b>N3754904549</b> |
|   |      |             |                | 1/2"         | 3/4"    | 120VAC                            | <b>N3155904553</b>                | <b>N3555904553</b>              | <b>N3755904553</b> |
|   |      |             |                |              |         | 24VDC                             | <b>N3155904549</b>                | <b>N3555904549</b>              | <b>N3755904549</b> |
|   | 3/4" | 9.0 to 11.0 | 3/4"           | 1"           | 120VAC  | <b>N3156904553</b>                | <b>N3556904553</b>                | <b>N3756904553</b>              |                    |
|   |      |             |                |              | 24VDC   | <b>N3156904549</b>                | <b>N3556904549</b>                | <b>N3756904549</b>              |                    |
|   |      |             | 1"             | 1"           | 120VAC  | <b>N3157904553</b>                | <b>N3557904553</b>                | <b>N3757904553</b>              |                    |
|   |      |             |                |              | 24VDC   | <b>N3157904549</b>                | <b>N3557904549</b>                | <b>N3757904549</b>              |                    |



Normally Closed    Normally Open

**Single Solenoid, Locking manual override, internal "P" pilot 125 PSI, standard service, P-pilot junction box w/ light.**

| Body size   |        | Cv           | In / cyl ports | Exhaust port | Voltage | 2-way, 2-position normally closed | 3-way, 2-position normally closed | 3-way, 2-position normally open |
|---|--------|--------------|----------------|--------------|---------|-----------------------------------|-----------------------------------|---------------------------------|
|   | 1-1/4" | 20.0 to 30.0 | 1-1/4"         | 1-1/4"       | 120VAC  | <b>N3257904753</b>                | <b>N3657904753</b>                | <b>N3857904753</b>              |
|   |        |              |                |              | 120VAC  | <b>N3258904753</b>                | <b>N3658904753</b>                | <b>N3858904753</b>              |
|   |        |              |                |              | 120VAC  | <b>N3259904753</b>                | <b>N3659904753</b>                | <b>N3859904753</b>              |



Normally Closed    Normally Open

**Single Remote Pilot, 1/4" NPT remote pilot port with internal pilot return.**

| Body size   |      | Cv         | In / cyl ports | Exhaust port | 2-way, 2-position normally closed | 3-way, 2-position normally closed | 3-way, 2-position normally open |                  |
|---|------|------------|----------------|--------------|-----------------------------------|-----------------------------------|---------------------------------|------------------|
|   | 3/8" | 3.0 to 4.4 | 3/8"           | 1/2"         | <b>N31431091</b>                  | <b>N35431091</b>                  | <b>N37431091</b>                |                  |
|   |      |            |                |              | <b>N31441091</b>                  | <b>N35441091</b>                  | <b>N37441091</b>                |                  |
|   |      |            |                | 1/2"         | 3/4"                              | <b>N31451091</b>                  | <b>N35451091</b>                | <b>N37451091</b> |
|   |      |            |                |              |                                   | <b>N31461091</b>                  | <b>N35461091</b>                | <b>N37461091</b> |
|   |      | 3/4"       | 9.0 to 11.0    | 3/4"         | 1"                                | <b>N31471091</b>                  | <b>N35471091</b>                | <b>N37471091</b> |
|   |      |            |                |              |                                   | <b>N31471091</b>                  | <b>N35471091</b>                | <b>N37471091</b> |

Normally Closed    Normally Open

**Single Remote Pilot, 1/4" NPT remote pilot port with internal pilot return.**

| Body size   |        | Cv           | In / cyl ports | Exhaust port | 2-way, 2-position normally closed | 3-way, 2-position normally closed | 3-way, 2-position normally open |
|---|--------|--------------|----------------|--------------|-----------------------------------|-----------------------------------|---------------------------------|
|   | 1-1/4" | 20.0 to 30.0 | 1-1/4"         | 1-1/2"       | <b>N32471091</b>                  | <b>N36471091</b>                  | <b>N38471091</b>                |
|   |        |              |                |              | <b>N32481091</b>                  | <b>N36481091</b>                  | <b>N38481091</b>                |
|   |        |              |                |              | <b>N32491091</b>                  | <b>N36491091</b>                  | <b>N38491091</b>                |

Normally Closed    Normally Open

**N Series**  
**ADEX Series**  
**B Series**  
**Viking Xtreme Series**  
**Viking Lite Series**  
**D**  
**Inline Valve Products**

**"N" Series 3/8", 3/4" & 1-1/4" Body Sizes - Solenoid 'L' Pilot**

**N 315 3 9 0 45 53**

| Valve function - solenoid |     |
|---------------------------|-----|
| 3/8" & 3/4" Body          |     |
| 2-way, normally closed    | 315 |
| 3-way, normally closed    | 355 |
| 3-way, normally open      | 375 |
| 1-1/4" Body               |     |
| 2-way, normally closed    | 325 |
| 3-way, normally closed    | 365 |
| 3-way, normally open      | 385 |

| Port size / thread type                              |          |
|--|----------|
| 3/8" Body size                                       |          |
| 3/8" Inlet & cyl - 1/2" exhaust - NPT                | 3        |
| 1/2" inlet & cyl - 1/2" exhaust - NPT                | 4        |
| 1/2" inlet & cyl - 1/2" exhaust - BSPP               | N        |
| 3/4" body size                                       |          |
| 1/2" inlet & cyl - 3/4" exhaust - NPT                | 5        |
| <b>3/4" inlet &amp; cyl - 1" exhaust - NPT</b>       | <b>6</b> |
| 3/4" inlet & cyl - 1" exhaust - BSPP                 | Q        |
| 1" inlet & cyl - 1" exhaust - NPT                    | 7        |
| 1-1/4" body size                                     |          |
| <b>1" inlet &amp; cyl - 1 1/4" exhaust - NPT</b>     | <b>7</b> |
| <b>1-1/4" inlet &amp; cyl - 1-1/2" exhaust - NPT</b> | <b>8</b> |
| 1-1/4" inlet & cyl - 1-1/2" exhaust - BSPP           | S*       |
| <b>1-1/2" inlet &amp; cyl - 1-1/2" exhaust - NPT</b> | <b>9</b> |
| 1-1/2" inlet & cyl - 1-1/2" exhaust - BSPP           | T*       |

\* Not available with valve function 325.  
 Note: BSPP is to the ISO 228 standard, and requires an R-BSPT male fitting.

| "L" pilot code |         |         |    |                              |                     |              |
|----------------|---------|---------|----|------------------------------|---------------------|--------------|
| Code           | Voltage |         |    | Solenoid enclosure options   |                     |              |
|                | AC 60hz | AC 50hz | DC | Standard duty (01, 45)       | Cont. duty (04, 48) | 200 PSI (46) |
| 49             |         |         | 24 | 1, 2, 3, 5, 6, 8, 9, W       | 6, 8, 9             | 9            |
| 53             | 120     | 110     |    | 1, 2, 3, 5, 6, 8, 9, E, N, W | 1, 6, 8, 9, N       | 8, 9, E      |
| 57             | 240     | 220     |    | 1, 3, W                      |                     |              |

| "L" pilot configuration |   |
|-------------------------|---|
| 01*                     | External pilot, std service, 140 PSI        |
| 04*                     | External pilot, cont duty, 140 PSI          |
| <b>45</b>               | <b>Internal pilot, std service, 140 PSI</b> |
| <b>48</b>               | <b>Internal pilot, cont duty, 140 PSI</b>   |

\* Not available with valve function 325, 365, and 385 (1-1/4" body).

| Solenoid type |                 |
|---------------|-----------------|
| <b>0</b>      | <b>Standard</b> |

| Solenoid enclosure |                                   |
|--------------------|-----------------------------------|
| <b>1</b>           | <b>Basic pilot</b>                |
| 2                  | Basic pilot NLMO                  |
| 3                  | Basic pilot LMO                   |
| 5                  | Junction box NLMO                 |
| 6                  | Junction box LMO                  |
| <b>8</b>           | <b>Junction box NLMO w/ light</b> |
| <b>9</b>           | <b>Junction box LMO w/ light</b>  |
| W                  | Basic pilot ext. LMO              |

N Series

ADEX Series

B Series

Viking Xtreme Solenoid

Viking Litee Solenoid

D

Inline Valve Products

**"N" Series 1-1/4" Body Sizes - Solenoid Hi-Flow 'P' Pilot**

**N 365 8 9 0 47 53**

| Valve function - solenoid |     |
|---------------------------|-----|
| 1-1/4" body               |     |
| 2-Way, normally closed    | 325 |
| 3-Way, normally closed    | 365 |
| 3-Way, normally open      | 385 |

| Port size / thread type                              |          |
|--|----------|
| 1-1/4" body size                                     |          |
| <b>1" inlet &amp; cyl - 1 1/4" exhaust - NPT</b>     | <b>7</b> |
| <b>1-1/4" inlet &amp; cyl - 1-1/2" exhaust - NPT</b> | <b>8</b> |
| 1-1/4" inlet & cyl - 1-1/2" exhaust - BSPP           | S        |
| <b>1-1/2" inlet &amp; cyl - 1-1/2" exhaust - NPT</b> | <b>9</b> |
| 1-1/2" inlet & cyl - 1-1/2" exhaust - BSPP           | T        |

Note: BSPP is to the ISO 228 standard, and requires an R-BSPT male fitting.

| "P" pilot code |         |         |    |                   |
|----------------|---------|---------|----|-------------------|
| Code           | Voltage |         |    | Enclosure options |
|                | AC 60hz | AC 50hz | DC | Standard duty     |
| 49             |         |         | 24 | 5, 6              |
| 53             | 120     | 110     |    | 5, 6, 8, 9        |

| "P" pilot configuration |   |
|-------------------------|---|
| 02                      | External pilot, std service, 125 PSI        |
| <b>47</b>               | <b>Internal pilot, std service, 125 PSI</b> |

| Solenoid type |                 |
|---------------|-----------------|
| <b>0</b>      | <b>Standard</b> |

| Solenoid enclosure |                                   |
|--------------------|-----------------------------------|
| 5                  | Junction box NLMO                 |
| 6                  | Junction box LMO                  |
| <b>8</b>           | <b>Junction box NLMO w/ light</b> |
| <b>9</b>           | <b>Junction box LMO w/ light</b>  |

**Replacement Pilots**

| Description   | Standard L-pilot  |                   | Continuous duty L-pilot |                   |
|---|-------------------|-------------------|-------------------------|-------------------|
|   | Locking           | Non-locking       | Locking                 | Non-locking       |
| Basic with override   | <b>K0653035**</b> | <b>K0652035**</b> | <b>K0853025**</b>       | <b>K0852025**</b> |
| JIC with junction box & override  | <b>K0656035**</b> | <b>K0655035**</b> | <b>K0856025**</b>       | <b>K0855025**</b> |
| JIC pilot with junction box & override & indicator lights (120VAC only) | <b>K0659035**</b> | <b>K0658035**</b> | <b>K0859025**</b>       | <b>K0858025**</b> |

\*\* Voltage code - (reference model index for availability)



**Replacement Pilots**

| Description                       | Hazardous duty L-pilot |                   | NEMA 4 L-pilot    |                   |
|-----------------------------------|------------------------|-------------------|-------------------|-------------------|
|                                   | Locking                | Non-Locking       | Locking           | Non-Locking       |
| Hazardous duty L-pilot - UL & CSA | <b>K0451025**</b>      | N/A               |                   |                   |
| Hazardous duty with override      | <b>K0453025**</b>      | <b>K0452025**</b> |                   |                   |
| NEMA 4 with override              |                        |                   | <b>K2553025**</b> | <b>K255202549</b> |

\*\* Voltage code - 49 & 53



**Replacement Pilots**

| Description   | Heavy duty P-Pilot |                   |                   |
|---|--------------------|-------------------|-------------------|
|   | No override        | Non-locking       | Locking           |
| Basic with override   | <b>K1351045**</b>  | N/A               | N/A               |
| JIC with junction box & override  | N/A                | <b>K1355045**</b> | <b>K1356045**</b> |
| JIC Pilot with junction box & override & indicator lights (120VAC only) | N/A                | <b>K135804553</b> | <b>K135904553</b> |

\*\* Voltage code - 49 & 53



**Coils for L-Pilot Operated Valves**

| Voltage Code ** | Voltage |      |                     | Coil           |           |
|-----------------|---------|------|---------------------|----------------|-----------|
|                 | 60Hz    | 50Hz | DC                  | 19" Leads      | 72" Leads |
| 40              | 12      | —    | —                   | K593007        | —         |
| 41,42           | 24      | —    | 6                   | K593003        | —         |
| 45*             | —       | —    | 12                  | <b>K593010</b> | —         |
| 49*             | —       | —    | 24 (Standard)       | <b>K593014</b> | —         |
| 79              | —       | —    | 24 (Arc Suppressed) | K593271        | —         |
| 51*             | —       | —    | 48                  | —              | K593185   |
| 53*             | 120     | 110  | —                   | <b>K593025</b> | —         |
| 57*             | 240     | 240  | —                   | <b>K593035</b> | —         |
| 60              | 240     | 220  | —                   | <b>K593035</b> | —         |
| 61              | —       | —    | 120                 | <b>K593041</b> | —         |

\* Indicates voltages approved for solenoid operators designed for use in hazardous locations.

**Coils for P-Pilot Operated Valves**

| Voltage Code ** | Voltage |      |    | Coil           |           |
|-----------------|---------|------|----|----------------|-----------|
|                 | 60Hz    | 50Hz | DC | 19" Leads      | 72" Leads |
| 42              | 24      | —    | —  | K593099        | —         |
| 43              | —       | 24   | —  | K593098        | —         |
| 45              | —       | —    | 12 | <b>K593094</b> | —         |
| 49              | —       | —    | 24 | <b>K593097</b> | —         |
| 51              | —       | —    | 48 | —              | K593254   |
| 53              | 115     | —    | —  | <b>K593108</b> | —         |
| 58              | —       | 230  | —  | <b>K593111</b> | —         |

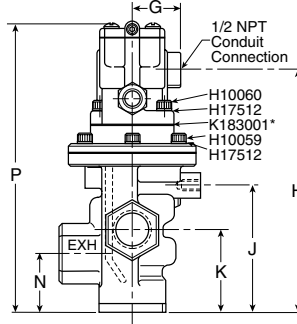
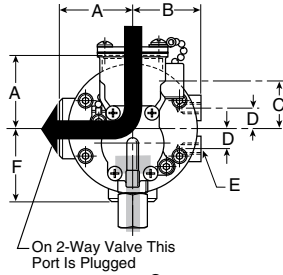
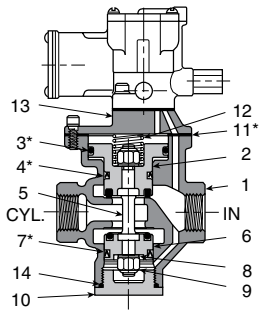
N □ □ □ □ □ □ □ \* \*  
 Voltage Code

N Series  
 ADEX Series  
 B Series  
 Viking Xtreme Series  
 Viking Lite Series  
 D  
 Inline Valve Products

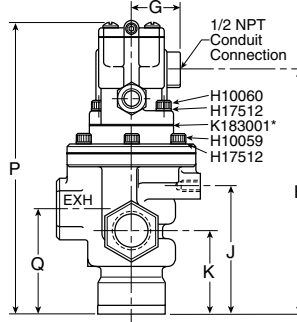
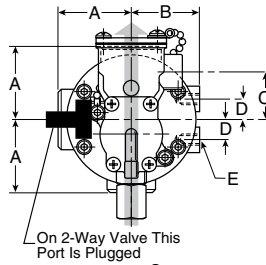
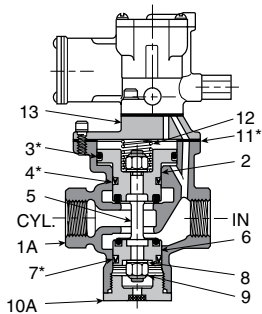


**Internal Pilot - 3/8" & 3/4" Basic Body**

**Normally Closed**



**Normally Open**



**Exhaust**  
**Pressure**

Top view indicates flow through 3-Way valve with coil de-energized.

**NOTE:** For normal valve operation, override must be in "out" position.

**Internal Pilot - 3/8" & 3/4" Basic Body**

| Key | 3/8" Body               |     | 3/4" Body               |     |
|-----|-------------------------|-----|-------------------------|-----|
|     | Inch                    | mm  | Inch                    | mm  |
| A   | 1.56                    | 40  | 2.13                    | 54  |
| B   | 1.50                    | 38  | 1.94                    | 49  |
| C   | 1.81                    | 46  | 1.34                    | 34  |
| D   | .56                     | 14  | .56                     | 14  |
| E   | 3/8-16UNC<br>7/16" deep |     | 3/8-16UNC<br>9/16" deep |     |
| F   | 1.75                    | 44  | 2.25                    | 57  |
| G   | 1.50                    | 38  | 1.50                    | 38  |
| H   | 5.92                    | 150 | 7.14                    | 181 |
| J   | 3.19                    | 81  | 3.75                    | 95  |
| K   | 1.88                    | 47  | 2.44                    | 62  |
| N   | 1.44                    | 37  | 1.78                    | 45  |
| P   | 7.36                    | 196 | 8.58                    | 218 |
| Q   | 2.31                    | 59  | 3.09                    | 84  |

**Service Kits**

Include all parts normally required for in-service maintenance:

- 3/8" Basic valve with standard service L-Pilots..... **K352076**
- 3/8" Basic valve with continuous duty L-Pilots..... **K352276**
- 3/4" Basic valve with standard service L-Pilots..... **K352077**
- 3/4" Basic valve with continuous duty L-Pilots..... **K352277**

| Key | 3/8" Valve          | 3/4" Valve          | Description       |
|-----|---------------------|---------------------|-------------------|
| 1   | —                   | 1/2" Tap<br>K053075 | Body (N.C.)       |
|     | 3/8" Tap<br>K053022 | 3/4" Tap<br>K053076 |                   |
|     | 1/2" Tap<br>K053023 | 1" Tap<br>K053220   |                   |
| 1A  | —                   | 3/4" Tap<br>K053077 | Body (N.O.)       |
|     | 3/8" Tap<br>K053025 | 3/4" Tap<br>K053078 |                   |
|     | 1/2" Tap<br>K053026 | 1" Tap<br>K053218   |                   |
| 2   | K212001             | K212002             | Upper piston assy |
| 3*  | H13648              | H13728              | Seal              |

| Key | 3/8" Valve | 3/4" Valve | Description               |
|-----|------------|------------|---------------------------|
| 4*  | H14510     | H13676     | U-cup (3/8), o-ring (3/4) |
| 5   | K493002    | K493009    | Stem                      |
| 6   | K202001    | K202002    | Lower piston assy.        |
| 7*  | H14509     | H13676     | U-cup (3/8), o-ring (3/4) |
| 8   | H17811     | H17813     | Washer (2)                |
| 9   | H06326     | H06332     | Stop nut (2)              |
| 10  | K103035    | K103053    | Bottom cap (N.C.)         |
| 10A | K092020    | K092034    | Bottom cap assy. (N.O.)   |
| 11* | K183049    | K183057    | Gasket                    |
| 12  | K473014    | K473015    | Spring                    |
| 13  | K563015    | K563017    | Adapter                   |
| 14* | K41RB72121 | K41RB72221 | O-ring                    |

\* Parts included in seal kit

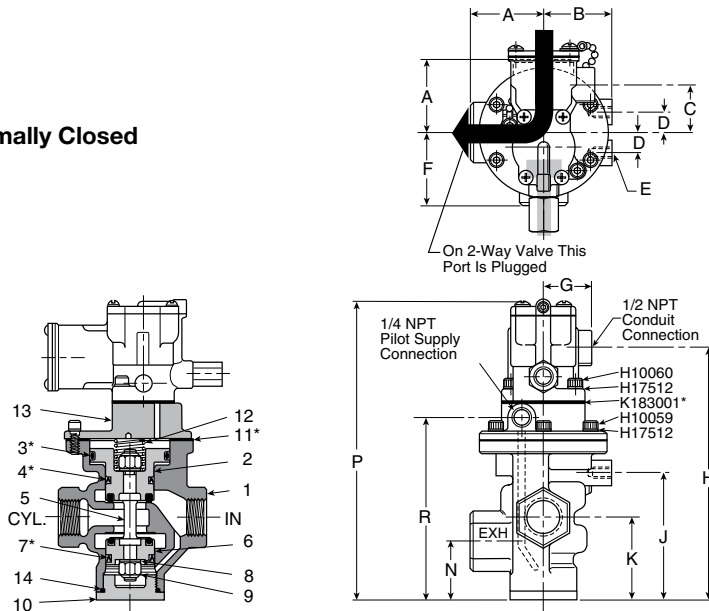


N Series  
 ADEX Series  
 B Series  
 Viking Xtreme Solenoid  
 Viking Litee Solenoid  
 D Inline Valve Products

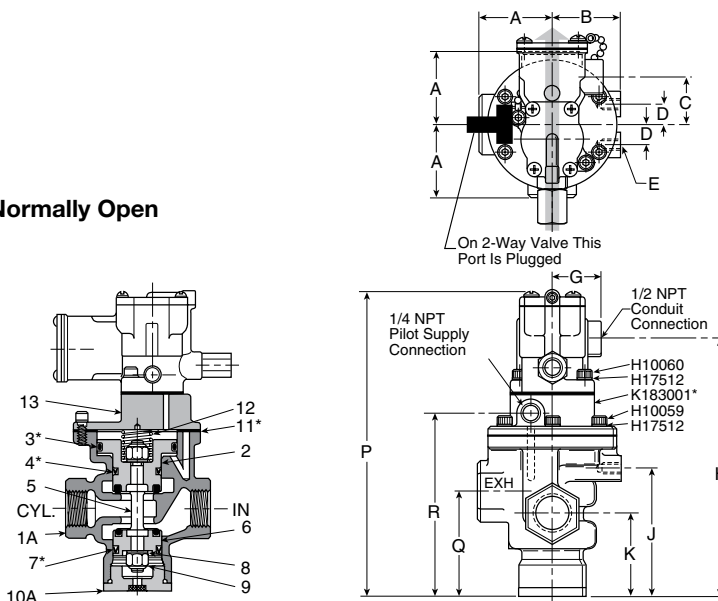


**External Pilot - 3/8" & 3/4" Basic Body**

**Normally Closed**



**Normally Open**



**Exhaust**  
**Pressure**

Top view indicates flow through 3-Way valve with coil de-energized.

**NOTE:** For normal valve operation, override must be in "out" position.

**External Pilot - 3/8" & 3/4" Basic Body**

| Key | 3/8" Body               |     | 3/4" Body               |     |
|-----|-------------------------|-----|-------------------------|-----|
|     | Inch                    | mm  | Inch                    | mm  |
| A   | 1.56                    | 40  | 2.13                    | 54  |
| B   | 1.50                    | 38  | 1.94                    | 49  |
| C   | 1.81                    | 46  | 1.34                    | 34  |
| D   | .56                     | 14  | .56                     | 14  |
| E   | 3/8-16UNC<br>7/16" deep |     | 3/8-16UNC<br>9/16" deep |     |
| F   | 1.75                    | 44  | 2.25                    | 57  |
| G   | 1.50                    | 38  | 1.50                    | 38  |
| H   | 6.42                    | 163 | 7.45                    | 189 |
| J   | 3.19                    | 81  | 3.75                    | 95  |
| K   | 1.88                    | 47  | 2.44                    | 62  |
| N   | 1.44                    | 37  | 1.78                    | 45  |
| P   | 7.86                    | 200 | 8.89                    | 226 |
| Q   | 2.31                    | 59  | 3.09                    | 84  |
| R   | 4.34                    | 110 | 5.38                    | 137 |

**Service Kits**

Include all parts normally required for in-service maintenance:

- 3/8" Basic valve with standard service L-Pilots..... **K352076**
- 3/8" Basic valve with continuous duty L-Pilots..... **K352276**
- 3/4" Basic valve with standard service L-Pilots..... **K352077**
- 3/4" Basic valve with continuous duty L-Pilots..... **K352277**

| Key | 3/8" Valve          | 3/4" Valve          | Description       |
|-----|---------------------|---------------------|-------------------|
| 1   | —                   | 1/2" Tap<br>K053067 | Body (N.C.)       |
|     | 3/8" Tap<br>K053019 | 3/4" Tap<br>K053069 |                   |
|     | 1/2" Tap<br>K053157 | 1" Tap<br>K053221   |                   |
| 1A  | —                   | 3/4" Tap<br>K053065 | Body (N.O.)       |
|     | 3/8" Tap<br>K053018 | 3/4" Tap<br>K053070 |                   |
|     | 1/2" Tap<br>K053064 | 1" Tap<br>K053219   |                   |
| 2   | K212001             | K212002             | Upper piston assy |
| 3*  | H13648              | H13728              | Seal              |

| Key | 3/8" Valve | 3/4" Valve | Description             |
|-----|------------|------------|-------------------------|
| 4*  | K41RB72211 | H13676     | O-ring                  |
| 5   | K493002    | K493009    | Stem                    |
| 6   | K202001    | K202002    | Lower piston assy.      |
| 7*  | K41RB72210 | H13676     | O-ring                  |
| 8   | H17811     | H17813     | Washer (2)              |
| 9   | H06326     | H06332     | Stop nut (2)            |
| 10  | K103035    | K103053    | Bottom cap (N.C.)       |
| 10A | K092020    | K092034    | Bottom cap assy. (N.O.) |
| 11  | K473014    | K473015    | Spring                  |
| 12* | K183049    | K183057    | Gasket                  |
| 13  | K563016    | K563021    | Adapter                 |
| 14* | K41RB72121 | K41RB72221 | O-ring                  |

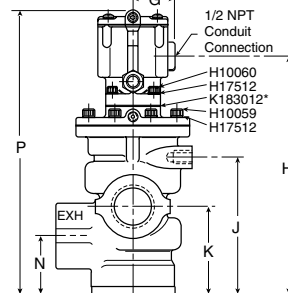
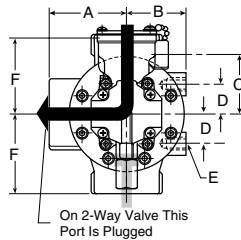
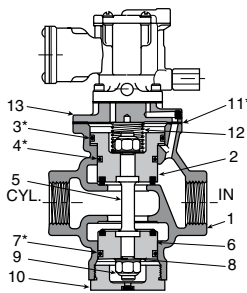
\* Parts included in seal kit



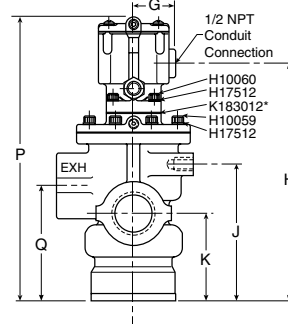
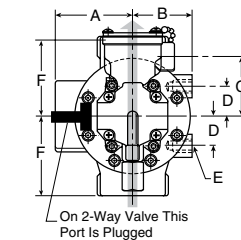
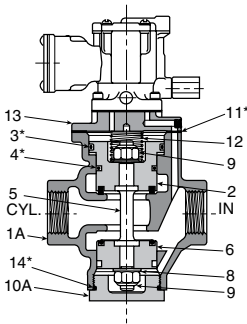
**N Series**  
**ADEX Series**  
**B Series**  
**Viking Xtreme Series**  
**Viking Lite Series**  
**D Inline Valve Products**

**Internal Pilot - 1-1/4" Basic Body**

**Normally Closed**



**Normally Open**



**Exhaust**  
**Pressure**

Top view indicates flow through 3-Way valve with coil de-energized.

**NOTE:** For normal valve operation, override must be in "out" position.

**Internal Pilot - 1-1/4" Basic Body**

| Key | 1-14" Body |          |
|-----|------------|----------|
|     | Inch       | mm       |
| A   | 3.00       | 76       |
| B   | 2.25       | 57       |
| C   | 1.34       | 34       |
| D   | 1.19       | 30       |
| E   | 1/2-13 UNC | 3/4 Deep |
| F   | 3.13       | 80       |
| G   | 1.50       | 38       |
| H   | 9.30       | 236      |
| J   | 5.34       | 136      |
| K   | 3.44       | 87       |
| N   | 2.31       | 59       |
| P   | 11.14      | 283      |
| Q   | 4.56       | 116      |

**Service Kits**

Include all parts normally required for in-service maintenance:

1-1/4" Basic valve with standard service P-Pilots ..... **K352078**

| Key | 1-1/4" Valve          | Description       |
|-----|-----------------------|-------------------|
| 1   | 1" Tap<br>K053111     | Body (N.C.)       |
|     | 1-1/4" Tap<br>K053112 |                   |
|     | 1-1/2" Tap<br>K053113 |                   |
| 1A  | 1" Tap<br>K053114     | Body (N.O.)       |
|     | 1-1/4" Tap<br>K053115 |                   |
|     | 1-1/2" Tap<br>K053116 |                   |
| 2   | K313029               | Upper piston assy |
| 3*  | H13752                | O-ring            |

| Key | 1-1/4" Valve | Description       |
|-----|--------------|-------------------|
| 4*  | H13728       | Seal              |
| 5   | K493016      | Stem              |
| 6   | K313028      | Lower piston      |
| 7*  | H13728       | Seal              |
| 8   | H17817       | Washer            |
| 9   | H06338       | Stop nut          |
| 10  | K092046      | Bottom cap (N.C.) |
| 10A | K103061      | Bottom cap (N.O.) |
| 11* | K183058      | Gasket            |
| 12  | K473016      | Spring            |
| 13  | K012003      | Adapter           |
| 14* | K41RB72143   | O-ring            |

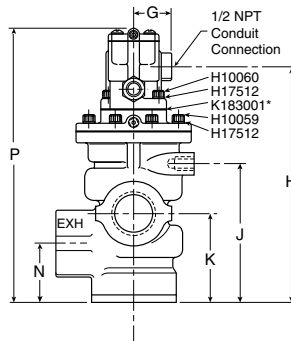
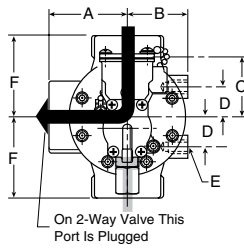
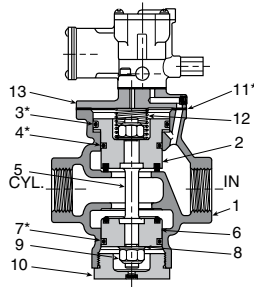
\* Parts included in seal kit



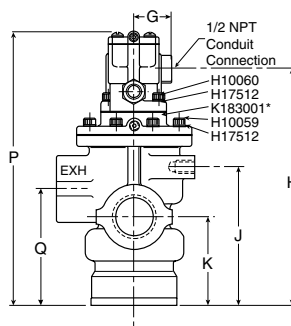
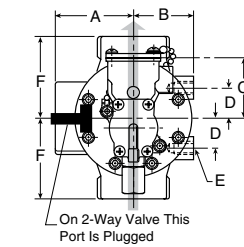
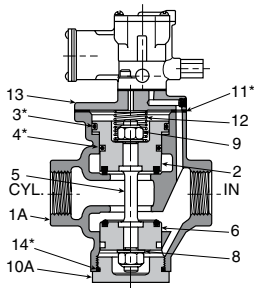


**Continuous Duty Pilot - 1-1/4" Basic Body**

**Normally Closed**



**Normally Open**



**Exhaust**  
**Pressure**

Top view indicates flow through 3-Way valve with coil de-energized.

**NOTE:** For normal valve operation, override must be in "out" position.

**Continuous Duty Pilot - 1-1/4" Basic Body**

| Key | 1-1/4" Body |          |
|-----|-------------|----------|
|     | Inch        | mm       |
| A   | 3.00        | 76       |
| B   | 2.25        | 57       |
| C   | 1.34        | 34       |
| D   | 1.19        | 30       |
| E   | 1/2-13 UNC  | 3/4 Deep |
| F   | 3.13        | 80       |
| G   | 1.50        | 38       |
| H   | 9.02        | 229      |
| J   | 5.34        | 136      |
| K   | 3.44        | 87       |
| N   | 2.31        | 59       |
| P   | 10.45       | 265      |
| Q   | 4.56        | 116      |

**Service Kits**

Include all parts normally required for in-service maintenance:

1-1/4" Basic valve with continuous duty L-Pilot ..... **K352080**

| Key | 1-1/4" Valve          | Description       |
|-----|-----------------------|-------------------|
| 1   | 1" Tap<br>K053111     | Body (N.C.)       |
|     | 1-1/4" Tap<br>K053112 |                   |
|     | 1-1/2" Tap<br>K053113 |                   |
| 1A  | 1" Tap<br>K053114     | Body (N.O.)       |
|     | 1-1/4" Tap<br>K053115 |                   |
|     | 1-1/2" Tap<br>K053116 |                   |
| 2   | K313029               | Upper piston assy |
| 3*  | H13752                | O-Ring            |

| Key | 1-1/4" Valve | Description       |
|-----|--------------|-------------------|
| 4*  | H13728       | Seal              |
| 5   | K493016      | Stem              |
| 6   | K313028      | Lower piston      |
| 7*  | H13728       | Seal              |
| 8   | H17817       | Washer            |
| 9   | H06338       | Stop nut          |
| 10  | K092046      | Bottom cap (N.C.) |
| 10A | K103061      | Bottom cap (N.O.) |
| 11* | K183058      | Gasket            |
| 12  | K473016      | Spring            |
| 13  | K012003      | Adapter           |
| 14* | K41RB72143   | O-ring            |

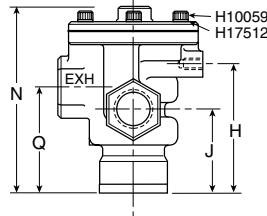
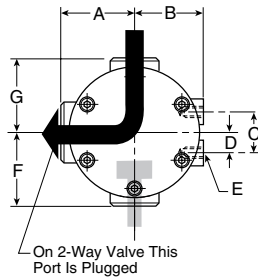
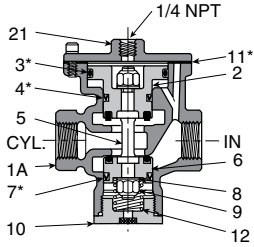
\* Parts included in seal kit



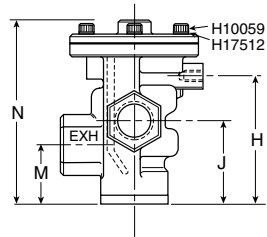
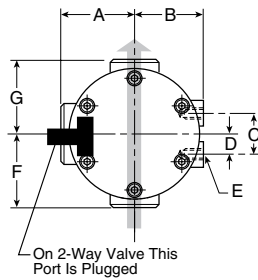
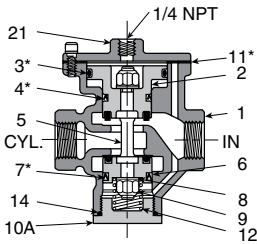
|                         |
|-------------------------|
| N Series                |
| ADEX Series             |
| B Series                |
| Viking Xtreme Series    |
| Viking Lite Series      |
| D Inline Valve Products |

**Internal Return - 3/8", 3/4", 1-1/4" Basic Body**

**Normally Closed**



**Normally Open**



**Exhaust**  
**Pressure**

Top view indicates flow through 3-Way valve.

**NOTE:** For normal valve operation, override must be in "out" position.

**Internal Return - 3/8", 3/4", 1-1/4" Basic Body**

| Key | 3/8" Body |     | 3/4" Body |     | 1-1/4" Body |     |
|-----|-----------|-----|-----------|-----|-------------|-----|
|     | Inch      | mm  | Inch      | mm  | Inch        | mm  |
| H   | 3.19      | 81  | 3.75      | 95  | 5.34        | 136 |
| J   | 1.88      | 48  | 2.44      | 62  | 3.44        | 87  |
| M   | 1.44      | 37  | 1.78      | 45  | 2.66        | 67  |
| N   | 4.22      | 107 | 5.31      | 135 | 7.19        | 183 |
| Q   | 2.31      | 59  | 3.09      | 78  | 4.56        | 116 |

**Service Kits**

Include all parts normally required for in-service maintenance:

- 3/8" Basic valve..... **K352073**
- 3/4" Basic valve.....**K352074**
- 1-1/4" Basic valve ..... **K352075**

| Key | 3/8" Valve          | 3/4" Valve          | 1-1/4" Valve          | Description       |
|-----|---------------------|---------------------|-----------------------|-------------------|
| 1   | —                   | 1/2" Tap<br>K053075 | 1" Tap<br>K053111     | Body (N.O.)       |
|     | 3/8" Tap<br>K053022 | 3/4" Tap<br>K053076 | 1-1/4" Tap<br>K053112 |                   |
|     | 1/2" Tap<br>K053023 | 1" Tap<br>K053220   | 1-1/2" Tap<br>K053113 |                   |
| 1A  | —                   | 1/2" Tap<br>K053077 | 1" Tap<br>K053114     | Body (N.C.)       |
|     | 3/8" Tap<br>K053025 | 3/4" Tap<br>K053078 | 1-1/4" Tap<br>K053115 |                   |
|     | 1/2" Tap<br>K053026 | 1" Tap<br>K053218   | 1-1/2" Tap<br>K053116 |                   |
| 2   | K212001             | K212002             | K313029               | Upper piston assy |
| 3*  | H13648              | H13728              | H13752                | Seal              |
| 4*  | H14510              | H13676              | H13728                | Seal              |

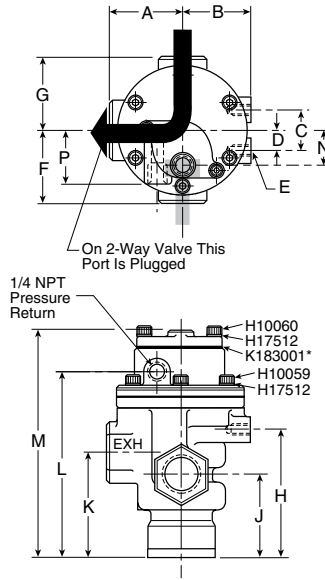
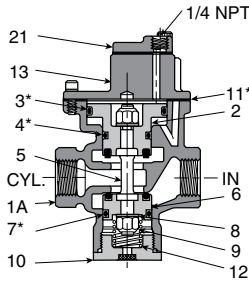
| Key | 3/8" Valve | 3/4" Valve | 1-1/4" Valve | Description        |
|-----|------------|------------|--------------|--------------------|
| 5   | K493002    | K493009    | K493016      | Stem               |
| 6   | K202001    | K202002    | K313028      | Lower piston assy. |
| 7*  | H13499     | H13676     | H13728       | Seal               |
| 8   | H17811     | H17813     | H17817       | Washer (2)         |
| 9   | H06326     | H06332     | H06338       | Stop nut (2)       |
| 10  | K092020    | K092034    | K092046      | Bottom cap (N.C.)  |
| 10A | K103035    | K103053    | K103061      | Bottom cap (N.O.)  |
| 11* | K183049    | K183057    | K183058      | Gasket             |
| 12  | K473014    | K473015    | K473016      | Spring             |
| 14* | K41RB72121 | K41RB72221 | K41RB72143   | O-ring             |
| 21  | K123018    | K123021    | K123024      | Cover              |

\* Parts included in seal kit

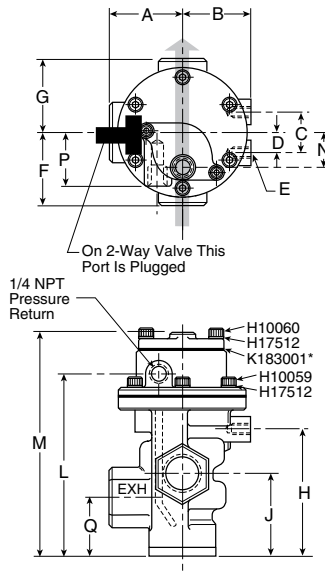
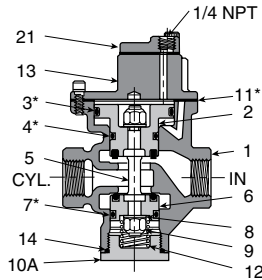


**External Return - 3/8", 3/4", 1-1/4" Basic Body**

**Normally Closed**



**Normally Open**



**Exhaust**  
**Pressure**

Top view indicates flow through 3-Way valve.

**NOTE:** For normal valve operation, override must be in "out" position.

**Internal Return - 3/8", 3/4", 1-1/4" Basic Body**

| Key | 3/8" Body               |     | 3/4" Body                |     | 1-1/4" Body            |     |
|-----|-------------------------|-----|--------------------------|-----|------------------------|-----|
|     | Inch                    | mm  | Inch                     | mm  | Inch                   | mm  |
| A   | 1.56                    | 40  | 2.13                     | 54  | 3.00                   | 76  |
| B   | 1.50                    | 38  | 1.94                     | 49  | 2.25                   | 57  |
| C   | 1.13                    | 29  | 1.13                     | 29  | 2.38                   | 60  |
| D   | .56                     | 14  | .56                      | 14  | 1.19                   | 30  |
| E   | 3/8-16UNC<br>7/16" deep |     | 3/8- 16UNC<br>9/16" deep |     | 1/2-13UNC<br>3/4" deep |     |
| F   | 1.75                    | 44  | 2.25                     | 57  | 3.13                   | 79  |
| G   | 1.56                    | 40  | 2.13                     | 54  | 3.13                   | 79  |
| H   | 3.19                    | 81  | 3.75                     | 95  | 5.34                   | 136 |
| J   | 1.88                    | 48  | 2.44                     | 62  | 3.44                   | 87  |
| K   | 2.31                    | 59  | 3.09                     | 78  | 4.56                   | 116 |
| L   | 4.34                    | 110 | 5.38                     | 137 | 7.31                   | 186 |
| M   | 5.31                    | 135 | 6.34                     | 161 | 7.88                   | 200 |
| N   | Left of center<br>.53   |     | On center<br>1.00        |     | 25                     |     |
| Q   | 1.44                    | 37  | 1.78                     | 45  | 2.31                   | 59  |

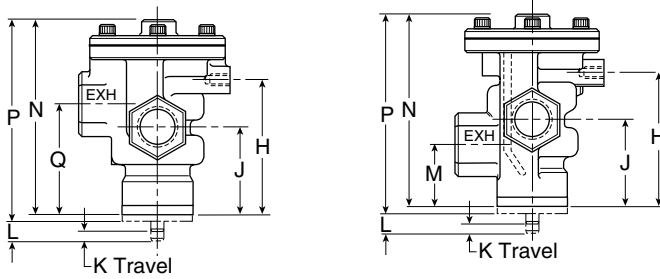
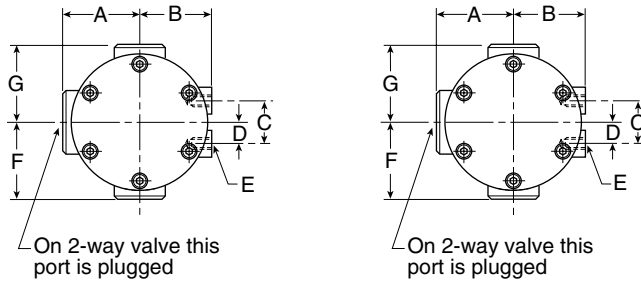
| Key | 3/8" Valve          | 3/4" Valve          | 1-1/4" Valve          | Description       |
|-----|---------------------|---------------------|-----------------------|-------------------|
| 1   | 1/4" Tap<br>K053011 | 1/2" Tap<br>K053067 | 1" Tap<br>K053143     | Body (N.O.)       |
|     | —                   | 3/4" Tap<br>K053069 | 1-1/4" Tap<br>K053110 |                   |
|     | 1/2" Tap<br>K053157 | 1" Tap<br>K053221   | 1-1/2" Tap<br>K053146 |                   |
| 1A  | 1/4" Tap<br>K053010 | 1/2" Tap<br>K053065 | 1" Tap<br>K053159     | Body (N.C.)       |
|     | —                   | 3/4" Tap<br>K053070 | 1-1/4" Tap<br>K053144 |                   |
|     | 1/2" Tap<br>K053064 | 1" Tap<br>K053 219  | 1-1/2" Tap<br>K053145 |                   |
| 2   | K212001             | K212002             | K313029               | Upper piston assy |
| 3*  | H13648              | H13728              | H13752                | Seal              |
| 4*  | H13529              | H13676              | H13728                | Seal              |

| Key | 3/8" Valve | 3/4" Valve | 1-1/4" Valve | Description             |
|-----|------------|------------|--------------|-------------------------|
| 5   | K493002    | K493009    | K493016      | Stem                    |
| 6   | K202001    | K202002    | K313028      | Lower piston assy.      |
| 7*  | H13499     | H13676     | H13728       | Seal                    |
| 8   | H17811     | H17813     | H17817       | Washer (2)              |
| 9   | H06326     | H06332     | H06338       | Stop nut (2)            |
| 10  | K092020    | K092034    | K092046      | Bottom cap assy. (N.C.) |
| 10A | K103035    | K103053    | K103061      | Bottom cap (N.O.)       |
| 11* | K183049    | K183057    | K183058      | Gasket                  |
| 12  | K473014    | K473015    | K473016      | Spring                  |
| 13  | K563016    | K563021    | K563027      | Adapter                 |
| 14* | K41RB72121 | K41RB72221 | K41RB72143   | O-ring                  |
| 21  | K323027    | K323027    | Not used     | Cover                   |

\* Parts included in seal kit



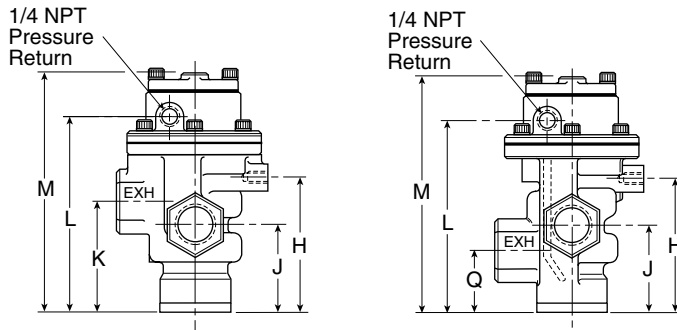
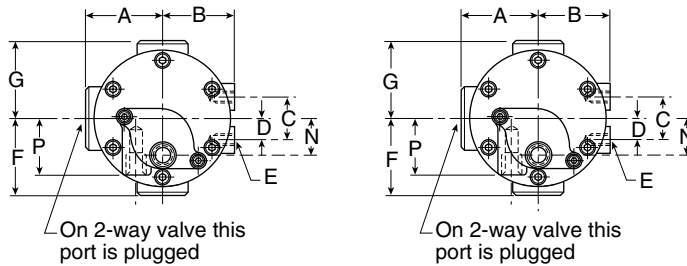
**Internal Return - 3/8" & 3/4" Basic Body**



**Internal Return -  
 3/8" & 3/4" Basic Body**

| Key | 3/8" Body               |     | 3/4" Body               |     | 1-1/4" Body            |     |
|-----|-------------------------|-----|-------------------------|-----|------------------------|-----|
|     | Inch                    | mm  | Inch                    | mm  | Inch                   | mm  |
| A   | 1.56                    | 40  | 2.13                    | 54  | 3.00                   | 76  |
| B   | 1.50                    | 38  | 1.94                    | 49  | 2.25                   | 57  |
| C   | 1.13                    | 29  | 1.13                    | 29  | 2.38                   | 60  |
| D   | .56                     | 14  | .56                     | 14  | 1.19                   | 30  |
| E   | 3/8-16UNC<br>7/16" deep |     | 3/8-16UNC<br>9/16" deep |     | 1/2-13UNC<br>3/4" deep |     |
| F   | 1.75                    | 44  | 2.25                    | 57  | 3.13                   | 79  |
| G   | 1.56                    | 40  | 2.13                    | 54  | 3.13                   | 79  |
| H   | 3.19                    | 81  | 3.75                    | 95  | 5.34                   | 136 |
| J   | 1.88                    | 48  | 2.44                    | 62  | 3.44                   | 87  |
| K   | .50                     | 13  | .50                     | 13  | .50                    | 13  |
| L   | .11                     | 3   | .16                     | 4   | .25                    | 6   |
| M   | 1.44                    | 37  | 1.78                    | 45  | 2.66                   | 67  |
| N   | 4.22                    | 107 | 5.31                    | 135 | 7.19                   | 183 |
| P   | 4.78                    | 121 | 5.56                    | 141 | 7.53                   | 191 |
| Q   | 2.31                    | 59  | 3.09                    | 78  | 4.56                   | 116 |

**External Return - 3/8" & 3/4" Basic Body**



**Internal Return -  
 3/8" & 3/4" Basic Body**

| Key | 3/8" Body                |     | 3/4" Body               |     | 1-1/4" Body            |     |
|-----|--------------------------|-----|-------------------------|-----|------------------------|-----|
|     | Inch                     | mm  | Inch                    | mm  | Inch                   | mm  |
| A   | 1.56                     | 40  | 2.13                    | 54  | 3.00                   | 76  |
| B   | 1.50                     | 38  | 1.94                    | 49  | 2.25                   | 57  |
| C   | 1.13                     | 29  | 1.13                    | 29  | 2.38                   | 60  |
| D   | .56                      | 14  | .56                     | 14  | 1.19                   | 30  |
| E   | 3/8-16UNC<br>7/16" deep  |     | 3/8-16UNC<br>9/16" deep |     | 1/2-13UNC<br>3/4" deep |     |
| F   | 1.75                     | 44  | 2.25                    | 57  | 3.13                   | 79  |
| G   | 1.56                     | 40  | 2.13                    | 54  | 3.13                   | 79  |
| H   | 3.19                     | 81  | 3.75                    | 95  | 5.34                   | 136 |
| J   | 1.88                     | 48  | 2.44                    | 62  | 3.44                   | 87  |
| K   | 2.31                     | 59  | 3.09                    | 78  | 4.56                   | 116 |
| L   | 4.34                     | 110 | 5.38                    | 137 | 7.31                   | 186 |
| M   | 5.31                     | 135 | 6.34                    | 161 | 7.88                   | 200 |
| N   | Left of center<br>.53 13 |     | On center<br>1.00 25    |     |                        |     |
| Q   | 1.44                     | 37  | 1.78                    | 45  | 2.31                   | 59  |

N Series  
 ADEX Series  
 B Series  
 Viking Xtreme Solenoid  
 Viking Litee Solenoid  
 D Inline Valve Products

The Moduflex Valve System redefines flexibility for pneumatic users. Whether configured from basic components or ordered as a pre-assembled and tested valve manifold, Moduflex flexibility is unmatched in the market place.

**Ports**

- Size 1: Push-in connectors for 5/32, 1/4 inch, 4, 6mm OD tube
- Size 2: Push-in connectors for 1/4, 3/8, 1/2 inch, 6, 8, 10, 12 mm OD tube

**Mounting**

- S Series – Individual subbase
- T Series – Manifold mount with individual connectors
- V Series – Manifold mount with collective wiring or fieldbus

**Fieldbus options**

- DeviceNet, Profibus, CANopen, AS-i, Interbus-S

**Solenoids**

- 1.0 Watt
- 24 VDC
- Compatible with PNP or NPN outputs

**Certification / approval**

- IP65 rated
- CE, as marked



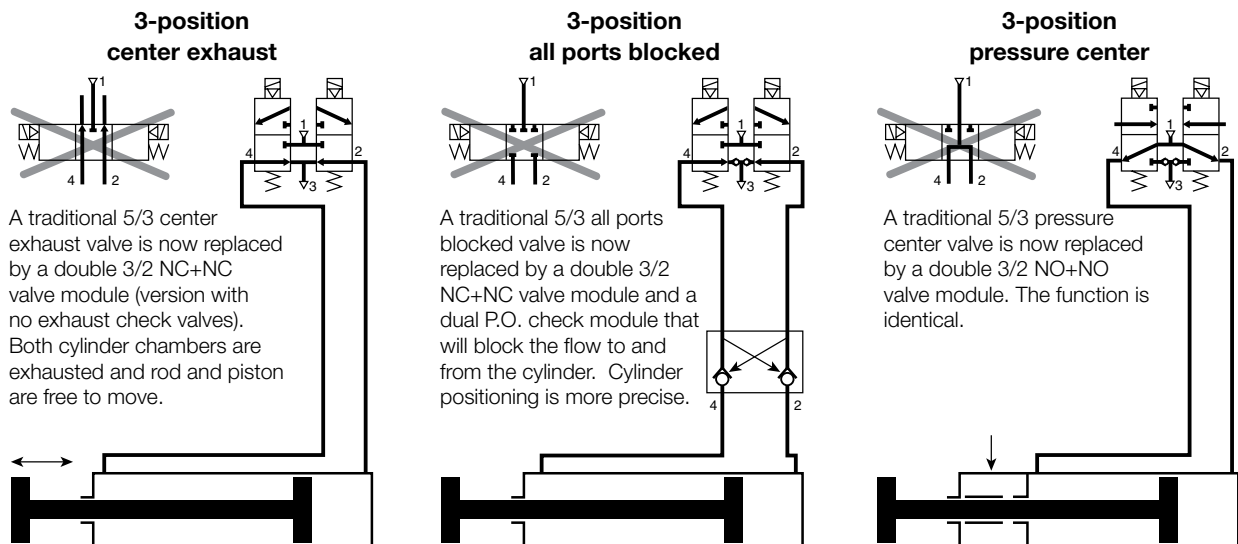
**Operating information**

|                                 |  |
|---------------------------------|--|
| Operating pressure:             | Vacuum to 123 PSIG (Vacuum to 8.3 bar) |
| Operating temperature:          | 5°F to 140°F (-15°C to 60°C)           |
| Fieldbus operating temperature: | 32°F to 130°F (0°C to 55°C)            |

**Material specifications**

|                             |  |
|-----------------------------|--|
| End plates (T and V series) | Plastic                                      |
| Fasteners                   | Nickel plated steel                          |
| Spool                       | Aluminum and nitrile rubber or ceramic plate |
| Subbase or manifold         | Plastic                                      |
| Valve body                  | Plastic                                      |

**Dual 3/2 valves replace all 3-position valves for a better performance**



Most popular. For technical information see CD



Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

Isys Micro Series

Moduflex Series

**D**

Subbase & Manifold Valve Products












**“S” Series Individual Subbase Valves Size 1 (Valve & Base without Pneumatic Connectors)**

|                   |                  | Symbol | Type  | Cv   | Operator         | Part number       |
|-------------------|------------------|--------|---|------|------------------|-------------------|
| Valvair II Series | Single Solenoid  |        | 4-way, 2-position                                     | 0.32 | Single solenoid  | <b>P2M1S4ES2C</b> |
|                   |                  |        |   |      | Single air pilot | <b>P2M1S4PS</b>   |
|                   | Single Air Pilot |        | 4-way, 2-position                                     | 0.32 | Double solenoid  | <b>P2M1S4EE2C</b> |
|                   |                  |        |   |      | Double air pilot | <b>P2M1S4PP</b>   |
| DX ISOMAX Series  | Double Solenoid  |        | 3-way, 2-position, dual valve, NC/NC w/ exhaust check | 0.22 | Double solenoid  | <b>P2M1SDEE2C</b> |
|                   |                  |        |   |      | Double air pilot | <b>P2M1SDPP</b>   |
|                   | Double Air Pilot |        | 3-way, 2-position, dual valve, NO/NO w/ exhaust check | 0.22 | Double solenoid  | <b>P2M1SCEE2C</b> |
|                   |                  |        |   |      | Double air pilot | <b>P2M1SCPP</b>   |
| Fieldbus Series   | Double Solenoid  |        | 3-way, 2-position, dual valve, NC/NO w/ exhaust check | 0.22 | Double solenoid  | <b>P2M1SEEE2C</b> |
|                   |                  |        |   |      | Single solenoid  | <b>P2M1S3ES2C</b> |
|                   | Double Air Pilot |        | 3-way, 2-position, dual valve, NC w/ exhaust check    | 0.22 | Single air pilot | <b>P2M1S3PS</b>   |
|                   |                  |        | 3-way, 2-position, dual valve, NC/NC                  | 0.22 | Double solenoid  | <b>P2M1SGEE2C</b> |







**“S” Series Size 1 Accessories**

|                                   | Description              | Tube Size | Option                        | Part number        |
|-----------------------------------|--------------------------|-----------|-------------------------------|--------------------|
| Isys ISO Series                   |                          | 5/32"     | Elbow                         | <b>CMD04-1</b>     |
|                                   |                          |           | Straight                      | <b>FMD04-1</b>     |
| Isys Micro Series                 |                          | 1/4"      | Elbow                         | <b>CMD07-1B</b>    |
|                                   |                          |           | Straight                      | <b>FMD07-1B</b>    |
| Moduflex Series                   |                          | 6mm       | Elbow                         | <b>CMD06-1</b>     |
|                                   |                          |           | Straight                      | <b>FMD06-1</b>     |
|                                   | Muffler for exhaust port |           |                               | <b>MMDVA1</b>      |
|                                   | Plug                     |           |                               | <b>PMDYY1</b>      |
|                                   | Double male union        |           | Connecting peripheral modules | <b>HMDXX1</b>      |
| Subbase & Manifold Valve Products |                          |           | 2m Cable                      | <b>P8LS08L226C</b> |
|                                   |                          |           | 5m Cable                      | <b>P8LS08L526C</b> |
|                                   |                          |           | 9m Cable                      | <b>P8LS08L926C</b> |
|                                   |                          |           | M8 Connector                  | <b>P8CS0803J</b>   |
|                                   |                          |           | M12 Connector                 | <b>P8CS1204J</b>   |

**“S” Series Individual Subbase Valves Size 2 (Valve & Base without Pneumatic Connectors)**

|  | Symbol  | Type  | Cv   | Operator         | Part number       |
|--|---|---|------|------------------|-------------------|
| <br><b>Single Solenoid</b>  |  | 4-way, 2-position                                     | 0.8  | Single solenoid  | <b>P2M2S4ES2C</b> |
|  |   |   |      | Single air pilot | <b>P2M2S4PS</b>   |
| <br><b>Single Air Pilot</b> |  | 4-way, 2-position                                     | 0.8  | Double solenoid  | <b>P2M2S4EE2C</b> |
|  |   |   |      | Double air pilot | <b>P2M2S4PP</b>   |
| <br><b>Double Solenoid</b>  |  | 3-way, 2-position, dual valve, NC/NC w/ exhaust check | 0.44 | Double solenoid  | <b>P2M2SDEE2C</b> |
|  |   |   |      | Double air pilot | <b>P2M2SDPP</b>   |
| <br><b>Double Air Pilot</b> |  | 3-way, 2-position, dual valve, NO/NO w/ exhaust check | 0.44 | Double solenoid  | <b>P2M2SCEE2C</b> |
|  |   |   |      | Double air pilot | <b>P2M2SCPP</b>   |
|  |  | 3-way, 2-position, dual valve, NC/NO w/ exhaust check | 0.44 | Double solenoid  | <b>P2M2SEEE2C</b> |
|  |   |   |      |                  |                   |
|  |  | 3-way, 2-position, NC w/ exhaust check                | 0.44 | Single solenoid  | <b>P2M2S3ES2C</b> |
|  |   |   |      | Single air pilot | <b>P2M2S3PS</b>   |
|  |  | 3-way, 2-position, dual valve, NC/NC                  | 0.44 | Double solenoid  | <b>P2M2SGEE2C</b> |

**“S” Series Size 2 Accessories**

|   | Description   | Tube Size                | Option                        | Part number        |
|---|---|--------------------------|-------------------------------|--------------------|
|  | Size 2 push to connect fitting  | 1/4" OD tube             | Elbow                         | <b>CMD07-2B</b>    |
|   |   |                          | Straight                      | <b>FMD07-2B</b>    |
|   | Size 2 push to connect fitting  | 3/8" OD tube             | Elbow                         | <b>CMD09-2B</b>    |
|   |   |                          | Straight                      | <b>FMD09-2B</b>    |
|   | Size 2 push to connect fitting  | 1/2" OD tube             | Straight                      | <b>FMD13-2B</b>    |
|   | Size 2 push to connect fitting  | 6mm OD tube              | Elbow                         | <b>CMD06-2</b>     |
|   |   |                          | Straight                      | <b>FMD06-2</b>     |
|   | Size 2 push to connect fitting  | 8mm OD tube              | Elbow                         | <b>CMD08-2</b>     |
|   |   |                          | Straight                      | <b>FMD08-2</b>     |
|   | Size 2 push to connect fitting  | 10mm OD tube             | Elbow                         | <b>CMD10-2</b>     |
|   |   |                          | Straight                      | <b>FMD10-2</b>     |
|   | Size 2 push to connect fitting  | 12mm OD tube             | Elbow                         | <b>CMD12-2</b>     |
|   |   |                          | Straight                      | <b>FMD12-2</b>     |
|   |  | Muffler for exhaust port |                               |                    |
|  | Plug  |                          |                               | <b>PMDYY2</b>      |
|  | Double male union   |                          | Connecting peripheral modules | <b>HMDXX2</b>      |
|  | M8 female connector to flying lead - IP67 LED and surge protection                  |                          | 2m Cable                      | <b>P8LS08L226C</b> |
|   |   |                          | 5m Cable                      | <b>P8LS08L526C</b> |
|   |   |                          | 9m Cable                      | <b>P8LS08L926C</b> |
|  | Field wireable connector  |                          | M8 Connector                  | <b>P8CS0803J</b>   |
|   |   |                          | M12 Connector                 | <b>P8CS1204J</b>   |

Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

Isys Micro Series

Moduflex Series

**D**

Subbase & Manifold Valve Products



**“S” Series Individual Subbase Valve**  
*(Complete with Pneumatic and Electrical Connectors)*

Valvair II Series  
 DX ISOMAX Series  
 Fieldbus  
 Isys ISO Series  
 Isys Micro Series  
 Moduflex Series  
**D** Subbase & Manifold Valve Products

**P2M 1 S 4ES 2C 00 A F4**

| Basic series |     |
|--------------|-----|
| Moduflex     | P2M |

| Size   |   |
|--------|---|
| Size 1 | 1 |
| Size 2 | 2 |

| Valve series       |   |
|--------------------|---|
| Individual subbase | S |

| Valve type / function                           |      |
|---|------|
| <b>3-way / 2-position</b>                       |      |
| Single solenoid, NC spring return               | 3ES  |
| Single air pilot, NC spring return              | 3PS  |
| <b>4-way / 2-position</b>                       |      |
| Single solenoid, spring return                  | 4ES  |
| Single air pilot, spring return                 | 4PS  |
| Double solenoid                                 | 4EE  |
| Double air pilot                                | 4PP  |
| <b>Dual 3-way, 2-position, spring return</b>    |      |
| Solenoid, NC / NC + PO check (4/3 APB)          | BEE* |
| Air pilot, NC / NC + PO check (4/3 APB)         | BPP* |
| Solenoid, NO / NO (4/3 Pressure Ctr.)           | CEE  |
| Air pilot NO / NO (4/3 Pressure Ctr.)           | CPP  |
| <b>Solenoid, NC / NC with exhaust check</b>     |      |
| Air pilot, NC / NC with exhaust check           | DPP  |
| Solenoid, NO / NC with exhaust check            | EEE  |
| Solenoid, NC / NC without check (4/3 Exh. Ctr.) | GEE  |

| Ports (all ports) |                              |
|-------------------|------------------------------|
| C0*               | 10mm Elbow fitting           |
| C2*               | 12mm Elbow fitting           |
| C4                | 5/32" (4mm) Elbow fitting    |
| C6                | 6mm Elbow fitting            |
| C7                | 1/4" Elbow fitting           |
| C8*               | 8mm Elbow fitting            |
| C9*               | 3/8" Elbow fitting           |
| F0*               | 10mm Straight fitting        |
| F2*               | 12mm Straight fitting        |
| F3*               | 1/2" Straight fitting        |
| F4                | 5/32" (4mm) Straight fitting |
| F6                | 6mm Straight fitting         |
| F7                | 1/4" Straight fitting        |
| F8*               | 8mm Straight fitting         |
| F9*               | 3/8" Straight fitting        |

\* Only available with size 2 valves.

| Fitting configuration |                            |
|-----------------------|----------------------------|
| A*                    | Straight fittings          |
| B*                    | Elbow fittings             |
| C*†                   | Straight fitting & muffler |
| D*†                   | Elbow fitting & muffler    |

\* Ports 1 & 3 fittings sizes are same as ports 2 & 4 (see example at left.)  
 † Fitting in port 1, muffler in port 3.

| LED / Cable |  |
|-------------|--|
| 00          | No cable, no LED, no surge suppression       |
| V2          | 2 Meter cable with LED and surge suppression |
| V5          | 5 Meter cable with LED and surge suppression |
| V9          | 9 Meter cable with LED and surge suppression |

Example for fitting configuration:  
 Size 1

CF7 Ports 1 & 3  
 1/4" straight fitting & muffler  
 Ports 2 & 4  
 1/4" straight fittings

Size 2

AC0 Ports 1 & 3  
 10mm elbow fittings  
 Ports 2 & 4  
 10mm elbow fittings

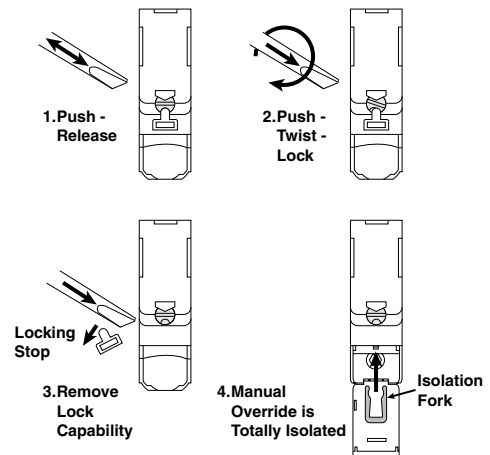
| Operator voltage                |    |
|---------------------------------|----|
| 24VDC                           | 2C |
| Remote pilot - 5/32" (4mm) Tube | 00 |

\* Valve includes peripheral P. O. Check Valve and union fittings.

**With only one universal solenoid pilot for all configurations**















24VDC is now a global standard for all machines.  
 The Moduflex 24VDC unique solenoid pilot is supplied with the multi-function manual override that can be adapted to all requirements, as explained by the drawings.

**Multi-function adaptable manual override**

















**"T" Series Manifold Valves with Individual Connectors Size 1**

|  | Symbol  | Type  | Cv   | Operator         | Part number       |
|--|---|---|------|------------------|-------------------|
| <br><b>Single Solenoid</b>  |  | 4-way, 2-position                                     | 0.32 | Single solenoid  | <b>P2M1T4ES2C</b> |
|  |   |   |      | Single air pilot | <b>P2M1T4PS</b>   |
| <br><b>Single Air Pilot</b> |  | 4-way, 2-position                                     | 0.32 | Double solenoid  | <b>P2M1T4EE2C</b> |
|  |   |   |      | Double air pilot | <b>P2M1T4PP</b>   |
| <br><b>Double Solenoid</b>  |  | 4-way, 2-position, dual valve w/ exhaust check        | 0.18 | Double solenoid  | <b>P2M1TJEE2C</b> |
|  |   |   |      | Double air pilot | <b>P2M1TJPP</b>   |
| <br><b>Double Air Pilot</b> |  | 3-way, 2-position, dual valve, NC/NC w/ exhaust check | 0.22 | Double solenoid  | <b>P2M1TDEE2C</b> |
|  |   |   |      | Double air pilot | <b>P2M1TDPP</b>   |
| <br><b>Double Solenoid</b>  |  | 3-way, 2-position, dual valve, NO/NO w/ exhaust check | 0.22 | Double solenoid  | <b>P2M1TCEE2C</b> |
|  |   |   |      | Double air pilot | <b>P2M1TCPP</b>   |
| <br><b>Double Air Pilot</b> |  | 3-way, 2-position, dual valve, NC/NO w/ exhaust check | 0.22 | Double solenoid  | <b>P2M1TEEE2C</b> |
|  |   |   |      | Single solenoid  | <b>P2M1T3ES2C</b> |
| <br><b>Double Solenoid</b>  |  | 3-way, 2-position, NC w/ exhaust check                | 0.22 | Single air pilot | <b>P2M1T3PS</b>   |
|  |   |   |      | Double solenoid  | <b>P2M1TGEE2C</b> |

**"T" Series Size 1 Accessories**

|  | Description   | Tube size    | Option                        | Part number        |
|--|---|--------------|-------------------------------|--------------------|
| <br>   | Size 1 push to connect fitting  | 5/32" or 4mm | Elbow                         | <b>CMD04-1</b>     |
|  |   |              | Straight                      | <b>FMD04-1</b>     |
| <br> | Size 1 push to connect fitting  | 1/4"         | Elbow                         | <b>CMD07-1B</b>    |
|  |   |              | Straight                      | <b>FMD07-1B</b>    |
| <br> | Size 1 push to connect fitting  | 6mm          | Elbow                         | <b>CMD06-1</b>     |
|  |   |              | Straight                      | <b>FMD06-1</b>     |
|   | Muffler for exhaust port  |              |                               | <b>MMDVA1</b>      |
|   | Plug  |              |                               | <b>PMDYY1</b>      |
|   | Double male union   |              | Connecting peripheral modules | <b>HMDXX1</b>      |
|   | M8 female connector to flying lead - IP67<br>LED and surge protection |              | 2M cable                      | <b>P8LS08L226C</b> |
|  |   |              | 5M cable                      | <b>P8LS08L526C</b> |
|  |   |              | 9M cable                      | <b>P8LS08L926C</b> |
|   | Field wireable connector  |              | M8 connector                  | <b>P8CS0803J</b>   |
|  |   |              | M12 connector                 | <b>P8CS1204J</b>   |
|   | Torx screwdriver  |              |                               | <b>P2M1K0TASD</b>  |

**Manifold Options**

| Module  | Part number       |
|---|-------------------|
| Pneumatic end plate kit   | <b>P2M2HXT01*</b> |
| Pneumatic end plate kit with torx screwdriver                   | <b>P2M2HXT0T*</b> |
| Intermediate supply module<br>(Includes 4 configuration plates) | <b>P2M2BXT0A*</b> |

\* Use Fittings for Size 2 Modules Only



P2M2HXT01



P2M2BXT0A

Valvair II Series

DX ISOMAX Series

Fieldbus







Isys ISO Series

Isys Micro Series







Moduflex Series

**D**  
Subbase & Manifold Valve Products

**“T” Series Manifold Valves with Individual Connectors Size 2**

|                   | Symbol  | Type  | Cv   | Operator         | Part number       |
|-------------------|---|---|------|------------------|-------------------|
| Valvair II Series |  | 4-way, 2-position                                     | 0.8  | Single solenoid  | <b>P2M2T4ES2C</b> |
|                   |   |   |      | Single air pilot | <b>P2M2T4PS</b>   |
|                   |  | 4-way, 2-position                                     | 0.8  | Double solenoid  | <b>P2M2T4EE2C</b> |
|                   |   |   |      | Double air pilot | <b>P2M2T4PP</b>   |
| DX ISOMAX Series  |  | 3-way, 2-position, dual valve, NC/NC w/ exhaust check | 0.44 | Double solenoid  | <b>P2M2TDEE2C</b> |
|                   |   |   |      | Double air pilot | <b>P2M2TDPP</b>   |
| Fieldbus Series   |  | 3-way, 2-position, dual valve, NO/NO w/ exhaust check | 0.44 | Double solenoid  | <b>P2M2TCEE2C</b> |
|                   |   |   |      | Double air pilot | <b>P2M2TCPP</b>   |
| Fieldbus Series   |  | 3-way, 2-position, dual valve, NC/NO w/ exhaust check | 0.44 | Double solenoid  | <b>P2M2TEEE2C</b> |
|                   |   |   |      | Single solenoid  | <b>P2M2T3ES2C</b> |
|                   |   |   |      |                  | Single air pilot  |
|                   |  | 3-way, 2-position, dual valve, NC/NC                  | 0.44 | Double solenoid  | <b>P2M2TGEE2C</b> |

**“T” Series Size 2 Accessories**

|                                   | Description   | Tube size  | Option                         | Part number        |
|-----------------------------------|---|--|--------------------------------|--------------------|
| Ilys ISO Series                   | Size 2 push to connect fitting  | 1/4"   | Elbow                          | <b>CMD07-2B</b>    |
|                                   |   |  | Straight                       | <b>FMD07-2B</b>    |
|                                   | Size 2 push to connect fitting  | 3/8"   | Elbow                          | <b>CMD09-2B</b>    |
|                                   |   |  | Straight                       | <b>FMD09-2B</b>    |
| Ilys Micro Series                 | Size 2 push to connect fitting  | 1/2"   | Straight                       | <b>FMD13-2B</b>    |
|                                   |   |  | Size 2 push to connect fitting | 6mm                |
|                                   | Straight  | <b>FMD06-2</b>   |                                |                    |
|                                   | Size 2 push to connect fitting  | 8mm  | Elbow                          | <b>CMD08-2</b>     |
|                                   |   |  | Straight                       | <b>FMD08-2</b>     |
|                                   | Size 2 push to connect fitting  | 10mm   | Elbow                          | <b>CMD10-2</b>     |
| Straight                          |   |  | <b>FMD10-2</b>                 |                    |
| Moduflex Series                   | Size 2 Push to connect fitting  | 12mm   | Elbow                          | <b>CMD12-2</b>     |
|                                   |   |  | Straight                       | <b>FMD12-2</b>     |
|                                   |  | Muffler for exhaust port   |                                | <b>MMDVA2</b>      |
|                                   |  | Plug   |                                | <b>PMDYY2</b>      |
|                                   |  | Double male union  | Connecting peripheral modules  | <b>HMDXX2</b>      |
| Subbase & Manifold Valve Products |  | M8 female connector to flying lead - IP67 LED and surge protection | 2M cable                       | <b>P8LS08L226C</b> |
|                                   |   |  | 5M cable                       | <b>P8LS08L526C</b> |
|                                   |   |  | 9M cable                       | <b>P8LS08L926C</b> |
|                                   |  | Field wireable connector   | M8 connector                   | <b>P8CS0803J</b>   |
|                                   |   |  | M12 connector                  | <b>P8CS1204J</b>   |
|                                   |  | Torx screwdriver   |                                | <b>P2M1K0TASD</b>  |

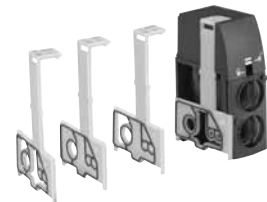
**Manifold Options**

| Module   | Part number       |
|--|-------------------|
| Pneumatic end plate kit                                      | <b>P2M2HXT01*</b> |
| Pneumatic end plate kit with torx screwdriver                | <b>P2M2HXT0T*</b> |
| Intermediate supply module (Includes 4 configuration plates) | <b>P2M2BXT0A*</b> |

\* Use Fittings for Size 2 Modules Only



**P2M2HXT01**



**P2M2BXT0A**

**"T" Series Valve Manifold with Individual Connectors**  
*(Complete with Pneumatic and Electrical Connectors)*

**P2M 1 T 4ES 2C 00 0 F4**

|  |            |  |  |
|--|------------|--|--|
| <b>Basic series</b>                                    |            |  |  |
| Valvetronic modules                                    | P2M        |  |  |
| <b>Size</b>  |            |  |  |
| Size 1   | 1          |  |  |
| Size 2   | 2          |  |  |
| <b>Valve series</b>                                    |            |  |  |
| Individual wire  | T          |  |  |
| <b>Valve type / function</b>                           |            |  |  |
| <b>3-way / 2-position</b>                              |            |  |  |
| Single solenoid, NC spring return                      | 3ES        |  |  |
| Single air pilot, NC spring return                     | 3PS        |  |  |
| <b>4-way / 2-position</b>                              |            |  |  |
| Single solenoid, spring return                         | 4ES        |  |  |
| Single air pilot, spring return                        | 4PS        |  |  |
| Double solenoid  | 4EE        |  |  |
| Double air pilot                                       | 4PP        |  |  |
| <b>Dual 3-way, 2-position, spring return</b>           |            |  |  |
| Solenoid, NC / NC + PO check (4/3 APB)                 | BEE*       |  |  |
| Air pilot, NC / NC + PO check (4/3 APB)                | BPP*       |  |  |
| Solenoid, NO / NO (4/3 Pressure Ctr.)                  | CEE        |  |  |
| Air pilot NO / NO (4/3 Pressure Ctr.)                  | CPP        |  |  |
| Solenoid, NC / NC with exhaust check                   | DEE        |  |  |
| Air pilot, NC / NC with exhaust check                  | DPP        |  |  |
| <b>Solenoid, NO / NC with exhaust check</b>            | <b>EEE</b> |  |  |
| <b>Solenoid, NC / NC without check (4/3 Exh. Ctr.)</b> | <b>GEE</b> |  |  |
| <b>Dual 4-way, 2-position, Spring Return</b>           |            |  |  |
| Solenoid   | JEE**      |  |  |
| Air pilot  | JPP**      |  |  |

|                        |                                     |
|------------------------|-------------------------------------|
| <b>Ports 2 &amp; 4</b> |                                     |
| C0*                    | 10mm Elbow fitting                  |
| C2*                    | 12mm Elbow fitting                  |
| <b>C4</b>              | <b>5/32" (4mm) Elbow fitting</b>    |
| C6                     | 6mm Elbow fitting                   |
| <b>C7</b>              | <b>1/4" Elbow fitting</b>           |
| C8*                    | 8mm Elbow fitting                   |
| <b>C9*</b>             | <b>3/8" Elbow fitting</b>           |
| F0*                    | 10mm Straight fitting               |
| F2*                    | 12mm Straight fitting               |
| <b>F3*</b>             | <b>1/2" Straight fitting</b>        |
| <b>F4</b>              | <b>5/32" (4mm) Straight fitting</b> |
| F6                     | 6mm Straight fitting                |
| <b>F7</b>              | <b>1/4" Straight fitting</b>        |
| F8*                    | 8mm Straight fitting                |
| <b>F9*</b>             | <b>3/8" Straight fitting</b>        |

\* Only available with size 2 valves.

|                        |      |
|------------------------|------|
| <b>Ports 1 &amp; 3</b> |      |
| 0                      | None |

|                    |  |
|--------------------|--|
| <b>Led / Cable</b> |  |
| 00                 | No cable, no led, no surge suppression       |
| V2                 | 2 Meter cable with led and surge suppression |
| V5                 | 5 Meter cable with led and surge suppression |
| V9                 | 9 Meter cable with led and surge suppression |

|                         |                                 |
|-------------------------|---------------------------------|
| <b>Operator Voltage</b> |                                 |
| 2C                      | 24VDC                           |
| 00                      | Remote pilot - 5/32" (4mm) tube |

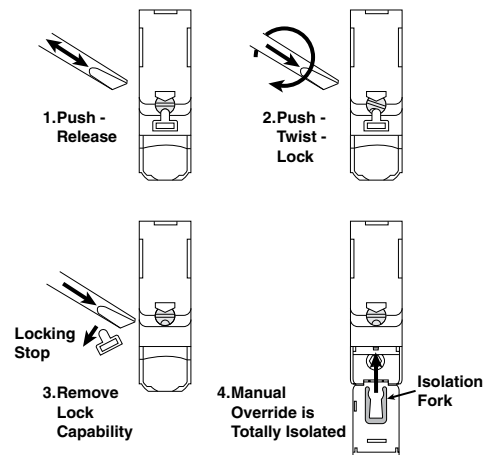
\* Valve includes peripheral P. O. check valve and union fittings.  
 \*\* Size 1 only.

Valvoir II Series  
 DX ISOMAX Series  
 Fieldbus  
 Isys ISO Series  
 Isys Micro Series  
 Moduflex Series  
**D**  
 Subbase & Manifold Valve Products









**With only one universal solenoid pilot for all configurations**

24VDC is now a global standard for all machines. The Moduflex 24VDC unique solenoid pilot is supplied with the multi-function manual override that can be adapted to all requirements, as explained by the drawings.










**Multi-function adaptable manual override**



**“V” Series Manifold Valves with Collective Wiring Size 1**

|   | Symbol  | Type  | Cv   | Operator        | Part number        |
|---|---|---|------|-----------------|--------------------|
|  <p>Single Solenoid      Double Solenoid</p> |  | 4-way, 2-position                                     | 0.32 | Single solenoid | <b>P2M1V4ES2CV</b> |
|   |  | 4-way, 2-position                                     | 0.32 | Double solenoid | <b>P2M1V4EE2CV</b> |
|   |   | 4-way, 2-position, dual valve, w/ exhaust check       | 0.18 |                 | <b>P2M1VJEE2CV</b> |
|   |  | 3-way, 2-position, dual valve, NC/NC w/ exhaust check | 0.22 | Double solenoid | <b>P2M1VDEE2CV</b> |
|   |  | 3-way, 2-position, dual valve, NO/NO w/ exhaust check | 0.22 | Double solenoid | <b>P2M1VCEE2CV</b> |
|   |  | 3-way, 2-position, dual valve, NC/NO w/ exhaust check | 0.22 | Double solenoid | <b>P2M1VEEE2CV</b> |
|   |  | 3-way, 2-position, NC w/ exhaust check                | 0.22 | Single solenoid | <b>P2M1V3ES2CV</b> |
|   |  | 3-way, 2-position, dual valve, NC/NC                  | 0.22 | Double solenoid | <b>P2M1VGEE2CV</b> |

**“V” Series Size 1 Accessories**

|   | Description   | Tube size            | Option                        | Part number       |                 |
|---|---|----------------------|-------------------------------|-------------------|-----------------|
|  | Size 1 push to connect fitting                            | 5/32"                | Elbow                         | <b>CMD04-1</b>    |                 |
|   |   |                      | Straight                      | <b>FMD04-1</b>    |                 |
|  | Size 1 push to connect fitting                            | 1/4"                 | Elbow                         | <b>CMD07-1B</b>   |                 |
|   |   |                      | Straight                      | <b>FMD07-1B</b>   |                 |
|  | Size 1 push to connect fitting                            | 6mm                  | Elbow                         | <b>CMD06-1</b>    |                 |
|   |   |                      | Straight                      | <b>FMD06-1</b>    |                 |
|  | Muffler for exhaust port                                  |                      |                               | <b>MMDVA1</b>     |                 |
|  | Plug  |                      |                               | <b>PMDYY1</b>     |                 |
|  | Double male union   |                      | Connecting peripheral modules | <b>HMDXX1</b>     |                 |
|  | Electrical 20-pin multi-connector cable with flying leads | IP65 rated           | 2M cable                      | <b>P8LMH20M2A</b> |                 |
|   |   |                      | 5M cable                      | <b>P8LMH20M5A</b> |                 |
|   |   |                      | 9M cable                      | <b>P8LMH20M9A</b> |                 |
|  | Electrical 25-pin D-sub cable                             | IP20 rated           | 3M cable                      | <b>P8LMH25M3A</b> |                 |
|   |   |                      | 9M cable                      | <b>SCD259D</b>    |                 |
|   |   |                      | IP65 rated                    | 3M cable          | <b>SCD253W</b>  |
|   |   |                      |                               | 9M cable          | <b>SCD259WE</b> |
|   | Field wireable connector for power supply                 | Female               | M12 - A code                  | <b>P8CS1205AA</b> |                 |
|   | Line termination resistor                                 | Profibus DP          | M12 type B                    | <b>P8BPA00MB</b>  |                 |
|   |   | Devicenet or Canopen | M12 type A                    | <b>P8BPA00MA</b>  |                 |
|   | AS-i M12 cable with jack for addressing                   |                      | 1M cable                      | <b>P8LS12JACK</b> |                 |
|  | Torx screwdriver  |                      |                               | <b>P2M1K0TASD</b> |                 |

### Electrical Connections

| Description                                    | Part number      |
|--|------------------|
| 20-pin, Multi-connector electrical head module | <b>P2M2HEV0A</b> |
| 25-pin, D-sub, electrical head module          | <b>P2M2HEV0D</b> |

### Fieldbus Connections

| Description               | Part number   |                       |
|---------------------------|---|-----------------------|
| Profibus DP               | <b>P2M2HBVP21600</b>  |                       |
| DeviceNet                 | <b>P2M2HBVD21600</b>  |                       |
| CANopen                   | <b>P2M2HBVC21600</b>  |                       |
| Interbus S                | <b>P2M2HBVS11600</b>  |                       |
| AS-i                      | 0 inputs and 8 solenoid outputs                                     | <b>P2M2HBVA10800</b>  |
| AS-i                      | 8 (PNP) inputs on eight (M8) connectors and 8 solenoid outputs      | <b>P2M2HBVA10808A</b> |
| AS-i                      | 8 (PNP) inputs on four (M12) connectors and 8 solenoid outputs      | <b>P2M2HBVA10808B</b> |
| AS-i Version 2.1 Protocol | AS-i 0 inputs and 6 solenoid outputs                                | <b>P2M2HBVA20600</b>  |
| AS-i Version 2.1 Protocol | AS-i 8 (PNP) inputs on eight (M8) connectors and 6 solenoid outputs | <b>P2M2HBVA20608A</b> |
| AS-i Version 2.1 Protocol | AS-i 8 (PNP) inputs on four (M12) connectors and 6 solenoid outputs | <b>P2M2HBVA20608B</b> |

### Manifold Options

| Module  | Part number       |
|---|-------------------|
| Pneumatic end plate kit   | <b>P2M2HXT01*</b> |
| Pneumatic end plate kit with torx screwdriver                   | <b>P2M2HXT0T*</b> |
| Intermediate supply module<br>(Includes 4 configuration plates) | <b>P2M2BXV0A*</b> |

\* Use Fittings for Size 2 Modules Only



P2M2HXT01



P2M2BXV0A

Valvair II  
Series

DX ISOMAX  
Series

Fieldbus

Isys ISO  
Series










Isys Micro  
Series

Moduflex  
Series














**D**

Subbase & Manifold  
Valve Products

**“V” Series Manifold Valves with Collective Wiring Size 2**

|  | Symbol  | Type  | Cv   | Operator        | Part number        |
|--|---|---|------|-----------------|--------------------|
| <br>Single Solenoid<br><br><br>Double Solenoid |  | 4-way, 2-position                                     | 0.8  | Single solenoid | <b>P2M2V4ES2CV</b> |
|  |  | 4-way, 2-position                                     | 0.8  | Double solenoid | <b>P2M2V4EE2CV</b> |
|  |  | 3-way, 2-position, dual valve, NC/NC w/ exhaust check | 0.44 | Double solenoid | <b>P2M2VDEE2CV</b> |
|  |  | 3-way, 2-position, dual valve, NO/NO w/ exhaust check | 0.44 | Double solenoid | <b>P2M2VCEE2CV</b> |
|  |  | 3-way, 2-position, dual valve, NC/NO w/ exhaust check | 0.44 | Double solenoid | <b>P2M2VEEE2CV</b> |
|  |  | 3-way, 2-position, NC w/ exhaust check                | 0.44 | Single solenoid | <b>P2M2V3ES2CV</b> |
|  |  | 3-way, 2-position, dual valve, NC/NC                  | 0.44 | Double solenoid | <b>P2M2VGEE2CV</b> |

**“V” Series Size 2 Accessories**

|   | Description   | Tube size    | Option  | Part number       |
|---|---|--------------|---|-------------------|
|  | Size 2 push to connect fitting                            | 1/4" OD tube | Elbow   | <b>CMD07-2B</b>   |
|   |   |              | Straight  | <b>FMD07-2B</b>   |
|  | Size 2 push to connect fitting                            | 3/8" OD tube | Elbow   | <b>CMD09-2B</b>   |
|   |   |              | Straight  | <b>FMD09-2B</b>   |
|  | Size 2 push to connect fitting                            | 1/2" OD tube | Straight  | <b>FMD13-2B</b>   |
|   |   |              |  | 6mm OD tube       |
|   | Size 2 push to connect fitting                            | Straight     | <b>FMD06-2</b>  |                   |
|  | Size 2 push to connect fitting                            | 8mm OD tube  | Elbow   | <b>CMD08-2</b>    |
|   |   |              | Straight  | <b>FMD08-2</b>    |
|  | Size 2 push to connect fitting                            | 10mm OD tube | Elbow   | <b>CMD10-2</b>    |
|   |   |              | Straight  | <b>FMD10-2</b>    |
|  | Size 2 push to connect fitting                            | 12mm OD tube | Elbow   | <b>CMD12-2</b>    |
|   |   |              | Straight  | <b>FMD12-2</b>    |
|  | Muffler for exhaust port                                  |              |   | <b>MMDVA2</b>     |
|  | Plug  |              |   | <b>PMDYY2</b>     |
|  | Double Male Union   |              | Connecting peripheral modules   | <b>HMDXX2</b>     |
|  | Electrical 20-pin multi-connector cable with flying leads | IP65 rated   | 2M cable  | <b>P8LMH20M2A</b> |
|   |   |              | 5M cable  | <b>P8LMH20M5A</b> |
|   |   |              | 9M cable  | <b>P8LMH20M9A</b> |
|  | Electrical 25-pin D-sub cable                             | IP20 rated   | 3M cable  | <b>P8LMH25M3A</b> |
|   |   |              | 9M cable  | <b>SCD259D</b>    |
|   |   |              | 3M cable  | <b>SCD253W</b>    |
|   |   | IP65 rated   | 9M cable  | <b>SCD259WE</b>   |
|  | Torx screwdriver  |              |   | <b>P2M1K0TASD</b> |

### Electrical Connections

| Description                                    | Part number      |
|--|------------------|
| 20-pin, Multi-connector electrical head module | <b>P2M2HEV0A</b> |
| 25-pin, D-sub, electrical head module          | <b>P2M2HEV0D</b> |

### Fieldbus Connections

| Description                    | Part number   |
|--------------------------------|---|
| Profibus DP                    | <b>P2M2HBVP21600</b>  |
| DeviceNet                      | <b>P2M2HBVD21600</b>  |
| CANopen                        | <b>P2M2HBVC21600</b>  |
| Interbus S                     | <b>P2M2HBVS11600</b>  |
| AS-i                           | 0 inputs and 8 solenoid outputs<br><b>P2M2HBVA10800</b>                                 |
| AS-i                           | 8 (PNP) inputs on eight (M8) connectors and 8 solenoid outputs<br><b>P2M2HBVA10808A</b> |
| AS-i                           | 8 (PNP) inputs on four (M12) connectors and 8 solenoid outputs<br><b>P2M2HBVA10808B</b> |
| AS-i Version 2.1 Protocol AS-i | 0 inputs and 6 solenoid outputs<br><b>P2M2HBVA20600</b>                                 |
| AS-i Version 2.1 Protocol AS-i | 8 (PNP) inputs on eight (M8) connectors and 6 solenoid outputs<br><b>P2M2HBVA20608A</b> |
| AS-i Version 2.1 Protocol AS-i | 8 (PNP) inputs on four (M12) connectors and 6 solenoid outputs<br><b>P2M2HBVA20608B</b> |

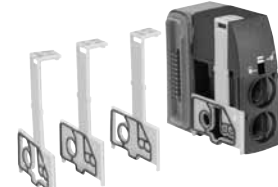
### Manifold Options

| Module  | Part number       |
|---|-------------------|
| Pneumatic end plate kit   | <b>P2M2HXT01*</b> |
| Pneumatic end plate kit with torx screwdriver                   | <b>P2M2HXT0T*</b> |
| Intermediate supply module<br>(Includes 4 configuration plates) | <b>P2M2BXV0A*</b> |

\* Use Fittings for Size 2 Modules Only



P2M2HXT01



P2M2BXV0A

Valvair II  
Series

DX ISOMAX  
Series

Fieldbus

Isys ISO  
Series

Isys Micro  
Series

Moduflex  
Series

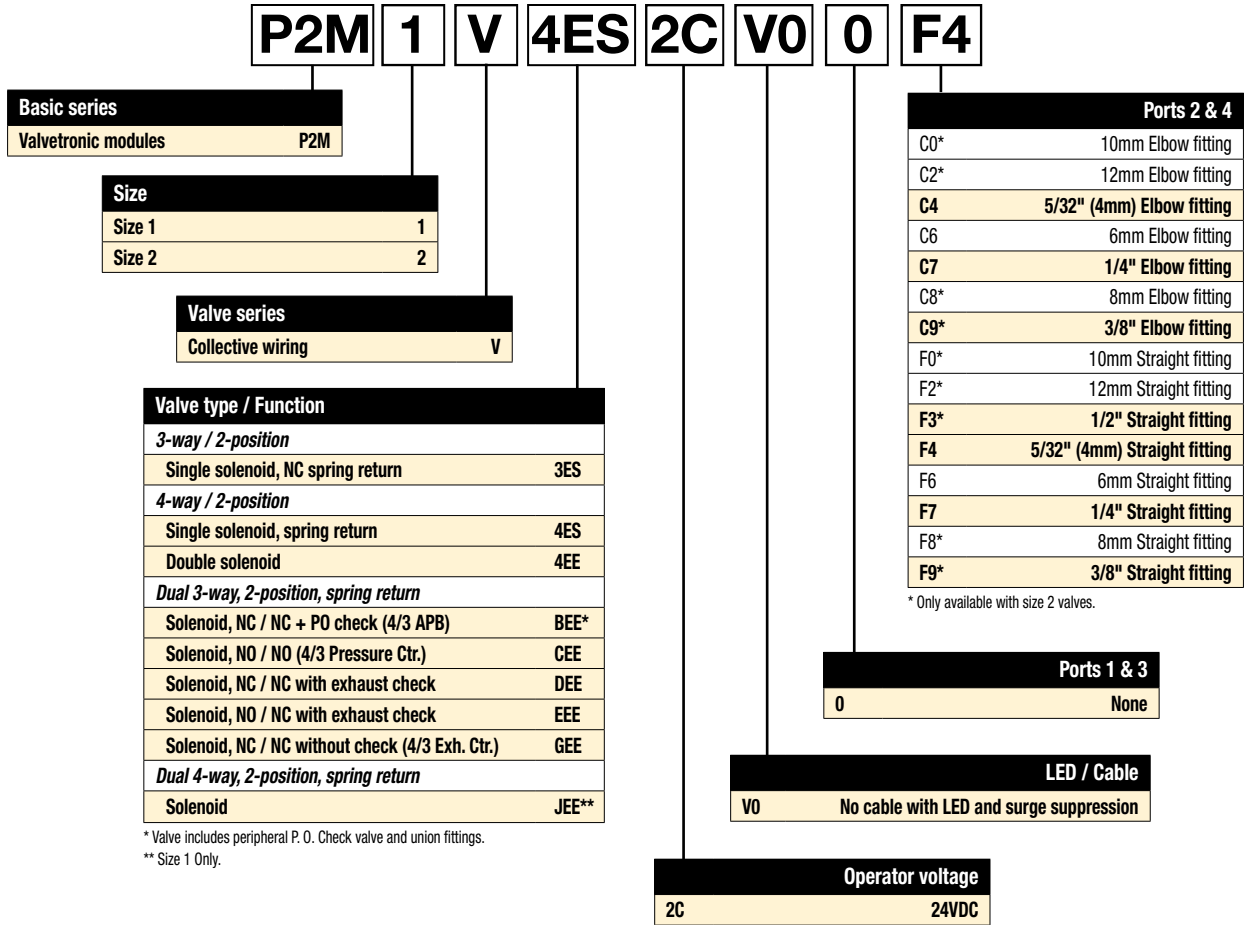
**D**

Subbase & Manifold  
Valve Products



**“V” Series Valve Manifold with Collective Wiring**  
*(Complete with Pneumatic Connectors)*

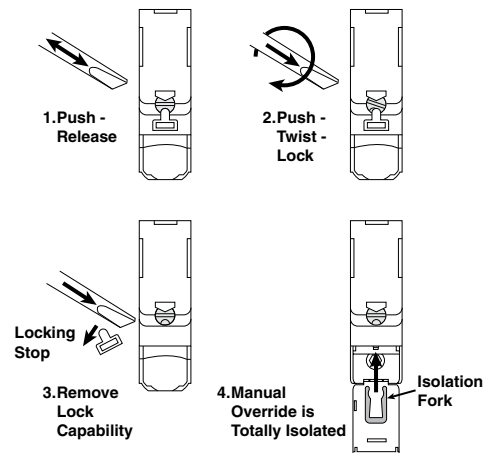
Valvair II Series  
 DX ISOMAX Series  
 Fieldbus  
 Isys ISO Series  
 Isys Micro Series  
 Moduflex Series  
**D**  
 Subbase & Manifold Valve Products



**With only one universal solenoid pilot for all configurations**













24VDC is now a global standard for all machines. The Moduflex 24VDC unique solenoid pilot is supplied with the multi-function manual override that can be adapted to all requirements, as explained by the drawings.

**Multi-function adaptable manual override**



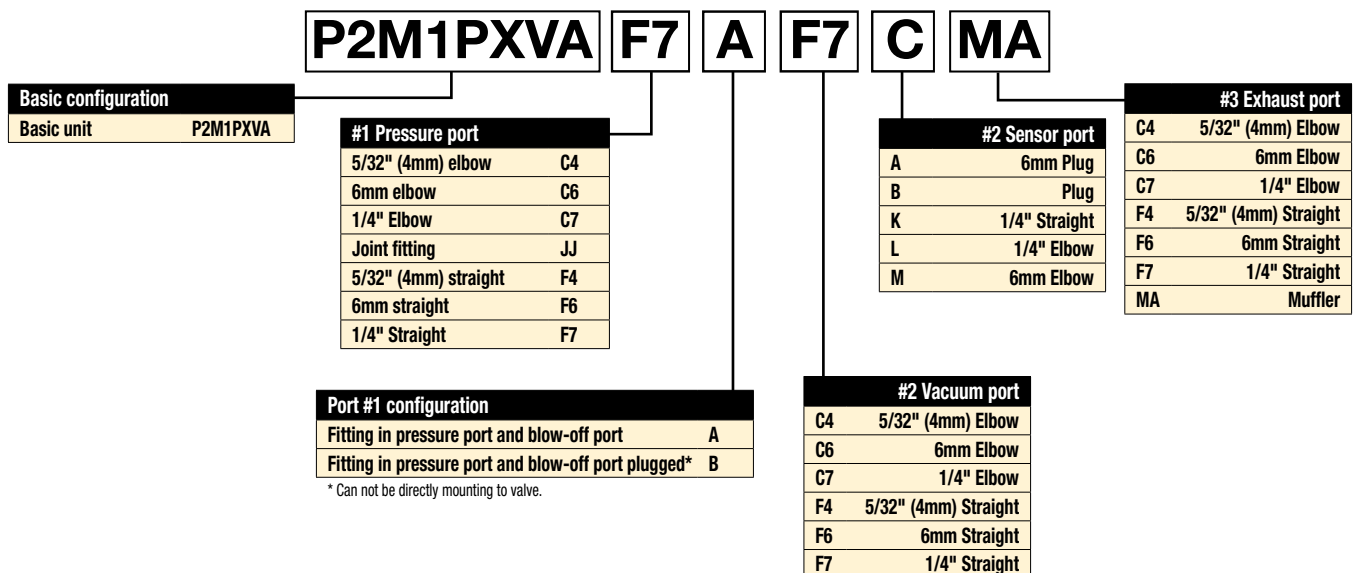


**Peripheral Modules Size 1**

| Accessories   | Description                      | Option                         | Part number                 |
|---|----------------------------------|--------------------------------|-----------------------------|
|    | Pressure regulator without gauge | 0 to 30 PSI                    | <b>P2M1PXST</b>             |
|   |                                  | 0 to 60 PSI                    | <b>P2M1PXSL</b>             |
|   |                                  | 0 to 120 PSI                   | <b>P2M1PXSX</b>             |
|    | Pressure regulator with gauge    | 0 to 30 PSI                    | <b>P2M1PXSR</b>             |
|   |                                  | 0 to 60 PSI                    | <b>P2M1PXSM</b>             |
|   |                                  | 0 to 120 PSI                   | <b>P2M1PXSG</b>             |
|    | Gauge                            | 0 to 30 PSI                    | <b>P2M1K0GT</b>             |
|   |                                  | 0 to 60 PSI                    | <b>P2M1K0GL</b>             |
|   |                                  | 0 to 120 PSI                   | <b>P2M1K0GN</b>             |
|    | Dual P.O. Check valve            |                                | <b>P2M1PXCA</b>             |
|    | Dual flow control                |                                | <b>P2M1PXFA</b>             |
|    | Vacuum generator                 | See ordering information below | <b>P2M1PXVA</b>             |
|    | Size 1 push to connect fitting   | 5/32" or 4mm OD tube           | Elbow<br><b>CMD04-1</b>     |
|   |                                  |                                | Straight<br><b>FMD04-1</b>  |
|   | Size 1 push to connect fitting   | 1/4" OD tube                   | Elbow<br><b>CMD07-1B</b>    |
|   |                                  |                                | Straight<br><b>FMD07-1B</b> |
|  | Size 1 push to connect fitting   | 6mm OD tube                    | Elbow<br><b>CMD06-1</b>     |
|   |                                  |                                | Straight<br><b>FMD06-1</b>  |
|  | Double male union                | Connecting peripheral modules  | <b>HMDXX1</b>               |
|  | Muffler for vacuum exhaust port  |                                | <b>MMDVA1</b>               |
|  | Plug                             |                                | <b>PMDYY1</b>               |
















Valvair II Series  
 DX ISOMAX Series  
 Fieldbus  
 Isys ISO Series  
 Isys Micro Series  
 Moduflex Series

**Vacuum Generator Model Number Index**

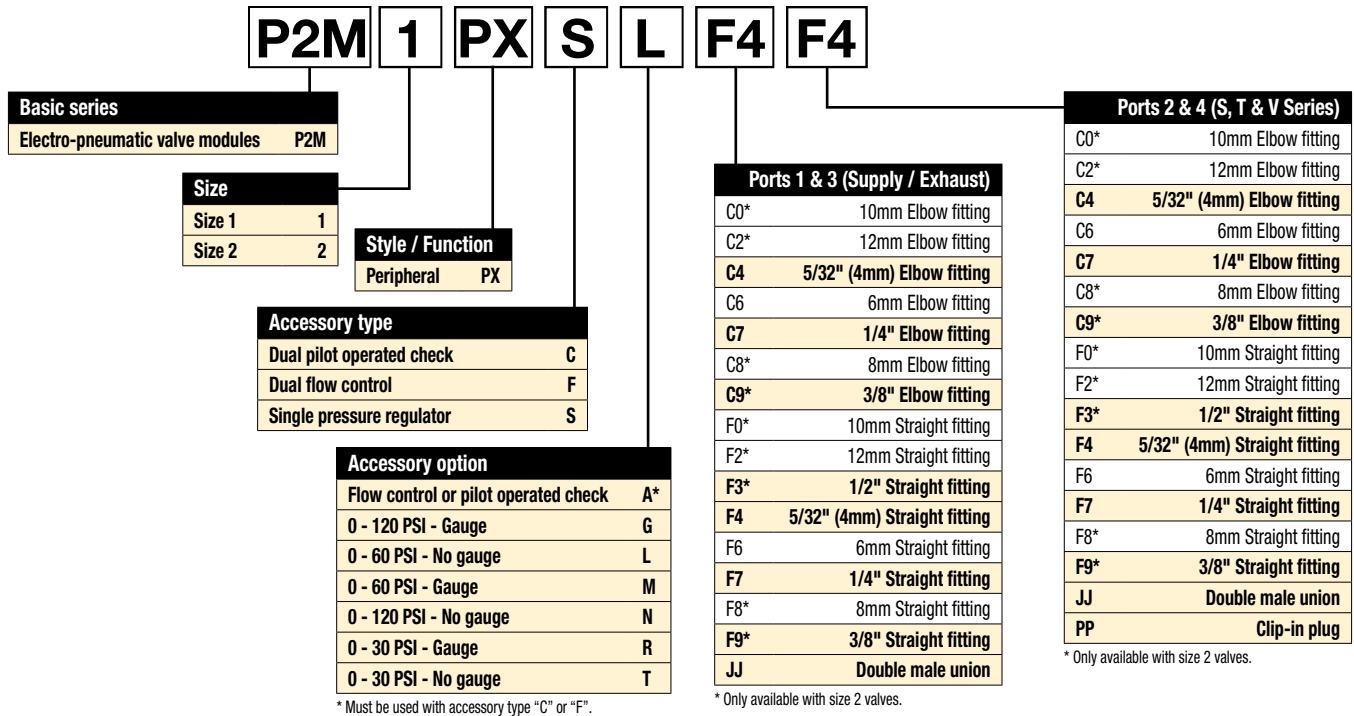


**D**  
 Subbase & Manifold Valve Products

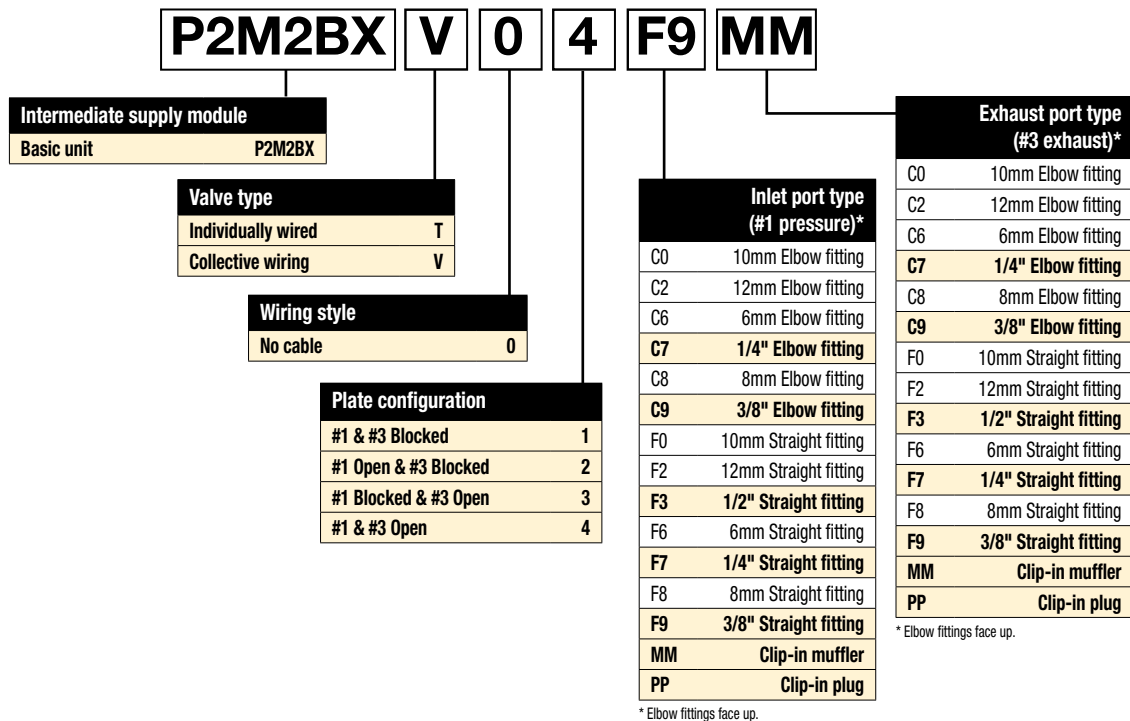
**Peripheral Modules Size 2**

|                                   | Acessories  | Description                      | Option  | Part number                 |
|-----------------------------------|---|----------------------------------|---|-----------------------------|
| Valvair II Series                 |    | Pressure regulator without gauge | 0 to 30 PSI   | <b>P2M2PXST</b>             |
|                                   |   |                                  | 0 to 60 PSI   | <b>P2M2PXSL</b>             |
|                                   |   |                                  | 0 to 120 PSI  | <b>P2M2PXSN</b>             |
| Valvair II Series                 |    | Pressure regulator with gauge    | 0 to 30 PSI   | <b>P2M2PXSR</b>             |
|                                   |   |                                  | 0 to 60 PSI   | <b>P2M2PXSM</b>             |
|                                   |   |                                  | 0 to 120 PSI  | <b>P2M2PXSG</b>             |
| DX ISOMAX Series                  |    | Gauge                            | 0 to 30 PSI   | <b>P2M1K0GT</b>             |
|                                   |   |                                  | 0 to 60 PSI   | <b>P2M1K0GL</b>             |
|                                   |   |                                  | 0 to 120 PSI  | <b>P2M1K0GN</b>             |
| Fieldbus                          |    | Dual P.O. check valve            |   | <b>P2M2PXCA</b>             |
|                                   |   |                                  |    | Dual flow control           |
| Isys ISO Series                   |   | Size 2 push to connect fitting   | 1/4" OD tube  | Elbow<br><b>CMD07-2B</b>    |
|                                   |   |                                  | 3/8" OD tube  | Straight<br><b>FMD07-2B</b> |
| Isys Micro Series                 |   | Size 2 push to connect fitting   | 1/2" OD tube  | Elbow<br><b>CMD09-2B</b>    |
|                                   |   |                                  | 6mm OD tube   | Straight<br><b>FMD09-2B</b> |
| Moduflex Series                   |   | Size 2 push to connect fitting   | 8mm OD tube   | Elbow<br><b>CMD13-2B</b>    |
|                                   |   |                                  | 10mm OD tube  | Straight<br><b>FMD13-2B</b> |
| Moduflex Series                   |   | Size 2 push to connect fitting   | 12mm OD tube  | Elbow<br><b>CMD06-2</b>     |
|                                   |   |                                  |   | Straight<br><b>FMD06-2</b>  |
| Moduflex Series                   |   | Size 2 push to connect fitting   | 8mm OD tube   | Elbow<br><b>CMD08-2</b>     |
|                                   |   |                                  | 10mm OD tube  | Straight<br><b>FMD08-2</b>  |
| Moduflex Series                   |   | Size 2 push to connect fitting   | 12mm OD tube  | Elbow<br><b>CMD10-2</b>     |
|                                   |   |                                  |   | Straight<br><b>FMD10-2</b>  |
| Moduflex Series                   |   | Size 2 push to connect fitting   | 12mm OD tube  | Elbow<br><b>CMD12-2</b>     |
|                                   |   |                                  |   | Straight<br><b>FMD12-2</b>  |
| D                                 |  | Muffler for exhaust port         |   | <b>MMDVA2</b>               |
|                                   |   |                                  |  | Plug                        |
| Subbase & Manifold Valve Products |  | Double Male Union                | Connecting peripheral modules   | <b>HMDXX2</b>               |
|                                   |   |                                  |   |                             |

**“P” Series Peripheral Modules Model Number Index**  
*(Complete with Pneumatic Connectors)*



**Intermediate Supply Module Model Number Index**



**Moduflex Add-A-Fold Assembly Model Number Index**  
*(Complete with Pneumatic and Electrical Connectors)*

**How To Order Plug-in Add-A-Fold Assemblies**

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List valves and manifolds. List left to right, LOOKING AT THE CYLINDER PORTS on the manifold.

**P2MA V 0 1 C9 C9 ##**

| Moduflex island assembly |       |
|--------------------------|-------|
| Add-A-Fold               | P2MA* |

\*Includes pneumatic H & T end plate kit.

| Style              |    |
|--------------------|----|
| Individually wired | T  |
| Collective wiring  | V* |

\* Includes 20-pin multi-connector or 25-pin, D-sub electrical head module.

| Wiring / Bus protocol                      |   |
|--|---|
| No cable (20-pin multi-connector T series) | 0 |
| 2 Meter cable (20-pin)                     | 2 |
| 5 Meter cable (20-pin)                     | 5 |
| 9 Meter cable (20-pin)                     | 9 |
| Bus  |   |
| No cable (25-pin, D-sub)                   | D |
| 3 Meter cable (25-pin, D-sub)              | F |

\* Order bus module as a separate line item.  
 † Default to option "0" for T series.

| Pilot source                       |   |
|------------------------------------|---|
| Internal supply / Internal exhaust | 1 |
| Internal supply / External exhaust | 2 |
| External supply / Internal exhaust | 3 |
| External supply / External exhaust | 4 |

| Number of stations <sup>†</sup> |        |
|---------------------------------|--------|
| 01 - 19*                        | V-Type |
| 01 - 30                         | T-Type |

\* Max. number of addresses for V type is 19. Single solenoid valves equal one address. Double solenoid valves equal two addresses. Maximum address may depend upon choice of bus protocol.

† Intermediate modules are considered stations, but do not count against maximum number of addresses for manifold.

| Exhaust port type (#3 Exhaust)* |                              |
|---------------------------------|------------------------------|
| C0                              | 10mm Elbow fitting           |
| C2                              | 12mm Elbow fitting           |
| C6                              | 6mm Elbow fitting            |
| <b>C7</b>                       | <b>1/4" Elbow fitting</b>    |
| C8                              | 8mm Elbow fitting            |
| <b>C9</b>                       | <b>3/8" Elbow fitting</b>    |
| F0                              | 10mm Straight fitting        |
| F2                              | 12mm Straight fitting        |
| <b>F3</b>                       | <b>1/2" Straight fitting</b> |
| F6                              | 6mm Straight fitting         |
| <b>F7</b>                       | <b>1/4" Straight fitting</b> |
| F8                              | 8mm Straight fitting         |
| <b>F9</b>                       | <b>3/8" Straight fitting</b> |
| MM                              | Clip-in muffler              |
| PP                              | Clip-in plug                 |

\* Elbow fittings face up.

| Inlet port type (#1 pressure)* |                              |
|--------------------------------|------------------------------|
| C0                             | 10mm Elbow fitting           |
| C2                             | 12mm Elbow fitting           |
| C6                             | 6mm Elbow fitting            |
| <b>C7</b>                      | <b>1/4" Elbow fitting</b>    |
| C8                             | 8mm Elbow fitting            |
| <b>C9</b>                      | <b>3/8" Elbow fitting</b>    |
| F0                             | 10mm Straight fitting        |
| F2                             | 12mm Straight fitting        |
| <b>F3</b>                      | <b>1/2" Straight fitting</b> |
| F6                             | 6mm Straight fitting         |
| <b>F7</b>                      | <b>1/4" Straight fitting</b> |
| F8                             | 8mm Straight fitting         |
| <b>F9</b>                      | <b>3/8" Straight fitting</b> |
| MM                             | Clip-in muffler              |
| PP                             | Clip-in plug                 |

\* Elbow fittings face up.



"V" Series with 20-pin Connector



"V" Series with Field Bus Connection

Valvair II Series  
 DX ISOMAX Series  
 Fieldbus  
 Isys ISO Series  
 Isys Micro Series  
 Moduflex Series  
**D**  
 Subbase & Manifold Valve Products

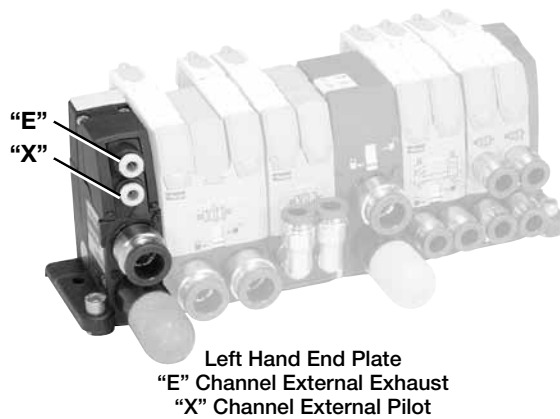
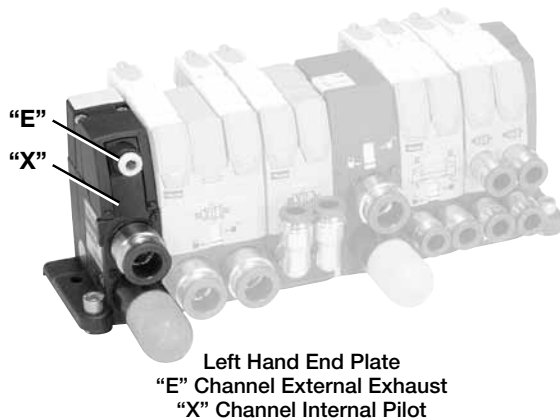
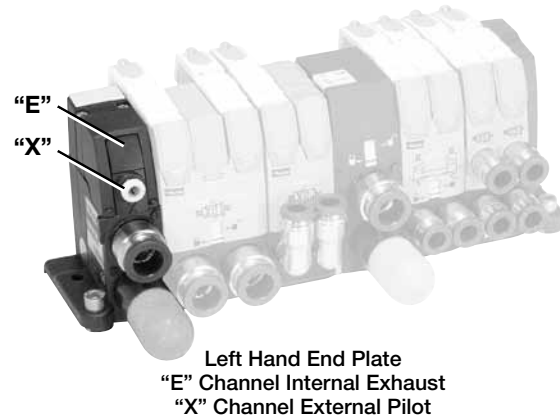
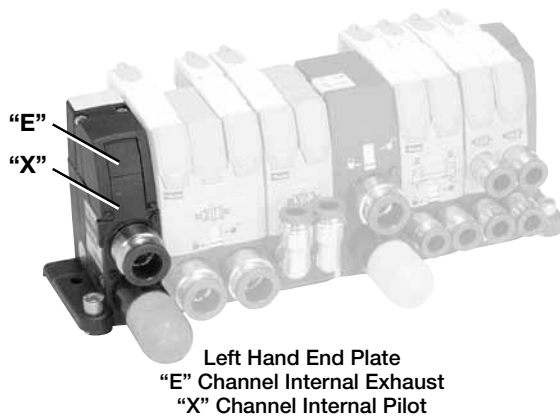
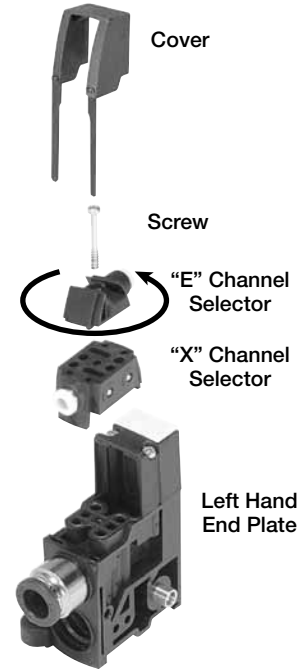
**Internal and external pilot supply options**

All T and V Series Valve bases incorporate an auxiliary channel "X" to supply pressure to the solenoid pilots. The "X" galley is pressurized from the left hand end plate. Depending on the configuration of the left hand end plate, this pressure is either supplied from the #1 port in the left hand end plate or supplied externally through a 4mm OD tube fitting in the left hand end plate. This fitting is supplied in all left hand end plates and can be converted in the field.

**Internal and external solenoid pilot exhaust options**

All T and V Series Valve bases incorporate an auxiliary channel "E" which is used to exhaust the solenoid pilot pressure from each solenoid valve. The "E" galley is connected to the left hand end plate. Depending on the configuration of the left hand end plate, this exhaust is either connected to the #3 exhaust port or is connected to a 4mm OD Tube fitting in the left hand end plate. This fitting is supplied in all left hand end plates and can be converted in the field.

To configure the left hand end plate, with pressure off, remove head cover to expose the selector section. Loosen selector section and rotate "X" or "E" channel selector to desired position. Tighten selector section and assemble cover.



Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

Isys Micro Series

Moduflex Series

**D**

Subbase & Manifold Valve Products

**Solenoid Pilot 24VDC**

| Description   | Part number      |
|---|------------------|
| Solenoid pilot (without plug-in electrical connector) | <b>P2D8V32C5</b> |
| Air pilot with 5/32" (4mm) tube fitting               | <b>P2M2K0PA</b>  |



P2D8V32C5



P2M2K0PA

Valvair II Series

DX ISOMAX Series

**Size 1 Valve Without Solenoid Pilot and Without Subbase**

**4-way / 2-position / Single Valve**



P2M1X4EE

| Solenoid                     | Part number     |
|------------------------------|-----------------|
| Single solenoid (Monostable) | <b>P2M1X4ES</b> |
| Double solenoid (Bistable)   | <b>P2M1X4EE</b> |

**4-way / 2-position / Dual Valve**

| Solenoid                           | Part number     |
|------------------------------------|-----------------|
| Solenoid spring with exhaust check | <b>P2M1XJEE</b> |

**3-way / 2-position / Dual Valve**

| Solenoid                                   | Part number     |
|--|-----------------|
| Double solenoid NC + NC with exhaust check | <b>P2M1XDEE</b> |
| Double solenoid NO + NO with exhaust check | <b>P2M1XCEE</b> |
| Double solenoid NC + NO with exhaust check | <b>P2M1XEEE</b> |
| Single solenoid NC with exhaust check      | <b>P2M1X3ES</b> |

**Size 2 Valve Without Solenoid Pilot and Without Subbase**

**4-way / 2-position / Dual Valve**



P2M2X4EE

| Solenoid                     | Part number     |
|------------------------------|-----------------|
| Single solenoid (Monostable) | <b>P2M2X4ES</b> |
| Double solenoid (Bistable)   | <b>P2M2X4EE</b> |

**3-way / 2-position / Dual Valve**

| Solenoid                                   | Part number     |
|--|-----------------|
| Double solenoid NC + NC with exhaust check | <b>P2M2XDEE</b> |
| Double solenoid NO + NO with exhaust check | <b>P2M2XCEE</b> |
| Double solenoid NC + NO with exhaust check | <b>P2M2XEEE</b> |
| Single solenoid NC with exhaust check      | <b>P2M2X3ES</b> |

Fieldbus Series

Isys ISO Series

Isys Micro Series

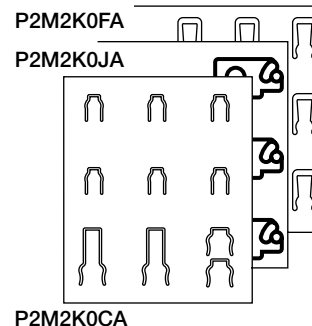
Moduflex Series

**D**

Subbase & Manifold Valve Products

**Set of Maintenance Parts**

| Description   | Part number     |
|---|-----------------|
| Clips Set of 10 clips: 6 for size 1 valves, 2 for size 2 valves, 2 for end plate and intermediate modules                                       | <b>P2M2K0CA</b> |
| Seals Set of 10 seals: 3 for manifold to manifold seals, 3 under solenoid pilot seals, 4 under valve seals (two size 1 seals, two size 2 seals) | <b>P2M2K0JA</b> |
| Forks Set of 10 isolation forks for solenoid pilot manual override  | <b>P2M2K0FA</b> |



**“S” Series Individual Subbase Valve Dimensions and Mounting**

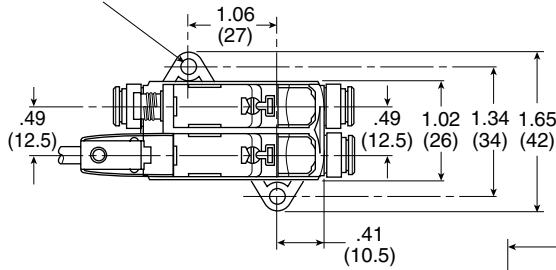
**Subbase Valve Size 1**



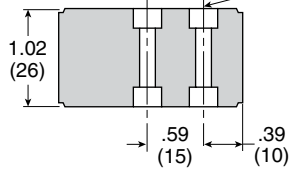
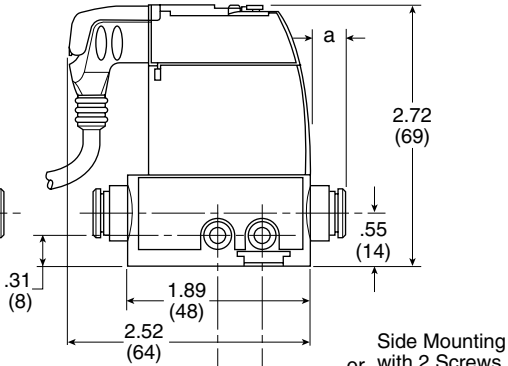
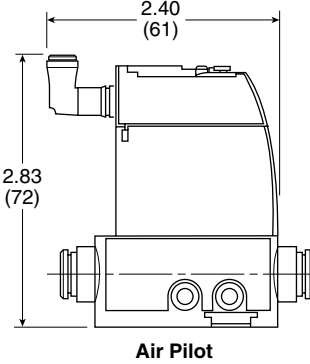
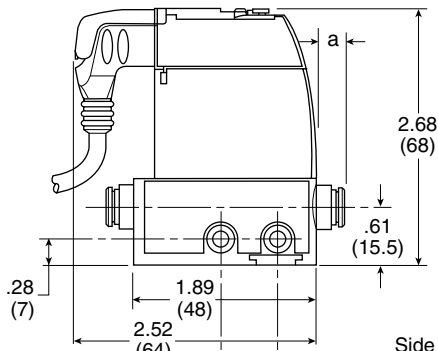
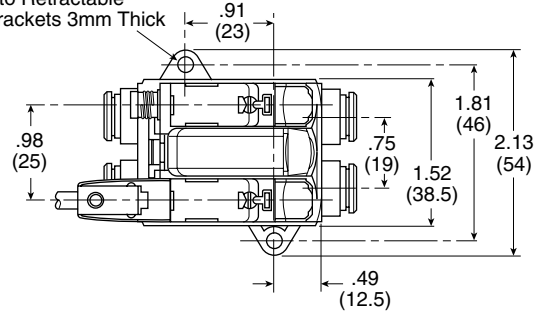
**Subbase Valve Size 2**



Surface Mounting with Screws 4 mm Dia. into Retractable Brackets 3mm Thick

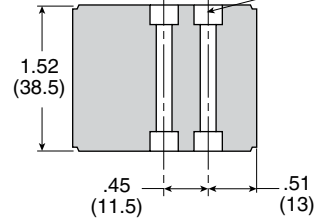


Surface Mounting with Screws 4 mm Dia. into Retractable Brackets 3mm Thick



**Size 1**

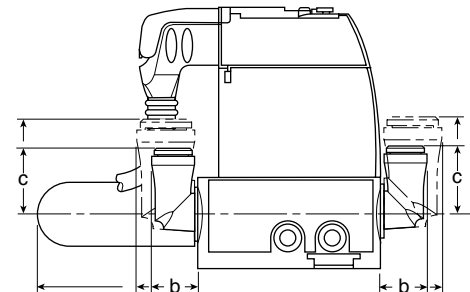
Side Mounting with 2 Screws 4mm Dia.



**Size 2**

**Special Case:** 4/3 all ports blocked. Add the dual P.O. check valve that has been plugged in the basic valve.

|                      | OD Tube Ext. | a  | b  | c  |
|----------------------|--------------|----|----|----|
| <b>Size 1 Valves</b> | 5/32" (4 mm) | 8  | 10 | 12 |
|                      | 6 mm         | 8  | 13 | 16 |
|                      | 1/4"         | 15 | 18 | 22 |
|                      | Muffler      | 31 |    |    |
| <b>Size 2 Valves</b> | 1/4"         | 12 | 18 | 22 |
|                      | 8 mm         | 9  | 16 | 19 |
|                      | 3/8"         | 16 | 23 | 26 |
|                      | 10 mm        | 13 | 18 | 22 |
|                      | Muffler      | 40 |    |    |



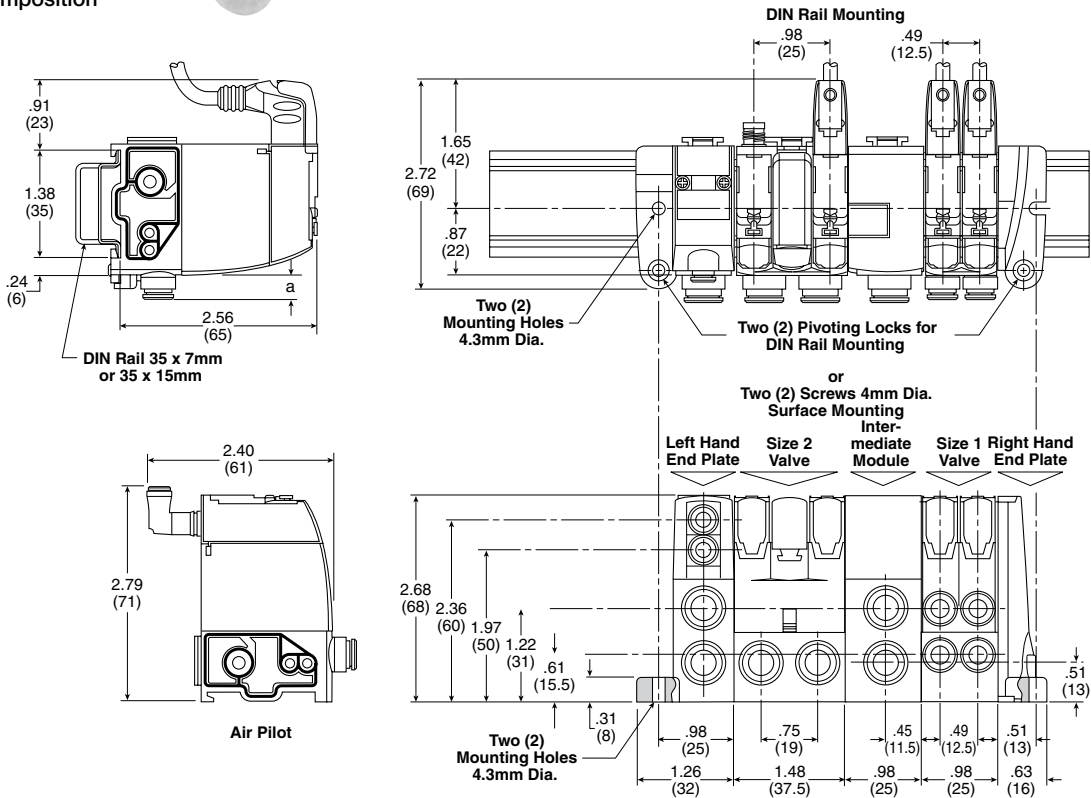


**"T" Series Manifold Dimensions and Mounting**

Valvair II Series  
 DX ISOMAX Series  
 Fieldbus  
 Isys ISO Series  
 Isys Micro Series  
 Moduflex Series  
**D**  
 Subbase & Manifold Valve Products



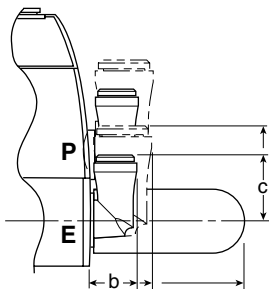
Total Width Depends on Valve Composition



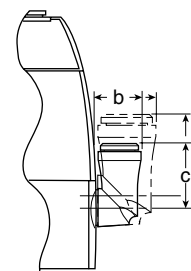
**Special Case:** 4/3 all ports blocked function within island version, add the dimensions of the dual P.O. check valve plugged into the island.

**End Plate and Intermediate Modules**

|               | a  | b  | c  |
|---------------|----|----|----|
| 6 mm Tube OD  | 8  | 13 | 16 |
| 1/4" Tube OD  | 12 | 18 | 22 |
| 8 mm Tube OD  | 9  | 16 | 19 |
| 3/8" Tube OD  | 16 | 23 | 26 |
| 10 mm Tube OD | 13 | 18 | 25 |
| 12 mm Tube OD | 13 | 19 | 25 |
| 1/2" Tube OD  | 13 |    |    |
| Muffler       | 40 |    |    |



| OD Tube       | Ext.         | a  | b  | c  |
|---------------|--------------|----|----|----|
| Size 1 Valves | 5/32" (4 mm) | 8  | 10 | 12 |
|               | 6 mm         | 8  | 13 | 16 |
|               | 1/4"         | 15 | 18 | 22 |
| Size 2 Valves | 1/4"         | 12 | 18 | 22 |
|               | 8 mm         | 9  | 16 | 19 |
|               | 3/8"         | 16 | 23 | 26 |
|               | 10 mm        | 13 | 18 | 22 |

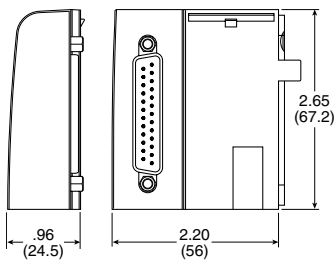
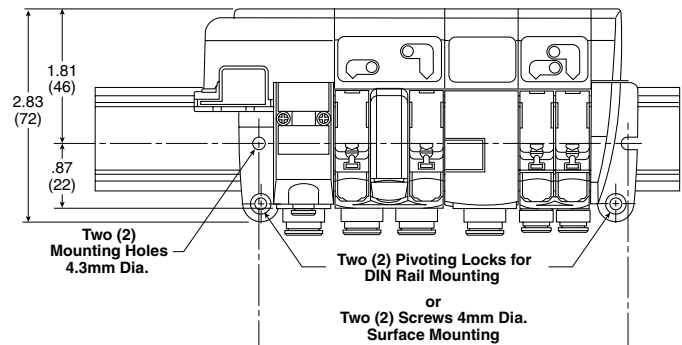
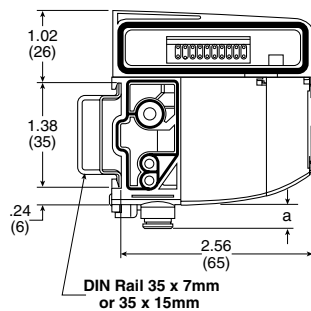




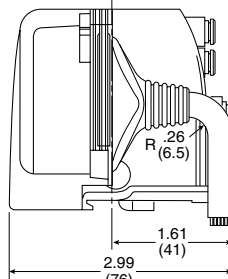
**“V” Series Manifold Dimensions and Mounting**  
 20-pin, Multi-Connector Valve Manifold



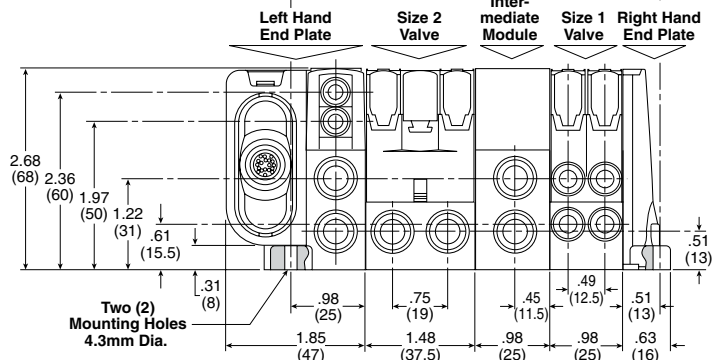
Total Width Depends  
 on Valve Composition



25-pin,  
 D-Sub

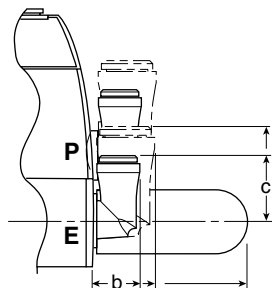


20-pin,  
 Multi-Connector

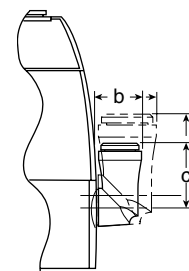


**End Plate and  
 Intermediate Modules**

|               | a  | b  | c  |
|---------------|----|----|----|
| 6 mm Tube OD  | 8  | 13 | 16 |
| 1/4" Tube OD  | 12 | 18 | 22 |
| 8 mm Tube OD  | 9  | 16 | 19 |
| 3/8" Tube OD  | 16 | 23 | 26 |
| 10 mm Tube OD | 13 | 18 | 25 |
| 12 mm Tube OD | 13 | 19 | 25 |
| 1/2" Tube OD  | 13 |    |    |
| Muffler       | 40 |    |    |



| OD Tube           | Ext.         | a  | b  | c  |
|-------------------|--------------|----|----|----|
| Size 1<br>Modules | 5/32" (4 mm) | 8  | 10 | 12 |
|                   | 6 mm         | 8  | 13 | 16 |
| Size 2<br>Modules | 1/4"         | 15 | 18 | 22 |
|                   | 1/4"         | 12 | 18 | 22 |
|                   | 8 mm         | 9  | 16 | 19 |
|                   | 3/8"         | 16 | 23 | 26 |
|                   | 10 mm        | 13 | 18 | 22 |



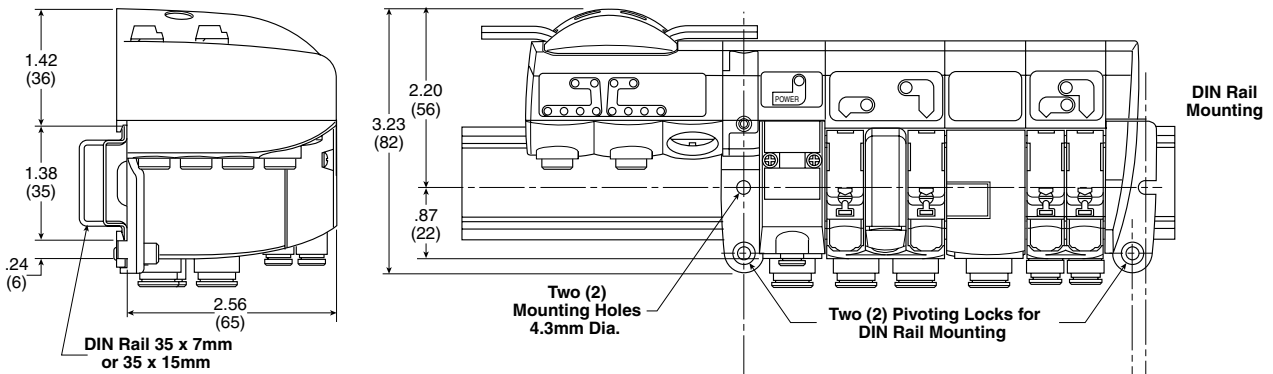
**"V" Series Manifold Dimensions and Mounting**  
 Fieldbus Connected Manifolds

Total Width Depends  
 on Valve Composition

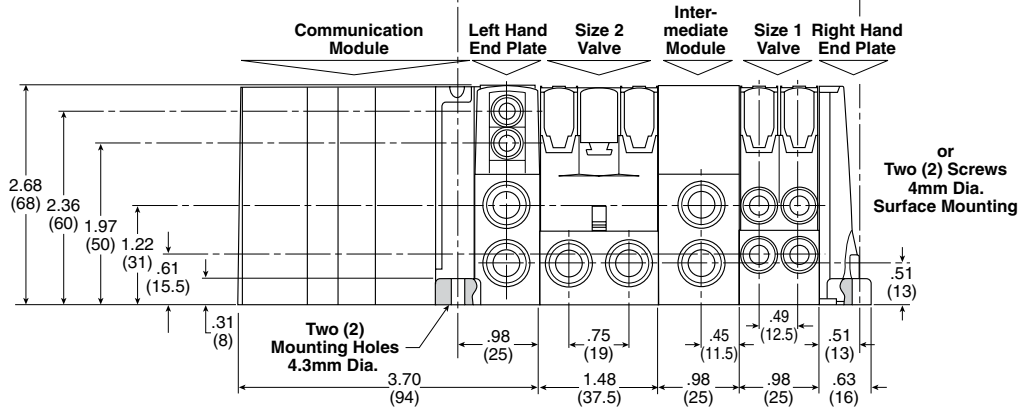
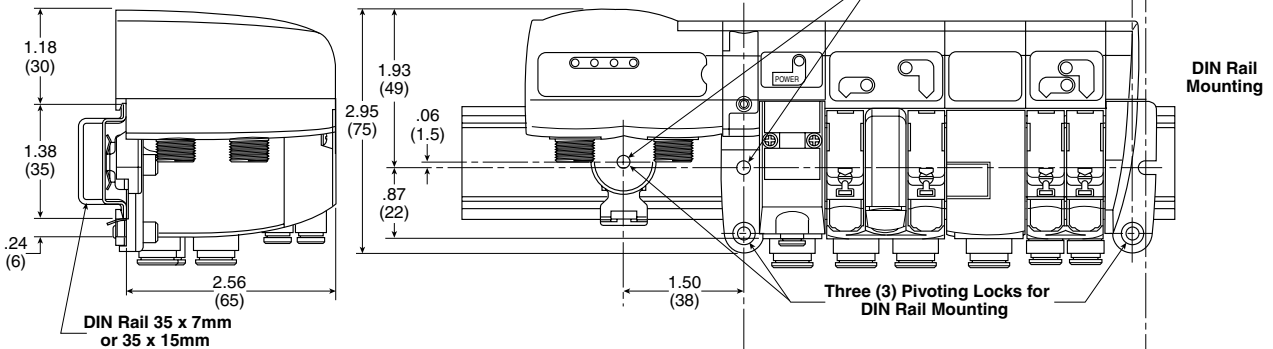


|                                   |
|-----------------------------------|
| Valvair II Series                 |
| DX ISOMAX Series                  |
| Fieldbus                          |
| Isys ISO Series                   |
| Isys Micro Series                 |
| Moduflex Series                   |
| <b>D</b>                          |
| Subbase & Manifold Valve Products |

**AS-i Bus Islands**



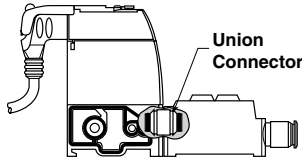
**Device Bus Islands**



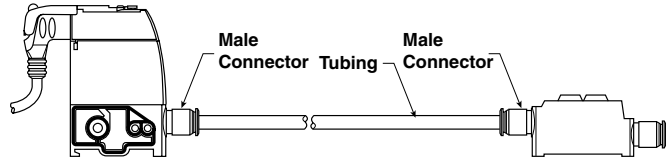
**“P” Series Peripheral Modules Dimensions and Mounting**

**Reminder:** Peripheral modules may either be plugged in the valve output ports or mounted in-line separate from the valve.

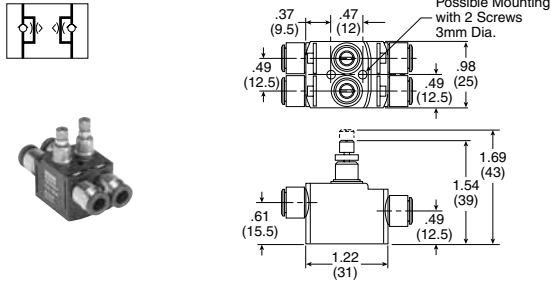
Peripheral Module  
 Plugged in a Valve



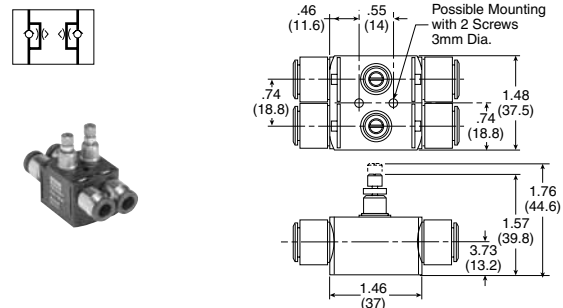
In-Line Peripheral Modules:  
 Mounting is Required



**Dual Flow Control Size 1**

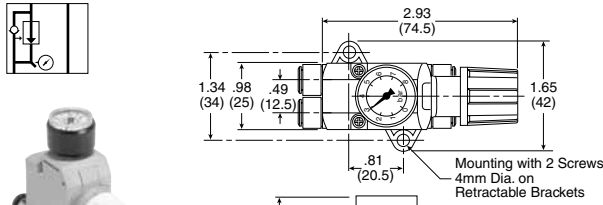


**Dual Flow Control Size 2**



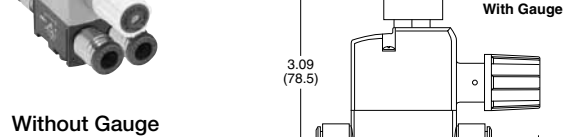
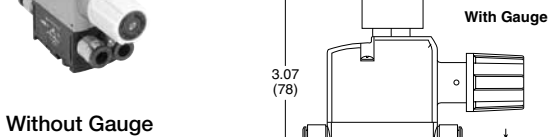
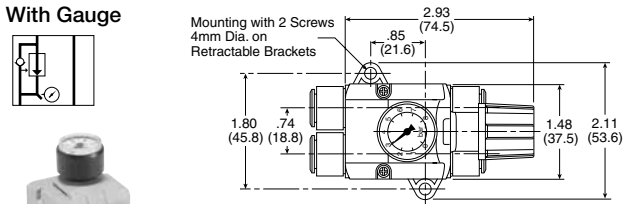
**Pressure Regulator Size 1**

With Gauge



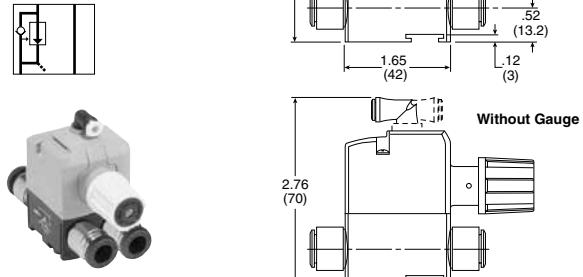
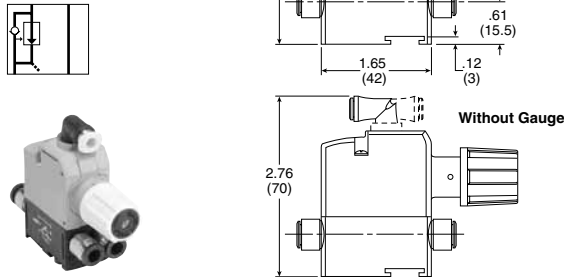
**Pressure Regulator Size 2**

With Gauge

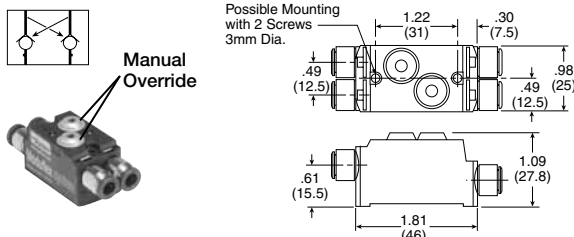


Without Gauge

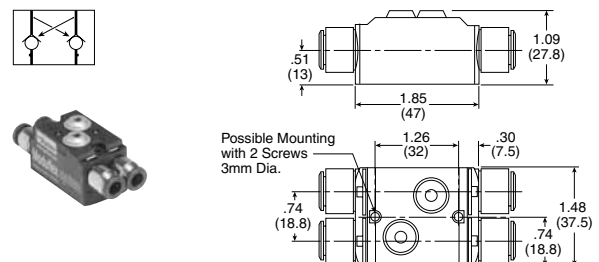
Without Gauge



**Dual P.O. Check Valve Size 1**



**Dual P.O. Check Valve Size 2**



Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

Isys Micro Series

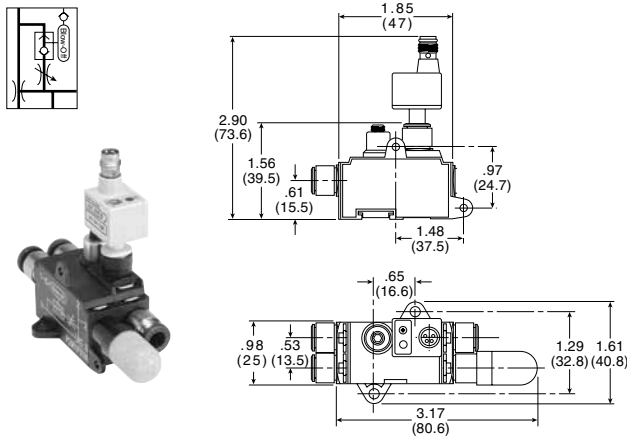
Moduflex Series

**D**  
 Subbase & Manifold Valve Products

**“P” Series Peripheral Modules Dimensions and Mounting**

**Reminder:** Peripheral modules may either be plugged in the valve output ports or mounted in-line separate from the valve.

**Vacuum Generator Size 1**

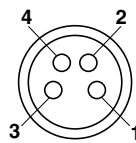


**Sensor specifications**

|                                     |                       |  |
|-------------------------------------|-----------------------|--|
| Isys ISO Series                     | Media                 | Air and non-corrosives gases                                     |
|                                     | Proof pressure        | (M) 72.5 PSI   |
|                                     | Operating temperature | 32 to 122°F (0 to 50°C)  |
|                                     | Storage temperature   | 14 to 140°F (-10 to 60°C)  |
| Isys Micro Series                   | Humidity              | 35 to 85% RH   |
|                                     | Electrical connection | (C) 4-pin, M8 connector  |
|                                     | Power supply          | 10.8 to 30 VDC, ripple Vp-p 10% max., reverse voltage protection |
|                                     | Switch output         | 1 output signal open and closed, NPN or PNP, 30VDC, 125mA        |
| Moduflex Series                     | Linear output         | Analog output 1 to 5 VDC   |
|                                     | Switch point setting  | 2/3 turn trimmer   |
|                                     | Hysteresis setting    | < 2% of F.S.   |
|                                     | Output response time  | <1ms   |
| D Subbase & Manifold Valve Products | Repeatability         | <0.2% F.S.   |
|                                     | Shock resistance      | 100 G, XYZ   |
|                                     | Material              | Housing: Polycarbonate, pressure port: Zinc die-cast             |
|                                     | Mass                  | T Port: 0.25 oz. (7g)  |

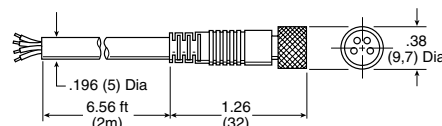
**Sensor pin out**

- Pin #
- 1 Brown: 24VDC
  - 2 White: NPN / PNP open collector output
  - 3 Blue: 0VDC
  - 4 Black: NPN / PNP open collector output

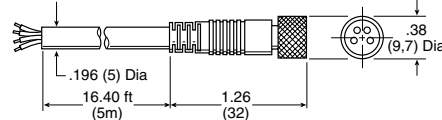


**Cables**

**CB-M8-4P-2M, Female to Open Lead**



**CB-M8-4P-5M, Female to Open Lead**



The Isys Micro Valve System incorporates a space saving back to back valve mounting design, and achieves flow rates of 0.35 Cv per valve with 4 valves having a combined width of 42mm. This plug-in valve solution simplifies wiring with the use of 25 pin connectors or fieldbus systems.

**Ports**

- M7 on manifolds
- 3/8 Inch on end plates

**Mounting**

- Manifold

**Solenoids**

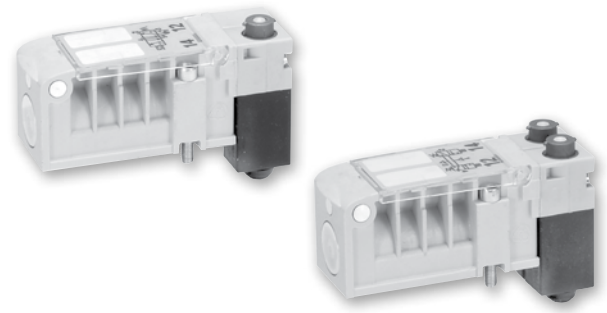
- 24 VDC, 1.0 watt

**Certification / approval**

- IP65 rated
- EMC / CE Mark: According to EN 61 000-6-2

**Material specifications**

|                 |                                 |
|-----------------|---------------------------------|
| Body            | Polyamide reinforced fiberglass |
| End plates      | Aluminum                        |
| Fasteners       | Zinc plated steel               |
| Manifolds       | Aluminum                        |
| Spool           | Brass and nitrile rubber        |
| Spool enclosure | Brass                           |



**Operating information**

Operating pressure: Vacuum to 145 PSIG (Vacuum to 10 bar)

Pilot pressure requirements:

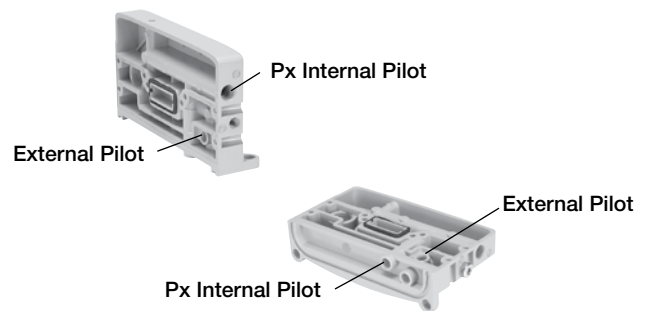
| Valve number | Minimum pilot pressure | Maximum pilot pressure |
|--------------|------------------------|------------------------|
| HMEVX2049A   | 40 PSI                 | 120 PSI                |
| HM2VX2049A   | 25 PSI                 | 120 PSI                |
| HM5VX2049A   | 45 PSI                 | 120 PSI                |
| HMN VX2049A  | 40 PSI                 | 120 PSI                |
| HMPVX2049A   | 40 PSI                 | 120 PSI                |
| HMQVX2049A   | 40 PSI                 | 120 PSI                |

Temperature range: 5°F to 120°F (-15°C to 49°C)

**Pilot configuration**

Manifolds can be configured for either internal or external pilot in the field. Side ported manifolds are configured for internal pilot when the M7 plug is located in the Px port on the front of the right hand end plate. Moving this plug to the inside of the right hand end plate and replacing it with a fitting allows an external pilot to be used.

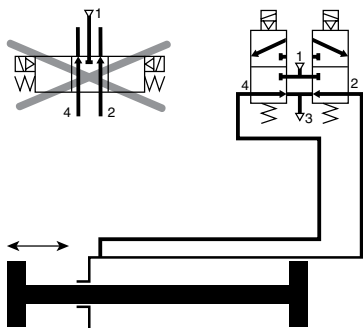
Bottom ported manifolds are configured for internal pilot when the M7 plug is located in the Px port on the bottom of the right hand end plate. Moving this plug to the inside of the right hand end plate and replacing it with a fitting allows an external pilot to be used.



**Dual 3/2 valves replace 3-position valves for better performance**

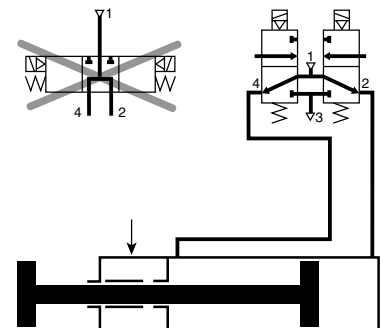
**3-position center exhaust**

A traditional 5/3 center exhaust valve is now replaced by a double 3/2 NC+NC valve module. Both cylinder chambers are exhausted and rod and piston are free to move.



**3-position pressure center**

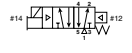
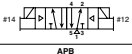
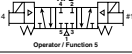
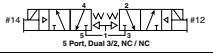
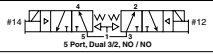
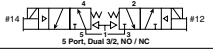
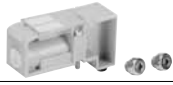

A traditional 5/3 pressure center valve is now replaced by a double 3/2 NO+NO valve module. The function is identical.



Most popular. For technical information see CD










**Isys Micro Valves**

|                   | Symbol  | Type                                 | Cv   | Operator        | Part number       |
|-------------------|---|--------------------------------------|------|-----------------|-------------------|
| Valvair II Series |  | 4-way, 2-position                    | 0.35 | Single solenoid | <b>HMEVX2049A</b> |
|                   |  | 4-way, 2-position                    | 0.35 | Double solenoid | <b>HM2VX2049A</b> |
|                   |  | 4-way, 3-position, all ports blocked | 0.3  | Double solenoid | <b>HM5VX2049A</b> |
| DX ISOMAX Series  |  | 3-way, 2-position, dual valve, NC/NC | 0.35 | Double solenoid | <b>HMNVX2049A</b> |
|                   |  | 3-way, 2-position, dual valve, NO/NO | 0.35 | Double solenoid | <b>HMPVX2049A</b> |
|                   |  | 3-way, 2-position, dual valve, NO/NC | 0.35 | Double solenoid | <b>HMQVX2049A</b> |
| Fieldbus Series   |  | Blanking plate                       | N/A  | N/A             | <b>HMBVX00XXA</b> |
|                   |  | Intermediate air supply              | N/A  | N/A             | <b>HMCVX00XXA</b> |

**Manifold Bases**

| Isys ISO Series | Plug-in valve manifolds           | Part numbers    |                 |
|-----------------|-----------------------------------|-----------------|-----------------|
|                 |                                   |                 | Side port       |
| Isys ISO Series | Single solenoid outputs only      | <b>PSM21JAP</b> | <b>PSM22JAP</b> |
|                 | Double or single solenoid outputs | <b>PSM21MAP</b> | <b>PSM22MAP</b> |

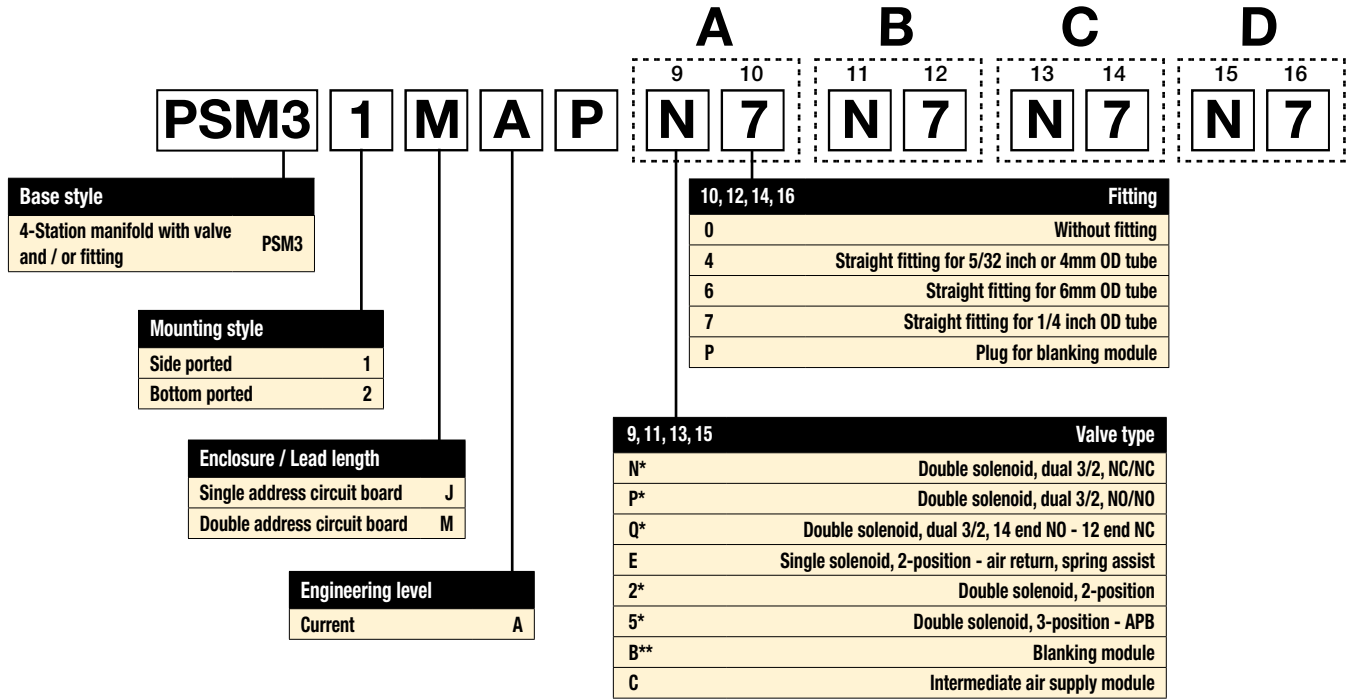
**Internal Pilot End Plate Kits**

|                                     | Electrical option   | Porting | Side port       | Bottom port     |
|-------------------------------------|---|---------|-----------------|-----------------|
| Isys Micro Series                   |  | NPT     | <b>PSML25AP</b> | <b>PSML26AP</b> |
|                                     |   | BSPP    | <b>PSML21AP</b> | <b>PSML22AP</b> |
| Modulflex Series                    |  | NPT     | <b>PSMT15AP</b> | <b>PSMT16AP</b> |
|                                     |   | BSPP    | <b>PSMT11AP</b> | <b>PSMT12AP</b> |
| D Subbase & Manifold Valve Products |  | NPT     | <b>PSMT25AP</b> | <b>PSMT26AP</b> |
|                                     |   | BSPP    | <b>PSMT21AP</b> | <b>PSMT22AP</b> |
| D Subbase & Manifold Valve Products |  | NPT     | <b>PSMM45AP</b> | <b>PSMM46AP</b> |
|                                     |   | BSPP    | <b>PSMM41AP</b> | <b>PSMM42AP</b> |
| D Subbase & Manifold Valve Products |  | NPT     | <b>PSML65AP</b> | <b>PSML66AP</b> |
|                                     |   | BSPP    | <b>PSML61AP</b> | <b>PSML62AP</b> |
| D Subbase & Manifold Valve Products |  | NPT     | <b>PSMM55AP</b> | <b>PSMM56AP</b> |
|                                     |   | BSPP    | <b>PSMM51AP</b> | <b>PSMM52AP</b> |
| D Subbase & Manifold Valve Products |  | NPT     | <b>PSMM65AP</b> | <b>PSMM66AP</b> |
|                                     |   | BSPP    | <b>PSMM61AP</b> | <b>PSMM62AP</b> |
| D Subbase & Manifold Valve Products |  | NPT     | <b>PSMM75AP</b> | <b>PSMM76AP</b> |
|                                     |   | BSPP    | <b>PSMM71AP</b> | <b>PSMM72AP</b> |



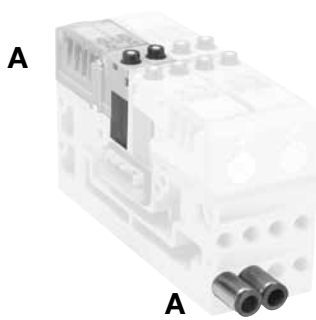
**Simple Manifold Assemblies**

Includes a valve manifold with 4 valves and fittings installed.  
 End Plates must be ordered separately.

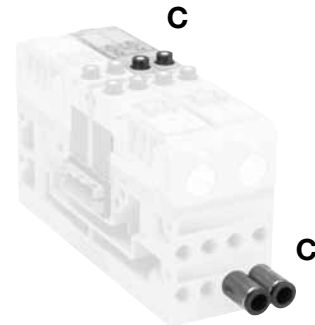


**BOLD OPTIONS ARE MOST POPULAR.**

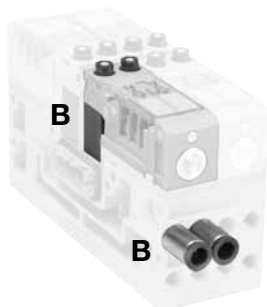
\* Requires double address circuit board, enclosure "M".  
 \*\* Requires fitting "P".



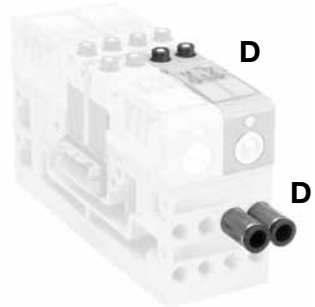
**Valve Position A - Character 9**  
**Fitting Position A - Character 10**



**Valve Position C - Character 13**  
**Fitting Position C - Character 14**



**Valve Position B - Character 11**  
**Fitting Position B - Character 12**



**Valve Position D - Character 15**  
**Fitting Position D - Character 16**

|                                   |
|-----------------------------------|
| Valvoir II Series                 |
| DX ISOMAX Series                  |
| Fieldbus                          |
| Isys ISO Series                   |
| <b>Isys Micro Series</b>          |
| Moduflex Series                   |
| <b>D</b>                          |
| Subbase & Manifold Valve Products |



**How To Order Plug-in Add-A-Fold Assemblies**

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List Simple Manifold Assemblies. List left to right, LOOKING AT THE CYLINDER PORTS on the manifold.

**Maximum Number of Solenoids  
(Maximum Energized Simultaneously)**

| 24VDC | 25-pin<br>D-sub | Moduflex | Isysnet* | Turck         |               |
|-------|-----------------|----------|----------|---------------|---------------|
|       |                 |          |          | 16<br>Outputs | 32<br>Outputs |
|       | 24 (24)         | 16 (16)  | 32 (32)  | 16 (16)       | 32 (32)       |

\* Maximum of 32 solenoids per manifold. With Bus Extension functionality, 4 manifolds with up to 32 solenoids each can be connected on the same network.

**Add-A-Fold Assembly Model Number**

**AAHM D 3 24 0 0 0 0**

| Valve series          |      |
|-----------------------|------|
| Isys micro add-a-fold | AAHM |

| End plate option   |   |
|--|---|
| Turck fieldbus with valve driver module - 16 outputs                               | A |
| Turck fieldbus with valve driver module - 32 outputs                               | B |
| 25-pin, D-sub - 24 outputs   | D |
| Isysnet with valve drive module - 32 outputs                                       | Y |
| Isysnet with valve drive module and bus extension connector - 32 outputs           | W |
| Isysnet with valve drive module and 24VDC connector - 32 outputs                   | X |
| Isysnet with valve drive module and bus extension and 24VDC connector - 32 outputs | Z |
| Moduflex - 16 outputs  | T |

Isysnet and Moduflex communication modules must be ordered separately.

| End plate type          |                                  |   |
|-------------------------|----------------------------------|---|
| <b>BSPP<br/>Threads</b> | BSPP side port, internal pilot   | 1 |
|                         | BSPP bottom port, internal pilot | 2 |
|                         | BSPP side port, external pilot   | 3 |
|                         | BSPP bottom port, external pilot | 4 |
| <b>NPT<br/>Threads</b>  | NPT side port, internal pilot    | 5 |
|                         | NPT bottom port, internal pilot  | 6 |
|                         | NPT side port, external pilot    | 7 |
|                         | NPT bottom port, external pilot  | 8 |

| Number of stations |    |
|--------------------|----|
| 4 Valve manifold   | 04 |
| 8 Valve manifold   | 08 |
| 12 Valve manifold  | 12 |
| 16 Valve manifold  | 16 |
| 20 Valve manifold  | 20 |
| 24 Valve manifold  | 24 |
| 28 Valve manifold  | 28 |
| 32 Valve manifold  | 32 |

| Pilot exhaust on end plate |  |                         |
|----------------------------|--|-------------------------|
| 0                          | Without fitting                        |                         |
| M                          | Muffler                                |                         |
| 4                          | Straight fitting for 4mm OD tube       | <b>BSPP<br/>Threads</b> |
| 6                          | Straight fitting for 6mm OD tube       |                         |
| 4                          | Straight fitting for 5/32 inch OD tube | <b>NPT<br/>Threads</b>  |
| 7                          | Straight fitting for 1/4 inch OD tube  |                         |

| M7 pilot port on end plate      |  |                         |
|---------------------------------|--|-------------------------|
| <i>Internal pilot end plate</i> |  |                         |
| 0                               | With standard plug                     |                         |
| <i>External pilot end plate</i> |  |                         |
| 0                               | Without fitting                        |                         |
| 4                               | Straight fitting for 4mm OD tube       | <b>BSPP<br/>Threads</b> |
| 6                               | Straight fitting for 6mm OD tube       |                         |
| 4                               | Straight fitting for 5/32 inch OD tube | <b>NPT<br/>Threads</b>  |
| 7                               | Straight fitting for 1/4 inch OD tube  |                         |

| 3/8" exhaust on end plate |                                       |                         |
|---------------------------|---------------------------------------|-------------------------|
| 0                         | Without fitting                       |                         |
| M                         | Muffler                               |                         |
| 8                         | Straight fitting for 8mm OD tube      | <b>BSPP<br/>Threads</b> |
| A                         | Straight fitting for 10mm OD tube     |                         |
| 7                         | Straight fitting for 1/4 inch OD tube | <b>NPT<br/>Threads</b>  |
| 9                         | Straight fitting for 3/8 inch OD tube |                         |

| 3/8" inlet port on end plate |                                       |                         |
|------------------------------|---------------------------------------|-------------------------|
| 0                            | Without fitting                       |                         |
| 8                            | Straight fitting for 8mm OD tube      | <b>BSPP<br/>Threads</b> |
| A                            | Straight fitting for 10mm OD tube     |                         |
| 7                            | Straight fitting for 1/4 inch OD tube | <b>NPT<br/>Threads</b>  |
| 9                            | Straight fitting for 3/8 inch OD tube |                         |

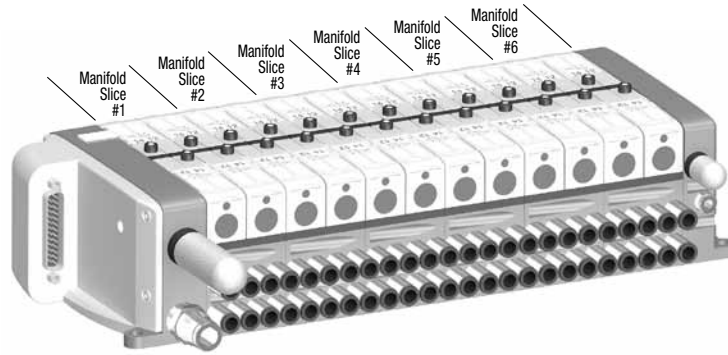
**Note:**  
BSPP fittings can only be used with BSPP Manifolds.  
NPT fittings can only be used with NPT Manifolds.



Valvair II Series  
DX ISOMAX Series  
Fieldbus  
Isys ISO Series  
Isys Micro Series  
Moduflex Series  
**D**  
Subbase & Manifold Valve Products

## 25-pin, D-Sub Manifolds

### 24 Single Solenoid Valves



### Add-A-Fold


Manifold is factory assembled and tested for pneumatic leaks and electrical continuity.

| Item | Qty | Description                         | Part number             |
|------|-----|-------------------------------------|-------------------------|
| 01   | 1   | 24 valve Add-A-Fold with end plates | <b>AAHMD5249M0M</b>     |
| 02   | 6   | 4 valve simple manifold slices #1-6 | <b>PSM31JAPE7E7E7E7</b> |

### Component Level

| Item | Qty | Description                           | Part number       |
|------|-----|---------------------------------------|-------------------|
| 01   | 1   | 25-pin, D-sub, end plate              | <b>PSML25AP</b>   |
| 02   | 24  | Single solenoid valve                 | <b>HMEVX2049A</b> |
| 03   | 6   | Manifold, side ported, single address | <b>PSM21JAP</b>   |
| 04   | 50  | 1/4" Tube fittings (in box quantity)  | <b>PS567925</b>   |
| 05   | 10  | 3/8" Tube fittings (in box quantity)  | <b>PS568338</b>   |
| 06   | 1   | 3/8" Exhaust muffer                   | <b>P6M-PAB3</b>   |
| 07   | 1   | 1/8" Exhaust muffer                   | <b>P6M-PAB1</b>   |




### Sandwich Regulator

| Description  | Kit number       |
|--|------------------|
|  Common port regulator, 5 to 125 PSI with gauge | <b>PSMRAX6AP</b> |


Note: Cv values are reduced when using a sandwich regulator to 0.20 for 2-position and Dual 3/2 valves, and 0.17 for 3-position APB valves.

Note: The sandwich regulator passes full pilot pressure from the manifold, allowing the regulated pressure to adjusted down to 5 PSI without affecting valve functionality.


### Mufflers

| Description   | Part number     |
|---|-----------------|
|  1/8" pilot exhaust – BSPP or NPT                                  | <b>P6M-PAB1</b> |
|  3/8" main exhaust – BSPP or NPT                                   | <b>P6M-PAB3</b> |
|  M7 bottom port pilot exhaust (must be ordered in multiples of 10) | <b>PS568800</b> |




### Flow Controls

| Description  | Kit number        |
|--|-------------------|
|  4mm to 4mm or 5/32" to 5/32" OD tube | <b>FC800-5/32</b> |
| 1/4" to 1/4" O.D. tube   | <b>FC800-4</b>    |

### 25-pin, D-Sub Cable (Female)

| Description   | Length   | Part number       |
|---|----------|-------------------|
|  25-pin, D-sub cable, IP20 | 3 meters | <b>P8LMH25M3A</b> |
| 25-pin, D-sub cable, IP20   | 9 meters | <b>SCD259D</b>    |
| 25-pin, D-sub cable, IP65   | 3 meters | <b>SCD253W</b>    |
| 25-pin, D-sub cable, IP65   | 9 meters | <b>SCD259WE</b>   |

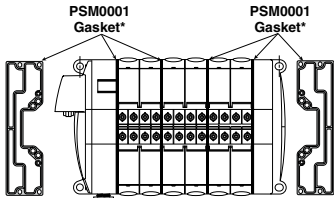
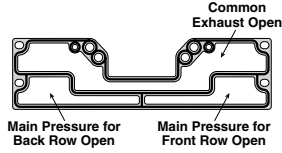
### Fittings – Must be ordered in multiples of 10

| Thread   | Tube O.D.    | Part number     |
|--|--------------|-----------------|
| <b>Manifold or pilot supply ports – straight</b>   |              |                 |
|  M7       | 4mm or 5/32" | <b>PS567904</b> |
| M7   | 6mm          | <b>PS567906</b> |
| M7   | 1/4"         | <b>PS567925</b> |
| <b>Main inlet or exhaust ports</b>   |              |                 |
|  3/8" NPT | 1/4"         | <b>PS568325</b> |
| 3/8" NPT   | 3/8"         | <b>PS568338</b> |
| 3/8" BSPP  | 8mm          | <b>PS568308</b> |
| 3/8" BSPP  | 10mm         | <b>PS568310</b> |
| <b>Pilot exhaust ports</b>   |              |                 |
|  1/8" NPT | 5/32"        | <b>PS568215</b> |
| 1/8" NPT   | 1/4"         | <b>PS568225</b> |
| 1/8" BSPP  | 4mm          | <b>PS568204</b> |
| 1/8" BSPP  | 6mm          | <b>PS568206</b> |

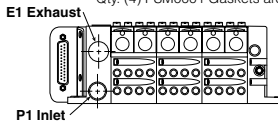
**Multiple Pressure Zones**

**PSM0001 –**

All ports open. Common pressure for front and rear manifold.  
 Common exhausts.  
 Standard gasket included with each manifold and end plate.

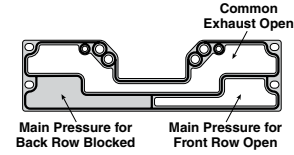


\* Qty. (4) PSM0001 Gaskets are required.

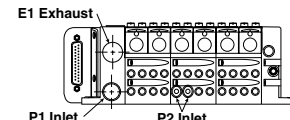
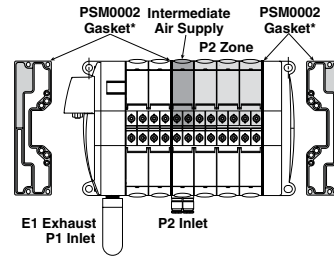


**PSM0002 –**

Rear manifold blocked for separate pressure supply.  
 Common exhausts.  
 Flip gasket to block front of manifold.



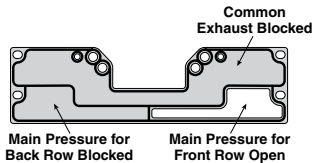
**Internal Pilot Pressure from P1 Inlet**



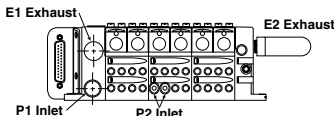
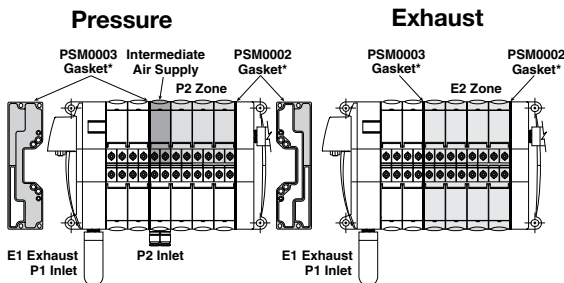
\* Qty. (2) PSM0002 Gaskets are required.  
 Remainder are PSM0001 Gaskets (Not shown)

**PSM0003 –**

Rear manifold blocked for separate pressure supply.  
 Exhaust blocked also.  
 Flip gasket to block front of manifold.  
 If used with bottom ported end plates, second exhaust must be piped from the side of the right end plate.



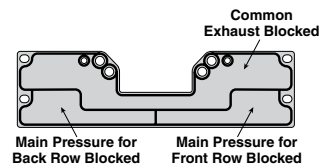
**Internal Pilot Pressure from P1 Inlet**



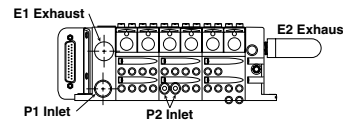
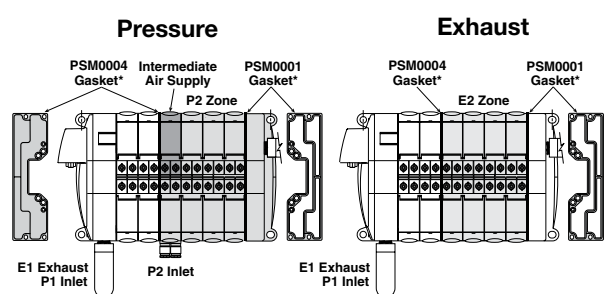
\* Qty. (1) PSM0003 and Qty. (1) PSM0002 Gaskets are required.  
 Remainder are PSM0001 Gaskets (Not shown)

**PSM0004 –**

All galleys blocked.  
 Two pressure zones and two exhaust zones.  
 If used with bottom ported end plates, second exhaust must be piped from the side of the right end plate.



**Internal Pilot Pressure from P2 Inlet**



\* Qty. (1) PSM0004 Gasket is required.  
 Remainder are PSM0001 Gaskets (Not shown)

Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series



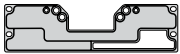

Isys Micro Series

Modulflex Series

**D**


Subbase & Manifold Valve Products

**Manifold to Manifold Gaskets\***


|   | Description  | Part number    |
|---|--|----------------|
|  | All galleys passing  | <b>PSM0001</b> |
|  | Main pressure to rear or front valves blocked, exhaust passing | <b>PSM0002</b> |
|  | Main pressure to rear or front valves blocked, exhaust blocked | <b>PSM0003</b> |
|  | All galleys blocked  | <b>PSM0004</b> |

\* Includes 1 Gasket

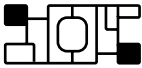
**Replacement Solenoid Kit**

|   | Description                    | Part number    |
|---|--------------------------------|----------------|
|  | 24VDC solenoid kit with screws | <b>PSM0010</b> |


**Replacement Override Caps**

|   | Description                    | Part number    |
|---|--------------------------------|----------------|
|  | Set of 10 manual override caps | <b>PSM0011</b> |

**Replacement Gaskets and Valve Screws**

|   | Description                                      | Part number    |
|---|--|----------------|
|  | Set of 5 valve to manifold gaskets and 10 screws | <b>PSM0012</b> |

**Replacement Plugs**


|   | Description   | Part number    |
|---|---|----------------|
|  | Set of 10 M7 plugs (Part No. PS567900) for auxiliary and pilot pressure ports | <b>PSM0013</b> |

**Valve Labels\***


| Description  | Part number    |
|--|----------------|
| Single solenoid diagram                                  | <b>PSM002E</b> |
| Double solenoid diagram                                  | <b>PSM0022</b> |
| Double solenoid diagram – APB                            | <b>PSM0025</b> |
| Double solenoid diagram – Dual 3/2 NC/NC                 | <b>PSM002N</b> |
| Double solenoid diagram – Dual 3/2 NO/NO                 | <b>PSM002P</b> |
| Double solenoid diagram – Dual 3/2, 14 end NO, 12 end NC | <b>PSM002Q</b> |

\*Includes 10 Labels.


**Replacement Screws**

|  | Description                              | Part number    |
|--|--|----------------|
|  | Set of 10 manifold to manifold M3 screws | <b>PSM0014</b> |

**Replacement Regulator Gauge**

|   | Description        | Part number     |
|---|--------------------|-----------------|
|  | 5 to 125 PSI Gauge | <b>P0566202</b> |

**Replacement Protective Cover**

|  | Description                             | Part number   |
|--|---|---------------|
|  | Protective Polyester Cover<br>Set of 10 | <b>PS5706</b> |

Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

Isys Micro Series

Moduflex Series

**D**  
 Subbase & Manifold Valve Products

**25-pin, D-Sub with Isys Micro Valves, Side Ported**

**Dimensions**

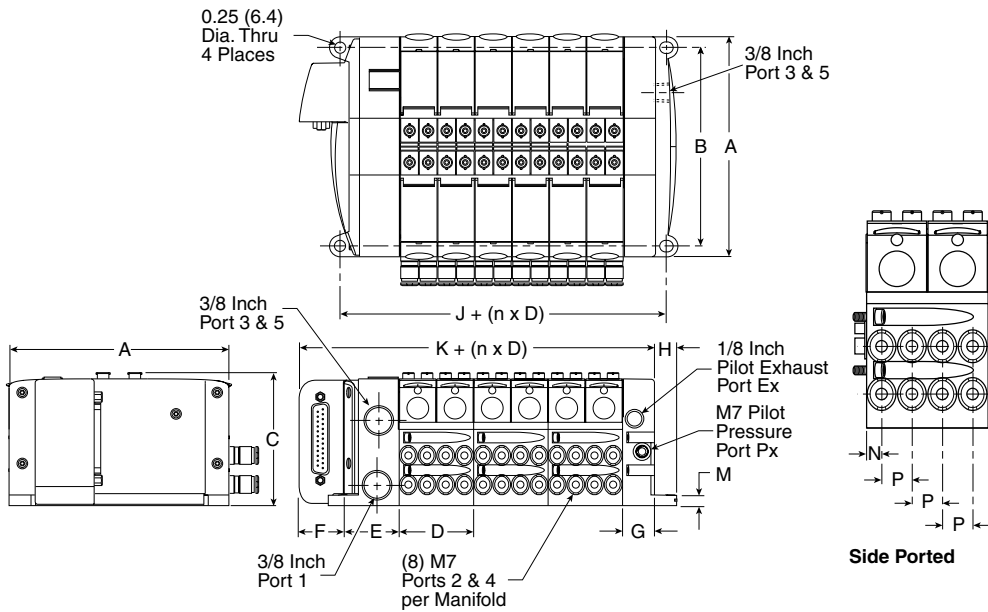
|                 |                 |                |                |
|-----------------|-----------------|----------------|----------------|
| <b>A</b>        | <b>B</b>        | <b>C</b>       | <b>D</b>       |
| 4.88<br>(124.0) | 4.41<br>(112.0) | 2.95<br>(75.0) | 1.65<br>(42.0) |

|                |                |                |                |
|----------------|----------------|----------------|----------------|
| <b>E</b>       | <b>F</b>       | <b>G</b>       | <b>H</b>       |
| 1.22<br>(31.0) | 1.02<br>(26.0) | 0.71<br>(18.0) | 0.49<br>(12.5) |

|                |                |               |               |
|----------------|----------------|---------------|---------------|
| <b>J</b>       | <b>K</b>       | <b>M</b>      | <b>N</b>      |
| 2.28<br>(58.0) | 3.44<br>(87.5) | 0.24<br>(6.1) | 0.21<br>(5.2) |

|                |
|----------------|
| <b>P</b>       |
| 0.41<br>(10.5) |

Inches (mm)  
 n = Number of manifolds



**25-pin, D-Sub with Isys Micro Valves, Bottom Ported**

**Dimensions**

|                 |                 |                |                |
|-----------------|-----------------|----------------|----------------|
| <b>A</b>        | <b>B</b>        | <b>C</b>       | <b>D</b>       |
| 4.88<br>(124.0) | 4.41<br>(112.0) | 2.95<br>(75.0) | 1.65<br>(42.0) |

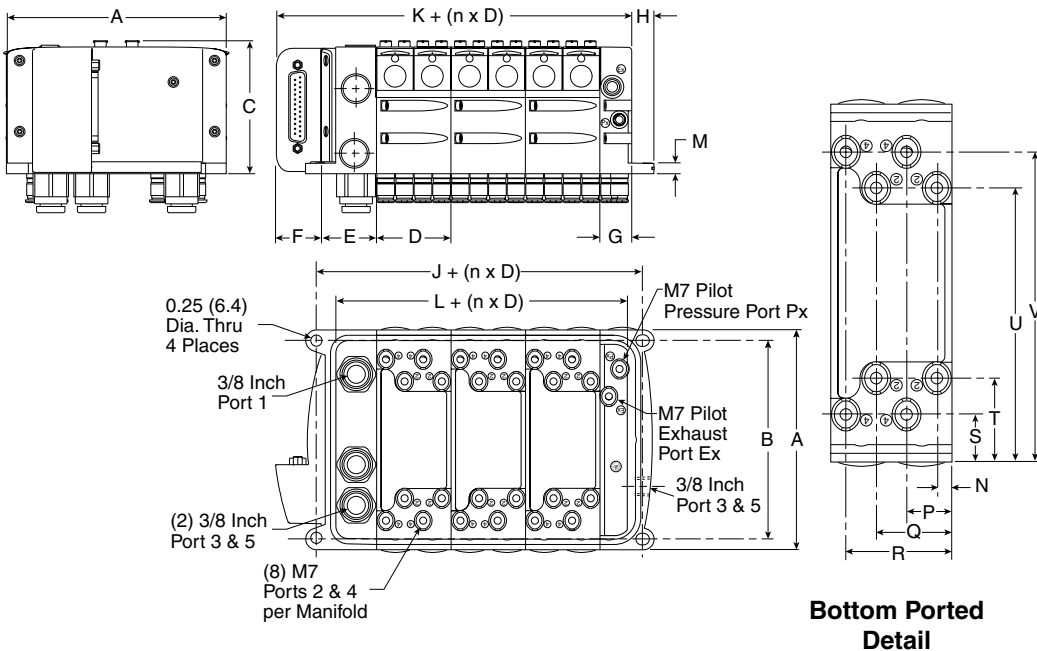
|                |                |                |                |
|----------------|----------------|----------------|----------------|
| <b>E</b>       | <b>F</b>       | <b>G</b>       | <b>H</b>       |
| 1.22<br>(31.0) | 1.02<br>(26.0) | 0.71<br>(18.0) | 0.49<br>(12.5) |

|                |                |                |               |
|----------------|----------------|----------------|---------------|
| <b>J</b>       | <b>K</b>       | <b>L</b>       | <b>M</b>      |
| 2.28<br>(58.0) | 3.44<br>(87.5) | 1.69<br>(43.0) | 0.24<br>(6.1) |

|               |                |                |                |
|---------------|----------------|----------------|----------------|
| <b>N</b>      | <b>P</b>       | <b>Q</b>       | <b>R</b>       |
| 0.21<br>(5.3) | 0.62<br>(15.8) | 1.03<br>(26.3) | 1.45<br>(36.8) |

|                 |                |                |                 |
|-----------------|----------------|----------------|-----------------|
| <b>S</b>        | <b>T</b>       | <b>U</b>       | <b>V</b>        |
| 0.64<br>(16.40) | 1.14<br>(29.0) | 3.73<br>(94.9) | 4.23<br>(107.4) |

Inches (mm)  
 n = Number of manifolds



Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

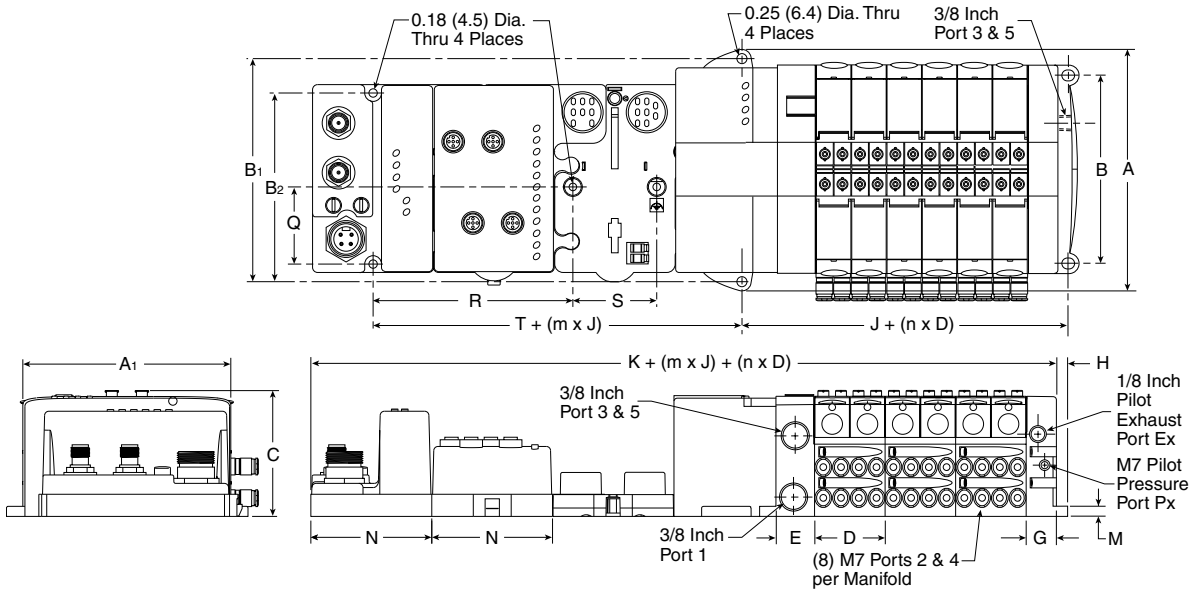
Isys Micro Series

Modulflex Series

**D**

Subbase & Manifold Valve Products

**Isysnet with Isys Micro Valves, Side Ported**

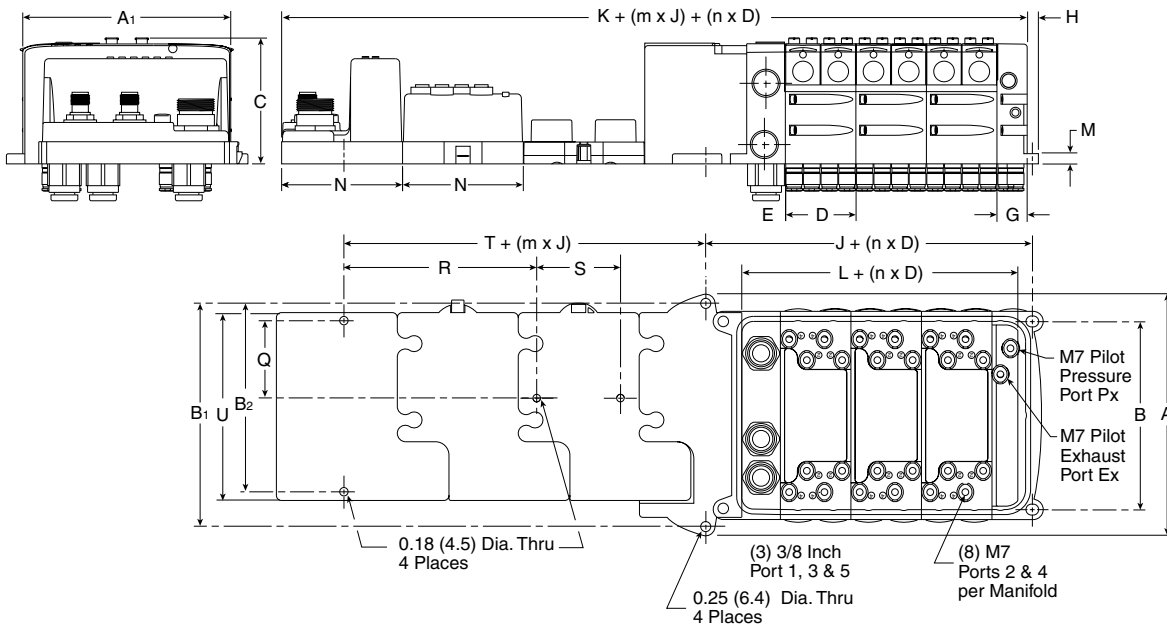


**Dimensions**

|                 |                      |                 |                      |                      |                |                 |                |                |
|-----------------|----------------------|-----------------|----------------------|----------------------|----------------|-----------------|----------------|----------------|
| <b>A</b>        | <b>A<sub>1</sub></b> | <b>B</b>        | <b>B<sub>1</sub></b> | <b>B<sub>2</sub></b> | <b>C</b>       | <b>D</b>        | <b>E</b>       | <b>G</b>       |
| 5.67<br>(144.0) | 4.88<br>(124.0)      | 4.41<br>(112.0) | 5.24<br>(133.0)      | 4.02<br>(102.0)      | 2.95<br>(75.0) | 1.65<br>(42.0)  | 0.91<br>(23.0) | 0.71<br>(18.0) |
| <b>H</b>        | <b>J</b>             | <b>K</b>        | <b>M</b>             | <b>N</b>             | <b>Q</b>       | <b>R</b>        | <b>S</b>       | <b>T</b>       |
| 0.49<br>(12.5)  | 2.72<br>(69.0)       | 7.32<br>(186.0) | 0.24<br>(6.1)        | 2.83<br>(72.0)       | 1.81<br>(46.0) | 4.72<br>(120.0) | 2.01<br>(51.0) | 2.01<br>(51.0) |

Inches (mm)  
 n = Number of Manifolds  
 m = Number of Modules

**Isysnet with Isys Micro Valves, Bottom Ported**



**Dimensions**

|                 |                      |                 |                      |                      |                |                 |                |                |                |
|-----------------|----------------------|-----------------|----------------------|----------------------|----------------|-----------------|----------------|----------------|----------------|
| <b>A</b>        | <b>A<sub>1</sub></b> | <b>B</b>        | <b>B<sub>1</sub></b> | <b>B<sub>2</sub></b> | <b>C</b>       | <b>D</b>        | <b>E</b>       | <b>G</b>       | <b>H</b>       |
| 5.67<br>(144.0) | 4.88<br>(124.0)      | 4.41<br>(112.0) | 5.24<br>(133.0)      | 4.02<br>(102.0)      | 2.95<br>(75.0) | 1.65<br>(42.0)  | 0.91<br>(23.0) | 0.71<br>(18.0) | 0.49<br>(12.5) |
| <b>J</b>        | <b>K</b>             | <b>L</b>        | <b>M</b>             | <b>N</b>             | <b>Q</b>       | <b>R</b>        | <b>S</b>       | <b>T</b>       | <b>U</b>       |
| 2.72<br>(69.0)  | 7.32<br>(186.0)      | 1.69<br>(43.0)  | 0.24<br>(6.1)        | 2.83<br>(72.0)       | 1.81<br>(46.0) | 4.72<br>(120.0) | 2.01<br>(51.0) | 2.01<br>(51.0) | 4.41<br>(112)  |

Inches (mm)  
 n = Number of Manifolds  
 m = Number of Modules

Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

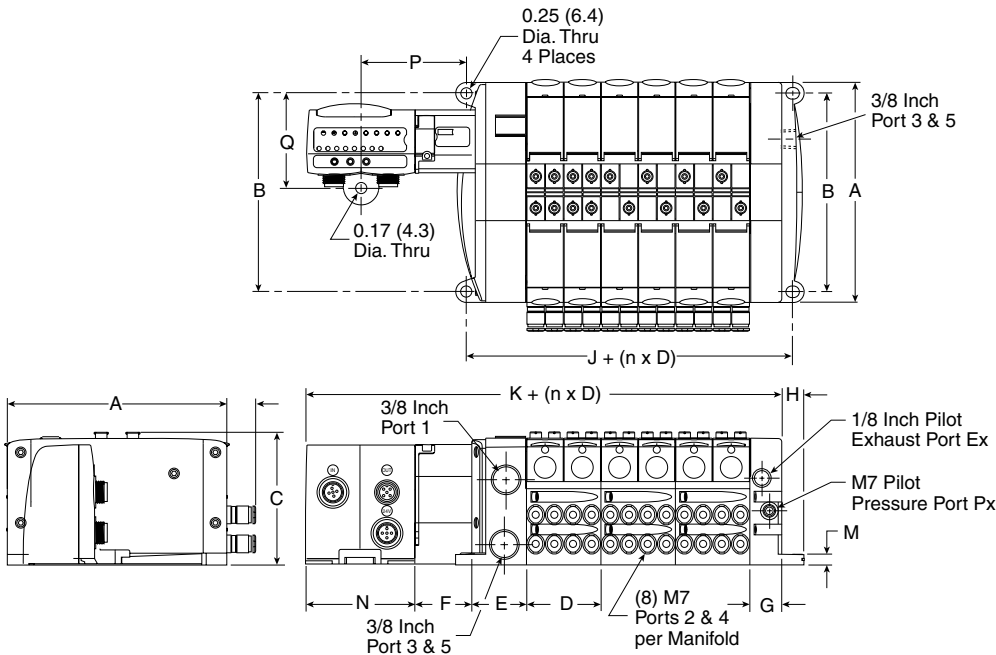
Isys Micro Series

Modulflex Series

**D**  
 Subbase & Manifold Valve Products



**Moduflex with Isys Micro Valves, Side Ported**

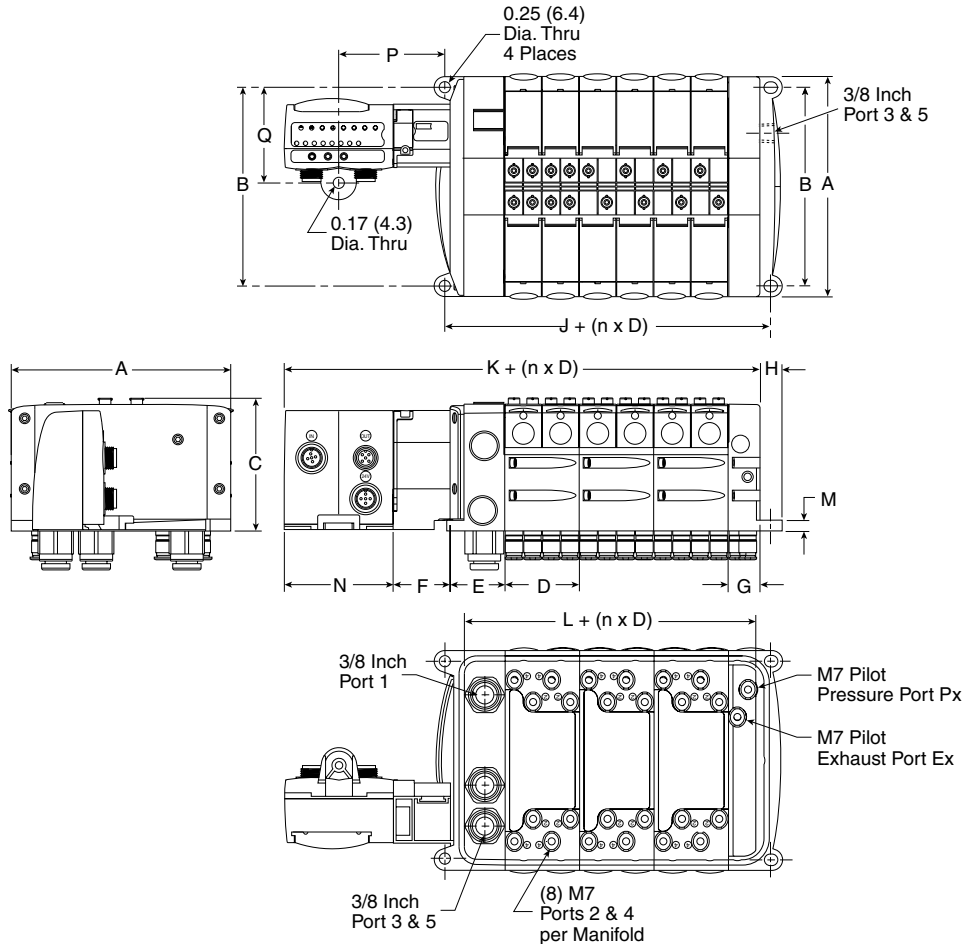


**Dimensions**

| A               | B               | C              | D              |
|-----------------|-----------------|----------------|----------------|
| 4.88<br>(124.0) | 4.41<br>(112.0) | 2.95<br>(75.0) | 1.65<br>(42.0) |
| E               | F               | G              | H              |
| 1.22<br>(31.0)  | 1.28<br>(32.5)  | 0.71<br>(18.0) | 0.49<br>(12.5) |
| J               | K               | M              | N              |
| 2.28<br>(58.0)  | 6.10<br>(155.0) | 0.24<br>(6.1)  | 2.40<br>(61.0) |
| P               | Q               |                |                |
| 2.36<br>(60.0)  | 2.07<br>(52.55) |                |                |

Inches (mm)  
 n = Number of manifolds

**Moduflex with Isys Micro Valves, Bottom Ported**



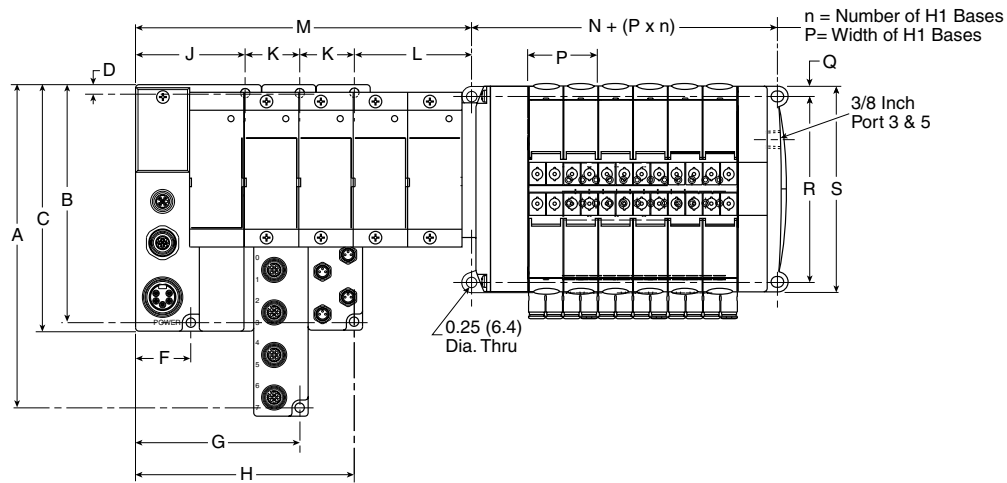
**Dimensions**

| A               | B               | C               | D              |
|-----------------|-----------------|-----------------|----------------|
| 4.88<br>(124.0) | 4.41<br>(112.0) | 2.95<br>(75.0)  | 1.65<br>(42.0) |
| E               | F               | G               | H              |
| 1.22<br>(31.0)  | 1.02<br>(26.0)  | 0.71<br>(18.0)  | 0.49<br>(12.5) |
| J               | K               | L               | M              |
| 2.28<br>(58.0)  | 6.10<br>(155.0) | 1.69<br>(43.0)  | 0.24<br>(6.1)  |
| N               | P               | Q               |                |
| 2.40<br>(61.0)  | 2.36<br>(60.0)  | 2.07<br>(52.55) |                |

Inches (mm)  
 n = Number of manifolds



**Turck with Isys Micro Valves, Side Ported**



**Dimensions**

| A              | B              | C               | D              |
|----------------|----------------|-----------------|----------------|
| 7.48<br>(190)  | 5.51<br>(140)  | 5.71<br>(145)   | 0.20<br>(5)    |
| F              | G              | H               | J              |
| 1.28<br>(32.5) | 3.79<br>(96.5) | 5.06<br>(128.5) | 2.53<br>(64.5) |
| K              | L              | M               | N              |
| 1.26<br>(32)   | 2.54<br>(64)   | See<br>note 1   | 2.28<br>(58)   |
| P              | Q              | R               | S              |
| 1.65<br>(42)   | .19<br>(4.9)   | 4.41<br>(112)   | 4.88<br>(124)  |

Note 1:  $M = J + L + n_2 \times K$ , where  $n_2$  = Number of Turck input / output modules  
 Inches (mm)

Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

Isys Micro Series

Modulflex Series

**D**

Subbase & Manifold Valve Products

The Isys ISO valve conforms to international standards 15407 and 5599, providing maximum flexibility for end users. As Parker's premier manifold mount product offering, Isys ISO offers machine builders a complete offering with a wide variety of accessories and options in a valve family with flow ranges from 0.55 Cv up to 6.0 Cv. Individual wiring is available with DIN or central connectors, and collective solutions offer installation time savings with either multi-pin connectors or fieldbus solutions.

**Ports, Flow**

- HB: 1/8 inch, 0.55 Cv
- HA: 1/4 inch, 1.1 Cv
- H1: 3/8 inch, 1.5 Cv
- H2: 1/2 inch, 3.0 Cv
- H3: 3/4 inch, 6.0 Cv

**Mounting**

- Manifold or subbase

**Solenoids**

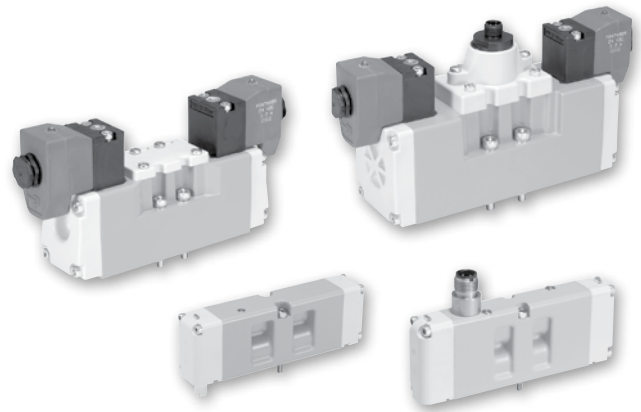
- HB & HA: 24 VDC, 1.0 Watt, and 120 VAC, 1.0 VA
- H1, H2, & H3: 24 VDC, 3.2 Watt, and 120VAC, 4.5 VA

**Certification / approval**

- IP65 rated
- CSA / C-US approved

**Material specifications**

|            |                   |
|------------|-------------------|
| Body       | Aluminum          |
| End caps   | PBT               |
| End plates | Aluminum          |
| Fasteners  | Zinc plated steel |
| Manifolds  | Aluminum          |
| Seals      | Nitrile           |
| Spool      | Aluminum          |



**Operating information**

|                     |                                       |
|---------------------|---------------------------------------|
| Operating pressure: | Vacuum to 145 PSIG (Vacuum to 10 bar) |
| Pilot pressure:     | See chart                             |
| Temperature range:  | 5°F to 120°F (-15°C to 49°C)          |

**Operating Pressure**

**Maximum: 145 PSIG (1000 kPa)**

**Minimum:**

| Operator / function | Internal pilot                                 | PSIG (Min. kPa) HB | PSIG (Min. kPa) HA | PSIG (Min. kPa) H1 | PSIG (Min. kPa) H2 | PSIG (Min. kPa) H3 |
|---------------------|--|--------------------|--------------------|--------------------|--------------------|--------------------|
| 1                   | Single solenoid - 2-position                   | 30                 | 25                 | 25                 | 25                 | 35                 |
| 2                   | Double solenoid- 2-position                    | (207)              | (173)              | (173)              | (173)              | (241)              |
| 3                   | Single remote pilot - 2-position **            | Vacuum             | Vacuum             | Vacuum             | Vacuum             | Vacuum             |
| 4                   | Double remote pilot - 2-position**             | Vacuum             | Vacuum             | Vacuum             | Vacuum             | Vacuum             |
| 5, 6, 7             | Double solenoid - 3-position APB, CE, PC       | 35                 | 35                 | 35                 | 50                 | 50                 |
|                     |  | (241)              | (241)              | (241)              | (345)              | (345)              |
| 8, 9, 0             | Double remote pilot - 3-position** APB, CE, PC | Vacuum             | Vacuum             | Vacuum             | Vacuum             | Vacuum             |
| E                   | Single solenoid pilot - 2-position             |                    |                    |                    |                    |                    |
|                     | Air return / spring assist                     | 30                 | 30                 | 35                 | 45                 | 45                 |
|                     |  | (207)              | (207)              | (241)              | (310)              | (310)              |
| F                   | Single remote pilot - 2-position**             |                    |                    |                    |                    |                    |
|                     | Air return / spring assist                     |                    |                    |                    |                    |                    |
| N, P, Q             | Double solenoid - dual 3/2                     | 30                 | N/A                | N/A                | N/A                | N/A                |
|                     |  | (207)              |                    |                    |                    |                    |
|                     | External pilot *                               | *                  | *                  | *                  | *                  | *                  |
| All                 | Isys   | Vacuum             | Vacuum             | Vacuum             | Vacuum             | Vacuum             |

\* External Pilot Pressure / Remote Pilot Supply - Must meet or exceed minimum pilot pressure for internal pilot option. Not available on Operator / Function N, P, or Q.

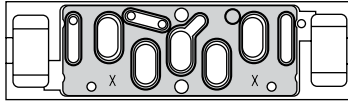
\*\* Must be equal to or greater than operating pressure.

Most popular. For technical information see CD

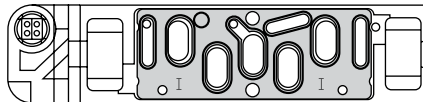


**ISO Pneumatic Valve Standard Definitions**

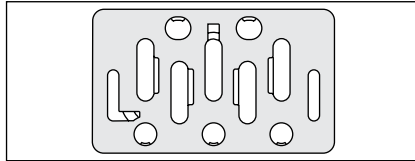
**15407-1:** Non-Plug-in Standards for Size 01 (26mm) & Size 02 (18mm) Wide Valves



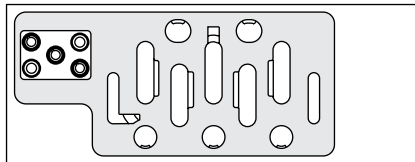
**15407-2:** Plug-in Standards for Size 01 (26mm) & Size 02 (18mm) Wide Valves



**5599-1:** Non-Plug-in Standards for Sizes 1, 2, 3

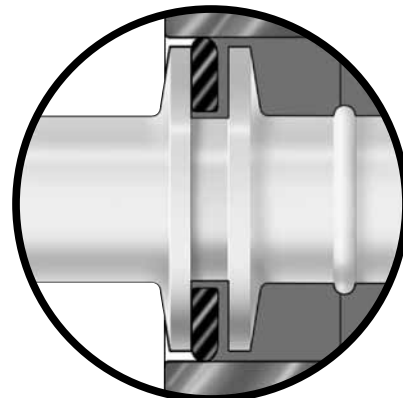


**5599-2:** Plug-in Standards for Size 1, 2, 3



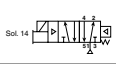
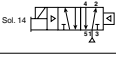

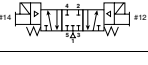
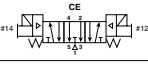
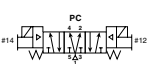
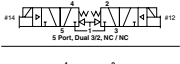
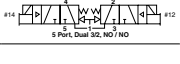
**Wear Compensation System**

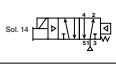
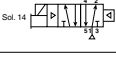

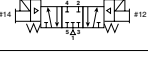
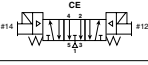
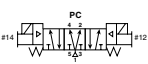
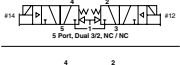

- Maximum Performance
  - Low Friction
  - Lower Operating Pressures
  - Fast Response
  - Less Wear
- Long Cycle Life - Under pressure, radial expansion of the seal occurs to maintain sealing contact with the valve bore.
- Non-Lube Service - No lubrication required for continuous valve shifting.
- Bi-Directional Spool Seals - Common spool used for any pressure, including vacuum.




|                                   |
|-----------------------------------|
| Valvair II Series                 |
| DX ISOMAX Series                  |
| Fieldbus                          |
| Isys ISO Series                   |
| Isys Micro Series                 |
| Moduflex Series                   |
| <b>D</b>                          |
| Subbase & Manifold Valve Products |

**15407-2, Plug-in, Size 18mm (HB)**


|                   | Symbol  | Type  | Cv                                   | Operator           | Voltage         | Pilot    | Non-locking        | Locking            |
|-------------------|---|---|--------------------------------------|--------------------|-----------------|----------|--------------------|--------------------|
| Valvair II Series |  | 4-way, 2-position, spring return  | 0.55                                 | Single solenoid    | 24 VDC          | Internal | <b>HBEVXBG0G9A</b> | <b>HBEVXBH0G9A</b> |
|                   |   | External  | <b>HBEVXLG0G9A</b>                   | <b>HBEVXLH0G9A</b> |                 |          |                    |                    |
|                   |  | 4-way, 2-position, air return   | 0.55                                 | Single solenoid    | 24 VDC          | Internal | <b>HB1VXBG0G9A</b> | <b>HB1VXBH0G9A</b> |
|                   |   | External  | <b>HB1VXLG0G9A</b>                   | <b>HB1VXLH0G9A</b> |                 |          |                    |                    |
| DX ISOMAX Series  |  | 4-way, 2-position   | 0.55                                 | Double solenoid    | 24 VDC          | Internal | <b>HB2VXBG0G9A</b> | <b>HB2VXBH0G9A</b> |
|                   |   | External  | <b>HB2VXLG0G9A</b>                   | <b>HB2VXLH0G9A</b> |                 |          |                    |                    |
|                   |  | 4-way, 3-position, all ports blocked  | 0.5                                  | Double solenoid    | 24 VDC          | Internal | <b>HB5VXBG0G9A</b> | <b>HB5VXBH0G9A</b> |
|                   |   | External  | <b>HB5VXLG0G9A</b>                   | <b>HB5VXLH0G9A</b> |                 |          |                    |                    |
|                   |  | 4-way, 3-position, center exhaust   | 0.5                                  | Double solenoid    | 24 VDC          | Internal | <b>HB6VXBG0G9A</b> | <b>HB6VXBH0G9A</b> |
|                   |   | External  | <b>HB6VXLG0G9A</b>                   | <b>HB6VXLH0G9A</b> |                 |          |                    |                    |
|                   |  | 4-way, 3-position, pressure center  | 0.5                                  | Double solenoid    | 24 VDC          | Internal | <b>HB7VXBG0G9A</b> | <b>HB7VXBH0G9A</b> |
|                   |   | External  | <b>HB7VXLG0G9A</b>                   | <b>HB7VXLH0G9A</b> |                 |          |                    |                    |
| Fieldbus          |  | 3-way, 2-position, dual valve, NC/NC  | 0.45                                 | Double solenoid    | 24 VDC          | Internal | <b>HBNVXBG0G9A</b> | <b>HBNVXBH0G9A</b> |
|                   |   |  | 3-way, 2-position, dual valve, NO/NO | 0.45               | Double solenoid | 24 VDC   | Internal           | <b>HBPVXBG0G9A</b> |

|                                     | Symbol  | Type  | Cv                                   | Operator           | Voltage         | Pilot    | Non-locking        | Locking            |
|-------------------------------------|---|---|--------------------------------------|--------------------|-----------------|----------|--------------------|--------------------|
| Isys ISO Series                     |    | 4-way, 2-position, spring return  | 0.55                                 | Single solenoid    | 120 VAC         | Internal | <b>HBEVXBG023A</b> | <b>HBEVXBH023A</b> |
|                                     |   | External  | <b>HBEVXLG023A</b>                   | <b>HBEVXLH023A</b> |                 |          |                    |                    |
| Isys Micro Series                   |   | 4-way, 2-position, air return   | 0.55                                 | Single solenoid    | 120 VAC         | Internal | <b>HB1VXBG023A</b> | <b>HB1VXBH023A</b> |
|                                     |   | External  | <b>HB1VXLG023A</b>                   | <b>HB1VXLH023A</b> |                 |          |                    |                    |
| Modulflex Series                    |  | 4-way, 2-position   | 0.55                                 | Double solenoid    | 120 VAC         | Internal | <b>HB2VXBG023A</b> | <b>HB2VXBH023A</b> |
|                                     |   | External  | <b>HB2VXLG023A</b>                   | <b>HB2VXLH023A</b> |                 |          |                    |                    |
|                                     |  | 4-way, 3-position, all ports blocked  | 0.5                                  | Double solenoid    | 120 VAC         | Internal | <b>HB5VXBG023A</b> | <b>HB5VXBH023A</b> |
|                                     |   | External  | <b>HB5VXLG023A</b>                   | <b>HB5VXLH023A</b> |                 |          |                    |                    |
|                                     |  | 4-way, 3-position, center exhaust   | 0.5                                  | Double solenoid    | 120 VAC         | Internal | <b>HB6VXBG023A</b> | <b>HB6VXBH023A</b> |
|                                     |   | External  | <b>HB6VXLG023A</b>                   | <b>HB6VXLH023A</b> |                 |          |                    |                    |
|                                     |  | 4-way, 3-position, pressure center  | 0.5                                  | Double solenoid    | 120 VAC         | Internal | <b>HB7VXBG023A</b> | <b>HB7VXBH023A</b> |
|                                     |   | External  | <b>HB7VXLG023A</b>                   | <b>HB7VXLH023A</b> |                 |          |                    |                    |
| D Subbase & Manifold Valve Products |  | 3-way, 2-position, dual valve, NC/NC  | 0.45                                 | Double solenoid    | 120 VAC         | Internal | <b>HBNVXBG023A</b> | <b>HBNVXBH023A</b> |
|                                     |   |  | 3-way, 2-position, dual valve, NO/NO | 0.45               | Double solenoid | 120 VAC  | Internal           | <b>HBPVXBG023A</b> |






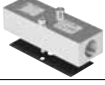

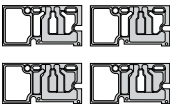
**15407-2, Plug-in, Size 18mm (HB), 2-Station Manifold Bases**

| End ported bases  | Enclosure / Lead length                | Solenoid addresses            | 1/8" NPT          | 1/8" BSPP         |
|---|--|-------------------------------|-------------------|-------------------|
|  | Circuit board                          | Single solenoid - 1 address   | <b>PS561151JP</b> | <b>PS561152JP</b> |
|   | Circuit board                          | Double solenoid - 2 addresses | <b>PS561151MP</b> | <b>PS561152MP</b> |
|   | Circuit board with 32 output expansion | Single solenoid - 1 address   | <b>PS561151NP</b> | <b>PS561152NP</b> |
|   | Circuit board with 32 output expansion | Double solenoid - 2 addresses | <b>PS561151PP</b> | <b>PS561152PP</b> |

**Bottom / end ported bases**

|   |  |                               |                   |                   |
|---|--|-------------------------------|-------------------|-------------------|
|  | Circuit board                          | Single solenoid - 1 address   | <b>PS561161JP</b> | <b>PS561162JP</b> |
|   | Circuit board                          | Double solenoid - 2 addresses | <b>PS561161MP</b> | <b>PS561162MP</b> |
|   | Circuit board with 32 output expansion | Single solenoid - 1 address   | <b>PS561161NP</b> | <b>PS561162NP</b> |
|   | Circuit board with 32 output expansion | Double solenoid - 2 addresses | <b>PS561161PP</b> | <b>PS561162PP</b> |

**15407-2, Plug-in, Size 18mm (HB) Accessories**

| Accessories   | Description                            | Part number                              |
|---|--|--|
|  Sandwich regulator                | Common pressure                        | 2-60 PSIG w/ gauge<br><b>PS5638155P</b>  |
|   | Common pressure                        | 5-125 PSIG w/ gauge<br><b>PS5638166P</b> |
|   | Independent pressure                   | 2-60 PSIG w/ gauge<br><b>PS5638255P</b>  |
|   | Independent pressure                   | 5-125 PSIG w/ gauge<br><b>PS5638266P</b> |
|  Gauge adapter kit                 | Includes 1/8" coupling and long nipple | <b>PS5651160P</b>                        |
|  Blanking plate kit                |  | <b>PS5634P</b>                           |
|  Sandwich supply module            | 1/8" NPT                               | <b>PS561600P</b>                         |
|   | 1/8" BSPP                              | <b>PS561601P</b>                         |
|  Sandwich exhaust module           | 1/8" NPT                               | <b>PS561700P</b>                         |
|   | 1/8" BSPP                              | <b>PS561701P</b>                         |
|  Intermediate air supply module    | 1/8" NPT                               | <b>D02P-01-80</b>                        |
|  Sandwich flow control             |  | <b>PS5635P</b>                           |
|  Manifold to manifold gasket kits | Standard                               | <b>PS561AP</b>                           |
|   | Blocked #1 port                        | <b>PS561BP</b>                           |
|   | Blocked #1, 3, 5, ports                | <b>PS561CP</b>                           |
|   | Blocked #3, 5 ports                    | <b>PS561DP</b>                           |

Valvoir II Series

DX ISOMAX Series

Fieldbus


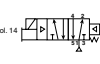



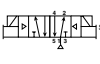
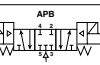

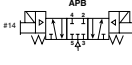
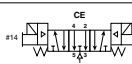

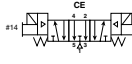
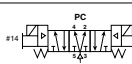

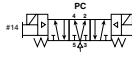
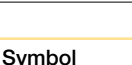
Isys ISO Series


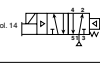

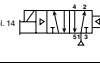

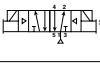
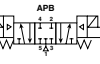

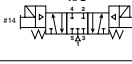
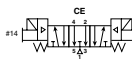

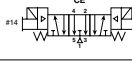
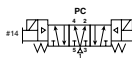

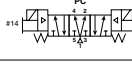

Isys Micro Series

Moduflex Series


**D**  
 Subbase & Manifold Valve Products

**15407-2, Plug-in, Size 26mm (HA)**


| Symbol  | Type                                 | Cv  | Operator        | Voltage | Pilot    | Non-locking        | Locking            |
|---|--------------------------------------|-----|-----------------|---------|----------|--------------------|--------------------|
| <br>Sol. 14   | 4-way, 2-position, spring return     | 1.1 | Single solenoid | 24 VDC  | Internal | <b>HAEVXBG0G9A</b> | <b>HAEVXBH0G9A</b> |
|   |                                      |     |                 |         | External | <b>HAEVXLG0G9A</b> | <b>HAEVXLH0G9A</b> |
| <br>Sol. 13   | 4-way, 2-position, air return        | 1.1 | Single solenoid | 24 VDC  | Internal | <b>HA1VXBG0G9A</b> | <b>HA1VXBH0G9A</b> |
|   |                                      |     |                 |         | External | <b>HA1VXLG0G9A</b> | <b>HA1VXLH0G9A</b> |
| <br>Sol. 14 <br>Sol. 12  | 4-way, 2-position                    | 1.1 | Double solenoid | 24 VDC  | Internal | <b>HA2VXBG0G9A</b> | <b>HA2VXBH0G9A</b> |
|   |                                      |     |                 |         | External | <b>HA2VXLG0G9A</b> | <b>HA2VXLH0G9A</b> |
| <br>#14 <br>#12          | 4-way, 3-position, all ports blocked | 1.0 | Double solenoid | 24 VDC  | Internal | <b>HA5VXBG0G9A</b> | <b>HA5VXBH0G9A</b> |
|   |                                      |     |                 |         | External | <b>HA5VXLG0G9A</b> | <b>HA5VXLH0G9A</b> |
| <br>#14 <br>#12          | 4-way, 3-position, center exhaust    | 1.0 | Double solenoid | 24 VDC  | Internal | <b>HA6VXBG0G9A</b> | <b>HA6VXBH0G9A</b> |
|   |                                      |     |                 |         | External | <b>HA6VXLG0G9A</b> | <b>HA6VXLH0G9A</b> |
| <br>#14 <br>#12          | 4-way, 3-position, pressure center   | 1.0 | Double solenoid | 24 VDC  | Internal | <b>HA7VXBG0G9A</b> | <b>HA7VXBH0G9A</b> |
|   |                                      |     |                 |         | External | <b>HA7VXLG0G9A</b> | <b>HA7VXLH0G9A</b> |

| Symbol  | Type                                 | Cv  | Operator        | Voltage | Pilot    | Non-locking        | Locking            |
|---|--------------------------------------|-----|-----------------|---------|----------|--------------------|--------------------|
| <br>Sol. 14   | 4-way, 2-position, spring return     | 1.1 | Single solenoid | 120 VAC | Internal | <b>HAEVXBG023A</b> | <b>HAEVXBH023A</b> |
|   |                                      |     |                 |         | External | <b>HAEVXLG023A</b> | <b>HAEVXLH023A</b> |
| <br>Sol. 14   | 4-way, 2-position, air return        | 1.1 | Single solenoid | 120 VAC | Internal | <b>HA1VXBG023A</b> | <b>HA1VXBH023A</b> |
|   |                                      |     |                 |         | External | <b>HA1VXLG023A</b> | <b>HA1VXLH023A</b> |
| <br>Sol. 14 <br>Sol. 12  | 4-way, 2-position                    | 1.1 | Double solenoid | 120 VAC | Internal | <b>HA2VXBG023A</b> | <b>HA2VXBH023A</b> |
|   |                                      |     |                 |         | External | <b>HA2VXLG023A</b> | <b>HA2VXLH023A</b> |
| <br>#14 <br>#12       | 4-way, 3-position, all ports blocked | 1.0 | Double solenoid | 120 VAC | Internal | <b>HA5VXBG023A</b> | <b>HA5VXBH023A</b> |
|   |                                      |     |                 |         | External | <b>HA5VXLG023A</b> | <b>HA5VXLH023A</b> |
| <br>#14 <br>#12      | 4-way, 3-position, center exhaust    | 1.0 | Double solenoid | 120 VAC | Internal | <b>HA6VXBG023A</b> | <b>HA6VXBH023A</b> |
|   |                                      |     |                 |         | External | <b>HA6VXLG023A</b> | <b>HA6VXLH023A</b> |
| <br>#14 <br>#12      | 4-way, 3-position, pressure center   | 1.0 | Double solenoid | 120 VAC | Internal | <b>HA7VXBG023A</b> | <b>HA7VXBH023A</b> |
|   |                                      |     |                 |         | External | <b>HA7VXLG023A</b> | <b>HA7VXLH023A</b> |


**15407-2, Plug-in, Size 26mm (HA), Single Subbase**

| Enclosure / Lead length   | Solenoid addresses            | 1/4" NPT         | 1/4" BSPP        |
|---|-------------------------------|------------------|------------------|
| <br>Terminal strip in the base | Double solenoid - 2 addresses | <b>PS55113CP</b> | <b>PS55114CP</b> |

**15407-2, Plug-in, Size 26mm (HA), 2-Station Manifold Bases**








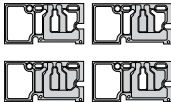
| End ported bases  | Enclosure / Lead length                | Solenoid addresses            | 1/4" NPT          | 1/4" BSPP         |
|---|--|-------------------------------|-------------------|-------------------|
|  | Circuit board                          | Single solenoid - 1 address   | <b>PS551153JP</b> | <b>PS551154JP</b> |
|   | Circuit board                          | Double solenoid - 2 addresses | <b>PS551153MP</b> | <b>PS551154MP</b> |
|   | Circuit board with 32 output expansion | Single solenoid - 1 address   | <b>PS551153NP</b> | <b>PS551154NP</b> |
|   | Circuit board with 32 output expansion | Double solenoid - 2 addresses | <b>PS551153PP</b> | <b>PS551154PP</b> |
|   | Terminal strip in the base             | Double solenoid - 2 addresses | <b>PS551153CP</b> | <b>PS551154CP</b> |

**Bottom / end ported bases**

|   |  |                               |                   |                   |
|---|--|-------------------------------|-------------------|-------------------|
|  | Circuit board                          | Single solenoid - 1 address   | <b>PS551163JP</b> | <b>PS551164JP</b> |
|   | Circuit board                          | Double solenoid - 2 addresses | <b>PS551163MP</b> | <b>PS551164MP</b> |
|   | Circuit board with 32 output expansion | Single solenoid - 1 address   | <b>PS551163NP</b> | <b>PS551164NP</b> |
|   | Circuit board with 32 output expansion | Double solenoid - 2 addresses | <b>PS551163PP</b> | <b>PS551164PP</b> |
|   | Terminal strip in the base             | Double solenoid - 2 addresses | <b>PS551163CP</b> | <b>PS551164CP</b> |

Valvair II Series  
 DX ISOMAX Series  
 Fieldbus Series  
 Isys ISO Series  
 Isys Micro Series  
 Modulflex Series  
**D**  
 Subbase & Manifold Valve Products

**15407-2, Plug-in, Size 26mm (HA) Accessories**

| Accessories  | Description                            | Part number                              |
|--|--|--|
| <br>Sandwich regulator                | Common pressure                        | 2-60 PSIG w/ gauge<br><b>PS5538155P</b>  |
|  | Common pressure                        | 5-125 PSIG w/ gauge<br><b>PS5538166P</b> |
|  | Independent pressure                   | 2-60 PSIG w/ gauge<br><b>PS5538255P</b>  |
|  | Independent pressure                   | 5-125 PSIG w/ gauge<br><b>PS5538266P</b> |
| <br>Gauge adapter kit                 | Includes 1/8" coupling and long nipple | <b>PS5551160P</b>                        |
| <br>Blanking plate kit                |  | <b>PS5534P</b>                           |
| <br>Sandwich supply module            | 1/4" NPT                               | <b>PS551600P</b>                         |
|  | 1/4" BSPP                              | <b>PS551601P</b>                         |
| <br>Sandwich exhaust module           | 1/4" NPT                               | <b>PS551700P</b>                         |
|  | 1/4" BSPP                              | <b>PS551701P</b>                         |
| <br>Intermediate air supply module    | 1/4" NPT                               | <b>D01P-02-80</b>                        |
| <br>Sandwich flow control             |  | <b>PS5535P</b>                           |
| <br>Manifold to manifold gasket kits | Standard                               | <b>PS561AP</b>                           |
|  | Blocked #1 port                        | <b>PS561BP</b>                           |
|  | Blocked #1, 3, 5, ports                | <b>PS561CP</b>                           |
|  | Blocked #3, 5 ports                    | <b>PS561DP</b>                           |

Valvir II  
Series

DX ISOMAX  
Series

Fieldbus

Isys ISO  
Series

Isys Micro  
Series











Moduflex  
Series

**D**

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Valve Products




**15407-2, Plug-in, Size 18mm & 26mm End Plate Kits**

|                   | Electrical option  | NPT port          | BSPP port         |
|-------------------|--|-------------------|-------------------|
| Valvair II Series |  No connector - use with terminal strip in base         | <b>PS5631010P</b> | <b>PS5631011P</b> |
|                   |  25-pin, D-Sub  | <b>PS5620L20P</b> | <b>PS5620L21P</b> |
| DX ISOMAX Series  |  19-pin, round, Brad Harrison                           | <b>PS5620L30P</b> | <b>PS5620L31P</b> |
|                   |  12-pin, M23  | <b>PS5620L40P</b> | <b>PS5620L41P</b> |
| Fieldbus Series   |  16-point terminal strip                                | <b>PS5620L50P</b> | <b>PS5620L51P</b> |
|                   |  19-pin, M23  | <b>PS5620M20P</b> | <b>PS5620M21P</b> |
| Isys ISO Series   |  Moduflex fieldbus                                     | <b>PS5620M40P</b> | <b>PS5620M41P</b> |
|                   |  Isysnet, with valve driver module                    | <b>PS5620L60P</b> | <b>PS5620L61P</b> |
| Isys Micro Series |  Turck fieldbus with valve driver module - 16 outputs | <b>PS5620T10P</b> | <b>PS5620T11P</b> |
|                   |  Turck fieldbus with valve driver module - 32 outputs | <b>PS5620T20P</b> | <b>PS5620T21P</b> |

**D**

Subbase & Manifold  
 Valve Products

**15407-2 End Plate Kits with Transition to H2**

|   | Electrical option                                    | NPT port          | BSPP port         |
|---|--|-------------------|-------------------|
|  | 25-pin, D-sub  | <b>PS5624L20P</b> | <b>PS5624L21P</b> |
|   | 19-pin, round, Brad Harrison                         | <b>PS5624L30P</b> | <b>PS5624L31P</b> |
|   | 12-pin, M23  | <b>PS5624L40P</b> | <b>PS5624L41P</b> |
|   | 16-point terminal strip                              | <b>PS5624L50P</b> | <b>PS5624L51P</b> |
|   | 19-pin, M23  | <b>PS5624M20P</b> | <b>PS5624M21P</b> |
|   | Moduflex fieldbus                                    | <b>PS5624M40P</b> | <b>PS5624M41P</b> |
|   | Isysnet, with valve driver module                    | <b>PS5624L60P</b> | <b>PS5624L61P</b> |
|   | Turck fieldbus with valve driver module - 16 outputs | <b>PS5624T10P</b> | <b>PS5624T11P</b> |
|   | Turck fieldbus with valve driver module - 32 outputs | <b>PS5624T20P</b> | <b>PS5624T21P</b> |

Turck, Isysnet, and Moduflex communication modules must be ordered separately. See Fieldbus Section for more information.

**15407-2, Plug-in, Size 18mm (HB) & 26mm (HA)**

**HB 1 VX B G 0 G9 A**

| Basic series 15407-2 |    |
|----------------------|----|
| ISO 15407-2 18mm     | HB |
| ISO 15407-2 26mm     | HA |

| 15407-2 Engineering level |         |
|---------------------------|---------|
| A                         | Current |

| 15407-2 Operator / Function                             |    |
|---|----|
| Single solenoid, 2-position - air return                | 1  |
| Double solenoid, 2-position                             | 2  |
| Double solenoid, 3-position - APB                       | 5  |
| Double solenoid, 3-position - CE                        | 6  |
| Double solenoid, 3-position - PC                        | 7  |
| Single solenoid, 2-position - air return, spring assist | E  |
| Double solenoid, dual 3/2, NC/NC                        | N* |
| Double solenoid, dual 3/2, NO/NO                        | P* |
| Double solenoid, dual 3/2, 14 end NC – 12 end NO        | Q* |

\* Available on HB Only, must use Internal Pilot Source Option "B".

| 15407-2 Voltage & frequency |      |      |    |                           |
|-----------------------------|------|------|----|---------------------------|
|                             | AC   |      | DC | Light & surge suppression |
|                             | 60Hz | 50Hz |    |                           |
| G9                          |      |      | 24 | LED & suppression         |
| 23                          | 120  | 115  |    | LED & suppression         |

| 15407-2 Enclosure / Lead length |                 |
|---------------------------------|-----------------|
| 0                               | Valve less base |

| 15407-2 Overrides / Lights |  |
|----------------------------|--|
| G                          | Non-locking, flush, push - w/ light    |
| H                          | Locking, flush, push / turn - w/ light |

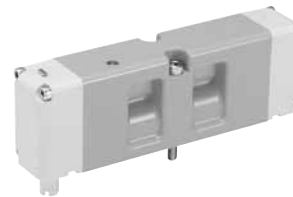
| Mounting                |    |
|-------------------------|----|
| 15407-2 Valve less base | VX |

| 15407-2 Pilot source / Pilot exhaust |    |
|--------------------------------------|----|
| Internal pilot, port #1 / vented     | B  |
| External pilot, port #14 / vented    | L* |

\* Must be specified when using Sandwich Regulators.



HB: 18mm



HA: 26mm

Most popular.



|                                   |
|-----------------------------------|
| Valvair II Series                 |
| DX ISOMAX Series                  |
| Fieldbus                          |
| Isys ISO Series                   |
| Isys Micro Series                 |
| Moduflex Series                   |
| <b>D</b>                          |
| Subbase & Manifold Valve Products |

**How To Order Plug-in Add-A-Fold Assemblies**

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

**Example**

Application requires a 4-Station manifold.  
 (Two 18mm + Two 26mm Stations)

| Item | Qty. | Part No.    | Location      |
|------|------|-------------|---------------|
| 01   | 1    | AAHBD004    |               |
| 02   | 1    | HB1VXBG0G9A | Station 1     |
| 03   | 1    | HB2VXLG0G9A | Station 2     |
| 04   | 1    | PS561151MP  | Station 1 & 2 |
| 05   | 2    | HA1VXBG0G9A | Station 3 & 4 |
| 06   | 1    | PS551151MP  | Station 3 & 4 |

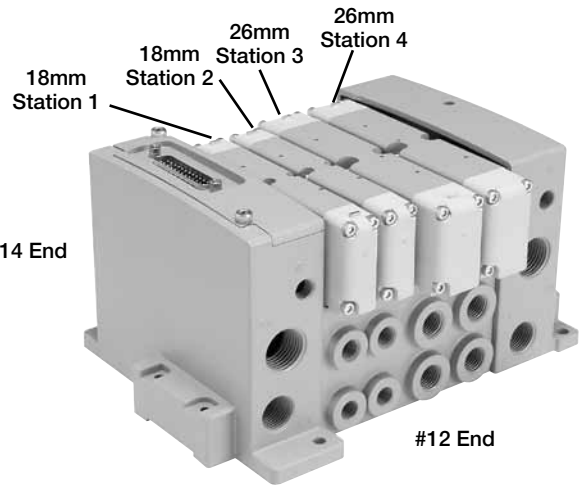
**NOTE:** Construct manifold assemblies from left to right while looking at the ports. Valves must be ordered as External Pilot when using Sandwich Regulator.

**When using an HA or HB manifold base with the "N" Enclosure / Lead Length option:**

- Outputs 1 – 24 can be single or double address bases. Use a base with "J" or "M" Enclosure / Lead Length option.
- Outputs 25 – 26 are a single address base. Use a base with "N" Enclosure / Lead Length option (this is a single address board with a ribbon connection from the valve driver module, PSSV32A).
- Outputs 27 – 32 can be single or double. Use a base with "J" or "M" Enclosure / Lead Length option.

**When using an HA or HB manifold base with the "P" Enclosure / Lead Length option:**

- Outputs 1 – 24 can be single or double address bases. Use a base with "J" or "M" Enclosure / Lead Length option.
- Outputs 25 – 28 are a double address base. Use a base with "P" Enclosure / Lead Length option (this is a double address board with a ribbon connection from the valve driver module, PSSV32A).
- Outputs 29 – 32 can be single or double. Use a base with "J" or "M" Enclosure / Lead Length option.



**Example:**  
 4-Station Manifold with (2) 18mm and (2) 26mm Valves on Manifold Bases with 25-pin, D-Sub End Plates

**Maximum Number of Solenoids (Maximum energized simultaneously)**

| Voltage | Voltage code | 25-pin D-sub | 19-pin M23 or Brad Harrison |       | 12-pin M23 Moduflex | Isysnet | Turck   |         |
|---------|--------------|--------------|-----------------------------|-------|---------------------|---------|---------|---------|
|         |              |              | 16                          | 32    |                     |         | 16      | 32      |
| 24VDC   | G9           | 24 (24)      | 16 (16)                     | 8 (8) | 16 (16)             | 32 (32) | 16 (16) | 32 (32) |
| 120VAC* | 23           | 24 (24)      | 16 (16)                     | 8 (8) | N/A                 | N/A     | N/A     | N/A     |

\* Not CSA certified for 25-pin, D-Sub option.

**Add-A-Fold Assembly Model Number**

**AA HB D 0 04**

|   |                            |
|---|----------------------------|
| <b>Valve series</b>   | <b>Number of stations*</b> |
| Right & left end plate 15407-2 (plug-in, HB 18mm & HA 26mm) HB* | 02                         |
|   | 04                         |
|   | •                          |
|   | 24                         |
|   | •                          |
|   | 32                         |

\* Common end plates for HA & HB.

|  |    |
|--|----|
| <b>End plate type</b>                                |    |
| Turck fieldbus with valve driver module - 16 outputs | A* |
| Turck fieldbus with valve driver module - 32 outputs | B* |
| 25-pin, D-sub  | D  |
| 19-pin, Brad Harrison                                | E  |
| 16 Point terminal strip                              | F  |
| 12-pin, M23  | G  |
| 19-pin, M23  | H  |
| Moduflex fieldbus                                    | T* |
| Isysnet, with valve driver module                    | Y* |

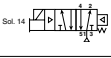
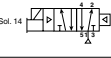
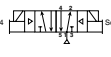
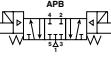
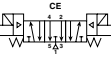
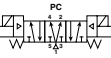
\* Must order communication modules separately.

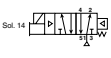
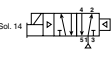
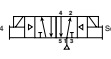
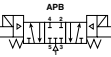
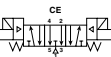
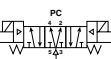
|                    |          |
|--------------------|----------|
| <b>Thread type</b> |          |
| 0                  | NPT      |
| 1*                 | BSPP "G" |

\* BSPP conforms to ISO 1179-1 with 228-1 threads.


Valvair II Series  
 DX ISOMAX Series  
 Fieldbus  
 Isys ISO Series  
 Isys Micro Series  
 Moduflex Series  
**D**  
 Subbase & Manifold Valve Products

**5599-2, Plug-in, Size 1 (H1)**


| Symbol  | Type                                 | Cv  | Operator        | Voltage | Pilot    | Non-locking        | Locking            |
|---|--------------------------------------|-----|-----------------|---------|----------|--------------------|--------------------|
|  | 4-way, 2-position, spring return     | 1.5 | Single solenoid | 24 VDC  | Internal | <b>H1EVXBG0B9D</b> | <b>H1EVXBH0B9D</b> |
|   |                                      |     |                 |         | External | <b>H1EVXXG0B9D</b> | <b>H1EVXXH0B9D</b> |
|  | 4-way, 2-position, air return        | 1.5 | Single solenoid | 24 VDC  | Internal | <b>H11VXBG0B9D</b> | <b>H11VXBH0B9D</b> |
|   |                                      |     |                 |         | External | <b>H11VXXG0B9D</b> | <b>H11VXXH0B9D</b> |
|  | 4-way, 2-position                    | 1.5 | Double solenoid | 24 VDC  | Internal | <b>H12VXBG0B9D</b> | <b>H12VXBH0B9D</b> |
|   |                                      |     |                 |         | External | <b>H12VXXG0B9D</b> | <b>H12VXXH0B9D</b> |
|  | 4-way, 3-position, all ports blocked | 1.2 | Double solenoid | 24 VDC  | Internal | <b>H15VXBG0B9D</b> | <b>H15VXBH0B9D</b> |
|   |                                      |     |                 |         | External | <b>H15VXXG0B9D</b> | <b>H15VXXH0B9D</b> |
|  | 4-way, 3-position, center exhaust    | 1.2 | Double solenoid | 24 VDC  | Internal | <b>H16VXBG0B9D</b> | <b>H16VXBH0B9D</b> |
|   |                                      |     |                 |         | External | <b>H16VXXG0B9D</b> | <b>H16VXXH0B9D</b> |
|  | 4-way, 3-position, pressure center   | 1.2 | Double solenoid | 24 VDC  | Internal | <b>H17VXBG0B9D</b> | <b>H17VXBH0B9D</b> |
|   |                                      |     |                 |         | External | <b>H17VXXG0B9D</b> | <b>H17VXXH0B9D</b> |

| Symbol  | Type                                 | Cv  | Operator        | Voltage | Pilot    | Non-locking        | Locking            |
|---|--------------------------------------|-----|-----------------|---------|----------|--------------------|--------------------|
|    | 4-way, 2-position, spring return     | 1.5 | Single solenoid | 120 VAC | Internal | <b>H1EVXBG023D</b> | <b>H1EVXBH023D</b> |
|   |                                      |     |                 |         | External | <b>H1EVXXG023D</b> | <b>H1EVXXH023D</b> |
|    | 4-way, 2-position, air return        | 1.5 | Single solenoid | 120 VAC | Internal | <b>H11VXBG023D</b> | <b>H11VXBH023D</b> |
|   |                                      |     |                 |         | External | <b>H11VXXG023D</b> | <b>H11VXXH023D</b> |
|    | 4-way, 2-position                    | 1.5 | Double solenoid | 120 VAC | Internal | <b>H12VXBG023D</b> | <b>H12VXBH023D</b> |
|   |                                      |     |                 |         | External | <b>H12VXXG023D</b> | <b>H12VXXH023D</b> |
|    | 4-way, 3-position, all ports blocked | 1.2 | Double solenoid | 120 VAC | Internal | <b>H15VXBG023D</b> | <b>H15VXBH023D</b> |
|   |                                      |     |                 |         | External | <b>H15VXXG023D</b> | <b>H15VXXH023D</b> |
|   | 4-way, 3-position, center exhaust    | 1.2 | Double solenoid | 120 VAC | Internal | <b>H16VXBG023D</b> | <b>H16VXBH023D</b> |
|   |                                      |     |                 |         | External | <b>H16VXXG023D</b> | <b>H16VXXH023D</b> |
|  | 4-way, 3-position, pressure center   | 1.2 | Double solenoid | 120 VAC | Internal | <b>H17VXBG023D</b> | <b>H17VXBH023D</b> |
|   |                                      |     |                 |         | External | <b>H17VXXG023D</b> | <b>H17VXXH023D</b> |

**5599-2, Plug-in Single Subbase, Size 1 (H1)**

| Side ported   | Enclosure / Lead length                               | Solenoid addresses            | 3/8" NPT            | 3/8" BSPP           |
|---|---|-------------------------------|---------------------|---------------------|
|  | Terminal strip in base                                | Double solenoid - 2 address   | <b>PS401115CDP</b>  | <b>PS401116CDP</b>  |
|   | 6" flying leads                                       | Double solenoid - 2 addresses | <b>PS401115ADP</b>  | <b>PS401116ADP</b>  |
|   | 4-pin, M12 micro connector in base, SAE / Ford wiring | Double solenoid - 2 addresses | <b>PS4011158FDP</b> | <b>PS4011168FDP</b> |

**5599-2, Plug-in Manifold Bases, Size 1 (H1)**

| Bottom / End  | Enclosure / Lead length                               | Solenoid addresses            | 3/8" NPT            | 3/8" BSPP           |
|---|---|-------------------------------|---------------------|---------------------|
|  | Circuit board   | Single solenoid - 1 address   | <b>PS401165JCP</b>  | <b>PS401166JCP</b>  |
|   | Circuit board   | Double solenoid - 2 addresses | <b>PS401165MCP</b>  | <b>PS401166MCP</b>  |
|   | Terminal strip in base                                | Double solenoid - 2 address   | <b>PS401165CCP</b>  | <b>PS401166CCP</b>  |
|   | 6" flying leads                                       | Double solenoid - 2 addresses | <b>PS401165ACP</b>  | <b>PS401166ACP</b>  |
|   | 4-pin, M12 micro connector in base, SAE / Ford wiring | Double solenoid - 2 addresses | <b>PS4011658FCP</b> | <b>PS4011668FCP</b> |

Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series




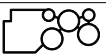
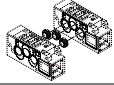

Isys Micro Series

Modulflex Series








**D**

Subbase & Manifold Valve Products

**5599-2, Size 1 (H1) Accessories**

| Accessory   | Description                              | Part number        |
|---|--|--------------------|
|  | Common pressure 5-125 PSIG w/ gauge      | <b>PS4038166CP</b> |
|   | Independent pressure 5-125 PSIG w/ gauge | <b>PS4038266CP</b> |
|  | Blanking plate kit                       | <b>PS4034CP</b>    |
|  | Sandwich flow control                    | <b>PS4035CP</b>    |
|  | Manifold to manifold gasket kits         | <b>PS4013P</b>     |
|  | Main galley (1, 3, 5)                    | <b>PS4032CP</b>    |
|   | Pilot galley                             | <b>PS4033CP</b>    |
|  | 1/4" & 3/8" NPT                          | <b>PS403000CP</b>  |
|   | BSPP                                     | <b>PS403001CP</b>  |

**Plug-in, 5599-2 End Plate Kits, Size 1 (H1)**

| Electrical option   | Description  | NPT port           | BSPP port          |
|---|--|--------------------|--------------------|
|  | No connector - use with individually wired base      | <b>PS4031010CP</b> | <b>PS4031011CP</b> |
|  | 25-pin, D-sub  | <b>PS4020L20CP</b> | <b>PS4020L21CP</b> |
|  | 19-pin, round, Brad Harrison                         | <b>PS4020L30CP</b> | <b>PS4020L31CP</b> |
|  | 12-pin, M23  | <b>PS4020L40CP</b> | <b>PS4020L41CP</b> |
|   | 19-pin, M23  | <b>PS4020M20CP</b> | <b>PS4020M21CP</b> |
|  | Moduflex fieldbus                                    | <b>PS4020M40CP</b> | <b>PS4020M41CP</b> |
|  | Isysnet, with valve driver module                    | <b>PS4020L60CP</b> | <b>PS4020L61CP</b> |
|  | Turck fieldbus with valve driver module - 16 outputs | <b>PS4020T10CP</b> | <b>PS4020T11CP</b> |
|   | Turck fieldbus with valve driver module - 32 outputs | <b>PS4020T20CP</b> | <b>PS4020T21CP</b> |

Turck, Isysnet, and Moduflex communication modules must be ordered separately. See Fieldbus Section for more information.

Valvair II Series  
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 Fieldbus Series  
 Isys ISO Series  
 Isys Micro Series  
 Moduflex Series  
**D**  
 Subbase & Manifold Valve Products

### How To Order Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

### Example

Application requires a 3-Station manifold with a valve, regulator on Station 3.

| Item | Qty. | Part No.    | Location  |
|------|------|-------------|-----------|
| 01   | 1    | AAH1D003    |           |
| 02   | 1    | H11VXBG0B9D | Station 1 |
| 03   | 1    | PS401155MCP | Station 1 |
| 04   | 1    | H12VXBG0B9D | Station 2 |
| 05   | 1    | PS401155MCP | Station 2 |
| 06   | 1    | H12VXXG0B9D | Station 3 |
| 07   | 1    | PS4038166CP | Station 3 |
| 08   | 1    | PS401155MCP | Station 3 |

**NOTE:**

Construct manifold assemblies from left to right while looking at the cylinder ports. Valves must be ordered as External Pilot when using Sandwich Regulator.



**Example:  
 3-Station Manifold with (3) H1 Valves  
 on Manifold Bases  
 and Regulator at Station 3**

### Maximum Number of Solenoids (Maximum energized simultaneously)

| Voltage | Voltage code | 25-pin D-sub | 19-pin M23 or Brad Harrison |       | 12-pin M23 Moduflex | Isysnet | Turck   |         |
|---------|--------------|--------------|-----------------------------|-------|---------------------|---------|---------|---------|
|         |              |              | 16                          | 8     |                     |         | 16      | 32      |
| 24VDC   | G9           | 24 (24)      | 16 (16)                     | 8 (8) | 16 (16)             | 24 (21) | 16 (16) | 24 (21) |
| 120VAC* | 23           | 24 (24)      | 16 (16)                     | 8 (8) | N/A                 | N/A     | N/A     | N/A     |

\* Not CSA certified for 25-pin, D-Sub option.

### Add-A-Fold Assembly Model Numbers







**AA H1 D 0 03**






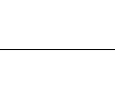
| Valve series       | Right & left end plate H1  |
|--------------------|--|
| End plate type     | Turck fieldbus with valve driver module - 16 outputs A*<br>Turck fieldbus with valve driver module - 32 outputs B*<br>25-pin, D-sub D<br>19-pin, brad harrison E<br>12-pin, M23 G<br>19-pin, M23 H<br>Moduflex fieldbus T*<br>Isysnet, with valve driver module X* |
| Number of stations | 01<br>02<br>03<br>04<br>•<br>•<br>24   |
| Thread type        | 0 NPT<br>1* BSPP "G"   |

\* Must order communication modules separately.  
 \* BSPP conforms to ISO 1179-1 w 228-1 threads.


Valvair II Series  
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 Isys Micro Series  
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**D**  
 Subbase & Manifold Valve Products

**5599-2, Plug-in, Size 2 (H2)**


| Symbol   | Type                                 | Cv  | Operator        | Voltage | Pilot    | Non-locking        | Locking            |
|--|--------------------------------------|-----|-----------------|---------|----------|--------------------|--------------------|
| <br>Sol. 14 | 4-way, 2-position, spring return     | 3.0 | Single solenoid | 24 VDC  | Internal | <b>H2EVXBG0B9D</b> | <b>H2EVXBH0B9D</b> |
|  |                                      |     |                 |         | External | <b>H2EVXXG0B9D</b> | <b>H2EVXXH0B9D</b> |
| <br>Sol. 14 | 4-way, 2-position, air return        | 3.0 | Single solenoid | 24 VDC  | Internal | <b>H21VXBG0B9D</b> | <b>H21VXBH0B9D</b> |
|  |                                      |     |                 |         | External | <b>H21VXXG0B9D</b> | <b>H21VXXH0B9D</b> |
| <br>Sol. 14 | 4-way, 2-position                    | 3.0 | Double solenoid | 24 VDC  | Internal | <b>H22VXBG0B9D</b> | <b>H22VXBH0B9D</b> |
|  |                                      |     |                 |         | External | <b>H22VXXG0B9D</b> | <b>H22VXXH0B9D</b> |
| <br>#14     | 4-way, 3-position, all ports blocked | 2.8 | Double solenoid | 24 VDC  | Internal | <b>H25VXBG0B9D</b> | <b>H25VXBH0B9D</b> |
|  |                                      |     |                 |         | External | <b>H25VXXG0B9D</b> | <b>H25VXXH0B9D</b> |
| <br>#14     | 4-way, 3-position, center exhaust    | 2.8 | Double solenoid | 24 VDC  | Internal | <b>H26VXBG0B9D</b> | <b>H26VXBH0B9D</b> |
|  |                                      |     |                 |         | External | <b>H26VXXG0B9D</b> | <b>H26VXXH0B9D</b> |
| <br>#14     | 4-way, 3-position, pressure center   | 2.8 | Double solenoid | 24 VDC  | Internal | <b>H27VXBG0B9D</b> | <b>H27VXBH0B9D</b> |
|  |                                      |     |                 |         | External | <b>H27VXXG0B9D</b> | <b>H27VXXH0B9D</b> |

| Symbol   | Type                                 | Cv  | Operator        | Voltage | Pilot    | Non-locking        | Locking            |
|--|--------------------------------------|-----|-----------------|---------|----------|--------------------|--------------------|
| <br>Sol. 14 | 4-way, 2-position, spring return     | 3.0 | Single solenoid | 120 VAC | Internal | <b>H2EVXBG023D</b> | <b>H2EVXBH023D</b> |
|  |                                      |     |                 |         | External | <b>H2EVXXG023D</b> | <b>H2EVXXH023D</b> |
| <br>Sol. 14 | 4-way, 2-position, air return        | 3.0 | Single solenoid | 120 VAC | Internal | <b>H21VXBG023D</b> | <b>H21VXBH023D</b> |
|  |                                      |     |                 |         | External | <b>H21VXXG023D</b> | <b>H21VXXH023D</b> |
| <br>Sol. 14 | 4-way, 2-position                    | 3.0 | Double solenoid | 120 VAC | Internal | <b>H22VXBG023D</b> | <b>H22VXBH023D</b> |
|  |                                      |     |                 |         | External | <b>H22VXXG023D</b> | <b>H22VXXH023D</b> |
| <br>#14    | 4-way, 3-position, all ports blocked | 2.8 | Double solenoid | 120 VAC | Internal | <b>H25VXBG023D</b> | <b>H25VXBH023D</b> |
|  |                                      |     |                 |         | External | <b>H25VXXG023D</b> | <b>H25VXXH023D</b> |
| <br>#14   | 4-way, 3-position, center exhaust    | 2.8 | Double solenoid | 120 VAC | Internal | <b>H26VXBG023D</b> | <b>H26VXBH023D</b> |
|  |                                      |     |                 |         | External | <b>H26VXXG023D</b> | <b>H26VXXH023D</b> |
| <br>#14   | 4-way, 3-position, pressure center   | 2.8 | Double solenoid | 120 VAC | Internal | <b>H27VXBG023D</b> | <b>H27VXBH023D</b> |
|  |                                      |     |                 |         | External | <b>H27VXXG023D</b> | <b>H27VXXH023D</b> |

**5599-2, Plug-in Single Subbase, Size 2 (H2)**




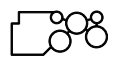
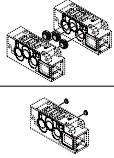
| Side ported base  | Enclosure / Lead length | Solenoid addresses            | 1/2" NPT           | 1/2" BSPP          |
|---|-------------------------|-------------------------------|--------------------|--------------------|
|  | Terminal strip in base  | Double solenoid - 2 address   | <b>PS411117CCP</b> | <b>PS411118CCP</b> |
|   | 6" flying leads         | Double solenoid - 2 addresses | <b>PS411117ACP</b> | <b>PS411118ACP</b> |

**5599-2, Plug-in Manifold Bases, Size 2 (H2)**








| Bottom / End ported bases   | Enclosure / Lead length | Solenoid addresses            | 1/2" NPT           | 1/2" BSPP          |
|---|-------------------------|-------------------------------|--------------------|--------------------|
|  | Circuit board           | Single solenoid - 1 address   | <b>PS411167JCP</b> | <b>PS411168JCP</b> |
|   | Circuit board           | Double solenoid - 2 addresses | <b>PS411167MCP</b> | <b>PS411168MCP</b> |
|   | Terminal strip in base  | Double solenoid - 2 address   | <b>PS411167CCP</b> | <b>PS411168CCP</b> |
|   | 6" flying leads         | Double solenoid - 2 addresses | <b>PS411167ACP</b> | <b>PS411168ACP</b> |



**5599-2, Size 2 (H2) Accessories**

| Accessory   | Description                              | Part number        |
|---|--|--------------------|
| <br>Sandwich regulator               | Common pressure 5-125 PSIG w/ gauge      | <b>PS4138166CP</b> |
|   | Independent pressure 5-125 PSIG w/ gauge | <b>PS4138266CP</b> |
| <br>Blanking plate kit               |  | <b>PS4134CP</b>    |
| <br>Sandwich flow control            |  | <b>PS4135CP</b>    |
| <br>Manifold to manifold gasket kits |  | <b>PS4113P</b>     |
| <br>Manifold port isolation kit      | Main galley (1, 3, 5)                    | <b>PS4132CP</b>    |
|   | Pilot galley                             | <b>PS4033CP</b>    |

**Plug-in, 5599-2 End Plate Kits, Size 2 (H2)**

| Electrical option   | Description  | NPT port           | BSPP port          |
|---|--|--------------------|--------------------|
| <br>No connector - use with individually wired base       |  | <b>PS4131010CP</b> | <b>PS4131011CP</b> |
| <br>25-pin, D-sub  |  | <b>PS4120L20CP</b> | <b>PS4120L21CP</b> |
| <br>19-pin, round, Brad Harrison                         |  | <b>PS4120L30CP</b> | <b>PS4120L31CP</b> |
| <br>12-pin, M23  |  | <b>PS4120L40CP</b> | <b>PS4120L41CP</b> |
|   | 19-pin, M23  | <b>PS4120M20CP</b> | <b>PS4120M21CP</b> |
| <br>Moduflex fieldbus                                    |  | <b>PS4120M40CP</b> | <b>PS4120M41CP</b> |
| <br>Isysnet, with valve driver module                    |  | <b>PS4120L60CP</b> | <b>PS4120L61CP</b> |
| <br>Turck fieldbus with valve driver module - 16 outputs |  | <b>PS4120T10CP</b> | <b>PS4120T11CP</b> |
|   | Turck fieldbus with valve driver module - 32 outputs | <b>PS4120T20CP</b> | <b>PS4120T21CP</b> |

Turck, Isysnet, and Moduflex communication modules must be ordered separately. See Fieldbus Section for more information.

Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

Isys Micro Series

Moduflex Series

**D**

Subbase & Manifold Valve Products

### How To Order Plug-in Add-A-Fold Assemblies

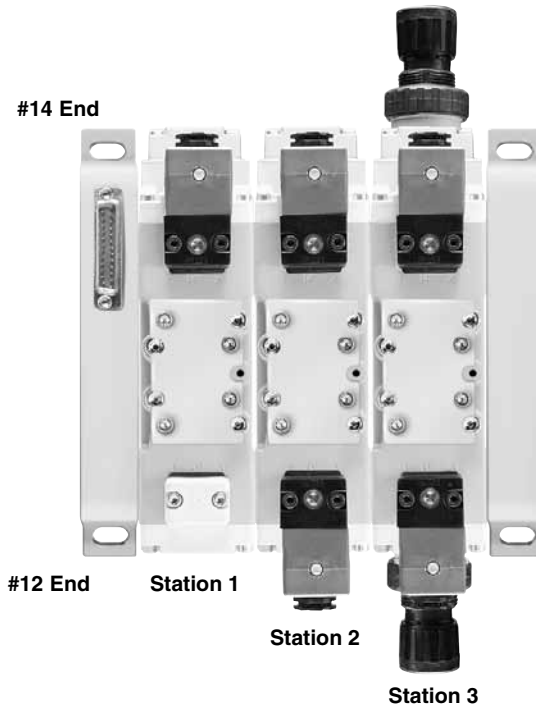
1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

### Example

Application requires a 3-Station manifold with a valve and regulator on Station 3.

| Item | Qty. | Part No.         | Location  |
|------|------|------------------|-----------|
| 01   | 1    | AAH2D003         |           |
| 02   | 1    | H21VXBG0B9D..... | Station 1 |
| 03   | 1    | PS411157MCP..... | Station 1 |
| 04   | 1    | H22VXBG0B9D..... | Station 2 |
| 05   | 1    | PS411157MCP..... | Station 2 |
| 06   | 1    | H22VXXG0B9D..... | Station 3 |
| 07   | 1    | PS4138166CP..... | Station 3 |
| 08   | 1    | PS411157MCP..... | Station 3 |

**NOTE:** Construct manifold assemblies from left to right while looking at the cylinder ports.  
 Valves must be ordered as External Pilot when using Sandwich Regulator.



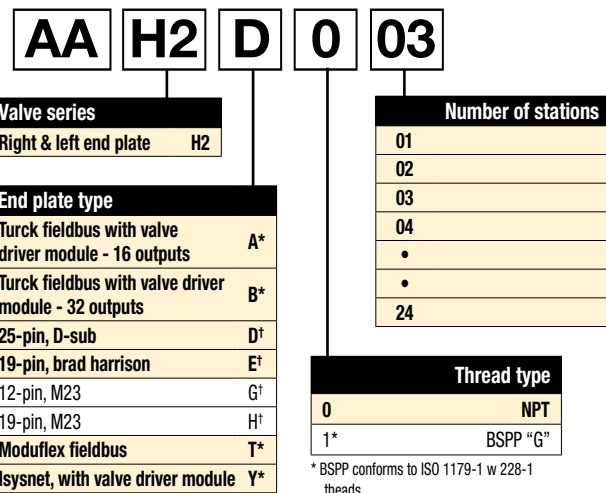
**Example:**  
**3-Station Manifold with (3) H2 Valves on Manifold Bases and Regulator at Station 3**

### Maximum Number of Solenoids (Maximum energized simultaneously)

| Voltage | Voltage code | 25-pin D-sub | 19-pin M23 or |            | Moduflex Isysnet | Turck   |         |         |
|---------|--------------|--------------|---------------|------------|------------------|---------|---------|---------|
|         |              |              | Brad Harrison | 12-pin M23 |                  | 16      | 32      |         |
| 24VDC   | G9           | 24 (24)      | 16 (16)       | 8 (8)      | 16 (16)          | 24 (21) | 16 (16) | 24 (21) |
| 120VAC* | 23           | 24 (24)      | 16 (16)       | 8 (8)      | N/A              | N/A     | N/A     | N/A     |

\* Not CSA certified for 25-pin, D-Sub option.

### Add-A-Fold Assembly Model Numbers

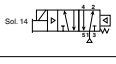
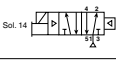
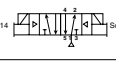
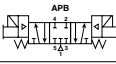
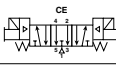
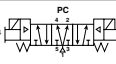


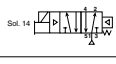
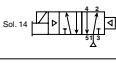
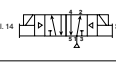
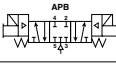
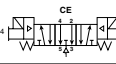
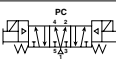
\* Must order communication modules separately.  
 † Collective wiring module included.

\* BSPP conforms to ISO 1179-1 w 228-1 threads.


Valvair II Series  
 DX ISOMAX Series  
 Fieldbus Series  
 Isys ISO Series  
 Isys Micro Series  
 Moduflex Series  
**D**  
 Subbase & Manifold Valve Products

**5599-2, Plug-in, Size 3 (H3)**


| Symbol  | Type                                 | Cv  | Operator        | Voltage | Pilot    | Non-locking        | Locking            |
|---|--------------------------------------|-----|-----------------|---------|----------|--------------------|--------------------|
|  | 4-way, 2-position, spring return     | 6.0 | Single solenoid | 24 VDC  | Internal | <b>H3EVXBG0B9D</b> | <b>H3EVXBH0B9D</b> |
|   |                                      |     |                 |         | External | <b>H3EVXXG0B9D</b> | <b>H3EVXXH0B9D</b> |
|  | 4-way, 2-position, air return        | 6.0 | Single solenoid | 24 VDC  | Internal | <b>H31VXBG0B9D</b> | <b>H31VXBH0B9D</b> |
|   |                                      |     |                 |         | External | <b>H31VXXG0B9D</b> | <b>H31VXXH0B9D</b> |
|  | 4-way, 2-position                    | 6.0 | Double solenoid | 24 VDC  | Internal | <b>H32VXBG0B9D</b> | <b>H32VXBH0B9D</b> |
|   |                                      |     |                 |         | External | <b>H32VXXG0B9D</b> | <b>H32VXXH0B9D</b> |
|  | 4-way, 3-position, all ports blocked | 5.0 | Double solenoid | 24 VDC  | Internal | <b>H35VXBG0B9D</b> | <b>H35VXBH0B9D</b> |
|   |                                      |     |                 |         | External | <b>H35VXXG0B9D</b> | <b>H35VXXH0B9D</b> |
|  | 4-way, 3-position, center exhaust    | 5.0 | Double solenoid | 24 VDC  | Internal | <b>H36VXBG0B9D</b> | <b>H36VXBH0B9D</b> |
|   |                                      |     |                 |         | External | <b>H36VXXG0B9D</b> | <b>H36VXXH0B9D</b> |
|  | 4-way, 3-position, pressure center   | 5.0 | Double solenoid | 24 VDC  | Internal | <b>H37VXBG0B9D</b> | <b>H37VXBH0B9D</b> |
|   |                                      |     |                 |         | External | <b>H37VXXG0B9D</b> | <b>H37VXXH0B9D</b> |

| Symbol  | Type                                 | Cv  | Operator        | Voltage | Pilot    | Non-locking        | Locking            |
|---|--------------------------------------|-----|-----------------|---------|----------|--------------------|--------------------|
|    | 4-way, 2-position, spring return     | 6.0 | Single solenoid | 120 VAC | Internal | <b>H3EVXBG023D</b> | <b>H3EVXBH023D</b> |
|   |                                      |     |                 |         | External | <b>H3EVXXG023D</b> | <b>H3EVXXH023D</b> |
|    | 4-way, 2-position, air return        | 6.0 | Single solenoid | 120 VAC | Internal | <b>H31VXBG023D</b> | <b>H31VXBH023D</b> |
|   |                                      |     |                 |         | External | <b>H31VXXG023D</b> | <b>H31VXXH023D</b> |
|    | 4-way, 2-position                    | 6.0 | Double solenoid | 120 VAC | Internal | <b>H32VXBG023D</b> | <b>H32VXBH023D</b> |
|   |                                      |     |                 |         | External | <b>H32VXXG023D</b> | <b>H32VXXH023D</b> |
|    | 4-way, 3-position, all ports blocked | 5.0 | Double solenoid | 120 VAC | Internal | <b>H35VXBG023D</b> | <b>H35VXBH023D</b> |
|   |                                      |     |                 |         | External | <b>H35VXXG023D</b> | <b>H35VXXH023D</b> |
|   | 4-way, 3-position, center exhaust    | 5.0 | Double solenoid | 120 VAC | Internal | <b>H36VXBG023D</b> | <b>H36VXBH023D</b> |
|   |                                      |     |                 |         | External | <b>H36VXXG023D</b> | <b>H36VXXH023D</b> |
|  | 4-way, 3-position, pressure center   | 5.0 | Double solenoid | 120 VAC | Internal | <b>H37VXBG023D</b> | <b>H37VXBH023D</b> |
|   |                                      |     |                 |         | External | <b>H37VXXG023D</b> | <b>H37VXXH023D</b> |

**5599-2, Plug-in Single Subbase, Size 3 (H3)**

| Side ported base  | Enclosure / Lead length | Solenoid addresses            | 3/4" NPT           | 3/4" BSPP          |
|---|-------------------------|-------------------------------|--------------------|--------------------|
|  | Terminal strip in base  | Double solenoid - 2 address   | <b>PS421119CCP</b> | <b>PS401110CCP</b> |
|   | 6" flying leads         | Double solenoid - 2 addresses | <b>PS421119ACP</b> | <b>PS421110ACP</b> |

**5599-2, Plug-in Manifold Bases, Size 3 (H3)**

| Bottom / End ported bases   | Enclosure / Lead length | Solenoid addresses            | 3/4" NPT           | 3/4" BSPP          |
|---|-------------------------|-------------------------------|--------------------|--------------------|
|  | Circuit board           | Single solenoid - 1 address   | <b>PS421169JCP</b> | <b>PS421160JCP</b> |
|   | Circuit board           | Double solenoid - 2 addresses | <b>PS421169MCP</b> | <b>PS421160MCP</b> |
|   | Terminal strip in base  | Double solenoid - 2 address   | <b>PS421169CCP</b> | <b>PS421160CCP</b> |
|   | 6" flying leads         | Double solenoid - 2 addresses | <b>PS421169ACP</b> | <b>PS421160ACP</b> |

Valvair II Series

DX ISOMAX Series

Fieldbus




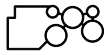
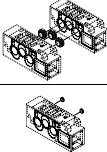
Isys ISO Series

Isys Micro Series








Modulflex Series

**D**  
 Subbase & Manifold Valve Products

**5599-2, Size 3 (H3) Accessories**

| Accessory   | Description                              | Part number        |
|---|--|--------------------|
| <br>Sandwich regulator               | Common pressure 5-125 PSIG w/ gauge      | <b>PS4238166CP</b> |
|   | Independent pressure 5-125 PSIG w/ gauge | <b>PS4238266CP</b> |
| <br>Blanking plate kit               |  | <b>PS4234CP</b>    |
| <br>Sandwich flow control            |  | <b>PS4235CP</b>    |
| <br>Manifold to manifold gasket kits |  | <b>PS4213P</b>     |
| <br>Manifold port isolation kit      | Main galley (1, 3, 5)                    | <b>PS4232CP</b>    |
|   | Pilot galley                             | <b>PS4033CP</b>    |

**Plug-in, 5599-2 End Plate Kits, Size 3 (H3)**

| Electrical option   | NPT port           | BSPP port          |
|---|--------------------|--------------------|
| <br>No connector - use with individually wired base   | <b>PS4231010CP</b> | <b>PS4231011CP</b> |
| <br>25-pin, D-sub  | <b>PS4220L20CP</b> | <b>PS4220L21CP</b> |
| <br>19-pin, round, Brad Harrison   | <b>PS4220L30CP</b> | <b>PS4220L31CP</b> |
| <br>12-pin, M23<br>19-pin, M23   | <b>PS4220L40CP</b> | <b>PS4220L41CP</b> |
|   | <b>PS4220M20CP</b> | <b>PS4220M21CP</b> |
| <br>Moduflex fieldbus  | <b>PS4220M40CP</b> | <b>PS4220M41CP</b> |
| <br>Isysnet, with valve driver module  | <b>PS4220L60CP</b> | <b>PS4220L61CP</b> |
| <br>Turck fieldbus with valve driver module - 16 outputs<br>Turck fieldbus with valve driver module - 32 outputs | <b>PS4220T10CP</b> | <b>PS4220T11CP</b> |
|   | <b>PS4220T20CP</b> | <b>PS4220T21CP</b> |

Turck, Isysnet, and Moduflex communication modules must be ordered separately. See Fieldbus Section for more information.

Valvair II Series  
 DX ISOMAX Series  
 Fieldbus  
 Isys ISO Series  
 Isys Micro Series  
 Moduflex Series  
**D**  
 Subbase & Manifold Valve Products

### How To Order Plug-in Add-A-Fold Assemblies

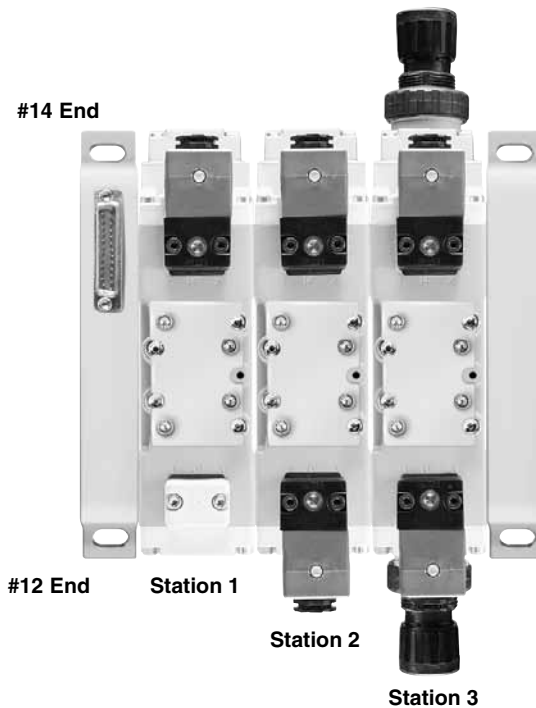
1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

### Example

Application requires a 3-Station manifold with a valve and regulator on Station 3.

| Item | Qty. | Part No.         | Location  |
|------|------|------------------|-----------|
| 01   | 1    | AAH3D003         |           |
| 02   | 1    | H31VXBG0B9D..... | Station 1 |
| 03   | 1    | PS421159MCP..... | Station 1 |
| 04   | 1    | H32VXBG0B9D..... | Station 2 |
| 05   | 1    | PS421159MCP..... | Station 2 |
| 06   | 1    | H32VXXG0B9D..... | Station 3 |
| 07   | 1    | PS4238166CP..... | Station 3 |
| 08   | 1    | PS421159MCP..... | Station 3 |

**NOTE:** Construct manifold assemblies from left to right while looking at the cylinder ports.  
 Valves must be ordered as External Pilot when using Sandwich Regulator.



**Example:  
 3-Station Manifold with (3) H3 Valves  
 on Manifold Bases and Regulator at Station 3**

### Maximum Number of Solenoids (Maximum energized simultaneously)

| Voltage | Voltage code | 25-pin D-sub | 19-pin M23 or |            | Moduflex | Isysnet | Turck      |            |
|---------|--------------|--------------|---------------|------------|----------|---------|------------|------------|
|         |              |              | Brad Harrison | 12-pin M23 |          |         | 16 Outputs | 32 Outputs |
| 24VDC   | G9           | 24 (24)      | 16 (16)       | 8 (8)      | 16 (16)  | 24 (21) | 16 (16)    | 24 (21)    |
| 120VAC* | 23           | 24 (24)      | 16 (16)       | 8 (8)      | N/A      | N/A     | N/A        | N/A        |

\* Not CSA certified for 25-pin, D-Sub option.

### Add-A-Fold Assembly Model Numbers

|   |           |   |   |  |
|---|-----------|---|---|--|
| <b>AA</b>                                     | <b>H3</b> | <b>D</b>  | <b>0</b>  | <b>03</b>                                  |
| <b>Valve series</b><br>Right & left end plate | <b>H3</b> | <b>End plate type</b><br>Turck fieldbus with valve driver module - 16 outputs<br>Turck fieldbus with valve driver module - 32 outputs<br>25-pin, D-sub<br>19-pin, brad harrison<br>12-pin, M23<br>19-pin, M23<br>Moduflex fieldbus<br>Isysnet, with valve driver module | <b>Number of stations</b><br>01<br>02<br>03<br>04<br>•<br>•<br>24 | <b>Thread type</b><br>0 NPT<br>1* BSPP "G" |

\* Must order communication modules separately.  
 † Collective wiring module included.  
 \* BSPP Conforms to ISO 1179-1 w 228-1 Threads.

**Plug-in, 5599-2, Size 1, 2, & 3**

Valvair II Series  
 DX ISOMAX Series  
 Fieldbus  
 Isys ISO Series  
 Isys Micro Series  
 Modulflex Series  
**D**  
 Subbase & Manifold Valve Products

**H1 E VX B G O B9 D**

| Basic series 5599-2 |    |
|---------------------|----|
| ISO 5599-2 Size 1   | H1 |
| ISO 5599-2 Size 2   | H2 |
| ISO 5599-2 Size 3   | H3 |

| 5599-2 Engineering level |         |
|--------------------------|---------|
| D                        | Current |

| 5599-2 Operator / Function                              |   |
|---|---|
| Single solenoid, 2-position - air return                | 1 |
| Double solenoid, 2-position                             | 2 |
| Double solenoid, 3-position - APB                       | 5 |
| Double solenoid, 3-position - CE                        | 6 |
| Double solenoid, 3-position - PC                        | 7 |
| Single solenoid, 2-position - air return, spring assist | E |

| 5599-2 Voltage & Frequency |      |      |    |                           |
|----------------------------|------|------|----|---------------------------|
|                            | AC   |      | DC | Light & surge suppression |
|                            | 60Hz | 50Hz |    |                           |
| 42                         | 24   |      |    |                           |
| 45                         |      |      | 12 |                           |
| B9                         |      |      | 24 | LED & suppression         |
| 23                         | 120  | 115  |    | LED & suppression         |
| 57                         | 240  |      |    |                           |

| 5599-2 Mounting        |    |
|------------------------|----|
| 5599-2 Valve less vase | VX |

| 5599-2 Enclosure / Lead length |                       |
|--------------------------------|-----------------------|
| 0                              | None, valve less base |

| 5599-2 Pilot source / Pilot exhaust      |    |
|--|----|
| Internal pilot, port #1 / vented         | B  |
| External pilot, port #12 or #14 / vented | X* |

\* Must be specified when using Sandwich Regulators.

| 5599-2 Overrides / Lights |              |   |
|---------------------------|--------------|---|
|                           | Voltage code |   |
| B                         | 42, 45, 57   | Non-locking, flush, push - w/o light    |
| C                         | 42, 45, 57   | Locking, flush, push / turn - w/o light |
| G                         | B9, 23       | Non-locking, flush, push - w/ light     |
| H                         | B9, 23       | Locking, flush, push / turn - w/ light  |

**Plug-in, 5599-2 Transition Plate Kits**

**PS4026 L2 0 C P**

| Transition plate type* |        |
|------------------------|--------|
| H1 to H2 to H3         | PS4025 |
| H1 to H3               | PS4026 |
| H1 to H2               | PS4027 |
| H2 to H3               | PS4028 |

\* Includes Left Hand and Right Hand End Plates

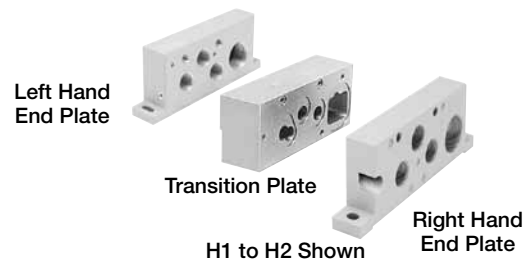
| Engineering level |                   |
|-------------------|-------------------|
| C                 | Basic series PS40 |

| Thread type |          |
|-------------|----------|
| 0           | NPT      |
| 1*          | BSPP "G" |

\* BSPP conforms to ISO 1179-1 w 228-1 threads.


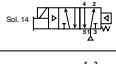

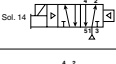

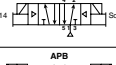

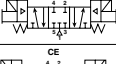

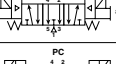

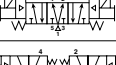

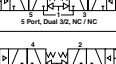


| Options  |     |
|--|-----|
| 25-pin, D-sub  | L2  |
| 19-pin, round, brad harrison                         | L3  |
| 12-pin, M23  | L4  |
| 19-pin, M23  | M2  |
| Modulflex fieldbus                                   | M4* |
| Isysnet, with valve driver module                    | L6* |
| Turck fieldbus with valve driver module - 16 outputs | T1  |
| Turck fieldbus with valve driver module - 32 outputs | T2  |

\* Must order communication module separately  
 turck, isysnet, and modulflex communication modules must be ordered separately.  
 See fieldbus section for more information.















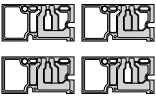
**15407-1, Non Plug-in, Size 18mm (HB)**

| Symbol  | Type  | Cv                                   | Operator | Voltage         | Pilot  | Non-locking | Locking                |                        |
|---|---|--------------------------------------|----------|-----------------|--------|-------------|------------------------|------------------------|
|  |  | 4-way, 2-position, spring return     | 0.55     | Single solenoid | 24 VDC | Internal    | <b>HBEWXBG2G9000FA</b> | <b>HBEWXBH2G9000FA</b> |
|   |   |                                      |          |                 |        | External    | <b>HBEWXLG2G9000FA</b> | <b>HBEWXLH2G9000FA</b> |
|  |  | 4-way, 2-position, air return        | 0.55     | Single solenoid | 24 VDC | Internal    | <b>HB1WXBG2G9000FA</b> | <b>HB1WXBH2G9000FA</b> |
|   |   |                                      |          |                 |        | External    | <b>HB1WXLG2G9000FA</b> | <b>HB1WXLH2G9000FA</b> |
|  |  | 4-way, 2-position                    | 0.55     | Double solenoid | 24 VDC | Internal    | <b>HB2WXBG2G9000FA</b> | <b>HB2WXBH2G9000FA</b> |
|   |   |                                      |          |                 |        | External    | <b>HB2WXLG2G9000FA</b> | <b>HB2WXLH2G9000FA</b> |
|  |  | 4-way, 3-position, all ports blocked | 0.5      | Double solenoid | 24 VDC | Internal    | <b>HB5WXBG2G9000FA</b> | <b>HB5WXBH2G9000FA</b> |
|   |   |                                      |          |                 |        | External    | <b>HB5WXLG2G9000FA</b> | <b>HB5WXLH2G9000FA</b> |
|  |  | 4-way, 3-position, center exhaust    | 0.5      | Double solenoid | 24 VDC | Internal    | <b>HB6WXBG2G9000FA</b> | <b>HB6WXBH2G9000FA</b> |
|   |   |                                      |          |                 |        | External    | <b>HB6WXLG2G9000FA</b> | <b>HB6WXLH2G9000FA</b> |
|  |  | 4-way, 3-position, pressure center   | 0.5      | Double solenoid | 24 VDC | Internal    | <b>HB7WXBG2G9000FA</b> | <b>HB7WXBH2G9000FA</b> |
|   |   |                                      |          |                 |        | External    | <b>HB7WXLG2G9000FA</b> | <b>HB7WXLH2G9000FA</b> |
|  |  | 3-way, 2-position, dual valve, NC/NC | 0.45     | Double solenoid | 24 VDC | Internal    | <b>HBNWXBG2G9000FA</b> | <b>HBNWXBH2G9000FA</b> |
|   |   |                                      |          |                 |        | External    | <b>HBNWXLG2G9000FA</b> | <b>HBNWXLH2G9000FA</b> |
|  |  | 3-way, 2-position, dual valve, NO/NO | 0.45     | Double solenoid | 24 VDC | Internal    | <b>HBPWXBG2G9000FA</b> | <b>HBPWXBH2G9000FA</b> |
|   |   |                                      |          |                 |        | External    | <b>HBPWXLG2G9000FA</b> | <b>HBPWXLH2G9000FA</b> |

**15407-1, Non Plug-in, Size 18mm (HB)**

| Single subbase  | Description                     | 1/8" NPT          | 1/8" BSPP         |
|---|---------------------------------|-------------------|-------------------|
|    | Side ported base                | <b>PL02-01-80</b> | <b>PL02-01-70</b> |
|   | End ported bases                | <b>PS5611510P</b> | <b>PS5611520P</b> |
| 2 Station manifold bases  | Description                     | 1/8" NPT          | 1/8" BSPP         |
|    | End ported bases                | <b>PS5611510P</b> | <b>PS5611520P</b> |
|   | Non-collective wiring end plate | <b>PS5631010P</b> | <b>PS5631011P</b> |
| End plate kit   | Description                     | NPT port          | BSPP port         |
|  | Non-collective wiring end plate | <b>PS5631010P</b> | <b>PS5631011P</b> |

**15407-1, Non-Plug-in, Size 18mm (HB) Accessories**

| Accessories   | Description                    | Part number  |
|---|--------------------------------|--|
|  | Common pressure                | 2-60 PSIG w/ gauge <b>PS5637155P</b>                     |
|   | Common pressure                | 5-125 PSIG w/ gauge <b>PS5637166P</b>                    |
|   | Independent pressure           | 2-60 PSIG w/ gauge <b>PS5637255P</b>                     |
|   | Independent pressure           | 5-125 PSIG w/ gauge <b>PS5637266P</b>                    |
|  | Gauge adapter kit              | Includes 1/8" coupling and long nipple <b>PS5651160P</b> |
|  | Blanking plate kit             | <b>PS5634P</b>   |
|  | 1/8" NPT                       | <b>PS562600P</b>   |
|   | 1/8" BSPP                      | <b>PS562601P</b>   |
|  | 1/8" NPT                       | <b>PS562700P</b>   |
|   | 1/8" BSPP                      | <b>PS562701P</b>   |
|  | Intermediate air supply module | 1/8" NPT <b>D02P-01-80</b>                               |
|  | Sandwich flow control          | <b>PS5642P</b>   |
|  | Standard                       | <b>PS561AP</b>   |
|   | Blocked #1 port                | <b>PS561BP</b>   |
|   | Blocked #1, 3, 5, ports        | <b>PS561CP</b>   |
|   | Blocked #3, 5 ports            | <b>PS561DP</b>   |

Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

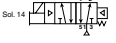
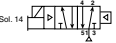

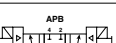
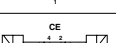
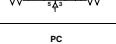
Isys Micro Series

Moduflex Series




**D**  
 Subbase & Manifold Valve Products










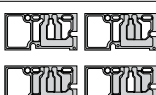
**15407-1, Non Plug-in, Size 26mm (HA)**

| Symbol  | Type                                 | Cv  | Operator        | Voltage | Pilot    | Non-locking            | Locking                |
|---|--------------------------------------|-----|-----------------|---------|----------|------------------------|------------------------|
|  | 4-way, 2-position, spring return     | 1.1 | Single solenoid | 24 VDC  | Internal | <b>HAEWXBG2G9000FA</b> | <b>HAEWXBH2G9000FA</b> |
|   |                                      |     |                 |         | External | <b>HAEWXLG2G9000FA</b> | <b>HAEWXLH2G9000FA</b> |
|  | 4-way, 2-position, air return        | 1.1 | Single solenoid | 24 VDC  | Internal | <b>HA1WXBG2G9000FA</b> | <b>HA1WXBH2G9000FA</b> |
|   |                                      |     |                 |         | External | <b>HA1WXLG2G9000FA</b> | <b>HA1WXLH2G9000FA</b> |
|  | 4-way, 2-position                    | 1.1 | Double solenoid | 24 VDC  | Internal | <b>HA2WXBG2G9000FA</b> | <b>HA2WXBH2G9000FA</b> |
|   |                                      |     |                 |         | External | <b>HA2WXLG2G9000FA</b> | <b>HA2WXLH2G9000FA</b> |
|  | 4-way, 3-position, all ports blocked | 1.0 | Double solenoid | 24 VDC  | Internal | <b>HA5WXBG2G9000FA</b> | <b>HA5WXBH2G9000FA</b> |
|   |                                      |     |                 |         | External | <b>HA5WXLG2G9000FA</b> | <b>HA5WXLH2G9000FA</b> |
|  | 4-way, 3-position, center exhaust    | 1.0 | Double solenoid | 24 VDC  | Internal | <b>HA6WXBG2G9000FA</b> | <b>HA6WXBH2G9000FA</b> |
|   |                                      |     |                 |         | External | <b>HA6WXLG2G9000FA</b> | <b>HA6WXLH2G9000FA</b> |
|  | 4-way, 3-position, pressure center   | 1.0 | Double solenoid | 24 VDC  | Internal | <b>HA7WXBG2G9000FA</b> | <b>HA7WXBH2G9000FA</b> |
|   |                                      |     |                 |         | External | <b>HA7WXLG2G9000FA</b> | <b>HA7WXLH2G9000FA</b> |

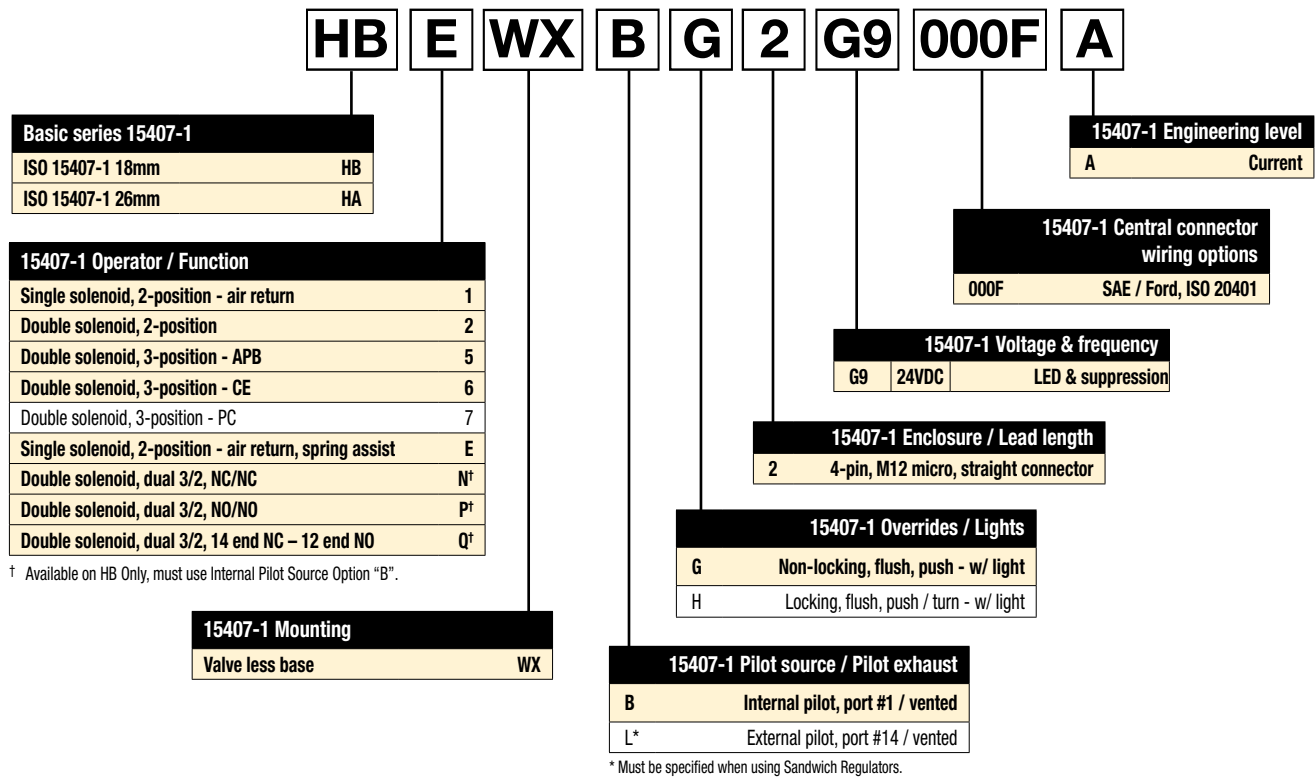
**15407-1, Non Plug-in, Size 26mm (HA)**

| Single subbase   | Description                     | 1/4" NPT          | 1/4" BSPP         |
|--|---------------------------------|-------------------|-------------------|
|   | Side ported base                | <b>PL01-02-80</b> | <b>PL01-02-70</b> |
| 2 Station manifold bases   | Description                     | 1/4" NPT          | 1/4" BSPP         |
|   | End ported bases                | <b>PS5511530P</b> | <b>PS5511540P</b> |
| End plate kit  | Description                     | NPT port          | BSPP port         |
|  | Non-collective wiring end plate | <b>PS5631010P</b> | <b>PS5631011P</b> |

**15407-1, Non-Plug-in, Size 18mm (HB) Accessories**

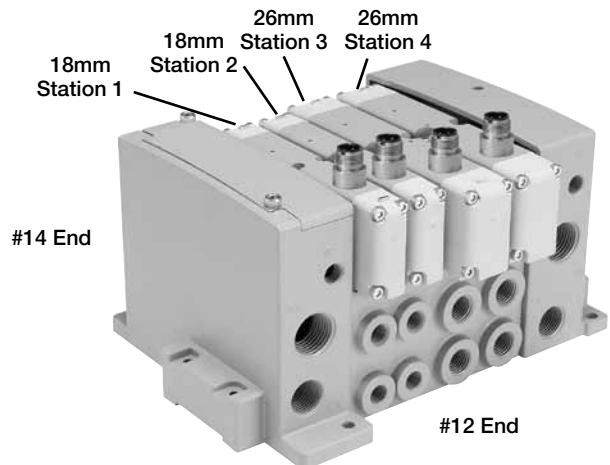
| Accessories   | Description                    | Part number  |
|---|--------------------------------|--|
|  | Common pressure                | 2-60 PSIG w/ gauge <b>PS5537155P</b>                     |
|   | Common pressure                | 5-125 PSIG w/ gauge <b>PS5537166P</b>                    |
|   | Independent pressure           | 2-60 PSIG w/ gauge <b>PS5537255P</b>                     |
|   | Independent pressure           | 5-125 PSIG w/ gauge <b>PS5537266P</b>                    |
|  | Gauge adapter kit              | Includes 1/8" coupling and long nipple <b>PS5651160P</b> |
|  | Blanking plate kit             | <b>PS5634P</b>   |
|  | 1/8" NPT                       | <b>PS562600P</b>   |
|   | 1/8" BSPP                      | <b>PS562601P</b>   |
|  | 1/8" NPT                       | <b>PS562700P</b>   |
|   | 1/8" BSPP                      | <b>PS562701P</b>   |
|  | Intermediate air supply module | 1/8" NPT <b>D01P-02-80</b>                               |
|  | Sandwich flow control          | <b>PS5542P</b>   |
|  | Standard                       | <b>PS561AP</b>   |
|   | Blocked #1 port                | <b>PS561BP</b>   |
|   | Blocked #1, 3, 5, ports        | <b>PS561CP</b>   |
|   | Blocked #3, 5 ports            | <b>PS561DP</b>   |

**Non Plug-in, 15407-1, Size 18mm (HB) & 26mm (HA)**



**How To Order 15407-1 Non Plug-in Add-A-Fold Assemblies**

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)



Example:  
 4-Station Manifold with (2) 18mm and (2) 26mm Valves on Manifold Bases

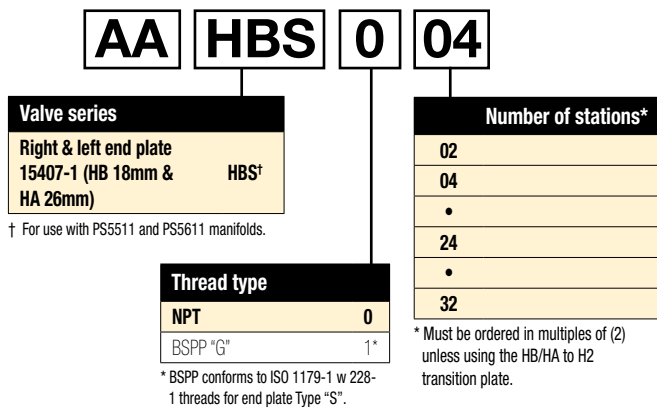
**Example**

Application requires a 4-Station manifold. (Two 18mm + Two 26mm Stations)

| Item | Qty. | Part No.         | Location      |
|------|------|------------------|---------------|
| 01   | 1    | AAHBS004         |               |
| 02   | 1    | 1HB1WXBG2G9000FA | Station 1     |
| 03   | 1    | 1HB2WXBG2G9000FA | Station 2     |
| 04   | 1    | 1PS5611510P      | Station 1 & 2 |
| 05   | 2    | 2HA1WXBG2G9000FA | Station 3 & 4 |
| 06   | 1    | 1PS5511510P      | Station 3 & 4 |

**NOTE:** Construct manifold assemblies from left to right while looking at the ports. Valves must be ordered as External Pilot when using Sandwich Regulator.

**Add-A-Fold Assembly Model Number**

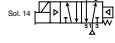
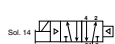
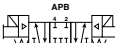
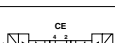
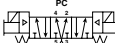


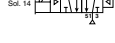
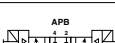

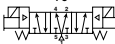



† For use with PS5511 and PS5611 manifolds.

\* BSPP conforms to ISO 1179-1 w 228-1 threads for end plate Type "S".

Valvair II Series  
 DX ISOMAX Series  
 Fieldbus  
 Isys ISO Series  
 Isys Micro Series  
 Moduflex Series  
**D**  
 Subbase & Manifold Valve Products

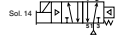
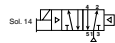
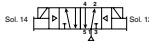
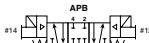


**5599-1, Non Plug-in, Size 1 (H1) with Central Connectors**

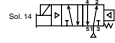
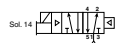
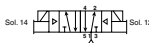
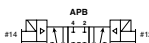
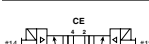
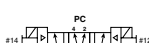
|                   | Symbol  | Type                                 | Cv  | Operator        | Voltage | Enclosure                          | Pilot    | Internal pilot         | External pilot         |
|-------------------|---|--------------------------------------|-----|-----------------|---------|------------------------------------|----------|------------------------|------------------------|
| Valvair II Series |    | 4-way, 2-position, spring return     | 1.5 | Single solenoid | 24 VDC  | 4-pin, central M12 connector       | Internal | <b>H1EWXBG2B9000FD</b> | <b>H1EWXBH2B9000FD</b> |
|                   |   | 4-way, 2-position, air return        | 1.5 | Single solenoid | 24 VDC  | 4-pin, central M12 connector       | External | <b>H1EWXXG2B9000FD</b> | <b>H1EWXXH2B9000FD</b> |
|                   |    | 4-way, 2-position                    | 1.5 | Double solenoid | 24 VDC  | 4-pin, central M12 connector       | Internal | <b>H12WXBG2B9000FD</b> | <b>H12WXBH2B9000FD</b> |
|                   |   | 4-way, 2-position                    | 1.5 | Double solenoid | 24 VDC  | 4-pin, central M12 connector       | External | <b>H12WXXG2B9000FD</b> | <b>H12WXXH2B9000FD</b> |
| DX ISOMAX Series  |    | 4-way, 3-position, all ports blocked | 1.2 | Double solenoid | 24 VDC  | 4-pin, central M12 connector       | Internal | <b>H15WXBG2B9000FD</b> | <b>H15WXBH2B9000FD</b> |
|                   |   | 4-way, 3-position, center exhaust    | 1.2 | Double solenoid | 24 VDC  | 4-pin, central M12 connector       | External | <b>H16WXXG2B9000FD</b> | <b>H16WXXH2B9000FD</b> |
|                   |    | 4-way, 3-position, center exhaust    | 1.2 | Double solenoid | 24 VDC  | 4-pin, central M12 connector       | Internal | <b>H16WXBG2B9000FD</b> | <b>H16WXBH2B9000FD</b> |
|                   |   | 4-way, 3-position, pressure center   | 1.2 | Double solenoid | 24 VDC  | 4-pin, central M12 connector       | External | <b>H17WXXG2B9000FD</b> | <b>H17WXXH2B9000FD</b> |
| Fieldbus Series   |    | 4-way, 2-position, spring return     | 1.5 | Single solenoid | 120 VAC | 5-Pin, central 7/8" mini connector | Internal | <b>H1EWXBG323000FD</b> | <b>H1EWXBH323000FD</b> |
|                   |   | 4-way, 2-position, air return        | 1.5 | Single solenoid | 120 VAC | 5-Pin, central 7/8" mini connector | External | <b>H11WXXG323000FD</b> | <b>H11WXXH323000FD</b> |
|                   |    | 4-way, 2-position                    | 1.5 | Double solenoid | 120 VAC | 5-Pin, central 7/8" mini connector | Internal | <b>H12WXBG323000FD</b> | <b>H12WXBH323000FD</b> |
|                   |   | 4-way, 2-position                    | 1.5 | Double solenoid | 120 VAC | 5-Pin, central 7/8" mini connector | External | <b>H12WXXG323000FD</b> | <b>H12WXXH323000FD</b> |
| Isys ISO Series   |    | 4-way, 3-position, all ports blocked | 1.2 | Double solenoid | 120 VAC | 5-Pin, central 7/8" mini connector | Internal | <b>H15WXBG323000FD</b> | <b>H15WXBH323000FD</b> |
|                   |   | 4-way, 3-position, center exhaust    | 1.2 | Double solenoid | 120 VAC | 5-Pin, central 7/8" mini connector | External | <b>H16WXXG323000FD</b> | <b>H16WXXH323000FD</b> |
|                   |    | 4-way, 3-position, center exhaust    | 1.2 | Double solenoid | 120 VAC | 5-Pin, central 7/8" mini connector | Internal | <b>H16WXBG323000FD</b> | <b>H16WXBH323000FD</b> |
|                   |   | 4-way, 3-position, pressure center   | 1.2 | Double solenoid | 120 VAC | 5-Pin, central 7/8" mini connector | External | <b>H17WXXG323000FD</b> | <b>H17WXXH323000FD</b> |
| Isys Micro Series |  | 4-way, 2-position, spring return     | 1.5 | Single solenoid | 120 VAC | 5-Pin, central 7/8" mini connector | Internal | <b>H1EWXBG323000FD</b> | <b>H1EWXBH323000FD</b> |
|                   |   | 4-way, 2-position, air return        | 1.5 | Single solenoid | 120 VAC | 5-Pin, central 7/8" mini connector | External | <b>H11WXXG323000FD</b> | <b>H11WXXH323000FD</b> |
|                   |  | 4-way, 2-position                    | 1.5 | Double solenoid | 120 VAC | 5-Pin, central 7/8" mini connector | Internal | <b>H12WXBG323000FD</b> | <b>H12WXBH323000FD</b> |
|                   |   | 4-way, 2-position                    | 1.5 | Double solenoid | 120 VAC | 5-Pin, central 7/8" mini connector | External | <b>H12WXXG323000FD</b> | <b>H12WXXH323000FD</b> |
| Modulflex Series  |  | 4-way, 3-position, all ports blocked | 1.2 | Double solenoid | 120 VAC | 5-Pin, central 7/8" mini connector | Internal | <b>H15WXBG323000FD</b> | <b>H15WXBH323000FD</b> |
|                   |   | 4-way, 3-position, center exhaust    | 1.2 | Double solenoid | 120 VAC | 5-Pin, central 7/8" mini connector | External | <b>H16WXXG323000FD</b> | <b>H16WXXH323000FD</b> |
|                   |  | 4-way, 3-position, center exhaust    | 1.2 | Double solenoid | 120 VAC | 5-Pin, central 7/8" mini connector | Internal | <b>H16WXBG323000FD</b> | <b>H16WXBH323000FD</b> |
|                   |   | 4-way, 3-position, pressure center   | 1.2 | Double solenoid | 120 VAC | 5-Pin, central 7/8" mini connector | External | <b>H17WXXG323000FD</b> | <b>H17WXXH323000FD</b> |

**Valvair II Series**  
**DX ISOMAX Series**  
**Fieldbus Series**  
**Isys ISO Series**  
**Isys Micro Series**  
**Modulflex Series**  
**D**  
**Subbase & Manifold Valve Products**






**5599-1, Non Plug-in, Size 1 (H1) with 3-Pin DIN Connectors**




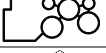
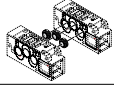
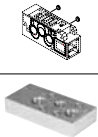
| Symbol  | Type                                 | Cv  | Operator        | Voltage | Enclosure                   | Pilot    | Internal pilot     | External pilot     |
|---|--------------------------------------|-----|-----------------|---------|-----------------------------|----------|--------------------|--------------------|
|  | 4-way, 2-position, spring return     | 1.5 | Single solenoid | 24 VDC  | 3-pin DIN connector on coil | Internal | <b>H1EWXBBL49D</b> | <b>H1EWXBDL49D</b> |
|   |                                      |     |                 |         |                             | External | <b>H1EWXXBL49D</b> | <b>H1EWXXDL49D</b> |
|  | 4-way, 2-position, air return        | 1.5 | Single solenoid | 24 VDC  | 3-pin DIN connector on coil | Internal | <b>H11WXBBL49D</b> | <b>H11WXBDL49D</b> |
|   |                                      |     |                 |         |                             | External | <b>H11WXXBL49D</b> | <b>H11WXXDL49D</b> |
|  | 4-way, 2-position                    | 1.5 | Double solenoid | 24 VDC  | 3-pin DIN connector on coil | Internal | <b>H12WXBBL49D</b> | <b>H12WXBDL49D</b> |
|   |                                      |     |                 |         |                             | External | <b>H12WXXBL49D</b> | <b>H12WXXDL49D</b> |
|  | 4-way, 3-position, all ports blocked | 1.2 | Double solenoid | 24 VDC  | 3-pin DIN connector on coil | Internal | <b>H15WXBBL49D</b> | <b>H15WXBDL49D</b> |
|   |                                      |     |                 |         |                             | External | <b>H15WXXBL49D</b> | <b>H15WXXDL49D</b> |
|  | 4-way, 3-position, center exhaust    | 1.2 | Double solenoid | 24 VDC  | 3-pin DIN connector on coil | Internal | <b>H16WXBBL49D</b> | <b>H16WXBDL49D</b> |
|   |                                      |     |                 |         |                             | External | <b>H16WXXBL49D</b> | <b>H16WXXDL49D</b> |
|  | 4-way, 3-position, pressure center   | 1.2 | Double solenoid | 24 VDC  | 3-pin DIN connector on coil | Internal | <b>H17WXBBL49D</b> | <b>H17WXBDL49D</b> |
|   |                                      |     |                 |         |                             | External | <b>H17WXXBL49D</b> | <b>H17WXXDL49D</b> |

| Symbol  | Type                                 | Cv  | Operator        | Voltage | Pilot    | Non-locking        | Locking            |
|---|--------------------------------------|-----|-----------------|---------|----------|--------------------|--------------------|
|    | 4-way, 2-position, spring return     | 1.5 | Single solenoid | 120 VAC | Internal | <b>H1EWXBBL53D</b> | <b>H1EWXBDL53D</b> |
|   |                                      |     |                 |         | External | <b>H1EWXXBL53D</b> | <b>H1EWXXDL53D</b> |
|    | 4-way, 2-position, air return        | 1.5 | Single solenoid | 120 VAC | Internal | <b>H11WXBBL53D</b> | <b>H11WXBDL53D</b> |
|   |                                      |     |                 |         | External | <b>H11WXXBL53D</b> | <b>H11WXXDL53D</b> |
|   | 4-way, 2-position                    | 1.5 | Double solenoid | 120 VAC | Internal | <b>H12WXBBL53D</b> | <b>H12WXBDL53D</b> |
|   |                                      |     |                 |         | External | <b>H12WXXBL53D</b> | <b>H12WXXDL53D</b> |
|  | 4-way, 3-position, all ports blocked | 1.2 | Double solenoid | 120 VAC | Internal | <b>H15WXBBL53D</b> | <b>H15WXBDL53D</b> |
|   |                                      |     |                 |         | External | <b>H15WXXBL53D</b> | <b>H15WXXDL53D</b> |
|  | 4-way, 3-position, center exhaust    | 1.2 | Double solenoid | 120 VAC | Internal | <b>H16WXBBL53D</b> | <b>H16WXBDL53D</b> |
|   |                                      |     |                 |         | External | <b>H16WXXBL53D</b> | <b>H16WXXDL53D</b> |
|  | 4-way, 3-position, pressure center   | 1.2 | Double solenoid | 120 VAC | Internal | <b>H17WXBBL53D</b> | <b>H17WXBDL53D</b> |
|   |                                      |     |                 |         | External | <b>H17WXXBL53D</b> | <b>H17WXXDL53D</b> |


**5599-1, Non Plug-in, Size 1 (H1)**

|   |                       |                                     |                    |                    |
|---|-----------------------|-------------------------------------|--------------------|--------------------|
|  | <b>Single subbase</b> | <b>Description</b>                  | <b>3/8" NPT</b>    | <b>3/8" BSPP</b>   |
|   |                       | Side ported base                    | <b>PS4011150DP</b> | <b>PS4011160DP</b> |
|  | <b>Manifold bases</b> | <b>Description</b>                  | <b>3/8" NPT</b>    | <b>3/8" BSPP</b>   |
|   |                       | Bottom / End ported bases           | <b>PS4011650CP</b> | <b>PS4011660CP</b> |
|  | <b>End plate kits</b> | <b>Description</b>                  | <b>NPT port</b>    | <b>BSPP port</b>   |
|   |                       | H1 Non-collective wiring end plates | <b>PS4031010CP</b> | <b>PS4031011CP</b> |

**5599-1, Non Plug-in, Size 1 (H1) Accessories**

| Accessory  | Description           | Part number                               |
|--|-----------------------|---|
|  Sandwich regulator               | Common pressure       | 5-125 PSIG w/ gauge<br><b>PS4037166CP</b> |
|  | Independent pressure  | 5-125 PSIG w/ gauge<br><b>PS4037266CP</b> |
|  Blanking plate kit               |                       | <b>PS4034CP</b>                           |
|  Sandwich flow control            |                       | <b>PS4042CP</b>                           |
|  Manifold to manifold gasket kits |                       | <b>PS4013P</b>                            |
|  Manifold port isolation kit      | Main galley (1, 3, 5) | <b>PS4032CP</b>                           |
|  | Pilot galley          | <b>PS4033CP</b>                           |
|  Auxiliary access plate kit       | 1/4" & 3/8"           | NPT<br><b>PS403000CP</b>                  |
|  |                       | BSPP<br><b>PS403001CP</b>                 |

**Plug-in, 5599-1 End Plate Kits, Size 1 (H1)**

| Electrical option   | Description | NPT port           | BSPP port          |
|---|-------------|--------------------|--------------------|
|  No connector - use with individually wired base |             | <b>PS4211590CP</b> | <b>PS4211500CP</b> |

Valvair II Series  
 DX ISOMAX Series  
 Fieldbus  
 Isys ISO Series  
 Isys Micro Series  
 Moduflex Series  
**D**  
 Subbase & Manifold Valve Products

### How To Order Non Plug-in Add-A-Fold Assemblies

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

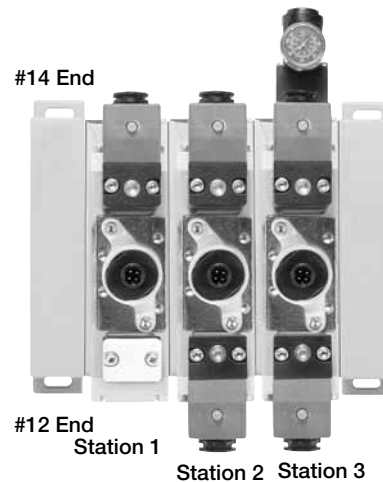
#### Example

Application requires a 3-Station manifold with a valve, regulator on Station 3.

| Item | Qty. | Part No.        | Location  |
|------|------|-----------------|-----------|
| 01   | 1    | AAH1S003        |           |
| 02   | 1    | H11WXBG2B9000FD | Station 1 |
| 03   | 1    | PS4011550CP     | Station 1 |
| 04   | 1    | H12WXBG2B9000FD | Station 2 |
| 05   | 1    | PS4011550CP     | Station 2 |
| 06   | 1    | H12WXXG2B9000FD | Station 3 |
| 07   | 1    | PS4037166CP     | Station 3 |
| 08   | 1    | PS4011550CP     | Station 3 |

**NOTE:** Construct manifold assemblies from left to right while looking at the cylinder ports.

Valves must be ordered as External Pilot when using Sandwich Regulator.



Example:  
 3-Station Manifold with (3) H1 Valves  
 on Manifold Bases  
 and Regulator at Station 3

#### Add-A-Fold Assembly Model Number

|                           |           |                                    |          |                           |  |
|---------------------------|-----------|------------------------------------|----------|---------------------------|--|
| <b>AA</b>                 | <b>H1</b> | <b>S</b>                           | <b>0</b> | <b>03</b>                 |  |
| <b>Valve series</b>       |           | <b>End plate type</b>              |          | <b>Transition plate</b>   |  |
| Right & left end plate H1 |           | Standard - non-collective wiring S |          | Blank No transition plate |  |
|                           |           |                                    |          | C H1 to H2                |  |
|                           |           |                                    |          | D H1 to H3                |  |
|                           |           |                                    |          | <b>Number of stations</b> |  |
|                           |           |                                    |          | 01                        |  |
|                           |           |                                    |          | 02                        |  |
|                           |           |                                    |          | 03                        |  |
|                           |           |                                    |          | 04                        |  |
|                           |           |                                    |          | •                         |  |
|                           |           |                                    |          | •                         |  |
|                           |           |                                    |          | 24                        |  |

\* BSPP Conforms to ISO 1179-1 w 228-1 Threads.

Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

Isys Micro Series

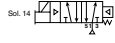
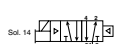
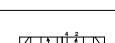
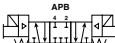
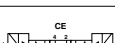

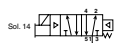
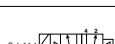
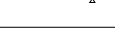
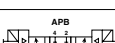
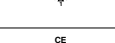
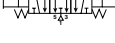
Moduflex Series

**D**


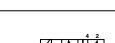

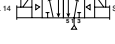
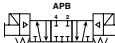
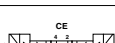
Subbase & Manifold Valve Products



**5599-1, Non Plug-in, Size 2 (H2) with Central Connectors**

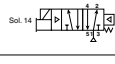
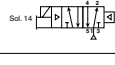

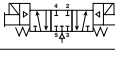
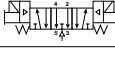

|                   | Symbol  | Type                                 | Cv                     | Operator               | Voltage | Enclosure                          | Pilot    | Internal pilot         | External pilot         |
|-------------------|---|--------------------------------------|------------------------|------------------------|---------|------------------------------------|----------|------------------------|------------------------|
| Valvair II Series |    | 4-way, 2-position, spring return     | 3.0                    | Single solenoid        | 24 VDC  | 4-pin, central M12 connector       | Internal | <b>H2EWXBG2B9000FD</b> | <b>H2EWXBH2B9000FD</b> |
|                   |   | External                             | <b>H2EWXXG2B9000FD</b> | <b>H2EWXXH2B9000FD</b> |         |                                    |          |                        |                        |
|                   |    | 4-way, 2-position, air return        | 3.0                    | Single solenoid        | 24 VDC  | 4-pin, central M12 connector       | Internal | <b>H21WXBG2B9000FD</b> | <b>H21WXBH2B9000FD</b> |
|                   |   | External                             | <b>H21WXXG2B9000FD</b> | <b>H21WXXH2B9000FD</b> |         |                                    |          |                        |                        |
|                   |    | 4-way, 2-position                    | 3.0                    | Double solenoid        | 24 VDC  | 4-pin, central M12 connector       | Internal | <b>H22WXBG2B9000FD</b> | <b>H22WXBH2B9000FD</b> |
|                   |   | External                             | <b>H22WXXG2B9000FD</b> | <b>H22WXXH2B9000FD</b> |         |                                    |          |                        |                        |
| DX ISOMAX Series  |    | 4-way, 3-position, all ports blocked | 2.8                    | Double solenoid        | 24 VDC  | 4-pin, central M12 connector       | Internal | <b>H25WXBG2B9000FD</b> | <b>H25WXBH2B9000FD</b> |
|                   |   | External                             | <b>H25WXXG2B9000FD</b> | <b>H25WXXH2B9000FD</b> |         |                                    |          |                        |                        |
|                   |    | 4-way, 3-position, center exhaust    | 2.8                    | Double solenoid        | 24 VDC  | 4-pin, central M12 connector       | Internal | <b>H26WXBG2B9000FD</b> | <b>H26WXBH2B9000FD</b> |
|                   |   | External                             | <b>H26WXXG2B9000FD</b> | <b>H26WXXH2B9000FD</b> |         |                                    |          |                        |                        |
| Fieldbus Series   |    | 4-way, 3-position, pressure center   | 2.8                    | Double solenoid        | 24 VDC  | 4-pin, central M12 connector       | Internal | <b>H27WXBG2B9000FD</b> | <b>H27WXBH2B9000FD</b> |
|                   |   | External                             | <b>H27WXXG2B9000FD</b> | <b>H27WXXH2B9000FD</b> |         |                                    |          |                        |                        |
|                   | Symbol  | Type                                 | Cv                     | Operator               | Voltage | Enclosure                          | Pilot    | Non-locking            | Locking                |
| Isys ISO Series   |    | 4-way, 2-position, spring return     | 3.0                    | Single solenoid        | 120 VAC | 5-Pin, central 7/8" mini connector | Internal | <b>H2EWXBG323000FD</b> | <b>H2EWXBH323000FD</b> |
|                   |   | External                             | <b>H2EWXXG323000FD</b> | <b>H2EWXXH323000FD</b> |         |                                    |          |                        |                        |
|                   |    | 4-way, 2-position, air return        | 3.0                    | Single solenoid        | 120 VAC | 5-Pin, central 7/8" mini connector | Internal | <b>H21WXBG323000FD</b> | <b>H21WXBH323000FD</b> |
|                   |   | External                             | <b>H21WXXG323000FD</b> | <b>H21WXXH323000FD</b> |         |                                    |          |                        |                        |
|                   |    | 4-way, 2-position                    | 3.0                    | Double solenoid        | 120 VAC | 5-Pin, central 7/8" mini connector | Internal | <b>H22WXBG323000FD</b> | <b>H22WXBH323000FD</b> |
|                   |   | External                             | <b>H22WXXG323000FD</b> | <b>H22WXXH323000FD</b> |         |                                    |          |                        |                        |
| Isys Micro Series |  | 4-way, 3-position, all ports blocked | 2.8                    | Double solenoid        | 120 VAC | 5-Pin, central 7/8" mini connector | Internal | <b>H25WXBG323000FD</b> | <b>H25WXBH323000FD</b> |
|                   |   | External                             | <b>H25WXXG323000FD</b> | <b>H25WXXH323000FD</b> |         |                                    |          |                        |                        |
|                   |  | 4-way, 3-position, center exhaust    | 2.8                    | Double solenoid        | 120 VAC | 5-Pin, central 7/8" mini connector | Internal | <b>H26WXBG323000FD</b> | <b>H26WXBH323000FD</b> |
|                   |   | External                             | <b>H26WXXG323000FD</b> | <b>H26WXXH323000FD</b> |         |                                    |          |                        |                        |
| Modulflex Series  |  | 4-way, 3-position, pressure center   | 2.8                    | Double solenoid        | 120 VAC | 5-Pin, central 7/8" mini connector | Internal | <b>H27WXBG323000FD</b> | <b>H27WXBH323000FD</b> |
|                   |   | External                             | <b>H27WXXG323000FD</b> | <b>H27WXXH323000FD</b> |         |                                    |          |                        |                        |

**5599-1, Non Plug-in, Size 2 (H2) with 3-Pin DIN Connectors**




|                    | Symbol  | Type                                 | Cv                 | Operator           | Voltage | Enclosure                   | Pilot    | Internal pilot     | External pilot     |
|--------------------|---|--------------------------------------|--------------------|--------------------|---------|-----------------------------|----------|--------------------|--------------------|
| Subbase & Manifold |  | 4-way, 2-position, spring return     | 3.0                | Single solenoid    | 24 VDC  | 3-pin DIN connector on coil | Internal | <b>H2EWXBBL49D</b> | <b>H2EWXBCL49D</b> |
|                    |   | External                             | <b>H2EWXXBL49D</b> | <b>H2EWXXCL49D</b> |         |                             |          |                    |                    |
| Subbase & Manifold |  | 4-way, 2-position, air return        | 3.0                | Single solenoid    | 24 VDC  | 3-pin DIN connector on coil | Internal | <b>H21WXBBL49D</b> | <b>H21WXBCL49D</b> |
|                    |   | External                             | <b>H21WXXBL49D</b> | <b>H21WXXCL49D</b> |         |                             |          |                    |                    |
| Subbase & Manifold |  | 4-way, 2-position                    | 3.0                | Double solenoid    | 24 VDC  | 3-pin DIN connector on coil | Internal | <b>H22WXBBL49D</b> | <b>H22WXBCL49D</b> |
|                    |   | External                             | <b>H22WXXBL49D</b> | <b>H22WXXCL49D</b> |         |                             |          |                    |                    |
| Subbase & Manifold |  | 4-way, 3-position, all ports blocked | 2.8                | Double solenoid    | 24 VDC  | 3-pin DIN connector on coil | Internal | <b>H25WXBBL49D</b> | <b>H25WXBCL49D</b> |
|                    |   | External                             | <b>H25WXXBL49D</b> | <b>H25WXXCL49D</b> |         |                             |          |                    |                    |
| Subbase & Manifold |  | 4-way, 3-position, center exhaust    | 2.8                | Double solenoid    | 24 VDC  | 3-pin DIN connector on coil | Internal | <b>H26WXBBL49D</b> | <b>H26WXBCL49D</b> |
|                    |   | External                             | <b>H26WXXBL49D</b> | <b>H26WXXCL49D</b> |         |                             |          |                    |                    |
| Subbase & Manifold |  | 4-way, 3-position, pressure center   | 2.8                | Double solenoid    | 24 VDC  | 3-pin DIN connector on coil | Internal | <b>H27WXBBL49D</b> | <b>H27WXBCL49D</b> |
|                    |   | External                             | <b>H27WXXBL49D</b> | <b>H27WXXCL49D</b> |         |                             |          |                    |                    |







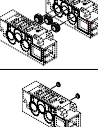
**5599-1, Non Plug-in, Size 2 (H2) with 3-Pin DIN Connectors**

| Symbol  | Type                                 | Cv  | Operator        | Voltage | Enclosure                   | Pilot    | Non-locking         | Locking            |
|---|--------------------------------------|-----|-----------------|---------|-----------------------------|----------|---------------------|--------------------|
|  | 4-way, 2-position, spring return     | 3.0 | Single solenoid | 120 VAC | 3-pin DIN connector on coil | Internal | <b>H2EWXBBL53D</b>  | <b>H2EWXBCL53D</b> |
|   |                                      |     |                 |         |                             | External | <b>H2EWXXBBL53D</b> | <b>H2EWXXCL53D</b> |
|  | 4-way, 2-position, air return        | 3.0 | Single solenoid | 120 VAC | 3-pin DIN connector on coil | Internal | <b>H21WXBBL53D</b>  | <b>H21WXBCL53D</b> |
|   |                                      |     |                 |         |                             | External | <b>H21WXXBBL53D</b> | <b>H21WXXCL53D</b> |
|  | 4-way, 2-position                    | 3.0 | Double solenoid | 120 VAC | 3-pin DIN connector on coil | Internal | <b>H22WXBBL53D</b>  | <b>H22WXBCL53D</b> |
|   |                                      |     |                 |         |                             | External | <b>H22WXXBBL53D</b> | <b>H22WXXCL53D</b> |
|  | 4-way, 3-position, all ports blocked | 2.8 | Double solenoid | 120 VAC | 3-pin DIN connector on coil | Internal | <b>H25WXBBL53D</b>  | <b>H25WXBCL53D</b> |
|   |                                      |     |                 |         |                             | External | <b>H25WXXBBL53D</b> | <b>H25WXXCL53D</b> |
|  | 4-way, 3-position, center exhaust    | 2.8 | Double solenoid | 120 VAC | 3-pin DIN connector on coil | Internal | <b>H26WXBBL53D</b>  | <b>H26WXBCL53D</b> |
|   |                                      |     |                 |         |                             | External | <b>H26WXXBBL53D</b> | <b>H26WXXCL53D</b> |
|  | 4-way, 3-position, pressure center   | 2.8 | Double solenoid | 120 VAC | 3-pin DIN connector on coil | Internal | <b>H27WXBBL53D</b>  | <b>H27WXBCL53D</b> |
|   |                                      |     |                 |         |                             | External | <b>H27WXXBBL53D</b> | <b>H27WXXCL53D</b> |

**5599-1, Non Plug-in, Size 2 (H2)**

| Single subbase  | Description  | 1/2" NPT           | 1/2" BSPP          |
|---|--|--------------------|--------------------|
|    | Side ported base   | <b>PS4111170CP</b> | <b>PS4111180CP</b> |
| Manifold bases  | Description  | 1/2" NPT           | 1/2" BSPP          |
|   | Bottom / End ported bases<br><b>Note:</b> Manifolds include 2 pipe plugs | <b>PS4111670CP</b> | <b>PS4111680CP</b> |
| End plate kits  | Description  | NPT port           | BSPP port          |
|  | H2 Non-collective wiring end plates                                      | <b>PS4131010CP</b> | <b>PS4131011CP</b> |

**5599-1, Non Plug-in, Size 2 (H2) Accessories**

| Accessory   | Description                              | Part number        |
|---|--|--------------------|
|  | Common pressure 5-125 PSIG w/ gauge      | <b>PS4137166CP</b> |
|   | Independent pressure 5-125 PSIG w/ gauge | <b>PS4137266CP</b> |
|  | Blanking plate kit                       | <b>PS4134CP</b>    |
|  | Sandwich flow control                    | <b>PS4142CP</b>    |
|  | Manifold to manifold gasket kits         | <b>PS4113P</b>     |
|  | Main galley (1, 3, 5)                    | <b>PS4132CP</b>    |
|   | Pilot galley                             | <b>PS4033CP</b>    |

Valvoir II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

Isys Micro Series

Modulflex Series

**D**  
 Subbase & Manifold Valve Products

### How To Order Non Plug-in Add-A-Fold Assemblies

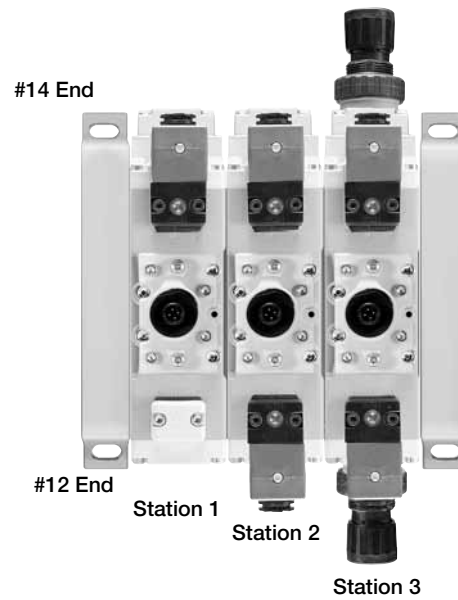
1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blanking plate part number and the individual manifold number in the station specified.)

#### Example

Application requires a 3-Station manifold with a valve and regulator on Station 3.

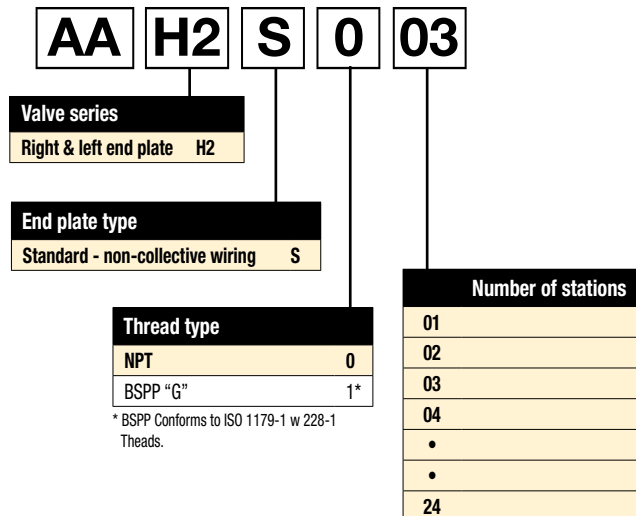
| Item | Qty. | Part No.        | Location  |
|------|------|-----------------|-----------|
| 01   | 1    | AAH2S003        |           |
| 02   | 1    | H21WXBG2B9000FD | Station 1 |
| 03   | 1    | PS4111570CP     | Station 1 |
| 04   | 1    | H22WXBG2B9000FD | Station 2 |
| 05   | 1    | PS4111570CP     | Station 2 |
| 06   | 1    | H22WXXG2B9000FD | Station 3 |
| 07   | 1    | PS4137166CP     | Station 3 |
| 08   | 1    | PS4111570CP     | Station 3 |

**NOTE:** Construct manifold assemblies from left to right while looking at the cylinder ports.  
 Valves must be ordered as External Pilot when using Sandwich Regulator.



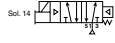
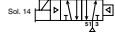
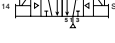
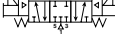
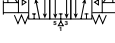
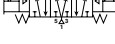
**Example:**  
 3-Station Manifold with (3) H2 Valves on Manifold Bases and Regulator at Station 3

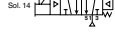
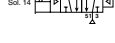
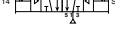
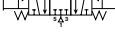
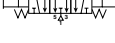

### Add-A-Fold Assembly Model Number



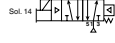
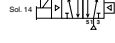
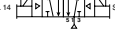



Valvair II Series  
 DX ISOMAX Series  
 Fieldbus  
 Isys ISO Series  
 Isys Micro Series  
 Modulflex Series  
**D**  
 Subbase & Manifold Valve Products

**5599-1, Non Plug-in, Size 3 (H3) with Central Connectors**

| Symbol  | Type                                 | Cv  | Operator        | Voltage | Enclosure                    | Pilot    | Internal pilot          | External pilot          |
|---|--------------------------------------|-----|-----------------|---------|------------------------------|----------|-------------------------|-------------------------|
|  | 4-way, 2-position, spring return     | 6.0 | Single solenoid | 24 VDC  | 4-pin, central M12 connector | Internal | <b>H3EWWXBG2B9000FD</b> | <b>H3EWWXBH2B9000FD</b> |
|   |                                      |     |                 |         |                              | External | <b>H3EWWXXG2B9000FD</b> | <b>H3EWWXXH2B9000FD</b> |
|  | 4-way, 2-position, air return        | 6.0 | Single solenoid | 24 VDC  | 4-pin, central M12 connector | Internal | <b>H31WXBG2B9000FD</b>  | <b>H31WXBH2B9000FD</b>  |
|   |                                      |     |                 |         |                              | External | <b>H31WXXG2B9000FD</b>  | <b>H31WXXH2B9000FD</b>  |
|  | 4-way, 2-position                    | 6.0 | Double solenoid | 24 VDC  | 4-pin, central M12 connector | Internal | <b>H32WXBG2B9000FD</b>  | <b>H32WXBH2B9000FD</b>  |
|   |                                      |     |                 |         |                              | External | <b>H32WXXG2B9000FD</b>  | <b>H32WXXH2B9000FD</b>  |
|  | 4-way, 3-position, all ports blocked | 5.0 | Double solenoid | 24 VDC  | 4-pin, central M12 connector | Internal | <b>H35WXBG2B9000FD</b>  | <b>H35WXBH2B9000FD</b>  |
|   |                                      |     |                 |         |                              | External | <b>H35WXXG2B9000FD</b>  | <b>H35WXXH2B9000FD</b>  |
|  | 4-way, 3-position, center exhaust    | 5.0 | Double solenoid | 24 VDC  | 4-pin, central M12 connector | Internal | <b>H36WXBG2B9000FD</b>  | <b>H36WXBH2B9000FD</b>  |
|   |                                      |     |                 |         |                              | External | <b>H36WXXG2B9000FD</b>  | <b>H36WXXH2B9000FD</b>  |
|  | 4-way, 3-position, pressure center   | 5.0 | Double solenoid | 24 VDC  | 4-pin, central M12 connector | Internal | <b>H37WXBG2B9000FD</b>  | <b>H37WXBH2B9000FD</b>  |
|   |                                      |     |                 |         |                              | External | <b>H37WXXG2B9000FD</b>  | <b>H37WXXH2B9000FD</b>  |

| Symbol  | Type                                 | Cv  | Operator        | Voltage | Enclosure                          | Pilot    | Non-locking             | Locking                 |
|---|--------------------------------------|-----|-----------------|---------|------------------------------------|----------|-------------------------|-------------------------|
|    | 4-way, 2-position, spring return     | 6.0 | Single solenoid | 120 VAC | 5-Pin, central 7/8" mini connector | Internal | <b>H3EWWXBG323000FD</b> | <b>H3EWWXBH323000FD</b> |
|   |                                      |     |                 |         |                                    | External | <b>H3EWWXXG323000FD</b> | <b>H3EWWXXH323000FD</b> |
|    | 4-way, 2-position, air return        | 6.0 | Single solenoid | 120 VAC | 5-Pin, central 7/8" mini connector | Internal | <b>H31WXBG323000FD</b>  | <b>H31WXBH323000FD</b>  |
|   |                                      |     |                 |         |                                    | External | <b>H31WXXG323000FD</b>  | <b>H31WXXH323000FD</b>  |
|   | 4-way, 2-position                    | 6.0 | Double solenoid | 120 VAC | 5-Pin, central 7/8" mini connector | Internal | <b>H32WXBG323000FD</b>  | <b>H32WXBH323000FD</b>  |
|   |                                      |     |                 |         |                                    | External | <b>H32WXXG323000FD</b>  | <b>H32WXXH323000FD</b>  |
|  | 4-way, 3-position, all ports blocked | 5.0 | Double solenoid | 120 VAC | 5-Pin, central 7/8" mini connector | Internal | <b>H35WXBG323000FD</b>  | <b>H35WXBH323000FD</b>  |
|   |                                      |     |                 |         |                                    | External | <b>H35WXXG323000FD</b>  | <b>H35WXXH323000FD</b>  |
|  | 4-way, 3-position, center exhaust    | 5.0 | Double solenoid | 120 VAC | 5-Pin, central 7/8" mini connector | Internal | <b>H36WXBG323000FD</b>  | <b>H36WXBH323000FD</b>  |
|   |                                      |     |                 |         |                                    | External | <b>H36WXXG323000FD</b>  | <b>H36WXXH323000FD</b>  |
|  | 4-way, 3-position, pressure center   | 5.0 | Double solenoid | 120 VAC | 5-Pin, central 7/8" mini connector | Internal | <b>H37WXBG323000FD</b>  | <b>H37WXBH323000FD</b>  |
|   |                                      |     |                 |         |                                    | External | <b>H37WXXG323000FD</b>  | <b>H37WXXH323000FD</b>  |

**5599-1, Non Plug-in, Size 3 (H3) with 3-Pin DIN Connectors**

| Symbol  | Type                                 | Cv  | Operator        | Voltage | Enclosure                   | Pilot    | Internal pilot     | External pilot     |
|---|--------------------------------------|-----|-----------------|---------|-----------------------------|----------|--------------------|--------------------|
|  | 4-way, 2-position, spring return     | 6.0 | Single solenoid | 24 VDC  | 3-pin DIN connector on coil | Internal | <b>H3EWWBBL49D</b> | <b>H3EWWBCL49D</b> |
|   |                                      |     |                 |         |                             | External | <b>H3EWWXBL49D</b> | <b>H3EWWXCL49D</b> |
|  | 4-way, 2-position, air return        | 6.0 | Single solenoid | 24 VDC  | 3-pin DIN connector on coil | Internal | <b>H31WXBBL49D</b> | <b>H31WXBCL49D</b> |
|   |                                      |     |                 |         |                             | External | <b>H31WXXBL49D</b> | <b>H31WXXCL49D</b> |
|  | 4-way, 2-position                    | 6.0 | Double solenoid | 24 VDC  | 3-pin DIN connector on coil | Internal | <b>H32WXBBL49D</b> | <b>H32WXBCL49D</b> |
|   |                                      |     |                 |         |                             | External | <b>H32WXXBL49D</b> | <b>H32WXXCL49D</b> |
|  | 4-way, 3-position, all ports blocked | 5.0 | Double solenoid | 24 VDC  | 3-pin DIN connector on coil | Internal | <b>H35WXBBL49D</b> | <b>H35WXBCL49D</b> |
|   |                                      |     |                 |         |                             | External | <b>H35WXXBL49D</b> | <b>H35WXXCL49D</b> |
|  | 4-way, 3-position, center exhaust    | 5.0 | Double solenoid | 24 VDC  | 3-pin DIN connector on coil | Internal | <b>H36WXBBL49D</b> | <b>H36WXBCL49D</b> |
|   |                                      |     |                 |         |                             | External | <b>H36WXXBL49D</b> | <b>H36WXXCL49D</b> |
|  | 4-way, 3-position, pressure center   | 5.0 | Double solenoid | 24 VDC  | 3-pin DIN connector on coil | Internal | <b>H37WXBBL49D</b> | <b>H37WXBCL49D</b> |
|   |                                      |     |                 |         |                             | External | <b>H37WXXBL49D</b> | <b>H37WXXCL49D</b> |



Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

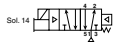

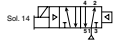
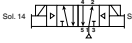
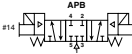

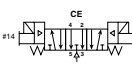
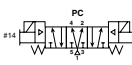
Isys Micro Series

Modulflex Series




**D**

Subbase & Manifold Valve Products




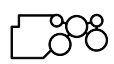
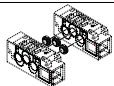
**5599-1, Non Plug-in, Size 3 (H3) with 3-Pin DIN Connectors**

|                   | Symbol  | Type                                 | Cv  | Operator        | Voltage |   | Pilot                       | Non-locking        | Locking            |                    |
|-------------------|---|--------------------------------------|-----|-----------------|---------|---|-----------------------------|--------------------|--------------------|--------------------|
| Valvair II Series |  | 4-way, 2-position, spring return     | 6.0 | Single solenoid | 120 VAC |  | 3-pin DIN connector on coil | Internal           | <b>H3EWXBBL53D</b> | <b>H3EWXBCL53D</b> |
|                   |   |                                      |     |                 |         |   | External                    | <b>H3EWXXBL53D</b> | <b>H3EWXXCL53D</b> |                    |
|                   |  | 4-way, 2-position, air return        | 6.0 | Single solenoid | 120 VAC |   | 3-pin DIN connector on coil | Internal           | <b>H31WXBBL53D</b> | <b>H31WXBCL53D</b> |
|                   |   |                                      |     |                 |         | External  | <b>H31WXXBL53D</b>          | <b>H31WXXCL53D</b> |                    |                    |
|                   |  | 4-way, 2-position                    | 6.0 | Double solenoid | 120 VAC |   | 3-pin DIN connector on coil | Internal           | <b>H32WXBBL53D</b> | <b>H32WXBCL53D</b> |
|                   |   |                                      |     |                 |         | External  | <b>H32WXXBL53D</b>          | <b>H32WXXCL53D</b> |                    |                    |
| DX ISOMAX Series  |  | 4-way, 3-position, all ports blocked | 5.0 | Double solenoid | 120 VAC |  | 3-pin DIN connector on coil | Internal           | <b>H35WXBBL53D</b> | <b>H35WXBCL53D</b> |
|                   |   |                                      |     |                 |         |   | External                    | <b>H35WXXBL53D</b> | <b>H35WXXCL53D</b> |                    |
|                   |  | 4-way, 3-position, center exhaust    | 5.0 | Double solenoid | 120 VAC |   | 3-pin DIN connector on coil | Internal           | <b>H36WXBBL53D</b> | <b>H36WXBCL53D</b> |
|                   |   |                                      |     |                 |         | External  | <b>H36WXXBL53D</b>          | <b>H36WXXCL53D</b> |                    |                    |
| Fieldbus Series   |  | 4-way, 3-position, pressure center   | 5.0 | Double solenoid | 120 VAC |   | 3-pin DIN connector on coil | Internal           | <b>H37WXBBL53D</b> | <b>H37WXBCL53D</b> |
|                   |   |                                      |     |                 |         | External  | <b>H37WXXBL53D</b>          | <b>H37WXXCL53D</b> |                    |                    |

**5599-1, Non Plug-in, Size 3 (H3)**

|                   |   |  |                    |                    |
|-------------------|---|--|--------------------|--------------------|
| Isys ISO Series   | Single subbase  | <b>Description</b>   | 3/4" NPT           | 3/4" BSPP          |
|                   |    | Side ported base   | <b>PS4211190CP</b> | <b>PS4211180CP</b> |
| Isys Micro Series | Manifold bases  | <b>Description</b>   | 3/4" NPT           | 3/4" BSPP          |
|                   |   | Bottom / End ported bases<br><b>Note:</b> Manifolds include 2 pipe plugs | <b>PS4211690CP</b> | <b>PS4211600CP</b> |
| Modulflex Series  | End plate kits  | <b>Description</b>   | NPT port           | BSPP port          |
|                   |  | H3 Non-collective wiring end plates                                      | <b>PS4231010CP</b> | <b>PS4231011CP</b> |

**5599-1, Non Plug-in, Size 3 (H3) Accessories**

|   | Accessory                        | Description                              | Part number        |
|---|----------------------------------|--|--------------------|
|  | Sandwich regulator               | Common pressure 5-125 PSIG w/ gauge      | <b>PS4237166CP</b> |
|   |                                  | Independent pressure 5-125 PSIG w/ gauge | <b>PS4237266CP</b> |
|  | Blanking plate kit               |  | <b>PS4234CP</b>    |
|  | Sandwich flow control            |  | <b>PS4242CP</b>    |
|  | Manifold to manifold gasket kits |  | <b>PS4213P</b>     |
|  | Manifold port isolation kit      | Main galley (1, 3, 5)                    | <b>PS4232CP</b>    |
|   |                                  | Pilot galley                             | <b>PS4033CP</b>    |

### How To Order Non Plug-in Add-A-Fold Assemblies

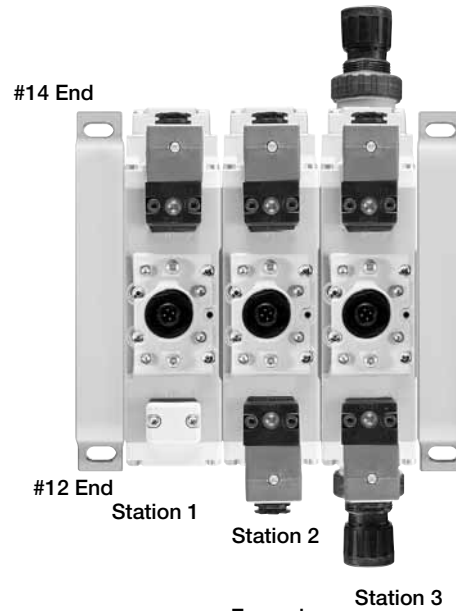
1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete Valve, Regulator, Flow Control and Base model number. List left to right, LOOKING AT THE CYLINDER PORTS on the #12 end of the manifold. The left most station is station 1. (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

#### Example

Application requires a 3-Station manifold with a valve and regulator on Station 3.

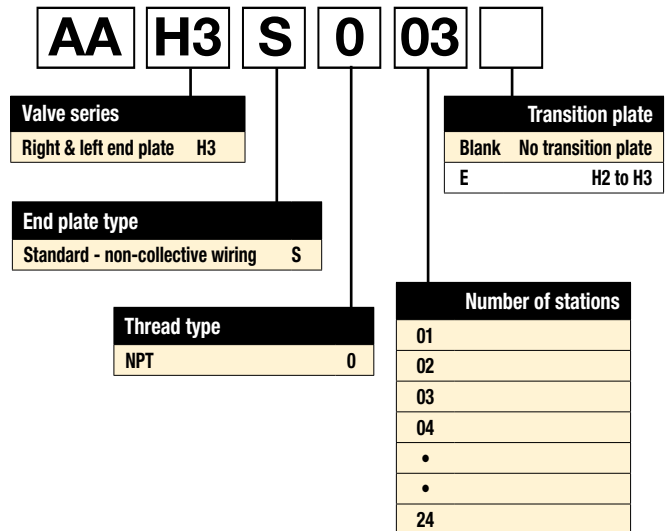
| Item | Qty. | Part No.        | Location  |
|------|------|-----------------|-----------|
| 01   | 1    | AAH3S003        |           |
| 02   | 1    | H31WXBG2B9000FD | Station 1 |
| 03   | 1    | PS4211590CP     | Station 1 |
| 04   | 1    | H32WXBG2B9000FD | Station 2 |
| 05   | 1    | PS4211590CP     | Station 2 |
| 06   | 1    | H32WXXG2B9000FD | Station 3 |
| 07   | 1    | PS4237166CP     | Station 3 |
| 08   | 1    | PS4211590CP     | Station 3 |

**NOTE:** Construct manifold assemblies from left to right while looking at the cylinder ports.  
 Valves must be ordered as External Pilot when using Sandwich Regulator.

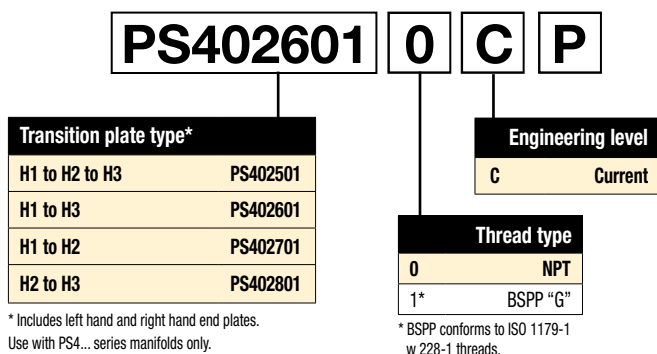


Example:  
 3-Station Manifold with (3) H3 Valves  
 on Manifold Bases and Regulator at Station 3

#### Add-A-Fold Assembly Model Number



#### 5599-1 Non Plug-in Transition Plate Kits



\* Includes left hand and right hand end plates.  
 Use with PS4... series manifolds only.

\* BSPP conforms to ISO 1179-1  
 w 228-1 threads.



**Non Plug-in, 5599-1, Central Connector - Size 1, 2, & 3**

Valvair II Series  
 DX ISOMAX Series  
 Fieldbus  
 Isys ISO Series  
 Isys Micro Series  
 Modulflex Series  
**D**  
 Subbase & Manifold Valve Products

**H1 E WX B G 2B9 000F D**

| Basic series 5599-1 |    |
|---------------------|----|
| ISO 5599-1 Size 1   | H1 |
| ISO 5599-1 Size 2   | H2 |
| ISO 5599-1 Size 3   | H3 |

| 5599 -1 Engineering level |         |
|---------------------------|---------|
| D                         | Current |

| 5599-1 Operator / Function                              |   |
|---|---|
| Single solenoid, 2-position - air return                | 1 |
| Double solenoid, 2-position                             | 2 |
| Double solenoid, 3-position - APB                       | 5 |
| Double solenoid, 3-position - CE                        | 6 |
| Double solenoid, 3-position - PC                        | 7 |
| Single solenoid, 2-position - air return, spring assist | E |

| 5599-1 Central connector wiring options |                       |
|---|-----------------------|
| 000C                                    | Chrysler              |
| 000F*                                   | SAE / Ford, ISO 20401 |
| 000G                                    | General Motors        |

\* Complies to ISO 20401 with Enclosure Lead Length "2".

| 5599-1 Mounting |    |
|-----------------|----|
| Valve less base | WX |

| 5599-1 Pilot source / Pilot exhaust      |    |
|--|----|
| Internal pilot, port #1 / vented         | B  |
| External pilot, port #12 or #14 / vented | X* |

\* Must be specified when using Sandwich Regulators.

| 5599-1 Overrides / Lights      |   |
|--------------------------------|---|
| Non-locking, flush, with light | G |
| Locking, flush, with light     | H |

| Enclosure / Lead length / Voltage* |      |      |           |                                     |
|------------------------------------|------|------|-----------|-------------------------------------|
|                                    | AC   |      | DC        |                                     |
|                                    | 60Hz | 50Hz |           |                                     |
| 1B9 <sup>†</sup>                   |      |      | 24        | 3-pin, central mini connector       |
| 123 <sup>†</sup>                   | 120  | 115  |           | 3-pin, central mini connector       |
| <b>2B9</b>                         |      |      | <b>24</b> | <b>4-pin, central M12 connector</b> |
| 3B9                                |      |      | 24        | 5-pin, central mini connector       |
| 323                                | 120  | 115  |           | 5-pin, central mini connector       |
| 619 <sup>†</sup>                   |      |      | 24        | 2-pin, M12 connector on coil        |

\* All coils include LED & suppression

<sup>†</sup> Operator function "1" or "E"

\* Only available with wiring option "000F"

**Non Plug-in, 5599-1, CNOMO - Size 1, 2, & 3**

**H1 E WX B B L53 D**

| Basic series 5599-1 |    |
|---------------------|----|
| ISO 5599-1 Size 1   | H1 |
| ISO 5599-1 Size 2   | H2 |
| ISO 5599-1 Size 3   | H3 |

| 5599-1 Engineering level |         |
|--------------------------|---------|
| D                        | Current |

| 5599-1 Operator / Function                              |   |
|---|---|
| Single solenoid, 2-position - air return                | 1 |
| Double solenoid, 2-position                             | 2 |
| Double solenoid, 3-position - APB                       | 5 |
| Double solenoid, 3-position - CE                        | 6 |
| Double solenoid, 3-position - PC                        | 7 |
| Single solenoid, 2-position - air return, spring assist | E |

| Enclosure / Lead length / Voltage |            |            |           |  |
|-----------------------------------|------------|------------|-----------|--|
|                                   | AC         |            | DC        |  |
|                                   | 60Hz       | 50Hz       |           |  |
| L42                               | 24         |            |           | 3-pin, 30mm DIN 43650A with CNOMO connector        |
| L45                               |            |            | 12        | 3-pin, 30mm DIN 43650A with CNOMO connector        |
| <b>L49</b>                        |            |            | <b>24</b> | <b>3-pin, 30mm DIN 43650A with CNOMO connector</b> |
| <b>L53</b>                        | <b>120</b> | <b>115</b> |           | <b>3-pin, 30mm DIN 43650A with CNOMO connector</b> |
| L57                               | 240        |            |           | 3-pin, 30mm DIN 43650A with CNOMO connector        |
| NXX                               |            |            |           | Valve less coil                                    |

| 5599-1 Mounting |    |
|-----------------|----|
| Valve less base | WX |

| 5599-1 Pilot source / Pilot exhaust      |    |
|--|----|
| Internal pilot, port #1 / vented         | B  |
| External pilot, port #12 or #14 / vented | X* |

\* Must be specified when using Sandwich Regulators.

| 5599-1 Overrides / Lights |  |
|---------------------------|--|
| <b>B</b>                  | <b>Non-locking, flush, push - no light</b> |
| C                         | Locking, flush, push / turn - no light     |



**Maximum Number of Solenoids**  
 (Maximum energized simultaneously)

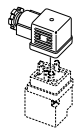
| HA & HB | Voltage code | 25-pin D-sub | 19-pin Brad Harrison | 12-Pin M23 | 19-pin M23 | Moduflex | Isysnet | Turck      |            |
|---------|--------------|--------------|----------------------|------------|------------|----------|---------|------------|------------|
|         |              |              |                      |            |            |          |         | 16 Outputs | 32 Outputs |
| 24VDC   | G9           | 24 (24)      | 16 (16)              | 8 (8)      | 16 (16)    | 16 (16)  | 32 (32) | 16 (16)    | 32 (32)    |
| 120VAC* | 23           | 24 (24)      | 16 (16)              | 8 (8)      | 16 (16)    | N/A      | N/A     | N/A        | N/A        |

| H1, H2 & H3 | Voltage code | 25-pin D-sub | 19-pin Brad Harrison | 12-Pin M23 | 19-pin M23 | Moduflex | Isysnet | Turck      |            |
|-------------|--------------|--------------|----------------------|------------|------------|----------|---------|------------|------------|
|             |              |              |                      |            |            |          |         | 16 Outputs | 32 Outputs |
| 12VDC       | 45           | 24 (13)      | 16 (13)              | 8 (8)      | 16 (13)    | N/A      | N/A     | N/A        | N/A        |
| 24VAC*      | 42           | 24 (24)      | 16 (16)              | 8 (8)      | 16 (16)    | N/A      | N/A     | N/A        | N/A        |
| 24VDC       | B9           | 24 (20)      | 16 (16)              | 8 (8)      | 16 (16)    | 16 (16)  | 24 (21) | 16 (16)    | 24 (21)    |
| 120VAC*     | 23           | 24 (24)      | 16 (16)              | 8 (8)      | 16 (16)    | N/A      | N/A     | N/A        | N/A        |

\* Not CSA certified for 25-pin, D-sub option.

**Female Electrical Connectors (IP65 Rated) 30mm, 3-Pin ISO 4400, (DIN 43650A)**



| Description                     | Connector with 6' (2m) cord | Connector         |
|---------------------------------|-----------------------------|-------------------|
| Unlighted                       | <b>PS2028JCP</b>            | <b>PS2028BP</b>   |
| Light – 6-48V, 50/60Hz; 6-48VDC | <b>PS2032J79CP*</b>         | <b>PS203279BP</b> |
| Light – 120V/60Hz               | <b>PS2032J83CP*</b>         | <b>PS203283BP</b> |
| Light – 240V/60Hz               | <b>N/A</b>                  | <b>PS203283BP</b> |

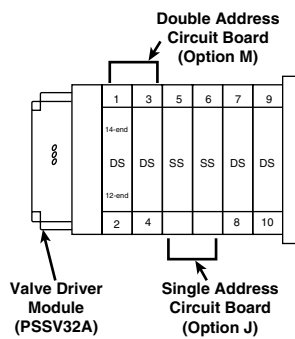
\* With surge suppression.

**Engineering data:**

Conductors: 2 poles plus ground; cable range (connector only): 8 to 10mm (0.31 To 0.39 inch); Contact spacing: 18mm

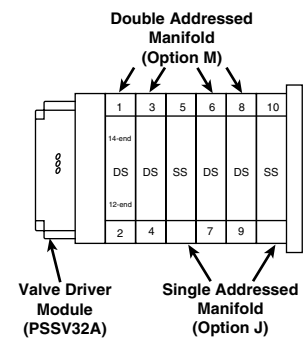
**I/O Addressing Examples**

**HB & HA Example**  
 Two Station Manifold Bases



**Notes:** SS = Single Solenoid Valve  
 DS = Double Solenoid Valve  
 First output address the #14 end of the valve closest to the valve driver module.

**H1, H2 & H3 Example:**  
 Single Station Manifold Bases



**5599-2 & 5599-1 AUTO Solenoid Kits**

| Valve size | Voltage code | Coil kit number  |
|------------|--------------|------------------|
|            | 42 (24VAC)   | <b>PS404142P</b> |
|            | 45 (12VDC)   | <b>PS404145P</b> |
|            | H1, H2 & H3  | <b>PS4041B9P</b> |
|            | 23 (120VAC)  | <b>PS404123P</b> |
|            | 57 (240VAC)  | <b>PS404157P</b> |

Quantity 1

**5599-1 CNOMO Solenoid Kits**

| Voltage code | 3-pin, 30mm 'L' coil kit | 2-pin, M12 Euro '6' coil kit |
|--------------|--------------------------|------------------------------|
| 19           | —                        | <b>PS2828619P</b>            |
| 42           | <b>P2FCA442</b>          | —                            |
| 45           | <b>P2FCA445</b>          | —                            |
| 49           | <b>P2FCA449</b>          | —                            |
| 53           | <b>P2FCA453</b>          | —                            |
| 57           | <b>P2FCA457</b>          | —                            |

Quantity 1



Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

Isys Micro Series

Moduflex Series

**D**

Subbase & Manifold Valve Products



**Pilot Operator - CNOMO**

| Valve size  |             | Kit number      |
|-------------|-------------|-----------------|
| H1, H2 & H3 | Locking     | <b>PS4052CP</b> |
|             | Non-locking | <b>PS4053CP</b> |

**Manifold Hardware Kits – PS Series**

| Valve size  | Kit number     |
|-------------|----------------|
| HA & HB     | <b>PS5612P</b> |
|             | <b>PS5512P</b> |
|             | <b>PS4012P</b> |
| H1, H2 & H3 | <b>PS4112P</b> |
|             | <b>PS4212P</b> |

Quantity 12

**Valve Bolt Kits**

| Valve size  | Kit number      |
|-------------|-----------------|
| HA & HB     | <b>PS5687P</b>  |
|             | <b>PS5587P</b>  |
|             | <b>PS4087DP</b> |
| H1, H2 & H3 | <b>PS4187DP</b> |
|             | <b>PS4287DP</b> |

Quantity 12

**Valve to Base Gasket Kits**

| Valve size  | Standard        | Remote pilot    | Dual pressure #3 | Dual pressure #5 |
|-------------|-----------------|-----------------|------------------|------------------|
| HA & HB     | <b>PS5605P*</b> | —               | —                | —                |
|             | <b>PS5505P*</b> | —               | —                | —                |
| H1, H2 & H3 | <b>PS4005DP</b> | <b>PS4006DP</b> | <b>PS40D3DP</b>  | —                |
|             | <b>PS4105DP</b> | <b>PS4106DP</b> | <b>PS41D3DP</b>  | <b>PS41D5DP</b>  |
|             | <b>PS4205DP</b> | <b>PS4206DP</b> | <b>PS42D3DP</b>  | <b>PS42D5DP</b>  |

Quantity 1  
 \* Quantity 10

**Body Service Kits**



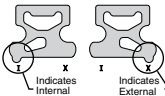
| Valve size  | 2-position      | 3-position      |                 |                 |
|-------------|-----------------|-----------------|-----------------|-----------------|
|             |                 | APB             | CE              | PC              |
| HA & HB     | <b>PS5601P</b>  | <b>PS5602P</b>  | <b>PS5603P</b>  | <b>PS5604P</b>  |
|             | <b>PS5501P</b>  | <b>PS5502P</b>  | <b>PS5503P</b>  | <b>PS5504P</b>  |
| H1, H2 & H3 | <b>PS4001CP</b> | <b>PS4002CP</b> | <b>PS4003CP</b> | <b>PS4004CP</b> |
|             | <b>PS4101CP</b> | <b>PS4102CP</b> | <b>PS4103CP</b> | <b>PS4104CP</b> |
|             | <b>PS4201CP</b> | <b>PS4202CP</b> | <b>PS4203CP</b> | <b>PS4204CP</b> |

HB / HA Kit Includes: Spool assembly with seals.

H1, H2, H3 Kit Includes: Spool assembly with seals, all piston seals, return spring, pilot selector gasket, coil to end cap gasket.

Quantity 1

**Pilot Select Gasket Kits**

|  | Valve size  | Kit number     |
|--|-------------|----------------|
|   | HB          | <b>PS5605P</b> |
|   | HA          | <b>PS5505P</b> |
|  | H1, H2 & H3 | <b>PS4007P</b> |

Quantity 10

Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

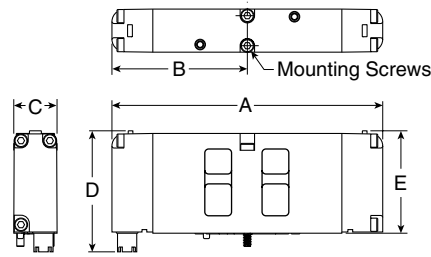
Isys Micro Series

Modulflex Series

**D**

Subbase & Manifold Valve Products

**Isys ISO 15407-2, Plug-in, Size 18mm (HB)**



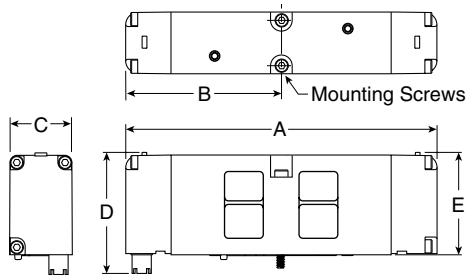
**18mm Dimensions**

| A     | B    | C    | D    |
|-------|------|------|------|
| 4.43  | 2.22 | .72  | 1.98 |
| (113) | (56) | (18) | (50) |

**E**  
 1.68  
 (43)

Inches (mm)

**Isys ISO 15407-2, Plug-in, Size 26mm (HA)**



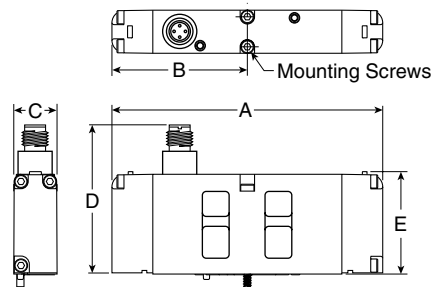
**26mm Dimensions**

| A     | B    | C    | D    |
|-------|------|------|------|
| 5.10  | 2.55 | 1.02 | 1.98 |
| (130) | (65) | (26) | (50) |

**E**  
 1.66  
 (42)

Inches (mm)

**Isys ISO 15407-1, Plug-in, Size 18mm (HB)**



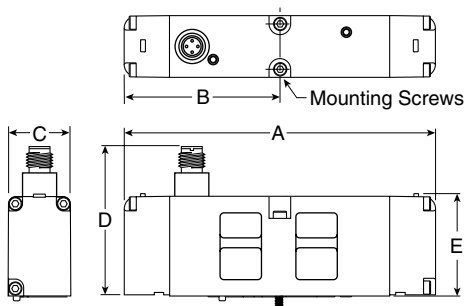
**18mm Dimensions**

| A     | B    | C    | D    |
|-------|------|------|------|
| 4.43  | 2.22 | .72  | 2.40 |
| (113) | (56) | (18) | (61) |

**E**  
 1.68  
 (43)

Inches (mm)

**Isys ISO 15407-1, Plug-in, Size 26mm (HA)**



**26mm Dimensions**

| A     | B    | C    | D    |
|-------|------|------|------|
| 5.10  | 2.55 | 1.02 | 2.40 |
| (130) | (65) | (26) | (61) |

**E**  
 1.66  
 (42)

Inches (mm)

Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

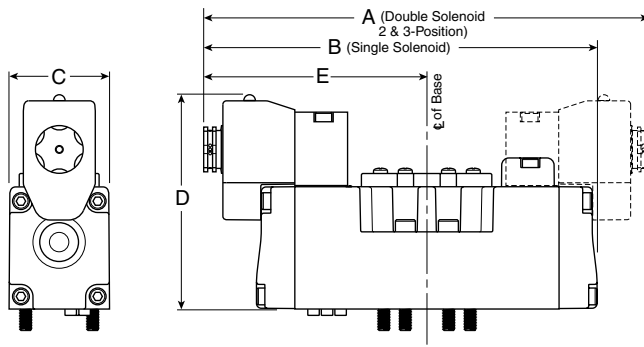
Isys Micro Series

Moduflex Series

**D**

Subbase & Manifold Valve Products

**Isys ISO 5599-2**



**H1 Valves Shown**

**H1 Dimensions**

| A              | A <sub>1</sub> | B              | C              |
|----------------|----------------|----------------|----------------|
| 7.32<br>(186)  | 5.59<br>(142)  | 6.46<br>(164)  | 1.65<br>(42)   |
| D              | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> |
| 3.54<br>(90)   | 4.29<br>(109)  | 4.29<br>(109)  | 2.50<br>(63.5) |
| D <sub>4</sub> | E              | E <sub>1</sub> |                |
| 2.48<br>(63)   | 3.66<br>(93)   | 2.80<br>(71)   |                |

Inches (mm)

**H2 Dimensions**

| A             | A <sub>1</sub> | B              | C              |
|---------------|----------------|----------------|----------------|
| 8.35<br>(212) | 6.62<br>(168)  | 7.48<br>(190)  | 2.17<br>(55)   |
| D             | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> |
| 4.05<br>(103) | 4.80<br>(122)  | 4.57<br>(116)  | 2.99<br>(76)   |
| E             | E <sub>1</sub> |                |                |
| 4.17<br>(106) | 3.31<br>(84)   |                |                |

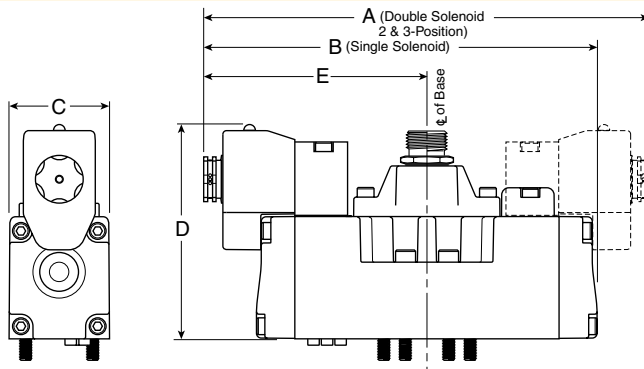
Inches (mm)

**H3 Dimensions**

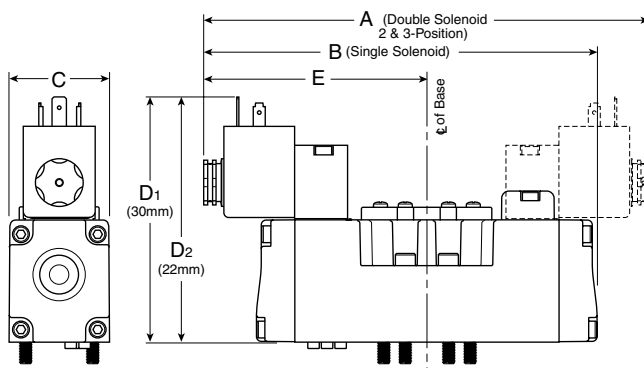
| A             | A <sub>1</sub> | B              | C              |
|---------------|----------------|----------------|----------------|
| 9.49<br>(241) | 6.98<br>(177)  | 8.23<br>(209)  | 2.17<br>(55)   |
| D             | D <sub>1</sub> | D <sub>2</sub> | D <sub>3</sub> |
| 4.05<br>(103) | 4.80<br>(122)  | 4.57<br>(116)  | 2.99<br>(76)   |
| E             | E <sub>1</sub> |                |                |
| 4.74<br>(121) | 3.49<br>(89)   |                |                |

Inches (mm)

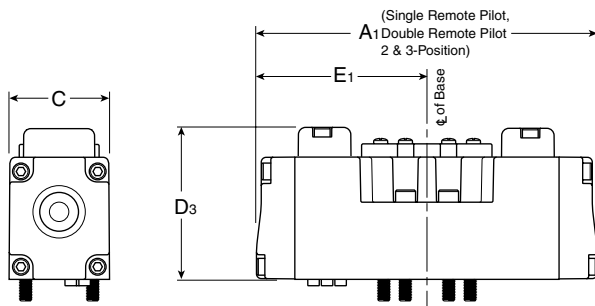
**Isys ISO 5599-1 Auto**



**Isys ISO 5599-1 CNOMO**

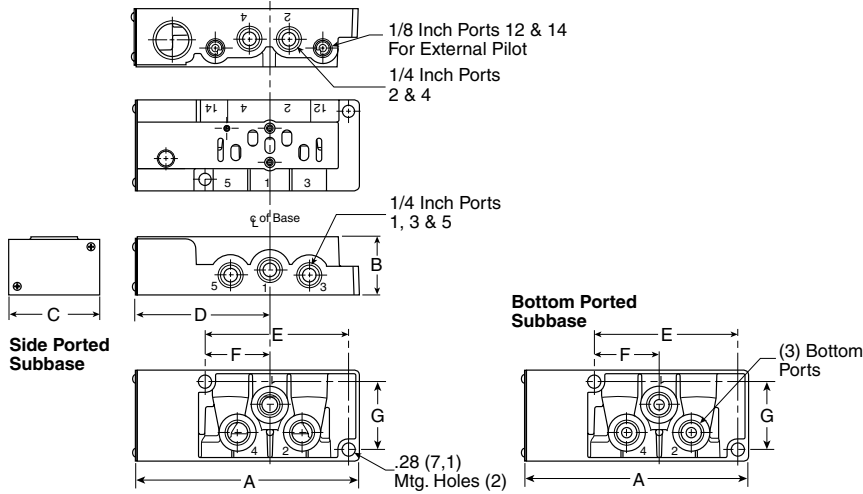


**Isys ISO 5599-2 / 5599-1 Remote Pilot**



- Valvair II Series
- DX ISOMAX Series
- Fieldbus
- Isys ISO Series
- Isys Micro Series
- Modulflex Series
- D**
- Subbase & Manifold Valve Products

**Isys ISO 15407-2 & 15407-1 Size 18mm (HA), PS511 Subbases**

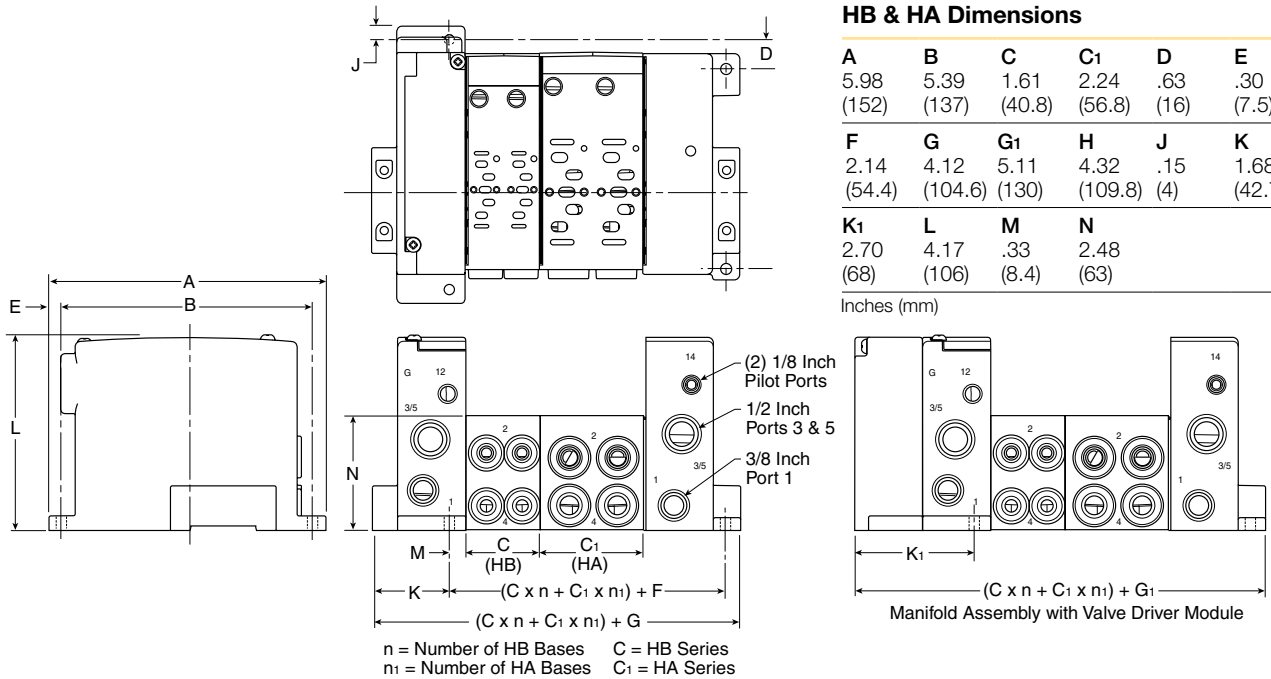


**HA Dimensions**

| A              | B              | C              | D            |
|----------------|----------------|----------------|--------------|
| 4.88<br>(124)  | 1.28<br>(32.5) | 2.00<br>(50.8) | 2.91<br>(74) |
| E              | F              | G              |              |
| 1.43<br>(36.2) | 3.16<br>(80.2) | 1.49<br>(37.9) |              |

Inches (mm)

**Isys ISO 15407-2 & 15407-1 Size 26mm (HB) & 18mm (HA), PS5611 & PS5511 Manifolds**

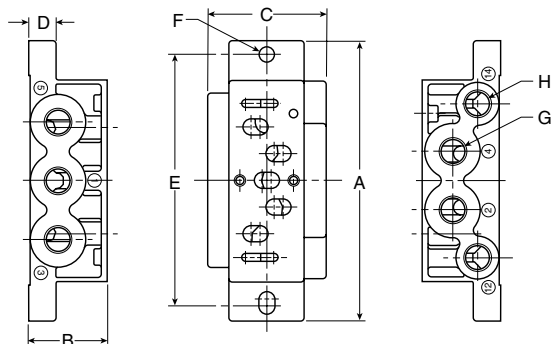


**HB & HA Dimensions**

| A              | B               | C              | C1              | D           | E              |
|----------------|-----------------|----------------|-----------------|-------------|----------------|
| 5.98<br>(152)  | 5.39<br>(137)   | 1.61<br>(40.8) | 2.24<br>(56.8)  | .63<br>(16) | .30<br>(7.5)   |
| F              | G               | G1             | H               | J           | K              |
| 2.14<br>(54.4) | 4.12<br>(104.6) | 5.11<br>(130)  | 4.32<br>(109.8) | .15<br>(4)  | 1.68<br>(42.7) |
| K1             | L               | M              | N               |             |                |
| 2.70<br>(68)   | 4.17<br>(106)   | .33<br>(8.4)   | 2.48<br>(63)    |             |                |

Inches (mm)

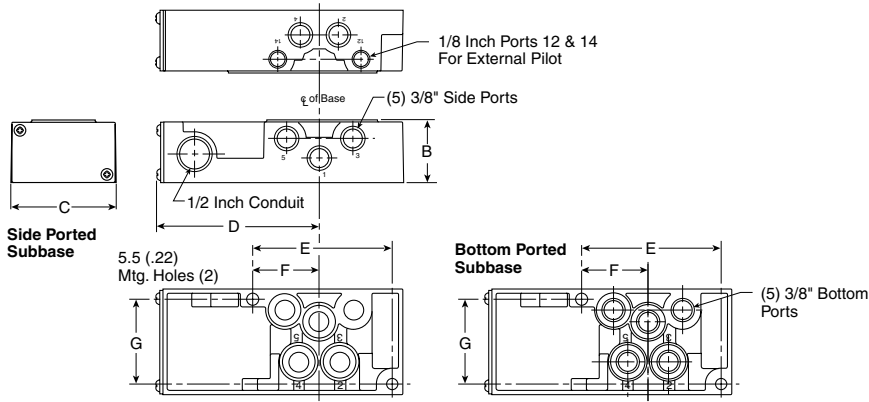
**Isys ISO Size 26mm (HB) & 18mm (HA), Individual Subbase**



| Series | Part number | A             | B            | C            | D           | E            | F                    | G   | H   |
|--------|-------------|---------------|--------------|--------------|-------------|--------------|----------------------|-----|-----|
| HB     | PL02        | 3.15<br>(80)  | .87<br>(22)  | 1.06<br>(27) | .31<br>(8)  | 2.76<br>(70) | .216 Dia.<br>(Ø 5.5) | 1/8 | M5  |
| HA     | PL01        | 3.94<br>(100) | 1.10<br>(28) | 1.65<br>(42) | .39<br>(10) | 3.54<br>(90) | .216 Dia.<br>(Ø 5.5) | 1/4 | 1/8 |

Inches (mm)

**Isys ISO 5599-1 Size H1, PS4011 Subbase**



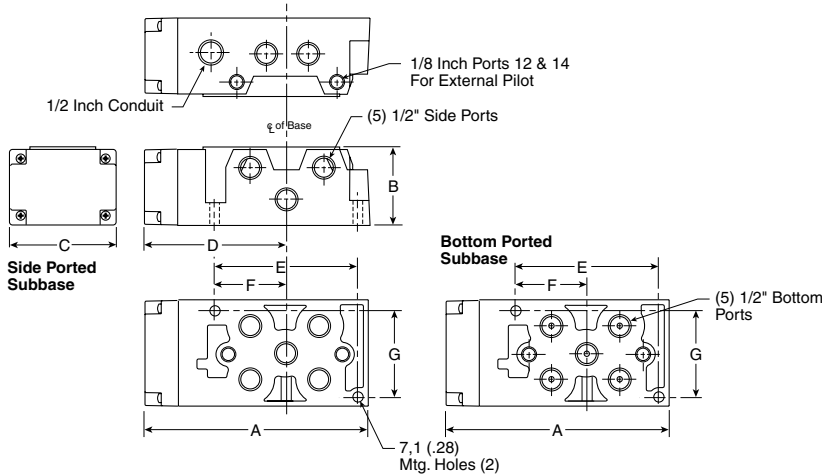
**PS4011 Subbase Dimensions**

| A     | B    | C    | D    |
|-------|------|------|------|
| 5.83  | 1.48 | 2.50 | 3.86 |
| (148) | (38) | (64) | (98) |

| E    | F    | G    |
|------|------|------|
| 3.29 | 1.57 | 2.00 |
| (84) | (40) | (51) |

Inches (mm)

**Isys ISO 5599-1 Size H2, PS4111 Subbase**



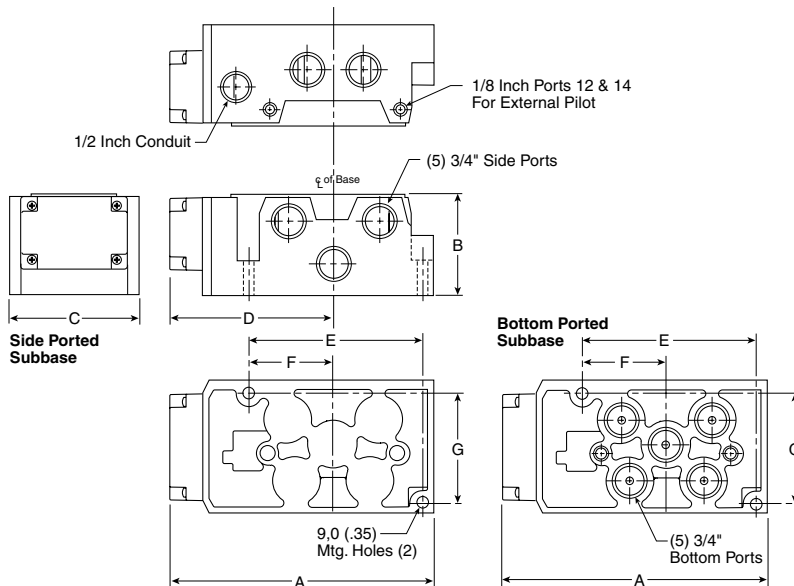
**PS4111 Subbase Dimensions**

| A     | B    | C    | D     |
|-------|------|------|-------|
| 6.69  | 2.33 | 3.15 | 4.25  |
| (170) | (59) | (80) | (108) |

| E     | F    | G    |
|-------|------|------|
| 4.21  | 2.07 | 2.56 |
| (107) | (52) | (65) |

Inches (mm)

**Isys ISO 5599-1 Size H3, PS4211 Subbase**



**PS4211 Subbase Dimensions**

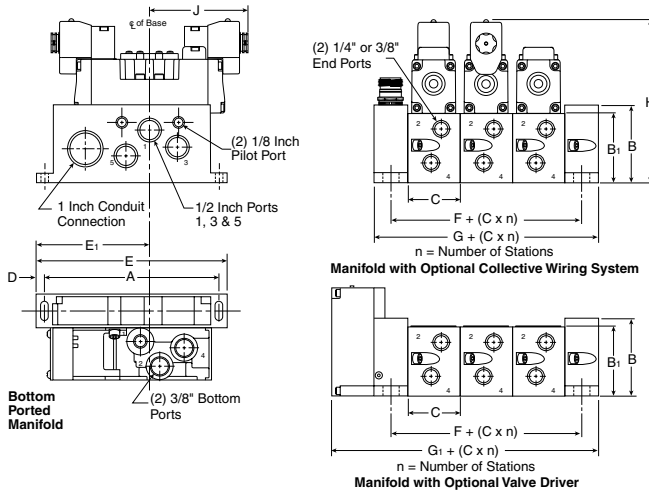
| A     | B    | C    | D     |
|-------|------|------|-------|
| 7.90  | 2.96 | 3.90 | 4.92  |
| (201) | (75) | (99) | (125) |

| E     | F    | G    |
|-------|------|------|
| 5.14  | 2.50 | 3.24 |
| (131) | (64) | (82) |

Inches (mm)

Valvair II Series  
 DX ISOMAX Series  
 Fieldbus  
 Isys ISO Series  
 Isys Micro Series  
 Modulflex Series  
**D**  
 Subbase & Manifold Valve Products

**Isys ISO 5599 Size H1, PS4011 Manifold**

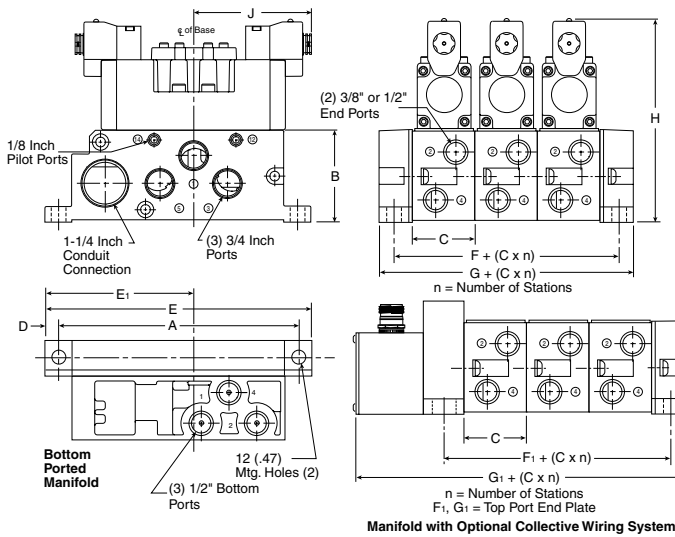


**PS4011 Manifold Dimensions**

| A             | B              | B <sub>1</sub> | C              | D              |
|---------------|----------------|----------------|----------------|----------------|
| 6.50<br>(165) | 2.87<br>(73)   | 2.64<br>(67)   | 1.96<br>(50)   | .33<br>(8)     |
| E             | E <sub>1</sub> | F              | G              | G <sub>1</sub> |
| 7.15<br>(182) | 4.25<br>(108)  | 1.25<br>(32)   | 2.50<br>(63.5) | 4.06<br>(86)   |
| H             | J              |                |                |                |
| 6.18<br>(157) | 3.66<br>(93)   |                |                |                |

Inches (mm)

**Isys ISO 5599 Size H2, PS4111 Manifold**



**PS4111 Manifold Dimensions**

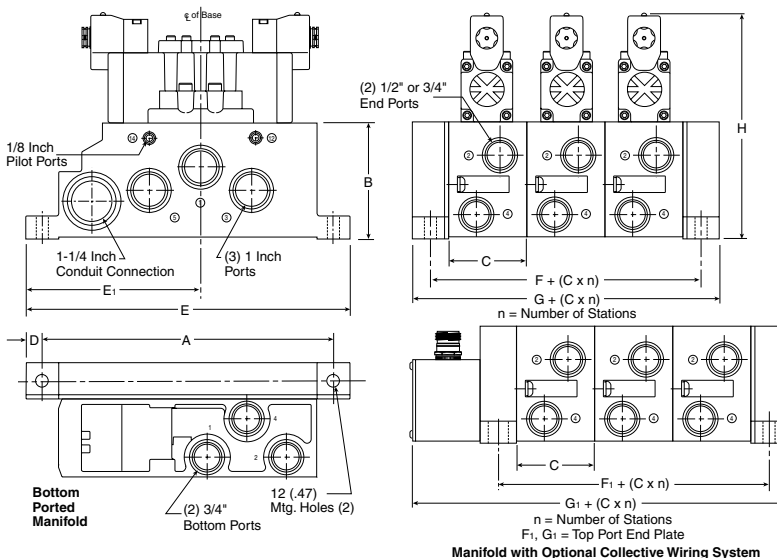
| A              | B             | C              | D            | E                |
|----------------|---------------|----------------|--------------|------------------|
| 8.46<br>(215)  | 3.35<br>(85)  | 2.20<br>(56)   | .47<br>(12)  | 9.41<br>(239)    |
| E <sub>1</sub> | F             | F <sub>1</sub> | G            | G <sub>1</sub> * |
| 5.28<br>(134)  | 1.18<br>(30)  | 1.30<br>(33)   | 2.36<br>(60) | 3.78<br>(96)     |
| H              | J             |                |              |                  |
| 7.40<br>(188)  | 4.17<br>(106) |                |              |                  |

Inches (mm)

\* For Isysnet End Plate, add 0.39" (10mm) to the G<sub>1</sub> dimensions.

For 19-pin Round Connector Module, add 1.08" (27.5mm) to the G<sub>1</sub> dimensions.

**Isys ISO 5599 Size H3, PS4211 Manifold**



**PS4211 Manifold Dimensions**

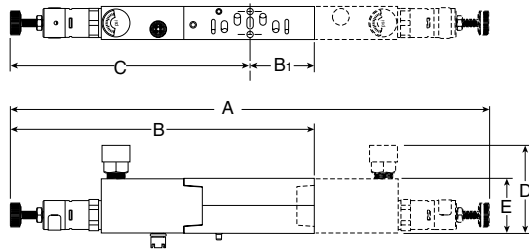
| A              | B             | C              | D            | E                |
|----------------|---------------|----------------|--------------|------------------|
| 10.41<br>(265) | 4.13<br>(105) | 2.80<br>(71)   | .59<br>(15)  | 11.61<br>(295)   |
| E <sub>1</sub> | F             | F <sub>1</sub> | G            | G <sub>1</sub> * |
| 6.26<br>(159)  | 1.30<br>(33)  | 1.60<br>(41)   | 2.60<br>(63) | 4.37<br>(111)    |
| H              |               |                |              |                  |
| 8.19<br>(208)  |               |                |              |                  |

Inches (mm)

\* For Isysnet End Plate, add 0.39" (10mm) to the G<sub>1</sub> dimensions.

For 19-pin Round Connector Module, add 1.08" (27.5mm) to the G<sub>1</sub> dimensions.

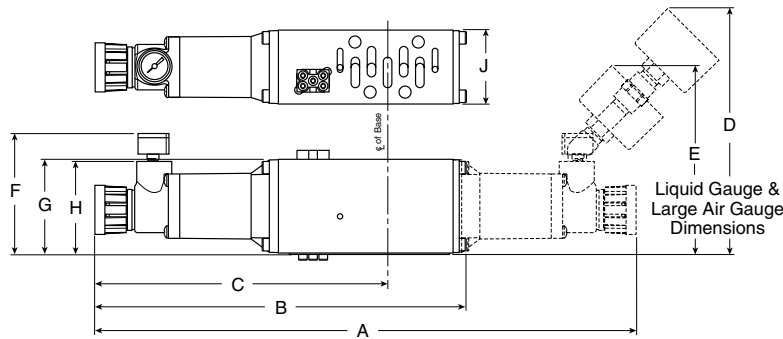
**Isys ISO 15407 Sandwich Regulator**



| Series | Part number   | A              | B             | B <sub>1</sub> | C             | D            | E            |
|--------|---------------|----------------|---------------|----------------|---------------|--------------|--------------|
| HB     | <b>PS5637</b> | 10.28<br>(261) | 6.14<br>(156) | 1.02<br>(26)   | 5.13<br>(130) | 2.60<br>(66) | 1.18<br>(30) |
| HA     | <b>PS5537</b> | 10.00<br>(254) | 6.42<br>(163) | 1.42<br>(36)   | 5.00<br>(127) | 2.72<br>(69) | 1.18<br>(30) |

Inches (mm)

**Isys ISO 5599, Size H1 Sandwich Regulator**

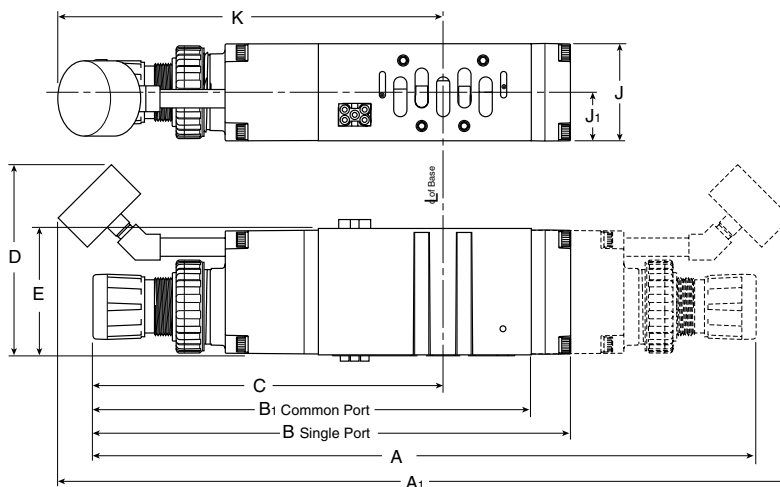


| Series | Part number   | A              | B             | C             | D             | E             | F            | G            | H            | J            |
|--------|---------------|----------------|---------------|---------------|---------------|---------------|--------------|--------------|--------------|--------------|
| H1     | <b>PS4037</b> | 11.84<br>(301) | 8.13<br>(207) | 6.40<br>(163) | 5.45<br>(138) | 4.25<br>(108) | 2.85<br>(72) | 2.09<br>(53) | 2.05<br>(52) | 1.63<br>(41) |
|        | <b>PS4038</b> |                |               |               |               |               |              |              |              |              |

Inches (mm)

**Isys ISO 5599, Size H2 & H3 Sandwich Regulator**

**H2 Sandwich Regulator Shown**



| Series | Part number   | A              | A <sub>1</sub> | B              | B <sub>1</sub> | C             | D             | E            | J            | J <sub>1</sub> | K             |
|--------|---------------|----------------|----------------|----------------|----------------|---------------|---------------|--------------|--------------|----------------|---------------|
| H2     | <b>PS4137</b> | 14.65<br>(372) | 16.18<br>(411) | 10.56<br>(268) | 9.84<br>(250)  | 7.71<br>(196) | 4.20<br>(107) | 2.80<br>(71) | 2.15<br>(55) | 1.07<br>(27)   | 8.50<br>(216) |
|        | <b>PS4138</b> |                |                |                |                |               |               |              |              |                |               |
| H3     | <b>PS4237</b> | 15.67<br>(398) | 17.15<br>(436) | 11.53<br>(293) | 10.67<br>(271) | 8.37<br>(213) | 4.20<br>(107) | 2.93<br>(75) | 2.50<br>(64) | 1.25<br>(32)   | 9.10<br>(231) |
|        | <b>PS4238</b> |                |                |                |                |               |               |              |              |                |               |

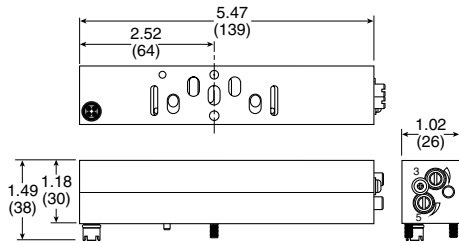
Inches (mm)

- Valvair II Series
- DX ISOMAX Series
- Fieldbus
- Isys ISO Series
- Isys Micro Series
- Modulflex Series
- D** Subbase & Manifold Valve Products

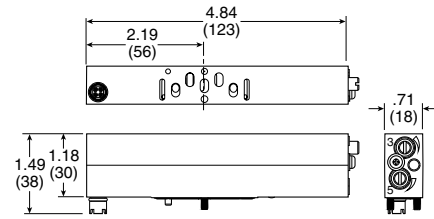


**Isys ISO 15407, Size 26mm (HB) & 18mm (HA), Flow Control**

**HA Flow Control**

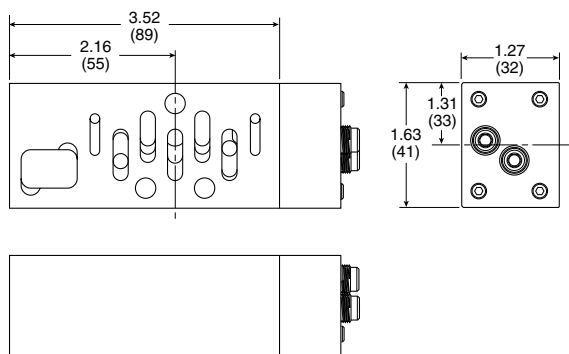


**HB Flow Control**

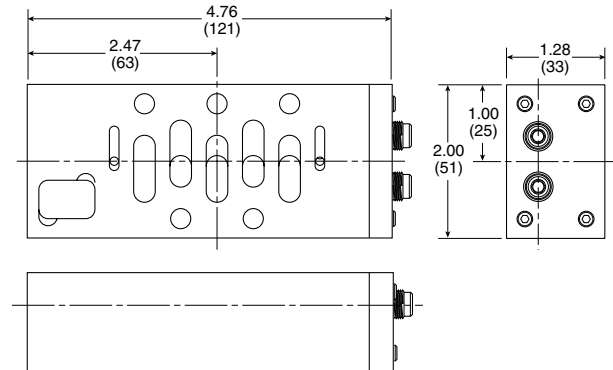


**Isys ISO 5599, Size H1, H2 & H3, Flow Control**

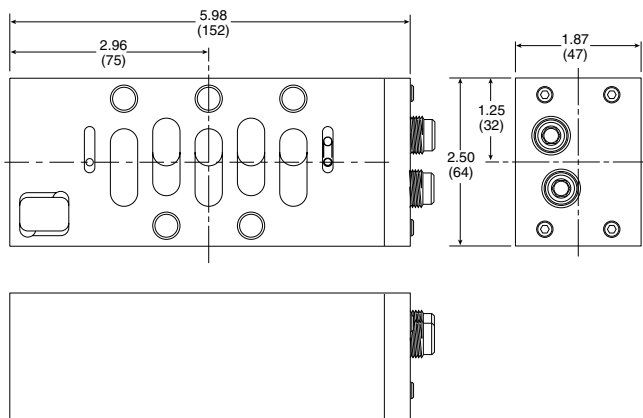
**H1 Flow Control**



**H2 Flow Control**



**H3 Flow Control**



Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

Isys Micro Series

Moduflex Series

**D**

Subbase & Manifold Valve Products

**Fieldbus Offering**

| Valve series | Moduflex | Isysnet | Turck |
|--------------|----------|---------|-------|
| Moduflex     | X        |         |       |
| Isys Micro   | X        | X       | X     |
| Isys ISO     | X        | X       | X     |

| Protocol    | Moduflex | Isysnet | Turck |
|-------------|----------|---------|-------|
| DeviceNet   | X        | X       | X     |
| Ethernet/IP |          | X       | X     |
| Profibus-DP | X        | X       | X     |
| Profinet    |          |         | X     |
| Modbus/TCP  |          |         | X     |
| AS-i        | X        |         |       |
| CANopen     | X        |         | X     |
| Interbus-S  | X        |         |       |
| ControlNet  |          | X       |       |

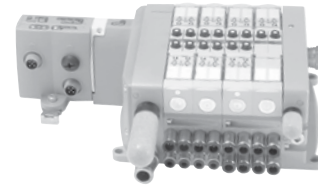
| Options                            | Moduflex | Isysnet | Turck |
|------------------------------------|----------|---------|-------|
| Digital inputs / outputs*          |          | X       | X     |
| Analog inputs / outputs            |          | X       | X     |
| 16 Solenoid control*               | X        |         | X     |
| 32 Solenoid control                |          | X       | X     |
| Short circuit protection on inputs |          |         | X     |
| Current sensing outputs            |          |         | X     |
| Bus expansion                      |          | X       |       |
| DeviceNet subnet                   |          |         | X     |
| Programmable comm modules          |          |         | X     |
| Power over DeviceNet / CANopen     |          |         | X     |
| Preferred connectivity             |          | X       |       |
| CANopen expansion                  |          |         | X     |

\* Moduflex AS-i modules are available with 6 or 8 inputs and 6 or 8 solenoid outputs

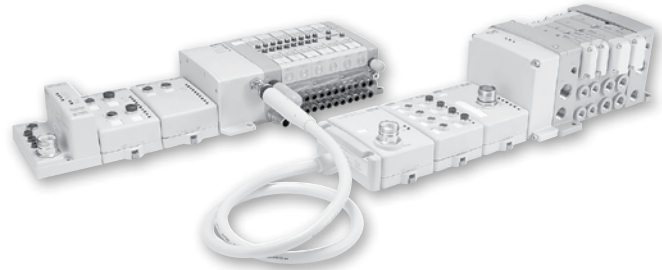
|                                 | Turck fieldbus  | Isysnet  | Moduflex                                       |
|---------------------------------|---|--|--|
| <b>Solenoid control</b>         | Up to 32 solenoids on main valve manifold.<br>Devicenet Subnet<br>Allows an additional 32 solenoids per node<br>63 nodes maximum.<br>CANopen expansion<br>Allows an additional 64 solenoids per expansion<br>5 expansions maximum.  | Up to 32 solenoids on main valve manifold<br>Isys Micro Bus Expansion<br>Allows an additional 32 solenoids per expansion<br>3 expansions maximum<br>1 meter fixed cable length per expansion | Up to 16 solenoids on main valve manifold      |
| <b>I/O capabilities</b>         | 256 maximum inputs and outputs directly connected to communication module.<br>Devicenet Subnet<br>Allows an additional 256 I/O per node<br>63 nodes maximum<br>Third party DeviceNet modules can be used<br>CANopen expansion<br>Allows an additional 64 I/O per expansion<br>5 expansions maximum<br>Third party CANopen modules can be used | Maximum of 256 inputs and 256 outputs directly connected to the communication module, including Isys Micro Bus Expansion.  | 8 Inputs available on AS-i communication only. |
| <b>Short circuit protection</b> | SXG and diagnostic electronic modules have each point isolated. All other electronic modules are isolated from the backplane.   | Devices must be fused between input / output and electronic module.  |  |

Most popular. For technical information see CD

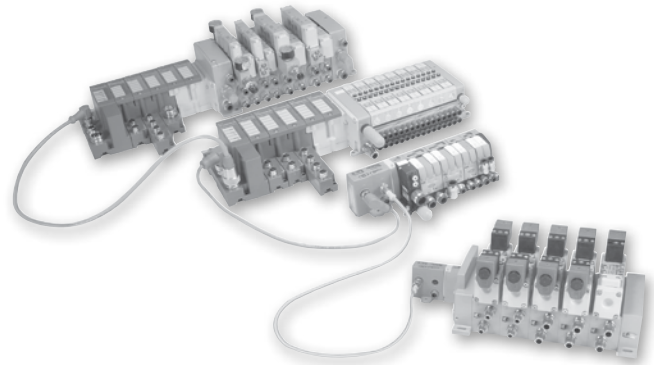
**The Moduflex Fieldbus System**



**The Isysnet Fieldbus System**



**The Turck Fieldbus System**



Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

Isys Micro Series

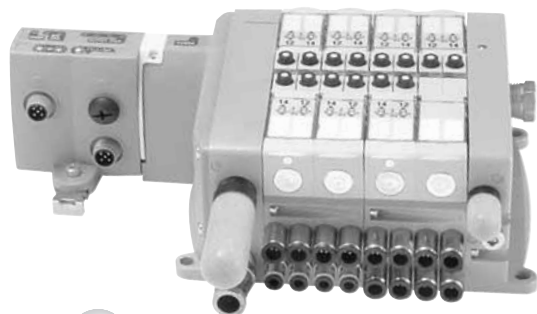
Moduflex Series

**D**

Subbase & Manifold Valve Products

**The Moduflex Fieldbus System**

Moduflex communication modules directly attach to the end plate. It offers a compact and low cost fieldbus solution.



**CANopen**

**INTERBUS-S**



P2M2HBVA10808A



P2M2HBVA10808B

**Standard AS-i Protocol (up to 31 nodes)**  
**Communication module for 8 solenoids max.**  
**(2 nodes per module, 4 inputs, 4 solenoids per node)**

| Input / Output capability                                      | Weight (oz) | Part number           |
|--|-------------|-----------------------|
| 0 inputs and 8 solenoid outputs                                | 5.29        | <b>P2M2HBVA10800</b>  |
| 8 (PNP) inputs on eight (M8) connectors and 8 solenoid outputs | 7.05        | <b>P2M2HBVA10808A</b> |
| 8 (PNP) inputs on four (M12) connectors and 8 solenoid outputs | 7.05        | <b>P2M2HBVA10808B</b> |

**Moduflex Features**

- Small, compact product design
- Broad protocol offering, including DeviceNet, Profibus, AS-i, CANopen, and Interbus
- Channel-level diagnostics (LED and Electronic)
- Inputs available with AS-i modules
- Horizontal and vertical mounting without derating
- 5g vibration
- Quick-disconnects for I/O and network connectivity
- Built-in panel grounding
- CE certification

| Protocol    | Part number          |
|-------------|----------------------|
| Profibus DP | <b>P2M2HBVP21600</b> |
| DeviceNet   | <b>P2M2HBVD21600</b> |
| CANopen     | <b>P2M2HBVC21600</b> |
| InterBus-S  | <b>P2M2HBVS11600</b> |

**Fieldbus Accessories**

|                           | Protocol                                       | Connector type          | Part number                         |
|---------------------------|--|-------------------------|-------------------------------------|
| Power supply              | Profibus DP / InterBus-S / DeviceNet / CANopen | M12 type A female       | <b>P8CS1205AA</b>                   |
| Line termination resistor | Profibus DP / DeviceNet / CANopen              | M12 type B / M12 type A | <b>P8BPA00MB</b> / <b>P8BPA00MA</b> |

**AS-i Version 2.1 Protocol (up to 62 nodes)**  
**Communication module for 6 solenoids max.**  
**(2 nodes per module, 4 inputs, 3 solenoids per node)**

| Input / Output capability                                      | Weight (oz) | Part number           |
|--|-------------|-----------------------|
| 0 inputs and 6 solenoid outputs                                | 5.29        | <b>P2M2HBVA20600</b>  |
| 8 (PNP) inputs on eight (M8) connectors and 6 solenoid outputs | 7.05        | <b>P2M2HBVA20608A</b> |
| 8 (PNP) inputs on four (M12) connectors and 6 solenoid outputs | 7.05        | <b>P2M2HBVA20608B</b> |

Valvir II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

Isys Micro Series

Moduflex Series

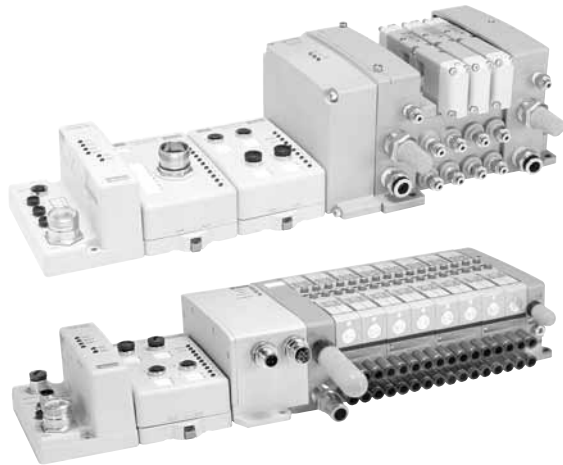
**D**

Subbase & Manifold Valve Products

**The Isysnet System**

**Isysnet has four major components:**

- Valve driver module provide control for 32 solenoids on a manifold, with bus extension providing connectivity to 3 more manifolds
- I/O modules provide the field interface, system-interface circuitry, and bases for mounting
- Communication modules provide the network-interface circuitry
- Power distribution module provide 5 additional power inputs to the Isysnet system



**Isysnet Features**

- Highly modular design (4pt – 16pt modularity)
- Broad application coverage
- Channel-level diagnostics (LED)
- Channel-level alarm and annunciation (electronic)
- Channel-level open-wire detection with electronic feedback
- Parameter-level explicit messaging
- Horizontal and vertical mounting without derating
- 5g vibration
- Electronic and mechanical keying
- Robust backplane design
- Quick-disconnects for I/O and network connectivity
- Built-in panel grounding
- Color-coded module labels
- UL, C-UL, and CE certifications (as marked)
- Highly reliable structural integrity
- Optical isolation between field and system circuits

Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

Isys Micro Series

Modulflex Series

**D**

Subbase & Manifold Valve Products

**Communications Module**



| Protocol      | Part number                                      |
|---------------|--|
| DeviceNet™    | <b>PSSCDM18PA (7/8" Mini) or PSSCDM12A (M12)</b> |
| ControlNet™   | <b>PSSCCNA</b>                                   |
| EtherNet I/P™ | <b>PSSCENA</b>                                   |
| Profibus-DP®  | <b>PSSCPBA</b>                                   |

**PSSCENA**

All Modules IP67 Certified  
 EDS and GSD files located at [www.parker.com/pneu/Isysnet](http://www.parker.com/pneu/Isysnet)

**Digital Inputs**






**PSSN16M12A**



**PSSN8M8A**


| I/O modules  | Voltage       | Part number       |
|--|---------------|-------------------|
| 16 digital inputs M12, 5-pin used with PNP sourcing input device | 10 to 28.8VDC | <b>PSSN16M12A</b> |
| 8 digital inputs M12, 5-pin used with PNP sourcing input device  | 10 to 28.8VDC | <b>PSSN8M12A</b>  |
| 8 digital inputs M12, 5-pin used with NPN sinking input device   | 10 to 28.8VDC | <b>PSSP8M12A</b>  |
| 8 digital inputs M8, 3-pin used with PNP sourcing input device   | 10 to 28.8VDC | <b>PSSN8M8A</b>   |
| 8 digital inputs M8, 3-pin used with NPN sinking input device    | 10 to 28.8VDC | <b>PSSP8M8A</b>   |
| 8 digital inputs M23, 12-pin used with NPN sinking input device  | 10 to 28.8VDC | <b>PSSP8M23A</b>  |
| 8 digital inputs M23, 12-pin used with PNP sourcing input device | 10 to 28.8VDC | <b>PSSN8M23A</b>  |

### Digital Outputs

|  | I/O modules   | Voltage       | Part number       |
|--|---|---------------|-------------------|
| <br><b>PSST16D25A</b> | 16 digital outputs M23, 19-pin used with PNP sourcing outputs                       | 10 to 28.8VDC | <b>PSST16M23A</b> |
|  | 16 digital outputs D-sub, 25-pin used with PNP sourcing outputs                     | 10 to 28.8VDC | <b>PSST16D25A</b> |
|  | 16 digital outputs M12, 5-pin used with PNP sourcing outputs                        | 10 to 28.8VDC | <b>PSST16M12A</b> |
| <br><b>PSST16M12A</b> | 8 digital outputs M12, 5-pin used with PNP sourcing outputs                         | 10 to 28.8VDC | <b>PSST8M12A</b>  |
|  | 8 digital outputs M8, 3-pin used with PNP sourcing outputs                          | 10 to 28.8VDC | <b>PSST8M8A</b>   |
| <br><b>PSST8M12A</b>  | 4 digital output, high watt relay M12, 5-pin used with PNP sourcing outputs (2 Amp) | 24VDC         | <b>PSSTR4M12A</b> |
|  | 8 digital outputs M23, 12-pin used with PNP sourcing outputs                        | 10 to 28.8VDC | <b>PSST8M23A</b>  |


All modules IP67 certified  
 See [www.parker.com/pneu/Isysnet](http://www.parker.com/pneu/Isysnet)

### Analog Inputs

|  | I/O modules                        | Voltage                    | Part number       |
|--|------------------------------------|----------------------------|-------------------|
| <br><b>PSSNACM12A</b> | 2 Analog inputs voltage M12, 5-pin | -10 to 10VDC or 0 to 10VDC | <b>PSSNAVM12A</b> |
|  | 2 Analog inputs current M12, 5-pin | 4 to 20mA or 0 to 20mA     | <b>PSSNACM12A</b> |


All modules IP67 certified  
 See [www.parker.com/pneu/Isysnet](http://www.parker.com/pneu/Isysnet)

### Analog Outputs

|  | I/O modules                         | Voltage                | Part number       |
|--|-------------------------------------|------------------------|-------------------|
| <br><b>PSSTACM12A</b> | 2 Analog outputs voltage M12, 5-pin | 0 to 10V ± 10V         | <b>PSSTAVM12A</b> |
|  | 2 Analog outputs current M12, 5-pin | 4 to 20mA or 0 to 20mA | <b>PSSTACM12A</b> |


All modules IP67 certified  
 See [www.parker.com/pneu/Isysnet](http://www.parker.com/pneu/Isysnet)

### Terminating Base Module

|   | Base module                            | Part number    |
|---|--|----------------|
|  | Termination base for stand alone units | <b>PSSTERM</b> |

Used as the last terminating module for a stand alone isysnet assembly.

### Power Extender Module

|   | Extender module          | Part number     |
|---|--------------------------|-----------------|
|  | 24VDC field power module | <b>PSSSE24A</b> |

A Power Extender Module must be used on every 14th Module in an Isysnet assembly. See [www.parker.com/pneu/Isysnet](http://www.parker.com/pneu/Isysnet)

Valvair II Series

DX ISOMAX Series

Fieldbus


Isys ISO Series

Isys Micro Series

Modulflex Series

**D**  
 Subbase & Manifold Valve Products


**Bus Extender Cable**

|   | Description    | Voltage | Part number    |
|---|----------------|---------|----------------|
|  | 1 Meter Cable* | 24VDC   | <b>PSSEXT1</b> |
|   | 3 Meter Cable* | 24VDC   | <b>PSSEXT3</b> |

\* Requires a PSSSE24 Power Extender Module  
 IP67 certified  
 See [www.parker.com/pneu/Isysnet](http://www.parker.com/pneu/Isysnet)

Valvair II Series

**Isys Micro Bus Extender Cable**

|   | Description    | Voltage | Part number     |
|---|----------------|---------|-----------------|
|  | 1 Meter Cable* | 24VDC   | <b>PSSVEXT1</b> |

\* IP67 certified.

DX ISOMAX Series

Fieldbus

**Example**

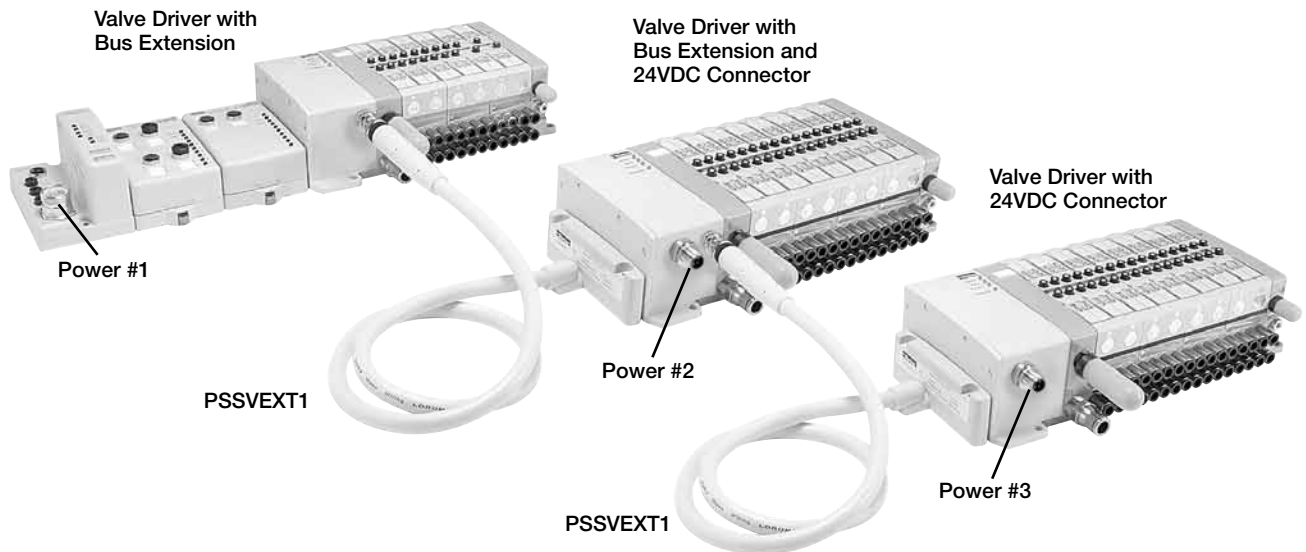
Isys Micro with Bus Extension on Valve Driver Module – No additional I/O at the Extension

- Add up to three additional valve manifolds without adding another communication module.
- No PSSSE24A is needed on the Extension when the Valve Driver Module with 24VDC Connector is used.
- Commonly used when many valves are required.
- Bus expansion only available with Isys Micro valves.

Isys ISO Series

Isys Micro Series

Modulflex Series



**D**

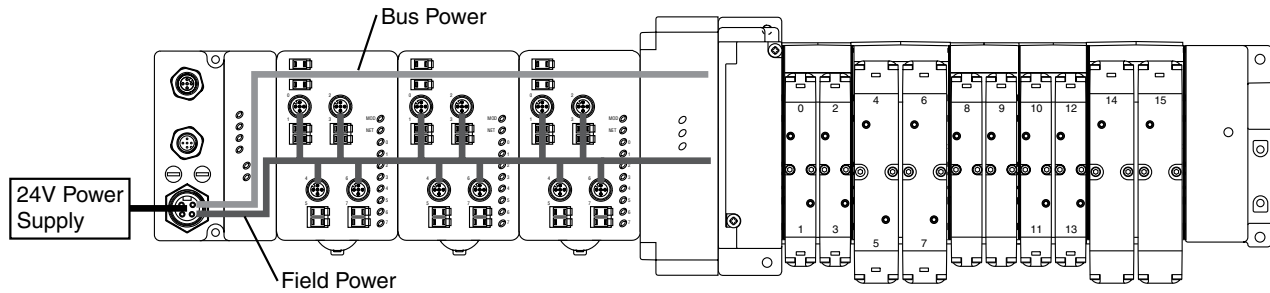
Subbase & Manifold Valve Products



**Power Distribution Options for Isys ISO**

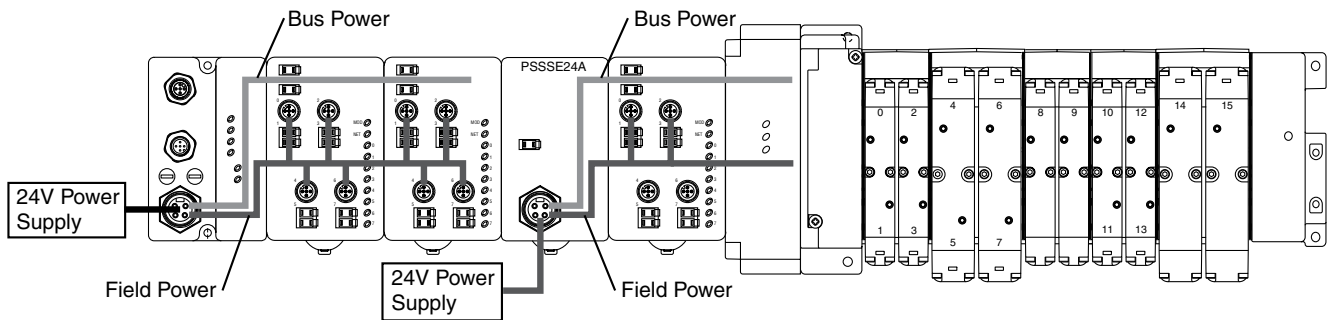
**Isysnet Communication and I/O Modules**

An auxiliary 24VDC power supply from the communication module provides power to the backplane bus power and I/O module field power. You can connect up to 13 I/O modules with a maximum of 10 A field power, using the auxiliary power.



**Isysnet System with 24VDC Expansion Power Unit (PSSSE24A)**

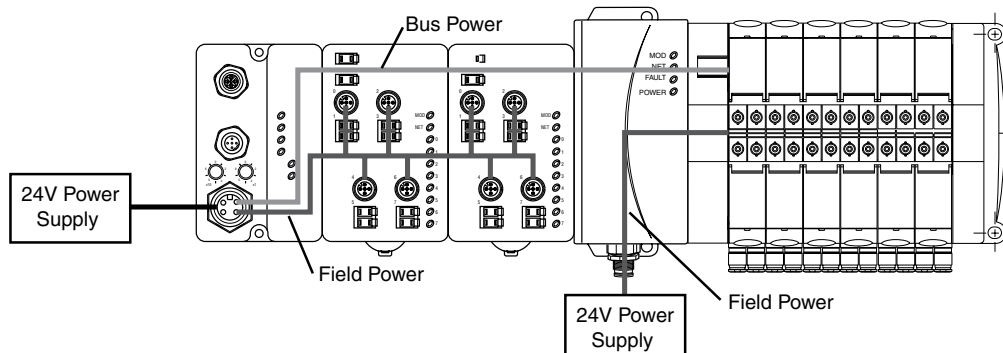
The auxiliary power from the communication module supports up to 13 I/O modules with a maximum of 10 A field power. The 24VDC Power Extender Module (PSSSE24A) extends the backplane bus power and I/O Module field power to support up to 13 more I/O modules. Connect additional Power Extender Modules to expand the I/O assembly up to the maximum of 63 I/O modules. This secondary 24VDC connector on the PSSSE24A can be wired into an Emergency Stop circuit.



**Additional Power Distribution Options for Isys Micro**

**Isysnet Communication Module and Valve Driver Module with 24VDC Connector**

The 24VDC power supply from the Communication Adaptor provides power to the backplane bus power and I/O module field power for up to 13 modules and an adapter with a maximum of 10 A Field Power. In this configuration, backplane bus power and I/O module field power are supplied to the input and output modules. The communication module only supplies backplane bus power to the Valve Driver Module, as the Isys Micro with 24VDC Connector separates the field power from the rest of the network. This secondary 24VDC Connector on the Valve Driver Module supplies Field Power to the valves, and can be wired into an Emergency Stop Circuit.



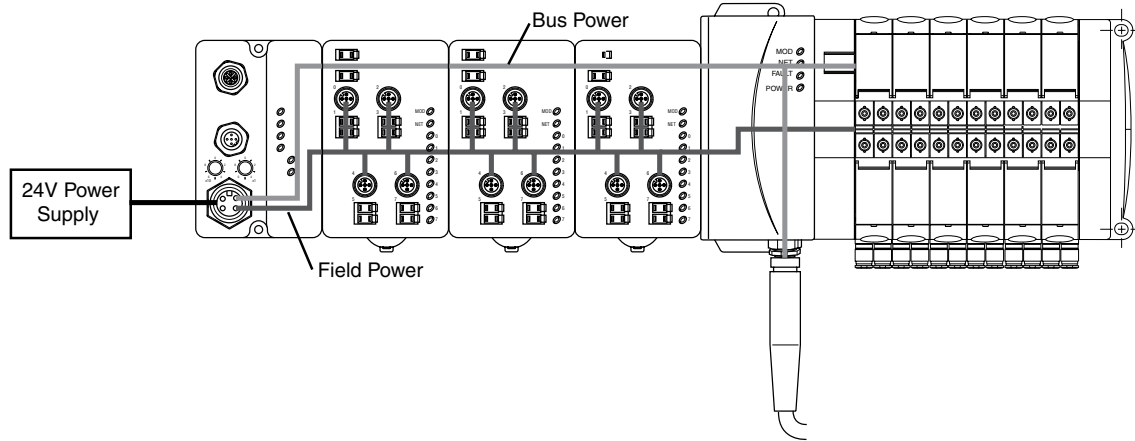
|                                   |
|-----------------------------------|
| Valvoir II Series                 |
| DX ISOMAX Series                  |
| Fieldbus                          |
| Isys ISO Series                   |
| Isys Micro Series                 |
| Modulflex Series                  |
| <b>D</b>                          |
| Subbase & Manifold Valve Products |



**Power Distribution Options for Isys Micro (Continued)**

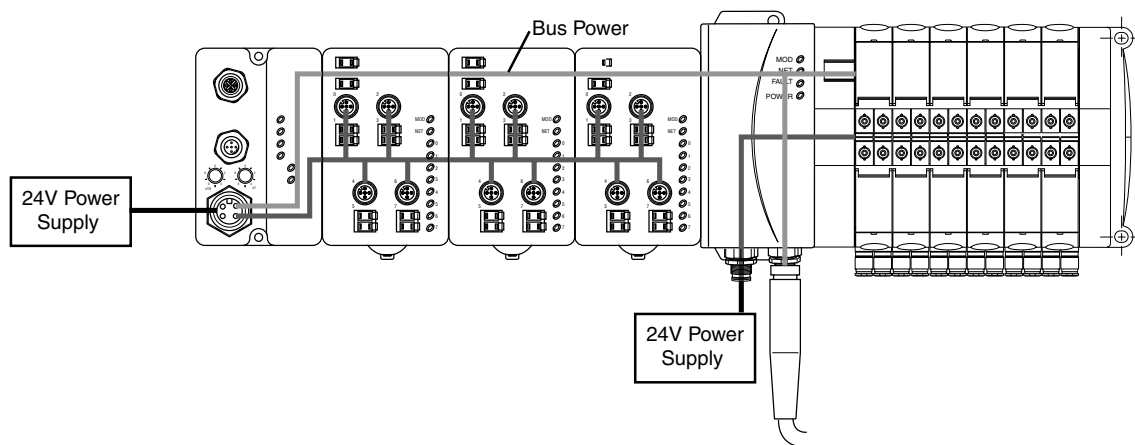
**Isysnet Communication Module with Bus Extension Connector and I/O Modules**

The 24VDC power supply from the communication module provides power to the backplane bus power and I/O module field power. You can connect up to 13 modules and an adapter with a maximum of 10 A field power, using this power source. The Isys Micro with Bus Extension Connector carries backplane bus power and communication down to another Isysnet Assembly through the PSSVEXT1 cable. If additional Isysnet Input and Output Modules or Isys ISO valve manifold is used on this extension, a PSSSE24A Power Extender Module is required to provide Field Power. If the extension is attached directly to an Isys Micro Manifold, Field Power can be supplied directly by using the 24VDC Connector option.



**Isysnet Communication Module with 24VDC and Bus Extension Connectors and I/O Modules**

The 24VDC power supply from the communication module provides power to the backplane bus power and I/O module field power. In this configuration, bus power and field power are supplied to the input and output modules. The communication module only supplies bus power to the Valve Driver Module, as the 24VDC Connector separates the Field Power from the rest of the network. This secondary 24VDC connector on the Valve Driver Module supplies field power to the valves, and can be wired into an Emergency Stop Circuit. The Bus Extension Connector carries bus power and communication down to another Isysnet Assembly through the PSSVEXT1 cable. If additional Isysnet input and output modules or Isys ISO valve manifold is used on this extension, a PSSSE24A Power Extender Module is required to provide field power. If the extension is attached directly to an Isys Micro Manifold with 24VDC Connector, field power can be supplied directly by using the 24VDC Connector option.

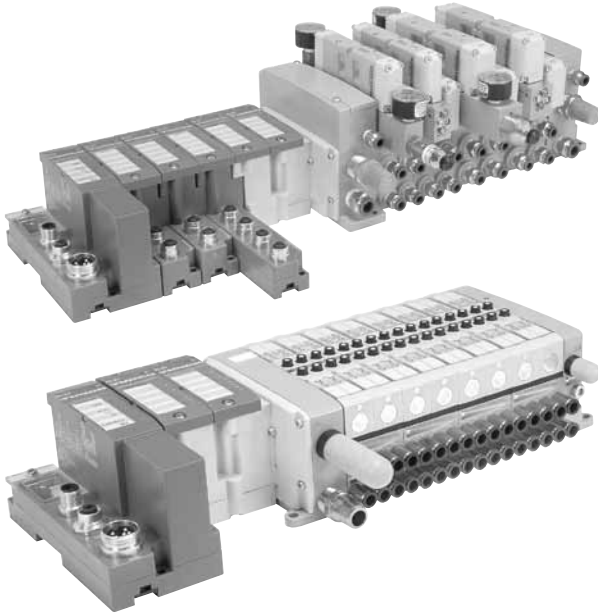


|                                   |
|-----------------------------------|
| Valvair II Series                 |
| DX ISOMAX Series                  |
| Fieldbus                          |
| Isys ISO Series                   |
| Isys Micro Series                 |
| Modulflex Series                  |
| <b>D</b>                          |
| Subbase & Manifold Valve Products |

### The Turck Fieldbus System

Isysnet has four major components:

- **Valve driver module** provide control for either 16 or 32 solenoids on a manifold
- **I/O modules** provide the field interface and system-interface circuitry
- **Communication modules** provide the network-interface circuitry
- **Power distribution module** provide 5 additional power inputs to the Turck system



### Turck Features

- Highly modular design (4pt – 16pt modularity)
- Broad application coverage
- Channel-level diagnostics (LED and electronic)
- Channel-level alarm and annunciation (electronic)
- Channel-level open-wire detection with electronic feedback
- Channel-level short-circuit detection with electronic feedback
- Horizontal and vertical mounting without derating
- 5g vibration
- Electronic and mechanical keying
- Robust backplane design
- Quick-disconnects for I/O and network connectivity
- Built-in panel grounding
- Color-coded module labels
- UL, C-UL, and CE certifications (as marked)
- Highly reliable structural integrity
- Optical isolation between field and system circuits

### Communication Modules

|  |                         |
|--|-------------------------|
| CANopen  | <b>BL67-GW-CO</b>       |
| CANopen with power over network  | <b>BL67-GW-CO-T</b>     |
| DeviceNet with power over network  | <b>BL67-GW-DN</b>       |
| Profibus DP  | <b>BL67-GW-DPV1</b>     |
| Multiprotocol communication module (Ethernet / IP, Profinet, Modbus / TCP) | <b>BL67-GW-EN</b>       |
| Ethernet / IP communication module   | <b>BL67-GW-EN-IP</b>    |
| Profinet communication module  | <b>BL67-GW-EN-PN</b>    |
| Modbus / TCP communication module with DeviceNet subnet                    | <b>BL67-GW-EN-DN</b>    |
| Ethernet / IP communication module with DeviceNet subnet                   | <b>BL67-GW-EN-IP-DN</b> |

### Programmable Communication Modules

|  |                         |
|--|-------------------------|
| Profibus DP  | <b>BL67-PG-DP</b>       |
| Modbus / TCP communication module                        | <b>BL67-PG-EN</b>       |
| Ethernet / IP communication module                       | <b>BL67-PG-EN-IP</b>    |
| Modbus / TCP communication module with DeviceNet subnet  | <b>BL67-PG-EN-DN</b>    |
| Ethernet / IP communication module with DeviceNet subnet | <b>BL67-PG-EN-IP-DN</b> |

Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series


Isys Micro Series





Modulflex Series

**D**






Subbase & Manifold Valve Products

**Digital Input Modules**


| I/O modules  | Voltage     | Part number        |
|--|-------------|--------------------|
|  8 PNP input module | 7 to 30 VDC | <b>BL67-8DI-P</b>  |
| 8 PNP input module, with diagnostics   | 7 to 30 VDC | <b>BL67-8DI-PD</b> |
| 8 NPN input module   | 24 VDC      | <b>BL67-8DI-N</b>  |





| Base module   | Part number          |
|---|----------------------|
|  8 x M8, 3 pole, female          | <b>BL67-B-8M8</b>    |
|  4 x M12, 5 pole, female, A-code | <b>BL67-B-4M12</b>   |
|  4 x M12, 5 pole, female, A-code | <b>BL67-B-4M12-P</b> |
|  1 x M23, 12 pole, female        | <b>BL67-B-1M23</b>   |

| I/O modules                          | Voltage     | Part number        |
|--------------------------------------|-------------|--------------------|
| 4 PNP input module                   | 7 to 30 VDC | <b>BL67-4DI-P</b>  |
| 4 PNP input module, with diagnostics | 7 to 30 VDC | <b>BL67-4DI-PD</b> |
| 4 NPN input module                   | 24 VDC      | <b>BL67-4DI-N</b>  |






| Base module   | Part number          |
|---|----------------------|
|  4 x M8, 3 pole, female          | <b>BL67-B-4M8</b>    |
|  2 x M12, 5 pole, female, A-code | <b>BL67-B-2M12</b>   |
|  2 x M12, 5 pole, female, A-code | <b>BL67-B-2M12-P</b> |
|  4 x M12, 5 pole, female, A-code | <b>BL67-B-4M12</b>   |
|  1 x M23, 12 pole, female        | <b>BL67-B-1M23</b>   |

**Digital Output Modules**

| I/O modules   | Output current       | Part number            |
|---|----------------------|------------------------|
|  8 PNP output module | 0.5 amps per channel | <b>BL67-8DO-0.5A-P</b> |
| 8 NPN output module   | 0.5 amps per channel | <b>BL67-8DO-0.5A-N</b> |

| Base module   | Part number          |
|---|----------------------|
|  8 x M8, 3 pole, female          | <b>BL67-B-8M8</b>    |
|  4 x M12, 5 pole, female, A-code | <b>BL67-B-4M12</b>   |
|  4 x M12, 5 pole, female, A-code | <b>BL67-B-4M12-P</b> |
|  1 x M23, 12 pole, female        | <b>BL67-B-1M23</b>   |

| I/O modules         | Output Current       | Part number            |
|---------------------|----------------------|------------------------|
| 4 PNP output module | 0.5 amps per channel | <b>BL67-4DO-0.5A-P</b> |
| 4 PNP output module | 2 amps per channel   | <b>BL67-4DO-2A-P</b>   |
| 4 PNP output module | 4 amps per channel   | <b>BL67-4DO-4A-P</b>   |
| 4 NPN output module | 2 amps per channel   | <b>BL67-4DO-2A-N</b>   |

| Base module   | Part number          |
|---|----------------------|
|  4 x M8, 3 pole, female          | <b>BL67-B-4M8</b>    |
|  2 x M12, 5 pole, female, A-code | <b>BL67-B-2M12</b>   |
|  2 x M12, 5 pole, female, A-code | <b>BL67-B-2M12-P</b> |
|  4 x M12, 5 pole, female, A-code | <b>BL67-B-4M12</b>   |
|  1 x M23, 12 pole, female        | <b>BL67-B-1M23</b>   |

Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

Isys Micro Series


Modulflex Series

**D**

Subbase & Manifold Valve Products


### Digital Output Modules

| I/O modules          | Output current        | Part number             |
|----------------------|-----------------------|-------------------------|
| 16 PNP output module | 0.14 amps per channel | <b>BL67-16DO-0.1A-P</b> |

| Base module  | Part number           |
|--|-----------------------|
|  1 x M23, 19 pole, female | <b>BL67-B-1M23-19</b> |


### Relay Output Modules

| I/O modules            | Output current        | Part number          |
|------------------------|-----------------------|----------------------|
| 8 normally open relays | 0.14 amps per channel | <b>BL67-8DO-R-NO</b> |


| Base module   | Part number          |
|---|----------------------|
|  4 x M12, 5 pole, female, A-code | <b>BL67-B-4M12-P</b> |

### Analog Input Modules

| I/O modules   | Input type   | Part number         |
|---|--|---------------------|
| 4 configurable current or voltage analog input module | 4 to 20 mA or 0 to 20 mA<br>-10 to +10 VDC or 0 to +10 VDC | <b>BL67-4AI-V/I</b> |




| Base module   | Part number        |
|---|--------------------|
|  4 x M12, 5 pole, female, A-code | <b>BL67-B-4M12</b> |

| I/O modules                       | Input type                                 | Part number        |
|-----------------------------------|--|--------------------|
| 2 Current analog input module     | 4 to 20 mA or 0 to 20 mA                   | <b>BL67-2AI-I</b>  |
| 2 Voltage analog input module     | -10 to +10 VDC or 0 to +10 VDC             | <b>BL67-2AI-V</b>  |
| 2 Temperature analog input module | PT100, PT200, PT500, PT1000, Ni100, Ni1000 | <b>BL67-2AI-PT</b> |
| 2 Temperature analog input module | Type B, E, J, K, N, R, S, T                | <b>BL67-2AI-TC</b> |

| Base module   | Part number        |
|---|--------------------|
|  2 x M12, 5 pole, female, A-code | <b>BL67-B-2M12</b> |


### Combination Input / Output Modules

| I/O modules   | Input voltage & output current | Part number           |
|---|--------------------------------|-----------------------|
| 4 PNP output 4 PNP input module, with diagnostics           | 7 to 30 VDC<br>0.5 Amps        | <b>BL67-4DI4DO-PD</b> |
| 8 PNP configurable input or output module, with diagnostics | 7 to 30 VDC<br>0.5 Amps        | <b>BL67-8XSG-PD</b>   |


| Base module   | Part number         |
|---|---------------------|
|  8 x M8, 3 pole, female          | <b>BL67-B-8M8</b>   |
|  4 x M12, 5 pole, female, A-code | <b>BL67-B-4M12</b>  |
|  4 x M12, 5 pole, female, A-code | <b>BL67-B-4M12P</b> |

### Analog Output Modules

| I/O modules                    | Input type                     | Part number       |
|--------------------------------|--------------------------------|-------------------|
| 4 Voltage analog output module | -10 to +10 VDC or 0 to +10 VDC | <b>BL67-4AO-V</b> |

| Base module   | Part number        |
|---|--------------------|
|  4 x M12, 5 pole, female, A-code | <b>BL67-B-4M12</b> |

| I/O modules                    | Input type                     | Part number       |
|--------------------------------|--------------------------------|-------------------|
| 2 Current analog output module | 4 to 20 mA or 0 to 20 mA       | <b>BL67-2AO-I</b> |
| 2 Voltage analog output module | -10 to +10 VDC or 0 to +10 VDC | <b>BL67-2AO-V</b> |

| Base module   | Part number        |
|---|--------------------|
|  2 x M12, 5 pole, female, A-code | <b>BL67-B-2M12</b> |

Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

Isys Micro Series

Modulflex Series

**D**

Subbase & Manifold Valve Products

**Combination Analog Input / Output Modules**

| I/O modules   | Output current   | Part number            |
|---|--|------------------------|
| 4 configurable input and 4 configurable output current or voltage analog module | 4 to 20 mA or 0 to 20 mA<br>-10 to +10 VDC or 0 to +10 VDC | <b>BL67-4AI4AO-V/I</b> |

| I/O modules  | Output current   | Part number            |
|--|--|------------------------|
| 2 onfigurable input and 2 configurable output current or voltage analog module | 4 to 20 mA or 0 to 20 mA<br>-10 to +10 VDC or 0 to +10 VDC | <b>BL67-2AI2AO-V/I</b> |

Valvair II Series

DX ISOMAX Series

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Isys ISO Series


Isys Micro Series


Modulflex Series


**D**


Subbase & Manifold Valve Products


| Base module  | Part number       |
|--|-------------------|
|  8 x M8, 3 pole, female | <b>BL67-B-8M8</b> |

| Base module  | Part number       |
|--|-------------------|
|  8 x M8, 3 pole, female | <b>BL67-B-8M8</b> |

|   |                    |
|---|--------------------|
|  4 x M12, 5 pole, female, A-code | <b>BL67-B-4M12</b> |
|---|--------------------|

|   |                      |
|---|----------------------|
|  2 x M12, 8 pole, female, A-code | <b>BL67-B-2M12-8</b> |
|---|----------------------|

|   |                        |
|---|------------------------|
|  2 x M12, 5 pole, female, A-code | <b>BL67-B-2M12-8-P</b> |
|---|------------------------|


|   |                        |
|---|------------------------|
|  2 x M12, 5 pole, female, A-code | <b>BL67-B-2M12-8-P</b> |
|---|------------------------|


**CANopen Subnet Module**


| Extender module      | Capacity                     | Part number      |
|----------------------|------------------------------|------------------|
| 1 CANopen connection | 64 bits of inputs or outputs | <b>BL67-1CVI</b> |


**Serial Interface Module**

| Extender module                 | Capacity          | Part number            |
|---------------------------------|-------------------|------------------------|
| 1 RS232 serial interface        | 300 to 115200 bps | <b>BL67-1RS232</b>     |
| 1 RS485 or 422 serial interface | 300 to 115200 bps | <b>BL67-1RS485/422</b> |

| Base module   | Part number        |
|---|--------------------|
|  1 x M12, 5 pole, female, A-code | <b>BL67-B-1M12</b> |

| Base module   | Part number        |
|---|--------------------|
|  1 x M12, 5 pole, female, A-code | <b>BL67-B-1M12</b> |

|   |                      |
|---|----------------------|
|  1 x M12, 8 pole, female, A-code | <b>BL67-B-1M12-8</b> |
|---|----------------------|


|  |                    |
|--|--------------------|
|  1 x M23, 12 pole, female | <b>BL67-B-1M23</b> |
|--|--------------------|


**Power Extender Module**


| Extender module           | Current capacity | Part number          |
|---------------------------|------------------|----------------------|
| 24 VDC field power module | 10 amps input    | <b>BL67-PF-24VDC</b> |


**SSI and Counting Modules**


| Extender module        | Capacity             | Part number          |
|------------------------|----------------------|----------------------|
| 1 SSI sensor interface | 65 kbps up to 1 Mbps | <b>BL67-1SSI</b>     |
| 1 counter interface    | Up to 250 kHz        | <b>BL67-1CNT/ENC</b> |

| Base module   | Part number        |
|---|--------------------|
|  5 Pole mini connector to supply bus power and field power | <b>BL67-B-1RSM</b> |

| Base module   | Part number          |
|---|----------------------|
|  1 x M12, 8 pole, female, A-code | <b>BL67-B-1M12-8</b> |

|   |                       |
|---|-----------------------|
|  5 Pole mini connector to field power only | <b>BL67-B-1RSM-VO</b> |
|---|-----------------------|

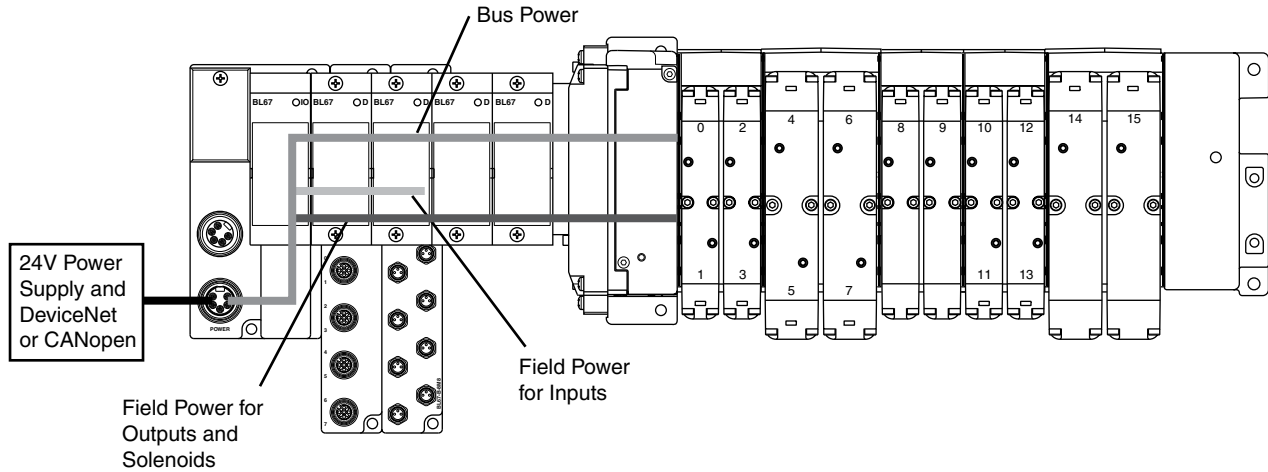
|  |                    |
|--|--------------------|
|  1 x M23, 12 pole, female | <b>BL67-B-1M23</b> |
|--|--------------------|

|   |                      |
|---|----------------------|
|  4 Pole mini connector to supply bus power and field power | <b>BL67-B-1RSM-4</b> |
|---|----------------------|

**Power Distribution Options for Turck Fieldbus**

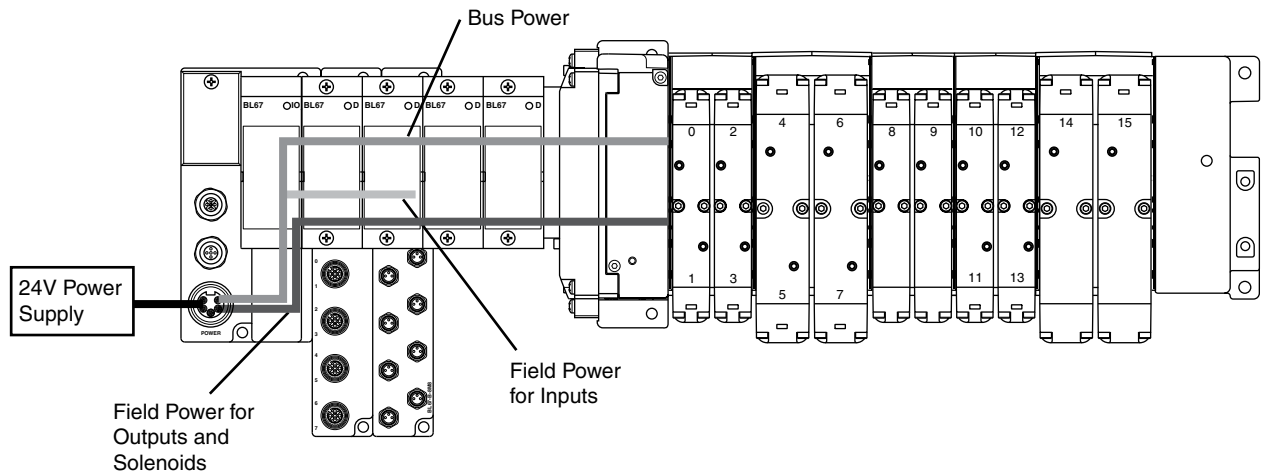
**Turck Communication and I/O Modules - DeviceNet and CANopen, Power over Network**

The 24VDC power supply pins from the DeviceNet or CANopen network connection on the communication module provides a single power circuit. This circuit provides 1.5 A bus power, 4 A field power for inputs and 8A field power for outputs.



**Turck Communication and I/O Modules - Ethernet/IP, Modbus/TCP, Profinet, Profibus, and CANopen**

An auxiliary 24VDC power supply from the communication module provides power across two separate circuits. The first circuit provides 1.5 A bus power and 4 A field power for inputs. The second circuit provides 10A field power for outputs which can be wired to an e-stop circuit to kill all outputs.

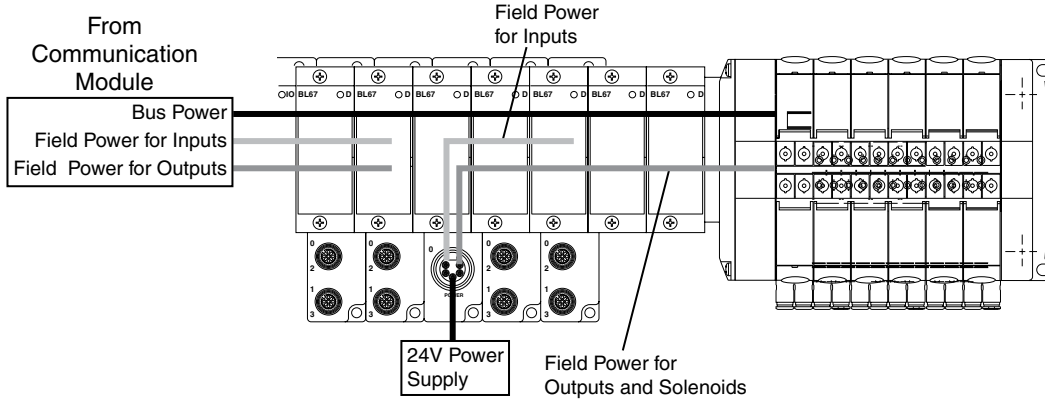


|                                   |
|-----------------------------------|
| Valvair II Series                 |
| DX ISOMAX Series                  |
| Fieldbus                          |
| Isys ISO Series                   |
| Isys Micro Series                 |
| Modulflex Series                  |
| <b>D</b>                          |
| Subbase & Manifold Valve Products |

**Power Distribution Options for Turk Fieldbus**

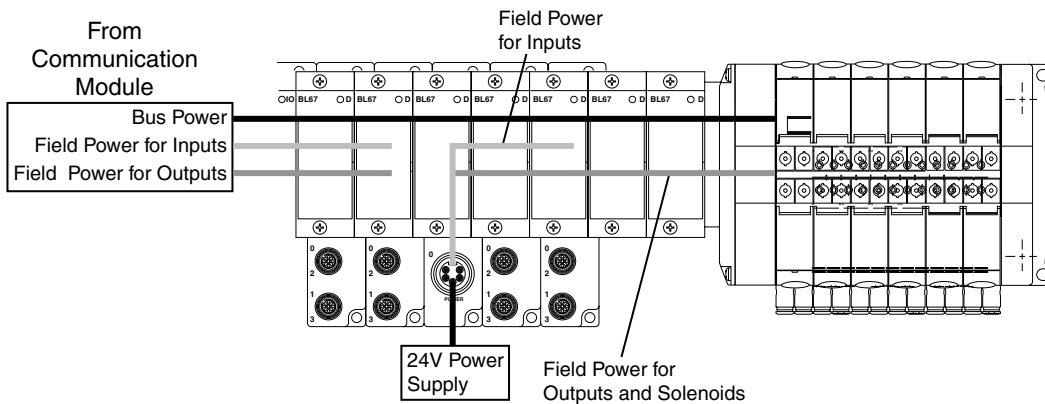
**24VDC Power Extender Module (BL67-PF-24VDC) with Base Module BL67-B-1RSM**

This configuration creates an auxiliary 24VDC power supply and provides power across two separate circuits, regardless of the communication module used. The first circuit provides 4 A field power for inputs. The second circuit provides 10A field power for outputs which can be wired to an e-stop circuit to kill all outputs and solenoids to the right of the module. The 1.5 A bus power is uninterrupted, and is still supplied from the communication module.



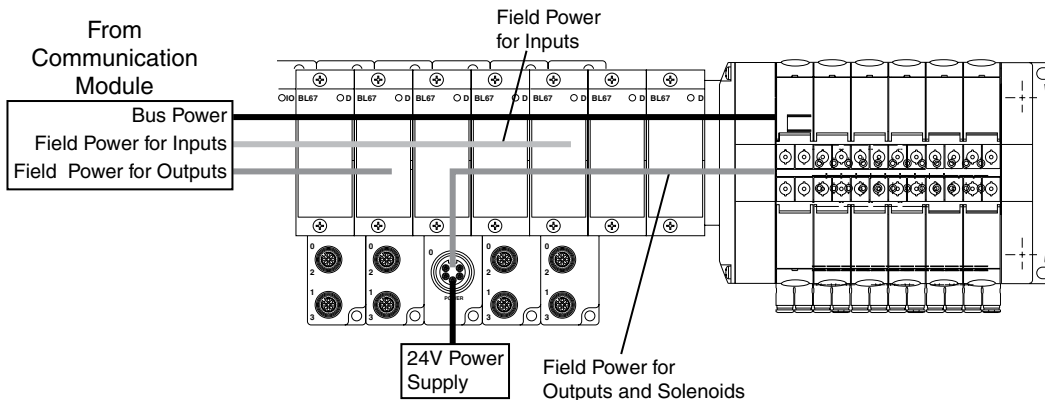
**24VDC Power Extender Module (BL67-PF-24VDC) with Base Module BL67-B-1RSM-4**

This configuration creates an auxiliary 24VDC power supply and provides power across one circuit, regardless of the communication module used. This circuit provides 4 A field power for inputs and 10A field power for outputs. The 1.5 A bus power is uninterrupted, and is still supplied from the communication module.



**24VDC Power Extender Module (BL67-PF-24VDC) with Base Module BL67-B-1RSM-VO**

This configuration creates an auxiliary 24VDC power supply and provides power across one circuit, regardless of the communication module used. This circuit provides 10A field power for outputs which can be wired to an e-stop circuit to kill all outputs and solenoids to the right of the module. The 1.5 A bus power and 4 A field power for inputs are uninterrupted, and are still supplied from the communication module.



|                                   |
|-----------------------------------|
| Valvair II Series                 |
| DX ISOMAX Series                  |
| Fieldbus                          |
| Isys ISO Series                   |
| Isys Micro Series                 |
| Modulflex Series                  |
| <b>D</b>                          |
| Subbase & Manifold Valve Products |



### 7/8" Mini Power Cables

| Description  | Part number               |
|--|---------------------------|
| 4 pin female to flying lead cable, TPE             | <b>RKM 46-xM/S1587</b>    |
| 5 pin female to flying lead cable, TPE             | <b>RKM 56-xM/S1587</b>    |
| 4 pin male to female cable, TPE                    | <b>RSM RKM 46-x/S1587</b> |
| 5 pin male to female cable, TPE                    | <b>RSM RKM 56-x/S1587</b> |
| 4 pin right angle female to flying lead cable, TPE | <b>WKM 46-xM/S1587</b>    |
| 5 pin right angle female to flying lead cable, TPE | <b>WKM 56-xM/S1587</b>    |

Where x = 2, 4, 5, 6, 8, 10 meter standard lengths

### Power Tee

| Description                    | Part number        |
|--------------------------------|--------------------|
| 4 pin Male to 2 female sockets | <b>RSM-2RKM 40</b> |
| 5 pin Male to 2 female sockets | <b>RSM-2RKM 50</b> |

### M12 A-code Cables

| Description                            | Part number                      |
|--|----------------------------------|
| 4 pin female to flying lead cable, PVC | <b>RKC 4.4T-*</b>                |
| 4 pin male to flying lead cable, PVC   | <b>RSC 4.4T-*</b>                |
| 4 pin male to female cable, PVC        | <b>RKC 4.4T-*/RSC 4.4T</b>       |
| 5 pin female to flying lead cable, TPE | <b>RKC 4.5T-*/S1587</b>          |
| 5 pin male to flying lead cable, TPE   | <b>RSC 4.5T-*/S1587</b>          |
| 5 pin male to female cable, TPE        | <b>RKC 4.5T-*/RSC 4.5T/S1587</b> |

Where \* = 1, 2, 3, 4 meter standard lengths

### M8 Cables

| Description                            | Part number                  |
|--|------------------------------|
| 3 pin female to flying lead cable, PUR | <b>PKG 3M-*/M/S90</b>        |
| 3 pin male to flying lead cable, PUR   | <b>PSG 3M-*/M/S90</b>        |
| 3 pin male to female cable, PUR        | <b>PKG 3M-*/M-PSG 3M/S90</b> |

Where \* = 1, 2, 3, 4 meter standard lengths

### M23 Cables

| Description   | Part number                      |
|---|----------------------------------|
| 12 pin double ended female thread with male pins and female socket, PUR. Pinout optimized for isysnet fieldbus. | <b>CSCM CKCM 12-11-x/S90</b>     |
| 19 pin double ended female thread with male pins and female socket, PUR. Pinout optimized for isysnet fieldbus. | <b>CSM CKM 19-19-x/S90</b>       |
| 19 pin double ended female thread with male pins and female socket, PUR. Pinout optimized for turck fieldbus.   | <b>CSWM CKWM 19-19-x/CS12852</b> |

Where x = 1, 2, 3, 4 meter standard lengths

### Profibus Cables

| Description                 | Part number             |
|-----------------------------|-------------------------|
| M12 Male to M12 Female, PUR | <b>RSSW RKSX 455-xM</b> |

Where x = 2, 4, 5, 6, 8, 10 meter standard lengths

### M12 A-code Cables

| Description                            | Part number                      |
|--|----------------------------------|
| 4 pin female to flying lead cable, PVC | <b>RKC 4.4T-*</b>                |
| 4 pin male to flying lead cable, PVC   | <b>RSC 4.4T-*</b>                |
| 4 pin male to female cable, PVC        | <b>RKC 4.4T-*/RSC 4.4T</b>       |
| 5 pin female to flying lead cable, TPE | <b>RKC 4.5T-*/S1587</b>          |
| 5 pin male to flying lead cable, TPE   | <b>RSC 4.5T-*/S1587</b>          |
| 5 pin male to female cable, TPE        | <b>RKC 4.5T-*/RSC 4.5T/S1587</b> |

Where \* = 1, 2, 3, 4 meter standard lengths

### Profibus Terminating Resistor

| Description                       | Part number      |
|-----------------------------------|------------------|
| M12 male pin terminating resistor | <b>P8BPA00MB</b> |

### Ethernet Cables

| Description                 | Part number              |
|-----------------------------|--------------------------|
| M12 female to M12 male, PUR | <b>RSSD RKSD 443-xM</b>  |
| RJ45 to M12 male, PUR       | <b>RSSD RJ45S 443-xM</b> |

Where x = 2, 5, 10, 15, 20, 30 meter standard lengths

### DeviceNet and CANopen Cables

| Description                             | Part number            |
|---|------------------------|
| 7/8" mini male to 7/8" mini female, PUR | <b>RSM RKM 5711-xM</b> |
| 7/8" mini male to M12 female, PUR       | <b>RSM RKC 5711-xM</b> |
| M12 male to M12 female, PUR             | <b>RSC RKC 5711-xM</b> |
| M12 male to 7/8" mini female, PUR       | <b>RSC RKM 5711-xM</b> |

Where x = 2, 4, 5, 6, 8, 10 meter standard lengths

### Bus Power Tee

| Description   | Part number                  |
|---------------|------------------------------|
| Bus power tee | <b>RSM RKM 57 WSM 40 PST</b> |

For systems not equipped with Power over network, combines separate network and power feeds into the communication module. Includes reverse current protection

### DeviceNet and CANopen Terminating Resistor

| Description                             | Part number       |
|---|-------------------|
| 7/8" Mini Male Pin Terminating Resistor | <b>RSM 57-TR2</b> |
| M12 Male Pin Terminating Resistor       | <b>P8BPA00MA</b>  |



Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

Isys Micro Series

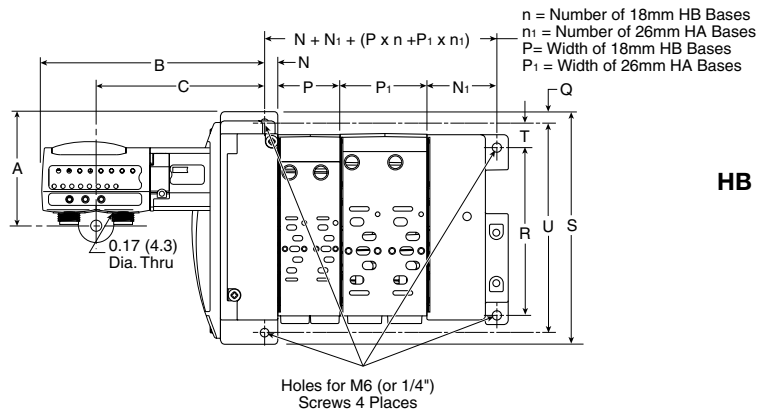
Modulflex Series

**D**

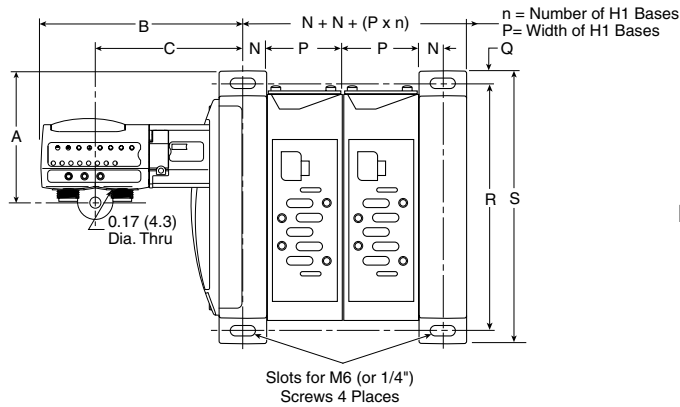
Subbase & Manifold Valve Products

**Moduflex with Isys ISO Valves**

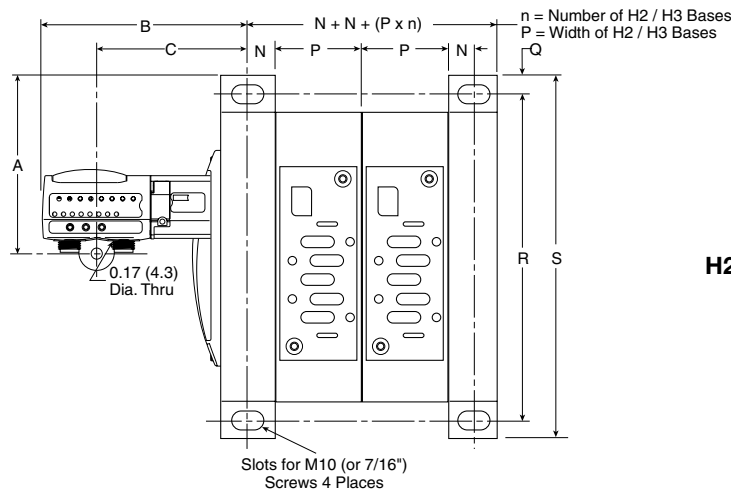
- Valvair II Series
- DX ISOMAX Series
- Fieldbus
- Isys ISO Series
- Isys Micro Series
- Moduflex Series
- D**
- Subbase & Manifold Valve Products



**HB - HA Manifold Assembly**



**H1 Manifold Assembly**



**H2 - H3 Manifold Assembly**

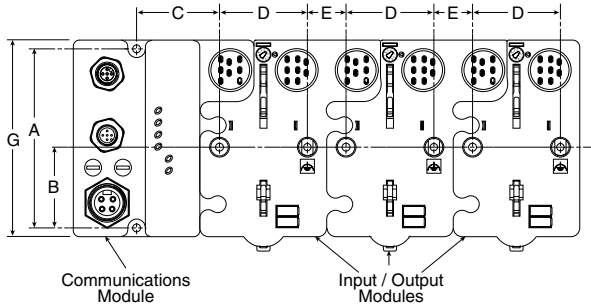
**Dimensions**

|         | A              | B               | C               | N             | N <sub>1</sub> | P              | P <sub>1</sub> | Q            | R              | S              | T           | U             |
|---------|----------------|-----------------|-----------------|---------------|----------------|----------------|----------------|--------------|----------------|----------------|-------------|---------------|
| HA / HB | 2.75<br>(69.8) | 5.61<br>(142.5) | 4.40<br>(111.8) | .33<br>(8.4)  | 1.80<br>(45.8) | 1.61<br>(40.8) | 2.24<br>(56.8) | .15<br>(4)   | 4.32<br>(110)  | 5.98<br>(152)  | .63<br>(16) | 5.39<br>(137) |
| H1      | 3.23<br>(82)   | 5.13<br>(130.2) | 6.33<br>(160.9) | .63<br>(15.9) | —              | 1.93<br>(49)   | —              | .33<br>(8.5) | 6.50<br>(165)  | 7.17<br>(182)  | —           | —             |
| H2      | 3.08<br>(78.2) | 5.13<br>(130.3) | 6.34<br>(161)   | .63<br>(16)   | —              | 2.20<br>(56)   | —              | .47<br>(12)  | 8.46<br>(215)  | 9.41<br>(239)  | —           | —             |
| H3      | 3.31<br>(84.2) | 5.44<br>(138.2) | 6.65<br>(168.9) | .65<br>(16.5) | —              | 2.80<br>(71)   | —              | .59<br>(15)  | 10.43<br>(265) | 11.61<br>(295) | —           | —             |

Inches (mm)



**Isysnet with Isys ISO Valves**

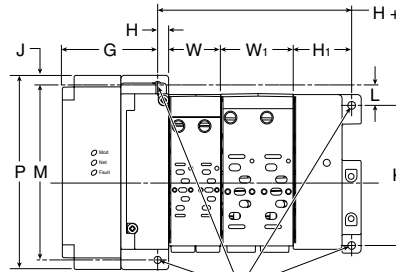
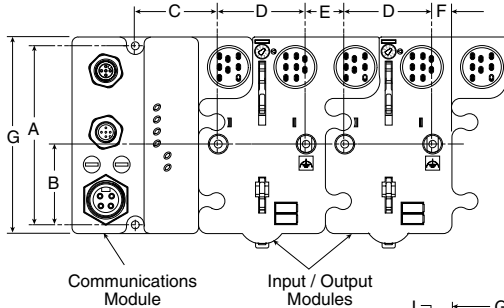


**Dimensions**

| A             | B            | C            | D            |
|---------------|--------------|--------------|--------------|
| 4.00<br>(102) | 1.80<br>(46) | 1.90<br>(48) | 2.00<br>(50) |

| E           | F           | G             |
|-------------|-------------|---------------|
| .87<br>(22) | .43<br>(11) | 4.41<br>(112) |

Inches (mm)



$H + H_1 + (W \times n + W_1 \times n_1)$   
 n = Number of 18mm HB Bases  
 n1 = Number of 26mm HA Bases  
 W = Width of 18mm HB Bases  
 W1 = Width of 26mm HA Bases

**HB - HA Manifold Assembly**

**HB - HA Dimensions**

| G            | H            | H <sub>1</sub> | J          | K             |
|--------------|--------------|----------------|------------|---------------|
| 2.68<br>(68) | .33<br>(8.4) | 1.80<br>(45.8) | .15<br>(4) | 4.32<br>(110) |

| L           | M             | P             | W              | W <sub>1</sub> |
|-------------|---------------|---------------|----------------|----------------|
| .63<br>(16) | 5.39<br>(137) | 5.98<br>(152) | 1.61<br>(40.8) | 2.24<br>(56.8) |

Inches (mm)

**H1 Dimensions**

| G            | H             | J            | K             | P             |
|--------------|---------------|--------------|---------------|---------------|
| 2.20<br>(56) | .63<br>(15.9) | .33<br>(8.5) | 6.50<br>(165) | 7.17<br>(182) |

**W**  
 1.93  
 (49)

Inches (mm)

**H2 Dimensions**

| G            | H           | J           | K             | P             |
|--------------|-------------|-------------|---------------|---------------|
| 2.28<br>(58) | .63<br>(16) | .47<br>(12) | 8.46<br>(215) | 9.41<br>(239) |

**W**  
 2.20  
 (56)

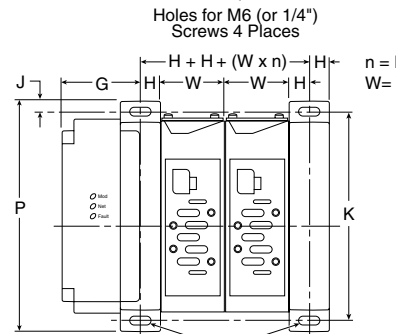
Inches (mm)

**H3 Dimensions**

| G            | H             | J           | K              | P              |
|--------------|---------------|-------------|----------------|----------------|
| 2.52<br>(64) | .65<br>(16.5) | .59<br>(15) | 10.43<br>(265) | 11.61<br>(295) |

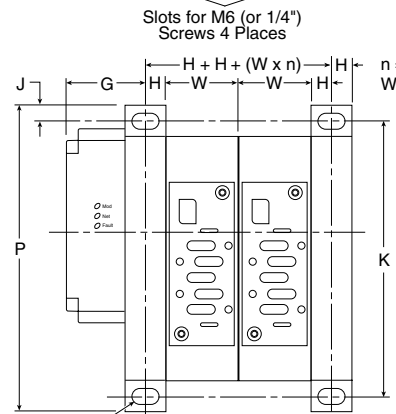
**W**  
 2.80  
 (71)

Inches (mm)



n = Number of H1 Bases  
 W = Width of H1 Bases

**H1 Manifold Assembly**



n = Number of H2 / H3 Bases  
 W = Width of H2 / H3 Bases

**H2 - H3 Manifold Assembly**

Slots for M10 (or 7/16")  
 Screws 4 Places

Valvoir II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

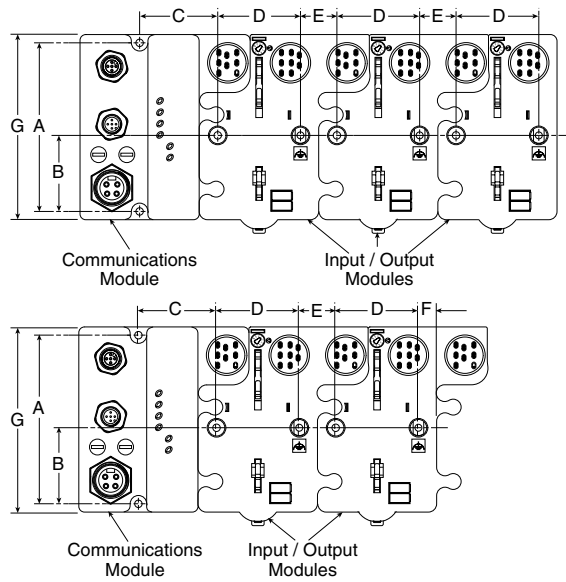
Isys Micro Series

Moduflex Series

**D**

Subbase & Manifold Valve Products

**Isysnet with Isys Micro Valves**



**Dimensions**

| A             | B            | C             | D            |
|---------------|--------------|---------------|--------------|
| 4.00<br>(102) | 1.80<br>(46) | 1.90<br>(48)  | 2.00<br>(50) |
| E             | F            | G             |              |
| .87<br>(22)   | .43<br>(11)  | 4.41<br>(112) |              |

Inches (mm)

Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

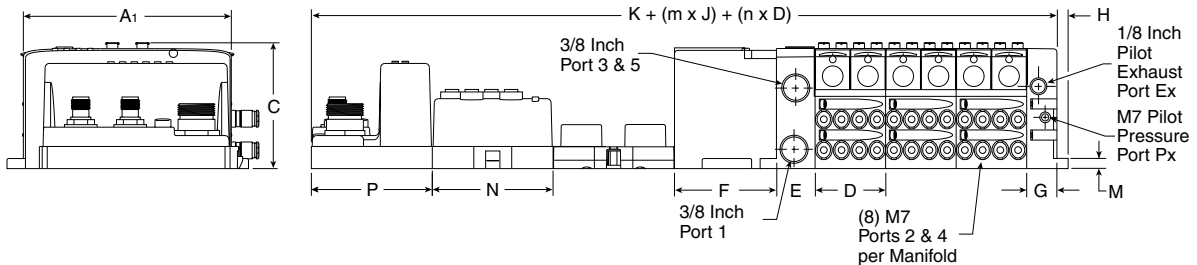
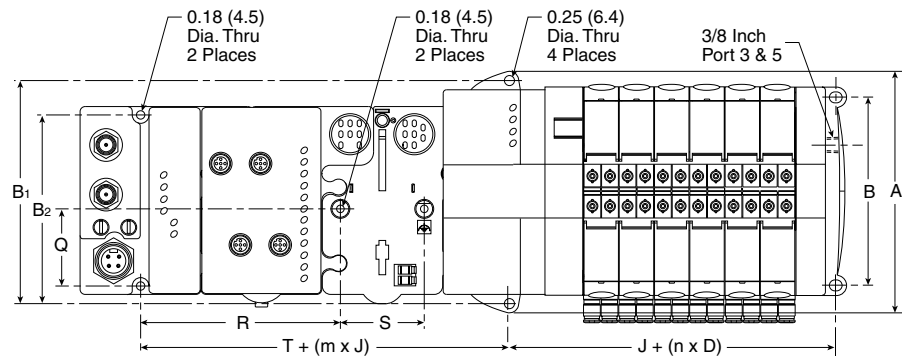
Isys Micro Series

Modulflex Series

**D**

Subbase & Manifold Valve Products

**Isys Micro Manifold Assembly**



**Dimensions**

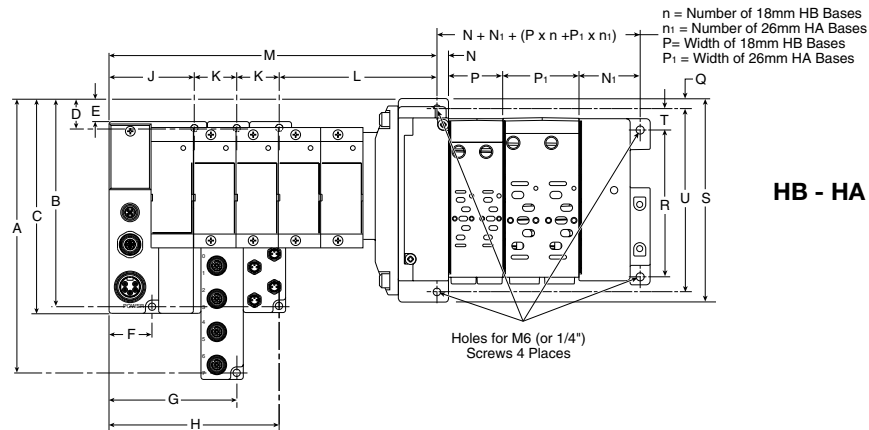
| A               | A1              | B               | B1              | B2              | C              | D              | E               | F              | G              |
|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|----------------|-----------------|----------------|----------------|
| 5.67<br>(144.0) | 4.88<br>(124.0) | 4.41<br>(112.0) | 5.24<br>(133.0) | 4.02<br>(102.0) | 2.95<br>(75.0) | 1.65<br>(42.0) | 0.91<br>(23.0)  | 2.40<br>(61.0) | 0.71<br>(18.0) |
| H               | J               | K               | M               | N               | P              | Q              | R               | S              | T              |
| 0.49<br>(12.5)  | 2.72<br>(69.0)  | 7.32<br>(186.0) | 0.24<br>(6.1)   | 2.83<br>(72.0)  | 2.83<br>(72.0) | 1.81<br>(46.0) | 4.72<br>(120.0) | 2.01<br>(51.0) | 2.01<br>(51.0) |

n = Number of Manifolds  
 m = Number of Modules

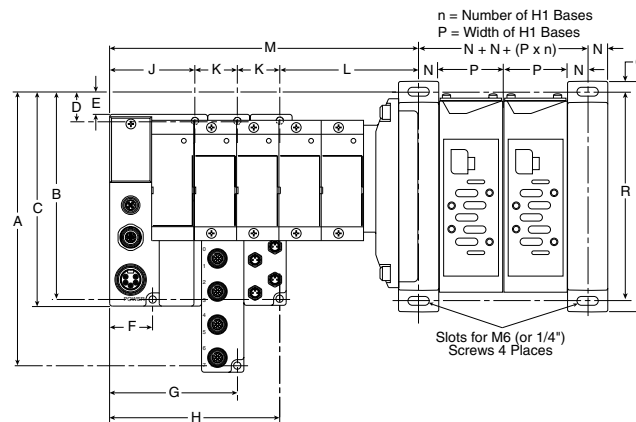
Inches (mm)



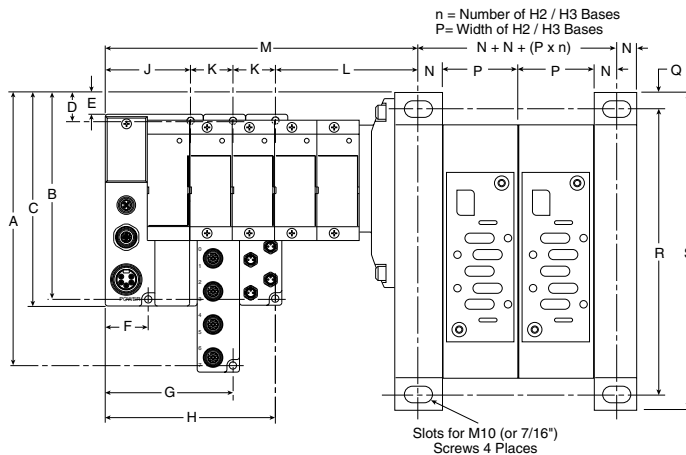
**Turck with Isys ISO Valves**



**HB - HA Manifold Assembly**



**H1 Manifold Assembly**



**H2 - H3 Manifold Assembly**

**Dimensions**

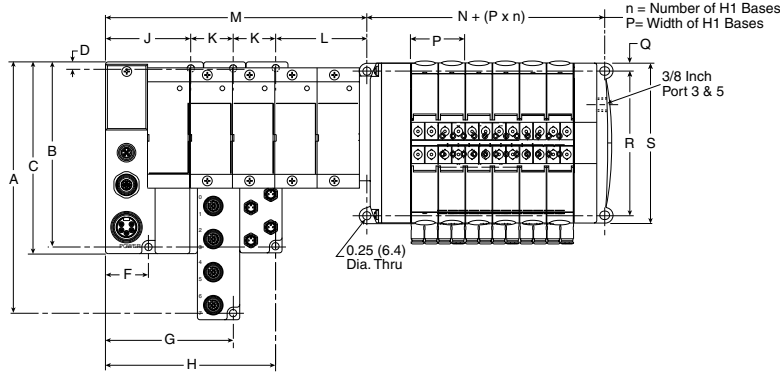
|                | A               | B               | C               | D              | E              | F              | G              | H               | J              | K            | L               | M             | N             | N <sub>1</sub> | P              | P <sub>1</sub> | Q            | R              | S              | T           | U             |
|----------------|-----------------|-----------------|-----------------|----------------|----------------|----------------|----------------|-----------------|----------------|--------------|-----------------|---------------|---------------|----------------|----------------|----------------|--------------|----------------|----------------|-------------|---------------|
| <b>HA / HB</b> | 8.05<br>(204.5) | 6.08<br>(154.5) | 6.28<br>(159.5) | 0.75<br>(19.5) | 0.57<br>(14.5) | 1.28<br>(32.5) | 3.79<br>(96.5) | 5.06<br>(128.5) | 2.53<br>(64.5) | 1.26<br>(32) | 4.75<br>(120.8) | See<br>note 1 | .33<br>(8.4)  | 1.80<br>(45.8) | 1.61<br>(40.8) | 2.24<br>(56.8) | .15<br>(4)   | 4.32<br>(110)  | 5.98<br>(152)  | .63<br>(16) | 5.39<br>(137) |
| <b>H1</b>      | 8.53<br>(216.7) | 6.56<br>(166.7) | 6.76<br>(171.7) | 1.25<br>(31.7) | 1.05<br>(26.7) | 1.28<br>(32.5) | 3.79<br>(96.5) | 5.06<br>(128.5) | 2.53<br>(64.5) | 1.26<br>(32) | 4.27<br>(108.5) | See<br>note 1 | .63<br>(15.9) | —              | 1.93<br>(49)   | —              | .33<br>(8.5) | 6.50<br>(165)  | 7.17<br>(182)  | —           | —             |
| <b>H2</b>      | 8.38<br>(212.9) | 6.41<br>(162.9) | 6.61<br>(167.9) | 1.10<br>(27.9) | .90<br>(22.9)  | 1.28<br>(32.5) | 3.79<br>(96.5) | 5.06<br>(128.5) | 2.53<br>(64.5) | 1.26<br>(32) | 4.26<br>(108.6) | See<br>note 1 | .63<br>(16)   | —              | 2.20<br>(56)   | —              | .47<br>(12)  | 8.46<br>(215)  | 9.41<br>(239)  | —           | —             |
| <b>H3</b>      | 8.62<br>(218.9) | 6.65<br>(168.9) | 6.85<br>(173.9) | 1.33<br>(33.9) | 1.14<br>(28.9) | 1.28<br>(32.5) | 3.79<br>(96.5) | 5.06<br>(128.5) | 2.53<br>(64.5) | 1.26<br>(32) | 4.59<br>(116.6) | See<br>note 1 | .65<br>(16.5) | —              | 2.80<br>(71)   | —              | .59<br>(15)  | 10.43<br>(265) | 11.61<br>(295) | —           | —             |

Note 1:  $M = J + L + n_2 \times K$ , where  $n_2$  = Number of Turck input / output modules  
 Inches (mm)

|                                   |
|-----------------------------------|
| Valvair II Series                 |
| DX ISOMAX Series                  |
| Fieldbus                          |
| Isys ISO Series                   |
| Isys Micro Series                 |
| Moduflex Series                   |
| <b>D</b>                          |
| Subbase & Manifold Valve Products |

**Turck with Isys Micro Valves**

Valvair II Series  
 DX ISOMAX Series  
 Fieldbus  
 Isys ISO Series  
 Isys Micro Series  
 Moduflex Series  
**D**  
 Subbase & Manifold

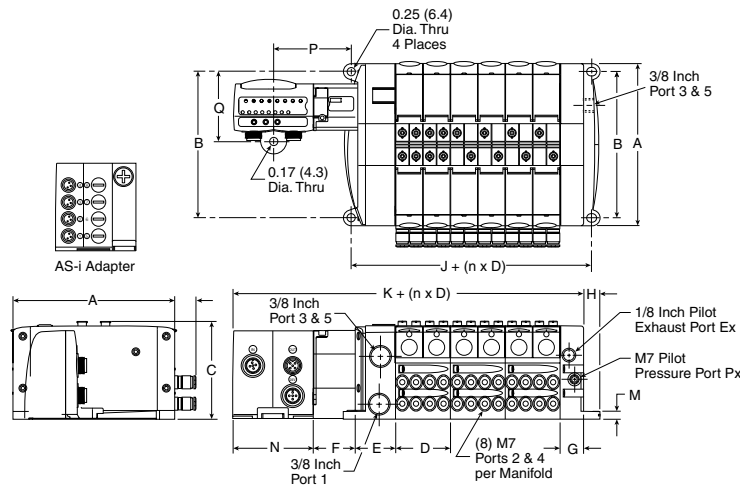


**Dimensions**

| A             | B             | C             | D           | F              | G              | H               | J              | K            | L            | M             | N            | P            | Q            | R             | S             |
|---------------|---------------|---------------|-------------|----------------|----------------|-----------------|----------------|--------------|--------------|---------------|--------------|--------------|--------------|---------------|---------------|
| 7.48<br>(190) | 5.51<br>(140) | 5.71<br>(145) | 0.20<br>(5) | 1.28<br>(32.5) | 3.79<br>(96.5) | 5.06<br>(128.5) | 2.53<br>(64.5) | 1.26<br>(32) | 2.54<br>(64) | See<br>note 1 | 2.28<br>(58) | 1.65<br>(42) | .19<br>(4.9) | 4.41<br>(112) | 4.88<br>(124) |

Note 1:  $M = J + L + n_2 \times K$ , where  $n_2 =$  Number of Turck input / output modules  
 Inches (mm)

**Moduflex Adapter, Side Ported**



**Dimensions**

| A               | B               | C              | D              | E              | F              | G              | H              | J              | K               | M             | N              | P              | Q              |
|-----------------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|---------------|----------------|----------------|----------------|
| 4.88<br>(124.0) | 4.41<br>(112.0) | 2.95<br>(75.0) | 1.65<br>(42.0) | 1.22<br>(31.0) | 1.28<br>(32.5) | 0.71<br>(18.0) | 0.49<br>(12.5) | 2.28<br>(58.0) | 6.10<br>(155.0) | 0.24<br>(6.1) | 2.40<br>(61.0) | 2.36<br>(60.0) | 2.07<br>(52.5) |

Inches (mm)

The ISOMAX range of directional control valves complies with ISO 15407-1 and VDMA 24563 for sizes 02 and 01 and ISO 5599-1 for sizes 1, 2 and 3. ISOMAX provides flows from 0.55 Cv to 4.15 Cv.

The ISOMAX range includes valves for pneumatic and electrical actuation with a wide choice of subbases and manifolds to suit different application needs.

All ISOMAX products use high-tech ceramic switching technology providing:

**Excellent reliability**

- Long life in excess of 100 million operations\*
- Operates with lubricated or non-lubricated air
- Low sensitivity to air quality changes

**High performance**

- Slide valve concept allows high flow / size ratio and short response time due to short slide stroke and low friction

**Stable long lasting performances**

- Low friction switching: minimum wear of the valve member / seal assembly

Valves fitted with switchable selector to give internal or external pilot supply

Corrosion free and modern design

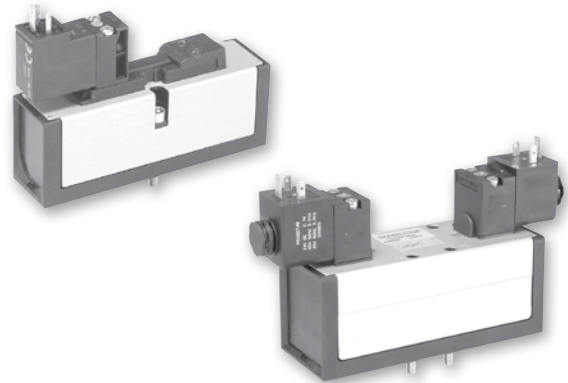
Vacuum operation

Dual pressure

\* Refer to our warranty conditions.

**Material specifications**

|                   |                                 |
|-------------------|---------------------------------|
| Body              | Polyamide reinforced fiberglass |
| Casing            | Anodized aluminum               |
| End plates        | Painted zinc plated steel       |
| Function selector | Polyamide reinforced fiberglass |
| Screws            | Zinc plated steel               |
| Seals             | Nitrile                         |
| Seat              | Ceramic                         |
| Springs           | Stainless steel                 |
| Top cover seals   | Polyester                       |
| Valve members     | Self lubricating acetal         |
| Valve plate       | Zinc                            |



**Operating information**

Operating Pressure: Vacuum to 145 PSIG (10 bar)

| Function       |                           | M.O.P (PSIG) |
|----------------|---------------------------|--------------|
| 20, 21, 22, 23 | 2-position, spring return | 36           |
| 50, 51, 53, 54 | 2-position, air return    | 30           |
| 04, 05, 06, 08 | 2-position                | 15           |
| 09, 11, 12, 27 | 3-position, CE            | 45           |
| 16, 18, 19, 25 | 3-position, APB           | 45           |

Working temperatures: -10°C to 60°C (14°F to 140°F)

Storage temperatures: -20°C to 70°C (-4°F to 158°F)

Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

Isys Micro Series

Moduflex Series

**D**

Subbase & Manifold Valve Products

 Most popular. For technical information see CD



**DX02 ISO Valves**

| Symbol | Type                                 | Cv   | Operator        | Pilot    | Override    | 24 VDC               | 120 VAC              |
|--------|--------------------------------------|------|-----------------|----------|-------------|----------------------|----------------------|
|        | 4-way, 2-position, spring return     | 0.55 | Single solenoid | Internal | Non-locking | <b>DX02-621-951M</b> | <b>DX02-621-951J</b> |
|        | 4-way, 2-position, air return        | 0.55 | Single solenoid | Internal | Non-locking | <b>DX02-651-951M</b> | <b>DX02-651-951J</b> |
|        | 4-way, 2-position                    | 0.55 | Double solenoid | Internal | Non-locking | <b>DX02-606-951M</b> | <b>DX02-606-951J</b> |
|        | 4-way, 3-position, center exhaust    | 0.4  | Double solenoid | Internal | Non-locking | <b>DX02-611-951M</b> | <b>DX02-611-951J</b> |
|        | 4-way, 3-position, all ports blocked | 0.4  | Double solenoid | Internal | Non-locking | <b>DX02-616-951M</b> | <b>DX02-616-951J</b> |

| Symbol | Type                                 | Cv   | Operator            | Pilot  | Part number        |
|--------|--------------------------------------|------|---------------------|--------|--------------------|
|        | 4-way, 2-position, spring return     | 0.55 | Single remote pilot | Remote | <b>DX02-421-60</b> |
|        | 4-way, 2-position, air return        | 0.55 | Single remote pilot | Remote | <b>DX02-451-60</b> |
|        | 4-way, 2-position                    | 0.55 | Double remote pilot | Remote | <b>DX02-406-60</b> |
|        | 4-way, 3-position, center exhaust    | 0.4  | Double remote pilot | Remote | <b>DX02-411-60</b> |
|        | 4-way, 3-position, all ports blocked | 0.4  | Double remote pilot | Remote | <b>DX02-416-60</b> |

**DX02 Series Subbase & Manifolds**

|                          |                      |                      |
|--------------------------|----------------------|----------------------|
| Single subbase           | 1/8" NPT             | 1/8" BSPP            |
| Side ported base         | <b>PL02-01-80</b>    | <b>PL02-01-70</b>    |
| 2 Station manifold bases |                      |                      |
| End ported bases         | 1/8" NPT             | 1/8" BSPP            |
|                          | <b>PJLP02-201-80</b> | <b>PJLP02-201-70</b> |
| End plate kit            | 1/8" NPT port        | 1/8" BSPP port       |
| End plate kit            | <b>PEJ02-02-80</b>   | <b>PEJ02-02-70</b>   |

**Add-A-Fold Assembly Model Number**

**AA 02U 0 04**

| Valve series                   | Number of stations* |
|--------------------------------|---------------------|
| Right & left end plate<br>DX02 | 02                  |
|                                | 04                  |
|                                | •                   |
|                                | 24                  |
|                                | •                   |
|                                | 32                  |

\* For use with PJLP02 Manifolds.

| Thread type |   |
|-------------|---|
| NPT         | 0 |
| BSPP "G"    | 1 |

\* Must be ordered in multiples of (2)

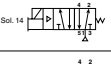

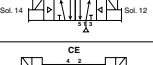


**DX02 Series Accessories**

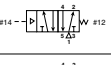
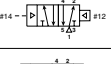
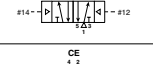
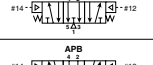

| Accessory  | Description   | Part number                              |
|--|---|--|
| Sandwich regulator                                   | Common pressure   | 2-60 PSIG w/ gauge<br><b>PS5637155P</b>  |
|  | Common pressure   | 5-125 PSIG w/ gauge<br><b>PS5637166P</b> |
|  | Independent pressure  | 2-60 PSIG w/ gauge<br><b>PS5637255P</b>  |
|  | Independent pressure  | 5-125 PSIG w/ gauge<br><b>PS5637266P</b> |
| Gauge adapter kit                                    | Includes 1/8" coupling and long nipple                                      | <b>PS5651160P</b>                        |
| Blanking plate kit                                   |   | <b>PS5634P</b>                           |
| Sandwich supply module                               | 1/8" NPT  | <b>PS562600P</b>                         |
|  | 1/8" BSPP   | <b>PS562601P</b>                         |
| Sandwich exhaust module                              | 1/8" NPT  | <b>PS562700P</b>                         |
|  | 1/8" BSPP   | <b>PS562701P</b>                         |
| Intermediate air supply module                       | 1/8" NPT  | <b>D02P-01-80</b>                        |
| Sandwich flow control                                |   | <b>PS5642P</b>                           |
| Manifold to manifold gasket kits                     | Used with manifold PJLP02   | <b>DX02M2MGSKT</b>                       |
| Manifold port isolation kits (main galley 1, 3, & 5) | For use on PJLP and PJL series manifolds. Kit includes: plugs with o-rings. | <b>D02BD0</b>                            |
| Manifold hardware kit                                | Includes 10 bolts, 10 washers, 10 nuts                                      | <b>Dx02m2mb</b>                          |






Valvair II Series  
 DX ISOMAX Series  
 Fieldbus Series  
 Isys ISO Series  
 Isys Micro Series  
 Modulflex Series  
**D**  
 Subbase & Manifold Valve Products

**DX01 ISO Valves**

| Symbol  | Type                                 | Cv   | Operator        | Pilot    | Override    | 24 VDC               | 120 VAC              |
|---|--------------------------------------|------|-----------------|----------|-------------|----------------------|----------------------|
|  | 4-way, 2-position, spring return     | 0.75 | Single solenoid | Internal | Non-locking | <b>DX01-621-951M</b> | <b>DX01-621-951J</b> |
|  | 4-way, 2-position, air return        | 0.75 | Single solenoid | Internal | Non-locking | <b>DX01-651-951M</b> | <b>DX01-651-951J</b> |
|  | 4-way, 2-position                    | 0.75 | Double solenoid | Internal | Non-locking | <b>DX01-606-951M</b> | <b>DX01-606-951J</b> |
|  | 4-way, 3-position, center exhaust    | 0.5  | Double solenoid | Internal | Non-locking | <b>DX01-611-951M</b> | <b>DX01-611-951J</b> |
|  | 4-way, 3-position, all ports blocked | 0.5  | Double solenoid | Internal | Non-locking | <b>DX01-616-951M</b> | <b>DX01-616-951J</b> |

| Symbol  | Type                                 | Cv   | Operator            | Pilot  | Part number        |
|---|--------------------------------------|------|---------------------|--------|--------------------|
|  | 4-way, 2-position, spring return     | 0.75 | Single remote pilot | Remote | <b>DX01-421-60</b> |
|  | 4-way, 2-position, air return        | 0.75 | Single remote pilot | Remote | <b>DX01-451-60</b> |
|  | 4-way, 2-position                    | 0.75 | Double remote pilot | Remote | <b>DX01-406-60</b> |
|  | 4-way, 3-position, center exhaust    | 0.5  | Double remote pilot | Remote | <b>DX01-411-60</b> |
|  | 4-way, 3-position, all ports blocked | 0.5  | Double remote pilot | Remote | <b>DX01-416-60</b> |

**DX01 Series Subbase & Manifolds**

|  |                      |                       |
|--|----------------------|-----------------------|
| <b>Single subbase</b>  | <b>1/4" NPT</b>      | <b>1/4" BSPP</b>      |
|  Side ported base  | <b>PL01-02-80</b>    | <b>PL01-02-70</b>     |
| <b>2 Station manifold bases</b>  | <b>1/4" NPT</b>      | <b>1/4" BSPP</b>      |
|  End ported bases | <b>PJLP01-202-80</b> | <b>PJLP01-202-70</b>  |
| <b>End plate kit</b>   | <b>1/4" NPT port</b> | <b>1/4" BSPP port</b> |
|  End plate kit    | <b>PEJ01-03-80</b>   | <b>PEJ01-03-70</b>    |


**Add-A-Fold Assembly Model Number**

|                             |                            |          |           |
|-----------------------------|----------------------------|----------|-----------|
| <b>AA</b>                   | <b>01U</b>                 | <b>0</b> | <b>04</b> |
| <b>Valve series</b>         | <b>Number of stations*</b> |          |           |
| Right & left end plate DX01 | 01U*                       | 02       | 04        |
|                             |                            | •        | 24        |
|                             |                            | •        | 32        |
| <b>Thread type</b>          |                            |          |           |
| NPT                         | 0                          |          |           |
| BSPP "G"                    | 1                          |          |           |

\* For use with PJLP01 or PJL01 Manifolds.

\* Must be ordered in multiples of (2)

**DX01 Series Accessories**

| Accessory  | Description   | Part number                           |
|--|---|---------------------------------------|
| Sandwich regulator  | Common pressure   | 2-60 PSIG w/ gauge <b>PS5537155P</b>  |
|  | Common pressure   | 5-125 PSIG w/ gauge <b>PS5537166P</b> |
|  | Independent pressure  | 2-60 PSIG w/ gauge <b>PS5537255P</b>  |
|  | Independent pressure  | 5-125 PSIG w/ gauge <b>PS5537266P</b> |
| Gauge adapter kit  | Includes 1/8" coupling and long nipple                                      | <b>PS5651160P</b>                     |
| Remote pilot access plate kit  | 1/4" NPT  | <b>PS551500P</b>                      |
|  | 1/4" BSPP   | <b>PS551501P</b>                      |
| Blanking plate kit   |   | <b>PS5534P</b>                        |
| Sandwich supply module   | 1/4" NPT  | <b>PS552600P</b>                      |
|  | 1/4" BSPP   | <b>PS552601P</b>                      |
| Sandwich exhaust module  | 1/4" NPT  | <b>PS552700P</b>                      |
|  | 1/4" BSPP   | <b>PS552701P</b>                      |
| Intermediate air supply module   | 1/4" NPT  | <b>D01P-02-80</b>                     |
| Sandwich flow control  |   | <b>PS5542P</b>                        |
| Manifold to manifold gasket kits   | Used with manifold PJLP02   | <b>DX01M2MGSKT</b>                    |
| Manifold port isolation kits (main galley 1, 3, & 5)   | For use on PJLP and PJL series manifolds. Kit includes: plugs with o-rings. | <b>D01BD0</b>                         |
| Manifold hardware kit  | Includes 10 bolts, 10 washers, 10 nuts                                      | <b>DX02M2MB</b>                       |



Valvair II Series

DX ISOMAX Series

Fieldbus

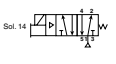
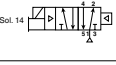
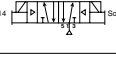
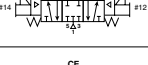

Isys ISO Series

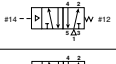
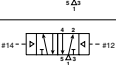
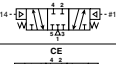
Isys Micro Series

Modulflex Series




**D**  
 Subbase & Manifold Valve Products

**DX1 ISO Valves**


| Symbol  | Type                                 | Cv   | Operator        | Pilot    | Override    | 24 VDC              | 120 VAC             |
|---|--------------------------------------|------|-----------------|----------|-------------|---------------------|---------------------|
|  | 4-way, 2-position, spring return     | 1.15 | Single solenoid | Internal | Non-locking | <b>DX1-621-BL49</b> | <b>DX1-621-BL53</b> |
|   |                                      |      |                 |          | Locking     | <b>DX1-621-CL49</b> | <b>DX1-621-CL53</b> |
|  | 4-way, 2-position, air return        | 1.15 | Single solenoid | Internal | Non-locking | <b>DX1-651-BL49</b> | <b>DX1-651-BL53</b> |
|   |                                      |      |                 |          | Locking     | <b>DX1-651-CL49</b> | <b>DX1-651-CL53</b> |
|  | 4-way, 2-position                    | 1.15 | Double solenoid | Internal | Non-locking | <b>DX1-606-BL49</b> | <b>DX1-606-BL53</b> |
|   |                                      |      |                 |          | Locking     | <b>DX1-606-CL49</b> | <b>DX1-606-CL53</b> |
|  | 4-way, 3-position, center exhaust    | 0.75 | Double solenoid | Internal | Non-locking | <b>DX1-611-BL49</b> | <b>DX1-611-BL53</b> |
|   |                                      |      |                 |          | Locking     | <b>DX1-611-CL49</b> | <b>DX1-611-CL53</b> |
|  | 4-way, 3-position, all ports blocked | 0.75 | Double solenoid | Internal | Non-locking | <b>DX1-616-BL49</b> | <b>DX1-616-BL53</b> |
|   |                                      |      |                 |          | Locking     | <b>DX1-616-CL49</b> | <b>DX1-616-CL53</b> |

| Symbol  | Type                              | Cv   | Operator            | Pilot  | Part number       |
|---|-----------------------------------|------|---------------------|--------|-------------------|
|  | 4-way, 2-position, spring return  | 1.15 | Single remote pilot | Remote | <b>DX1-421-60</b> |
|   |                                   |      |                     | Remote | <b>DX1-451-60</b> |
|  | 4-way, 2-position, air return     | 1.15 | Single remote pilot | Remote | <b>DX1-406-60</b> |
|   |                                   |      |                     | Remote | <b>DX1-411-60</b> |
|  | 4-way, 3-position, center exhaust | 0.75 | Double remote pilot | Remote | <b>DX1-416-60</b> |
|   |                                   |      |                     | Remote | <b>DX1-416-60</b> |

**DX1 Series Subbase & Manifolds**

| Single subbase  | Description                          | 3/8" NPT           | 3/8" BSPP          |
|---|--------------------------------------|--------------------|--------------------|
|  | Side ported base                     | <b>PS4011150CP</b> | <b>PS4011160CP</b> |
|   | End ported bases                     | <b>PS4011550CP</b> | <b>PS4011560CP</b> |
|  | Bottom / End ported bases            | <b>PS4011650CP</b> | <b>PS4011660CP</b> |
|   | End plate kits                       | NPT port           | BSPP port          |
|  | DX1 non-collective wiring end plates | <b>PS4031010CP</b> | <b>PS4031011CP</b> |

**5599-1, DX1 Accessories**

| Accessories   | Description           | Part number                               |
|---|-----------------------|---|
|  | Common pressure       | 5-125 PSIG w/ gauge<br><b>PS4037166CP</b> |
|   | Independent pressure  | 5-125 PSIG w/ gauge<br><b>PS4037266CP</b> |
| Remote pilot access plate kit   | 1/8" NPT<br>1/8" BSPP | <b>PS401500CP</b><br><b>PS401501CP</b>    |
| Blanking plate kit  |                       | <b>PS4034CP</b>                           |
| Sandwich flow control   |                       | <b>PS4042CP</b>                           |
| Manifold to manifold gasket kit   |                       | <b>PS4013P</b>                            |
| Manifold port isolation kits  | Main galley (1, 3, 5) | <b>PS4032CP</b>                           |
| Manifold port isolation kits  | Pilot galley          | <b>PS4033CP</b>                           |
| Auxiliary access plate kit  | 1/4" & 3/8"           | NPT<br><b>PS403000CP</b>                  |
|   |                       | BSPP<br><b>PS403001CP</b>                 |



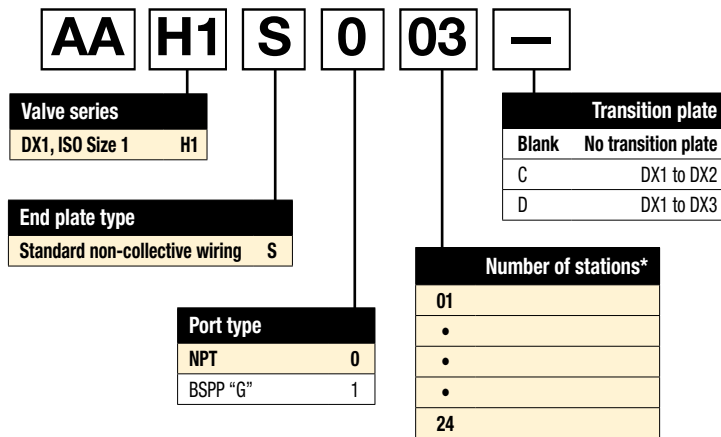
Valvair II Series  
 DX ISOMAX Series  
 Fieldbus Series  
 Ilys ISO Series  
 Ilys Micro Series  
 Moduflex Series  
 D Subbase & Manifold Valve Products

**How To Order Add-A-Fold Assemblies**

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete valve/base model number. List left to right, looking at the cylinder ports on the #12 end of the manifold. The left most station is station 1.  
 (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

**Example:** Application requires a 3-Station manifold.

| Qty. | Part No.     |                 |
|------|--------------|-----------------|
| 1    | AAH1S003     |                 |
| 1    | DX1-621-BL49 | Valve Station 1 |
| 1    | PS4011550CP  | Base Station 1  |
| 1    | DX1-616-BL49 | Valve Station 2 |
| 1    | PS4011550CP  | Base Station 2  |
| 1    | DX1-611-BL49 | Valve Station 3 |
| 1    | PS4011550CP  | Base Station 3  |



**DX2 ISO Valves**

| Symbol | Type                                 | Cv  | Operator        | Pilot    | Override    | 24 VDC              | 120 VAC             |
|--------|--------------------------------------|-----|-----------------|----------|-------------|---------------------|---------------------|
|        | 4-way, 2-position, spring return     | 2.5 | Single solenoid | Internal | Non-locking | <b>DX2-621-BL49</b> | <b>DX2-621-BL53</b> |
|        |                                      |     |                 |          | Locking     | <b>DX2-621-CL49</b> | <b>DX2-621-CL53</b> |
|        | 4-way, 2-position, air return        | 2.5 | Single solenoid | Internal | Non-locking | <b>DX2-651-BL49</b> | <b>DX2-651-BL53</b> |
|        |                                      |     |                 |          | Locking     | <b>DX2-651-CL49</b> | <b>DX2-651-CL53</b> |
|        | 4-way, 2-position                    | 2.5 | Double solenoid | Internal | Non-locking | <b>DX2-606-BL49</b> | <b>DX2-606-BL53</b> |
|        |                                      |     |                 |          | Locking     | <b>DX2-606-CL49</b> | <b>DX2-606-CL53</b> |
|        | 4-way, 3-position, center exhaust    | 2.4 | Double solenoid | Internal | Non-locking | <b>DX2-611-BL49</b> | <b>DX2-611-BL53</b> |
|        |                                      |     |                 |          | Locking     | <b>DX2-611-CL49</b> | <b>DX2-611-CL53</b> |
|        | 4-way, 3-position, all ports blocked | 2.4 | Double solenoid | Internal | Non-locking | <b>DX2-616-BL49</b> | <b>DX2-616-BL53</b> |
|        |                                      |     |                 |          | Locking     | <b>DX2-616-CL49</b> | <b>DX2-616-CL53</b> |

| Symbol | Type                              | Cv  | Operator            | Pilot  | Part number       |
|--------|-----------------------------------|-----|---------------------|--------|-------------------|
|        | 4-way, 2-position, spring return  | 2.5 | Single remote pilot | Remote | <b>DX2-421-60</b> |
|        |                                   |     |                     |        | <b>DX2-451-60</b> |
|        | 4-way, 2-position, air return     | 2.5 | Single remote pilot | Remote | <b>DX2-406-60</b> |
|        |                                   |     |                     |        | <b>DX2-411-60</b> |
|        | 4-way, 3-position, center exhaust | 2.4 | Double remote pilot | Remote | <b>DX2-416-60</b> |
|        |                                   |     |                     |        | <b>DX2-416-60</b> |



Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series


Isys Micro Series


Modulflex Series


**D**

Subbase & Manifold Valve Products


**DX2 Series Subbase & Manifolds**

| Single subbase  | Description      | 1/2" NPT           | 1/2" BSPP          |
|---|------------------|--------------------|--------------------|
|  | Side ported base | <b>PS4111170CP</b> | <b>PS4111180CP</b> |

| Manifold bases  | Description  | 1/2" NPT           | 1/2" BSPP          |
|---|--|--------------------|--------------------|
|  | Bottom / End ported bases<br><b>Note:</b> Manifolds include 2 pipe plugs | <b>PS4111670CP</b> | <b>PS4111680CP</b> |

| End plate kits  | Description                         | NPT port           | BSPP port          |
|---|-------------------------------------|--------------------|--------------------|
|  | H2 Non-collective wiring end plates | <b>PS4131010CP</b> | <b>PS4131011CP</b> |

**5599-1, DX2 Accessories**

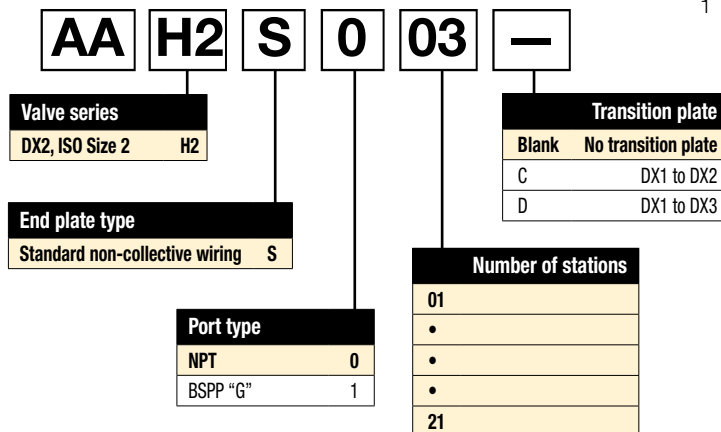
| Accessories  | Description                              | Part number        |
|--|--|--------------------|
| Sandwich regulator  | Common pressure 5-125 PSIG w/ gauge      | <b>PS4137166CP</b> |
|  | Independent pressure 5-125 PSIG w/ gauge | <b>PS4137266CP</b> |
| Remote pilot access plate kit  | 1/8" NPT                                 | <b>PS411500CP</b>  |
|  | 1/8" BSPP                                | <b>PS411501CP</b>  |
| Blanking plate kit   |  | <b>PS4134CP</b>    |
| Sandwich flow control  |  | <b>PS4142CP</b>    |
| Manifold to manifold gasket kit  |  | <b>PS4113P</b>     |
| Manifold port isolation kits   | Main galley (1, 3, 5)                    | <b>PS4132CP</b>    |
|  | Pilot galley                             | <b>PS4033CP</b>    |

**How To Order Add-A-Fold Assemblies**

- List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
- List complete valve/base model number. List left to right, looking at the cylinder ports on the #12 end of the manifold. The left most station is station 1.  
(If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

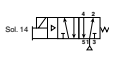
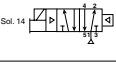
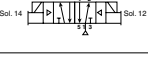
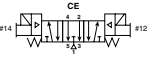
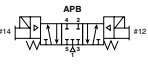
**Example:** Application requires a 3-station manifold.

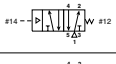
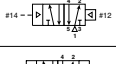
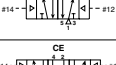
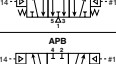
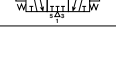
| Qty. | Part No.                           |
|------|------------------------------------|
| 1    | AAH2S003                           |
| 1    | DX2-621-BL49..... Valve Station 1  |
| 1    | PS4111570CP.....Base Station 1     |
| 1    | DX2-616-BL49 ..... Valve Station 2 |
| 1    | PS4111570CP.....Base Station 2     |
| 1    | DX2-611-BL49 ..... Valve Station 3 |
| 1    | PS4111570CP.....Base Station 3     |






Valvair II Series  
 DX ISOMAX Series  
 Fieldbus  
 Isys ISO Series  
 Isys Micro Series  
 Modulflex Series  
**D**  
 Subbase & Manifold Valve Products

**DX3 ISO Valves**


| Symbol  | Type                                 | Cv   | Operator        | Pilot    | Override    | 24 VDC              | 120 VAC             |
|---|--------------------------------------|------|-----------------|----------|-------------|---------------------|---------------------|
|  | 4-way, 2-position, spring return     | 4.15 | Single solenoid | Internal | Non-locking | <b>DX3-621-BL49</b> | <b>DX3-621-BL53</b> |
|   |                                      |      |                 |          | Locking     | <b>DX3-621-CL49</b> | <b>DX3-621-CL53</b> |
|  | 4-way, 2-position, air return        | 4.15 | Single solenoid | Internal | Non-locking | <b>DX3-651-BL49</b> | <b>DX3-651-BL53</b> |
|   |                                      |      |                 |          | Locking     | <b>DX3-651-CL49</b> | <b>DX3-651-CL53</b> |
|  | 4-way, 2-position                    | 4.15 | Double solenoid | Internal | Non-locking | <b>DX3-606-BL49</b> | <b>DX3-606-BL53</b> |
|   |                                      |      |                 |          | Locking     | <b>DX3-606-CL49</b> | <b>DX3-606-CL53</b> |
|  | 4-way, 3-position, center exhaust    | 4.0  | Double solenoid | Internal | Non-locking | <b>DX3-611-BL49</b> | <b>DX3-611-BL53</b> |
|   |                                      |      |                 |          | Locking     | <b>DX3-611-CL49</b> | <b>DX3-611-CL53</b> |
|  | 4-way, 3-position, all ports blocked | 4.0  | Double solenoid | Internal | Non-locking | <b>DX3-616-BL49</b> | <b>DX3-616-BL53</b> |
|   |                                      |      |                 |          | Locking     | <b>DX3-616-CL49</b> | <b>DX3-616-CL53</b> |

| Symbol  | Type                                 | Cv   | Operator            | Pilot  | Part number       |
|---|--------------------------------------|------|---------------------|--------|-------------------|
|  | 4-way, 2-position, spring return     | 4.15 | Single remote pilot | Remote | <b>DX3-421-60</b> |
|   |                                      |      |                     |        | <b>DX3-451-60</b> |
|  | 4-way, 2-position, air return        | 4.15 | Single remote pilot | Remote | <b>DX3-406-60</b> |
|   |                                      |      |                     |        | <b>DX3-411-60</b> |
|  | 4-way, 2-position                    | 4.15 | Double remote pilot | Remote | <b>DX3-416-60</b> |
|   |                                      |      |                     |        | <b>DX3-416-60</b> |
|  | 4-way, 3-position, center exhaust    | 4.0  | Double remote pilot | Remote | <b>DX3-421-60</b> |
|   |                                      |      |                     |        | <b>DX3-416-60</b> |
|  | 4-way, 3-position, all ports blocked | 4.0  | Double remote pilot | Remote | <b>DX3-416-60</b> |
|   |                                      |      |                     |        | <b>DX3-416-60</b> |

**DX3 Series Subbase & Manifolds**

| Single subbase  | Description  | 3/4" NPT           | 3/4" BSPP          |
|---|--|--------------------|--------------------|
|  | Side ported base   | <b>PS4211170CP</b> | <b>PS4211180CP</b> |
| Manifold bases  | Description  | 3/4" NPT           | 3/4" BSPP          |
|  | Bottom / End ported bases<br><b>Note:</b> Manifolds include 2 pipe plugs | <b>PS4211690CP</b> | <b>PS4211600CP</b> |
| End plate kits  | Description  | NPT port           | BSPP port          |
|  | H3 Non-collective wiring end plates                                      | <b>PS4231010CP</b> | <b>PS4231011CP</b> |

**5599-1, DX3 Accessories**

| Accessories  | Description                              | Part number        |
|--|--|--------------------|
| Sandwich regulator  | Common pressure 5-125 PSIG w/ gauge      | <b>PS4237166CP</b> |
|  | Independent pressure 5-125 PSIG w/ gauge | <b>PS4237266CP</b> |
| Remote pilot access plate kit  | 1/8" NPT                                 | <b>PS421500CP</b>  |
|  | 1/8" BSPP                                | <b>PS421501CP</b>  |
| Blanking plate kit   |  | <b>PS4134CP</b>    |
| Sandwich flow control  |  | <b>PS4242CP</b>    |
| Manifold to manifold gasket kit  |  | <b>PS4213P</b>     |
| Manifold port isolation kits   | Main galley (1, 3, 5)                    | <b>PS4232CP</b>    |
| Manifold port isolation kits   | Pilot galley                             | <b>PS4033CP</b>    |



Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

Isys Micro Series

Modulflex Series

**D**

Subbase & Manifold Valve Products



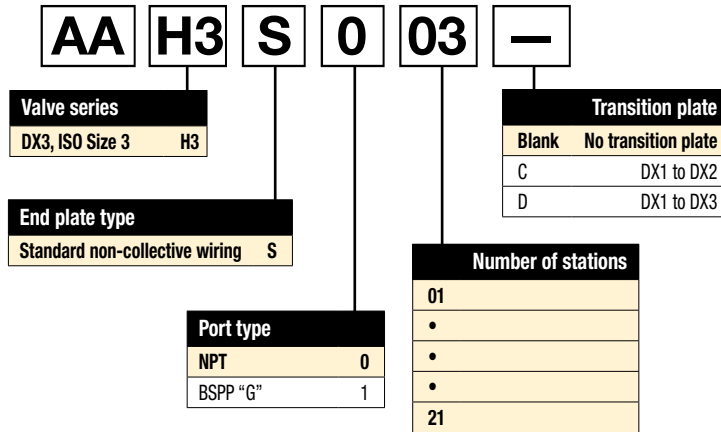
**How To Order Add-A-Fold Assemblies**

1. List Add-A-Fold Assembly call out. This automatically includes the end plate kit assembly.
2. List complete valve/base model number. List left to right, looking at the cylinder ports on the #12 end of the manifold. The left most station is station 1.  
 (If a blank station is needed, list the blanking plate part number and the individual manifold number in the station specified.)

**Example:** Application requires a 3-station manifold.

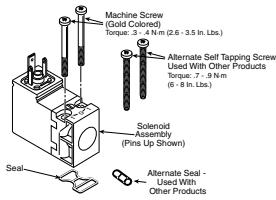
| Qty. | Part No.                           |
|------|------------------------------------|
| 1    | AAH3S003                           |
| 1    | DX3-621-BL49..... Valve Station 1  |
| 1    | PS4111590CP .....Base Station 1    |
| 1    | DX3-616-BL49 ..... Valve Station 2 |
| 1    | PS4111590CP .....Base Station 2    |
| 1    | DX3-611-BL49 ..... Valve Station 3 |
| 1    | PS4111590CP .....Base Station 3    |

Valvair II Series  
 DX ISOMAX Series  
 Fieldbus  
 Isys ISO Series  
 Isys Micro Series  
 Modulflex Series  
**D**  
 Subbase & Manifold Valve Products



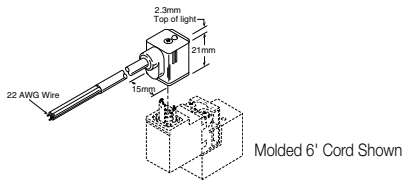


### 15mm 3-Pin DIN 43650C Replacement Solenoid Kits



| Voltage        | Non-locking       | Locking           |
|----------------|-------------------|-------------------|
| 24VDC          | <b>PS2982B49P</b> | <b>PS2982C49P</b> |
| 110/50, 120/60 | <b>PS2982B53P</b> | <b>PS2982C53P</b> |

### 15mm 3-Pin DIN 43650C Connectors



| Description        | Connector with 6' (2m) Cord | Connector         |
|--------------------|-----------------------------|-------------------|
| No circuit board   | <b>PS2932JBP</b>            | <b>PS2932BP</b>   |
| Light - 24DC       | <b>PS2946J79BP*</b>         | <b>PS294679BP</b> |
| Light - 110/120VAC | <b>PS2946J83BP*</b>         | <b>PS294683BP</b> |

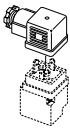
\* LED with surge suppression.

**Note:** Max. ø6.5mm cable size required for connector without 6' (2m) cord. IP65 rated when properly installed.

**Engineering Data:**

Conductors: 2 poles plus ground  
 Cable range (Connector only): 4 to 6mm (0.16 to 0.24 Inch)  
 Contact spacing: 8mm

### Female Electrical Connectors (IP65 Rated) 30mm, 3-Pin ISO 4400, (DIN 43650A)



| Description                     | Connector with 6' (2m) cord | Connector         |
|---------------------------------|-----------------------------|-------------------|
| Unlighted                       | <b>PS2028JCP</b>            | <b>PS2028BP</b>   |
| Light - 6-48V, 50/60Hz; 6-48VDC | <b>PS2032J79CP*</b>         | <b>PS203279BP</b> |
| Light - 120V/60Hz               | <b>PS2032J83CP*</b>         | <b>PS203283BP</b> |
| Light - 240V/60Hz               | <b>N/A</b>                  | <b>PS203283BP</b> |

\* With surge suppression.

**Engineering data:**

Conductors: 2 poles plus ground; cable range (connector only): 8 to 10mm (0.31 To 0.39 inch); Contact spacing: 18mm

### 5599-1 CNOMO Solenoid Kits

| Voltage code | 3-pin, 30mm 'L' coil kit | 2-pin, M12 Euro '6' coil kit |
|--------------|--------------------------|------------------------------|
| 19           | —                        | <b>PS2828619P</b>            |
| 42           | <b>P2FCA442</b>          | —                            |
| 45           | <b>P2FCA445</b>          | —                            |
| 49           | <b>P2FCA449</b>          | —                            |
| 53           | <b>P2FCA453</b>          | —                            |
| 57           | <b>P2FCA457</b>          | —                            |

Quantity 1

### Pilot Operator - CNOMO

| Valve size     | Kit number                  |
|----------------|-----------------------------|
| DX1, DX2 & DX3 | Locking <b>PS4052CP</b>     |
|                | Non-locking <b>PS4053CP</b> |

### CNOMO Operator Adapter

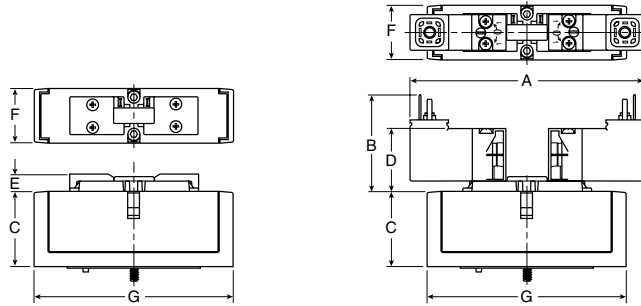
| Description      | Kit number     |
|------------------|----------------|
| Operator adapter | <b>PS2855P</b> |

### Manifold to Manifold Gasket Kits

| Size  | Part number                 |
|-------|-----------------------------|
| DX02* | <b>DX02M2MGSKT (PJLP02)</b> |
| DX01* | <b>DX01M2MGSKT (PJLP01)</b> |

\* Gaskets used with PS5611 & PS5511 manifolds.

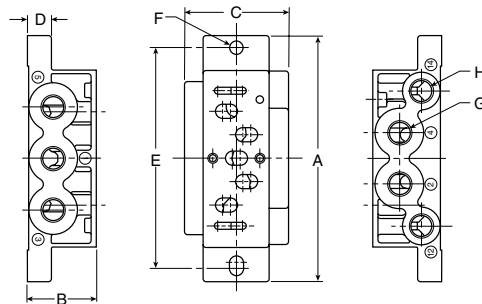
**DX01 & DX02 Valve Dimensions**



| Series      | A             | B            | C            | D            | E          | F            | G             |
|-------------|---------------|--------------|--------------|--------------|------------|--------------|---------------|
| <b>DX02</b> | 4.06<br>(103) | 1.61<br>(41) | 1.41<br>(36) | 1.06<br>(27) | .31<br>(8) | .71<br>(18)  | 3.15<br>(80)  |
| <b>DX01</b> | 4.06<br>(103) | 1.61<br>(41) | 1.41<br>(36) | 1.06<br>(27) | .31<br>(8) | 1.02<br>(26) | 3.94<br>(100) |

Inches (mm)

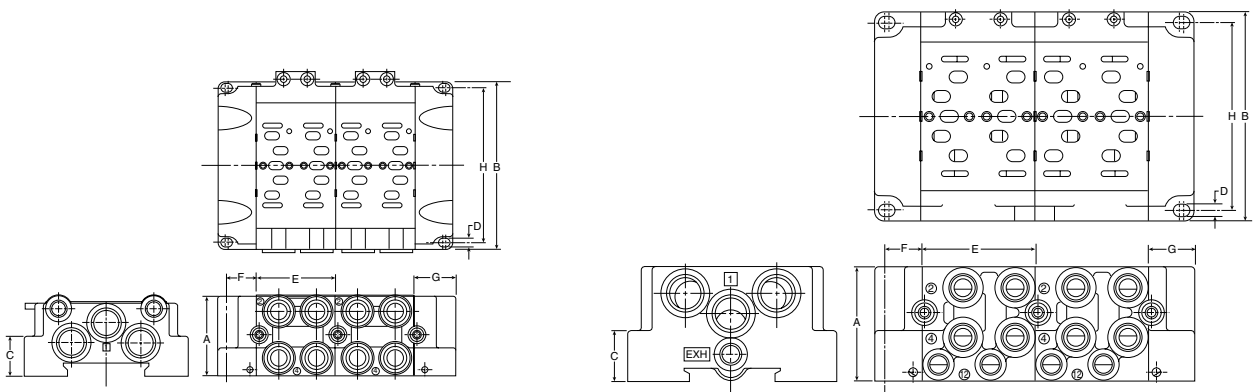
**DX01 & DX02 Individual Subbase Dimensions**



| Series      | Part number | A             | B            | C            | D           | E            | F                    | G   | H   |
|-------------|-------------|---------------|--------------|--------------|-------------|--------------|----------------------|-----|-----|
| <b>DX02</b> | <b>PL02</b> | 3.15<br>(80)  | .87<br>(22)  | 1.06<br>(27) | .31<br>(8)  | 2.76<br>(70) | .216 Dia.<br>(Ø 5.5) | 1/8 | M5  |
| <b>DX01</b> | <b>PL01</b> | 3.94<br>(100) | 1.10<br>(28) | 1.65<br>(42) | .39<br>(10) | 3.54<br>(90) | .216 Dia.<br>(Ø 5.5) | 1/4 | 1/8 |

Inches (mm)

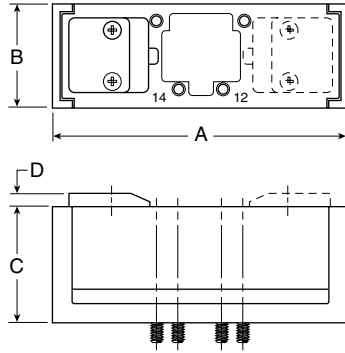
**DX01 & DX02 2-Station Manifold Base Dimensions**



| Series      | Part number                   | A              | B             | C           | D                    | E            | F           | G           | H            |
|-------------|-------------------------------|----------------|---------------|-------------|----------------------|--------------|-------------|-------------|--------------|
| <b>DX02</b> | <b>PJLP02 / PEJ02</b>         | 1.52<br>(38.5) | 3.15<br>(80)  | .47<br>(12) | .165 Dia.<br>(Ø 4.2) | 1.50<br>(38) | .55<br>(14) | .71<br>(18) | 2.83<br>(72) |
| <b>DX01</b> | <b>PJL01 / PJLP01 / PEJ01</b> | 2.17<br>(55)   | 3.94<br>(100) | .94<br>(24) | .216 Dia.<br>(Ø 5.5) | 2.13<br>(54) | .67<br>(17) | .87<br>(22) | 3.54<br>(90) |

Inches (mm)

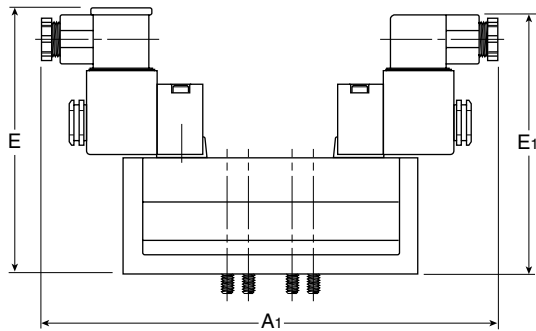
**DX1, DX2 & DX3 Air Operated Valve Dimensions**



| Series     | A             | B            | C              | D          |
|------------|---------------|--------------|----------------|------------|
| <b>DX1</b> | 4.72<br>(120) | 1.65<br>(42) | 1.85<br>(47)   | .20<br>(5) |
| <b>DX2</b> | 5.51<br>(140) | 2.13<br>(54) | 2.30<br>(58.5) | .20<br>(5) |
| <b>DX3</b> | 6.69<br>(170) | 2.68<br>(68) | 2.80<br>(71)   | .20<br>(5) |

Inches (mm)

**DX1, DX2 & DX3 Solenoid Operated Valve Dimensions**



| Series     | A1              | E               | E1              | E2              |
|------------|-----------------|-----------------|-----------------|-----------------|
| <b>DX1</b> | 7.97<br>(202.5) | 4.43<br>(112.5) | 4.69<br>(119)   | 4.53<br>(115)   |
| <b>DX2</b> | 8.58<br>(218)   | 4.86<br>(123.5) | 5.12<br>(130)   | 4.98<br>(126.5) |
| <b>DX3</b> | 9.27<br>(235.5) | 5.35<br>(136)   | 5.61<br>(142.5) | 5.47<br>(139)   |

Inches (mm)

Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

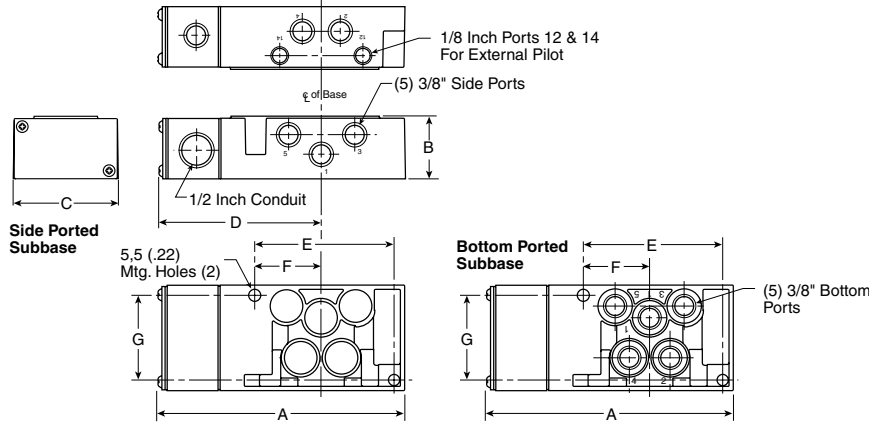
Isys Micro Series

Moduflex Series

**D**

Subbase & Manifold Valve Products

**DX1 Subbase Dimensions**

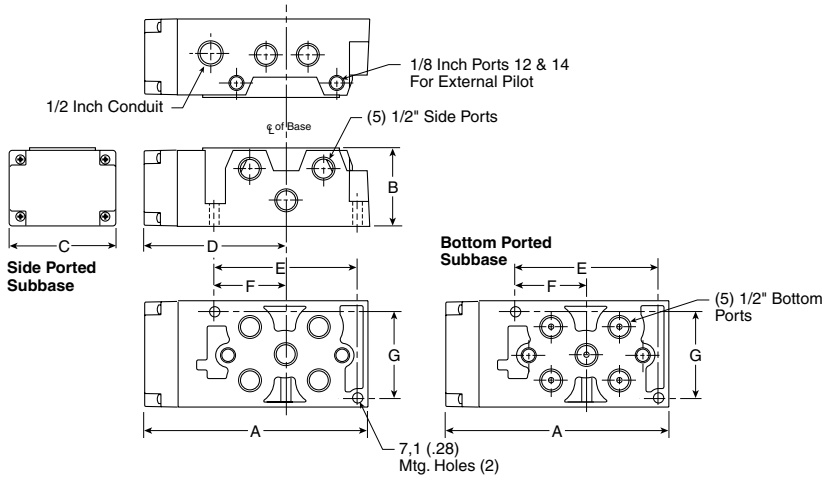


**PS4011 Subbase**

| A             | B            | C            | D            |
|---------------|--------------|--------------|--------------|
| 5.83<br>(148) | 1.48<br>(38) | 2.50<br>(64) | 3.86<br>(98) |
| E             | F            | G            |              |
| 3.29<br>(84)  | 1.57<br>(40) | 2.00<br>(51) |              |

Inches (mm)

**DX2 Subbase Dimensions**

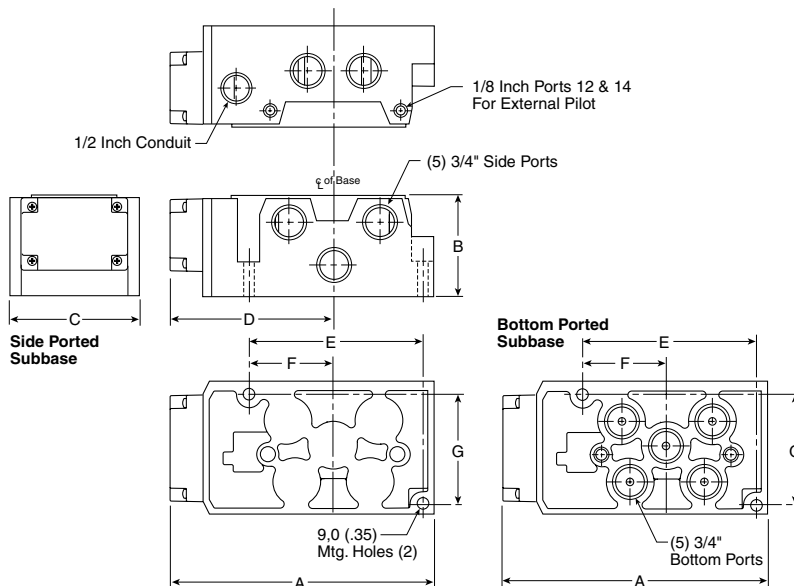


**PS4111 Subbase**

| A             | B            | C            | D             |
|---------------|--------------|--------------|---------------|
| 6.69<br>(170) | 2.33<br>(59) | 3.15<br>(80) | 4.25<br>(108) |
| E             | F            | G            |               |
| 4.21<br>(107) | 2.07<br>(52) | 2.56<br>(65) |               |

Inches (mm)

**DX3 Subbase Dimensions**



**PS4211 Subbase**

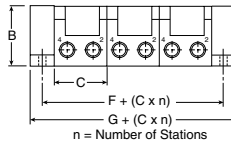
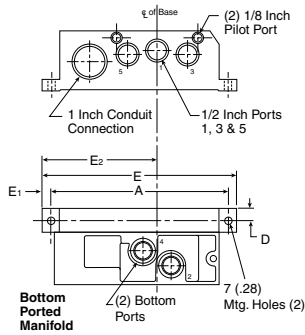
| A             | B            | C            | D             |
|---------------|--------------|--------------|---------------|
| 7.90<br>(201) | 2.96<br>(75) | 3.90<br>(99) | 4.92<br>(125) |
| E             | F            | G            |               |
| 5.14<br>(131) | 2.50<br>(64) | 3.24<br>(82) |               |

Inches (mm)

Valvair II Series  
 DX ISOMAX Series  
 Fieldbus  
 Isys ISO Series  
 Isys Micro Series  
 Modulflex Series  
**D**  
 Subbase & Manifold Valve Products



**DX1 Manifold Dimensions**



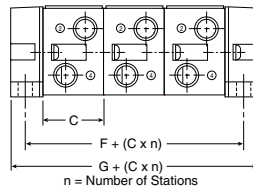
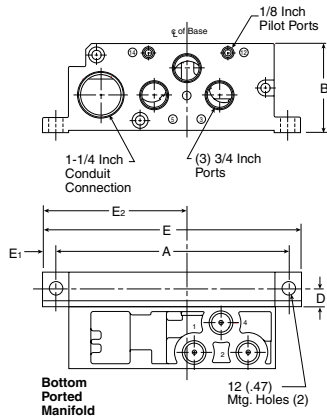
**PS4011 Manifold**

| A             | B            | C            | D           | E             |
|---------------|--------------|--------------|-------------|---------------|
| 6.50<br>(165) | 2.20<br>(56) | 1.93<br>(49) | .44<br>(11) | 7.15<br>(182) |

| E1         | E2            | F           | G            |
|------------|---------------|-------------|--------------|
| .33<br>(8) | 4.25<br>(108) | .87<br>(22) | 1.80<br>(46) |

Inches (mm)

**DX2 Manifold Dimensions**



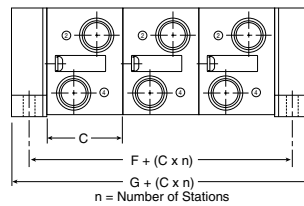
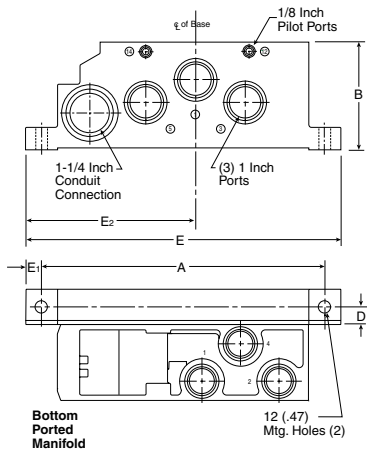
**PS4111 Manifold**

| A             | B            | C            | D           | E             |
|---------------|--------------|--------------|-------------|---------------|
| 8.46<br>(215) | 3.35<br>(85) | 2.20<br>(56) | .59<br>(15) | 9.41<br>(239) |

| E1          | E2            | F            | G            |
|-------------|---------------|--------------|--------------|
| .47<br>(12) | 5.28<br>(134) | 1.18<br>(30) | 2.36<br>(60) |

Inches (mm)

**DX3 Manifold Dimensions**



**PS4211 Manifold**

| A              | B             | C            | D            | E              |
|----------------|---------------|--------------|--------------|----------------|
| 10.41<br>(265) | 4.13<br>(105) | 2.80<br>(71) | .65<br>(175) | 11.61<br>(295) |

| E1          | E2            | F            | G            |
|-------------|---------------|--------------|--------------|
| .59<br>(15) | 6.26<br>(159) | 1.30<br>(33) | 2.60<br>(63) |

Inches (mm)

Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

Isys Micro Series

Modulflex Series

**D**

Subbase & Manifold Valve Products

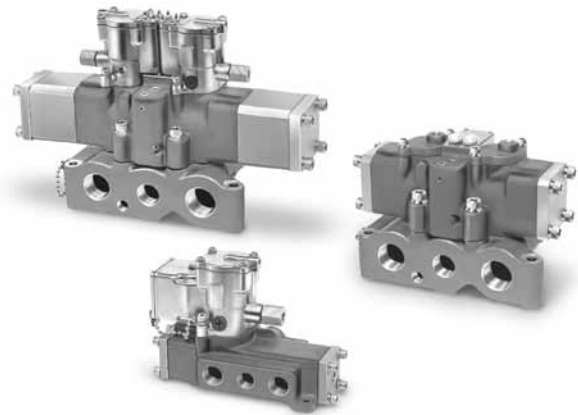
**Features**

- Full air operation for fastest response
- “Plug-In” option simplifies maintenance and installation  
 Reduces downtime. No wiring or plumbing to disturb
- “Direct pipe” design for economy and performance
- Variety of operators available; direct conduit, (JIC) junction box, NEMA 4, hazardous duty, (UL, CSA), and remote air pilot
- Field convertible to external pilot supply for vacuum or other services
- Synthetic rubber o-ring seals are specially compounded for minimum compression and friction for superior wear and abrasion resistance
- Precision ground spool “floats” on o-ring seals. Closed center cross-over design saves air
- General Purpose Approvals
  - CSA - Canadian Standards Association  
 File number 42024
- Hazardous Duty Approvals
  - UL - Underwriters Laboratories, Inc.  
 File number E42542 Category Y107
  - CSA - Canadian Standards Association  
 File number 24349

**Material specifications**

|                                |  |                         |
|--------------------------------|--|-------------------------|
| Manifolds & subbases           | Aluminum alloy   |                         |
| Other seals                    | Nitrile  |                         |
| Resilient seals: in valve body |  |                         |
| Dynamic                        | Polyurethane base on 3/8" basic valves*  |                         |
| Static / dynamic               | Nitrile base w / 12% Molybdenum Disulphide on 1/4" & 1/2" basic valves                   |                         |
| Shock pads                     | Polyurethane   |                         |
| Solenoid bodies                | Plated zinc alloy  |                         |
| Internal components            | Corrosion resistant steel  |                         |
| Resilient seals                | Standard service   | Nitrile                 |
|                                | Special service (continuous duty)  | Fluorocarbon & Silicone |
| Other seals                    | Nitrile  |                         |
| Coil                           | Class “B” epoxy encapsulated (Class “H” also available on some models, consult supplier) |                         |
| Valve bodies                   | Aluminum alloy   |                         |
| Valve spacers                  | Brass  |                         |
| Valve spool                    | Aluminum alloy with special coating on 3/8" basic valves*.                               |                         |
|                                | Hard chrome plated AISI type 416 stainless steel on 1/4" & 1/2" basic valves.            |                         |

\* These materials are specially designed for valves used on non-lubricated service



**Operating information**

Pressure range for solenoid operated valves

| Media  | Internal pilot supply |      | External pilot supply |       |                        |      |    |
|--------|-----------------------|------|-----------------------|-------|------------------------|------|----|
|        | 1/4"                  | 3/8" | 1/2"                  | 1/4"  | 3/8"                   | 1/2" | 1" |
| Air    | 35-140* PSIG          |      | N.A.                  | Main  | 0-250 PSIG             |      |    |
|        |                       |      |                       | Pilot | 35-140* PSIG           |      |    |
| Vacuum | do not use            |      | N.A.                  | Main  | within 1 Hg of perfect |      |    |
|        |                       |      |                       | Pilot | 35-140* PSIG           |      |    |

Other Consult supplier

\* 200 PSIG solenoid is optional (consult supplier).

Pressure range for remote pilot operated valves

| Media  |       | Valve type  |                         |
|--------|-------|-------------|-------------------------|
|        |       | Single      | Double & 3-position     |
| Air    | Main  | 35-250 PSIG | 0-250 PSIG              |
|        | Pilot | 35-200 PSIG | 35-200 PSIG             |
| Vacuum | Main  | Do not use  | Within 1" Hg of perfect |
|        | Pilot | Do not use  | 35-200 PSIG             |

Other Consult supplier

Ambient temperature – standard service solenoid operator

| Minimum   | Maximum           |                 |
|---|-------------------|-----------------|
|   | Intermittent duty | Continuous duty |
| 0°F   | 125°F             | 100°F           |
| Special service (continuous duty) solenoid operator |                   |                 |
| 0°F   | 125°F             | 125°F           |

Ambient temperature – remote pilot operated valves

|     |       |
|-----|-------|
| 0°F | 200°F |
|-----|-------|

As the above chart indicates, Standard Duty Solenoids may be used on continuous duty but ambient temperature is de-rated.  
 In some cases, Special Service Solenoids may be rated for higher ambient temperatures (consult supplier).





**Caution:**



If it is possible that the ambient temperature may fall below freezing, the medium must be moisture free to prevent internal damage and unpredictable behavior.

Most popular. For technical information see CD





**4-way, 5-port, 2-position, Plug-in**

| L675<br>(3/8" basic valve)<br>Single solenoid                                     | L655<br>(3/8" basic valve)<br>Double solenoid                                     | Nominal<br>Cv | Port<br>size<br>(NPT) | Subbase<br>(Side ports) | Manifold†<br>(End &<br>bottom ports) | Voltage   | Valve only      |                 |         |         |           |             |             |
|---|---|---------------|-----------------------|-------------------------|--------------------------------------|-----------|-----------------|-----------------|---------|---------|-----------|-------------|-------------|
|   |   |               |                       |                         |                                      |           | Single solenoid | Double solenoid |         |         |           |             |             |
|  |  | 4.8           | 3/8"                  | K022090                 | K142230                              | 120V 60Hz | L6753910253     | L6553910253     |         |         |           |             |             |
|   |   |               |                       |                         |                                      |           | 4.8             | 1/2"            | K022091 | K142231 | 110V 50Hz | L6753910253 | L6553910253 |
|   |   |               |                       |                         |                                      |           | 4.8             | 3/4"            | K022101 | K142270 | 24VDC     | L6753310249 | L6553310249 |



| L675<br>(1" basic valve)<br>Single solenoid                                       | L655<br>(1" basic valve)<br>Double solenoid                                       | Nominal<br>Cv | Port size<br>(NPT) | Subbase<br>(Side ports) | Manifold†<br>(End &<br>bottom ports) | Voltage   | Valve only      |                 |         |         |           |             |             |
|---|---|---------------|--------------------|-------------------------|--------------------------------------|-----------|-----------------|-----------------|---------|---------|-----------|-------------|-------------|
|   |   |               |                    |                         |                                      |           | Single solenoid | Double solenoid |         |         |           |             |             |
|  |  | 11.3          | 1"                 | K022095                 | K142230                              | 120V 60Hz | L6758910253     | L6558910253     |         |         |           |             |             |
|   |   |               |                    |                         |                                      |           | 11.3            | 1"              | K022095 | K142231 | 110V 50Hz | L6758910253 | L6558910253 |
|   |   |               |                    |                         |                                      |           | 11.3            | 1"              | K022095 | K142270 | 24VDC     | L6758310249 | L6558310249 |



**4-way, 5-port, 3-position, Plug-in**

| L665<br>(3/8" basic valve)<br>Double solenoid                                     | Nominal<br>Cv | Port size<br>(NPT) | Subbase<br>(side ports) | Manifold † (end &<br>bottom ports) | Voltage   | Valve only      |      |         |         |           |             |  |
|---|---------------|--------------------|-------------------------|------------------------------------|-----------|-----------------|------|---------|---------|-----------|-------------|--|
|   |               |                    |                         |                                    |           | Double solenoid |      |         |         |           |             |  |
|  | 4.8           | 3/8"               | K022090                 | K142230                            | 120V 60Hz | L6653921153     |      |         |         |           |             |  |
|   |               |                    |                         |                                    |           | 4.8             | 1/2" | K022091 | K142231 | 110V 50Hz | L6653921153 |  |
|   |               |                    |                         |                                    |           | 4.8             | 3/4" | K022101 | K142270 | 24VDC     | L6653321149 |  |



| L665<br>(1" basic valve)<br>Double solenoid  | Nominal<br>Cv | Port size<br>(NPT) | Subbase<br>(side ports) | Manifold (end &<br>bottom ports) | Voltage   | Valve only      |    |         |         |           |             |  |
|--|---------------|--------------------|-------------------------|----------------------------------|-----------|-----------------|----|---------|---------|-----------|-------------|--|
|  |               |                    |                         |                                  |           | Double solenoid |    |         |         |           |             |  |
|  | 11.3          | 1"                 | K022095                 | K142230                          | 120V 60Hz | L6658921153     |    |         |         |           |             |  |
|  |               |                    |                         |                                  |           | 11.3            | 1" | K022095 | K142231 | 110V 50Hz | L6658921153 |  |
|  |               |                    |                         |                                  |           | 11.3            | 1" | K022095 | K142270 | 24VDC     | L6658321149 |  |

**4-way, 5-port, 2-position, Direct Pipe Ported**

| L705<br>(3/8" basic valve)<br>single solenoid                                       | L685<br>(3/8" basic valve)<br>double solenoid                                       | Port size (NPT) |         | Nominal<br>Cv | Voltage   | Operator<br>type | Valve           |                 |
|---|---|-----------------|---------|---------------|-----------|------------------|-----------------|-----------------|
|   |   | P, A & B        | EA & EB |               |           |                  | Single solenoid | Double solenoid |
|  |  | 3/8"            | 1/2"    | 4.8           | 120V 60Hz | Junction box     | L7053910253     | L6853910253     |
|   |   |                 |         |               |           |                  | L7054910253     | L6854910253     |
|   |   | 3/8"            | 1/2"    | 4.8           | 24VDC     | Junction box     | L7053610249     | L6853610249     |
|   |   |                 |         |               |           |                  | L7054610249     | L6854610249     |
|   |   | 3/8"            | 1/2"    | 4.8           | 120V 60Hz | Basic            | L7053310253     | L6853310253     |
|   |   |                 |         |               |           |                  | L7054310253     | L6854310253     |
| L7054310253   | L6854310253   |                 |         |               |           |                  |                 |                 |

| L705<br>(1" basic valve)<br>single solenoid   | L685<br>(1" basic valve)<br>double solenoid   | Port size (NPT) |         | Nominal<br>Cv | Voltage   | Operator<br>type | Valve           |                 |
|---|---|-----------------|---------|---------------|-----------|------------------|-----------------|-----------------|
|   |   | P, A & B        | EA & EB |               |           |                  | Single solenoid | Double solenoid |
|  |  | 1"              | 1-1/4"  | 12.0          | 120V 60Hz | Junction box     | L7058910253     | L6858910253     |
|   |   |                 |         |               |           |                  | L7059910253     | L6859910253     |
|   |   | 1"              | 1-1/4"  | 12.0          | 24VDC     | Junction box     | L7058610249     | L6858610249     |
|   |   |                 |         |               |           |                  | L7059610249     | L6859610249     |

**4-way, 5-port, 3-position, Direct Pipe Ported**

| L695<br>(3/8" basic valve)<br>double solenoid                                       | L695<br>(1" basic valve)<br>double solenoid   | Port size (NPT) |         | Nominal<br>Cv | Voltage   | Operator<br>type | Valve           |               |
|---|---|-----------------|---------|---------------|-----------|------------------|-----------------|---------------|
|   |   | P, A & B        | EA & EB |               |           |                  | 3/8" basic size | 1" basic size |
|  |  | 3/8"            | 1/2"    | 4.5           | 120V 60Hz | Junction box     | L6953921153     | —             |
|   |   |                 |         |               |           |                  | L6954921153     | —             |
|   |   | 1"              | 1-1/4"  | 12.0          | 110V 50Hz | Junction box     | —               | L6958921153   |
|   |   |                 |         |               |           |                  | —               | L6959921153   |

† Manifolds include mounting hardware, except for port adapters.

Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

Isys Micro Series

Moduflex Series

**D**  
 Subbase & Manifold Valve Products





**Lubricated Non-Lubricated Service**  
**2-position, Plug-In, 3/8" & 1" Basic Size**

- Valvair II Series
- DX ISOMAX Series
- Fieldbus
- Isys ISO Series
- Isys Micro Series
- Modulflex Series
- D** Subbase & Manifold Valve Products

**L 67 5 3 9 10 2 53**

| Type   |    |
|--------|----|
| Double | 65 |
| Single | 67 |

| Operator |   |
|----------|---|
| Remote   | 4 |
| Solenoid | 5 |

| Size       |   |
|------------|---|
| 3/8" Basic | 3 |
| 1" Basic   | 8 |

| Operator options  |   |
|---|---|
| Solenoid (basic) or remote                              | 1 |
| Solenoid with locking override                          | 3 |
| Solenoid w/light (120VAC, 24VDC) & non-locking override | 8 |
| Solenoid w/light (120VAC, 24VDC) & locking override     | 9 |

| Voltage & frequency |      |      |    |
|---------------------|------|------|----|
|                     | 60Hz | 50Hz | DC |
| 45                  |      |      | 12 |
| 49                  |      |      | 24 |
| 53                  | 120  | 110  |    |
| 57                  | 240  | 220  |    |

| Duty Cycle |                                      |
|------------|--------------------------------------|
| 2          | Standard service, solenoid or remote |
| 4          | Continuous service solenoid          |

| Enclosure "Class" |                                  |
|-------------------|----------------------------------|
| 10                | Standard (NEMA 1 & 12) or remote |

**Lubricated or Non-Lubricated Service**  
**3-position, Plug-In, 3/8" & 1" Basic Size**

**L 66 5 3 9 21 1 53**

| Type   |    |
|--------|----|
| Double | 66 |

| Operator |   |
|----------|---|
| Remote   | 4 |
| Solenoid | 5 |

| Size       |   |
|------------|---|
| 3/8" Basic | 3 |
| 1" Basic   | 8 |

| Operator options  |   |
|---|---|
| Solenoid (basic) or remote                              | 1 |
| Solenoid with locking override                          | 3 |
| Solenoid w/light (120VAC, 24VDC) & non-locking override | 8 |
| Solenoid w/light (120VAC, 24VDC) & locking override     | 9 |

| Voltage & frequency |      |      |    |
|---------------------|------|------|----|
|                     | 60Hz | 50Hz | DC |
| 45                  |      |      | 12 |
| 49                  |      |      | 24 |
| 53                  | 120  | 110  |    |
| 57                  | 240  | 220  |    |

| Duty cycle |                                      |
|------------|--------------------------------------|
| 1          | Standard service, solenoid or remote |
| 5          | Continuous service solenoid          |

| Enclosure "class" |   |
|-------------------|---|
| 21                | All ports blocked in neutral (NEMA 1 & 12 enclosure) or remote          |
| 22                | Cyl. Ports open to exhaust in neutral (NEMA 1 & 12 enclosure) or remote |
| 23                | Cyl. Ports open to inlet in neutral (NEMA 1 & 12 enclosure) or remote   |

**Lubricated or Non-Lubricated Service**  
**2-position, Direct Pipe Ported, 3/8" & 1" Basic Size**

**L 70 5 3 9 10 2 53 —**

| Type   |    |
|--------|----|
| Double | 68 |
| Single | 70 |

| Operator |   |
|----------|---|
| Remote   | 4 |
| Solenoid | 5 |

| Size                                       |    |
|--|----|
| 3/8" NPT inlet & cylinder 1/2" NPT exhaust | 3  |
| 1/2" NPT inlet, cylinder & exhaust         | 4  |
| 1" NPT inlet & cylinder 1-1/4" NPT exhaust | 8  |
| 1-1/4" NPT inlet cylinder & exhaust        | 9* |

\* Not available operator option 4 - Remote pilot.

| Operator options  |   |
|---|---|
| Solenoid (basic) or remote  | 1 |
| Solenoid with locking override  | 3 |
| Solenoid w/ junction box & locking override                             | 6 |
| Solenoid w/ junction box & light (120VAC, 24VDC) & non-locking override | 8 |
| Solenoid w/ junction box & light (120VAC, 24VDC) & locking override     | 9 |

| Lead length |                |
|-------------|----------------|
| Blank       | 19" (Standard) |

| Voltage & frequency |      |      |    |
|---------------------|------|------|----|
|                     | 60Hz | 50Hz | DC |
| 45                  |      |      | 12 |
| 49                  |      |      | 24 |
| 53                  | 120  | 110  |    |
| 57                  | 240  | 220  |    |

| Duty cycle |                                      |
|------------|--------------------------------------|
| 2          | Standard service, solenoid or remote |
| 4          | Continuous service solenoid          |

| Enclosure "Class" |                                  |
|-------------------|----------------------------------|
| 10                | Standard (NEMA 1 & 12) or remote |
| 60*†              | Hazardous duty (NEMA 7 & 9)      |
| 80*†              | NEMA 4                           |

\* Voltage 49 / 53 only.  
 † Use with operator options 1, 2 & 3 only, voltage 53 only.

**Lubricated or Non-Lubricated Service**  
**3-position, Direct Pipe Ported, 3/8" & 1" Basic Size**

**L 69 5 3 9 21 1 53 —**

| Type   |    |
|--------|----|
| Double | 69 |

| Operator |   |
|----------|---|
| Remote   | 4 |
| Solenoid | 5 |

| Size                                       |    |
|--|----|
| 3/8" NPT inlet & cylinder 1/2" NPT exhaust | 3  |
| 1/2" NPT inlet, cylinder & exhaust         | 4  |
| 1" NPT inlet & cylinder 1-1/4" NPT exhaust | 8  |
| 1-1/4" NPT inlet cylinder & exhaust        | 9* |

\* Not available operator option 4 - Remote pilot.

| Operator options  |   |
|---|---|
| Solenoid (basic) or remote  | 1 |
| Solenoid with locking override  | 3 |
| Solenoid w/ junction box & locking override                             | 6 |
| Solenoid w/ junction box & light (120VAC, 24VDC) & non-locking override | 8 |
| Solenoid w/ junction box & light (120VAC, 24VDC) & locking override     | 9 |

| Lead length |                |
|-------------|----------------|
| Blank       | 19" (Standard) |

| Voltage & frequency |      |      |    |
|---------------------|------|------|----|
|                     | 60Hz | 50Hz | DC |
| 45                  |      |      | 12 |
| 49                  |      |      | 24 |
| 53                  | 120  | 110  |    |
| 57                  | 240  | 220  |    |


| Duty cycle |                                      |
|------------|--------------------------------------|
| 1          | Standard service, solenoid or remote |
| 5          | Continuous service solenoid          |

| Enclosure "Class"                         |                                  |
|---|----------------------------------|
| All ports blocked in neutral              |                                  |
| 21  | Standard (NEMA 1 & 12) or remote |
| 71*†                                      | Hazardous duty (NEMA 7 & 9)      |
| 91*†                                      | NEMA 4                           |
| Cylinder ports open to exhaust in neutral |                                  |
| 22  | Standard (NEMA 1 & 12) or remote |
| 72*†                                      | Hazardous duty (NEMA 7 & 9)      |
| 92*†                                      | NEMA 4                           |
| Cylinder ports open to inlet in neutral   |                                  |
| 23  | Standard (NEMA 1 & 12) or remote |
| 73*†                                      | Hazardous duty (NEMA 7 & 9)      |
| 93*†                                      | NEMA 4                           |

\* Voltage 49 / 53 only.  
 † Use with operator options 1, 2 & 3 only, voltage 53 only.



|                                   |
|-----------------------------------|
| Valvair II Series                 |
| DX ISOMAX Series                  |
| Fieldbus                          |
| Isys ISO Series                   |
| Isys Micro Series                 |
| Moduflex Series                   |
| <b>D</b>                          |
| Subbase & Manifold Valve Products |

**Plug-in Pilot**

|   | Description                       | Standard service  |                   | Special service   |                   |
|---|-----------------------------------|-------------------|-------------------|-------------------|-------------------|
|   |                                   | Locking           | Non-locking       | Locking           | Non-locking       |
| <br>With indicator light | <b>Override type</b>              | Locking           | Non-locking       | Locking           | Non-locking       |
|   | With override (120VAC)            | <b>K175903553</b> | <b>K175803553</b> | <b>K185902553</b> | <b>K185802553</b> |
|   | With override (Other than 120VAC) | <b>K1753035**</b> | —                 | <b>K1853025**</b> | —                 |



\*\* Voltage code - (reference model index for availability)

**NEMA 1 & 12**

|  | Description   | Standard service  |                   | Special service   |                   |
|--|---|-------------------|-------------------|-------------------|-------------------|
|  |   | Locking           | Non-locking       | Locking           | Non-locking       |
| <br>Basic Pilot | <b>Override type</b>  | Locking           | Non-locking       | Locking           | Non-locking       |
|  | Basic with override   | <b>K0653035**</b> | —                 | <b>K0853025**</b> | —                 |
| <br>JIC Pilot   | JIC with junction box & override  | <b>K0656035**</b> | <b>K0655035**</b> | <b>K0856025**</b> | <b>K0855025**</b> |
|  | JIC pilot with junction box & override & indicator lights (120VAC Only) | <b>K0659035**</b> | <b>K0658035**</b> | <b>K0859025**</b> | <b>K0858025**</b> |

\*\* Voltage code - (reference model index for availability)

**NEMA 4, 7 & 9**

|  | Description                     | Standard service   |                    | Special service    |                    |
|--|---------------------------------|--------------------|--------------------|--------------------|--------------------|
|  |                                 | Locking            | Non-locking        | Locking            | Non-locking        |
| <br>Hazardous Duty | Hazardous duty pilot - UL & CSA | <b>K0251035***</b> | —                  | <b>K0451025***</b> | —                  |
|  | NEMA 4 pilot                    | <b>K2351035***</b> | —                  | —                  | —                  |
| <br>NEMA 4 Pilot  | <b>Override type</b>            | Locking            | Non-locking        | Locking            | Non-locking        |
|  | Hazardous duty with override    | <b>K0253035***</b> | <b>K0252035***</b> | <b>K0453025***</b> | <b>K0452025***</b> |
|  | NEMA 4 with override            | —                  | <b>K2353035***</b> | <b>K2352035***</b> | —                  |

† 49 / 53 only      \*\* Voltage code - (reference model index for availability)

**Service Kits**

|             |                 | Solenoid operated *                  |                       |                                      |                       |                       |                       |
|-------------|-----------------|--------------------------------------|-----------------------|--------------------------------------|-----------------------|-----------------------|-----------------------|
| Basic valve |                 | Standard service (intermittent duty) |                       | Special service ** (continuous duty) |                       | Remote pilot operated |                       |
| Size        | Series (prefix) | Single                               | Double 2 & 3-position | Single                               | Double 2 & 3-position | Single                | Double 2 & 3-position |
| 3/8"        | L65             | —                                    | <b>K352126</b>        | —                                    | <b>K352127</b>        | —                     | <b>K352355</b>        |
|             | L66             | —                                    | <b>K352126</b>        | —                                    | <b>K352127</b>        | —                     | <b>K352355</b>        |
|             | L67             | <b>K352124</b>                       | —                     | <b>K352125</b>                       | —                     | <b>K352362</b>        | —                     |
|             | L68             | —                                    | <b>K352126</b>        | —                                    | <b>K352127</b>        | —                     | <b>K352355</b>        |
|             | L69             | —                                    | <b>K352126</b>        | —                                    | <b>K352127</b>        | —                     | <b>K352355</b>        |
|             | L70             | <b>K352124</b>                       | —                     | <b>K352125</b>                       | —                     | <b>K352362</b>        | —                     |
|             | L65             | —                                    | <b>K352130</b>        | —                                    | <b>K352131</b>        | —                     | <b>K352360</b>        |
| 1"          | L66             | —                                    | <b>K352130</b>        | —                                    | <b>K352131</b>        | —                     | <b>K352360</b>        |
|             | L67             | <b>K352128</b>                       | —                     | <b>K352129</b>                       | —                     | <b>K352359</b>        | —                     |
|             | L68             | —                                    | <b>K352130</b>        | —                                    | <b>K352131</b>        | —                     | <b>K352360</b>        |
|             | L69             | —                                    | <b>K352130</b>        | —                                    | <b>K352131</b>        | —                     | <b>K352360</b>        |
|             | L70             | <b>K352128</b>                       | —                     | <b>K352129</b>                       | —                     | <b>K352359</b>        | —                     |

**Notes:**

\* Kits for solenoid operated valves include solenoid service kits.

\*\* Special service (continuous duty) solenoids may be identified as having gold colored solenoid tops.



Valvair II Series  
 DX ISOMAX Series  
 Fieldbus  
 Isys ISO Series  
 Isys Micro Series  
 Modulflex Series  
**D** Subbase & Manifold Valve Products

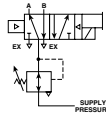
### Modular Pneumatic Controls, Plug-In Sandwich Block Design for Modular Port Regulation

These modular regulators assemble to any 3/8" basic valve interface pattern.

#### Common Port Regulator

| Pressure Adjustment | Pressure Range PSIG | Part number  |              |
|---------------------|---------------------|--------------|--------------|
|                     |                     | Assembly "A" | Assembly "B" |
| Manual              | 1 - 60              | L55402308C   | L55408302C   |
|                     | 2 - 125             | L55403308C   | L55408303C   |
| Remote              | 0 - 140             | L55411308C   | L55408311C   |

\* Assembly "A" places the regulator on the end opposite the electrical junction box. Assembly "B" places the regulator over the electrical junction box.

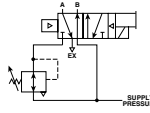


Regulated pressure at both "A" & "B"

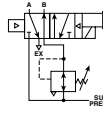
#### Single Port Regulator

| Pressure adjustment | Pressure range PSIG | Part number   |               |
|---------------------|---------------------|---------------|---------------|
|                     |                     | Cyl. port "A" | Cyl. port "B" |
| Manual              | 1 - 60              | L55405307C    | L55407305C    |
|                     | 2 - 125             | L55406307C    | L55407306C    |
| Remote              | 0 - 140             | L55414307C    | L55407314C    |

\* Assembly "A" places the regulator on the end opposite the electrical junction box. Assembly "B" places the regulator over the electrical junction box. Convert valve to external pilot.



Supply pressure at "B" & regulated at "A"

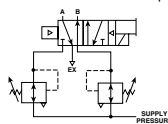


Supply pressure at "A" & regulated at "B"

#### Independent Port Regulator

| Pressure adjustment | Cylinder port "A" PSIG | Part number       |             |
|---------------------|------------------------|-------------------|-------------|
|                     |                        | Cylinder port "B" |             |
| Manual              | 1 - 60                 | L55405305C        | —           |
| Remote              | 0 - 140                | —                 | L55414314C† |

† Remote operator units 0-140 PSIG. Convert valve to external pilot.



Independently regulated pressure at both "A" & "B"

#### Blank Station Covers

| Manifold assembly | Blank cover kit  |
|-------------------|------------------|
| K142230           | 3/8" Basic valve |
| K142231           | 3/8" Basic valve |
| K142270           | 3/8" Basic valve |

### Flush Type Hex Drive Pipe Plugs for Port Isolation

| Size (NPTF) | Part number |
|-------------|-------------|
| 1/8"        | K21R02012L  |
| 1/4"        | K21R02025L  |
| 3/8"        | K21R02037L  |
| 1/2"        | K21R02050L  |
| 3/4"        | K21R02075L  |

### Interchangeable Manual Override Assemblies for Solenoid Operators



| Non-locking type | Locking type |
|------------------|--------------|
| K162001          | K152003      |

### Replacement Solenoid Coil

L □ □ □ □ □ □ □ □ \*\* Voltage Code

| Voltage code | Voltage |       |     | Coil number         |                     |
|--------------|---------|-------|-----|---------------------|---------------------|
|              | 60 Hz   | 50 Hz | DC  | Plug-In             | Flying lead (19") * |
| 49           | —       | —     | 24† | K593060<br>K593274‡ | K593014             |
| 53           | 120†    | 110   | —   | K593071<br>K593125‡ | K593025             |
| 57           | 240†    | 220   | —   | K593081             | K593035             |

Notes: **Bold Face** type indicated primary coil rating.

† Indicates voltages approved for solenoid operators designed for use in hazardous locations.

\* 19" Coil lead length is standard. Other lead lengths may be available, consult supplier.

‡ Assembly includes indicator light socket, less light.

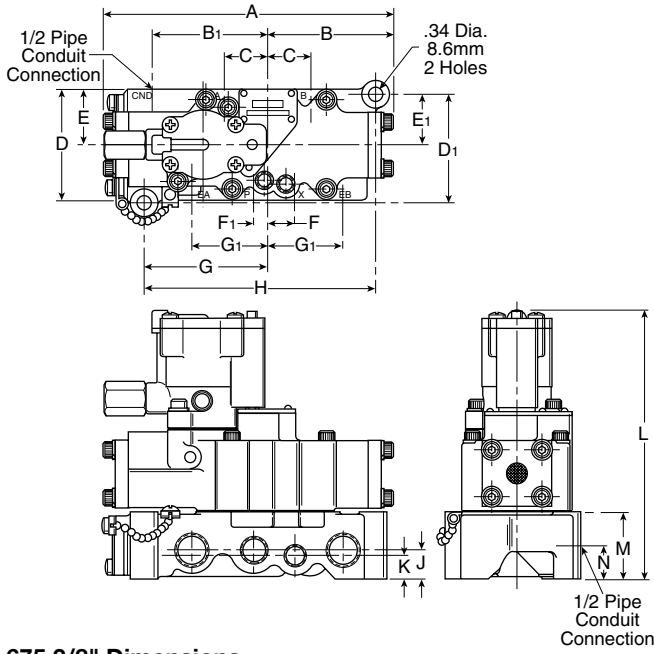
### Conversion Kits: Lubricated to Non-Lubricated Operation

| Basic size | Operators (solenoid or remote pilot) |                     |
|------------|--------------------------------------|---------------------|
|            | Single                               | Double (2-position) |
| 3/8"       | K322012                              | K322013             |

### Electrical Connectors Single or Double Solenoid Valves

| Basic size | Valve body      |                 | Subbase / manifold |           |
|------------|-----------------|-----------------|--------------------|-----------|
|            | Single solenoid | Double solenoid | 19" leads          | 72" leads |
| 3/8"       | H02723          | H02722          | H02713             | H02789    |
| 1"         |                 |                 |                    |           |

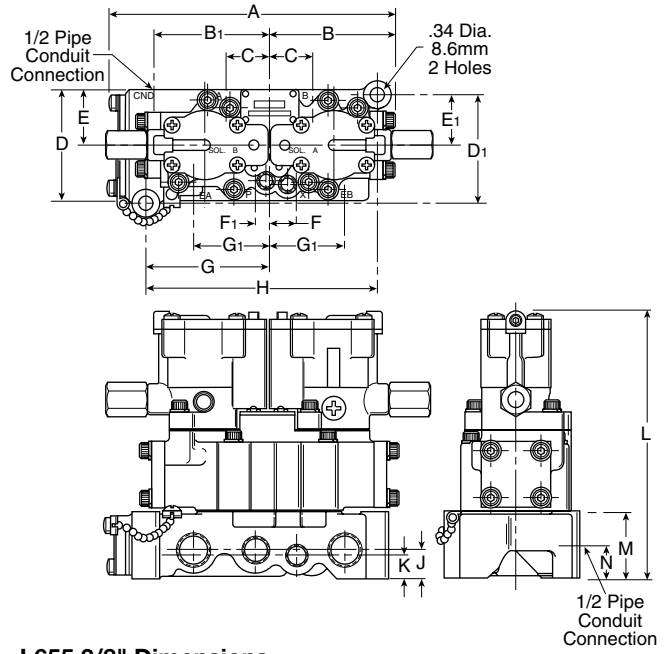
Valvair II Series  
 DX ISOMAX Series  
 Fieldbus  
 Isys ISO Series  
 Isys Micro Series  
 Modulflex Series  
**D**  
 Subbase & Manifold Valve Products



**L675 3/8" Dimensions**

| A              | B              | B <sub>1</sub> | C               | D              | D <sub>1</sub> | E              | E <sub>1</sub> | F              |
|----------------|----------------|----------------|-----------------|----------------|----------------|----------------|----------------|----------------|
| 7.56<br>(192)  | 3.32<br>(84.3) | 2.94<br>(74.7) | 1.12<br>(28.4)  | 2.88<br>(73.2) | 2.84<br>(72.1) | 1.44<br>(36.6) | 1.34<br>(34)   | .75<br>(19.1)  |
| F <sub>1</sub> | G              | G <sub>1</sub> | H               | J              | K              | L              | M              | N              |
| .38<br>(9.7)   | 3.16<br>(80.3) | 2.00<br>(50.8) | 6.03<br>(153.2) | .75<br>(19.1)  | .62<br>(15.7)  | 6.93<br>(176)  | 1.75<br>(44.5) | 1.00<br>(25.4) |

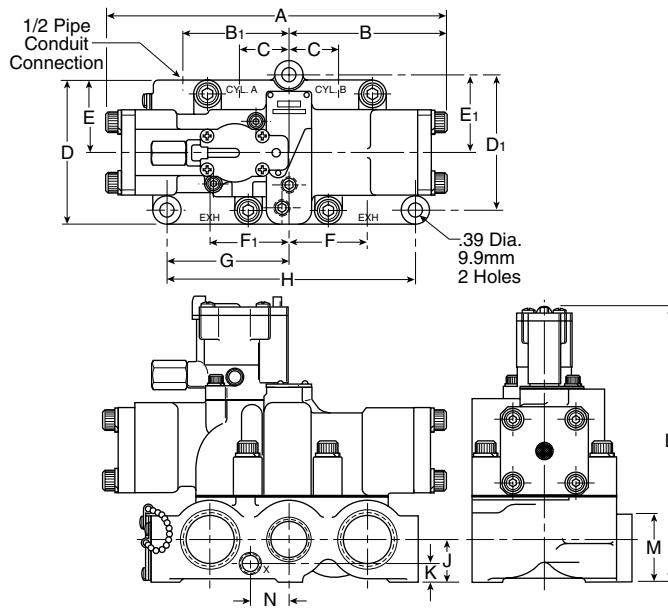
Inches (mm)



**L655 3/8" Dimensions**

| A               | B              | B <sub>1</sub> | C               | D              | D <sub>1</sub> | E              | E <sub>1</sub> | F              |
|-----------------|----------------|----------------|-----------------|----------------|----------------|----------------|----------------|----------------|
| 7.38<br>(187.5) | 3.32<br>(84.3) | 2.94<br>(74.7) | 1.12<br>(28.4)  | 2.88<br>(73.2) | 2.84<br>(72.1) | 1.44<br>(36.6) | 1.34<br>(34)   | .75<br>(19.1)  |
| F <sub>1</sub>  | G              | G <sub>1</sub> | H               | J              | K              | L              | M              | N              |
| .38<br>(9.7)    | 3.16<br>(80.3) | 2.00<br>(50.8) | 6.03<br>(153.2) | .75<br>(19.1)  | .62<br>(15.7)  | 6.93<br>(176)  | 1.75<br>(44.5) | 1.00<br>(25.4) |

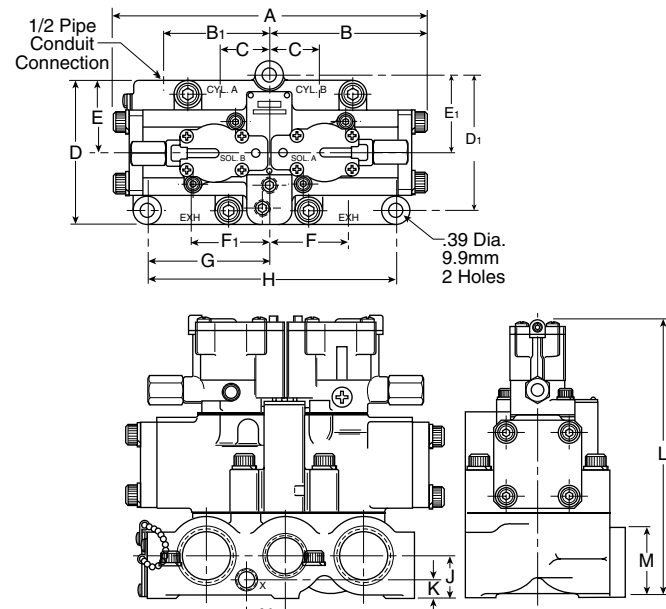
Inches (mm)



**L675 1" Dimensions**

| A                | B               | B <sub>1</sub>  | C              | D               | D <sub>1</sub>  | E              | E <sub>1</sub> | F              |
|------------------|-----------------|-----------------|----------------|-----------------|-----------------|----------------|----------------|----------------|
| 10.46<br>(265.7) | 4.75<br>(120.6) | 2.94<br>(74.7)  | 3.38<br>(85.8) | 4.56<br>(115.8) | 4.28<br>(108.7) | 2.28<br>(57.9) | 2.44<br>(62)   | 2.45<br>(62.2) |
| F <sub>1</sub>   | G               | H               | J              | K               | L               | M              | N              |                |
| 2.46<br>(62.5)   | 3.81<br>(96.8)  | 7.62<br>(193.5) | 1.31<br>(33.3) | .59<br>(15)     | 8.74<br>(222)   | 2.09<br>(53.1) | 1.22<br>(31)   |                |

Inches (mm)

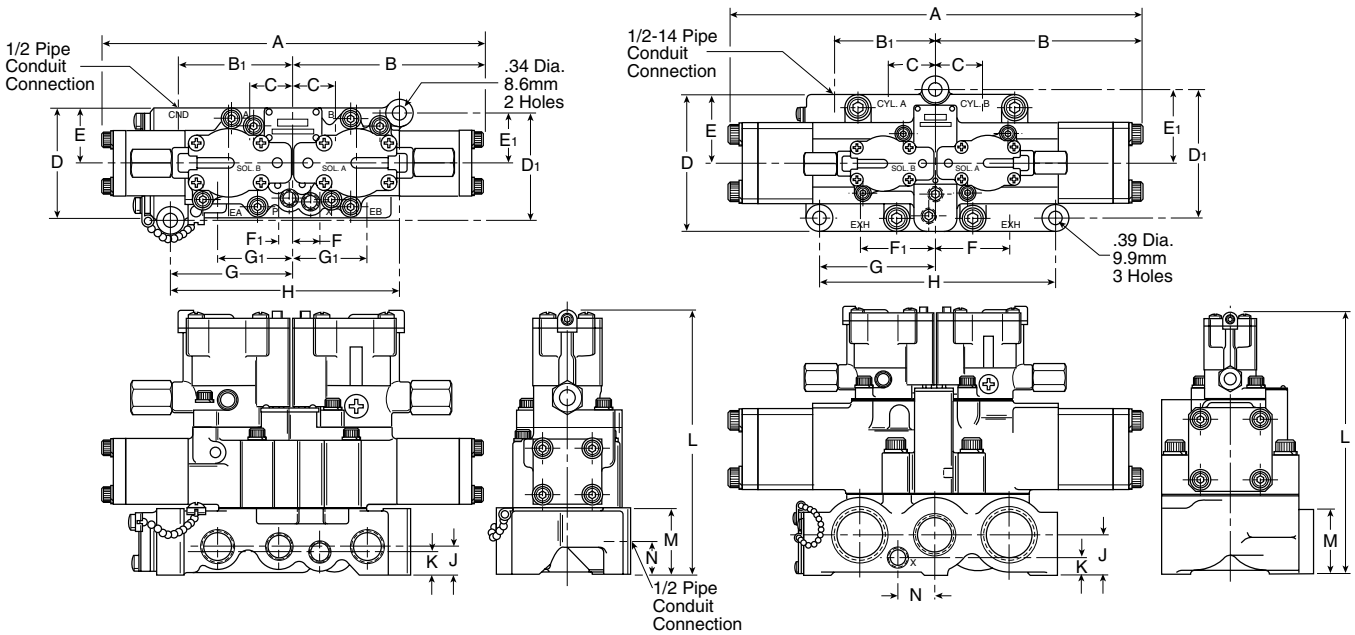


**L655 1" Dimensions**

| A               | B               | B <sub>1</sub>  | C              | D               | D <sub>1</sub>  | E              | E <sub>1</sub> | F              |
|-----------------|-----------------|-----------------|----------------|-----------------|-----------------|----------------|----------------|----------------|
| 9.50<br>(241.3) | 4.75<br>(120.6) | 3.38<br>(85.8)  | 1.53<br>(38.9) | 4.56<br>(115.8) | 4.28<br>(108.7) | 2.28<br>(57.9) | 2.44<br>(62)   | 2.45<br>(62.2) |
| F <sub>1</sub>  | G               | H               | J              | K               | L               | M              | N              |                |
| 2.46<br>(62.5)  | 3.81<br>(96.8)  | 7.62<br>(193.5) | 1.31<br>(33.3) | .59<br>(15)     | 8.74<br>(222)   | 2.09<br>(53.1) | 1.22<br>(31)   |                |

Inches (mm)





**L665 3/8" Dimensions**

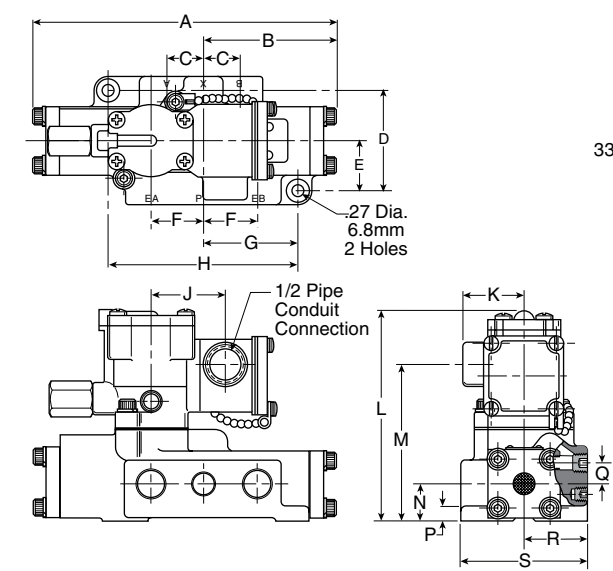
| A              | B       | B <sub>1</sub> | C       | D      | D <sub>1</sub> | E      | E <sub>1</sub> | F      |
|----------------|---------|----------------|---------|--------|----------------|--------|----------------|--------|
| 9.64           | 4.82    | 2.94           | 1.12    | 2.88   | 2.84           | 1.44   | 1.34           | .75    |
| (244.8)        | (122.4) | (74.7)         | (28.4)  | (73.2) | (72.1)         | (36.6) | (34)           | (19.1) |
| F <sub>1</sub> | G       | G <sub>1</sub> | H       | J      | K              | L      | M              |        |
| .38            | 3.16    | 2.00           | 6.03    | .75    | .62            | 6.93   | 1.00           |        |
| (9.7)          | (80.3)  | (50.8)         | (153.2) | (19.1) | (15.7)         | 176)   | (25.4)         |        |

Inches (mm)

**L665 1" Dimensions**

| A              | B      | B <sub>1</sub> | C      | D       | D <sub>1</sub> | E      | E <sub>1</sub> | F      |
|----------------|--------|----------------|--------|---------|----------------|--------|----------------|--------|
| 13.62          | 6.81   | 3.38           | 1.53   | 4.56    | 4.28           | 2.28   | 2.44           | 2.45   |
| (345.9)        | (173)  | (85.8)         | (38.9) | (115.8) | (108.7)        | (57.9) | (62)           | (62.2) |
| F <sub>1</sub> | G      | H              | J      | K       | L              | M      | N              |        |
| 2.46           | 3.81   | 7.62           | 1.31   | .59     | 8.74           | 2.09   | 1.22           |        |
| (62.5)         | (96.8) | (193.5)        | (33.3) | (15)    | (222)          | (53.1) | (31)           |        |

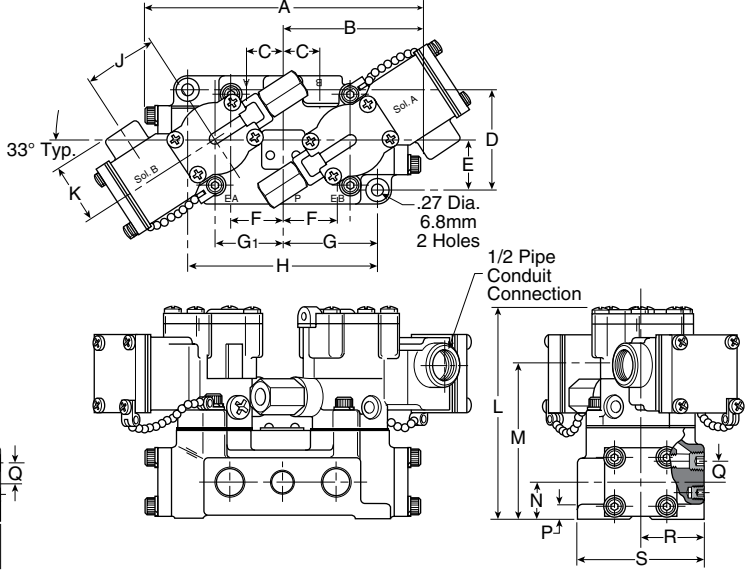
Inches (mm)



**L705 3/8" Dimensions**

| A      | B       | C      | D      | E      | F      | G      | H       | J      |
|--------|---------|--------|--------|--------|--------|--------|---------|--------|
| 7.56   | 3.32    | .90    | 2.56   | 1.28   | 1.33   | 2.34   | 4.69    | 1.82   |
| (192)  | (84.3)  | (22.9) | (65)   | (32.5) | (33.8) | (59.4) | (119.1) | (46.2) |
| K      | L       | M      | N      | P      | Q      | R      | S       |        |
| 1.50   | 5.35    | 3.91   | .94    | .38    | .53    | 1.62   | 3.25    |        |
| (38.1) | (135.9) | (99.3) | (23.9) | (9.7)  | (13.5) | (41.1) | (82.6)  |        |

Inches (mm)



**L685 3/8" Dimensions**

| A      | B      | C       | D      | E      | F      | G      | G <sub>1</sub> | H       |
|--------|--------|---------|--------|--------|--------|--------|----------------|---------|
| 7.56   | 3.32   | .90     | 2.56   | 1.28   | 1.33   | 2.34   | 1.66           | 4.69    |
| (192)  | (84.3) | (22.9)  | (65)   | (32.5) | (33.8) | (59.4) | (42.4)         | (119.1) |
| J      | K      | L       | M      | N      | P      | Q      | R              | S       |
| 1.82   | 1.50   | 5.35    | 3.91   | .94    | .38    | .53    | 1.62           | 3.25    |
| (46.2) | (38.1) | (135.9) | (99.3) | (23.9) | (9.7)  | (13.5) | (41.1)         | (82.6)  |

Inches (mm)

Valvair II Series

DX ISOMAX Series

Fieldbus

Isys ISO Series

Isys Micro Series

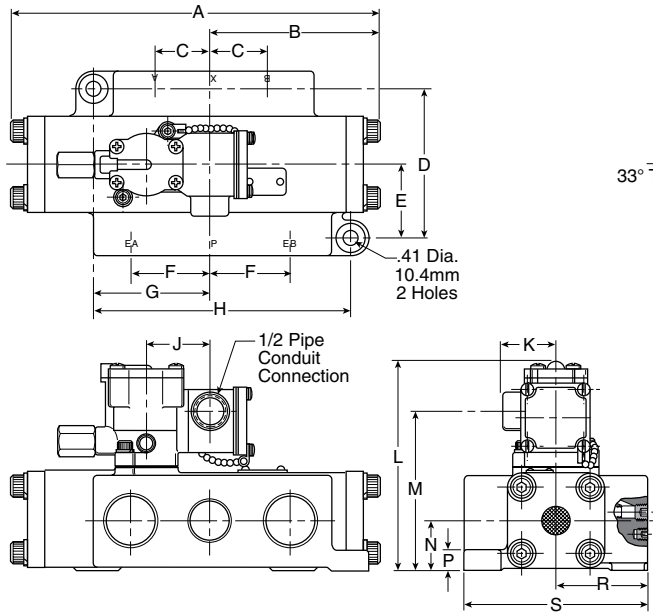
Moduflex Series

**D**

Subbase & Manifold Valve Products



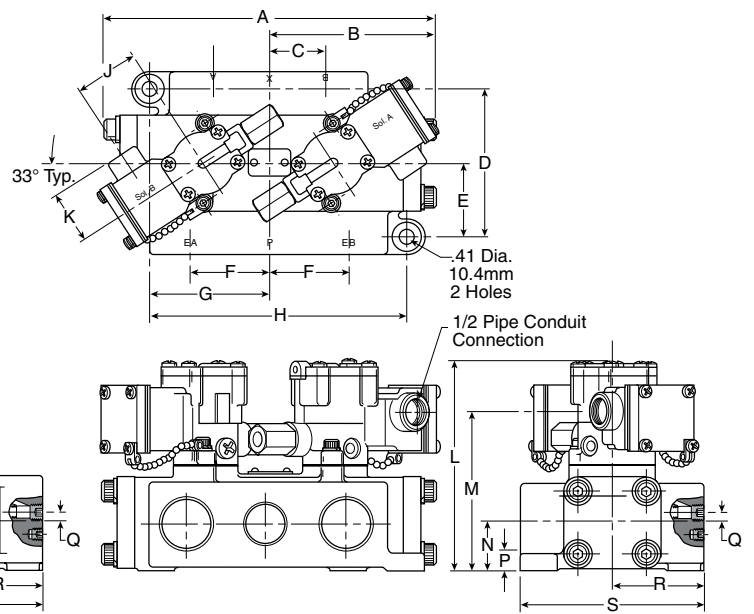
Valvair II Series  
 DX ISOMAX Series  
 Fieldbus  
 Isys ISO Series  
 Isys Micro Series  
 Modulflex Series  
 D Subbase & Manifold Valve Products



**L705 1" Dimensions**

| A       | B       | C       | D      | E      | F      | G      | H       | J      |
|---------|---------|---------|--------|--------|--------|--------|---------|--------|
| 10.46   | 4.75    | 1.62    | 4.25   | 2.12   | 2.19   | 3.44   | 7.44    | 1.82   |
| (265.7) | (120.6) | (41.1)  | (108)  | (53.8) | (55.6) | (87.4) | (189)   | (46.2) |
| K       | L       | M       | N      | P      | Q      | R      | S       |        |
| 1.50    | 6.44    | 4.95    | 1.50   | .69    | .20    | 2.62   | 5.25    |        |
| (38.1)  | (163.6) | (125.7) | (38.1) | (17.5) | (5.1)  | (66.5) | (133.4) |        |

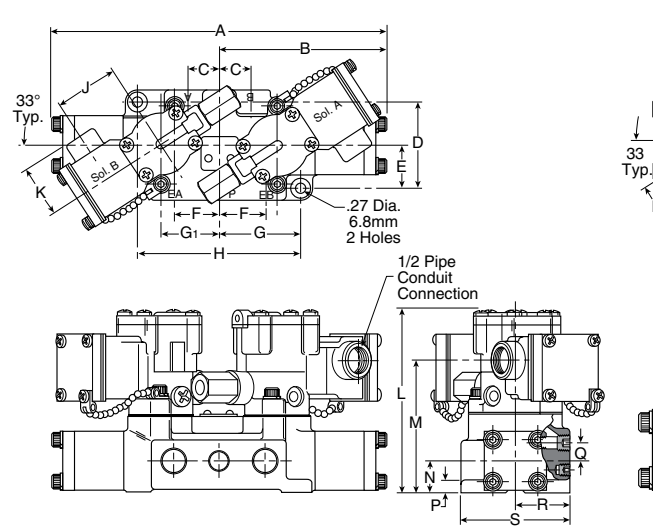
Inches (mm)



**L685 1" Dimensions**

| A       | B       | C       | D      | E      | F      | G      | H       | J      |
|---------|---------|---------|--------|--------|--------|--------|---------|--------|
| 9.50    | 4.75    | 1.62    | 4.25   | 2.12   | 2.19   | 3.44   | 7.44    | 1.82   |
| (241.3) | (120.6) | (41.1)  | (108)  | (53.8) | (55.6) | (87.4) | (189)   | (46.2) |
| K       | L       | M       | N      | P      | Q      | R      | S       |        |
| 1.50    | 6.44    | 4.95    | 1.50   | .69    | .20    | 2.62   | 5.25    |        |
| (38.1)  | (163.6) | (125.7) | (38.1) | (17.5) | (5.1)  | (66.5) | (133.4) |        |

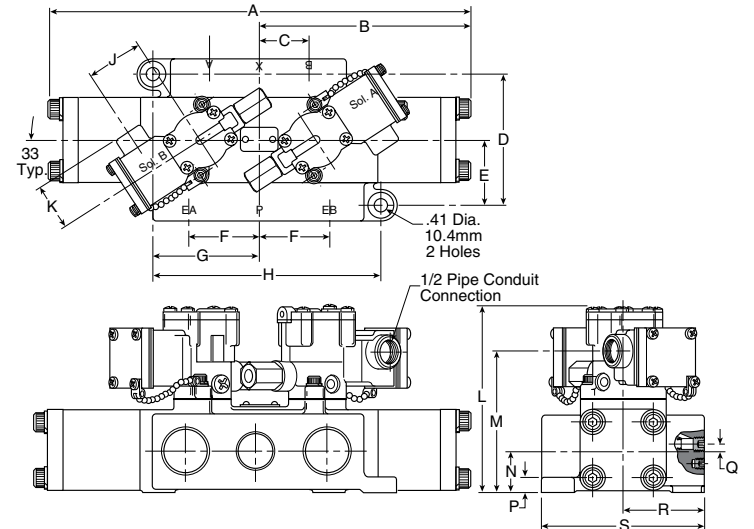
Inches (mm)



**L695 3/8" Dimensions**

| A       | B       | C       | D      | E      | F      | G      | G1     | H       |
|---------|---------|---------|--------|--------|--------|--------|--------|---------|
| 9.64    | 4.82    | .90     | 2.56   | 1.28   | 1.33   | 2.34   | 1.66   | 4.69    |
| (244.8) | (122.4) | (22.9)  | (65)   | (32.5) | (33.8) | (59.4) | (42.4) | (119.1) |
| J       | K       | L       | M      | N      | P      | Q      | R      | S       |
| 1.82    | 1.50    | 5.35    | 3.91   | .94    | .38    | .53    | 1.62   | 3.25    |
| (46.2)  | (38.1)  | (135.9) | (99.3) | (23.9) | (9.7)  | (13.5) | (41.1) | (82.6)  |

Inches (mm)



**L695 1" Dimensions**

| A       | B       | C       | D      | E      | F      | G      | H       | J      |
|---------|---------|---------|--------|--------|--------|--------|---------|--------|
| 13.63   | 6.81    | 1.62    | 4.25   | 2.12   | 2.19   | 3.44   | 7.44    | 1.82   |
| (346.2) | (173)   | (41.1)  | (108)  | (53.8) | (55.6) | (87.4) | (189)   | (46.2) |
| K       | L       | M       | N      | P      | Q      | R      | S       |        |
| 1.50    | 6.44    | 4.95    | 1.50   | .69    | .20    | 2.62   | 5.25    |        |
| (38.1)  | (163.6) | (125.7) | (38.1) | (17.5) | (5.1)  | (66.5) | (133.4) |        |

Inches (mm)





**Plug-in Manifold, 3/8" Basic**

- K142230 .....Cylinder ports 3/8" NPTF
- K142231 .....Cylinder ports 1/2" NPTF
- K142270 .....Cylinder ports 3/4" NPTF
  - Exhaust port..... 1" NPTF
  - Inlet port..... 1" NPTF
  - Conduit port..... 1-1/4" NPTF

**Note:** Manifold assemblies include mounting hardware.

|                                   |
|-----------------------------------|
| Valvair II Series                 |
| DX ISOMAX Series                  |
| Fieldbus                          |
| Isys ISO Series                   |
| Isys Micro Series                 |
| Moduflex Series                   |
| D                                 |
| Subbase & Manifold Valve Products |

**Features**

**Directair 2, 1/8" valves**  
**Poppet style – .17 Cv**

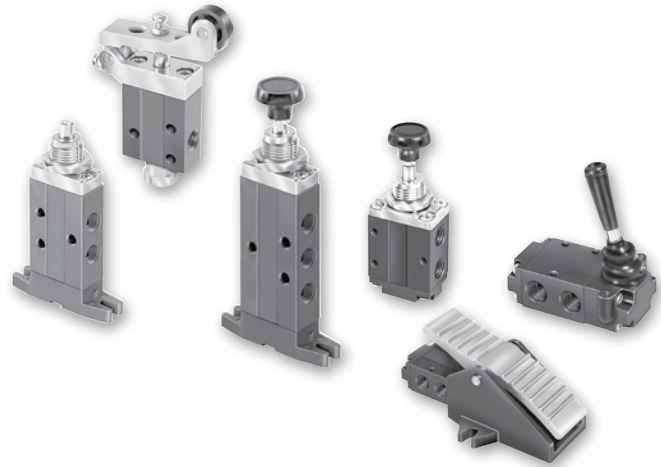
- Economical
- 3-way normally closed function

**Directair 2, 1/8" valves**  
**Packed bore style – .20 Cv**

- Stainless steel spool
- Fluorocarbon o-rings
- 3-way & 4-way

**Directair 4, 1/4" valves**  
**Packed bore style – .83 Cv**

- Stainless steel spool
- Fluorocarbon o-rings
- 3-way & 4-way



Brass Poppet /  
Sliding Seal

LV-EZ Series  
Lockout Valves

M0  
Series

42 Lever /  
Pedal Series

Viking Xtreme  
Lever Series

Directair 2,  
Directair 4

**D**

Manual / Mechanical  
Valve Products

**Material specifications**

|                            |                    |
|----------------------------|--------------------|
| Body and operator housings | Aluminum extrusion |
| Bushings and pilot piston  | Brass              |
| Dynamic seals              | Fluorocarbon       |
| O-rings                    | Buna (nitrile)     |
| Poppet ball                | Nylon              |
| Spacers - Directair 2      | Aluminum           |
| Spacers - Directair 4      | Zinc die cast      |
| Spool                      | Stainless steel    |

**Lubrication**

For maximum service life use clean, lubricated air. Valves are shipped pre-lubricated and can be operated without additional lubrication with reduced service life.

**Suggested Lubricant**

F442 Oil

**Operating information**

|  |   |
|--|---|
| Operating pressure   | Vacuum to 150 PSI<br>(28 inHg to 1035 kPa)* |
| Temperature range  | 32°F to 175°F (0°C to 80°C)                 |
| * Poppet valves cannot be used for vacuum.<br>Minimum operating pressure = 0 PSIG. |   |

**CAUTION:**  
 If it is possible that the ambient temperature may fall below freezing, the medium must be moisture free to prevent internal damage or unpredictable behavior.

**Mechanically operated actuating forces in lbs.**  
**1/4" Directair 4 valves**

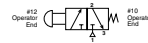
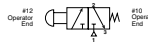
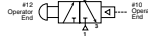

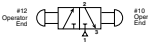
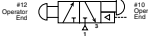
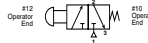
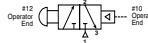
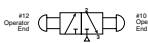
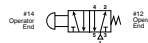
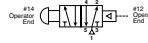

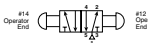
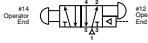

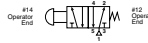





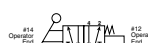

|                            | 2-Position<br>Spring<br>Return | 2-Position<br>Manual<br>Return | 3-Position<br>Spring<br>Return | 3-Position<br>Manual<br>Return |
|----------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| <b>Button<br/>Actuator</b> | 13.0                           | 2.0                            | 13.0                           | N/A                            |
| <b>Roller<br/>Actuator</b> | 13.0                           | N/A                            | N/A                            | N/A                            |
| <b>Lever<br/>Actuator</b>  | 4.0                            | 2.0                            | 4.0                            | 2.5                            |

**Notes:** N/A = Not Applicable  
 All valves are at 100 PSIG inlet pressure to the valve.

Most popular. For technical information see CD



**3-way & 4-way Valves**

|   | Symbol  | Port size                        | Cv                                 | Description                        | Valve type           | Part number      |                  |
|---|---|----------------------------------|------------------------------------|------------------------------------|----------------------|------------------|------------------|
| <br><br><br><br><br><br><br><br> | <p>Button operated, 3-way</p>   | 1/8"                             | .17                                | 3-way, spring return               | Poppet               | <b>404411000</b> |                  |
|   | 1/8"  | .20                              | 3-way, spring return               | Spool                              | <b>414411000</b>     |                  |                  |
|   | 1/8"  | .20                              | 3-way, spring return, foot mounted | Spool                              | <b>414421000</b>     |                  |                  |
|   | 1/8"  | .20                              | 3-way, pilot return                | Spool                              | <b>414451000</b>     |                  |                  |
|   | 1/8"  | .20                              | 3-way, manual return               | Spool                              | <b>414931000</b>     |                  |                  |
|   | 1/8"  | .20                              | 3-way, manual return, foot mounted | Spool                              | <b>414941000</b>     |                  |                  |
|   | 1/8"  | .20                              | 3-way, manual or pilot return      | Spool                              | <b>414951000</b>     |                  |                  |
|   | 1/4"  | .83                              | 3-way, spring return               | Spool                              | <b>524411000</b>     |                  |                  |
|   | 1/4"  | .83                              | 3-way, pilot return                | Spool                              | <b>524451000</b>     |                  |                  |
|   | 1/4"  | .83                              | 3-way, manual return               | Spool                              | <b>524431000</b>     |                  |                  |
|   | <br><br><br><br><br><br><br><br> | <p>Button operated, 4-way</p>    | 1/8"                               | .20                                | 4-way, spring return | Spool            | <b>410411000</b> |
|   |   | 1/8"                             | .20                                | 4-way, spring return, foot mounted | Spool                | <b>410421000</b> |                  |
| 1/8"  |   | .20                              | 4-way, pilot return                | Spool                              | <b>410451000</b>     |                  |                  |
| 1/8"  |   | .20                              | 4-way, manual return               | Spool                              | <b>410931000</b>     |                  |                  |
| 1/8"  |   | .20                              | 4-way, manual return, foot mounted | Spool                              | <b>410941000</b>     |                  |                  |
| 1/8"  |   | .20                              | 4-way, manual or pilot return      | Spool                              | <b>410951000</b>     |                  |                  |
| 1/4"  |   | .83                              | 4-way, spring return               | Spool                              | <b>520411000</b>     |                  |                  |
| 1/4"  |   | .83                              | 4-way, pilot return                | Spool                              | <b>520451000</b>     |                  |                  |
| 1/4"  |   | .83                              | 4-way, manual return               | Spool                              | <b>520431000</b>     |                  |                  |
| <br><br><br><br>   |   | <p>Toggle operated, detented</p> | 1/8"                               | .17                                | 3-way, spring return | Poppet           | <b>404811000</b> |
|   |   | 1/8"                             | .20                                | 3-way, spring return               | Spool                | <b>414811000</b> |                  |
|   |   | 1/8"                             | .20                                | 3-way, spring return, foot mounted | Spool                | <b>414821000</b> |                  |
|   | 1/8"  | .20                              | 4-way, spring return               | Spool                              | <b>410811000</b>     |                  |                  |
|   | 1/8"  | .20                              | 4-way, spring return, foot mounted | Spool                              | <b>410821000</b>     |                  |                  |

Brass Poppet / Sliding Seal

LV-EZ Series Lockout Valves

M0 Series

42 Lever / Pedal Series

Viking Xtreme Lever Series

Directair 2, Directair 4



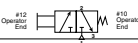
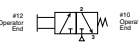
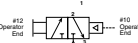
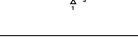

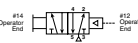
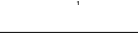


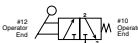
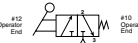
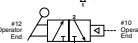
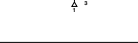


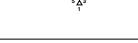


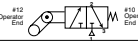
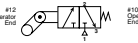
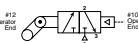

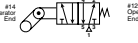
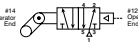


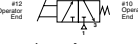
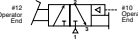

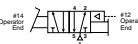

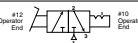
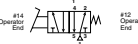
**D**  
 Manual / Mechanical Valve Products



**3-way & 4-way Valves**

|   | Symbol | Port size | Cv                                  | Description                                   | Valve type       | Part number      |
|---|--------|-----------|-------------------------------------|---|------------------|------------------|
| <b>Lever operated</b><br><br>Brass Poppet / Sliding Seal<br><br>LV-EZ Series Lockout Valves<br><br>M0 Series<br><br>42 Lever / Pedal Series<br><br>Viking Xtreme Lever Series<br><br>Directair 2, Directair 4<br><br>Manual / Mechanical Valve Products |        | 1/4"      | .83                                 | 3-way, spring return                          | Spool            | <b>524811000</b> |
|   |        | 1/4"      | .83                                 | 3-way, manual return                          | Spool            | <b>524831000</b> |
|   |        | 1/4"      | .83                                 | 3-way, 3-Position detented, all ports blocked | Spool            | <b>523831000</b> |
|   |        | 1/4"      | .83                                 | 4-way, spring return                          | Spool            | <b>520811000</b> |
|   |        | 1/4"      | .83                                 | 4-way, manual return                          | Spool            | <b>520831000</b> |
|   |        | 1/4"      | .83                                 | 4-way, spring centered, closed center         | Spool            | <b>521811000</b> |
|   |        | 1/4"      | .83                                 | 4-way, spring centered, pressure center       | Spool            | <b>522811000</b> |
|   |        | 1/4"      | .83                                 | 4-way, spring centered, exhaust center        | Spool            | <b>529811000</b> |
|   |        | 1/4"      | .83                                 | 4-way, detented, closed center                | Spool            | <b>521831000</b> |
|   |        | 1/4"      | .83                                 | 4-way, detented, pressure center              | Spool            | <b>522831000</b> |
|   |        | 1/4"      | .83                                 | 4-way, detented, exhaust center               | Spool            | <b>529831000</b> |
|   |        | 1/8"      | .20                                 | 3-way, spring return                          | Poppet           | <b>404211000</b> |
|   |        | 1/8"      | .20                                 | 3-way, spring return                          | Spool            | <b>414211000</b> |
|   |        | 1/8"      | .20                                 | 3-way, spring return, foot mounted            | Spool            | <b>414221000</b> |
|   | 1/8"   | .20       | 3-way, pilot return                 | Spool   | <b>414251000</b> |                  |
|   | 1/8"   | .20       | 4-way, spring return                | Spool   | <b>410211000</b> |                  |
|   | 1/8"   | .20       | 4-way, spring return, foot mounted  | Spool   | <b>410221000</b> |                  |
|   | 1/8"   | .20       | 4-way, pilot return                 | Spool   | <b>410251000</b> |                  |
|   | 1/4"   | .83       | 3-way, spring return, delrin roller | Spool   | <b>524211000</b> |                  |
|   | 1/4"   | .83       | 3-way, pilot return, delrin roller  | Spool   | <b>524251000</b> |                  |
|   | 1/4"   | .83       | 3-way, spring return, steel roller  | Spool   | <b>524A11000</b> |                  |
|   | 1/4"   | .83       | 3-way, pilot return, steel roller   | Spool   | <b>524A51000</b> |                  |
|   | 1/4"   | .83       | 4-way, spring return, delrin roller | Spool   | <b>520211000</b> |                  |
|   | 1/4"   | .83       | 4-way pilot return, delrin roller   | Spool   | <b>520251000</b> |                  |
|   | 1/4"   | .83       | 4-way, spring return, steel roller  | Spool   | <b>520A11000</b> |                  |
|   | 1/4"   | .83       | 4-way, pilot return, steel roller   | Spool   | <b>520A51000</b> |                  |

**3-way & 4-way Valves**

|   | Symbol  | Port size   | Cv   | Description                        | Valve type                         | Part number      |                  |
|---|---|---|------|------------------------------------|------------------------------------|------------------|------------------|
| <b>Plunger operated</b><br><br>             |    | 1/8"  | .17  | 3-way, spring return               | Poppet                             | <b>404111000</b> |                  |
|   |    | 1/8"  | .20  | 3-way, spring return               | Spool                              | <b>414111000</b> |                  |
|   |    | 1/8"  | .20  | 3-way, spring return, foot mounted | Spool                              | <b>414121000</b> |                  |
|   |    | 1/8"  | .20  | 3-way, pilot return                | Spool                              | <b>414151000</b> |                  |
|   |    | 1/8"  | .17  | 4-way, spring return               | Spool                              | <b>410111000</b> |                  |
|   |    | 1/8"  | .20  | 4-way, spring return, foot mounted | Spool                              | <b>410121000</b> |                  |
|   |    | 1/8"  | .20  | 4-way, pilot return                | Spool                              | <b>410151000</b> |                  |
|   | <b>Hand lever operated</b><br><br> |    | 1/8" | .17                                | 3-way, spring return               | Poppet           | <b>404711000</b> |
|   |   |    | 1/8" | .20                                | 3-way, spring return               | Spool            | <b>414711000</b> |
|   |   |    | 1/8" | .20                                | 3-way, spring return, foot mounted | Spool            | <b>414721000</b> |
|    |   | 1/8"  | .20  | 3-way, pilot return                | Spool                              | <b>414751000</b> |                  |
|    |   | 1/8"  | .20  | 4-way, spring return               | Spool                              | <b>410711000</b> |                  |
|    |   | 1/8"  | .20  | 4-way, spring return, foot mounted | Spool                              | <b>410721000</b> |                  |
|   |   | 1/8"  | .20  | 4-way, pilot return                | Spool                              | <b>410751000</b> |                  |
| <b>One way tripper operated</b><br><br> |   |  | 1/8" | .17                                | 3-way, spring return               | Poppet           | <b>404311000</b> |
|   |   |  | 1/8" | .20                                | 3-way, spring return               | Spool            | <b>414311000</b> |
|   |   |  | 1/8" | .20                                | 3-way, spring return, foot mounted | Spool            | <b>414321000</b> |
|   |    | 1/8"  | .20  | 3-way, pilot return                | Spool                              | <b>414351000</b> |                  |
|   |    | 1/8"  | .20  | 4-way, spring return               | Spool                              | <b>414311000</b> |                  |
|   |    | 1/8"  | .20  | 4-way, spring return, foot mounted | Spool                              | <b>414321000</b> |                  |
|   |    | 1/8"  | .20  | 4-way, pilot return                | Spool                              | <b>414351000</b> |                  |
|   | <b>Pedal operated</b><br>  |  | 1/4" | .83                                | 3-way, spring return               | Spool            | <b>524711000</b> |
|   |   |  | 1/4" | .83                                | 3-way, pilot return                | Spool            | <b>524751000</b> |
|   |   |  | 1/4" | .83                                | 4-way, spring return               | Spool            | <b>520711000</b> |
|    |   | 1/4"  | .83  | 4-way, pilot return                | Spool                              | <b>520751000</b> |                  |
| <b>Treadle operated</b><br>  |   |  | 1/4" | .83                                | 3-way, treadle operated, detented  | Spool            | <b>524931000</b> |
|   |    | 1/4"  | .83  | 4-way, treadle operated, detented  | Spool                              | <b>520931000</b> |                  |

**CAUTION:**  
 This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.217.

**CAUTION:**  
 This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.217.

Brass Poppet /  
Sliding Seal

LV-EZ Series  
Lockout Valves

M0  
Series

42 Lever /  
Pedal Series

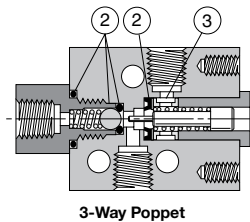
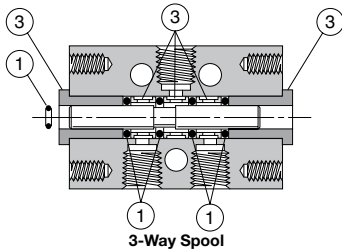
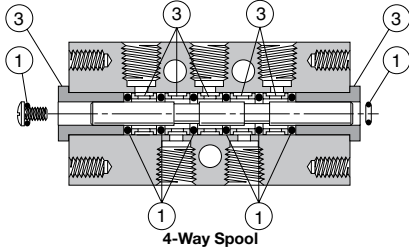
Viking Xtreme  
Lever Series

Directair 2,  
Directair 4

**D**  
Manual / Mechanical  
Valve Products

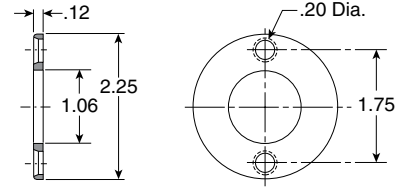
**Service kits – 1/8 port size valves (DA2)**

|   |   |                  |
|---|---|------------------|
| ① | Spool valve seal kit<br>(3 & 4-way, direct pipe ported) | <b>410008000</b> |
| ② | Poppet valve seal kit                                   | <b>404118000</b> |
| ③ | Body service kit  | <b>410008005</b> |



**Panel Mounting Kit – No. 520838004**

Available for panel mounting direct pipe ported, lever operated 1/4" Directair 4 Series valves only. Kit includes a flange and two screws.



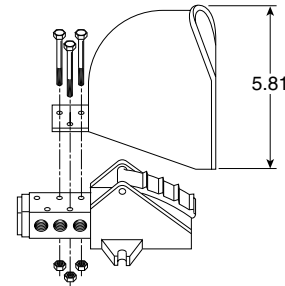
**Pedal Guard Kit – No. 520718001**

Pedal guard meets safety requirements for foot operated valves by protecting pedal from accidental tripping from all angles. Guard is constructed of lightweight aluminum casting for strength and durability. Bolts quickly into place with only three screws without special valve mounting. One model fits any pedal (not treadle) operated 1/4" Directair 4 Series valve.



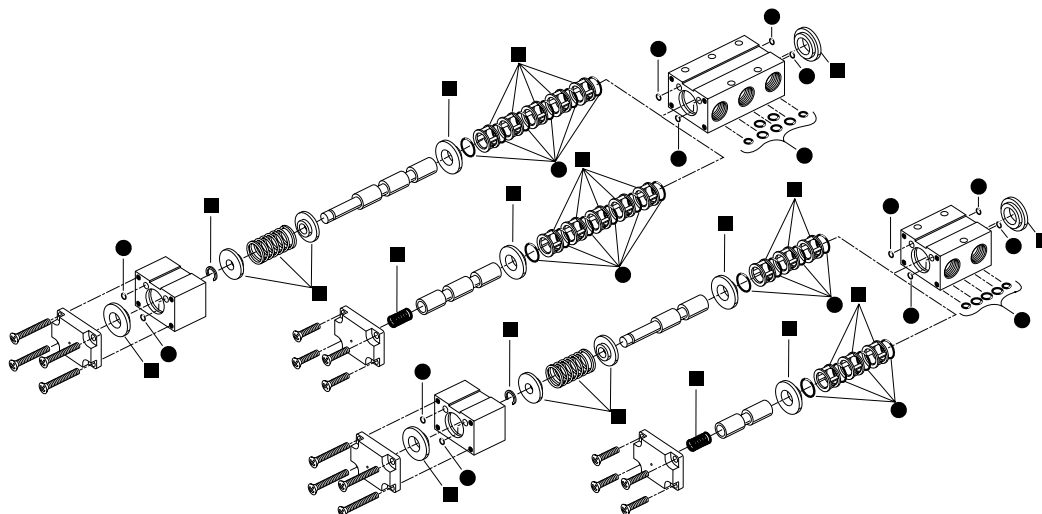
**CAUTION:**

*This valve shall not be used to actuate a punch press.  
 Do not use this valve on punch presses or press brakes.  
 See OSHA 1910.217.*



**Service kits – 1/4 port size valves (DA4)**

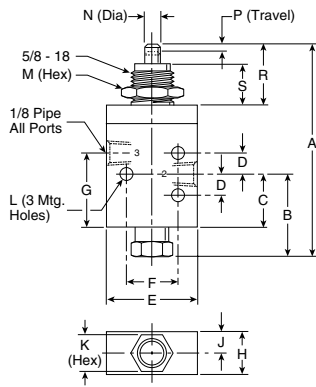
|   |   |                  |
|---|---|------------------|
| ● | <b>Valve seal kit</b><br>(Contains all soft seals found in 3 & 4-way bodies and all actuator styles.)<br>All fluorocarbon | <b>520008050</b> |
| ■ | <b>Body service kit</b><br>(Contains bushing, springs, retainers and shell from 2 & 3-position, 3 & 4-way bodies.)        | <b>520018005</b> |



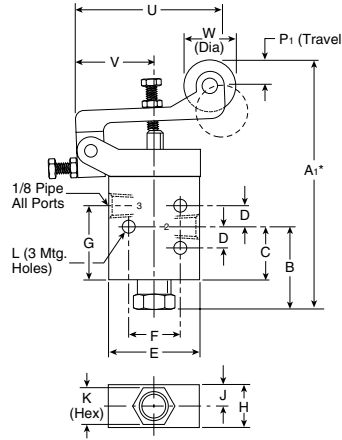
Brass Poppet / Sliding Seal  
 LV-EZ Series Lockout Valves  
 M0 Series  
 42 Lever / Pedal Series  
 Viking Xtreme Lever Series  
 Directair 2, Directair 4  
 Manual / Mechanical Valve Products

**Plunger, Roller, One-way Tripper & Toggle Operated — 3-Way, 3-Port, 2-Position – 1/8" Ports**

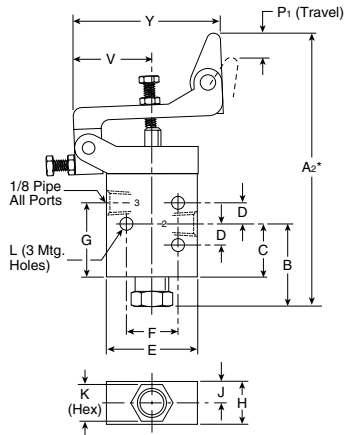
**Plunger Operated**



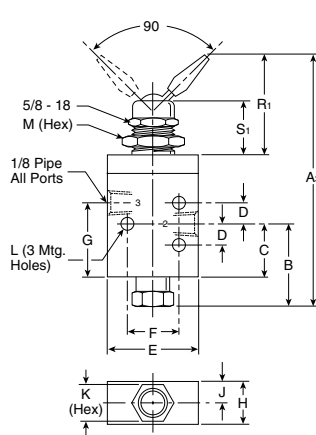
**Roller Operated**



**One-Way Tripper Operated**



**Toggle Operated**



**3-Way, 3-Port, 2-Position**

| A            | A1*           | A2*           | A3            | B            |
|--------------|---------------|---------------|---------------|--------------|
| 3.37<br>(86) | 4.21<br>(107) | 4.46<br>(113) | 3.99<br>(101) | 1.03<br>(26) |

| C           | D          | E            | F           | G           |
|-------------|------------|--------------|-------------|-------------|
| .55<br>(14) | .31<br>(8) | 1.31<br>(33) | .75<br>(19) | .90<br>(23) |

| H           | J          | K           | L          | M           |
|-------------|------------|-------------|------------|-------------|
| .62<br>(16) | .31<br>(8) | .56<br>(14) | .19<br>(5) | .88<br>(22) |

| N          | P          | P1          | R           | R1           |
|------------|------------|-------------|-------------|--------------|
| .25<br>(6) | .17<br>(4) | .38<br>(10) | .91<br>(23) | 1.53<br>(39) |

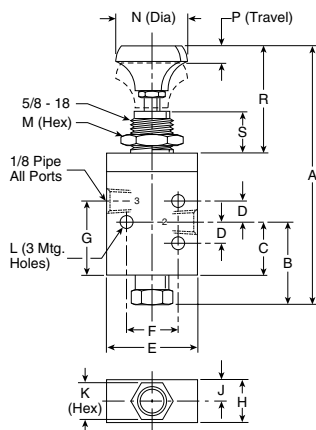
| S           | S1          | U            | V            | W           |
|-------------|-------------|--------------|--------------|-------------|
| .62<br>(16) | .78<br>(20) | 2.28<br>(58) | 1.19<br>(30) | .75<br>(19) |

| X          | Y            |
|------------|--------------|
| .19<br>(5) | 2.19<br>(56) |

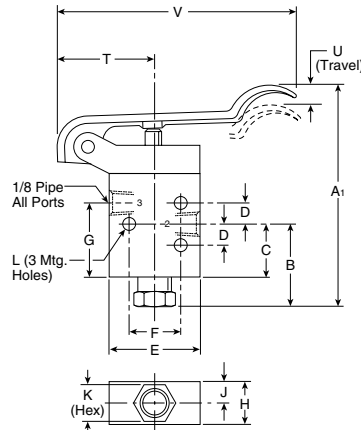
\* Dimensions may be reduced .44" using adjusting screw.  
 Inches (mm)

**Button & Hand Lever Operated — 3-Way, 3-Port, 2-Position – 1/8" Ports**

**Button Operated**



**Hand Lever Operated**



**3-Way, 3-Port, 2-Position**

| A             | A1           | B            | C           | D          |
|---------------|--------------|--------------|-------------|------------|
| 4.13<br>(105) | 3.34<br>(85) | 1.03<br>(26) | .55<br>(14) | .31<br>(8) |

| E            | F           | G           | H           | J          |
|--------------|-------------|-------------|-------------|------------|
| 1.31<br>(33) | .75<br>(19) | .90<br>(23) | .62<br>(16) | .31<br>(8) |

| K           | L          | M           | N            | P          |
|-------------|------------|-------------|--------------|------------|
| .56<br>(14) | .19<br>(5) | .88<br>(22) | 1.06<br>(27) | .17<br>(4) |

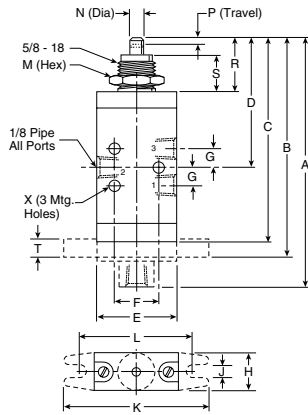
| R            | S           | T            | U           | V            |
|--------------|-------------|--------------|-------------|--------------|
| 1.67<br>(42) | .63<br>(16) | 1.19<br>(30) | .53<br>(13) | 3.38<br>(86) |

Inches (mm)

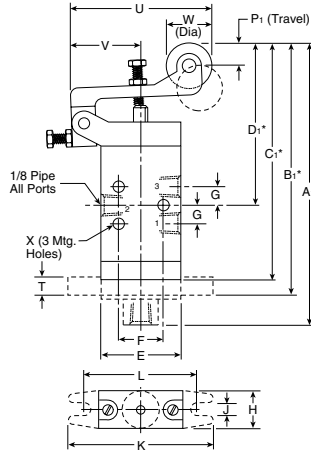


**Plunger, Roller, One-way Tripper & Toggle Operated — 3-Way, 3-Port, 2-Position – 1/8" Ports**

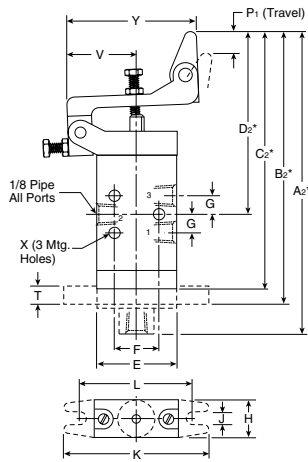
**Plunger Operated**



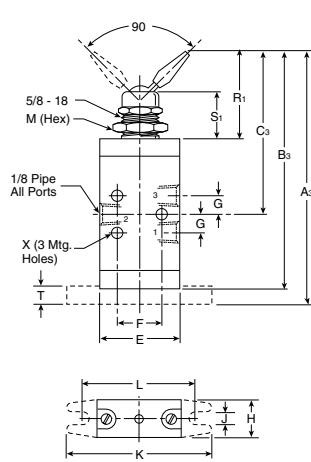
**Roller Operated**



**One-Way Tripper Operated**



**Toggle Operated**



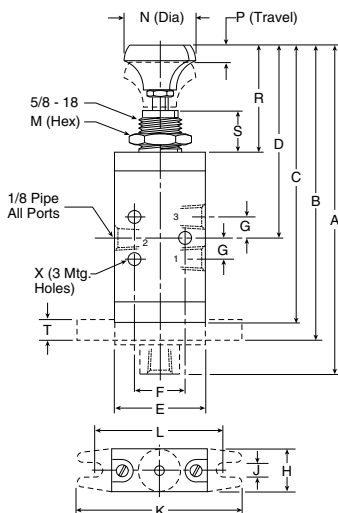
**3-Way, 3-Port, 2-Position**

|                            |                             |                             |                            |                            |
|----------------------------|-----------------------------|-----------------------------|----------------------------|----------------------------|
| <b>A</b><br>4.14<br>(105)  | <b>A1*</b><br>4.98<br>(126) | <b>A2*</b><br>5.23<br>(133) | <b>A3</b><br>4.23<br>(107) | <b>B</b><br>3.61<br>(92)   |
| <b>B1</b><br>4.45<br>(113) | <b>B2</b><br>4.70<br>(119)  | <b>B3</b><br>4.00<br>(102)  | <b>C</b><br>3.38<br>(86)   | <b>C1</b><br>4.22<br>(107) |
| <b>C2</b><br>4.47<br>(113) | <b>C3</b><br>2.75<br>(70)   | <b>D</b><br>2.05<br>(52)    | <b>D1</b><br>2.98<br>(76)  | <b>D2</b><br>3.22<br>(82)  |
| <b>E</b><br>1.31<br>(33)   | <b>F</b><br>.75<br>(19)     | <b>G</b><br>.31<br>(8)      | <b>H</b><br>.62<br>(16)    | <b>J</b><br>.20<br>(5)     |
| <b>K</b><br>2.38<br>(60)   | <b>L</b><br>1.88<br>(48)    | <b>M</b><br>.88<br>(22)     | <b>N</b><br>.25<br>(6)     | <b>P</b><br>.17<br>(4)     |
| <b>P1</b><br>.38<br>(10)   | <b>R</b><br>.91<br>(23)     | <b>R1</b><br>1.53<br>(39)   | <b>S</b><br>.62<br>(16)    | <b>S1</b><br>.78<br>(20)   |
| <b>T</b><br>.25<br>(6)     | <b>U</b><br>2.28<br>(58)    | <b>V</b><br>1.19<br>(30)    | <b>W</b><br>.75<br>(19)    | <b>X</b><br>.19<br>(5)     |
| <b>Y</b><br>2.19<br>(56)   |                             |                             |                            |                            |

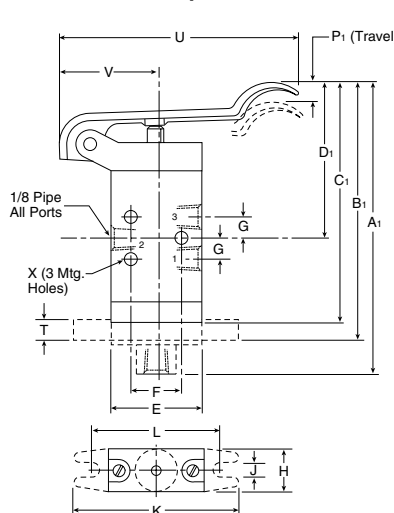
\* Dimensions may be reduced .44" using adjusting screw.  
 Inches (mm)

**Button, Hand Lever Operated — 3-Way, 3-Port, 2-Position – 1/8" Ports**

**Button Operated**



**Hand Lever Operated**



**3-Way, 3-Port, 2-Position**

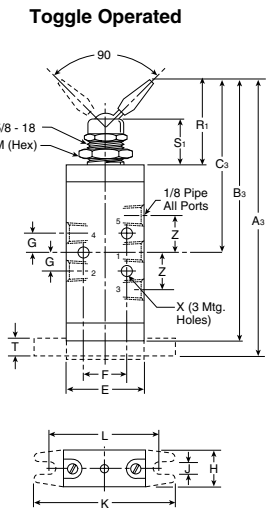
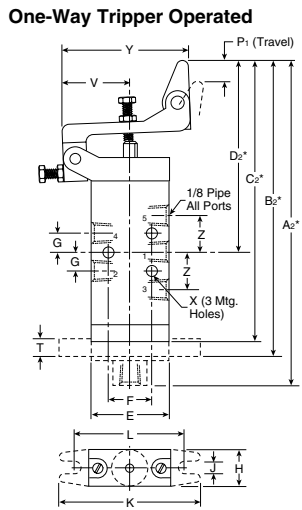
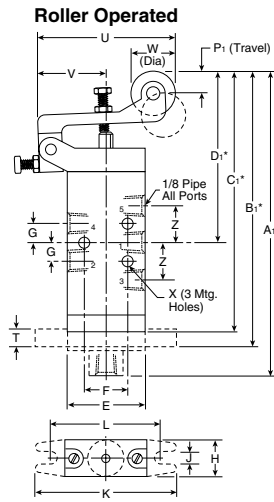
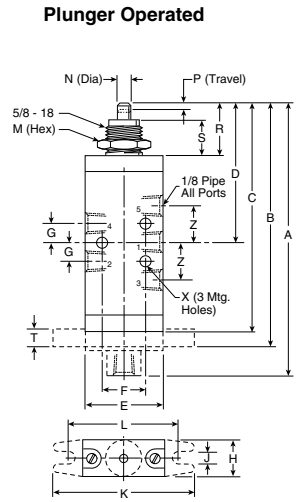
|                           |                            |                           |                           |                           |
|---------------------------|----------------------------|---------------------------|---------------------------|---------------------------|
| <b>A</b><br>5.08<br>(129) | <b>A1</b><br>4.29<br>(109) | <b>B</b><br>4.55<br>(115) | <b>B1</b><br>3.77<br>(96) | <b>C</b><br>4.31<br>(109) |
| <b>C1</b><br>3.53<br>(90) | <b>D</b><br>3.08<br>(78)   | <b>D1</b><br>2.29<br>(58) | <b>E</b><br>1.31<br>(33)  | <b>F</b><br>.75<br>(19)   |
| <b>G</b><br>.31<br>(8)    | <b>H</b><br>.62<br>(16)    | <b>J</b><br>.20<br>(5)    | <b>K</b><br>2.38<br>(60)  | <b>L</b><br>1.88<br>(48)  |
| <b>M</b><br>.88<br>(22)   | <b>N</b><br>1.06<br>(27)   | <b>P</b><br>.17<br>(4)    | <b>P1</b><br>.53<br>(13)  | <b>R</b><br>1.67<br>(42)  |
| <b>S</b><br>.63<br>(16)   | <b>T</b><br>.25<br>(6)     | <b>U</b><br>3.38<br>(86)  | <b>V</b><br>1.19<br>(30)  | <b>X</b><br>.19<br>(5)    |
| <b>Y</b><br>.59<br>(15)   |                            |                           |                           |                           |

Inches (mm)



Brass Poppet / Sliding Seal  
 LV-EZ Series Lockout Valves  
 M0 Series  
 42 Lever / Pedal Series  
 Viking Xtreme Lever Series  
 Directair 2, Directair 4  
**D**  
 Manual / Mechanical Valve Products

**Plunger, Roller, One-way Tripper & Toggle Operated — 4-Way, 5-Port, 2-Position – 1/8" Ports**

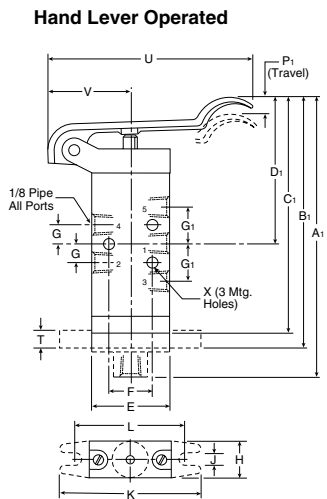
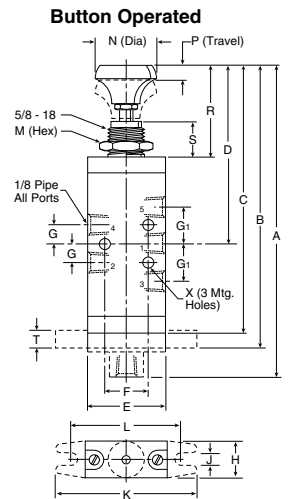


**4-Way, 5-Port, 2-Position**

|                             |                             |                             |                            |                             |
|-----------------------------|-----------------------------|-----------------------------|----------------------------|-----------------------------|
| <b>A</b><br>4.75<br>(121)   | <b>A1*</b><br>5.59<br>(142) | <b>A2*</b><br>5.84<br>(148) | <b>A3</b><br>4.84<br>(123) | <b>B</b><br>4.22<br>(107)   |
| <b>B1*</b><br>5.06<br>(128) | <b>B2*</b><br>5.31<br>(135) | <b>B3</b><br>4.61<br>(117)  | <b>C</b><br>3.99<br>(102)  | <b>C1*</b><br>4.83<br>(123) |
| <b>C2*</b><br>5.08<br>(129) | <b>C3</b><br>3.06<br>(78)   | <b>D</b><br>2.44<br>(62)    | <b>D1*</b><br>3.28<br>(83) | <b>D2*</b><br>3.53<br>(90)  |
| <b>E</b><br>1.31<br>(33)    | <b>F</b><br>.75<br>(19)     | <b>G</b><br>.31<br>(8)      | <b>H</b><br>.62<br>(16)    | <b>J</b><br>.20<br>(5)      |
| <b>K</b><br>2.38<br>(60)    | <b>L</b><br>1.88<br>(48)    | <b>M</b><br>.88<br>(22)     | <b>N</b><br>.25<br>(6)     | <b>P</b><br>.17<br>(4)      |
| <b>P1</b><br>.38<br>(10)    | <b>R</b><br>.91<br>(23)     | <b>R1</b><br>1.53<br>(39)   | <b>S</b><br>.62<br>(16)    | <b>S1</b><br>.78<br>(20)    |
| <b>T</b><br>.25<br>(6)      | <b>U</b><br>2.28<br>(58)    | <b>V</b><br>1.19<br>(30)    | <b>W</b><br>.75<br>(19)    | <b>X</b><br>.19<br>(5)      |
| <b>Y</b><br>2.19<br>(56)    | <b>Z</b><br>.62<br>(16)     |                             |                            |                             |

\* Dimensions may be reduced .44" using adjusting screw.  
 Inches (mm)

**Button & Hand Lever Operated — 4-Way, 5-Port, 2-Position – 1/8" Ports**



**4-Way, 5-Port, 2-Position**

|                            |                            |                           |                            |                           |
|----------------------------|----------------------------|---------------------------|----------------------------|---------------------------|
| <b>A</b><br>5.69<br>(144)  | <b>A1</b><br>4.90<br>(124) | <b>B</b><br>5.16<br>(131) | <b>B1</b><br>4.38<br>(111) | <b>C</b><br>4.92<br>(125) |
| <b>C1</b><br>4.14<br>(105) | <b>D</b><br>3.67<br>(93)   | <b>D1</b><br>2.90<br>(74) | <b>E</b><br>1.31<br>(33)   | <b>F</b><br>.75<br>(19)   |
| <b>G</b><br>.31<br>(8)     | <b>G1</b><br>.63<br>(16)   | <b>H</b><br>.62<br>(16)   | <b>J</b><br>.20<br>(5)     | <b>K</b><br>2.38<br>(60)  |
| <b>L</b><br>1.88<br>(48)   | <b>M</b><br>.88<br>(22)    | <b>N</b><br>1.06<br>(27)  | <b>P</b><br>.17<br>(4)     | <b>P1</b><br>.53<br>(13)  |
| <b>R</b><br>1.67<br>(42)   | <b>S</b><br>.63<br>(16)    | <b>T</b><br>.25<br>(6)    | <b>U</b><br>3.38<br>(86)   | <b>V</b><br>1.19<br>(30)  |
| <b>X</b><br>.19<br>(5)     | <b>Y</b><br>.59<br>(15)    |                           |                            |                           |

Inches (mm)



Brass Poppet /  
Sliding Seal

LV-EZ Series  
Lockout Valves

M0  
Series

42 Lever /  
Pedal Series

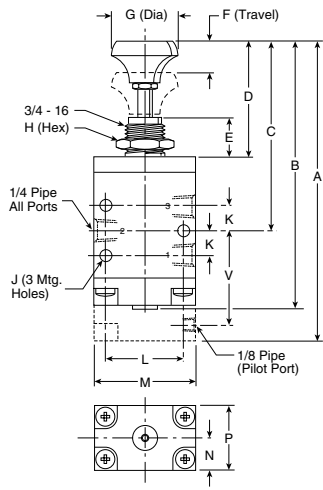
Viking Xtreme  
Lever Series

Directair 2,  
Directair 4

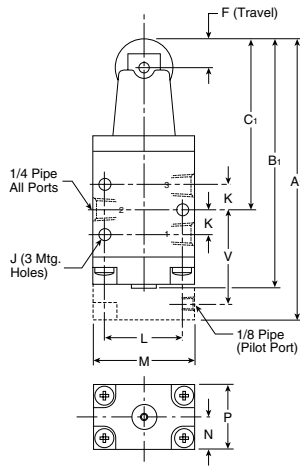
**D**  
Manual / Mechanical  
Valve Products

**Button & Roller Operated — 3-Way, 3-Port, 2-Position**

**Button Operated**



**Roller Operated**



**3-Way, 3-Port, 2-Position**

| A              | A <sub>1</sub> | B             | B <sub>1</sub> | C            |
|----------------|----------------|---------------|----------------|--------------|
| 4.91<br>(125)  | 4.25<br>(108)  | 4.44<br>(113) | 3.78<br>(96)   | 3.10<br>(79) |
| C <sub>1</sub> | D              | E             | F              | G            |
| 2.44<br>(62)   | 2.00<br>(51)   | .63<br>(16)   | .32<br>(8)     | 1.05<br>(27) |
| H              | J              | K             | L              | M            |
| 1.00<br>(25)   | .19<br>(5)     | .41<br>(10)   | 1.25<br>(32)   | 1.63<br>(42) |
| N              | P              | V             |                |              |
| .53<br>(14)    | 1.06<br>(27)   | 1.52<br>(39)  |                |              |

Inches (mm)

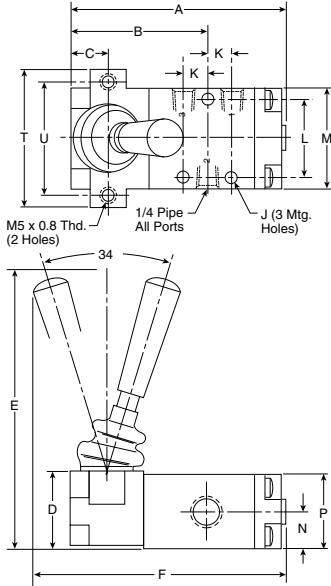
Brass Poppet /  
Sliding Seal

LV-EZ Series  
Lockout Valves

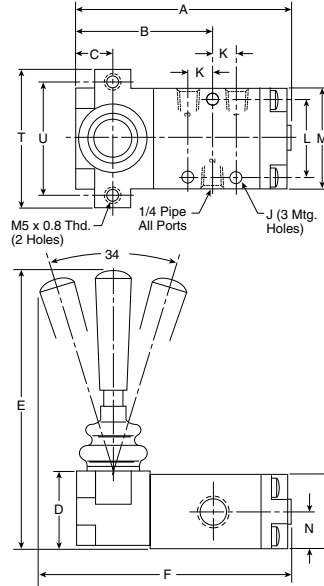
M0  
Series

**Lever & Pedal Operated — 3-Way, 3-Port, 2 & 3-Position**

**Lever Operated  
2-Position**



**Lever Operated  
3-Position**



**3-Way, 3-Port, 2 & 3-Position**

| A              | A <sub>1</sub> | B             | B <sub>1</sub> | C              |
|----------------|----------------|---------------|----------------|----------------|
| 3.31<br>(84)   | 6.55<br>(166)  | 1.97<br>(50)  | 5.20<br>(132)  | .53<br>(14)    |
| C <sub>1</sub> | D              | E             | F              | J              |
| 2.19<br>(56)   | 1.12<br>(28)   | 4.06<br>(103) | 3.90<br>(99)   | .19<br>(5)     |
| K              | L              | M             | N              | P              |
| .41<br>(10)    | 1.25<br>(32)   | 1.63<br>(42)  | .53<br>(14)    | 1.06<br>(27)   |
| Q              | R              | S             | T              | T <sub>1</sub> |
| .37<br>(10)    | 2.40<br>(61)   | .34<br>(9)    | 2.13<br>(54)   | 3.50<br>(89)   |
| U              | U <sub>1</sub> |               |                |                |
| 1.75<br>(44)   | 3.00<br>(76)   |               |                |                |

Inches (mm)

42 Lever /  
Pedal Series

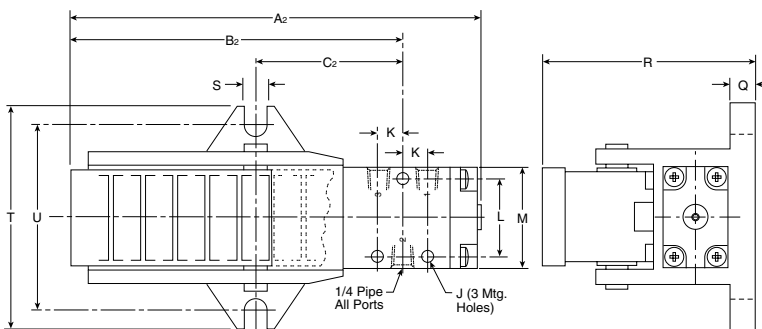
Viking Xtreme  
Lever Series

Directair 2,  
Directair 4

**D**

Manual / Mechanical  
Valve Products

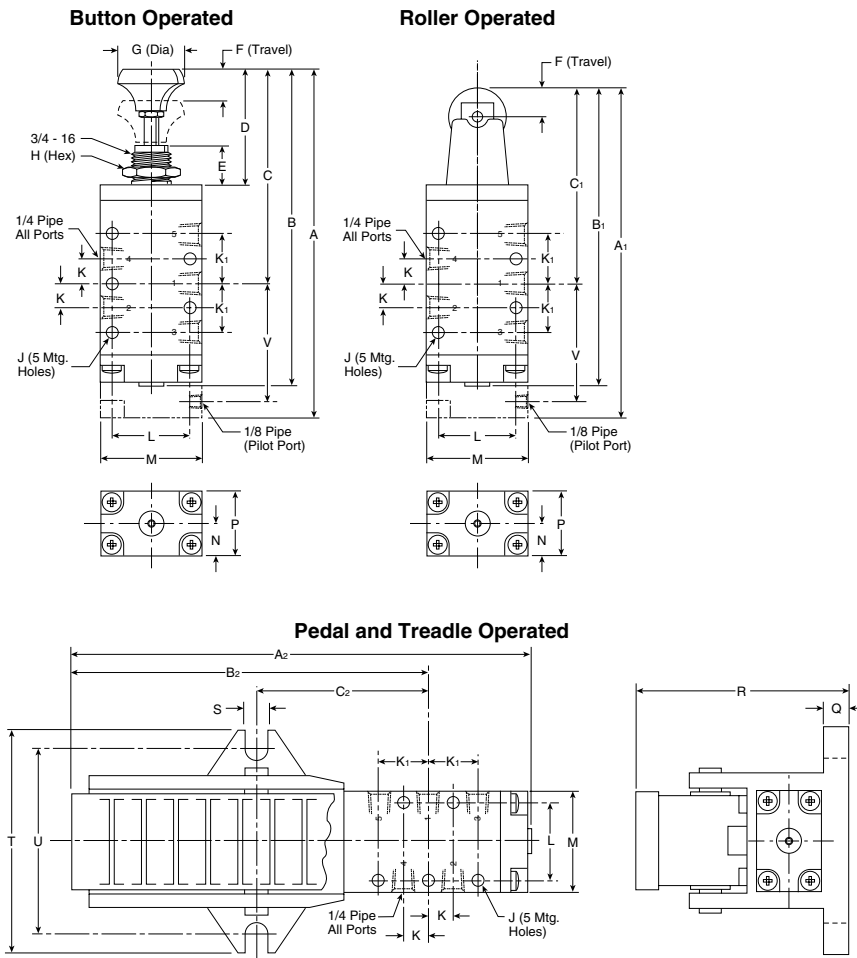
**Pedal / Treadle Operated**



**CAUTION:**

*This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.217.*

**Button, Roller, Pedal & Treadle, Lever Operated — 4-Way, 5-Port, 2-Position**



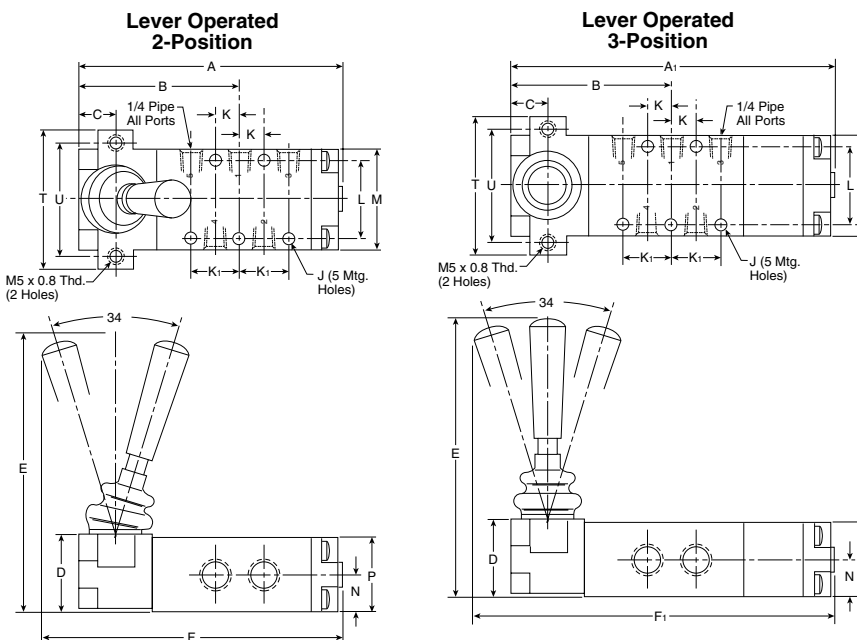
**4-Way, 5-Port, 2-Position**

|                      |                      |                      |                      |                      |
|----------------------|----------------------|----------------------|----------------------|----------------------|
| <b>A</b>             | <b>A<sub>1</sub></b> | <b>A<sub>2</sub></b> | <b>B</b>             | <b>B<sub>1</sub></b> |
| 5.75<br>(146)        | 5.13<br>(130)        | 7.41<br>(189)        | 5.28<br>(134)        | 4.66<br>(118)        |
| <b>B<sub>2</sub></b> | <b>C</b>             | <b>C<sub>1</sub></b> | <b>C<sub>2</sub></b> | <b>D</b>             |
| 5.63<br>(143)        | 3.50<br>(89)         | 2.88<br>(73)         | 2.64<br>(67)         | 2.00<br>(51)         |
| <b>E</b>             | <b>F</b>             | <b>G</b>             | <b>H</b>             | <b>J</b>             |
| .63<br>(16)          | .32<br>(8)           | 1.05<br>(27)         | 1.00<br>(25)         | .19<br>(5)           |
| <b>K</b>             | <b>K<sub>1</sub></b> | <b>L</b>             | <b>M</b>             | <b>N</b>             |
| .44<br>(11)          | .84<br>(21)          | 1.25<br>(32)         | 1.63<br>(41)         | .53<br>(14)          |
| <b>P</b>             | <b>Q</b>             | <b>R</b>             | <b>S</b>             | <b>T</b>             |
| 1.06<br>(27)         | .37<br>(10)          | 2.40<br>(61)         | .34<br>(9)           | 3.50<br>(89)         |
| <b>U</b>             | <b>V</b>             |                      |                      |                      |
| 3.00<br>(76)         | 1.96<br>(50)         |                      |                      |                      |

Inches (mm)

**CAUTION:**  
 This valve shall not be used to actuate a punch press.  
 Do not use this valve on punch presses or press brakes.  
 See OSHA 1910.217.

**Lever Operated — 4-Way, 5-Port, 2 & 3-Position**



**4-Way, 5-Port, 2 & 3-Position**

|                      |                      |                      |             |              |
|----------------------|----------------------|----------------------|-------------|--------------|
| <b>A</b>             | <b>A<sub>1</sub></b> | <b>B</b>             | <b>C</b>    | <b>D</b>     |
| 4.19<br>(106)        | 5.09<br>(129)        | 2.41<br>(61)         | .53<br>(14) | 1.12<br>(28) |
| <b>E</b>             | <b>F</b>             | <b>F<sub>1</sub></b> | <b>J</b>    | <b>K</b>     |
| 4.06<br>(103)        | 4.78<br>(121)        | 5.78<br>(147)        | .19<br>(5)  | .44<br>(11)  |
| <b>K<sub>1</sub></b> | <b>L</b>             | <b>M</b>             | <b>N</b>    | <b>P</b>     |
| .84<br>(21)          | 1.25<br>(32)         | 1.63<br>(42)         | .53<br>(14) | 1.06<br>(27) |
| <b>T</b>             | <b>U</b>             |                      |             |              |
| 2.13<br>(54)         | 1.75<br>(44)         |                      |             |              |

Inches (mm)



Brass Poppet / Sliding Seal

LV-EZ Series Lockout Valves

M0 Series

42 Lever / Pedal Series

Viking Xtreme Lever Series

Directair 2, Directair 4

**D**  
 Manual / Mechanical Valve Products

The Viking Xtreme Manual valve range is robust, versatile and combines high performance with compact installation dimensions. The valves rugged lever actuator has been specifically designed for gloved hands to suit mobile applications in the most arduous of environments. Available in 3/2, 5/2 and 5/3 functions with either spring return or detented lever. The lever actuated versions are available across the entire range from 1/8 to 1/2 port sizes.

- **Heavy duty lever**
- **Inline valve**
  - 1/8", 1/4", 3/8", 1/2" NPT & BSPP
- **2-position models**
  - 4-way & 3-way
- **3-position models**
  - all ports blocked
  - pressure center
  - center exhaust
- **Over-moulded single piece aluminium spool**
  - Reduced product complexity
  - Increased flow
  - Wide operating temperature range
  - Stable seal performance even with high flow / pressure drop across spool.



**Operating information**

Operating pressure: Type A & B: Vacuum to 232 PSIG (Vacuum to 16 bar Max.)  
 Type C & D: Vacuum to 174 PSIG (Vacuum to 12 bar Max.)  
 Temperature range: Xtreme: -40°F to 140°F (-40°C to 60°C)

**Material specifications**

|               |                                    |
|---------------|------------------------------------|
| End covers    | Anodized aluminum                  |
| Lever         | Reinforced polyamide plastic       |
| Lever housing | Acetal plastic                     |
| Piston        | Acetal plastic / anodized aluminum |
| Seals         | Nitrile rubber                     |
| Screws        | Stainless steel                    |
| Spool         | Aluminum & nitrile rubber          |
| Springs       | Stainless steel                    |
| Valve body    | Anodized aluminum                  |

**Lever Handle – 1/8" valve size, 5/2 & 5/3 only**

**Twist Handle – 1/4" valve sizes**


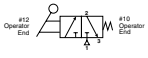

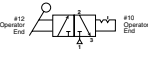

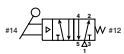

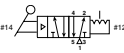

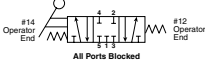

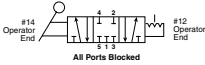




**Lever Handle – All other valve sizes**



**Features**

- Variety of manual actuators
- Robust Knobs
- Stainless steel shafts
- Handle boots for ingress protection
- **Over Molded Spool**
  - Aluminum spool with nitrile rubber coating ground to exact size for optimum performance
  - Precision ground for maximum performance
  - Wide operating temperature range - Low temperature to -40°
- Robust anodized aluminum valve body
- Diecast end covers with stainless steel screws to resist aggressive environments.
- Sintered bronze pilot chamber breathers provide increased protection against ingress of dust and dirt.
- The bore is polished to a very high surface finish for maximum flow capacity and long life.
- Stainless steel return spring

Brass Poppet / Sliding Seal  
 LV-EZ Series Lockout Valves  
 M0 Series  
 42 Lever / Pedal Series  
 Viking Xtreme Lever Series  
 Directair 2, Directair 4  
**D**  
 Manual / Mechanical Valve Products

| 3/2 - 2-position  | Symbol  | Valve type          | Port size | Cv  | Weight lb (kg) | Part number NPT   | Part number BSPP  |
|---|---|---------------------|-----------|-----|----------------|-------------------|-------------------|
|    |    | Lever spring return | 1/8       | 0.6 | 0.73 (0.33)    | <b>P2LAX391VS</b> | <b>P2LAX311VS</b> |
|   |   |                     | 1/4       | 1.5 | 0.73 (0.33)    | <b>P2LBX392VS</b> | <b>P2LBX312VS</b> |
|   |   |                     | 3/8       | 2.5 | 0.88 (0.40)    | <b>P2LCX393VS</b> | <b>P2LCX313VS</b> |
|   |   |                     | 1/2       | 2.7 | 1.32 (0.60)    | <b>P2LDX394VS</b> | <b>P2LDX314VS</b> |
|    |    | Lever detent        | 1/8       | 0.7 | 0.73 (0.33)    | <b>P2LAX391VV</b> | <b>P2LAX311VV</b> |
|   |   |                     | 1/4       | 1.3 | 0.73 (0.33)    | <b>P2LBX392VV</b> | <b>P2LBX312VV</b> |
|   |   |                     | 3/8       | 2.5 | 0.88 (0.40)    | <b>P2LCX393VV</b> | <b>P2LCX313VV</b> |
|   |   |                     | 1/2       | 2.7 | 1.32 (0.60)    | <b>P2LDX394VV</b> | <b>P2LDX314VV</b> |
| 5/2 - 2-position  | Symbol  | Valve type          | Port size | Cv  | Weight lb (kg) | Part number NPT   | Part number BSPP  |
|    |    | Lever spring return | 1/8       | 0.6 | 0.40 (0.18)    | <b>P2LAX591VS</b> | <b>P2LAX511VS</b> |
|   |   |                     | 1/4       | 1.5 | 0.73 (0.33)    | <b>P2LBX592VS</b> | <b>P2LBX512VS</b> |
|   |   |                     | 3/8       | 2.5 | 0.88 (0.40)    | <b>P2LCX593VS</b> | <b>P2LCX513VS</b> |
|   |   |                     | 1/2       | 2.7 | 1.32 (0.60)    | <b>P2LDX594VS</b> | <b>P2LDX514VS</b> |
|    |    | Lever detent        | 1/8       | 0.7 | 0.40 (0.18)    | <b>P2LAX591VV</b> | <b>P2LAX511VV</b> |
|   |   |                     | 1/4       | 1.3 | 0.73 (0.33)    | <b>P2LBX592VV</b> | <b>P2LBX512VV</b> |
|   |   |                     | 3/8       | 2.5 | 0.88 (0.40)    | <b>P2LCX593VV</b> | <b>P2LCX513VV</b> |
|   |   |                     | 1/2       | 2.7 | 1.32 (0.60)    | <b>P2LDX594VV</b> | <b>P2LDX514VV</b> |
| 5/3 - 3-position, all ports blocked   | Symbol  | Valve type          | Port size | Cv  | Weight lb (kg) | Part number NPT   | Part number BSPP  |
|  |  | Lever spring center | 1/8       | 0.6 | 0.40 (0.18)    | <b>P2LAX69111</b> | <b>P2LAX61111</b> |
|   |   |                     | 1/4       | 1.5 | 0.73 (0.33)    | <b>P2LBX69211</b> | <b>P2LBX61211</b> |
|   |   |                     | 3/8       | 2.5 | 1.56 (0.71)    | <b>P2LCX69311</b> | <b>P2LCX61311</b> |
|   |   |                     | 1/2       | 2.7 | 1.61 (0.73)    | <b>P2LDX69411</b> | <b>P2LDX61411</b> |
|  |  | Lever detent        | 1/8       | 0.7 | 0.40 (0.18)    | <b>P2LAX69122</b> | <b>P2LAX61122</b> |
|   |   |                     | 1/4       | 1.3 | 0.73 (0.33)    | <b>P2LBX69222</b> | <b>P2LBX61222</b> |
|   |   |                     | 3/8       | 2.5 | 1.56 (0.71)    | <b>P2LCX69322</b> | <b>P2LCX61322</b> |
|   |   |                     | 1/2       | 2.7 | 1.61 (0.73)    | <b>P2LDX69422</b> | <b>P2LDX61422</b> |
| 5/3 - 3-position, pressure center   | Symbol  | Valve type          | Port size | Cv  | Weight lb (kg) | Part number NPT   | Part number BSPP  |
|  |  | Lever spring center | 1/8       | 0.6 | 0.40 (0.18)    | <b>P2LAX79111</b> | <b>P2LAX71111</b> |
|   |   |                     | 1/4       | 1.5 | 0.73 (0.33)    | <b>P2LBX79211</b> | <b>P2LBX71211</b> |
|   |   |                     | 3/8       | 2.5 | 1.56 (0.71)    | <b>P2LCX79311</b> | <b>P2LCX71311</b> |
|   |   |                     | 1/2       | 2.7 | 1.61 (0.73)    | <b>P2LDX79411</b> | <b>P2LDX71411</b> |
|  |  | Lever detent        | 1/8       | 0.7 | 0.40 (0.18)    | <b>P2LAX79122</b> | <b>P2LAX71122</b> |
|   |   |                     | 1/4       | 1.3 | 0.73 (0.33)    | <b>P2LBX79222</b> | <b>P2LBX71222</b> |
|   |   |                     | 3/8       | 2.5 | 1.56 (0.71)    | <b>P2LCX79322</b> | <b>P2LCX71322</b> |
|   |   |                     | 1/2       | 2.7 | 1.61 (0.73)    | <b>P2LDX79422</b> | <b>P2LDX71422</b> |

Brass Poppet / Sliding Seal

LV-EZ Series Lockout Valves

M0 Series


42 Lever / Pedal Series

Viking Xtreme Lever Series

Directair 2, Directair 4


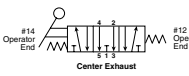

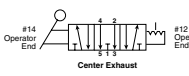
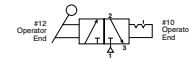
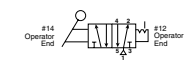
**D**

Manual / Mechanical Valve Products

 Most popular.





|                             | 5/3 - 3-position, center exhaust  | Symbol  | Valve type          | Port size | Cv  | Weight lb (kg) | Part number NPT   | Part number BSPP  |
|-----------------------------|---|---|---------------------|-----------|-----|----------------|-------------------|-------------------|
| Brass Poppet / Sliding Seal |  |  | Lever spring center | 1/8       | 0.6 | 0.40 (0.18)    | <b>P2LAX89111</b> | <b>P2LAX81111</b> |
|                             |   |   |                     | 1/4       | 1.5 | 0.73 (0.33)    | <b>P2LBX89211</b> | <b>P2LBX81211</b> |
|                             |   |   |                     | 3/8       | 2.5 | 1.56 (0.71)    | <b>P2LCX89311</b> | <b>P2LCX81311</b> |
|                             |   |   |                     | 1/2       | 2.7 | 1.61 (0.73)    | <b>P2LDX89411</b> | <b>P2LDX81411</b> |
| LV-EZ Series Lockout Valves |  |  | Lever detent        | 1/8       | 0.7 | 0.40 (0.18)    | <b>P2LAX89122</b> | <b>P2LAX81122</b> |
|                             |   |   |                     | 1/4       | 1.3 | 0.73 (0.33)    | <b>P2LBX89222</b> | <b>P2LBX81222</b> |
|                             |   |   |                     | 3/8       | 2.5 | 1.56 (0.71)    | <b>P2LCX89322</b> | <b>P2LCX81322</b> |
|                             |   |   |                     | 1/2       | 2.7 | 1.61 (0.73)    | <b>P2LDX89422</b> | <b>P2LDX81422</b> |
| M0 Series                   | 3/2 - 2-position  |  | Twist handle detent | 1/4       | 1.3 | 0.73 (0.33)    | <b>P2LBX392JJ</b> | <b>P2LBX312JJ</b> |
| 42 Lever / Pedal Series     | 5/2 - 2-position  |  | Twist handle detent | 1/8       | 0.7 | 0.73 (0.33)    | <b>P2LBX592JJ</b> | <b>P2LBX512JJ</b> |

**Manual Operated Valves**

Vacuum to 232 PSIG (Vacuum to 16 bar) -40°F to 158°F (-40°C to 70°C)

**P2L A X 5 91 VS**

| Valve size |   |
|------------|---|
| 1/8"       | A |
| 1/4"       | B |
| 3/8"       | C |
| 1/2"       | D |

| Valve type / function |   |
|-----------------------|---|
| 3/2 NC - 2-position   | 3 |
| 5/2 2-position        | 5 |
| 5/3 3-position, APB   | 6 |
| 5/3 3-position, PC    | 7 |
| 5/3 3-position, CE    | 8 |

| Actuator / return |   |
|-------------------|---|
| JJ*               | Twist handle detent, 2-position                 |
| VS                | Spring return lever, 2-position, 90° to ports   |
| VV                | Lever, detent, 2-position, 90° to ports         |
| 11                | Spring centered lever, 3-position, 90° to ports |
| 22                | Lever, detent, 3-position, 90° to ports         |

\* Not available with 3-position valves, size B only.

| Main port thread |                        |
|------------------|------------------------|
| 11               | G1/8 (P2LA)            |
| 12               | G1/4 (P2LB)            |
| 13               | G3/8 (P2LC)            |
| 14               | G1/2 (P2LD)            |
| <b>91</b>        | <b>1/8" NPT (P2LA)</b> |
| <b>92</b>        | <b>1/4" NPT (P2LB)</b> |
| <b>93</b>        | <b>3/8" NPT (P2LC)</b> |
| <b>94</b>        | <b>1/2" NPT (P2LD)</b> |

**NOTE:** For ATEX certified remote air pilot valves, build the valve part number from the model number index for remote pilot and add "-EX" following the number.

Example: P2LAX591PS-EX

 Most popular.





**Exhaust Mufflers**

| Pipe thread | Part number     |
|-------------|-----------------|
| M5          | <b>P6M-PAC5</b> |
| 1/8" NPT    | <b>EM12</b>     |
| 1/4" NPT    | <b>EM25</b>     |
| 3/8" NPT    | <b>EM37</b>     |
| 1/2" NPT    | <b>EM50</b>     |

P6M - Plastic; EM - Sintered bronze

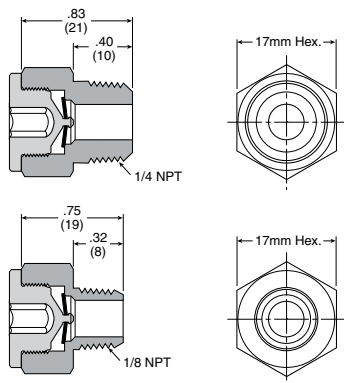


**Plastic Silencers**

| Thread size | Part number   |              | A (mm)    | B (mm)    |
|-------------|---------------|--------------|-----------|-----------|
|             | NPT           | BSPT         |           |           |
| M5          | <b>AS-5</b>   |              | .43 (11)  | .32 (8)   |
| 1/8"        | <b>ASN-6</b>  | <b>AS-6</b>  | 1.57 (40) | .63 (16)  |
| 1/4"        | <b>ASN-8</b>  | <b>AS-8</b>  | 2.56 (65) | .83 (21)  |
| 3/8"        | <b>ASN-10</b> | <b>AS-10</b> | 3.35 (85) | .98 (25)  |
| 1/2"        | <b>ASN-15</b> | <b>AS-15</b> | 3.74 (95) | 1.18 (30) |



**Exhaust Protector**



**Features**

- • 1/8 and 1/4 NPT male sizes
- • Fitted with a brass pipe adapter and a fluorocarbon membrane
- • Resistant to rust, clog, wash down and contamination

**Applications**

These protectors are intended for mobile applications, quick venting applications and alternative exhaust port breathers that require protection against clogging.

Ideal for valves exposed to harsh environmental conditions (which can cause a "caking up" in the exhaust pipe ports where the bronze mufflers or breather vents are installed).

Particularly suitable for time-sensitive applications such as axle-lift suspensions or pushers or tag axles.

**Specifications**

**Operating pressure** ..... 0 – 150 PSIG  
 .....(0 to 10 bar, 0 to 1034 kPa)

**Operating temperature** ..... -40°F to 158°F (-40°C to 70°C)

**Material:**

Body and pipe adapter ..... Brass  
 Membrane .....Fluorocarbon

**Flow Data (SCFM)**

| Part number   | Size | 60 PSIG inlet | 90 PSIG inlet | 125 PSIG inlet |
|---------------|------|---------------|---------------|----------------|
| <b>E90016</b> | 1/8" | 40.1          | 56.5          | 75.5           |
| <b>E90017</b> | 1/4" | 44.6          | 62.7          | 83.5           |

Brass Poppet / Sliding Seal

LV-EZ Series Lockout Valves

M0 Series

42 Lever / Pedal Series

Viking Xtreme Lever Series

Directair 2, Directair 4

**D**

Manual / Mechanical Valve Products

**P2LAX 3/2 Hand Lever Operated**

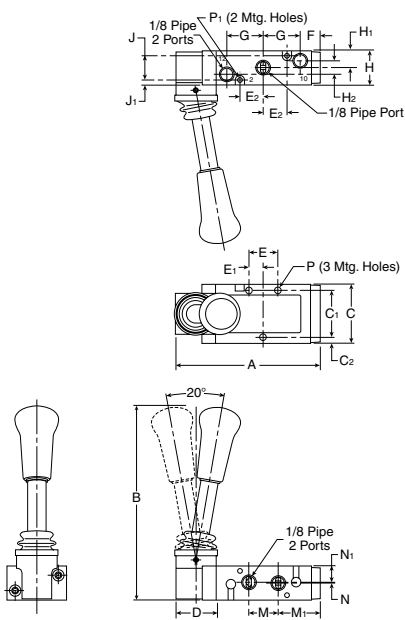
**P2LAX 5/2 & 5/3 Hand Lever Operated**

Brass Poppet /  
Sliding Seal

LV-EZ Series  
Lockout Valves

M0  
Series

42 Lever /  
Pedal Series



**P2LAX 3/2  
(hand lever)**

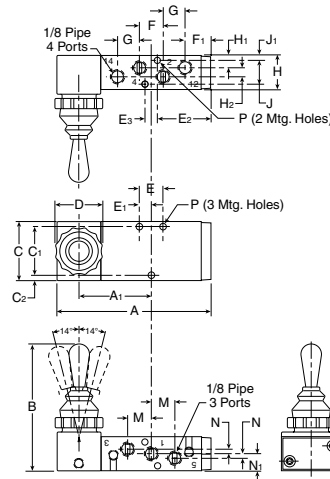
| A              | B                | C                |
|----------------|------------------|------------------|
| 3.88<br>(99)   | 5.23<br>(133)    | 1.57<br>(40)     |
| C <sub>1</sub> | C <sub>2</sub>   | D                |
| 1.26<br>(32)   | .16<br>(4)       | 1.06<br>(27)     |
| E              | E <sub>1</sub>   | E <sub>2</sub>   |
| .79<br>(20)    | .39<br>(10)      | .63<br>(16)      |
| F              | G                | H                |
| .55<br>(14)    | .98<br>(25)      | .87<br>(22)      |
| H <sub>1</sub> | H <sub>2</sub>   | J                |
| .42<br>(10.6)  | .02<br>(0.5)     | .65<br>(16.5)    |
| J <sub>1</sub> | M                | M <sub>1</sub>   |
| .11<br>(2.9)   | .79<br>(20)      | 1.14<br>(29)     |
| N              | N <sub>1</sub>   | P                |
| .18<br>(4.5)   | .26<br>(6.6)     | ∅ .17<br>(∅ 4.3) |
| P <sub>1</sub> | ∅ .12<br>(∅ 3.1) |                  |

Inches (mm)

**P2LAX 5/2 & 5/3  
(hand lever)**

| A             | A <sub>1</sub> | B                |
|---------------|----------------|------------------|
| 4.02<br>(102) | 1.89<br>(48)   | 3.23<br>(82)     |
| C             | C <sub>1</sub> | C <sub>2</sub>   |
| 1.57<br>(40)  | 1.30<br>(33)   | .14<br>(3.5)     |
| D             | E <sub>2</sub> | E <sub>3</sub>   |
| 1.18<br>(30)  | 1.42<br>(36)   | .33<br>(8.5)     |
| F             | F <sub>1</sub> | G                |
| .63<br>(16)   | .67<br>(17)    | .59<br>(15)      |
| H             | H <sub>1</sub> | H <sub>2</sub>   |
| .87<br>(22)   | .31<br>(8)     | .24<br>(6)       |
| J             | J <sub>1</sub> | M                |
| .63<br>(16)   | .12<br>(3)     | .63<br>(16)      |
| N             | N <sub>1</sub> | P                |
| .12<br>(3)    | .43<br>(11)    | ∅ .16<br>(∅ 4.1) |

Inches (mm)



**P2LBX 3/2 Hand Lever Operated**

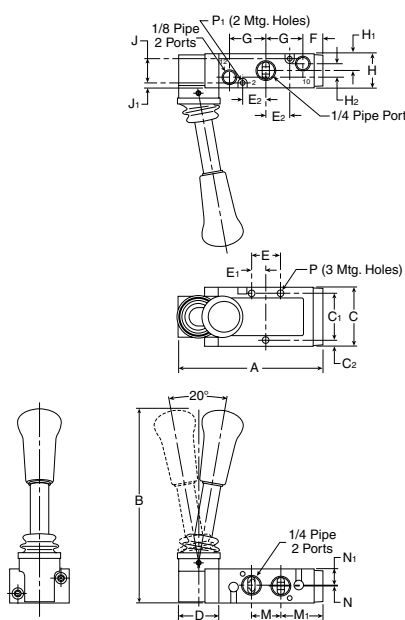
**P2LBX 5/2 & 5/3 Hand Lever Operated**

Viking Xtreme  
Lever Series

Directair 2,  
Directair 4

**D**

Manual / Mechanical  
Valve Products



**P2LBX 3/2  
(hand lever)**

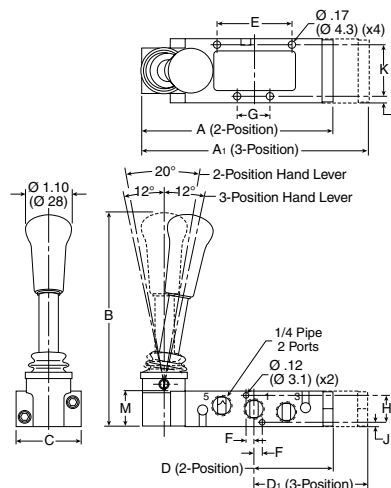
| A              | B                | C                |
|----------------|------------------|------------------|
| 3.88<br>(99)   | 5.23<br>(133)    | 1.57<br>(40)     |
| C <sub>1</sub> | C <sub>2</sub>   | D                |
| 1.26<br>(32)   | .16<br>(4)       | 1.06<br>(27)     |
| E              | E <sub>1</sub>   | E <sub>2</sub>   |
| .79<br>(20)    | .39<br>(10)      | .63<br>(16)      |
| F              | G                | H                |
| .55<br>(14)    | .98<br>(25)      | .87<br>(22)      |
| H <sub>1</sub> | H <sub>2</sub>   | J                |
| .42<br>(10.6)  | .02<br>(0.5)     | .65<br>(16.5)    |
| J <sub>1</sub> | M                | M <sub>1</sub>   |
| .11<br>(2.9)   | .79<br>(20)      | 1.14<br>(29)     |
| N              | N <sub>1</sub>   | P                |
| .18<br>(4.5)   | .26<br>(6.6)     | ∅ .17<br>(∅ 4.3) |
| P <sub>1</sub> | ∅ .12<br>(∅ 3.1) |                  |

Inches (mm)

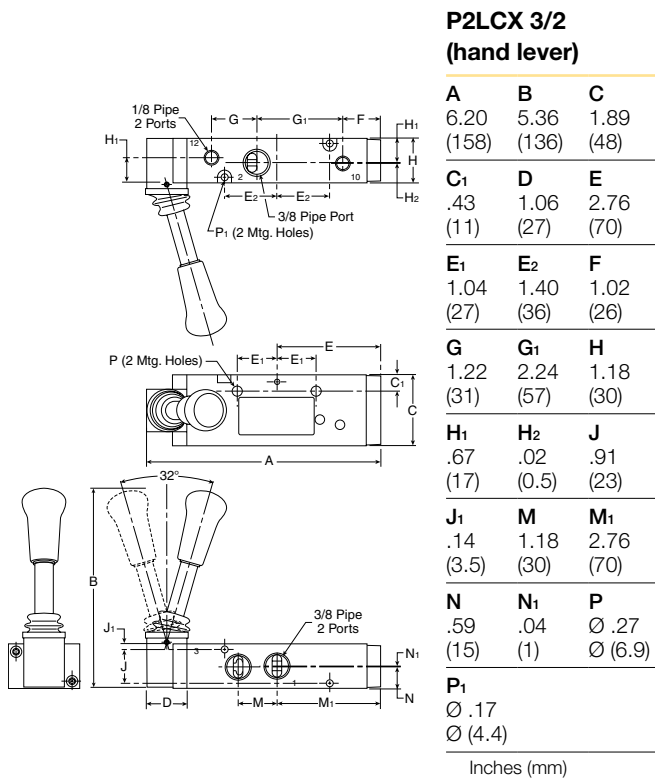
**P2LBX 5/2 & 5/3  
(hand lever)**

| A               | A <sub>1</sub> | B               |
|-----------------|----------------|-----------------|
| 4.67<br>(118.5) | 5.51<br>(140)  | 5.19<br>(131.8) |
| C               | D              | D <sub>1</sub>  |
| 1.57<br>(40)    | 1.93<br>(49)   | 2.35<br>(59.8)  |
| E               | F              | G               |
| 1.81<br>(46)    | .20<br>(5)     | .79<br>(20)     |
| H               | J              | K               |
| .65<br>(16.5)   | .11<br>(2.85)  | 1.26<br>(32)    |
| L               | M              |                 |
| .16<br>(4)      | .87<br>(22.2)  |                 |

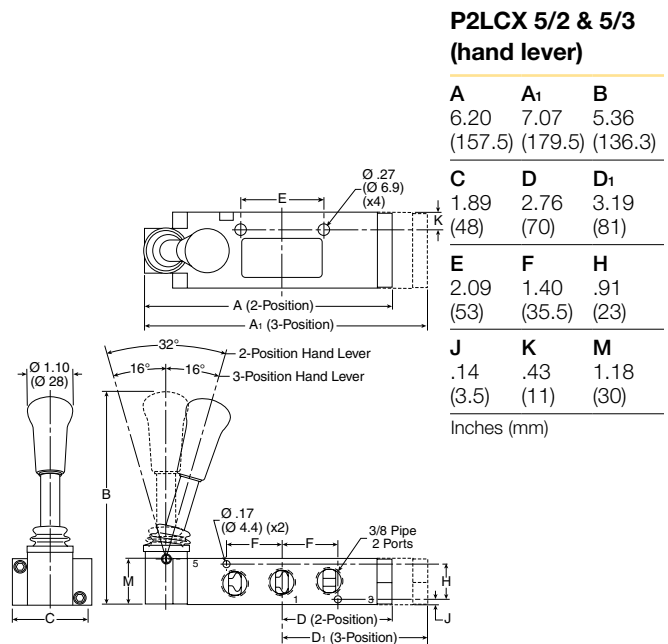
Inches (mm)



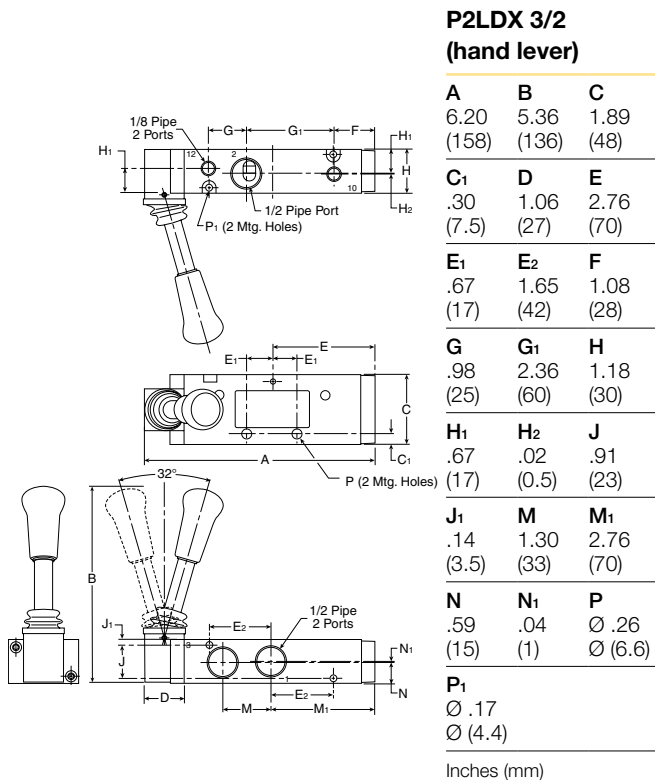
**P2LCX 3/2 Hand Lever Operated**



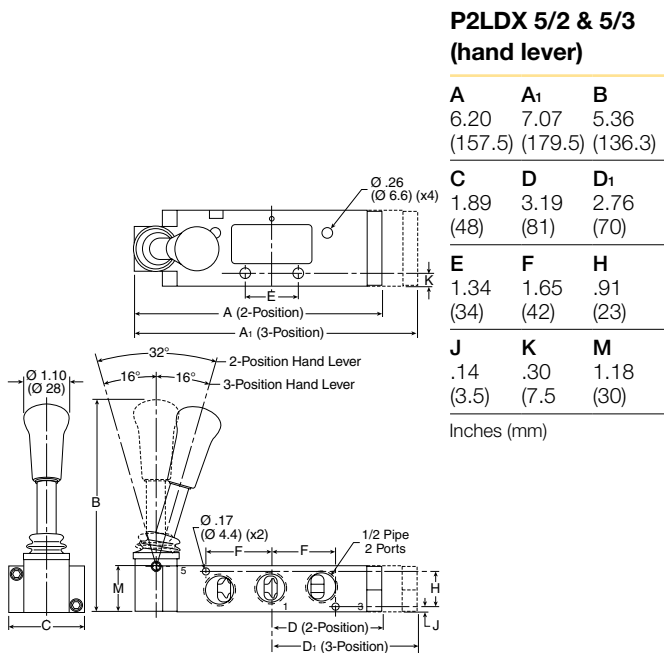
**P2LCX 5/2 & 5/3 Hand Lever Operated**



**P2LDX 3/2 Hand Lever Operated**



**P2LDX 5/2 & 5/3 Hand Lever Operated**



Brass Poppet/  
Sliding Seal

LV-EZ Series  
Lockout Valves

M0  
Series

42 Lever/  
Pedal Series

Viking Xtreme  
Lever Series

Directair 2,  
Directair 4

**D**  
Manual / Mechanical  
Valve Products

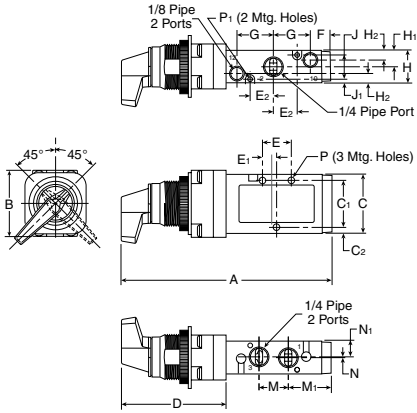
**P2LBX 3/2 Twist Lever Operated**

**P2LBX 5/2 Twist Lever Operated**

Brass Poppet / Sliding Seal  
 LV-EZ Series Lockout Valves  
 M0 Series  
 42 Lever / Pedal Series  
 Viking Xtreme Lever Series  
 Directair 2, Directair 4  
**D**  
 Manual / Mechanical Valve Products

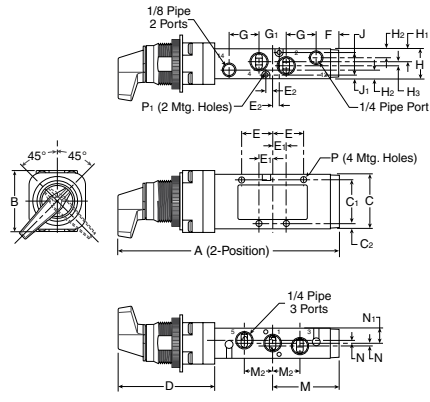
**P2LBX 3/2 (hand lever)**

**P2LBX 5/2 (hand lever)**



| A                | B              | C                |
|------------------|----------------|------------------|
| 5.67<br>(144)    | 1.79<br>(45.5) | 1.57<br>(40)     |
| C <sub>1</sub>   | C <sub>2</sub> | D                |
| 1.26<br>(32)     | .16<br>(4)     | 2.87<br>(73)     |
| E                | E <sub>1</sub> | E <sub>2</sub>   |
| .79<br>(20)      | .39<br>(10)    | .63<br>(16)      |
| F                | G              | H                |
| .55<br>(14)      | .98<br>(25)    | .87<br>(22.2)    |
| H <sub>1</sub>   | H <sub>2</sub> | J                |
| .44<br>(11.1)    | .26<br>(6.6)   | .65<br>(16.5)    |
| J <sub>1</sub>   | M              | M <sub>1</sub>   |
| .11<br>(2.9)     | .79<br>(20)    | 1.14<br>(29)     |
| N                | N <sub>1</sub> | P                |
| .02<br>(0.5)     | .42<br>(10.6)  | ∅ .17<br>∅ (4.3) |
| P <sub>1</sub>   |                |                  |
| ∅ .12<br>∅ (3.1) |                |                  |

Inches (mm)



| A                | B                | C              |  |
|------------------|------------------|----------------|--|
| 6.46<br>(164)    | 1.79<br>(45.5)   | 1.57<br>(40)   |  |
| C <sub>1</sub>   | C <sub>2</sub>   | D              |  |
| 1.26<br>(32)     | .15<br>(4)       | 2.87<br>(73)   |  |
| E                | E <sub>1</sub>   | E <sub>2</sub> |  |
| .91<br>(23)      | .39<br>(10)      | .20<br>(5)     |  |
| F                | G                | G <sub>1</sub> |  |
| .67<br>(17)      | .87<br>(22)      | .79<br>(20)    |  |
| H                | H <sub>1</sub>   | H <sub>2</sub> |  |
| .87<br>(22.2)    | .44<br>(11.1)    | .26<br>(6.6)   |  |
| H <sub>3</sub>   | J                | J <sub>1</sub> |  |
| .12<br>(3)       | .65<br>(16.5)    | .11<br>(2.9)   |  |
| M                | N                | N <sub>1</sub> |  |
| 1.93<br>(49)     | .08<br>(0.2)     | .44<br>(11.1)  |  |
| P                | P <sub>1</sub>   |                |  |
| ∅ .17<br>∅ (4.3) | ∅ .12<br>∅ (3.1) |                |  |

Inches (mm)

**Features**

**Heavy duty lever**

- Parallel mount handle
- Perpendicular mount handle

**Heavy duty foot pedal**

**2 port sizes**

- 1/4" port – 1.3 to 2.2 Cv
- 3/8" port – 1.3 to 2.9 Cv

**2-position and 3-position valves**



**Operating information**

Operating pressure: Vacuum to 150 PSI (710 mmHg to 1035 kPa)  
 Temperature range: 0°F to 140°F (-18°C to 60°C)

**Lever Valve - 2-Position**

|  | Symbol | Port size | Cv  | Description           | Valve type                | Part number      |
|--|--------|-----------|-----|-----------------------|---------------------------|------------------|
|  |        | 1/4"      | 2.2 | Inline, parallel      | 2-position, spring return | <b>422CS011K</b> |
|  |        | 3/8"      | 2.9 | Inline, parallel      | 2-position, spring return | <b>422CS021K</b> |
|  |        | 1/4"      | 2.2 | Inline, parallel      | 2-position, detent        | <b>422CS011W</b> |
|  |        | 3/8"      | 2.9 | Inline, parallel      | 2-position, detent        | <b>422CS021W</b> |
|  |        | 1/4"      | 2.2 | Inline, perpendicular | 2-position, spring return | <b>422CR011K</b> |
|  |        | 3/8"      | 2.9 | Inline, perpendicular | 2-position, spring return | <b>422CR021K</b> |
|  |        | 1/4"      | 2.2 | Inline, perpendicular | 2-position, detent        | <b>422CR011W</b> |
|  |        | 3/8"      | 2.9 | Inline, perpendicular | 2-position, detent        | <b>422CR021W</b> |

**Lever Valve - 3-Position**

|  | Symbol | Port size | Cv  | Description           | Valve type      | Part number      |
|--|--------|-----------|-----|-----------------------|-----------------|------------------|
|  |        | 1/4"      | 1.3 | Inline, parallel      | 3-position APB  | <b>422CS013W</b> |
|  |        | 3/8"      | 1.3 | Inline, parallel      | 3-position, APB | <b>422CS023W</b> |
|  |        | 1/4"      | 1.3 | Inline, parallel      | 3-position, CE  | <b>422CS014W</b> |
|  |        | 3/8"      | 1.3 | Inline, parallel      | 3-position, CE  | <b>422CS024W</b> |
|  |        | 1/4"      | 1.3 | Inline, perpendicular | 3-position, APB | <b>422CR013W</b> |
|  |        | 3/8"      | 1.3 | Inline, perpendicular | 3-position, APB | <b>422CR023W</b> |
|  |        | 1/4"      | 1.3 | Inline, perpendicular | 3-position, CE  | <b>422CR014W</b> |
|  |        | 3/8"      | 1.3 | Inline, perpendicular | 3-position, CE  | <b>422CR024W</b> |

**Foot Pedal Valve - 2-Position**

|  | Symbol | Port size | Cv  | Description      | Valve type                | Part number      |
|--|--------|-----------|-----|------------------|---------------------------|------------------|
|  |        | 1/4"      | 2.2 | Foot pedal       | 2-position, spring return | <b>422CT011K</b> |
|  |        | 3/8"      | 2.9 | Foot pedal       | 2-position, spring return | <b>422CT021K</b> |
|  |        |           |     | Foot pedal guard |                           | <b>PS2043P</b>   |

**CAUTION:**  
 This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.217.

**Valve body service kits, single pressure**

|                  |                |
|------------------|----------------|
| 2-position valve | <b>PS2038P</b> |
| 3-position valve | <b>PS2041P</b> |

Kit includes: all soft seals and spool.

Most popular. For technical information see CD



Brass Poppet / Sliding Seal

LV-EZ Series Lockout Valves

M0 Series

42 Lever / Pedal Series

Viking Xtreme Lever Series

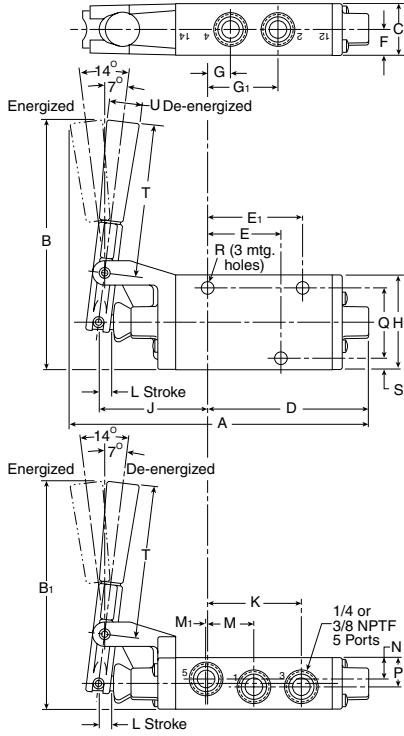
Directair 2, Directair 4

**D**

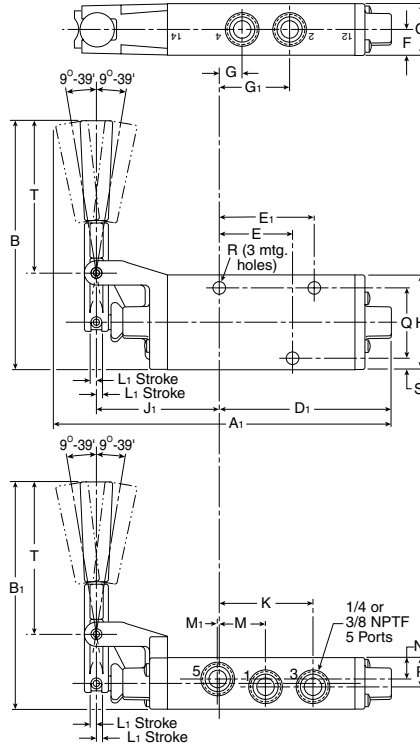
Manual / Mechanical Valve Products

Brass Poppet / Sliding Seal  
 LV-EZ Series Lockout Valves  
 M0 Series  
 42 Lever / Pedal Series  
 Viking Xtreme Lever Series  
 Directair 2, Directair 4  
**D** Manual / Mechanical Valve Products

**2-Position**



**3-Position**



**Lever Valve**

| A                              | A <sub>1</sub>                   | B                                | B <sub>1</sub> | C            |  |  |
|--------------------------------|----------------------------------|----------------------------------|----------------|--------------|--|--|
| 6.70<br>(170)                  | 7.58<br>(193)                    | 5.55<br>(141)                    | 5.05<br>(128)  | 1.15<br>(29) |  |  |
| D                              | D <sub>1</sub>                   | E                                | E <sub>1</sub> | F            |  |  |
| 3.59<br>(91)                   | 3.83<br>(97)                     | 1.58<br>(40)                     | 2.06<br>(52)   | .57<br>(14)  |  |  |
| G NPT                          | G <sub>1</sub> NPT               | H                                |                |              |  |  |
| 1/4" .51 (13)<br>3/8" .55 (14) | 1/4" 1.56 (40)<br>3/8" 1.51 (38) | 2.13 (54)                        |                |              |  |  |
| J                              | J <sub>1</sub>                   | K NPT                            | L              |              |  |  |
| 2.44<br>(62)                   | 2.80<br>(71)                     | 1/4" 2.08 (53)<br>3/8" 2.13 (54) | .25<br>(6)     |              |  |  |
| L <sub>1</sub>                 | M                                | M <sub>1</sub> NPT               | N              |              |  |  |
| .18<br>(5)                     | 1.03<br>(36)                     | 1/4" .02 (.5)<br>3/8" .06 (2)    | .50<br>(13)    |              |  |  |
| P                              | Q                                | R                                | S              | T            |  |  |
| .65<br>(17)                    | 1.58<br>(40)                     | .33<br>(8)                       | .27<br>(7)     | 3.42<br>(87) |  |  |

**U Dia**  
 .75  
 (19)

Inches (mm)

**Foot Pedal Valve**

| A                                | B              | B <sub>1</sub> | C                              | D            |  |
|----------------------------------|----------------|----------------|--------------------------------|--------------|--|
| 8.64<br>(220)                    | 2.18<br>(55)   | 1.03<br>(26)   | 1.15<br>(29)                   | 3.59<br>(91) |  |
| E                                | E <sub>1</sub> | F              | G NPT                          |              |  |
| 1.58<br>(40)                     | 2.06<br>(52)   | .57<br>(14)    | 1/4" .51 (13)<br>3/8" .55 (14) |              |  |
| G <sub>1</sub> NPT               | H              | H <sub>1</sub> | J                              |              |  |
| 1/4" 1.56 (40)<br>3/8" 1.51 (38) | 2.13 (54)      | 2.50<br>(64)   | 2.32<br>(59)                   |              |  |
| K NPT                            | L              | M              |                                |              |  |
| 1/4" 2.08 (53)<br>3/8" 2.13 (54) | .60<br>(15)    | 1.03<br>(26)   |                                |              |  |
| M <sub>1</sub> NPT               | N              | P              | Q                              |              |  |
| 1/4" .02 (.5)<br>3/8" .06 (2)    | .50<br>(13)    | .65<br>(17)    | 1.58<br>(40)                   |              |  |
| R                                | S              | T              | U                              |              |  |
| .33<br>(8)                       | .27<br>(7)     | 3.00<br>(76)   | .48<br>(11)                    |              |  |

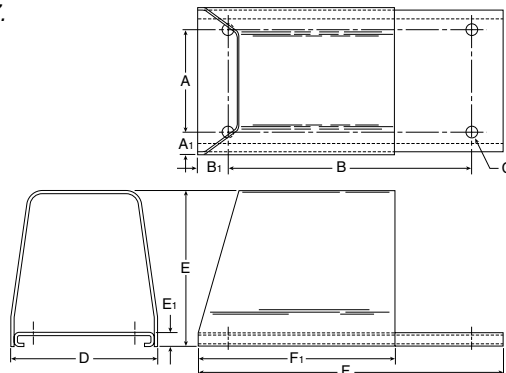
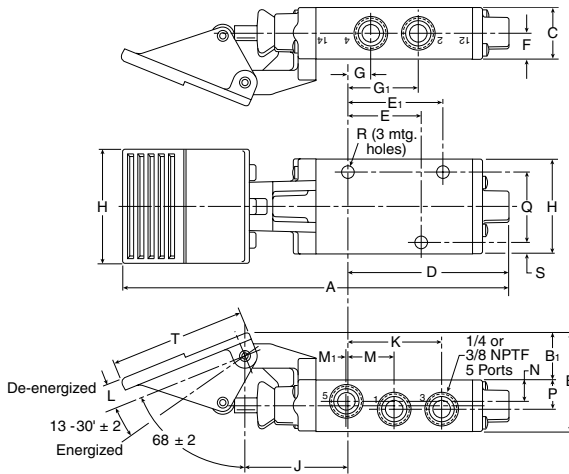
Inches (mm)

**Foot Valve Guard: FS043P**

| A             | A <sub>1</sub> | B              | B <sub>1</sub> | C              |
|---------------|----------------|----------------|----------------|----------------|
| 4.50<br>(114) | .75<br>(19)    | 10.50<br>(267) | 1.25<br>(32)   | .48<br>(11)    |
| D             | E              | E <sub>1</sub> | F              | F <sub>1</sub> |
| 6.00<br>(152) | 7.13<br>(181)  | .50<br>(13)    | 13.00<br>(330) | 8.38<br>(213)  |

Inches (mm)

**CAUTION:**  
 This valve shall not be used to actuate a punch press.  
 Do not use this valve on punch presses or press brakes.  
 See OSHA 1910.217.





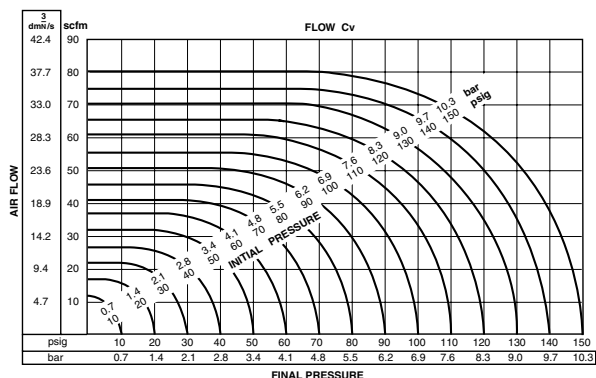
**Features**

- 1/4" to 3/4" NPTF ports
- Standard operators listed. Consult factor for variations in orientation
- Standard 2 position 3-way and 4-way valves listed. Consult factory for 2-way and 3 position valves
- Corrosion resistant bronze body
- High flow brass spacers position o-ring, permit reverse piping and vacuum service
- Specially compounded o-rings suitable for non-lube air service and low pressure oil service
- Floating stem of hard chrome plated stainless steel; no metal to metal contact
- Closed at crossover design for air savings
- Piped exhaust convenient for muffling
- Interchangeable operators
- Interchangeable end sections
- Service without disturbing plumbing
- Dual mounting brackets on most models

**Flow Cv ratings**

| Valve type       | Port size | Port 1 to 2 | Port 1 to 3 | Port 2 to 3 | Port 2 to 4 | Port 3 to 4 |
|------------------|-----------|-------------|-------------|-------------|-------------|-------------|
| 3-way 2-position | 1/4       | 2.4         | —           | 2.4         | —           | —           |
|                  | 3/8       | 3.2         | —           | 3.4         | —           | —           |
|                  | 1/2       | 5.0         | —           | 5.1         | —           | —           |
|                  | 3/4       | 9.5         | —           | 9.8         | —           | —           |
| 4-way 2-position | 1/4       | 2.4         | 2.4         | —           | 2.0         | 2.2         |
|                  | 3/8       | 3.4         | 3.2         | —           | 3.0         | 3.1         |
|                  | 1/2       | 5.2         | 5.3         | —           | 4.7         | 4.7         |
|                  | 3/4       | 8.7         | 9.2         | —           | 7.9         | 8.0         |

**Flow Cv**



**Flow capacities**

The capacity curves shown in the chart are for a theoretical valve having a Cv = 1.0 for air at standard conditions. Flow rating determined in accordance with NFPA recommended standard NFPA/T3.21.3 - 1974.



**Operating information**

**Pressure limitations knob (manual and spring return) and palm operators (manual and spring return)**

| Media               | Port size       | PSI (kPa)               |            |
|---------------------|-----------------|-------------------------|------------|
|                     |                 | 3-way                   | 4-way      |
| Air and Hydraulic ‡ | 1/4             | 200 (1380)              | 180 (1240) |
|                     | 3/8             | 175 (1210)              | 170 (1170) |
|                     | 1/2             | 160 (1100)              | 150 (1030) |
|                     | 3/4             | 150 (1030)              | 150 (1030) |
| Vacuum              | All             | Within 1" Hg of perfect |            |
| Other               | Consult factory |                         |            |

**Pressure limitations knob (detent), lever, pedal, treadle, clevis, cam air operated diaphragm and cylinder**

| Media               | Port size       | PSI (kPa)               |            |
|---------------------|-----------------|-------------------------|------------|
|                     |                 | 3-way                   | 4-way      |
| Air and Hydraulic ‡ | 1/4             | 225 (1550)              | 225 (1550) |
|                     | 3/8             | 225 (1550)              | 225 (1550) |
|                     | 1/2             | 215 (1480)              | 215 (1480) |
|                     | 3/4             | 200 (1380)              | 200 (1380) |
| Vacuum              | All             | Within 1" Hg of perfect |            |
| Other               | Consult factory |                         |            |

Temperature range: -15°F to 200°F (-26° to 93°C)

Lubrication: For best results and service life use clean, moisture free lubricated air.

‡ For technical information see CD

**Material specifications**

|                          |   |
|--------------------------|---|
| Body                     | High pressure valve bronze  |
| Knobs and palm buttons   | Anodized aluminum   |
| Operators                | Iron castings; steel rod, bar and tube, and plated for corrosion resistance |
| O-rings                  | Buna-N and impregnated with Molybdenum Disulfide                            |
| Spacers and end bearings | Brass bar stock   |
| Springs                  | high quality steel and plated for corrosion resistance                      |
| Stem                     | Stainless steel and hard chrome plated                                      |

**Warnings**

- ⚠ Install guards on all hand operated valves if accidental operation can cause personal injury.
- ⚠ Foot operated valves must be protected against inadvertent operation that can cause serious bodily injury. Use of a guard is strongly recommended as it will reduce the likelihood of inadvertent operation.



Brass Poppet / Sliding Seal

LV-EZ Series Lockout Valves

M0 Series

42 Lever / Pedal Series

























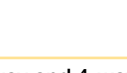


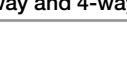

















Viking Xtreme Lever Series

Directair 2, Directair 4

**D**  
 Manual / Mechanical Valve Products











**M0 Series Air Pilot, Manual & Mechanically Actuated Valves**

|   |   | Description   | Part number<br>1/4 NPT   | Part number<br>3/8 NPT | Part number<br>1/2 NPT | Part number<br>3/4 NPT |                  |
|---|---|---|--|------------------------|------------------------|------------------------|------------------|
| Brass Poppet /<br>Sliding Seal /<br>LV-EZ Series<br>Lockout Valves                |    |  3-way, detent ball, foot bracket  | <b>M05422448</b>   | <b>M05432448</b>       | <b>M05442448</b>       | <b>M05462448</b>       |                  |
|   |   |  3-way, detent ball, panel mount with nut  | <b>M05822451</b>   | <b>M05832451</b>       | <b>M05842451</b>       | <b>M05862451</b>       |                  |
|   |    |  3-way, N.C., manual, foot bracket   | <b>M08521848</b>   | <b>M08531848</b>       | <b>M08541848</b>       | <b>M08561848</b>       |                  |
|   |   |  3-way, N.C., manual, panel nut  | <b>M08521851</b>   | <b>M08531851</b>       | <b>M08541851</b>       | <b>M08561851</b>       |                  |
|   |    |  3-way, N.C., pull to operate, spring return, foot bracket                       | <b>M09721848</b>   | <b>M09731848</b>       | <b>M09741848</b>       | <b>M09761848</b>       |                  |
|   |   |  3-way, N.C., pull to operate, spring return, panel mount with nut               | <b>M06421851</b>   | <b>M06431851</b>       | <b>M06441851</b>       | <b>M06461851</b>       |                  |
|   |    |  3-way, N.C., push to operate, spring return, foot bracket                       | <b>M09821848</b>   | <b>M09831848</b>       | <b>M09841848</b>       | <b>M09861848</b>       |                  |
|   |   |  3-way, N.C., push to operate, spring return, panel mount with nut               | <b>M06521851</b>   | <b>M06531851</b>       | <b>M06541851</b>       | <b>M06561851</b>       |                  |
|   | M0 Series   |    |  4-way, detent ball, foot bracket         | <b>M05425448</b>       | <b>M05435448</b>       | <b>M05445448</b>       | <b>M05465448</b> |
|   |   |   |  4-way, detent ball, panel mount with nut | <b>M05825451</b>       | <b>M05835451</b>       | <b>M05845451</b>       | <b>M05865451</b> |
|  |   |  4-way, manual, foot bracket   | <b>M08524648</b>   | <b>M08534648</b>       | <b>M08544648</b>       | <b>M08564648</b>       |                  |
|   |   |  4-way, manual, panel nut  | <b>M08524651</b>   | <b>M08534651</b>       | <b>M08544651</b>       | <b>M08564651</b>       |                  |
|  |   |  4-way, pull to operate, spring return, foot bracket                             | <b>M09724648</b>   | <b>M09734648</b>       | <b>M09744648</b>       | <b>M09764648</b>       |                  |
|   |   |  4-way, pull to operate, spring return, panel mount with nut                     | <b>M06424651</b>   | <b>M06434651</b>       | <b>M06444651</b>       | <b>M06464651</b>       |                  |
| 42 Lever /<br>Pedal Series  |    |  4-way, push to operate, spring return, foot bracket                             | <b>M09824648</b>   | <b>M09834648</b>       | <b>M09844648</b>       | <b>M09864648</b>       |                  |
|   |   |  4-way, push to operate, spring return, panel mount with nut                     | <b>M06524651</b>   | <b>M06534651</b>       | <b>M06544651</b>       | <b>M06564651</b>       |                  |
|   |   |  4-way, pull to operate, spring return, foot bracket                            | <b>M09724648</b>   | <b>M09734648</b>       | <b>M09744648</b>       | <b>M09764648</b>       |                  |
|   |   |  4-way, pull to operate, spring return, panel mount with nut                   | <b>M06424651</b>   | <b>M06434651</b>       | <b>M06444651</b>       | <b>M06464651</b>       |                  |
| Viking Xtreme<br>Lever Series   |  |  4-way, push to operate, spring return, foot bracket                           | <b>M09824648</b>   | <b>M09834648</b>       | <b>M09844648</b>       | <b>M09864648</b>       |                  |
|   |   |  4-way, push to operate, spring return, panel mount with nut                   | <b>M06524651</b>   | <b>M06534651</b>       | <b>M06544651</b>       | <b>M06564651</b>       |                  |
| Directair 2,<br>Directair 4   |  |  3-way, N.C., pull palm button to operate, spring return, panel mount with nut | <b>M06421859</b>   | <b>M06431859</b>       | <b>M06441859</b>       | <b>M06461859</b>       |                  |
|   |   |  3-way, N.C., push palm button to operate, spring return, panel mount with nut | <b>M06521859</b>   | <b>M06531859</b>       | <b>M06541859</b>       | <b>M06561859</b>       |                  |
|   |   |  4-way, pull palm button to operate, spring return panel mount with nut        | <b>M06424659</b>   | <b>M06434659</b>       | <b>M06444659</b>       | <b>M06464659</b>       |                  |
|   |   |  4-way, push palm button to operate, spring return, panel mount with nut       | <b>M06524659</b>   | <b>M06534659</b>       | <b>M06544659</b>       | <b>M06564659</b>       |                  |
| Manual / Mechanical<br>Valve Products   |  |  3-way, detent ball, foot bracket  | <b>M05422443</b>   | <b>M05432443</b>       | <b>M05442443</b>       | <b>M05462443</b>       |                  |
|   |   |  3-way, manual, foot bracket   | <b>M08521843</b>   | <b>M08531843</b>       | <b>M08541843</b>       | <b>M08561843</b>       |                  |
|   |   |  3-way, N.C., pull lever to operate, spring return, foot bracket               | <b>M09621843</b>   | <b>M09631843</b>       | <b>M09641843</b>       | <b>M09661843</b>       |                  |
|   |   |  3-way, N.C., push lever to operate, spring return, foot bracket               | <b>M09521843</b>   | <b>M09531843</b>       | <b>M09541843</b>       | <b>M09561843</b>       |                  |
|   |   |  4-way, detent ball, foot bracket  | <b>M05425443</b>   | <b>M05435443</b>       | <b>M05445443</b>       | <b>M05465443</b>       |                  |
|   |   |  4-way, manual, foot bracket   | <b>M08524643</b>   | <b>M08534643</b>       | <b>M08544643</b>       | <b>M08564643</b>       |                  |
|   |   |  4-way, pull lever to operate, spring return, foot bracket                     | <b>M09624643</b>   | <b>M09634643</b>       | <b>M09644643</b>       | <b>M09664643</b>       |                  |
|   |   |  4-way, push lever to operate, spring return, foot bracket                     | <b>M09524643</b>   | <b>M09534643</b>       | <b>M09544643</b>       | <b>M09564643</b>       |                  |
|   |   |  4-way, push lever to operate, spring return, foot bracket                     | <b>M09524643</b>   | <b>M09534643</b>       | <b>M09544643</b>       | <b>M09564643</b>       |                  |

 Most popular. For technical information see CD















**M0 Series Air Pilot, Manual & Mechanically Actuated Valves**

| 3-way and 4-way, foot operated: treadle / pedal type                              | Description  | Part number 1/4 NPT | Part number 3/8 NPT | Part number 1/2 NPT | Part number 3/4 NPT |
|---|--|---------------------|---------------------|---------------------|---------------------|
|  |  3-way, treadle operated, detent ball, foot bracket       | <b>M05422488</b>    | <b>M05432488</b>    | <b>M05442488</b>    | —                   |
|   |  3-way, treadle operated, manual return, foot bracket     | <b>M08521888</b>    | <b>M08531888</b>    | <b>M08541888</b>    | —                   |
|   |  3-way, N.C., spring return, pedel operated, foot bracket | <b>M06221840</b>    | <b>M06231840</b>    | <b>M06241840</b>    | —                   |
|  |  4-way, treadle operated, denent ball, foot bracket       | <b>M05425488</b>    | <b>M05435488</b>    | <b>M05445488</b>    | —                   |
|   |  4-way, treadle operated, manual return, foot bracket     | <b>M08524688</b>    | <b>M08534688</b>    | <b>M08544688</b>    | —                   |
|   |  4-way, spring return, pedel operated, foot bracket       | <b>M06224640</b>    | <b>M06234640</b>    | <b>M06244640</b>    | —                   |









**CAUTION:** This valve shall not be used to actuate a punch press. Do not use this valve on punch presses or press brakes. See OSHA 1910.217.

**3-way and 4-way air operated : diaphragm or cylinder**




|   |  |                  |                  |                  |                  |
|---|--|------------------|------------------|------------------|------------------|
|    |  3-way, N.C., single air diaphragm, air signal to actuate, spring return foot bracket | <b>M08421830</b> | <b>M08431830</b> | <b>M08441830</b> | —                |
|   |  3-way, single air cylinder signal to actuate, spring return foot bracket             | <b>M08521826</b> | <b>M08531826</b> | <b>M08541826</b> | <b>M08561826</b> |
|    |  3-way, double air diaphragm  | <b>M03321833</b> | <b>M03331833</b> | <b>M03341833</b> | —                |
|   |  3-way, double air cylinder foot bracket  | <b>M01921819</b> | <b>M01931819</b> | <b>M01941819</b> | <b>M01961819</b> |
|   |  4-way, single air diaphragm, air signal to actuate, spring return foot bracket      | <b>M08424630</b> | <b>M08434630</b> | <b>M08444630</b> | —                |
|   |  4-way, single air cylinder signal to actuate, spring return foot bracket           | <b>M08524626</b> | <b>M08534626</b> | <b>M08544626</b> | <b>M08564626</b> |
|  |  4-way, double air diaphragm  | <b>M03324633</b> | <b>M03334633</b> | <b>M03344633</b> | —                |
|   |  4-way, double air cylinder foot bracket  | <b>M01924619</b> | <b>M01934619</b> | <b>M01944619</b> | <b>M01964619</b> |

**Note:** diaphragm operators : pilot signal pressures from 20 to 60 psi. Cylinder operators : pilot signal pressures from 20 to 250 psi.

**3-way and 4-way clevis operated**

|   |  |                  |                  |                  |                  |
|---|--|------------------|------------------|------------------|------------------|
|  |  3-way, manual, foot bracket                                | <b>M08521805</b> | <b>M08531805</b> | <b>M08541805</b> | <b>M08561805</b> |
|   |  3-way, N.C., pull to operate, spring return foot bracket   | <b>M09621805</b> | <b>M09631805</b> | <b>M09641805</b> | <b>M09661805</b> |
|   |  3-way, N.C., push to operate, spring return, foot bracket  | <b>M09521805</b> | <b>M09531805</b> | <b>M09541805</b> | <b>M09561805</b> |
|  |  4-way, manual, foot bracket                                | <b>M08524605</b> | <b>M08534605</b> | <b>M08544605</b> | <b>M08564605</b> |
|   |  4-way, pull clevis to operate, spring return, foot bracket | <b>M09624605</b> | <b>M09634605</b> | <b>M09644605</b> | <b>M09664605</b> |
|   |  4-way, push clevis to operate, spring return, foot bracket | <b>M09524605</b> | <b>M09534605</b> | <b>M09544605</b> | <b>M09564605</b> |

**3-way and 4-way cam operated**

|   |  |                  |                  |                  |                  |
|---|--|------------------|------------------|------------------|------------------|
|  |  3-way, N.C., spring return, cam operated, foot bracket | <b>M09521803</b> | <b>M09531803</b> | <b>M09541803</b> | <b>M09561803</b> |
|   |  4-way, spring return, cam operated, foot bracket       | <b>M09524603</b> | <b>M09534603</b> | <b>M09544603</b> | <b>M09564603</b> |

Brass Poppet / Sliding Seal

LV-EZ Series Lockout Valves

M0 Series

42 Lever / Pedal Series

Viking Xtreme Lever Series

Directair 2, Directair 4

**D**  
 Manual / Mechanical Valve Products

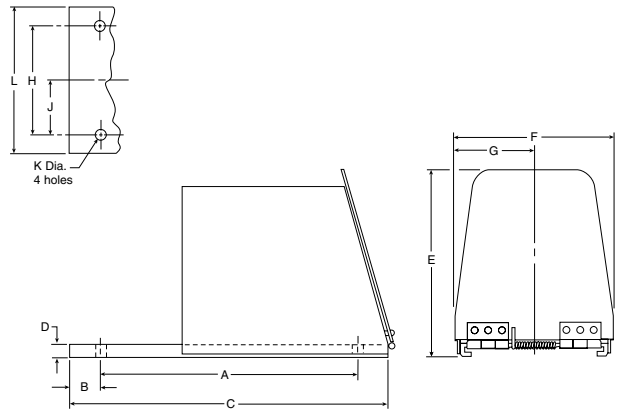
**Pedal Guard**  
**(Fits all pedal operated valves)**

| Description                              | Model number     |
|--|------------------|
| Guard with door                          | <b>M232 001</b>  |
| Guard without door                       | <b>M232 002</b>  |
| Guard with door for 1/4 and 3/8 valve    | <b>M232 003*</b> |
| Guard without door for 1/4 and 3/8 valve | <b>M232 004*</b> |
| Guard with door for 1/2 and 3/4          | <b>M232 005*</b> |
| Guard without door for 1/2 and 3/4       | <b>M232 006*</b> |

\* Includes mounting hardware.

**CAUTION:**

*Foot valves utilizing this guard shall not be used to actuate a punch press.  
 Do not use this valve on punch presses or press brakes.  
 See OSHA 1910.217.*



**Dimensions**

| A     | B    | C     | D     | E     | F     | G    |
|-------|------|-------|-------|-------|-------|------|
| 10.50 | 1.25 | 13.00 | .50   | 7.38  | 6.36  | 3.18 |
| 266.7 | 31.8 | 330.2 | 12.7  | 187.4 | 161.5 | 80.8 |
| H     | J    | K     | L     |       |       |      |
| 4.50  | 2.25 | .44   | 6.00  |       |       |      |
| 114.3 | 57.2 | 11.2  | 152.4 |       |       |      |

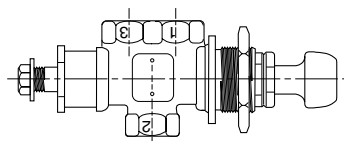
**M0 valve 9 digit part number dissection**

The M0 Valve Series has with wide variety of operating and return ends which can be ordered either on the left or right hand side of the valve body. Common part numbers on the previous pages can be ordered with the left and right hand ends swapped. Swapping operator and return end sections does not change the spool function, but can reverse the

expected function of the valve. For example, a 3-way, normally closed, "NC", spring return valve will become a 3-way normally open, "NO", valve when the operator and return section is swapped. There are other non-cataloged options available and this part number dissection will enable you to discuss your valve part number with the factory for options.

**3-way**

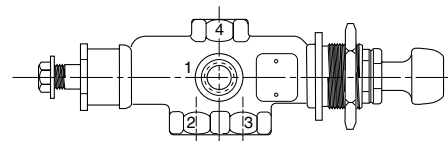
| Series name | Left end  | Port size | Body function | Right end |
|-------------|-----------|-----------|---------------|-----------|
| <b>M0</b>   | <b>XX</b> | <b>X</b>  | <b>XX</b>     | <b>XX</b> |



Left End Section in relation to port #2 ← → Right End Section in relation to port #2

**4-way**

| Series name | Left end  | Port size | Body function | Right end |
|-------------|-----------|-----------|---------------|-----------|
| <b>M0</b>   | <b>XX</b> | <b>X</b>  | <b>XX</b>     | <b>XX</b> |



Left End Section in relation to port #2 ← → Right End Section in relation to port #3

Brass Poppet / Sliding Seal  
 LV-EZ Series Lockout Valves  
 M0 Series  
 42 Lever / Pedal Series  
 Viking Xtreme Lever Series  
 Directair 2, Directair 4  
**D**  
 Manual / Mechanical Valve Products

Lockout valves are installed in pneumatic drop legs, or individual pneumatic control lines. In accordance with OSHA procedures, lockout valves are used during maintenance and service procedures of pneumatically (air) operated equipment.

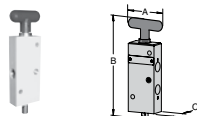
- Used for compliance with OSHA 29 CFR part 1910
- 1/4" to 2" pipe sizes. NPT or BSPP
- Yellow cast aluminum body with red handle or stainless steel (NACE MR0175 / ISO 15156)
- Inline or surface mountable
- Built in port for pressure verification to meet ANSI B11 and PMMI B155 requirements

**Material specifications**

| Description    | LV / EZ                  | LVSS                     |
|----------------|--------------------------|--------------------------|
| Body:          | Cast aluminum alloy      | Stainless steel          |
| Handle:        | Plastic                  | Stainless steel          |
| Spool:         | Aluminum                 | Stainless steel          |
| Seals:         | Carboxylated nitrile     | Carboxylated nitrile     |
| Detent spring: | Stainless steel          | Stainless steel          |
| Grease:        | Magnalube G <sup>†</sup> | Magnalube G <sup>†</sup> |

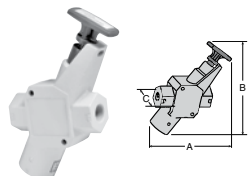
<sup>†</sup> Trademark Magnalube

**Compact**



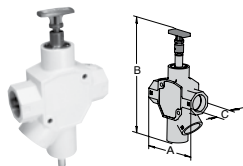
| Port in / out | Port exhaust | A (in) | B (in) | C (in) | Wt (lb) | Part number * |
|---------------|--------------|--------|--------|--------|---------|---------------|
| 1/4           | 3/8          | 2.3    | 6.5    | 1.0    | 0.9     | <b>LV2N3B</b> |
| 3/8           | 3/8          | 2.3    | 6.5    | 1.0    | 0.9     | <b>LV3N3B</b> |

**Standard**



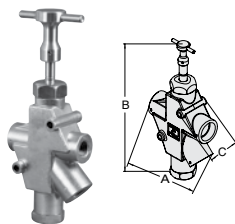
| Port in / out | Port exhaust | A (in) | B (in) | C (in) | Wt (lb) | Part number * |
|---------------|--------------|--------|--------|--------|---------|---------------|
| 3/8           | 3/4          | 6.4    | 8.8    | 2.0    | 2.0     | <b>LV3N6B</b> |
| 1/2           | 3/4          | 6.4    | 8.8    | 2.0    | 2.0     | <b>LV4N6B</b> |
| 3/4           | 3/4          | 6.4    | 8.8    | 2.0    | 2.0     | <b>LV6N6B</b> |
| 3/4           | 1-1/4        | 7.6    | 10.6   | 2.3    | 3.2     | <b>LV6NAB</b> |
| 1             | 1-1/4        | 7.6    | 10.6   | 2.3    | 3.2     | <b>LV8NAB</b> |
| 1-1/4         | 1-1/4        | 7.6    | 10.6   | 2.3    | 3.2     | <b>LVANAB</b> |

**High Flow**



| Port in / out | Port exhaust | A (in) | B (in) | C (in) | Wt (lb) | Part number * |
|---------------|--------------|--------|--------|--------|---------|---------------|
| 1-1/2         | 2            | 8.2    | 14.9   | 3.0    | 8.2     | <b>LVBNCB</b> |
| 2             | 2            | 8.2    | 14.9   | 3.0    | 8.2     | <b>LVCNCB</b> |

**Stainless Steel**



| Port in / out | Port exh. | A (in) | B (in) | C (in) | Wt (lb) | Part number *   |
|---------------|-----------|--------|--------|--------|---------|-----------------|
| 1/4           | 1/4       | 3.5    | 8.6    | 2.1    | 3.8     | <b>LV2N2BSS</b> |
| 3/8           | 1/2       | 4.3    | 10.5   | 1.8    | 6.0     | <b>LV3N4BSS</b> |
| 1/2           | 1/2       | 4.3    | 10.5   | 1.8    | 6.0     | <b>LV4N4BSS</b> |
| 3/4           | 1         | 6.0    | 14.1   | 2.5    | 13      | <b>LV6N8BSS</b> |
| 1             | 1         | 6.0    | 14.1   | 2.5    | 13      | <b>LV8N8BSS</b> |
| 1-1/2         | 2         | 8.2    | 18.5   | 4.0    | 35      | <b>LVBNCBSS</b> |
| 2             | 2         | 8.2    | 18.5   | 4.0    | 35      | <b>LVCNCBSS</b> |

\* For BSPP ports, change 4th digit from "N" to "B"



**Operating information**

| Operating pressure: | LV             | EZ             | LVSS           |
|---------------------|----------------|----------------|----------------|
| Compact             | 15 to 145 PSIG | –              | –              |
| Standard            | 15 to 300 PSIG | 15 to 300 PSIG | 15 to 300 PSIG |
| High flow           | 15 to 300 PSIG | –              | –              |

| Operating temperature: | 40°F to 175°F                         | 40°F to 175°F | 30°F to 175°F |
|------------------------|---------------------------------------|---------------|---------------|
| Operating media:       | Clean, dry, compressed air (5 micron) |               |               |

For technical information see CD

Brass Poppet / Sliding Seal  
LV-EZ Series Lockout Valves  
M0 Series  
42 Lever / Pedal Series  
Viking Xtreme Lever Series  
Directair 2, Directair 4  
Manual / Mechanical Valve Products



The EZ series meets all the same standards as the LV series with the added feature of a soft start when opened. There are still 2 detented positions for the handle (push close, pull to open), but when pulled open, an adjustable needle valve controls the rate of pressure build-up. This can protect equipment during start up after maintenance. The EZ is distinguishable from the LV series by the blue dot on the label.



**EZ Series**

|  | Port in / out | Port exhaust | A (in) | B (in) | C (in) | Wt (lb) | Part Number *  |
|--|---------------|--------------|--------|--------|--------|---------|----------------|
|  | 3/8           | 3/4          | 6.4    | 8.8    | 2.0    | 2.1     | <b>EZ03NB6</b> |
|  | 1/2           | 3/4          | 6.4    | 8.8    | 2.0    | 2.1     | <b>EZ04NB6</b> |
|  | 3/4           | 3/4          | 6.4    | 8.8    | 2.0    | 2.1     | <b>EZ06NB6</b> |
|  | 3/4           | 1-1/4        | 7.7    | 10.8   | 2.3    | 3.2     | <b>EZ06NBA</b> |
|  | 1             | 1-1/4        | 7.7    | 10.8   | 2.3    | 3.2     | <b>EZ08NBA</b> |
|  | 1-1/4         | 1-1/4        | 7.7    | 10.8   | 2.3    | 3.2     | <b>EZ0ANBA</b> |

\* For BSPP ports, change 5th digit from "N" to "B"

Brass Poppet / Sliding Seal

LV-EZ Series Lockout Valves

M0 Series

42 Lever / Pedal Series

Viking Xtreme Lever Series

Directair 2, Directair 4

**D**

Manual / Mechanical Valve Products

**LV / EZ Accessories**

**High Flow Silencers**

| Pipe size | Part number NPT | Part number BSPT |
|-----------|-----------------|------------------|
| 3/8       | <b>ES37MC</b>   | <b>ESB37MC</b>   |
| 3/4       | <b>ES75MC</b>   | <b>ESB75MC</b>   |
| 1-1/4     | <b>ES125MC</b>  | <b>ESB125MC</b>  |
| 2         | <b>ES200MC</b>  | <b>ESB200MC</b>  |

**Stainless Steel Mufflers**

| Pipe size | Part number NPT     |
|-----------|---------------------|
| 1/4       | <b>5500A2004</b>    |
| 1/2       | <b>5500A4004</b>    |
| 1         | <b>5500A6004</b>    |
| 2         | <b>5500A9004 **</b> |

\*\* Nickel Plated

**Pop-up Pressure Indicator**



**Brass** – Part # 988A30 – Can be used on all LV or EZ series to provide visual verification of line exhaust



**Stainless** – Part# 1155H30 – Can be used on SS LV series to provide visual verification of line exhaust

**Pressure Switch**



- Part # PPS1-2C3-RHM (DIN 9.4mm connector)
- Part # PPS1-2C3-RWL (18" leads)
- Signal verification of line exhaust
- Field adjustable set point

Most popular. For technical information see CD



These are 4-Way, 3-Position, rotary disc, direct-operated air valves. Two different types of control are offered. The forged bronze disc and the cast iron surface upon which the disc works are ground and lapped to provide a leak-proof seal. Air pressure from the inlet port is confined beneath the disc, making the seal tighter as the pressure increases, yet friction between the lapped surfaces is so low that only 15 pounds of force is required to move the lever at 100 PSI line pressure. The need for packing to seal around the stem is eliminated.

Valve can be furnished for gasketing to a manifold on customer's machine or with an adaptor for tapped bottom porting.

Valves are detented.

Operating handles may be installed in any of four positions.



**Operating information**

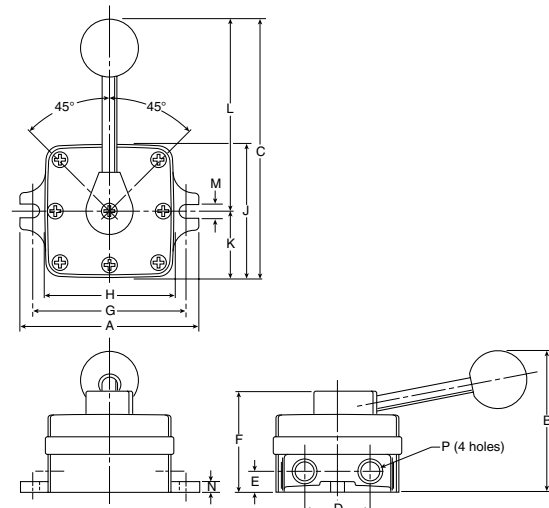
Operating pressure: 0 to 150 PSI (0 to 1035 kPa)  
 Temperature range: 18°F to 200°F (-8°C to 93°C)  
 Lubrication: Filtered and lubricated air recommended for maximum valve life and minimum maintenance.

**PL-VL Series Valves**

| Symbol | Port Size | Description                               | Cv  | Part number |
|--------|-----------|---|-----|-------------|
|        | 1/4" NPT  | 4-way, 3-position, detent, closed center  | 2.5 | <b>PL25</b> |
|        | 3/8" NPT  | 4-way, 3-position, detent, closed center  | 3.0 | <b>PL37</b> |
|        | 1/2" NPT  | 4-way, 3-position, detent, closed center  | 6.2 | <b>PL50</b> |
|        | 1/4" NPT  | 4-way, 3-position, detent, exhaust center | 2.5 | <b>VL25</b> |
|        | 3/8" NPT  | 4-way, 3-position, detent, exhaust center | 3.0 | <b>VL37</b> |
|        | 1/2" NPT  | 4-way, 3-position, detent, exhaust center | 6.2 | <b>VL50</b> |

**Service kits**

| Description                 | Valve size                               | Part number     |
|-----------------------------|--|-----------------|
| Lever assembly service kits | PL25, PL25HP, PL37, PL37HP, VL25, & VL37 | <b>PL2425BP</b> |
|                             | PL50, PL50HP & VL50                      | <b>PL2424BP</b> |
| Body gasket                 | PL25, PL25HP, PL37, PL37HP, VL25, & VL37 | <b>P66837</b>   |
|                             | PL50, PL50HP & VL50                      | <b>P66829</b>   |



**PL-VL Dimensions**

|              | A     | B     | C     | D    | E    | F    | G     | H     | J     | K    | L     | M   | N   | P   |
|--------------|-------|-------|-------|------|------|------|-------|-------|-------|------|-------|-----|-----|-----|
| <b>PL-25</b> | 4.75  | 3.81  | 6.81  | 1.69 | .56  | 2.75 | 4.12  | 3.50  | 3.50  | 1.69 | 5.06  | .34 | .28 | 1/4 |
| <b>VL-25</b> | (121) | (97)  | (173) | (43) | (14) | (70) | (105) | (89)  | (89)  | (43) | (129) | (9) | (7) | NPT |
| <b>PL-37</b> | 4.75  | 3.81  | 6.81  | 1.69 | .56  | .56  | 4.12  | 3.50  | 3.50  | 1.69 | 5.06  | .34 | .28 | 3/8 |
| <b>VL-37</b> | (121) | (97)  | (173) | (43) | (14) | (14) | (105) | (89)  | (89)  | (43) | (129) | (9) | (7) | NPT |
| <b>PL-50</b> | 5.62  | 4.44  | 8.94  | 2.12 | .66  | 3.25 | 5.00  | 4.38  | 4.38  | 2.12 | 6.75  | .34 | .34 | 1/2 |
| <b>VL-50</b> | (143) | (113) | (227) | (54) | (17) | (83) | (127) | (111) | (111) | (54) | (171) | (9) | (9) | NPT |

inches (mm)

Most popular. For technical information see CD



Brass Poppet / Sliding Seal

LV-EZ Series Lockout Valves

M0 Series

42 Lever / Pedal Series

Viking Xtreme Lever Series

Directair 2, Directair 4

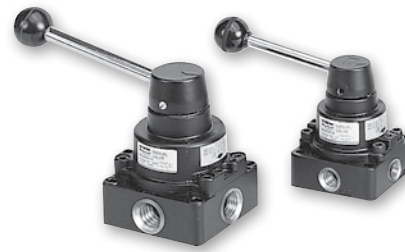
**D**

Manual / Mechanical Valve Products



**Features**

- Compact and simple design
- Rotary disc, direct operated valves
- Side porting
- Detent action smooth lever actuation
- General pneumatic applications



**Lubrication**

Filtered and lubricated air recommended for maximum valve life and minimum maintenance.

**Operating information**

Operating pressure: 0 to 150 PSI (0 to 10 bar)

Temperature range: 32°F to 166°F (0°C to 60°C)

Lubrication: Filtered and lubricated air recommended for maximum valve life and minimum maintenance.

**Material specifications**

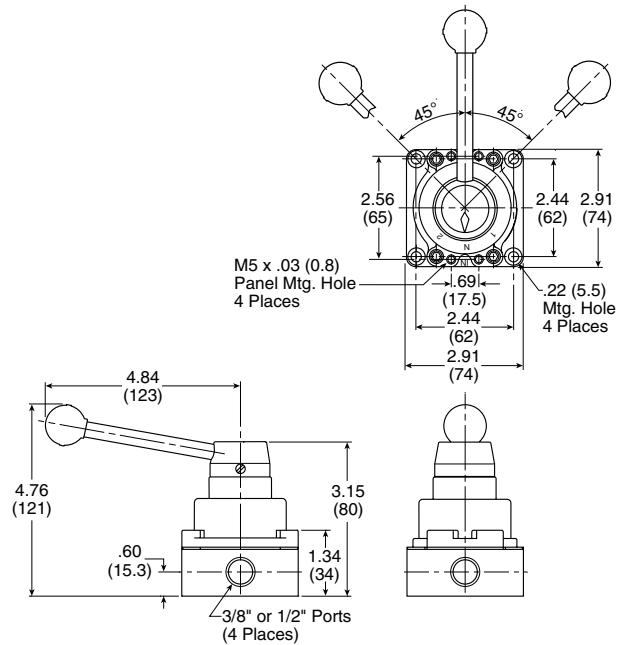
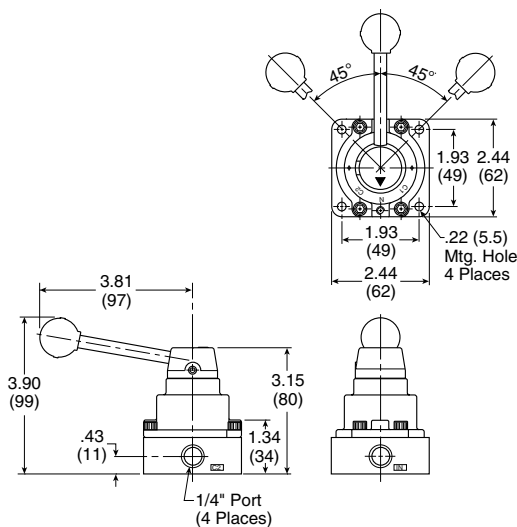
|       |              |
|-------|--------------|
| Cover | Zinc         |
| Body  | Aluminum     |
| Seals | Polyurethane |

**HV Valve Series**

| Symbol | Port size | Description       | Cv (ANSI) | Cv (JIS) | Part number       |
|--------|-----------|-------------------|-----------|----------|-------------------|
|        | 1/4" NPT  | 4-way, 3-position | 0.5       | 0.4      | <b>HVN4200-8</b>  |
|        | 3/8" NPT  | 4-way, 3-position | 1.4       | 2.72     | <b>HVN4400-10</b> |
|        | 1/2" NPT  | 4-way, 3-position | 1.5       | 3.26     | <b>HVN4400-15</b> |

**Service kits**

| Description              | Valve size | Part number       |
|--------------------------|------------|-------------------|
| Disk & seal service kits | HV4200     | <b>HVRK420001</b> |
|                          | HV4400     | <b>HVRK440001</b> |



**HVN4200-8**

**HVN4400-10, 15**

Most popular. For technical information see CD



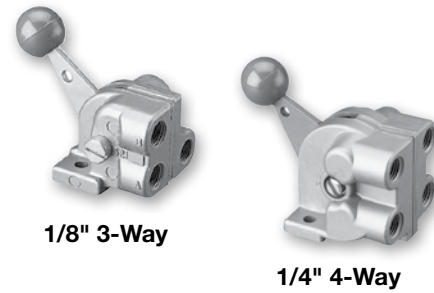


Sliding seal valves provide 3 or 4-Way directional control in a compact body size. Comfortable hand lever is easy to operate and maintains set position. Disc type valve has minimum number of moving parts. Valves should be used with filtered and lubricated air.

**CAUTION:**  
 Install guards on all hand operated valves.  
 Accidental operation can cause personal injury.

**Material specifications**

|                     |                        |
|---------------------|------------------------|
| Internal components | Brass, stainless steel |
| Body                | Die cast zinc          |
| Seals               | Buna N                 |



**Operating information**

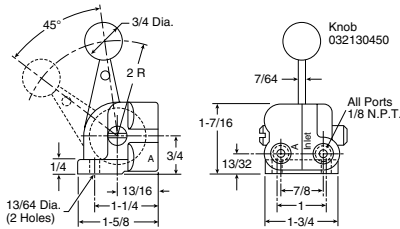
Operating pressure: Max. 200 PSIG air only  
 Min. 26" Hg vacuum  
 Temperature range: -40°F to 212°F (-40°C to 100°C)  
 (If it is possible that the ambient temperature may fall below freezing, the medium must be moisture free to prevent internal damage or unpredictable behavior.)

**Hand Operated Sliding Seal Valve**

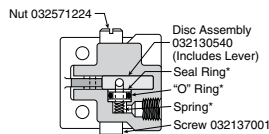
| Symbol | Port size | Function                                    | Cv (Avg) | Service kit*     | Part number      |
|--------|-----------|---|----------|------------------|------------------|
|        | 1/8"      | 3-way, 2-position, detented                 | 0.54     | <b>032130899</b> | <b>032130599</b> |
|        | 1/8"      | 4-way, 2-position, detented                 | 0.54     | <b>032130899</b> | <b>032140299</b> |
|        | 1/4"      | 3-way, 2-position, detented                 | 1.25     | <b>008230299</b> | <b>008230109</b> |
|        | 1/4"      | 4-way, 3-position, detented, center blocked | 1.25     | <b>008230299</b> | <b>008240109</b> |

Note: 3-Way exhaust passage is through an untapped hole in bottom side of valve.

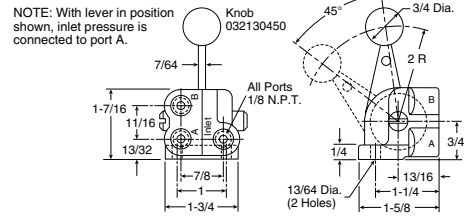
**1/8" 3-Way 032130599**



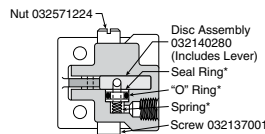
**Service Kit 032130899\***



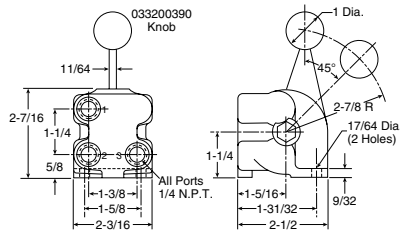
**1/8" 4-Way 032140299**



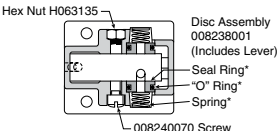
**Service Kit 032130899\***



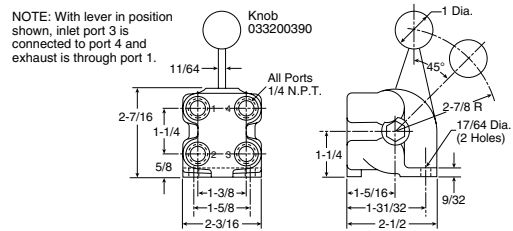
**1/4" 3-Way 008230109**



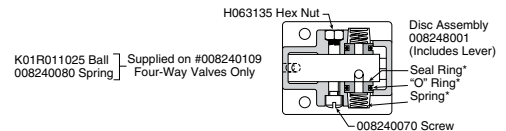
**Service Kit 032130899\***



**1/4" 4-Way 008240109**



**Service Kit 032130899\***



Most popular.

For technical information see CD

\* Service kits contain asterisk items



Brass Poppet / Sliding Seal

LV-EZ Series Lockout Valves

M0 Series

42 Lever / Pedal Series

Viking Xtreme Lever Series

Directair 2, Directair 4

**D**



Manual / Mechanical Valve Products

HUMAN-MACHINE DIALOG requires devices such as push buttons and selector switches to provide command inputs. A wide variety of these devices are available to meet most application needs; in both pneumatic and electrical switch bodies. All of these devices use the 22 mm (7/8") mounting standard.





**Complete Assemblies—  
 3/2 Valve Bodies with 5/32" Instant Straight Connections**

**Flush Push Buttons**

|   | Color | Function      | Type of switching*     | Part number        |
|---|-------|---------------|------------------------|--------------------|
|    | Black | Spring return | NNP                    | <b>PXBB3111BA2</b> |
|   | Green |               |                        | <b>PXBB3111BA3</b> |
|   | Red   |               |                        | <b>PXBB3111BA4</b> |
|  | Black | Spring return | NNP+NP                 | <b>PXBB3251BA2</b> |
|   | Black | Spring return | Single universal 3-way | <b>PXBB4131BA2</b> |
|   | Green |               |                        | <b>PXBB4131BA3</b> |
|   | Red   |               |                        | <b>PXBB4131BA4</b> |
|   | Black | Spring return | Dual universal 3-way   | <b>PXBB4231BA2</b> |


\* Type of switching: Universal 3-way: valve can be connected either as NP or NNP as required by connecting the primary air supply to port 1 or port 3.  
**Note:** Mount up to three valves on mounting ring.

**Mushroom Head Push Buttons (40mm Diameter)**

|   | Color | Function      | Type of switching*     | Part number        |
|---|-------|---------------|------------------------|--------------------|
|  | Black | Spring return | NNP                    | <b>PXBB3111BC2</b> |
|   | Red   | Push-pull     |                        | <b>PXBB3111BT4</b> |
|   | Red   | Push-pull     |                        | NP                 |
|  | Black | Spring return | Single universal 3-way | <b>PXBB4131BC2</b> |
|   | Red   | Push-pull     | Single universal 3-way | <b>PXBB4131BT4</b> |


\* Type of switching: Universal 3-way: valve can be connected either as NP or NNP as required by connecting the primary air supply to port 1 or port 3.  
**Note:** Mount up to three valves on mounting ring.

**Selector Switches**

|   | Color | Function  | Type of switching*     | Part number        |
|---|-------|---|------------------------|--------------------|
|  | Black | 2 maintained positions with std. handle               | NNP                    | <b>PXBB3111BD2</b> |
|   | Black |   | NNP+NNP                | <b>PXBB3211BD2</b> |
|   | Black |   | NNP+NP                 | <b>PXBB3251BD2</b> |
|   | Black | 3 maintained positions with std. handle               | NNP+NNP                | <b>PXBB3211BD3</b> |
|   | Black |   | NNP+NP                 | <b>PXBB3251BD3</b> |
|   | Black | 3 positions, spring return to center with long handle | NNP+NNP                | <b>PXBB3211BJ5</b> |
|   | Black | 2 maintained positions with std. Handle               | Single universal 3-way | <b>PXBB4131BD2</b> |
|   | Black | 2 maintained positions with std. handle               | Dual universal 3-way   | <b>PXBB4231BD2</b> |
|   | Black | 3 maintained positions with std. handle               | Dual universal 3-way   | <b>PXBB4231BD3</b> |
|   | Black | 3 maintained positions with long handle               | Dual universal 3-way   | <b>PXBB4231BJ5</b> |

\* Type of switching: Universal 3-way: valve can be connected either as NP or NNP as required by connecting the primary air supply to port 1 or port 3.





Sensing / Limit  
Switches  
Control Panel  
Products  
**D**  
Accessories  
Valve Products

 Most popular. For technical information see CD





**For Use With PXBB Valve Bodies and ZBE Electrical Switch Bodies**

**Push Buttons**

|   | Color  | Function          | Type     | Part number    |                |
|---|--------|-------------------|----------|----------------|----------------|
|   |        |                   |          | Plastic head** | Metal head*    |
|  | Black  | Spring return     | Flush    | <b>ZB5AA2</b>  | <b>ZB4BA2</b>  |
|   | Green  |                   |          | <b>ZB5AA3</b>  | <b>ZB4BA3</b>  |
|   | Red    |                   |          | <b>ZB5AA4</b>  | <b>ZB4BA4</b>  |
|   | Yellow |                   |          | —              | <b>ZB4BA5</b>  |
|   | Blue   |                   |          | —              | <b>ZB4BA6</b>  |
|   | Black  |                   |          | <b>ZB5AL2</b>  | <b>ZB4BL2</b>  |
|  | Green  | Spring return     | Extended | <b>ZB5AL3</b>  | <b>ZB4BL3</b>  |
|   | Red    |                   |          | <b>ZB5AL4</b>  | <b>ZB4BL4</b>  |
|   | Yellow |                   |          | —              | <b>ZB4BL5</b>  |
|   | Black  |                   |          | —              | <b>ZB4BP2</b>  |
|  | Green  | Spring return     | Booted   | —              | <b>ZB4BP3</b>  |
|   | Red    |                   |          | —              | <b>ZB4BP4</b>  |
|   | Black  |                   |          | —              | <b>ZB4BH02</b> |
|  | Green  | Detent 2 position | Flush    | —              | <b>ZB4BH03</b> |
|   | Red    |                   |          | —              | <b>ZB4BH04</b> |

\* ZB4\*\*\* model numbers are metal head operators  
 \*\* ZB5\*\*\* model numbers are plastic head operators



**Mushroom Head Push Buttons**

|   | Color | Function           | Description | Part number*  |
|---|-------|--------------------|-------------|---------------|
|  | Black | Spring return      | Ø 40mm head | <b>ZB4BC2</b> |
|   | Green |                    |             | <b>ZB4BC3</b> |
|   | Red   |                    |             | <b>ZB4BC4</b> |
|   | Black | Latching push-pull |             | <b>ZB4BT2</b> |
|   | Green |                    |             | <b>ZB4BT3</b> |
|   | Red   |                    |             | <b>ZB4BT4</b> |
|  | Black | Spring return      | Ø 60mm head | <b>ZB4BR2</b> |
|   | Green |                    |             | <b>ZB4BR3</b> |
|   | Red   |                    |             | <b>ZB4BR4</b> |

\* ZB4\*\*\* model numbers are metal head operators



**For Push Buttons and Visual Indicators**

**Mounting Ring for Valve Bodies, Switch Bodies and Operating Heads**

| Description  | Part number     |
|--|-----------------|
|  Metal mounting ring    | <b>ZB4BZ009</b> |
|  Plastic mounting ring | <b>ZB5AZ009</b> |

**Note:** To release push button from mounting ring, pull lever on top of mounting ring up and remove push button operator. To assemble push button operator to mounting ring, align arrows and snap into place.

**Selector Switches**

| Standard black handle   |             |  |               |
|---|-------------|--|---------------|
| Description   | Function    | Part number*                                       |               |
| Maintained  | 2 positions | <b>ZB4BD2</b>                                      |               |
| Spring return from right to left  |             | <b>ZB4BD4</b>                                      |               |
| Maintained  |             | <b>ZB4BD3</b>                                      |               |
| Spring return to center from left and right   |             | <b>ZB4BD5</b>                                      |               |
|  | 3 positions | <b>ZB4BD7</b>                                      |               |
|   |             | Maintained right spring return from left to center | <b>ZB4BD7</b> |
|   | 3 positions | <b>ZB4BD8</b>                                      |               |
|   |             | Maintained left spring return from right to center | <b>ZB4BD8</b> |
| Long Black Handle   |             |  |               |
| Maintained  | 2 positions | <b>ZB4BJ2</b>                                      |               |
| Spring return from right to left  |             | <b>ZB4BJ4</b>                                      |               |
|  | 3 positions | <b>ZB4BJ3</b>                                      |               |
|   |             | Maintained   | <b>ZB4BJ5</b> |
|   |             | Spring return to center from left and right        | <b>ZB4BJ5</b> |

\* ZB4\*\*\* model numbers are metal head operators

**Key Operated Selectors**

| Key withdrawal | Function                              | Part number*  |
|----------------|---------------------------------------|---------------|
| Left           | 2 maintained positions                | <b>ZB4BG2</b> |
| Left and right |                                       | <b>ZB4BG4</b> |
| Center         | 3 maintained positions                | <b>ZB4BG3</b> |
| Left and right |                                       | <b>ZB4BG5</b> |
| Center         | 3 positions 2 spring return to center | <b>ZB4BG7</b> |

\* ZB4\*\*\* Model numbers are metal head operators

**Mushroom Head Push Buttons with Key Select**

| Color | Function                 | Description | Part number*   |
|-------|--------------------------|-------------|----------------|
| Red   | Latching turn to release | Ø 40mm head | <b>ZB4BS54</b> |
|       |                          |             | <b>ZB4BS14</b> |
| Red   | Latching turn to release | Ø 60mm head | <b>ZB4BS64</b> |
|       |                          |             | <b>ZB4BS24</b> |

\* ZB4\*\*\*\* model numbers are metal head operators

**For Use With 2B4\*\*\* Metal Operating Heads**

**3/2 Valve Bodies with Mounting Ring**



| Connections   | Function | Type of switching* | Part number      |
|---------------|----------|--------------------|------------------|
| 5/32" Instant | 3/2      | NNP                | <b>PXBB3111B</b> |
| 5/32" Instant | 3/2      | NP                 | <b>PXBB3121B</b> |
| 5/32" Instant | 3/2      | Universal 3 way    | <b>PXBB4131B</b> |

\* NNP: Normally non-passing.  
 Note: Mount up to 3 valves on mounting ring for push buttons.  
 Mount up to 2 valves on mounting ring for selector switches, valves cannot be mounted in center position.

**Additional Valve Bodies**



| Connections            | Function | Type of switching* | Part number     |
|------------------------|----------|--------------------|-----------------|
| 5/32" instant straight | 3/2      | NNP                | <b>PXBB3911</b> |
| 5/32" instant swivel   |          |                    | <b>PXBB3912</b> |
| 5/32" instant straight | 3/2      | NP                 | <b>PXBB3921</b> |
| 5/32" instant swivel   |          |                    | <b>PXBB3922</b> |
| 5/32" instant straight | 3/2      | Universal          | <b>PXBB4931</b> |
| 5/32" instant swivel   |          |                    | 3 way           |

\* NNP: Normally non-passing.

**For Push Buttons and Visual Indicators**

**Legend Plates for PXBB Devices (22mm)**

| Description                                | Part number    |                |                |
|--|----------------|----------------|----------------|
| <b>Without text for customer engraving</b> |                |                |                |
| Black / red background (white letters)     | <b>ZBY2101</b> |                |                |
| Yellow / white background (black letters)  | <b>ZBY4101</b> |                |                |
| <b>With text for push buttons</b>          |                |                |                |
| Start                                      | <b>ZBY2303</b> |                |                |
| Stop                                       | <b>ZBY2304</b> |                |                |
| Forward                                    | <b>ZBY2305</b> |                |                |
| Reverse                                    | <b>ZBY2306</b> |                |                |
| Up   | <b>ZBY2307</b> |                |                |
| Down                                       | <b>ZBY2308</b> |                |                |
| Right                                      | <b>ZBY2309</b> |                |                |
| Left                                       | <b>ZBY2310</b> |                |                |
| On   | <b>ZBY2311</b> |                |                |
| Off  | <b>ZBY2312</b> |                |                |
| Open                                       | <b>ZBY2313</b> |                |                |
| Close                                      | <b>ZBY2314</b> |                |                |
| Inch                                       | <b>ZBY2321</b> |                |                |
| Reset                                      | <b>ZBY2323</b> |                |                |
| Power On                                   | <b>ZBY2326</b> |                |                |
| Slow                                       | <b>ZBY2327</b> |                |                |
| Fast                                       | <b>ZBY2328</b> |                |                |
| Emergency stop                             | <b>ZBY2330</b> |                |                |
| Run  | <b>ZBY2334</b> |                |                |
| <b>With text for 2 position selectors</b>  |                |                |                |
| Off  | On             | <b>ZBY2367</b> |                |
| <b>With text for 3 position selectors</b>  |                |                |                |
| Hand                                       | Off            | Auto           | <b>ZBY2387</b> |



**Blank Legend Plates for Inscription**

**For PXBB devices** (2 lines of 11 characters maximum)

**Please indicate the required text when ordering.**  
 (Allow 3 weeks for delivery)

| Description                      | Part number    |
|----------------------------------|----------------|
| Black background / White letters | <b>ZBY2002</b> |

**For 22mm Visual Indicators Only**

**2 lines of 11 characters maximum**

**Please indicate the required text when ordering.**  
 (Allow 3 weeks for delivery)

| Description                      | Part number      |
|----------------------------------|------------------|
| Black background / white letters | <b>ZB2BY2002</b> |

**Electrical Switch Bodies**

When combined with pneumatic valves, these contact blocks allow different forms of power to be provided from a single push button. Can be mounted with both types of valves PXBB3 / PXBB4.

| Type of contact      | Part number   |
|----------------------|---------------|
| Normally open (NO)   | <b>ZBE101</b> |
| Normally closed (NC) | <b>ZBE102</b> |


**Note:** Plastic mounting ring ZB5AZ009 to be used with ZB5 plastic operating heads. Metal mounting ring ZB4BZ009 to be used with ZB4 metal operating heads.

**Electrical specification:** 240V, 10Amp

Sensing / Limit Switches  
 Control Panel Products  
**D**  
 Accessories Valve Products


**With 5/32" Instant Connections**

**22mm Visual Indicators**


| Black Plastic Bezel   | Color  | Part number "ON" indicator | Part number "OFF" indicator |
|---|--------|----------------------------|-----------------------------|
|  | Green  | <b>PXVF131</b>             | <b>PXVF1213</b>             |
|   | Red    | <b>PXVF141</b>             | <b>PXVF1214</b>             |
|   | Yellow | <b>PXVF151</b>             | <b>PXVF1215</b>             |
|   | Blue   | <b>PXVF161</b>             | <b>PXVF1216</b>             |
|   | White  | <b>PXVF111</b>             | <b>PXVF1211</b>             |

**Notes:** The Pneumatic Indicators are black in one position and colored in the other. The colored position corresponds either to the presence of a pressure ("ON" Indicator) or the absence of pressure ("OFF" Indicator).


**Two-Hand Controls**

|   | Connections   | Part number    |
|---|---------------|----------------|
|  | 5/32" Instant | <b>PXPC111</b> |


**Mounting Accessories**

|   | Color         | Description                                     | Part number     |
|---|---------------|---|-----------------|
|  | —             | Plastic head (ZB5) mounting nut tightening tool | <b>ZB5AZ905</b> |
|   | Black plastic | Guard for 40mm                                  | <b>ZBZ1602</b>  |

**Two-Hand Control Module**

|  | Connections   | Part number   |
|--|---------------|---------------|
|  | 5/32" Instant | <b>PXPA11</b> |

**Two-Hand Control Module Guard**

|  | Base component | Part number   |
|--|----------------|---------------|
|  | PXPC111        | <b>PPRL15</b> |

Sensing / Limit  
Switches

Control Panel  
Products

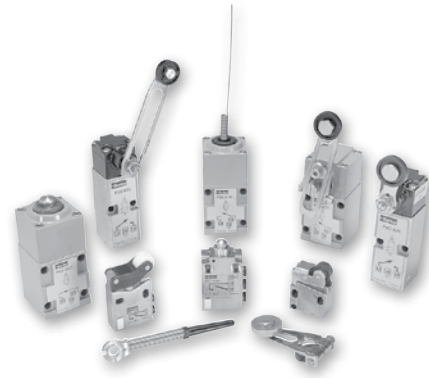
**D**

Accessories  
Valve Products

To achieve the sensing or feedback function, pneumatic sensors can be:

- Limit switches in a variety of sizes and configurations
- Pressure switches with many adjustable ranges
- Components designed specifically for pneumatic technology using pressure variation, air bleed or blocking for detection.

A wide variety of pneumatic sensors are available to suit any application requirement.



**Material specifications**

|         |                  |
|---------|------------------|
| Body    | Zinc alloy       |
| Poppets | Polyurethane     |
| Seals   | Nitrile (Buna N) |

**Operating information**

|                        |                                |
|------------------------|--------------------------------|
| Operating pressure:    | 40 to 115 PSIG (3 to 8 bar)    |
| Operating temperature: |                                |
| Operating              | 32°F to 122°F (0°C to 50°C)    |
| Storage                | -22°F to 140°F (-30°C to 60°C) |

**3/2 Miniature Direct Acting Limit Switches**  
**1/16" I.D. Internal Orifice**

|  | Actuator                                 | Type of switching* | Flow SCFM (NI/min) | Nominal bore  | Connection    | Part number    |
|--|--|--------------------|--------------------|---------------|---------------|----------------|
|  | Steel plunger operating levers available | NNP                | 2.2 (60)           | 1/16" (1.5mm) | 5/32" instant | <b>PXCM111</b> |
|  |  |                    |                    |               | 10-32 UNF     | <b>PXCM115</b> |
|  | Plastic roller                           | NNP                | 3.0 (85)           |               | 5/32" instant | <b>PXCM121</b> |
|  |  |                    |                    |               | 10-32 UNF     | <b>PXCM125</b> |

**7/64" I.D. Internal Orifice**

|  |                |     |  |  |               |                |
|--|----------------|-----|--|--|---------------|----------------|
|  | Plastic roller | NNP |  |  | 5/32" instant | <b>PXCM521</b> |
|--|----------------|-----|--|--|---------------|----------------|

**Actuators For Steel Plunger (Use with PXCM11\*)**

|  |                                    |  |  |  |  |               |
|--|------------------------------------|--|--|--|--|---------------|
|  | Plastic roller lever               |  |  |  |  | <b>PXCZ11</b> |
|  | Plastic roller lever, one way trip |  |  |  |  | <b>PXCZ12</b> |

**3/2 Compact Pilot Operated Limit Switches**  
**7/64" I.D. Internal Orifice, 5/32" Instant Connections, Pipeable Exhaust Port**

|  | Actuator                                 | Type of switching* | Flow SCFM (NI/min) | Nominal bore  | Connection    | Part number        |
|--|--|--------------------|--------------------|---------------|---------------|--------------------|
|  | Steel plunger operating levers available |                    |                    |               |               | <b>PXCM601A110</b> |
|  | Steel roller plunger                     | NNP                | 8.8 (250)          | 7/64" (2.5mm) | 5/32" instant | <b>PXCM601A102</b> |
|  | 90° Steel roller plunger                 |                    |                    |               |               | <b>PXCM601A103</b> |

\* NNP: Normally non-passing.

Most popular. For technical information see CD

Sensing /  
 Limit Switches

Control Panel  
 Products





**D**

Accessories  
 Valve Products

**Standard Duty Limit Switches – “K” Series**



**Plunger Operated Limit Switches**

1/8" I.D. Internal Orifice, 5/32" Instant Connections, Pipeable Exhaust Port


|   | Actuator               | Type of switching* | Flow SCFM (NI/min) | Nominal bore | Connection    | Part number      |
|---|------------------------|--------------------|--------------------|--------------|---------------|------------------|
|  | Steel plunger          | NNP                | 7.4 (210)          | 1/8" (3mm)   | 5/32" instant | <b>PXCK21101</b> |
|   |                        | NP                 |                    |              |               | <b>PXCK22101</b> |
|  | Steel roller plunger   | NNP                |                    |              |               | <b>PXCK21102</b> |
|   |                        | NP                 |                    |              |               | <b>PXCK22102</b> |
|  | Plastic roller plunger | NNP                |                    |              |               | <b>PXCK21121</b> |
|   |                        | NP                 |                    |              |               | <b>PXCK22121</b> |
|  | Cats whisker           | NNP                |                    |              |               | <b>PXCK21106</b> |
|   |                        | NP                 |                    |              |               | <b>PXCK22106</b> |

**Roller Operated Limit Switches**


1/8" I.D. Internal Orifice, 5/32" Instant Connections, Pipeable Exhaust Port



|   | Actuator   | Type of switching* | Flow SCFM (NI/min) | Nominal bore | Connection    | Part number        |
|---|--|--------------------|--------------------|--------------|---------------|--------------------|
|  | Fixed delrin roller lever multi-function head actuates:<br>- from right and left<br>- from right<br>- from left      | NNP                | 7.4 (210)          | 1/8" (3mm)   | 5/32" instant | <b>PXCK2110031</b> |
|   |  | NP                 |                    |              |               | <b>PXCK2210031</b> |
|  | Adjustable delrin roller lever multi-function head actuates:<br>- from right and left<br>- from right<br>- from left | NNP                |                    |              |               | <b>PXCK2110041</b> |
|   |  | NP                 |                    |              |               | <b>PXCK2210041</b> |

**Separate Pneumatic Switch Bodies**

|   | Actuator                                | Type of switching* | Part number    |
|---|---|--------------------|----------------|
|  | For use with ZCK series operating heads | NNP                | <b>PXCK211</b> |
|   |   | NP                 | <b>PXCK221</b> |

**Pneumatic Switch Bodies with Rotary Heads**

|   | Actuator  | Type of switching* | Part number      |
|---|---|--------------------|------------------|
|  | Multi-function head actuates:<br>- from right and left<br>- from right<br>- from left | NNP                | <b>PXCK21100</b> |
|   |   | NP                 | <b>PXCK22100</b> |


\* NNP: Normally non-passing.   
 NP: Normally passing. 



**Standard Duty Limit Switches – “K” Series**









**Operating Heads**

For Use With PXCK Switch Bodies

| Actuator  | Description      | Part number   |
|---|------------------|---------------|
| <b>Rotary operated</b>  |                  |               |
|  | Die cast zinc    | <b>ZCKG00</b> |
| <b>Plunger operated</b>   |                  |               |
| Roller plunger  | Plunger operated | <b>ZCKD02</b> |
| Whisker   |                  | <b>ZCKD06</b> |
| Rod plunger   |                  | <b>ZCKD10</b> |
| Delrin roller lever on plunger  |                  | <b>ZCKD21</b> |
| Steel roller lever on plunger   |                  | <b>ZCKD23</b> |


**Operating Levers for Rotary Heads**

For Use With Rotary Head ZCKG00


| Actuator  | Description                 | Part number   |
|---|-----------------------------|---------------|
|  | Steel 1/8" square           | <b>ZCKY51</b> |
|  | Fiberglass 1/8" dia. round  | <b>ZCKY52</b> |
|  | Plastic spring rod lever    | <b>ZCKY81</b> |
|  | Metal spring rod lever      | <b>ZCKY91</b> |
|  | Delrin roller lever         | <b>ZCKY11</b> |
|  | Steel roller lever          | <b>ZCKY13</b> |
|  | Adjust. delrin roller lever | <b>ZCKY41</b> |
|  | Adjust. steel roller lever  | <b>ZCKY43</b> |

**Heavy Duty Limit Switches – “J” Series**

**Switch Bodies Only**











|   | Type of switching* | Part number    |
|---|--------------------|----------------|
|  | NNP                | <b>PXCJ117</b> |
|   | NP                 | <b>PXCJ127</b> |

**Separate Pneumatic Switch Bodies**

|   | Direction of actuator        | Type of switching* | Part number      |
|---|------------------------------|--------------------|------------------|
|  | Right & left, spring return  | NNP                | <b>PXCJ11701</b> |
|   | Right or left, spring return |                    | <b>PXCJ11705</b> |
|   | Right & left, spring return  | NP                 | <b>PXCJ12701</b> |
|   | Right or left, spring return |                    | <b>PXCJ12705</b> |






**Operating Levers for Rotary Heads**

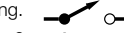
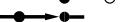
Die Cast Zinc. For Use With PXCJ Switch Bodies

| Operator  | Description                  | Part number    |
|---|------------------------------|----------------|
|  | Delrin roller                | <b>ZC2JY11</b> |
|  | Steel roller                 | <b>ZC2JY13</b> |
|  | Offset delrin roller         | <b>ZC2JY21</b> |
|  | Plastic spring rod           | <b>ZC2JY81</b> |
|  | Metal spring rod             | <b>ZC2JY91</b> |
|  | Delrin roller                | <b>ZC2JY31</b> |
|  | Offset delrin roller         | <b>ZC2JY41</b> |
|  | Rod lever                    | <b>ZC2JY51</b> |
|  | Single track, delrin roller  | <b>ZC2JY71</b> |
|  | Double track, delrin rollers | <b>ZC2JY61</b> |

**Top Plunger & Rotary Operating Heads**

Die Cast Zinc. For Use With PXCJ Switch Bodies

| Operation   | Description                 | Part number    |
|---|-----------------------------|----------------|
| <b>Top Plunger Type</b>   |                             |                |
|  | Top push                    | <b>ZC2JE61</b> |
|  | Top roller push             | <b>ZC2JE62</b> |
|  | Side push                   | <b>ZC2JE63</b> |
|  | Cat's whisker               | <b>ZC2JE70</b> |
| <b>Rotary Type</b>  |                             |                |
|  | From left & right           | <b>ZC2JE01</b> |
|   | Counterclockwise from right | <b>ZC2JE02</b> |
|   | Clockwise from left         | <b>ZC2JE03</b> |
|   | From left or right          | <b>ZC2JE05</b> |
|   | Maintained positions        | <b>ZC2JE09</b> |

\* NNP: Normally non-passing.   
 NNP: Normally passing. 

Sensing / Limit Switches  
 Control Panel Products  
**D**  
 Accessories Valve Products

The blocking valve is a single acting spring return 2/2 valve in a fitting format. The device requires a pneumatic pilot signal to open, which allows free flow of air or neutral gas. As long as a pilot signal is present, the device will remain open. When the pilot signal is removed, the internal spring will close the blocking valve, bubble tight.

These devices have two primary design uses: (1) to prevent unwanted gravity induced motion in cylinders during shut down procedures or during periods of lost supply pressure and (2) freezing the cylinder position by using a blocking valve at each end of the cylinder. Application needs such as tool or work piece protection, horizontal indexing or inspection stops are often satisfied by these devices.





**Material specifications**

|      |            |
|------|------------|
| Body | Zinc alloy |
|------|------------|



**Operating information**

|                        |                                |
|------------------------|--------------------------------|
| Operating pressure:    | 0 to 150 PSIG (0 to 10.3 bar)  |
| Operating temperature: |                                |
| Operating              | 5°F to 140°F (-15°C to 60°C)   |
| Storage                | -40°F to 160°F (-40°C to 70°C) |

**For Cylinder Mounting**  
 (Can also be mounted in Threshold Sensor Banjo)  
**With Instant Tube Fittings**

| BSPP   |                      |                             |                     |             | NPT                  |                             |                     |             |
|--|----------------------|-----------------------------|---------------------|-------------|----------------------|-----------------------------|---------------------|-------------|
| Symbol   | Connection for pilot | Cylinder port thread (male) | Connection for tube | Part number | Connection for pilot | Cylinder port thread (male) | Connection for tube | Part number |
| <br><br>PWBA3469 | 4mm Tube             | 1/8"                        | 6mm                 | PWBA1468    | 5/32" Tube           | 1/8"                        | 1/4"                | PWBA3468    |
|  |                      | 1/4"                        | 6mm                 | PWBA1469    |                      | 1/4"                        | 1/4"                | PWBA3469    |
|  |                      | 1/4"                        | 8mm                 | PWBA1489    |                      | 3/8"                        | 3/8"                | PWBA3493    |
|  |                      | 3/8"                        | 8mm                 | PWBA1483    |                      | 1/2"                        | 1/2"                | PWBA3412    |
|  |                      | 3/8"                        | 10mm                | PWBA1493    |                      |                             |                     |             |
|  |                      | 1/2"                        | 12mm                | PWBA1412    |                      |                             |                     |             |

**With Threaded Connections and Tube Pilot Port**

| BSPP   |                      |                             |                                |             | NPT                  |                             |                                |             |
|--|----------------------|-----------------------------|--------------------------------|-------------|----------------------|-----------------------------|--------------------------------|-------------|
| Symbol   | Connection for pilot | Cylinder port thread (male) | Connection from valve (female) | Part number | Connection for pilot | Cylinder port thread (male) | Connection from valve (female) | Part number |
| <br><br>PWBA3833 | 4mm Tube             | 1/8"                        | 1/4"                           | PWBA1898    | 5/32" * Tube         | 1/8"                        | 1/8"                           | PWBA3888    |
|  |                      | 1/4"                        | 1/4"                           | PWBA1899    |                      | 1/4"                        | 1/4"                           | PWBA3899    |
|  | M5 Female            | 3/8"                        | 3/8"                           | PWBA1833    |                      | 3/8"                        | 3/8"                           | PWBA3833    |
|  |                      | 1/2"                        | 1/2"                           | PWBA1822    |                      | 1/2"                        | 1/2"                           | PWBA3822    |
|  |                      | * Instant fitting           |                                |             |                      |                             |                                |             |

**With Threaded Connections and Threaded Pilot Port**

| NPT                  |                             |                       |             |
|----------------------|-----------------------------|-----------------------|-------------|
| Connection for pilot | Cylinder port thread (male) | Connection from valve | Part number |
| 1/8" pipe            | 1/8"                        | 1/8"                  | PWBA38887   |
|                      | 1/4"                        | 1/4"                  | PWBA38997   |
|                      | 3/8"                        | 3/8"                  | PWBA38337   |
|                      | 1/2"                        | 1/2"                  | PWBA38227   |

The plug-in threshold sensors provide feedback information on pneumatic cylinder status in either pneumatic or electrical outputs. Mounted into the cylinder port, these devices monitor the back pressure of the cylinder's exhaust. When the cylinder's piston stops, the back pressure rapidly drops and the threshold sensor provides the desired output. Ideal for variable stroke applications such as robotics where other sensor type devices such as limit switches are impractical, these devices provide a signal whenever the cylinder stops motion.

The threshold sensor consists of two complementary sub assemblies (1) the banjo fitting and (2) the plug-in sensor element. In all cases, the sensor is easily plugged into the banjo fitting and locked in place with a spring clip. The banjo fitting is designed to accept (piggy backed) other functional fittings such as flow controls or blocking valves. Simply select the sensor based on the type feedback signal that best fits the application.



**Material specifications**

|                |               |
|----------------|---------------|
| Body           | Thermoplastic |
| Mounting screw | Brass         |

**Operating information**

|                        |                                |
|------------------------|--------------------------------|
| Operating pressure:    | 0 to 150 PSIG (0 to 10.3 bar)  |
| Operating temperature: |                                |
| Operating              | 5°F to 140°F (-15°C to 60°C)   |
| Storage                | -40°F to 160°F (-40°C to 70°C) |

**Banjo Sockets (with Sensor Clip)**

| Port size | Wrench      | Part number     |
|-----------|-------------|-----------------|
| 10-32     | 5/16" Hex   | <b>PWSB1557</b> |
| 1/8"      | 3/16" Allen | <b>PWSB1887</b> |
| 1/4"      | 5/16" Allen | <b>PWSB1997</b> |
| 3/8"      | 3/8" Allen  | <b>PWSB1337</b> |
| 1/2"      | 1/2" Allen  | <b>PWSB1227</b> |



**Plug-in Sensors**

| Output     | Connection          | Part number     |
|------------|---------------------|-----------------|
| Pneumatic  | 5/32" push-in       | <b>PWSP111</b>  |
| Electrical | 3-wire cable (6 ft) | <b>PWSM1012</b> |



Sensing /  
Limit Switches

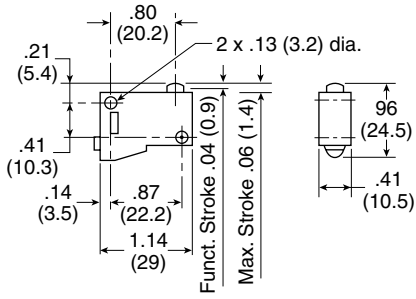
Control Panel  
Products

**D**

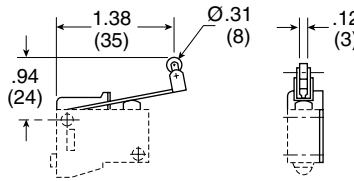
Accessories  
Valve Products

**Miniature Limit Switches**

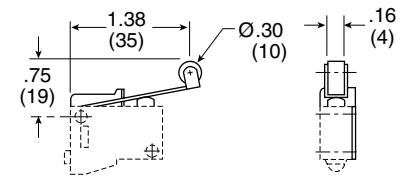
**PXCM111**



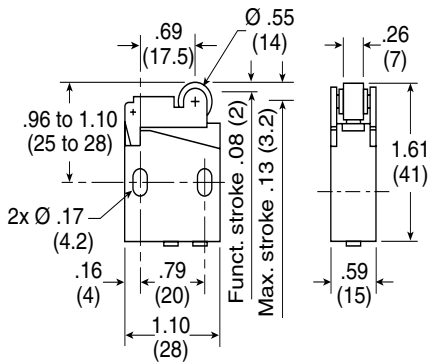
**PXCZ12**



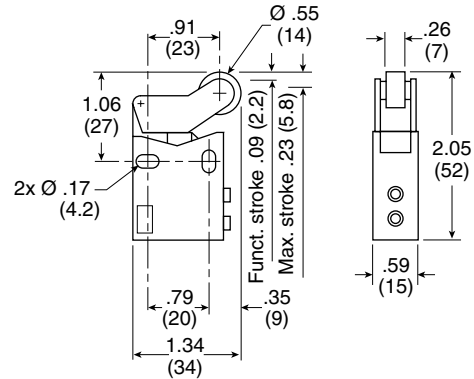
**PXCZ11**



**PXCM121, PXCM131**

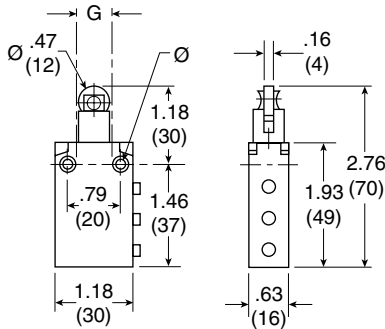


**PXCM521**

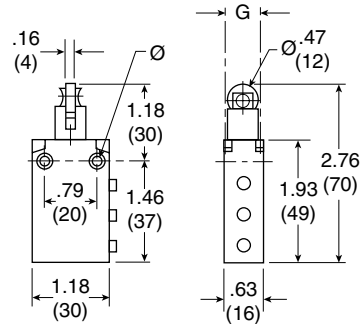


**Compact Limit Switches**

**PXCM601A102**



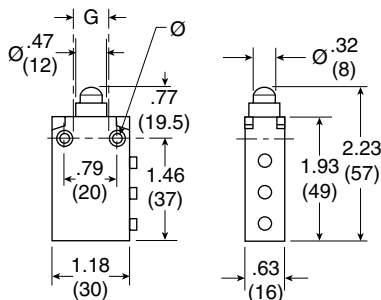
**PXCM601A103**



Ø: 2 mounting holes Ø .17" (4.3)  
 2 countersunk Ø .32" (8.2)  
 depth 4 mm

G: top mounting holes, 2 x M5  
 .71" (18 mm) centers

**PXCM601A110**



Sensing /  
 Limit Switches

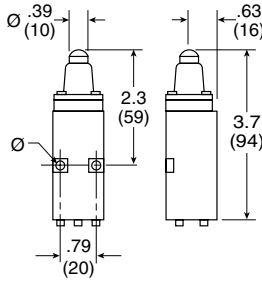
Control Panel  
 Products

**D**

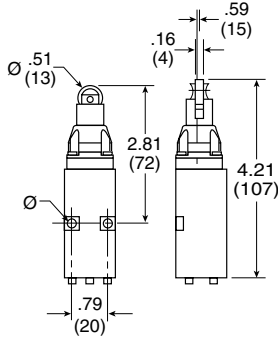
Accessories  
 Valve Products

**K Series**

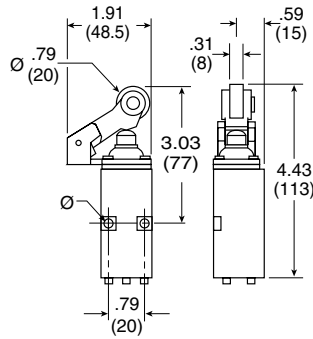
PXCK21101, PXCK22101



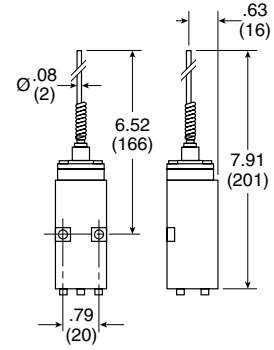
PXCK21102, PXCK22102



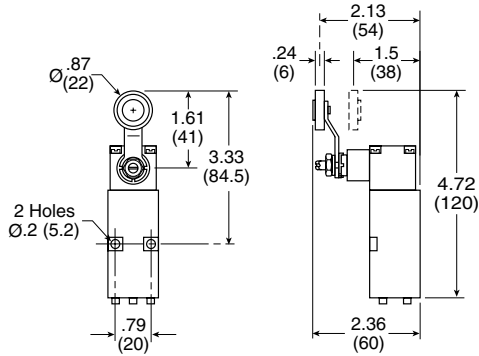
PXCK21121, PXCK22121



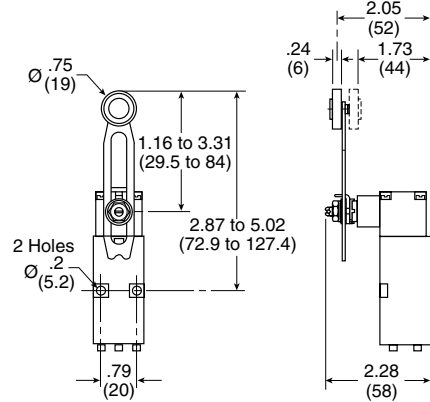
PXCK21106, PXCK22106



PXCK2110031, PXCK2210031

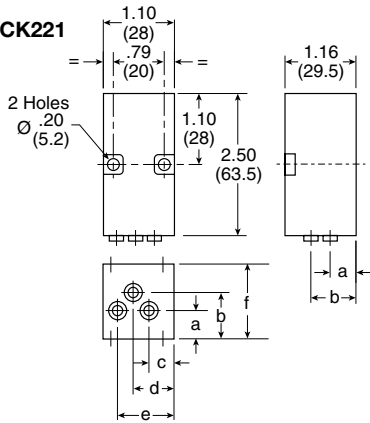


PXCK2110041, PXCK2210041



**Pneumatic Switch Bodies**

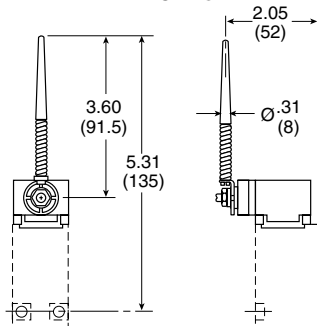
PXCK211, PXCK221



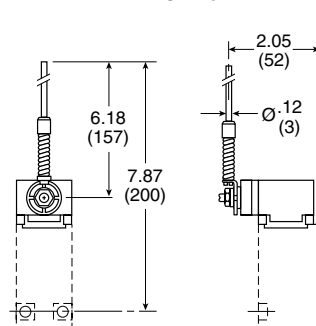
|   | inch | mm   |
|---|------|------|
| a | .39  | 10   |
| b | .77  | 19.5 |
| c | .35  | 9    |
| d | .61  | 15.5 |
| e | .87  | 22   |
| r | 1.66 | 29.5 |

**Rotary Heads with Operating Levers**

ZCKY81



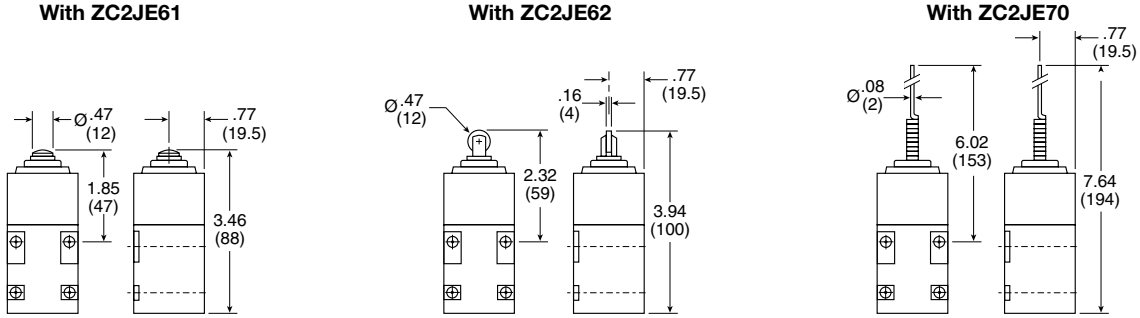
ZCKY91



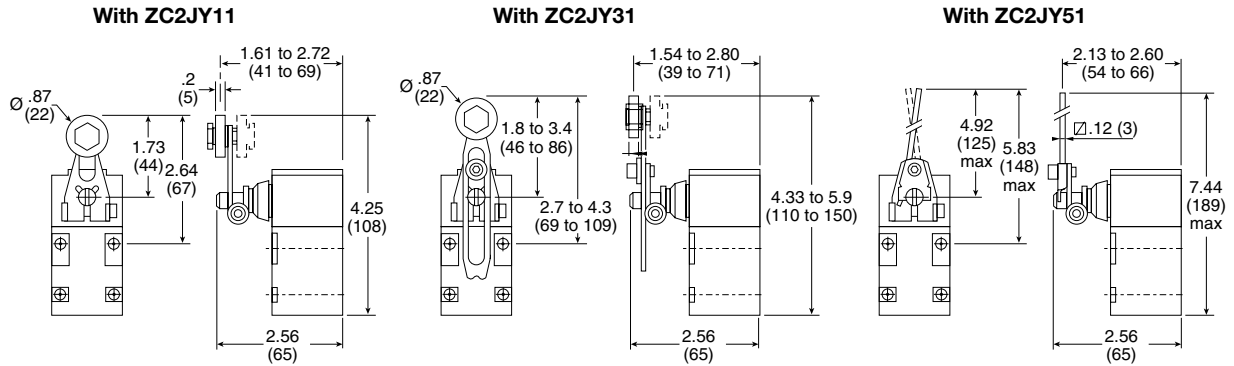
Sensing / Limit Switches  
 Control Panel Products  
**D**  
 Accessories Valve Products

**J Series**

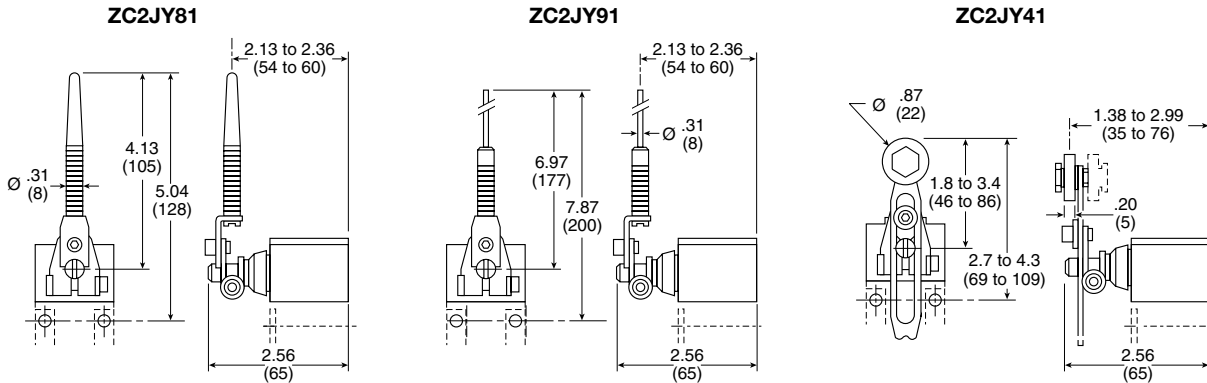
**Switch Body With Plunger Heads**



**Switch Body With Rotary Heads and Operating Levers**

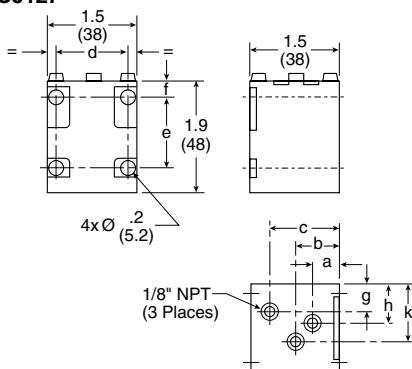


**Rotary Heads With Operating Levers**



**Pneumatic Switch Bodies**

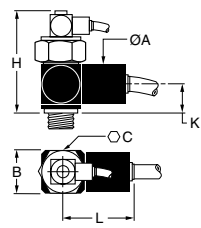
PXCJ117, PXCJ127



|   | inch         | mm       |
|---|--------------|----------|
| a | .47          | 12       |
| b | .75          | 19       |
| c | 1.16         | 29.5     |
| d | 1.14 to 1.18 | 29 to 30 |
| e | 1.18         | 30       |
| f | .28          | 7        |
| g | .43          | 11       |
| h | .51          | 13       |
| k | .94          | 24       |

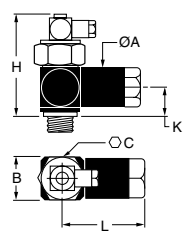
**Blocking Valves**

**PWBA14/34**



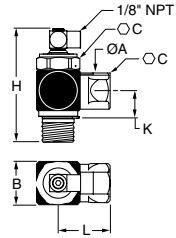
| ØA         | B          | C          | K            | H          | L          | Flow* | Part number                             |
|------------|------------|------------|--------------|------------|------------|-------|---|
| 0.86" (22) | 0.82" (21) | 0.94" (24) | 0.53" (13.5) | 2.32" (59) | 1.54" (39) | 14.8  | <b>PWBA1468/3468</b>                    |
| 0.86" (22) | 0.82" (21) | 0.94" (24) | 0.53" (13.5) | 2.09" (53) | 1.54" (39) | 19.4  | <b>PWBA1469/3469</b><br><b>PWBA1489</b> |
| 1.06" (27) | 1.10" (28) | 0.94" (24) | 0.55" (14)   | 2.09" (53) | 1.98" (50) | 45.9  | <b>PWBA1483</b><br><b>PWBA1493/3493</b> |
| 1.22" (31) | 1.30" (33) | 1.30" (33) | 0.94" (24)   | 2.59" (66) | 2.59" (66) | 81.2  | <b>PWBA1412/3412</b>                    |

**PWBA18/38**



|            |            |            |              |            |              |      |                      |
|------------|------------|------------|--------------|------------|--------------|------|----------------------|
| 0.86" (22) | 0.82" (21) | 0.94" (24) | 0.53" (13.5) | 2.32" (59) | 1.71" (43.5) | 14.8 | <b>PWBA1898/3888</b> |
| 0.86" (22) | 0.82" (21) | 0.94" (24) | 0.53" (13.5) | 2.09" (53) | 1.71" (43.5) | 19.4 | <b>PWBA1899/3899</b> |
| 1.06" (27) | 1.10" (28) | 0.94" (24) | 0.55" (14)   | 2.09" (53) | 2.18" (55)   | 45.9 | <b>PWBA1833/3833</b> |
| 1.22" (31) | 1.30" (33) | 1.30" (33) | 0.94" (24)   | 2.59" (66) | 2.47" (63)   | 81.2 | <b>PWBA1822/3822</b> |

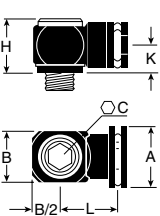
**PWBA38**



|            |            |            |            |            |            |      |                  |
|------------|------------|------------|------------|------------|------------|------|------------------|
| 0.75" (19) | 0.87" (22) | 0.83" (21) | 0.67" (17) | 2.20" (56) | 1.73" (44) | 14.8 | <b>PWBA38887</b> |
| 0.75" (19) | 0.87" (22) | 0.83" (21) | 0.67" (17) | 2.20" (56) | 1.73" (44) | 19.4 | <b>PWBA38997</b> |
| 1.06" (27) | 1.18" (30) | 1.06" (27) | 0.91" (23) | 2.64" (67) | 1.42" (36) | 45.9 | <b>PWBA38337</b> |
| 1.06" (27) | 1.18" (30) | 1.06" (27) | 0.91" (23) | 2.64" (67) | 1.42" (36) | 81.2 | <b>PWBA38227</b> |

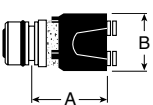
**Threshold Sensors**

**Banjo Socket**



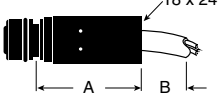
| A        | B         | C           | H        | K        | L         | Part number     |
|----------|-----------|-------------|----------|----------|-----------|-----------------|
| .98 (25) | .43 (11)  | 5/16" Hex   | .79 (20) | .40 (10) | .67 (17)  | <b>PWSB1557</b> |
| .98 (25) | .63 (16)  | 3/16" Allen | .71 (18) | .40 (10) | .79 (20)  | <b>PWSB1887</b> |
| .98 (25) | .83 (21)  | 5/16" Allen | .71 (18) | .40 (10) | .87 (22)  | <b>PWSB1997</b> |
| .98 (25) | 1.10 (28) | 3/8" Allen  | .79 (20) | .47 (12) | .98 (25)  | <b>PWSB1337</b> |
| .98 (25) | 1.30 (33) | 1/2" Allen  | .93 (24) | .55 (14) | 1.02 (26) | <b>PWSB1227</b> |

**PWSP111**



| A         | B        | Part number     |
|-----------|----------|-----------------|
| .87 (22)  | .79 (20) | <b>PWSP111</b>  |
| 1.26 (32) | .79 (20) | <b>PWSM1012</b> |

**PWSM1012**



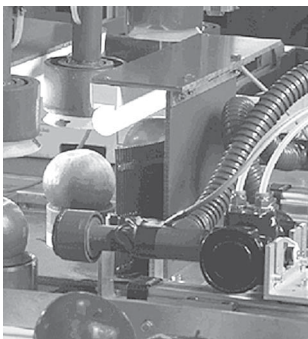
Sensing /  
Limit Switches

Control Panel  
Products

**D**

Accessories  
Valve Products






# Air Preparation Products

## Global Modular Air Preparation Products

**Global FRL's**




- Port size: 1/4 through 3/4 inch
- Maximum supply pressure: 300 PSIG
- Operating temperature: -13°F through 150°F
- Flows to 212 SCFM
- Filters, regulators, filter / regulators, lubricators and accessories

**E3**

| Product                            | Page    |
|------------------------------------|---------|
| Particulate Filters                | E3-E5   |
| Coalescing and Adsorber Filters    | E6-E8   |
| Regulators                         | E9-E11  |
| Common Regulators                  | E12-E13 |
| Filter / Regulators                | E14-E16 |
| Lubricators                        | E17-E19 |
| Combinations                       | E20-E22 |
| Electronic Proportional Regulators | E23-E24 |
| Soft Start / Dump Valves           | E25-E27 |
| Solenoid Operators                 | E28-E29 |
| Accessories                        | E30-E33 |
| Flow Curves                        | E34-E39 |

## Stainless Steel Air Preparation Products

**Stainless Steel FRL's**




- Port sizes: 1/4 and 1/2 inch
- Stainless steel construction handles most corrosive environments
- Fluorocarbon seals standard
- Meets NACE specifications MR-01-75/ISO 15156
- Filters, regulators, filter / regulators, and lubricators

**E101**

| Product             | Page      |
|---------------------|-----------|
| Filters             | E101-E102 |
| Regulators          | E103-E104 |
| Filter / Regulators | E105-E106 |
| Lubricators         | E107      |

## General Industrial Air Preparation Products

**Miniature, Compact, Standard, Hi-Flow**




- Port size: 1/8 through 3 inch
- Maximum supply pressure: 250 PSIG
- Operating temperature: -14°F through 176°F
- Flows to 2900 SCFM
- Filters, regulators, filter / regulators, lubricators and accessories
- 4" & 6" Separators & filters

**E40**

| Product                | Page     |
|------------------------|----------|
| Bulk Liquid Separators | E40-E42  |
| Particulate Filters    | E43-E50  |
| Coalescing Filters     | E51-E59  |
| Regulators             | E60-E76  |
| Filter / Regulators    | E77-E84  |
| Lubricators            | E85-E93  |
| Combos                 | E94-E100 |

## Precision & Proportional Regulator Air Preparation Products

**Precision / Proportional Regulators**



- Port sizes: 1/4 through 2 inch
- Maximum supply pressure: 300 PSIG
- Operating temperature: -40°F through 200°F
- Flows to 1600 SCFM
- Electronic proportional

**E108**

| Product                                    | Page      |
|--|-----------|
| Semi-Precision Dial Regulators             | E108-E109 |
| Precision Filter / Regulators              | E110      |
| Precision Pneumatic Input Signal Amplifier | E111-E112 |
| High Precision Regulators                  | E113-E114 |
| High Precision Relief Valve                | E115      |
| High Precision Vacuum Regulator            | E116      |
| Electronic Proportional Regulator          | E117-E118 |

- Integral 1/4", 3/8", 1/2", or 3/4" ports (NPT, BSPP & BSPT)
- High efficiency 5 micron element as standard
- Excellent water removal efficiency
- Robust but lightweight aluminum construction
- Positive bayonet latch to ensure correct & safe fitting



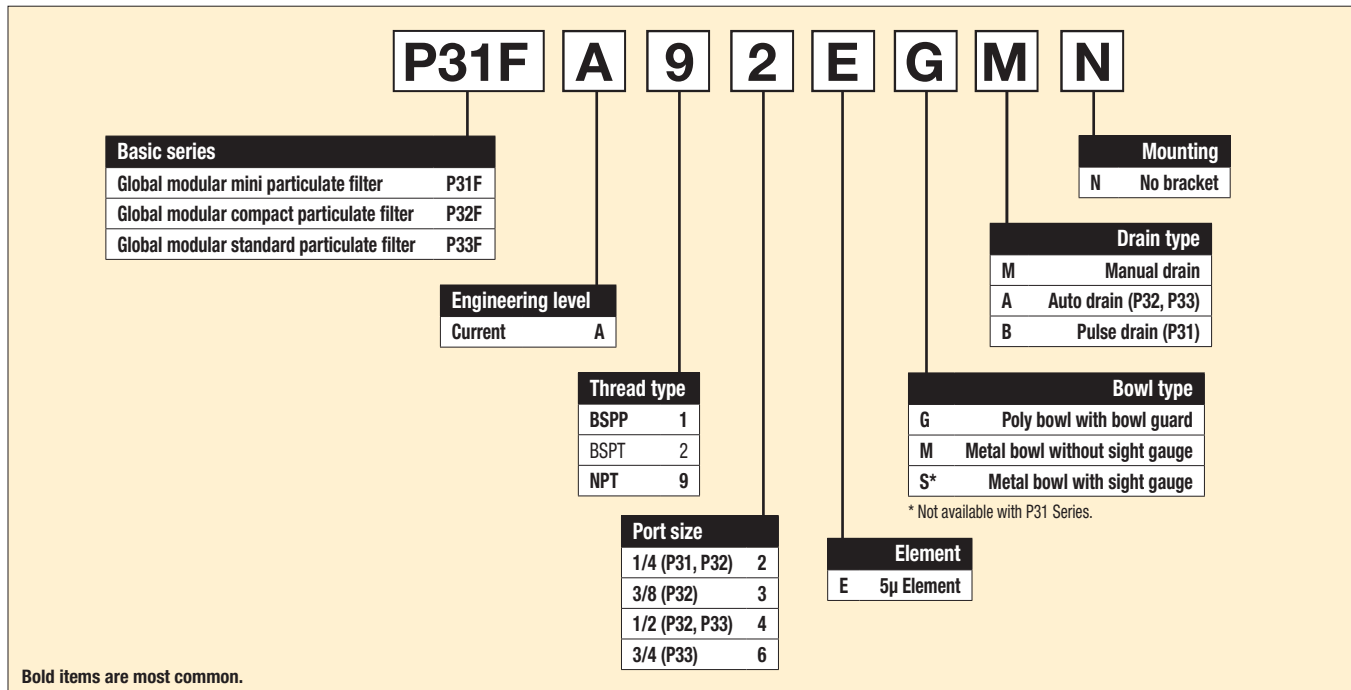
**Operating information**

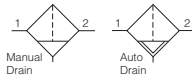
|                        | P31 (Mini)                      | P32 (Compact)                    | P33 (Standard)                   |
|------------------------|---------------------------------|----------------------------------|----------------------------------|
| Supply pressure (max): |                                 |                                  |                                  |
| Plastic Bowl           | 10 bar (150 PSIG)               | 10 bar (150 PSIG)                | 10 bar (150 PSIG)                |
| Metal Bowl             | 17 bar (250 PSIG)               | 17 bar (250 PSIG)                | 17 bar (250 PSIG)                |
| Operating temperature: |                                 |                                  |                                  |
| Plastic Bowl           | -10°C to 52°C (14°F to 25°F)    | -25°C to 52°C (-13°F to 25°F)    | -25°C to 52°C (-13°F to 25°F)    |
| Metal Bowl             | -10°C to 65.5°C (14°F to 150°F) | -25°C to 65.5°C (-13°F to 150°F) | -25°C to 65.5°C (-13°F to 150°F) |
| Standard filtration:   | 5 micron                        | 5 micron                         | 5 micron                         |
| Flow Capacity*:        |                                 |                                  |                                  |
| 1/4                    | 12 dm <sup>3</sup> /s (25 SCFM) | 18 dm <sup>3</sup> /s (38 SCFM)  | —                                |
| 3/8                    | —                               | 30 dm <sup>3</sup> /s (64 SCFM)  | —                                |
| 1/2                    | —                               | 38 dm <sup>3</sup> /s (80 SCFM)  | 40 dm <sup>3</sup> /s (85 SCFM)  |
| 3/4                    | —                               | —                                | 48 dm <sup>3</sup> /s (102 SCFM) |

\*Inlet pressure 6.3 bar (91.3 PSIG), pressure drop 0.34 bar (4.9 PSIG).

For technical information see CD. For Flow Curve Charts please see page E34.

**Ordering information**





**Particulate Filters**



| Port size | Bowl type | Drain type | Element type | Part number        |                    |                    |
|-----------|-----------|------------|--------------|--------------------|--------------------|--------------------|
|           |           |            |              | P31                | P32                | P33                |
| 1/4"      | Poly      | Manual     | 5 micron     | <b>P31FA92EGMN</b> | <b>P32FA92EGMN</b> |                    |
| 1/4"      | Poly      | Pulse      | 5 micron     | <b>P31FA92EGBN</b> |                    |                    |
| 1/4"      | Poly      | Auto       | 5 micron     |                    | <b>P32FA92EGAN</b> |                    |
| 1/4"      | Metal     | Manual     | 5 micron     | <b>P31FA92EMMN</b> | <b>P32FA92ESMN</b> |                    |
| 1/4"      | Metal     | Pulse      | 5 micron     | <b>P31FA92EMBN</b> |                    |                    |
| 1/4"      | Metal     | Auto       | 5 micron     |                    | <b>P32FA92ESAN</b> |                    |
| 3/8"      | Poly      | Manual     | 5 micron     |                    | <b>P32FA93EGMN</b> |                    |
| 3/8"      | Poly      | Auto       | 5 micron     |                    | <b>P32FA93EGAN</b> |                    |
| 3/8"      | Metal     | Manual     | 5 micron     |                    | <b>P32FA93ESMN</b> |                    |
| 3/8"      | Metal     | Auto       | 5 micron     |                    | <b>P32FA93ESAN</b> |                    |
| 1/2"      | Poly      | Manual     | 5 micron     |                    | <b>P32FA94EGMN</b> | <b>P33FA94EGMN</b> |
| 1/2"      | Poly      | Auto       | 5 micron     |                    | <b>P32FA94EGAN</b> | <b>P33FA94EGAN</b> |
| 1/2"      | Metal     | Manual     | 5 micron     |                    | <b>P32FA94ESMN</b> | <b>P33FA94ESMN</b> |
| 1/2"      | Metal     | Auto       | 5 micron     |                    | <b>P32FA94ESAN</b> | <b>P33FA94ESAN</b> |
| 3/4"      | Poly      | Manual     | 5 micron     |                    |                    | <b>P33FA96EGMN</b> |
| 3/4"      | Poly      | Auto       | 5 micron     |                    |                    | <b>P33FA96EGAN</b> |
| 3/4"      | Metal     | Manual     | 5 micron     |                    |                    | <b>P33FA96ESMN</b> |
| 3/4"      | Metal     | Auto       | 5 micron     |                    |                    | <b>P33FA96ESAN</b> |

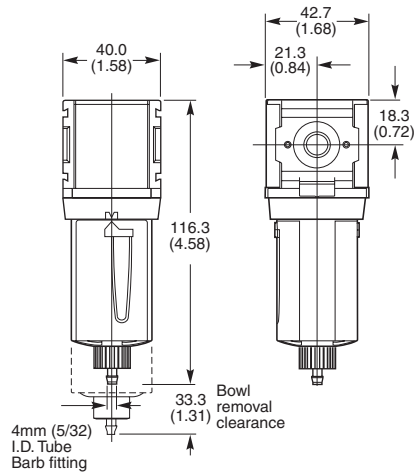
**Service kits**

| Description                                   |                        | P31               | P32               | P33               |
|---|------------------------|-------------------|-------------------|-------------------|
| Plastic bowl / bowl guard                     | Manual drain           | <b>P31KA00BGM</b> | <b>P32KA00BGM</b> | <b>P33KA00BGM</b> |
|   | Pulse drain            | <b>P31KA00BGB</b> |                   |                   |
|   | Auto drain             |                   | <b>P32KA00DA</b>  | <b>P32KA00DA</b>  |
| Metal bowl w/o sight gauge                    | Manual drain           | <b>P31KA00BMM</b> |                   |                   |
|   | Pulse drain            | <b>P31KA00BMB</b> |                   |                   |
|   | Auto drain             |                   | <b>P32KA00DA</b>  | <b>P32KA00DA</b>  |
| Metal bowl / sight gauge                      | Manual drain           |                   | <b>P32KA00BSM</b> | <b>P33KA00BSM</b> |
|   | Auto drain             |                   | <b>P32KA00DA</b>  | <b>P32KA00DA</b>  |
| Filter element                                | 5µ particulate         | <b>P31KA00ESE</b> | <b>P32KA00ESE</b> | <b>P33KA00ESE</b> |
| C-bracket                                     | Fits to body           | <b>P31KA00MW</b>  |                   |                   |
| L-bracket                                     | Fits to body           |                   | <b>P32KA00ML</b>  | <b>P33KA00ML</b>  |
|   | Fits to body connector |                   | <b>P32KA00MB</b>  | <b>P32KA00MB</b>  |
|   | With body connector    | <b>P31KA00MT</b>  | <b>P32KA00MT</b>  | <b>P33KA00MT</b>  |
| Body connector                                |                        | <b>P31KA00CB</b>  | <b>P32KA00CB</b>  | <b>P32KA00CB</b>  |
| Differential pressure indicator (replacement) |                        |                   | <b>P32KA00DM</b>  | <b>P32KA00DM</b>  |

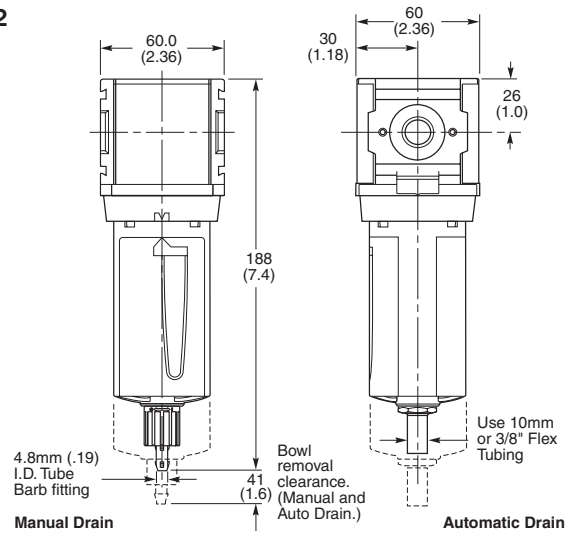
Most popular.



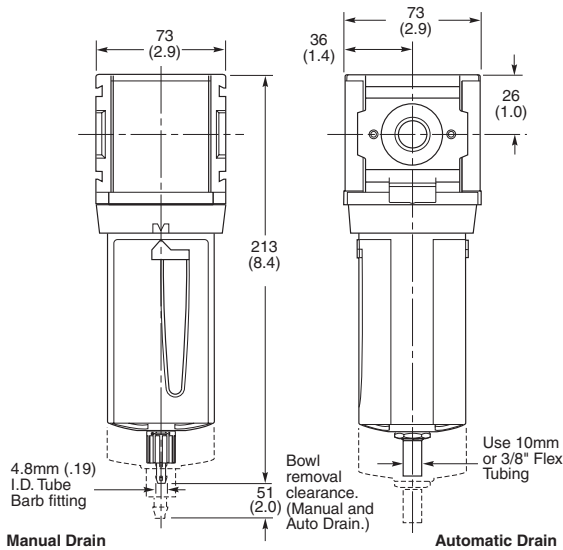
**P31**



**P32**



**P33**



**Material specifications**

| Description               |              | P31                   | P32                   | P33                   |
|---------------------------|--------------|-----------------------|-----------------------|-----------------------|
| Body                      |              | Aluminum              | Aluminum              | Aluminum              |
| Body cap                  |              | ABS                   | ABS                   | ABS                   |
| Bowl                      | Plastic bowl | Polycarbonate         | Polycarbonate         | Polycarbonate         |
|                           | Metal bowl   | Aluminum              | Aluminum              | Aluminum              |
| Bowl guard                |              | Nylon                 | Nylon                 | Nylon                 |
| Deflector                 |              | N/A                   | Polypropylene         | Polypropylene         |
| Element retainer / baffle |              | Acetal                | Acetal                | Acetal                |
| Filter element            |              | Sintered Polyethylene | Sintered Polyethylene | Sintered Polyethylene |
| Seals                     |              | Nitrile               | Nitrile               | Nitrile               |
| Sight gauge               | Metal bowl   | N/A                   | Polycarbonate         | Polycarbonate         |



Global Modular  
Air Preparation Products

Particulate  
Filters

Coalescing  
Filters

Regulators

Filter/  
Regulators

Lubricators

Combinations

Electronic  
Proportional

Soft Start/  
Dump Valves

Solenoid  
Operators

Accessories  
Flow Charts

- Integral 1/4", 3/8", 1/2", 3/4" ports (NPT, BSPP & BSPT)
- Removes liquid aerosols and sub micron particles
- Oil free air for critical applications, such as air gauging, pneumatic instrumentation and control
- Positive bayonet latch to ensure correct & safe fitting
- Adsorbing activated carbon element removes oil vapors and most hydrocarbons

**Note:** To optimize the life of coalescing element, it is advisable to install a pre-filter with a 5 micron element upstream of the coalescing filter. To optimize the life of an Adsorber it is advisable to install a Coalescing Filter upstream of the Adsorber. Adsorber element should be replaced approximately every 1000 hours of service.



Global Modular Air Preparation Products

Particulate Filters

Coalescing Filters

Regulators

Filter / Regulators

Lubricators

Combinations

Electronic Proportional

Soft Start / Dump Valves

Solenoid Operators

Accessories Flow Charts

**Operating information**

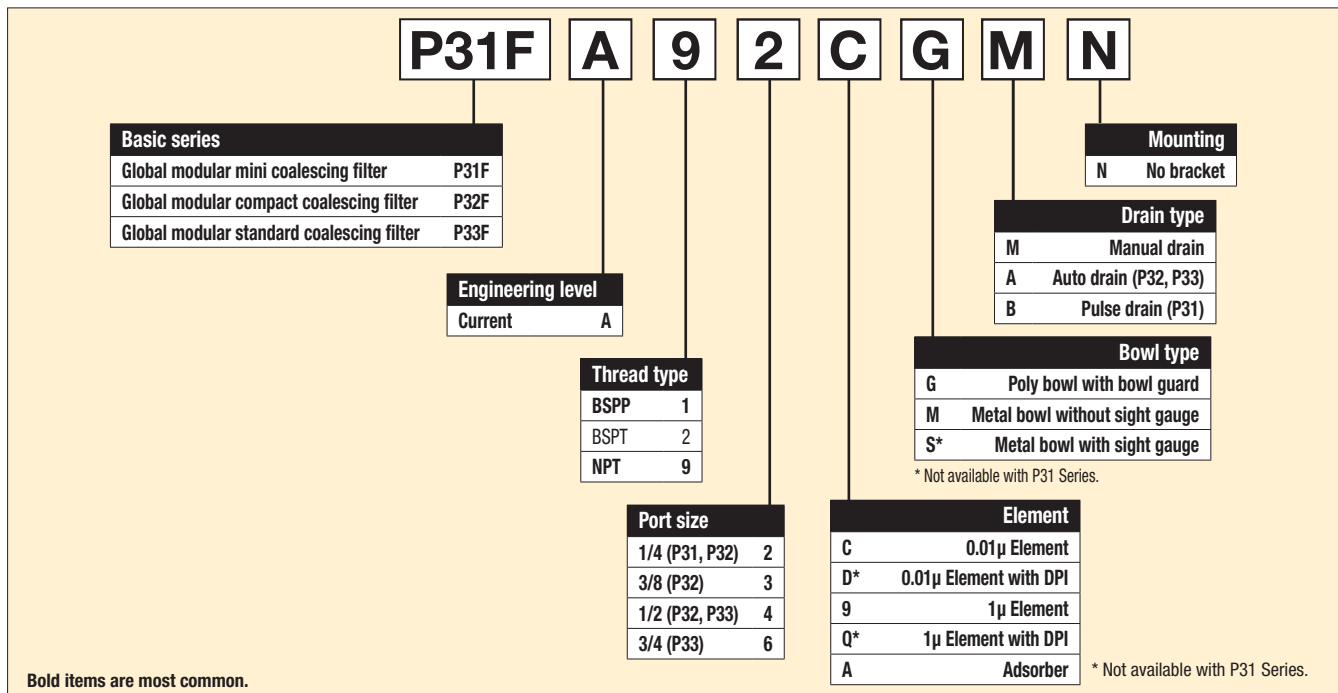
|                           | <b>P31 (Mini)</b>               | <b>P32 (Compact)</b>             | <b>P33 (Standard)</b>            |
|---------------------------|---------------------------------|----------------------------------|----------------------------------|
| Supply pressure (max):    |                                 |                                  |                                  |
| Plastic Bowl              | 10 bar (150 PSIG)               | 10 bar (150 PSIG)                | 10 bar (150 PSIG)                |
| Metal Bowl                | 17 bar (250 PSIG)               | 17 bar (250 PSIG)                | 17 bar (250 PSIG)                |
| Operating temperature:    |                                 |                                  |                                  |
| Plastic Bowl              | -10°C to 52°C (14°F to 125°F)   | -25°C to 52°C (-13°F to 125°F)   | -25°C to 52°C (-13°F to 125°F)   |
| Metal Bowl                | -10°C to 65.5°C (14°F to 150°F) | -25°C to 65.5°C (-13°F to 150°F) | -25°C to 65.5°C (-13°F to 150°F) |
| Standard filtration:      | 1.0 and 0.01 micron             | 1.0 and 0.01 micron              | 1.0 and 0.01 micron              |
| Flow Capacity:            |                                 |                                  |                                  |
| 1.0 Micron Coalescing –   |                                 |                                  |                                  |
| Energy Efficient Flow*    | 3.8 dm <sup>3</sup> /s (8 SCFM) | 17 dm <sup>3</sup> /s (36 SCFM)  | 32 dm <sup>3</sup> /s (68 SCFM)  |
| Maximum Flow**            | 6 dm <sup>3</sup> /s (13 SCFM)  | 27 dm <sup>3</sup> /s (57 SCFM)  | 44 dm <sup>3</sup> /s (93 SCFM)  |
| 0.01 Micron Coalescing –  |                                 |                                  |                                  |
| Energy Efficient Flow*    | 2 dm <sup>3</sup> /s (4.2 SCFM) | 11 dm <sup>3</sup> /s (23 SCFM)  | 20 dm <sup>3</sup> /s (42 SCFM)  |
| Maximum Flow**            | 3.8 dm <sup>3</sup> /s (8 SCFM) | 28 dm <sup>3</sup> /s (38 SCFM)  | 34 dm <sup>3</sup> /s (72 SCFM)  |
| Activated Carbon Adsorber |                                 |                                  |                                  |
| Rated Flow*:              | 6 dm <sup>3</sup> /s (13 SCFM)  | 27 dm <sup>3</sup> /s (57 SCFM)  | 44 dm <sup>3</sup> /s (93 SCFM)  |

\* Inlet pressure 6.3 bar (91.3 PSIG), pressure drop 0.2 bar (3 PSIG) saturated element.

\*\* Inlet pressure 6.3 bar (91.3 PSIG), pressure drop 0.4 bar (6 PSIG) saturated element.

For technical information see CD. For Flow Curve Charts please see page E35.

**Ordering information**





**Coalescing and Adsorber Filters**, (1 micron and adsorber elements available)



| Port size | Bowl type | Drain type | Element type | Part number        |                    |                    |
|-----------|-----------|------------|--------------|--------------------|--------------------|--------------------|
|           |           |            |              | P31                | P32                | P33                |
| 1/4"      | Poly      | Manual     | 0.01 micron  | <b>P31FA92CGMN</b> | <b>P32FA92DGMN</b> |                    |
| 1/4"      | Poly      | Pulse      | 0.01 micron  | <b>P31FA92CGBN</b> |                    |                    |
| 1/4"      | Poly      | Auto       | 0.01 micron  |                    | <b>P32FA92DGAN</b> |                    |
| 1/4"      | Metal     | Manual     | 0.01 micron  | <b>P31FA92CMMN</b> | <b>P32FA92DSMN</b> |                    |
| 1/4"      | Metal     | Pulse      | 0.01 micron  | <b>P31FA92CMBN</b> |                    |                    |
| 1/4"      | Metal     | Auto       | 0.01 micron  |                    | <b>P32FA92DSAN</b> |                    |
| 3/8"      | Poly      | Manual     | 0.01 micron  |                    | <b>P32FA93DGMN</b> |                    |
| 3/8"      | Poly      | Auto       | 0.01 micron  |                    | <b>P32FA93DGAN</b> |                    |
| 3/8"      | Metal     | Manual     | 0.01 micron  |                    | <b>P32FA93DSMN</b> |                    |
| 3/8"      | Metal     | Auto       | 0.01 micron  |                    | <b>P32FA93DSAN</b> |                    |
| 1/2"      | Poly      | Manual     | 0.01 micron  |                    | <b>P32FA94DGMN</b> | <b>P33FA94DGMN</b> |
| 1/2"      | Poly      | Auto       | 0.01 micron  |                    | <b>P32FA94DGAN</b> | <b>P33FA94DGAN</b> |
| 1/2"      | Metal     | Manual     | 0.01 micron  |                    | <b>P32FA94DSMN</b> | <b>P33FA94DSMN</b> |
| 1/2"      | Metal     | Auto       | 0.01 micron  |                    | <b>P32FA94DSAN</b> | <b>P33FA94DSAN</b> |
| 3/4"      | Poly      | Manual     | 0.01 micron  |                    |                    | <b>P33FA96DGMN</b> |
| 3/4"      | Poly      | Auto       | 0.01 micron  |                    |                    | <b>P33FA96DGAN</b> |
| 3/4"      | Metal     | Manual     | 0.01 micron  |                    |                    | <b>P33FA96DSMN</b> |
| 3/4"      | Metal     | Auto       | 0.01 micron  |                    |                    | <b>P33FA96DSAN</b> |

**Service kits**

| Description                                   |                           | P31               | P32               | P33               |
|---|---------------------------|-------------------|-------------------|-------------------|
| Plastic bowl / bowl guard                     | Manual drain              | <b>P31KA00BGM</b> | <b>P32KA00BGM</b> | <b>P33KA00BGM</b> |
|   | Pulse drain               | <b>P31KA00BGB</b> |                   |                   |
|   | Auto drain                |                   | <b>P32KA00DA</b>  | <b>P32KA00DA</b>  |
| Metal bowl w/o sight gauge                    | Manual drain              | <b>P31KA00BMM</b> |                   |                   |
|   | Pulse drain               | <b>P31KA00BMB</b> |                   |                   |
|   | Auto drain                |                   | <b>P32KA00DA</b>  | <b>P32KA00DA</b>  |
| Metal bowl / sight gauge                      | Manual drain              |                   | <b>P32KA00BSM</b> | <b>P33KA00BSM</b> |
|   | Auto drain                |                   | <b>P32KA00DA</b>  | <b>P32KA00DA</b>  |
| Filter element                                | 1µ coalescing             | <b>P31KA00ES9</b> | <b>P32KA00ES9</b> | <b>P33KA00ES9</b> |
|   | 0.01µ coalescing          | <b>P31KA00ESC</b> | <b>P32KA00ESC</b> | <b>P33KA00ESC</b> |
|   | Activated carbon adsorber | <b>P31KA00ESA</b> | <b>P32KA00ESA</b> | <b>P33KA00ESA</b> |
| C-bracket                                     | Fits to body              | <b>P31KA00MW</b>  |                   |                   |
| L-bracket                                     | Fits to body              |                   | <b>P32KA00ML</b>  | <b>P33KA00ML</b>  |
| T-bracket                                     | Fits to body connector    |                   | <b>P32KA00MB</b>  | <b>P32KA00MB</b>  |
|   | With body connector       | <b>P31KA00MT</b>  | <b>P32KA00MT</b>  | <b>P32KA00MT</b>  |
| Body connector                                |                           | <b>P31KA00CB</b>  | <b>P32KA00CB</b>  | <b>P32KA00CB</b>  |
| Differential pressure indicator (replacement) |                           |                   | <b>P32KA00RQ</b>  | <b>P32KA00RQ</b>  |

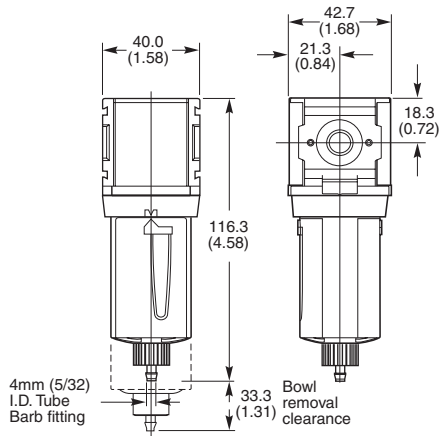
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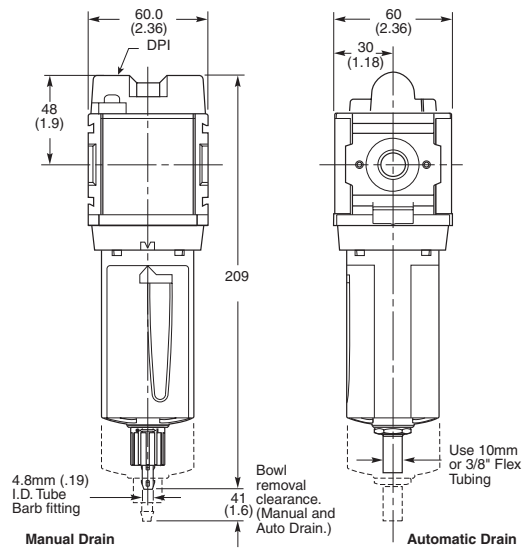


- P
- Global Modular Air Preparation Products
- Particulate Filters
- Coalescing Filters
- Regulators
- Filter / Regulators
- Lubricators
- Combinations
- Electronic Proportional Dump Valves
- Soft Start / Operators
- Solenoid Operators
- Accessories

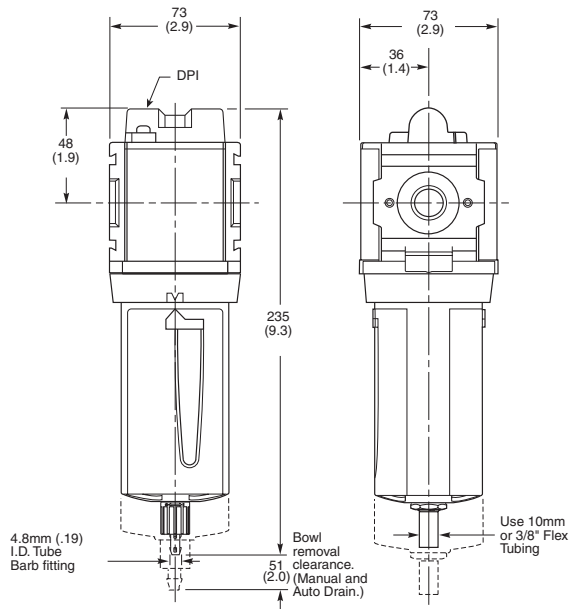
**P31**



**P32**



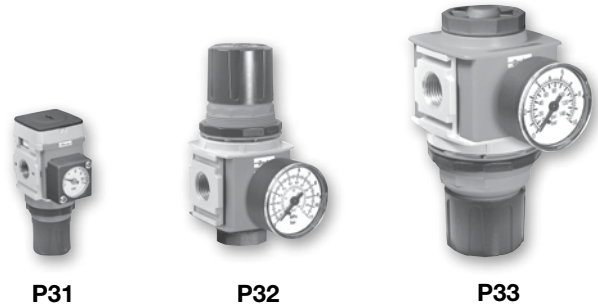
**P33**



**Material specifications**

| Description    | P31                                    | P32                                    | P33                                    |
|----------------|--|--|--|
| Body           | Aluminum                               | Aluminum                               | Aluminum                               |
| Body cap       | ABS                                    | ABS                                    | ABS                                    |
| Bowl           | Plastic bowl                           | Polycarbonate                          | Polycarbonate                          |
|                | Metal bowl                             | Aluminum                               | Aluminum                               |
| Bowl guard     | Nylon                                  | Nylon                                  | Nylon                                  |
| Filter element | Borosilicate cloth, 1.0 and .01 micron | Borosilicate cloth, 1.0 and .01 micron | Borosilicate cloth, 1.0 and .01 micron |
| Adsorber       | Activated carbon                       | Activated carbon                       | Activated carbon                       |
| Seals          | Nitrile                                | Nitrile                                | Nitrile                                |
| Sight gauge    | Metal bowl N/A                         | Polycarbonate                          | Polycarbonate                          |

- Integral 1/4", 3/8", 1/2", 3/4" ports (NPT, BSPP & BSPT)
- Robust but lightweight aluminum construction
- Secondary pressure ranges 0-2 bar (0-30 PSIG), 0-4 bar, (0-60 PSIG), 0-8 bar (0-125 PSIG)
- Secondary aspiration plus balanced poppet provides quick response and accurate pressure regulation.
- Relieving & Non-relieving types
- Non-rising knob



**WARNING**  
 Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

**CAUTION:**

**REGULATOR PRESSURE ADJUSTMENT -**

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

**Operating information**

|                           | P31 (Mini)                         | P32 (Compact)                       | P33 (Standard)                      |
|---------------------------|------------------------------------|-------------------------------------|-------------------------------------|
| Supply pressure (max):    | 20 bar (300 PSIG)                  | 20 bar (300 PSIG)                   | 20 bar (300 PSIG)                   |
| Operating temperature:    | -20°C to 65.5°C<br>(-4°F to 150°F) | -25°C to 65.5°C<br>(-13°F to 150°F) | -25°C to 65.5°C<br>(-13°F to 150°F) |
| Units with square gauges: | -15°C to 65.5°C<br>(5°F to 150°F)  |                                     |                                     |
| Flow Capacity*:           | 1/4 30 dm³/s<br>(64 SCFM)          | 41 dm³/s<br>(81 SCFM)               | —                                   |
|                           | 3/8 —                              | 65 dm³/s<br>(138 SCFM)              | —                                   |
|                           | 1/2 —                              | 67 dm³/s<br>(142 SCFM)              | 100 dm³/s<br>(212 SCFM)             |
|                           | 3/4 —                              | —                                   | 100 dm³/s<br>(212 SCFM)             |

\*Inlet pressure 10 bar (145 PSIG). Secondary pressure drop 6.3 bar (91.3 PSIG).

For technical information see CD. For Flow Curve Charts please see page E36.

**Ordering information**

**P31R A 9 2 B N N P**

| Basic series                      |      |
|-----------------------------------|------|
| Global modular mini regulator     | P31R |
| Global modular compact regulator  | P32R |
| Global modular standard regulator | P33R |

**Engineering level**  
 Current **A**

| Thread type |   |
|-------------|---|
| BSPP        | 1 |
| BSPT        | 2 |
| NPT         | 9 |

| Port size      |   |
|----------------|---|
| 1/4 (P31, P32) | 2 |
| 3/8 (P32)      | 3 |
| 1/2 (P32, P33) | 4 |
| 3/4 (P33)      | 6 |

**Mounting**  
**P** Plastic panel mount nut

| Adjustment range          |        |                            |                           |
|---------------------------|--------|----------------------------|---------------------------|
| P31 with square gauge     |        | P32 & P33 with round gauge |                           |
| psig                      | bar    | Z                          | 2 bar; 30 psig; 0.2 MPa   |
| 1 = 30*                   | V = 2* | M                          | 4 bar; 60 psig; 0.4 MPa   |
| 3 = 60                    | S = 4  | G                          | 8 bar; 125 psig; 0.8 MPa  |
| 5 = 125                   | T = 8  | J†                         | 17 bar; 250 psig; 1.7 MPa |
| P31 without square gauge† |        | P32 & P33 without gauge    |                           |
| psig                      | bar    | Y                          | 2 bar; 30 psig; 0.2 MPa   |
| Y = 30                    | Y = 2  | L                          | 4 bar; 60 psig; 0.4 MPa   |
| L = 60                    | L = 4  | N                          | 8 bar; 125 psig; 0.8 MPa  |
| N = 125                   | N = 8  | H‡                         | 17 bar; 250 psig; 1.7 MPa |

**Relief**  
**B** Relieving  
**N** Non-relieving  
**R** Reverse flow-relieving

\* Unit comes with 0-4 bar or 0-60 psig gauge respectively.  
 † Order round gauges separately - see next page.  
 ‡ Not available with P31 Series.

**Bold items are most common.**





**Regulators**



| Port size | Pressure (relieving) | Gauge | Part number        |                    |                    |
|-----------|----------------------|-------|--------------------|--------------------|--------------------|
|           |                      |       | P31                | P32                | P33                |
| 1/4"      | 8 bar (125 PSIG)     | —     | <b>P31RA92BNNP</b> | <b>P32RA92BNNP</b> |                    |
| 1/4"      | 8 bar (125 PSIG)     | Round | <b>P31RA92BN5P</b> | <b>P32RA92BNGP</b> |                    |
| 3/8"      | 8 bar (125 PSIG)     | —     |                    | <b>P32RA93BNNP</b> |                    |
| 3/8"      | 8 bar (125 PSIG)     | Round |                    | <b>P32RA93BNGP</b> |                    |
| 1/2"      | 8 bar (125 PSIG)     | —     |                    | <b>P32RA94BNNP</b> | <b>P33RA94BNNP</b> |
| 1/2"      | 8 bar (125 PSIG)     | Round |                    | <b>P32RA94BNGP</b> | <b>P33RA94BNGP</b> |
| 3/4"      | 8 bar (125 PSIG)     | —     |                    |                    | <b>P33RA96BNNP</b> |
| 3/4"      | 8 bar (125 PSIG)     | Round |                    |                    | <b>P33RA96BNGP</b> |

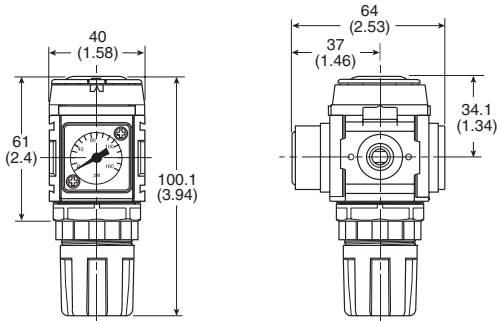
**Service kits**

| Description                            |                               | P31                | P32                | P33                |
|--|-------------------------------|--------------------|--------------------|--------------------|
| Regulator repair kit                   | Relieving                     | <b>P31KA00RC</b>   | <b>P32KA00RC</b>   | <b>P33KA00RC</b>   |
|  | Non-relieving                 | <b>P31KA00RH</b>   | <b>P32KA00RH</b>   | <b>P33KA00RH</b>   |
| Panel mount nut                        | Aluminum                      | <b>P31KA00MM</b>   | <b>P32KA00MM</b>   | <b>P33KA00MM</b>   |
|  | Plastic                       | <b>P31KA00MP</b>   | <b>P32KA00MP</b>   | <b>P33KA00MP</b>   |
| Angle bracket                          | Uses panel mount threads      | <b>P31KA00MR</b>   | <b>P32KA00MR</b>   | <b>P33KA00MR</b>   |
| C-bracket                              | Fits to body                  | <b>P31KA00MW</b>   |                    |                    |
| T-bracket                              | With body connector           | <b>P31KA00MT</b>   | <b>P32KA00MT</b>   | <b>P32KA00MT</b>   |
| T-bracket                              |                               |                    |                    | <b>P32KA00MB</b>   |
| Body connector                         |                               | <b>P31KA00CB</b>   | <b>P32KA00CB</b>   | <b>P32KA00CB</b>   |
| Gauges - Square flush mount gauge      | 0-4 bar                       | <b>K4511SCR04B</b> | <b>K4511SCR04B</b> |                    |
|  | 0-10 bar                      | <b>K4511SCR11B</b> | <b>K4511SCR11B</b> |                    |
|  | 0-60 PSIG                     | <b>K4511SCR060</b> | <b>K4511SCR060</b> |                    |
|  | 0-150 PSIG                    | <b>K4511SCR150</b> | <b>K4511SCR150</b> |                    |
| 1.00" round 1/8" center back mount     | 0-60 PSIG/0-4 bar             | <b>K4510N18060</b> |                    |                    |
|  | 0-160 PSIG/0-11 bar           | <b>K4510N18160</b> |                    |                    |
| 40mm round 1/8" center back mount      | 0-30 PSIG/0-2 bar             | <b>K4515N18030</b> |                    |                    |
|  | 0-60 PSIG/0-4 bar             | <b>K4515N18060</b> |                    |                    |
| 50mm (2") round 1/4" center back mount | 0-160 PSIG/0-11 bar           | <b>K4515N18160</b> |                    |                    |
|  | 0-30 PSIG/0-2 bar/0-0.2 MPa   |                    | <b>K4520N14030</b> | <b>K4520N14030</b> |
|  | 0-60 PSIG/0-4 bar/0-0.4 MPa   |                    | <b>K4520N14060</b> | <b>K4520N14060</b> |
|  | 0-160 PSIG/0-11 bar/0-1.1 MPa |                    | <b>K4520N14160</b> | <b>K4520N14160</b> |
|  | 0-300 PSIG/0-20 bar/0-2 MPa   |                    | <b>K4520N14300</b> | <b>K4520N14300</b> |

Most popular.

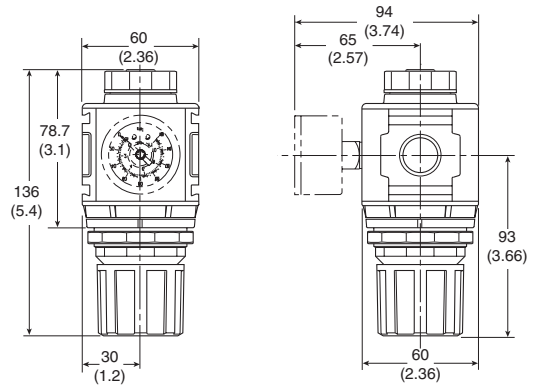


**P31**



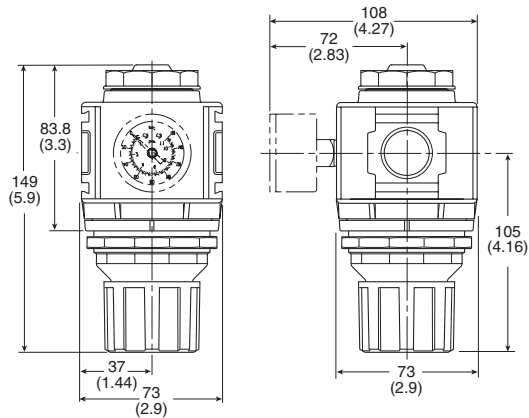
**NOTE:** 31.7 mm (1.25 in.) hole required for panel nut mounting.

**P32**



**NOTE:** 51 mm (2.00 in.) hole required for panel nut mounting.

**P33**



**NOTE:** 61 mm (2.40 in.) hole required for panel nut mounting.

**Material specifications**

| Description        | P31                    | P32                                | P33                                |
|--------------------|------------------------|------------------------------------|------------------------------------|
| Body               | Aluminum               | Aluminum                           | Aluminum                           |
| Adjustment knob    | Acetal                 | Acetal                             | Acetal                             |
| Body cap           | ABS                    | ABS                                | ABS                                |
| Bonnet             | PBT                    | 33% glass-filled nylon             | 33% glass-filled nylon             |
| Diaphragm assembly | Brass / nitrile        | Nitrile / zinc                     | Nitrile / zinc                     |
| Bottom plug        | 33% glass-filled nylon | 33% glass-filled nylon             | —                                  |
| Valve assembly     | Brass / nitrile        | Brass / nitrile                    | Brass / nitrile / acetal           |
| Springs            | Steel                  | Steel S.S. (main regulating valve) | Steel S.S. (main regulating valve) |
| Seals              | Nitrile                | Nitrile                            | Nitrile                            |
| Panel nut          | Acetal                 | Acetal                             | Acetal                             |



Global Modular  
 Air Preparation Products

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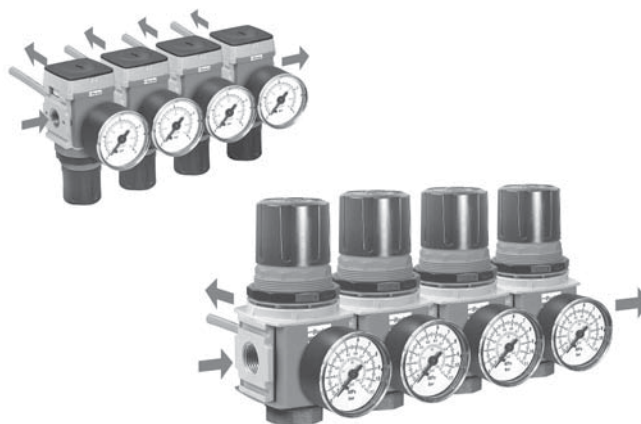
Electronic  
 Proportional

Soft Start/  
 Dump Valves

Solenoid  
 Operators

Accessories  
 Flow Charts

- Manifold style regulator with line pressure on both sides
- Pressure output is at front or rear
- Integral 1/4", 3/8" or 1/2" ports (NPT, BSPP & BSPT)
- Robust construction
- Secondary pressure ranges 0-2 bar (0-30 PSIG), 0-4 bar, (0-60 PSIG), 0-8 bar (0-125 PSIG), 0-17 bar (0-250 PSIG)
- Secondary aspiration plus balanced poppet provides quick response and accurate pressure regulation
- Relieving & Non-relieving types
- Non-rising knob



**WARNING**

Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

**CAUTION:**

**REGULATOR PRESSURE ADJUSTMENT –**

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

**Operating information**

|                        | <b>P31 (Mini)</b>                  | <b>P32 (Compact)</b>                |
|------------------------|------------------------------------|-------------------------------------|
| Supply pressure (max): | 20 bar (300 PSIG)                  | 20 bar (300 PSIG)                   |
| Operating temperature: | -20°C to 65.5°C<br>(-4°F to 150°F) | -25°C to 65.5°C<br>(-13°F to 150°F) |
| Flow Capacity*:        |                                    |                                     |
| 1/4                    | 18 dm <sup>3</sup> /s<br>(38 SCFM) | 28 dm <sup>3</sup> /s<br>(59 SCFM)  |
| 3/8                    | —                                  | 28 dm <sup>3</sup> /s<br>(59 SCFM)  |
| 1/2                    | —                                  | 28 dm <sup>3</sup> /s<br>(59 SCFM)  |

\*Inlet pressure 10 bar (145 PSIG). Secondary pressure drop 6.3 bar (91.3 PSIG).  
 For technical information see CD. For Flow Curve Charts please see page E36.

**Ordering information**

**P31H A 9 2 B N N P**

|   |                        |                                     |
|---|------------------------|-------------------------------------|
| <b>Basic series</b>                                 | <b>Relief</b>          | <b>Mounting</b>                     |
| Global modular mini common regulator <b>P31H</b>    | <b>B</b> Relieving     | <b>P</b> Plastic panel mount nut    |
| Global modular compact common regulator <b>P32H</b> | <b>N</b> Non-relieving |                                     |
| <b>Engineering level</b>                            | <b>Port size</b>       | <b>Adjustment range</b>             |
| Current <b>A</b>                                    | 2 1/4 (P31, P32)       | <b>Without gauge</b>                |
|   | 3 3/8 (P32)            | <b>Y</b> 2 bar; 30 psig; 0.2 MPa    |
| <b>Thread type</b>                                  | 4 1/2 (P32, P33)       | <b>L</b> 4 bar; 60 psig; 0.4 MPa    |
| BSPP <b>1</b>                                       |                        | <b>N</b> 8 bar; 125 psig; 0.8 MPa   |
| BSPT <b>2</b>                                       |                        | <b>H*</b> 17 bar; 250 psig; 1.7 MPa |
| NPT <b>9</b>  |                        |                                     |

**Bold items are most common.**

\* Not available with P31 Series.  
 Order gauges separately - see next page.

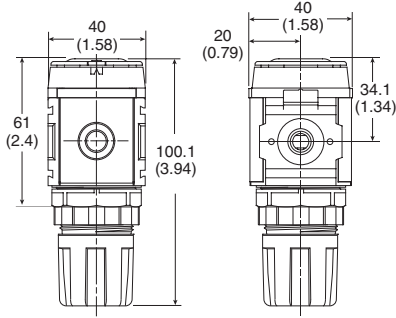
**Regulators**



|  | Port size | Pressure                   | Part number        |                    |
|--|-----------|----------------------------|--------------------|--------------------|
|  |           |                            | P31                | P32                |
|  | 1/4"      | 8 bar (125 PSIG) relieving | <b>P31HA92BNNP</b> | <b>P32HA92BNNP</b> |
|  | 3/8"      | 8 bar (125 PSIG) relieving |                    | <b>P32HA93BNNP</b> |
|  | 1/2"      | 8 bar (125 PSIG) relieving |                    | <b>P32HA94BNNP</b> |

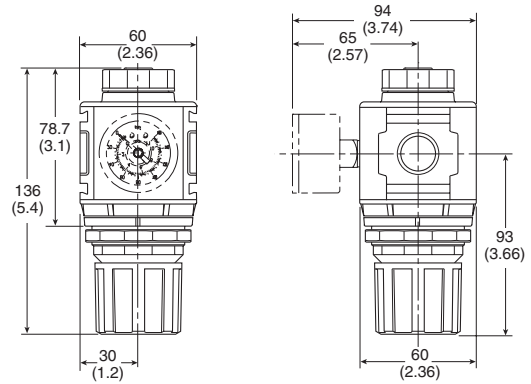
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 Combinations  
 Electronic Proportional  
 Soft Start / Dump Valves  
 Solenoid Operators  
 Accessories Flow Charts

**P31**



**NOTE:** 31.7 mm (1.25 in.) hole required for panel nut mounting.

**P32**



**NOTE:** 51 mm (2.00 in.) hole required for panel nut mounting.

**Service kits**

| Description                              |  | P31                           | P32                |                    |
|--|--|-------------------------------|--------------------|--------------------|
| Regulator repair kit                     | Relieving                              | <b>P31KA00RC</b>              | <b>P32KA00RC</b>   |                    |
|  | Non-relieving                          | <b>P31KA00RH</b>              | <b>P32KA00RH</b>   |                    |
| Panel mount nut                          | Aluminum                               | <b>P31KA00MM</b>              | <b>P32KA00MM</b>   |                    |
|  | Plastic                                | <b>P31KA00MP</b>              | <b>P32KA00MP</b>   |                    |
| Angle bracket (uses panel mount threads) |  | <b>P31KA00MR</b>              | <b>P32KA00MR</b>   |                    |
| T-bracket                                | With body connector                    | <b>P31KA00MT</b>              | <b>P32KA00MT</b>   |                    |
|  | Fits to body connector                 | <b>P31KA00MB</b>              | <b>P32KA00MB</b>   |                    |
| Body connector                           |  | <b>P31KA00CB</b>              | <b>P32KA00CB</b>   |                    |
| Gauges -                                 | Square flush mount gauge               | 0-4 bar                       | <b>K4511SCR04B</b> | <b>K4511SCR04B</b> |
|  |  | 0-10 bar                      | <b>K4511SCR11B</b> | <b>K4511SCR11B</b> |
|  |  | 0-60 PSIG                     | <b>K4511SCR060</b> | <b>K4511SCR060</b> |
|  |  | 0-150 PSIG                    | <b>K4511SCR150</b> | <b>K4511SCR150</b> |
|  | 1.00" round 1/8" center back mount     | 0-60 PSIG/0-4 bar             | <b>K4510N18060</b> |                    |
|  |  | 0-160 PSIG/0-11 bar           | <b>K4510N18160</b> |                    |
|  | 50mm (2") round 1/4" center back mount | 0-30 PSIG/0-2 bar/0-0.2 MPa   |                    | <b>K4520N14030</b> |
|  |  | 0-60 PSIG/0-4 bar/0-0.4 MPa   |                    | <b>K4520N14060</b> |
|  |  | 0-160 PSIG/0-11 bar/0-1.1 MPa |                    | <b>K4520N14160</b> |
|  |  | 0-300 PSIG/0-20 bar/0-2 MPa   |                    | <b>K4520N14300</b> |

**Material specifications**

| Description        | P31                    | P32                                |
|--------------------|------------------------|------------------------------------|
| Body               | Zinc                   | Zinc                               |
| Adjustment knob    | Acetal                 | Acetal                             |
| Body cap           | ABS                    | ABS                                |
| Bonnet             | 33% Glass-filled PBT   | 33% Glass-filled nylon             |
| Diaphragm assembly | Brass / nitrile        | Nitrile / zinc                     |
| Bottom plug        | 33% Glass-filled nylon | 33% Glass-filled nylon             |
| Valve assembly     | Brass / nitrile        | Brass / nitrile                    |
| Springs            |                        | Steel S.S. (Main regulating valve) |
| Seals              |                        | Nitrile                            |
| Panel nut          |                        | Acetal                             |

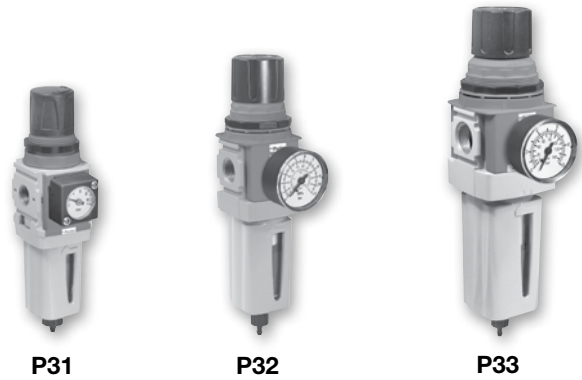
Most popular.





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 Solenoid Operators  
 Accessories Flow Charts

- Integral 1/4", 3/8", 1/2", 3/4" ports (NPT, BSPP & BSPT)
- High efficiency 5 micron element as standard
- Excellent water removal efficiency
- Robust but lightweight aluminum construction
- Positive bayonet latch to ensure correct & safe fitting
- Secondary pressure ranges 0-2 bar (0-30 PSIG), 0-4 bar, (0-60 PSIG), 0-8 bar (0-125 PSIG), 0-17 bar (0-250 PSIG)
- Secondary aspiration plus balanced poppet provides quick response and accurate pressure regulation



**WARNING**  
 Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

**CAUTION:**  
**REGULATOR PRESSURE ADJUSTMENT –**  
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

| Operating information     |                                    |                                     |                                     |
|---------------------------|------------------------------------|-------------------------------------|-------------------------------------|
|                           | P31 (Mini)                         | P32 (Compact)                       | P33 (Standard)                      |
| Supply pressure (max):    |                                    |                                     |                                     |
| Plastic Bowl              | 10 bar (150 PSIG)                  | 10 bar (150 PSIG)                   | 10 bar (150 PSIG)                   |
| Metal Bowl                | 17 bar (250 PSIG)                  | 17 bar (250 PSIG)                   | 17 bar (250 PSIG)                   |
| Operating temperature:    |                                    |                                     |                                     |
| Plastic Bowl              | -10°C to 52°C<br>(14°F to 125°F)   | -25°C to 52°C<br>(-13°F to 125°F)   | -25°C to 52°C<br>(-13°F to 125°F)   |
| Metal Bowl                | -10°C to 65.5°C<br>(14°F to 150°F) | -25°C to 65.5°C<br>(-13°F to 150°F) | -25°C to 65.5°C<br>(-13°F to 150°F) |
| Units with square gauges: | -15°C to 65.5°C<br>(5°F to 150°F)  |                                     |                                     |
| Standard filtration:      | 5 micron                           | 5 micron                            | 5 micron                            |
| Flow Capacity*:           |                                    |                                     |                                     |
| 1/4                       | 14 dm <sup>3</sup> /s<br>(30 SCFM) | 42 dm <sup>3</sup> /s<br>(89 SCFM)  | –                                   |
| 3/8                       | –                                  | 58 dm <sup>3</sup> /s<br>(123 SCFM) | –                                   |
| 1/2                       | –                                  | 64 dm <sup>3</sup> /s<br>(136 SCFM) | 90<br>(191 SCFM)                    |
| 3/4                       | –                                  | –                                   | 98 dm <sup>3</sup> /s<br>(208 SCFM) |

\*Inlet pressure 10 bar (145 PSIG). Secondary pressure drop 6.3 bar (91.3 PSIG).  
 For technical information see CD. For Flow Curve Charts please see page E37.

**Ordering information**

**P31E A 9 2 E G M B N 5 P**

|  |      |                                |   |                         |  |                                    |
|--|------|--------------------------------|---|-------------------------|--|------------------------------------|
| <b>Basic series</b>                        |      | <b>Element</b>                 |   | <b>Relief</b>           |  | <b>Mounting</b>                    |
| Global modular mini filter / regulator     | P31E | 5µ Element                     | E | B Relieving             |  | P Plastic panel mount nut          |
| Global modular compact filter / regulator  | P32E |                                |   | N Non-relieving         |  |                                    |
| Global modular standard filter / regulator | P33E |                                |   |                         |  |                                    |
| <b>Engineering level</b>                   |      | <b>Port size</b>               |   | <b>Drain type</b>       |  |                                    |
| Current                                    | A    | 1/4 (P31, P32)                 | 2 | M Manual drain          |  |                                    |
|  |      | 3/8 (P32)                      | 3 | A Auto drain (P32, P33) |  |                                    |
|  |      | 1/2 (P32, P33)                 | 4 | B Pulse drain (P31)     |  |                                    |
|  |      | 3/4 (P33)                      | 6 |                         |  |                                    |
| <b>Thread type</b>                         |      | <b>Bowl type</b>               |   |                         |  | <b>Adjustment range</b>            |
| BSPP                                       | 1    | Poly bowl with bowl guard      | G |                         |  | <b>P31 with square gauge</b>       |
| BSPT                                       | 2    | Metal bowl without sight gauge | M |                         |  | psig      bar                      |
| NPT  | 9    | Metal bowl with sight gauge    | S |                         |  | 1 = 30*      V = 2*                |
|  |      |                                |   |                         |  | 3 = 60      S = 4                  |
|  |      |                                |   |                         |  | 5 = 125      T = 8                 |
|  |      |                                |   |                         |  | <b>P31 without square gauge†</b>   |
|  |      |                                |   |                         |  | <b>P32 &amp; P33 without gauge</b> |
|  |      |                                |   |                         |  | psig      bar                      |
|  |      |                                |   |                         |  | Y = 30      Y = 2                  |
|  |      |                                |   |                         |  | L = 60      L = 4                  |
|  |      |                                |   |                         |  | N = 8 bar; 125 psig; 0.8 MPa       |
|  |      |                                |   |                         |  | N = 125      N = 8                 |
|  |      |                                |   |                         |  | H‡ 17 bar; 250 psig; 1.7 MPa       |

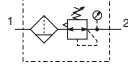
\* Unit comes with 0-4 bar or 0-60 psig gauge respectively.  
 † Order round gauges separately - see next page.  
 ‡ Not available with poly bowl with bowl guard.  
 ‡ Not available with P31 Series.

**Bold items are most common.**





**Filter / Regulator**



| Port size | Pressure (relieving) | Bowl type | Drain type | Part number           |                       |                       |
|-----------|----------------------|-----------|------------|-----------------------|-----------------------|-----------------------|
|           |                      |           |            | P31                   | P32                   | P33                   |
| 1/4"      | 8 bar (125 PSIG)     | Poly      | Manual     | <b>P31EA92EGMBN5P</b> | <b>P32EA92EGMBNGP</b> |                       |
| 1/4"      | 8 bar (125 PSIG)     | Poly      | Pulse      | <b>P31EA92EGBBN5P</b> |                       |                       |
| 1/4"      | 8 bar (125 PSIG)     | Poly      | Auto       |                       | <b>P32EA92EGMBNGP</b> |                       |
| 1/4"      | 8 bar (125 PSIG)     | Metal     | Manual     | <b>P31EA92EMMBN5P</b> | <b>P32EA92ESMBNGP</b> |                       |
| 1/4"      | 8 bar (125 PSIG)     | Metal     | Pulse      | <b>P31EA92EMBBN5P</b> |                       |                       |
| 1/4"      | 8 bar (125 PSIG)     | Metal     | Auto       |                       | <b>P32EA92ESABNGP</b> |                       |
| 3/8"      | 8 bar (125 PSIG)     | Poly      | Manual     |                       | <b>P32EA93EGMBNGP</b> |                       |
| 3/8"      | 8 bar (125 PSIG)     | Poly      | Auto       |                       | <b>P32EA93EGABNGP</b> |                       |
| 3/8"      | 8 bar (125 PSIG)     | Metal     | Manual     |                       | <b>P32EA93ESMBNGP</b> |                       |
| 3/8"      | 8 bar (125 PSIG)     | Metal     | Auto       |                       | <b>P32EA93ESABNGP</b> |                       |
| 1/2"      | 8 bar (125 PSIG)     | Poly      | Manual     |                       | <b>P32EA94EGMBNGP</b> | <b>P33EA94EGMBNGP</b> |
| 1/2"      | 8 bar (125 PSIG)     | Poly      | Auto       |                       | <b>P32EA94EGABNGP</b> | <b>P33EA94EGABNGP</b> |
| 1/2"      | 8 bar (125 PSIG)     | Metal     | Manual     |                       | <b>P32EA94ESMBNGP</b> | <b>P33EA94ESMBNGP</b> |
| 1/2"      | 8 bar (125 PSIG)     | Metal     | Auto       |                       | <b>P32EA94ESABNGP</b> | <b>P33EA94ESABNGP</b> |
| 3/4"      | 8 bar (125 PSIG)     | Poly      | Manual     |                       |                       | <b>P33EA96EGMBNGP</b> |
| 3/4"      | 8 bar (125 PSIG)     | Poly      | Auto       |                       |                       | <b>P33EA96EGABNGP</b> |
| 3/4"      | 8 bar (125 PSIG)     | Metal     | Manual     |                       |                       | <b>P33EA96ESMBNGP</b> |
| 3/4"      | 8 bar (125 PSIG)     | Metal     | Auto       |                       |                       | <b>P33EA96ESABNGP</b> |

Most popular.

**Service kits**

| Description                               |                               | P31                | P32                | P33                |
|---|-------------------------------|--------------------|--------------------|--------------------|
| Plastic bowl / bowl guard                 | Manual drain                  | <b>P31KA00BGM</b>  | <b>P32KA00BGM</b>  | <b>P33KA00BGM</b>  |
|   | Pulse drain                   | <b>P31KA00BGB</b>  |                    |                    |
|   | Auto drain                    |                    | <b>P32KA00DA</b>   | <b>P32KA00DA</b>   |
| Metal bowl w/o sight gauge                | Manual drain                  | <b>P31KA00BMM</b>  |                    |                    |
|   | Pulse drain                   | <b>P31KA00BMB</b>  |                    |                    |
|   | Auto drain                    |                    | <b>P32KA00DA</b>   | <b>P32KA00DA</b>   |
| Metal bowl / sight gauge                  | Manual drain                  |                    | <b>P32KA00BSM</b>  | <b>P33KA00BSM</b>  |
|   | Auto drain                    |                    | <b>P32KA00DA</b>   | <b>P32KA00DA</b>   |
| Filter element                            | 5µ particulate                | <b>P31KA00ESE</b>  | <b>P32KA00ESE</b>  | <b>P33KA00ESE</b>  |
| Regulator repair kit                      | Relieving                     | <b>P31KA00RC</b>   | <b>P32KA00RC</b>   | <b>P33KA00RC</b>   |
|   | Non-relieving                 | <b>P31KA00RH</b>   | <b>P32KA00RH</b>   | <b>P33KA00RH</b>   |
| Panel mount nut                           | Aluminum                      | <b>P31KA00MM</b>   | <b>P32KA00MM</b>   | <b>P33KA00MM</b>   |
|   | Plastic                       | <b>P31KA00MP</b>   | <b>P32KA00MP</b>   | <b>P33KA00MP</b>   |
| Angle bracket (uses panel mount threads)  |                               | <b>P31KA00MR</b>   | <b>P32KA00MR</b>   | <b>P33KA00MR</b>   |
| C-bracket                                 | Fits to body                  | <b>P31KA00MW</b>   |                    |                    |
| T-bracket                                 | Fits to body connector        |                    | <b>P32KA00MB</b>   | <b>P32KA00MB</b>   |
|   | With body connector           | <b>P31KA00MT</b>   | <b>P32KA00MT</b>   | <b>P32KA00MT</b>   |
| Body connector                            |                               | <b>P31KA00CB</b>   | <b>P32KA00CB</b>   | <b>P32KA00CB</b>   |
| Gauges - square flush mount gauge         | 0-4 bar                       | <b>K4511SCR04B</b> |                    |                    |
|   | 0-10 bar                      | <b>K4511SCR11B</b> |                    |                    |
|   | 0-60 PSIG                     | <b>K4511SCR060</b> |                    |                    |
|   | 0-150 PSIG                    | <b>K4511SCR150</b> |                    |                    |
| 50mm (2") round<br>1/4" center back mount | 0-30 PSIG/0-2 bar/0-0.2 MPa   |                    | <b>K4520N14030</b> | <b>K4520N14030</b> |
|   | 0-60 PSIG/0-4 bar/0-0.4 MPa   |                    | <b>K4520N14060</b> | <b>K4520N14060</b> |
|   | 0-160 PSIG/0-11 bar/0-1.1 MPa |                    | <b>K4520N14160</b> | <b>K4520N14160</b> |
|   | 0-300 PSIG/0-20 bar/0-2 MPa   |                    | <b>K4520N14300</b> | <b>K4520N14300</b> |



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Dump Valves

Solenoid  
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Accessories  
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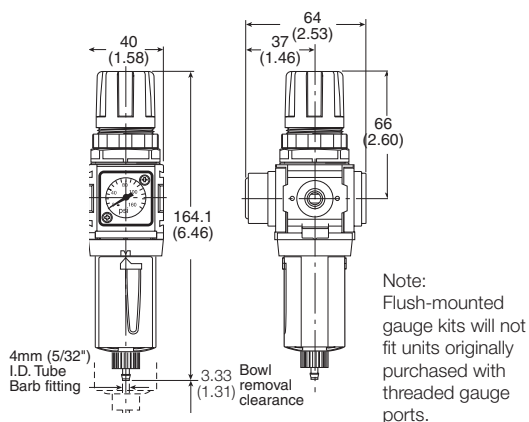
Electronic  
 Proportional

Soft Start /  
 Dump Valves

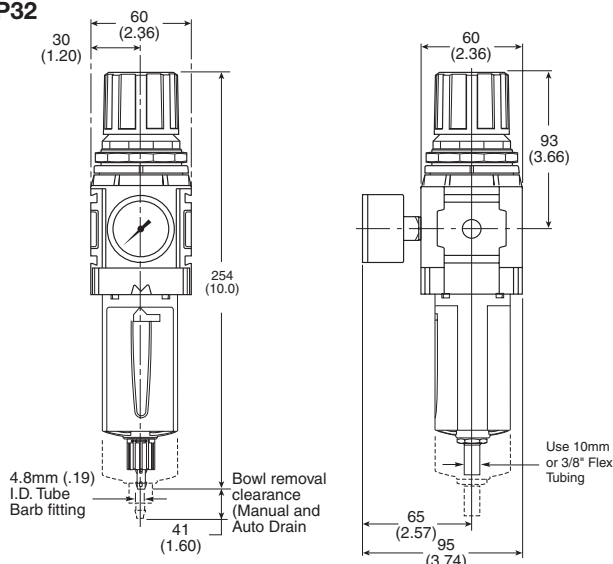
Solenoid  
 Operators

Accessories  
 Flow Charts

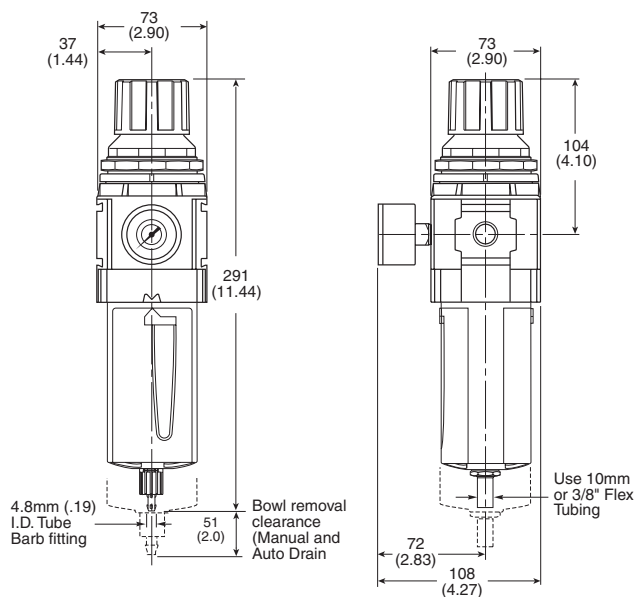
**P31**



**P32**



**P33**

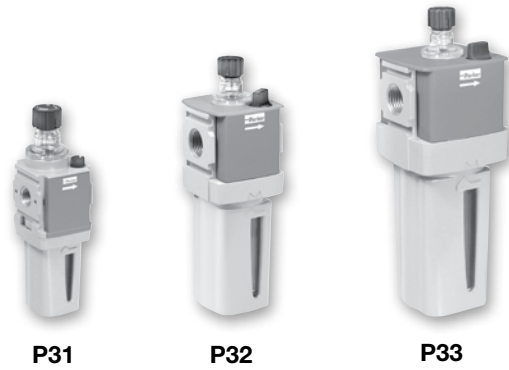


**Material Specifications**

| Description             | P31                     | P32                    | P33                    |
|-------------------------|-------------------------|------------------------|------------------------|
| Body                    | Aluminum                | Aluminum               | Aluminum               |
| Adjustment knob         | Acetal                  | Acetal                 | Acetal                 |
| Body cap                | ABS                     | ABS                    | ABS                    |
| Bonnet                  | PBT                     | 33% glass-filled nylon | 33% glass-filled nylon |
| Element retainer/baffle | N/A                     | Acetal                 | Acetal                 |
| Bowl                    | Plastic bowl            | Polycarbonate          | Polycarbonate          |
|                         | Metal bowl              | Aluminum               | Aluminum               |
| Bowl guard              | Nylon                   | Nylon                  | Nylon                  |
| Filter element          | Sintered polyethylene   | Sintered polyethylene  | Polyethylene           |
| Seals                   | Nitrile                 | Nitrile                | Nitrile                |
| Springs                 | Main regulating / valve | Steel                  | Steel / S.S.           |
| Valve assembly          | Brass / nitrile         | Brass / nitrile        | Brass / nitrile        |
| Diaphragm assembly      | Brass / nitrile         | Nitrile / zinc         | Nitrile / zinc         |
| Panel nut               | Acetal                  | Acetal                 | Acetal                 |
| Sight gauge             | Metal bowl              | N/A                    | Polycarbonate          |



- Integral 1/4", 3/8", 1/2", 3/4" ports (NPT, BSPP & BSPT)
- Robust but lightweight aluminum construction
- Proportional oil delivery over a wide range of air flows
- Finger tip ratchet control for precise oil drip rate adjustment



**Operating information**

Supply pressure (max): Plastic Bowl 10 bar (150 PSIG)  
 Metal Bowl 17 bar (250 PSIG)

Operating temperature: Plastic Bowl -10°C to 52°C (14°F to 125°F)  
 Metal Bowl -10°C to 65.5°C (14°F to 150°F)

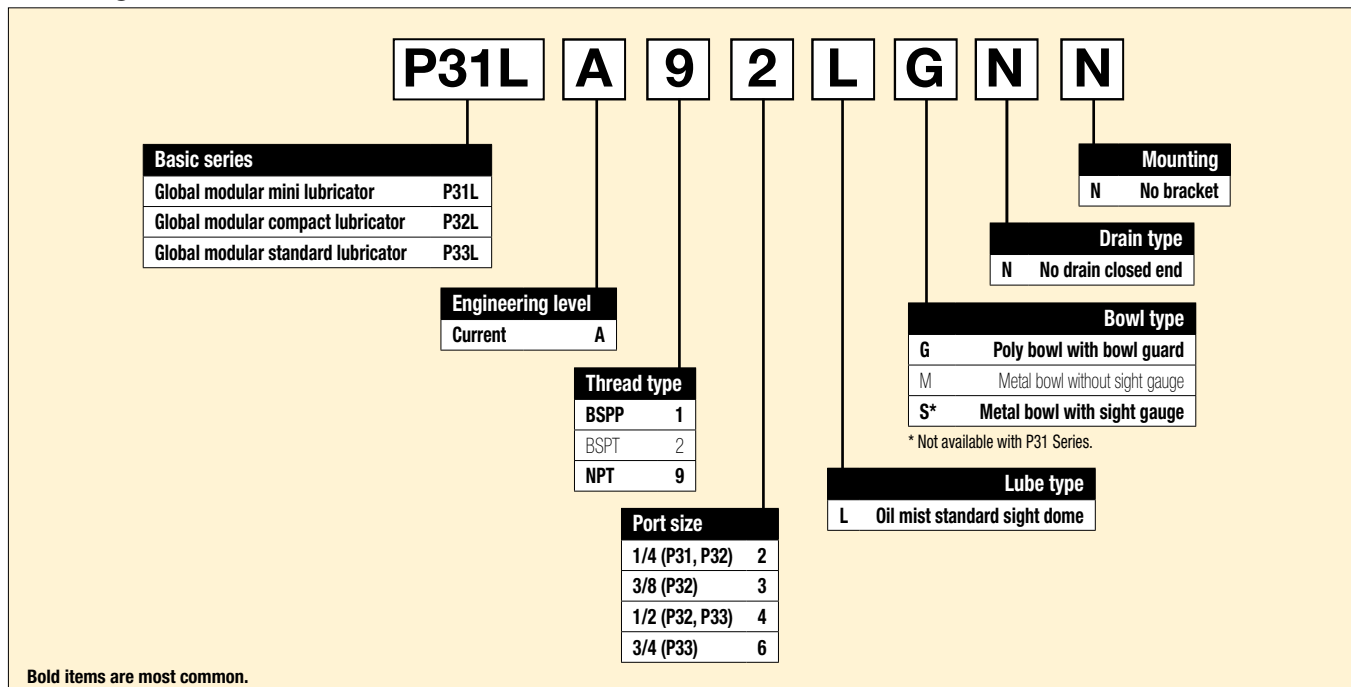
Standard filtration: 5 micron

|                     | <b>P31 (Mini)</b>               | <b>P32 (Compact)</b>             | <b>P33 (Standard)</b>            |
|---------------------|---------------------------------|----------------------------------|----------------------------------|
| Flow Capacity*: 1/4 | 13 dm <sup>3</sup> /s (28 SCFM) | 18 dm <sup>3</sup> /s (38 SCFM)  | -                                |
| 3/8                 | -                               | 32 dm <sup>3</sup> /s (68 SCFM)  | -                                |
| 1/2                 | -                               | 47 dm <sup>3</sup> /s (100 SCFM) | 48 (102 SCFM)                    |
| 3/4                 | -                               | -                                | 68 dm <sup>3</sup> /s (144 SCFM) |

\* Inlet pressure 6.3 bar (91.3 PSIG), pressure drop 0.34 bar (4.9 PSIG).

For technical information see CD. For Flow Curve Charts please see page E38.

**Ordering information**





**Lubricators**



| Port size | Bowl type        | Type               | Part number        |                    |                    |
|-----------|------------------|--------------------|--------------------|--------------------|--------------------|
|           |                  |                    | P31                | P32                | P33                |
| 1/4"      | Poly / no drain  | Mist               | <b>P31LA92LGNN</b> | <b>P32LA92LGNN</b> |                    |
| 1/4"      | Metal / no drain | Mist / sight gauge | <b>P31LA92LMNN</b> | <b>P32LA92LSNN</b> |                    |
| 3/8"      | Poly / no drain  | Mist               |                    | <b>P32LA93LGNN</b> |                    |
| 3/8"      | Metal / no drain | Mist / sight gauge |                    | <b>P32LA93LSNN</b> |                    |
| 1/2"      | Poly / no drain  | Mist               |                    | <b>P32LA94LGNN</b> | <b>P33LA94LGNN</b> |
| 1/2"      | Metal / no drain | Mist / sight gauge |                    | <b>P32LA94LSNN</b> | <b>P33LA94LSNN</b> |
| 3/4"      | Poly / no drain  | Mist               |                    |                    | <b>P33LA96LGNN</b> |
| 3/4"      | Metal / no drain | Mist / sight gauge |                    |                    | <b>P33LA96LSNN</b> |

**Service kits**

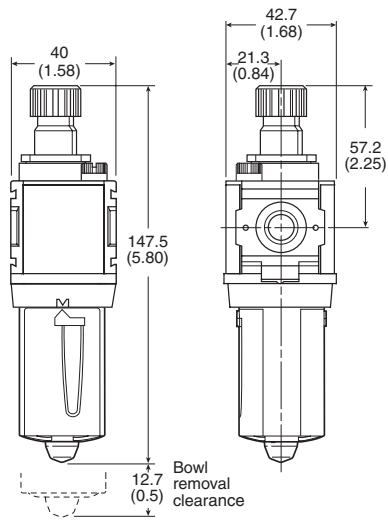
| Description                          | P31   | P32                                  | P33                                  |
|--------------------------------------|---|--------------------------------------|--------------------------------------|
| Plastic bowl / bowl guard / no drain | <b>P31KA00BGN</b>   | <b>P32KA00BGN</b>                    | <b>P33KA00BGN</b>                    |
| Drip control assembly                | <b>P32KA00PG</b>  | <b>P32KA00PG</b>                     | <b>P32KA00PG</b>                     |
| Fill plug                            | <b>P31KA00PL</b>  | <b>P32KA00PL</b>                     | <b>P32KA00PL</b>                     |
| C-bracket                            | Fits to body<br><b>P31KA00MW</b>                                  |                                      |                                      |
| L-bracket                            |   | <b>P32KA00ML</b>                     | <b>P33KA00ML</b>                     |
| T-bracket                            | Fits to body connector<br>With body connector<br><b>P31KA00MT</b> | <b>P32KA00MB</b><br><b>P32KA00MT</b> | <b>P32KA00MB</b><br><b>P32KA00MT</b> |
| Body connector                       | <b>P31KA00CB</b>  | <b>P32KA00CB</b>                     | <b>P32KA00CB</b>                     |
| Lubricant* (1 quart)                 | <b>F442001</b>  | <b>F442001</b>                       | <b>F442001</b>                       |

\* Petroleum based oil of 100 to 200 SUS viscosity at 38°C (100°F) and an aniline point greater than 93°C (200°F). **DO NOT USE OILS WITH ADDITIVES, COMPOUNDED OILS CONTAINING SOLVENTS, GRAPHITE, DETERGENTS, OR SYNTHETIC OILS.**

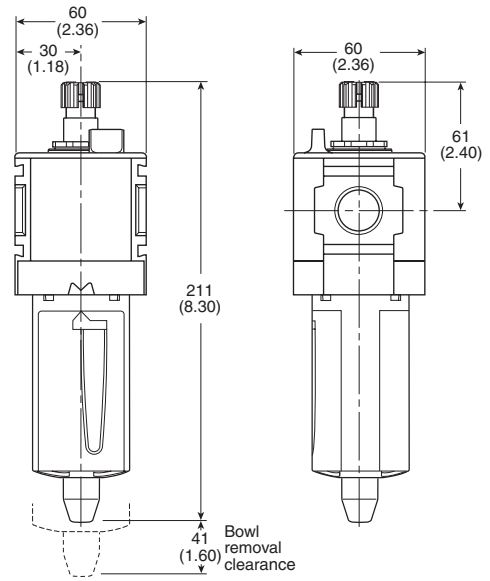
Most popular.



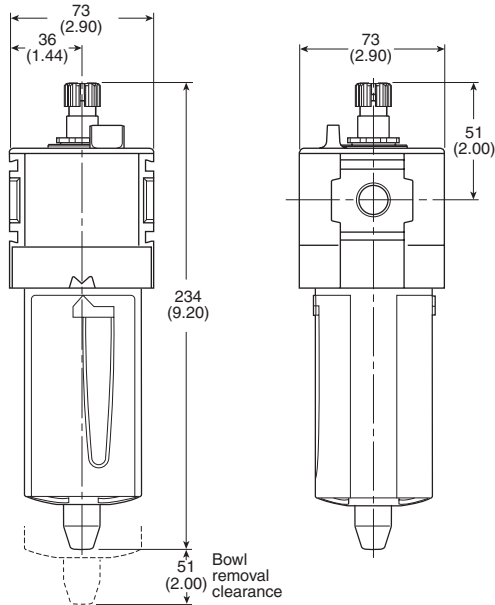
**P31**



**P32**



**P33**



**Material Specifications**

| Description         | P31   | P32                       | P33                       |
|---------------------|---|---------------------------|---------------------------|
| Body                | Aluminum  | Aluminum                  | Aluminum                  |
| Body cap            | ABS   | ABS                       | ABS                       |
| Bowl                | Plastic bowl<br>Polycarbonate<br>Metal bowl<br>Aluminum | Polycarbonate<br>Aluminum | Polycarbonate<br>Aluminum |
| Bowl guard          | Nylon   | Nylon                     | Nylon                     |
| Seals               | Nitrile   | Nitrile                   | Nitrile                   |
| Sight dome          | Polycarbonate   | Polycarbonate             | Polycarbonate             |
| Suggested lubricant | ISO / ASTM VG32   | ISO / ASTM VG32           | ISO / ASTM VG32           |
| Pick-up filter      | Sintered bronze   | Sintered bronze           | Sintered bronze           |
| Sight gauge         | Metal bowl<br>N/A                                       | Polycarbonate             | Polycarbonate             |



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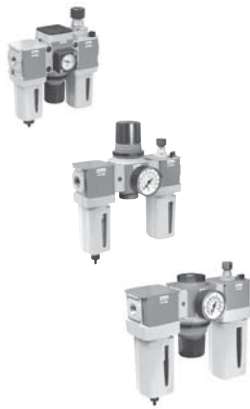
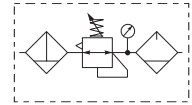
Soft Start/  
Dump Valves

Solenoid  
Operators

Accessories  
Flow Charts

**Filter + Regulator + Lubricator Combinations + Poly Bowl**

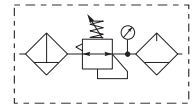
5 micron element, 8 bar (116 PSIG) Regulator + Gauge and Wall Mounting Brackets  
 Inlet pressure 10 bar (145 PSIG), Secondary pressure 6.3 bar (91.3 PSIG),  
 1 bar (14.5 PSIG) pressure drop.



| Port size | Drain type | Part number            |                        |                        |
|-----------|------------|------------------------|------------------------|------------------------|
|           |            | P31 Series             | P32 Series             | P33 Series             |
| 1/4"      | Manual     | <b>P31CB92GEMN5LNW</b> | <b>P32CB92GEMNGLNW</b> |                        |
| 1/4"      | Pulse      | <b>P31CB92GEBN5LNW</b> |                        |                        |
| 1/4"      | Auto       |                        | <b>P32CB92GEANGLNW</b> |                        |
| 3/8"      | Manual     |                        | <b>P32CB93GEMNGLNW</b> |                        |
| 3/8"      | Auto       |                        | <b>P32CB93GEANGLNW</b> |                        |
| 1/2"      | Manual     |                        | <b>P32CB94GEMNGLNW</b> | <b>P33CB94GEMNGLNW</b> |
| 1/2"      | Auto       |                        | <b>P32CB94GEANGLNW</b> | <b>P33CB94GEANGLNW</b> |
| 3/4"      | Manual     |                        |                        | <b>P33CB96GEMNGLNW</b> |
| 3/4"      | Auto       |                        |                        | <b>P33CB96GEANGLNW</b> |

**Filter / Regulator + Lubricator Combinations + Poly Bowl**

5 micron element, 8 bar (116 PSIG) Regulator + Gauge and Wall Mounting Brackets  
 Inlet pressure 10 bar (145 PSIG), Secondary pressure 6.3 bar (91.3 PSIG),  
 1 bar (14.5 PSIG) pressure drop.



| Port size | Drain type | Part number            |                        |                        |
|-----------|------------|------------------------|------------------------|------------------------|
|           |            | P31 Series             | P32 Series             | P33 Series             |
| 1/4"      | Manual     | <b>P31CA92GEMN5LNW</b> | <b>P32CA92GEMNGLNW</b> |                        |
| 1/4"      | Pulse      | <b>P31CA92GEBN5LNW</b> |                        |                        |
| 1/4"      | Auto       |                        | <b>P32CA92GEANGLNW</b> |                        |
| 3/8"      | Manual     |                        | <b>P32CA93GEMNGLNW</b> |                        |
| 3/8"      | Auto       |                        | <b>P32CA93GEANGLNW</b> |                        |
| 1/2"      | Manual     |                        | <b>P32CA94GEMNGLNW</b> | <b>P33CA94GEMNGLNW</b> |
| 1/2"      | Auto       |                        | <b>P32CA94GEANGLNW</b> | <b>P33CA94GEANGLNW</b> |
| 3/4"      | Manual     |                        |                        | <b>P33CA96GEMNGLNW</b> |
| 3/4"      | Auto       |                        |                        | <b>P33CA96GEANGLNW</b> |

**⚠ WARNING**

Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

**CAUTION:**

**REGULATOR PRESSURE ADJUSTMENT -**

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design.

For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular.

**Ordering information**

**Filter / Regulator coding**  
 (use with codes: A M)

| Filter coding   | Regulator coding         | Lubricator coding           | Assembly configuration |
|---|--------------------------|-----------------------------|------------------------|
| (use with combo codes: B F G). For multiple filters, repeat as needed | (use with combo code: B) | (use with combo codes: A B) |                        |

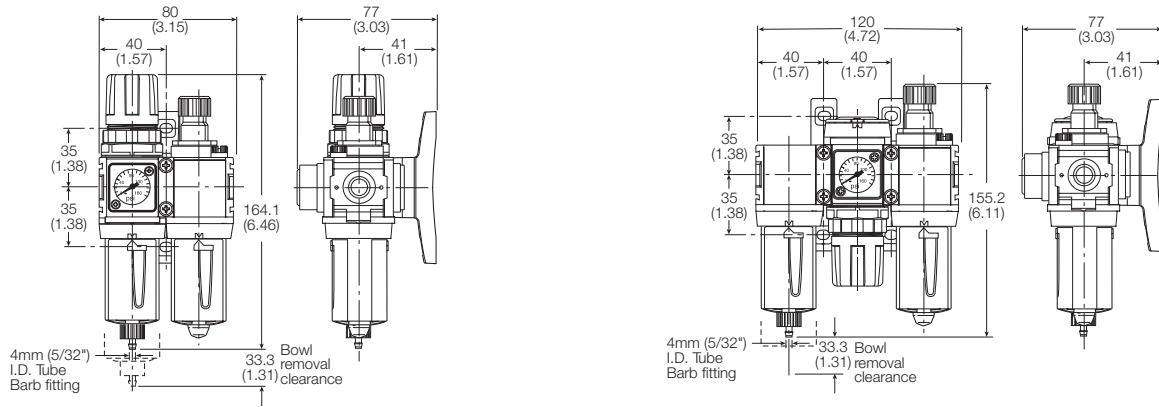
  

| <p><b>P31</b>      <b>C</b>      <b>B</b>      <b>9</b>      <b>2</b>      <b>G</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Combination</th></tr> <tr><td>B/V + Combination</td><td>Q</td></tr> <tr><td>Combination + B/V</td><td>X</td></tr> <tr><td>Combination</td><td>C</td></tr> </table><br><table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Thread type</th></tr> <tr><td>BSPP</td><td>1</td></tr> <tr><td>BSPT</td><td>2</td></tr> <tr><td>NPT</td><td>9</td></tr> </table><br><table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Combination type*</th></tr> <tr><td>F/R+L</td><td>A</td></tr> <tr><td>F+R+L</td><td>B</td></tr> <tr><td>F+Fc</td><td>F</td></tr> <tr><td>F+Fc+Fa</td><td>G</td></tr> <tr><td>F/R+Fc</td><td>M</td></tr> <tr><td>F+Fc1+Fc</td><td>Q</td></tr> </table> <p>* Combination type<br/>                 F = 5µ<br/>                 Fc1 = 1µ<br/>                 Fc = .01µ<br/>                 Fa = Adsorber</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Port size</th></tr> <tr><td>1/4 (P31, P32)</td><td>2</td></tr> <tr><td>3/8 (P32)</td><td>3</td></tr> <tr><td>1/2 (P32, P33)</td><td>4</td></tr> <tr><td>3/4 (P33)</td><td>6</td></tr> </table><br><table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Bowl type</th></tr> <tr><td>Poly bowl with bowl guard</td><td>G</td></tr> <tr><td>Metal bowl without sight gauge</td><td>M*</td></tr> <tr><td>Metal bowl with sight gauge</td><td>S‡</td></tr> </table> <p>* Not available when using lubricator.<br/>                 ‡ Not available with P31 Series.</p> <p>Note: All bowl types are the same for each component.<br/>                 Example: If a "G" is specified for a F+L, both units would get a poly bowl with bowl guard.</p> <p><b>Bold items are most common.</b></p> | Combination |                            | B/V + Combination | Q | Combination + B/V | X | Combination | C | Thread type |  | BSPP | 1 | BSPT | 2 | NPT | 9 | Combination type* |  | F/R+L | A | F+R+L | B | F+Fc | F | F+Fc+Fa | G | F/R+Fc | M | F+Fc1+Fc | Q | Port size |  | 1/4 (P31, P32) | 2 | 3/8 (P32) | 3 | 1/2 (P32, P33) | 4 | 3/4 (P33) | 6 | Bowl type |  | Poly bowl with bowl guard | G | Metal bowl without sight gauge | M* | Metal bowl with sight gauge | S‡ | <p><b>E M</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Element</th></tr> <tr><td>0.01µ Element</td><td>C</td></tr> <tr><td>0.01µ Element with DPI</td><td>D†</td></tr> <tr><td>5µ Element</td><td>E</td></tr> <tr><td>5µ Element with DPI</td><td>F†</td></tr> <tr><td>1µ Element</td><td>9</td></tr> <tr><td>1µ Element with DPI</td><td>Q†</td></tr> <tr><td>Adsorber</td><td>A</td></tr> </table><br><table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Drain type</th></tr> <tr><td>Auto drain</td><td>A†</td></tr> <tr><td>Manual drain</td><td>M</td></tr> <tr><td>Pulse drain</td><td>B</td></tr> </table> <p>† Not available on P31 Series<br/>                 ‡ Not available on P31 Series</p> | Element |  | 0.01µ Element | C | 0.01µ Element with DPI | D† | 5µ Element | E | 5µ Element with DPI | F† | 1µ Element | 9 | 1µ Element with DPI | Q† | Adsorber | A | Drain type |  | Auto drain | A† | Manual drain | M | Pulse drain | B | <p><b>N 5</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Relief adjustment</th></tr> <tr><td>Non-rising knob relieving</td><td>N</td></tr> </table><br><table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="4">Adjustment range</th></tr> <tr><th colspan="2">P31 with square gauge</th><th colspan="2">P32 &amp; P33 with round gauge</th></tr> <tr><td>psig</td><td>bar</td><td></td><td></td></tr> <tr><td>30* = 1</td><td>2* = V</td><td>2 bar; 30 psig; 0.2 MPa</td><td>Z</td></tr> <tr><td>60 = 3</td><td>4 = S</td><td>4 bar; 60 psig; 0.4 MPa</td><td>M</td></tr> <tr><td>125 = 5</td><td>8 = T</td><td>8 bar; 125 psig; 0.8 MPa</td><td>G</td></tr> <tr><td></td><td></td><td>17 bar; 250 psig; 1.7 MPa</td><td>J‡</td></tr> <tr><th colspan="2">P31 without square gauge†</th><th colspan="2">P32 &amp; P33 without gauge</th></tr> <tr><td>psig</td><td>bar</td><td></td><td></td></tr> <tr><td>30 = Y</td><td>2 = Y</td><td>2 bar; 30 psig; 0.2 MPa</td><td>Y</td></tr> <tr><td>60 = L</td><td>4 = L</td><td>4 bar; 60 psig; 0.4 MPa</td><td>L</td></tr> <tr><td>125 = N</td><td>8 = N</td><td>8 bar; 125 psig; 0.8 MPa</td><td>N</td></tr> <tr><td></td><td></td><td>17 bar; 250 psig; 1.7 MPa</td><td>H§</td></tr> </table> <p>* Unit comes with 0-4 bar or 0-60 psig gauge respectively.<br/>                 † Order round gauges separately - see next page.<br/>                 § Not available with poly bowl with bowl guard.<br/>                 ‡ Not available with P31 Series.</p> | Relief adjustment |  | Non-rising knob relieving | N | Adjustment range |  |  |  | P31 with square gauge |  | P32 & P33 with round gauge |  | psig | bar |  |  | 30* = 1 | 2* = V | 2 bar; 30 psig; 0.2 MPa | Z | 60 = 3 | 4 = S | 4 bar; 60 psig; 0.4 MPa | M | 125 = 5 | 8 = T | 8 bar; 125 psig; 0.8 MPa | G |  |  | 17 bar; 250 psig; 1.7 MPa | J‡ | P31 without square gauge† |  | P32 & P33 without gauge |  | psig | bar |  |  | 30 = Y | 2 = Y | 2 bar; 30 psig; 0.2 MPa | Y | 60 = L | 4 = L | 4 bar; 60 psig; 0.4 MPa | L | 125 = N | 8 = N | 8 bar; 125 psig; 0.8 MPa | N |  |  | 17 bar; 250 psig; 1.7 MPa | H§ | <p><b>L N</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Lube type</th></tr> <tr><td>Oil mist standard sight dome</td><td>L</td></tr> </table><br><table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Drain type</th></tr> <tr><td>No drain closed end</td><td>N</td></tr> </table> | Lube type |  | Oil mist standard sight dome | L | Drain type |  | No drain closed end | N | <p><b>W</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><th colspan="2">Mounting</th></tr> <tr><td>No bracket</td><td>A</td></tr> <tr><td>Port blocks</td><td>C*</td></tr> <tr><td>Port blocks with wall brkt</td><td>D*</td></tr> <tr><td>Wall bracket</td><td>W</td></tr> </table> <p>* For P31 Series 3/8" Port Blocks please order separately. See Kits section.</p> | Mounting |  | No bracket | A | Port blocks | C* | Port blocks with wall brkt | D* | Wall bracket | W |
|--|-------------|----------------------------|-------------------|---|-------------------|---|-------------|---|-------------|--|------|---|------|---|-----|---|-------------------|--|-------|---|-------|---|------|---|---------|---|--------|---|----------|---|-----------|--|----------------|---|-----------|---|----------------|---|-----------|---|-----------|--|---------------------------|---|--------------------------------|----|-----------------------------|----|---|---------|--|---------------|---|------------------------|----|------------|---|---------------------|----|------------|---|---------------------|----|----------|---|------------|--|------------|----|--------------|---|-------------|---|---|-------------------|--|---------------------------|---|------------------|--|--|--|-----------------------|--|----------------------------|--|------|-----|--|--|---------|--------|-------------------------|---|--------|-------|-------------------------|---|---------|-------|--------------------------|---|--|--|---------------------------|----|---------------------------|--|-------------------------|--|------|-----|--|--|--------|-------|-------------------------|---|--------|-------|-------------------------|---|---------|-------|--------------------------|---|--|--|---------------------------|----|--|-----------|--|------------------------------|---|------------|--|---------------------|---|---|----------|--|------------|---|-------------|----|----------------------------|----|--------------|---|
| Combination  |             |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| B/V + Combination  | Q           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Combination + B/V  | X           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Combination  | C           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Thread type  |             |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| BSPP   | 1           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| BSPT   | 2           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| NPT  | 9           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Combination type*  |             |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| F/R+L  | A           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| F+R+L  | B           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| F+Fc   | F           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| F+Fc+Fa  | G           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| F/R+Fc   | M           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| F+Fc1+Fc   | Q           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Port size  |             |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| 1/4 (P31, P32)   | 2           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| 3/8 (P32)  | 3           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| 1/2 (P32, P33)   | 4           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| 3/4 (P33)  | 6           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Bowl type  |             |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Poly bowl with bowl guard  | G           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Metal bowl without sight gauge   | M*          |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Metal bowl with sight gauge  | S‡          |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Element  |             |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| 0.01µ Element  | C           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| 0.01µ Element with DPI   | D†          |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| 5µ Element   | E           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| 5µ Element with DPI  | F†          |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| 1µ Element   | 9           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| 1µ Element with DPI  | Q†          |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Adsorber   | A           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Drain type   |             |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Auto drain   | A†          |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Manual drain   | M           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Pulse drain  | B           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Relief adjustment  |             |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Non-rising knob relieving  | N           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Adjustment range   |             |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| P31 with square gauge  |             | P32 & P33 with round gauge |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| psig   | bar         |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| 30* = 1  | 2* = V      | 2 bar; 30 psig; 0.2 MPa    | Z                 |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| 60 = 3   | 4 = S       | 4 bar; 60 psig; 0.4 MPa    | M                 |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| 125 = 5  | 8 = T       | 8 bar; 125 psig; 0.8 MPa   | G                 |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
|  |             | 17 bar; 250 psig; 1.7 MPa  | J‡                |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| P31 without square gauge†  |             | P32 & P33 without gauge    |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| psig   | bar         |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| 30 = Y   | 2 = Y       | 2 bar; 30 psig; 0.2 MPa    | Y                 |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| 60 = L   | 4 = L       | 4 bar; 60 psig; 0.4 MPa    | L                 |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| 125 = N  | 8 = N       | 8 bar; 125 psig; 0.8 MPa   | N                 |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
|  |             | 17 bar; 250 psig; 1.7 MPa  | H§                |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Lube type  |             |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Oil mist standard sight dome   | L           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Drain type   |             |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| No drain closed end  | N           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Mounting   |             |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| No bracket   | A           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Port blocks  | C*          |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Port blocks with wall brkt   | D*          |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |
| Wall bracket   | W           |                            |                   |   |                   |   |             |   |             |  |      |   |      |   |     |   |                   |  |       |   |       |   |      |   |         |   |        |   |          |   |           |  |                |   |           |   |                |   |           |   |           |  |                           |   |                                |    |                             |    |   |         |  |               |   |                        |    |            |   |                     |    |            |   |                     |    |          |   |            |  |            |    |              |   |             |   |   |                   |  |                           |   |                  |  |  |  |                       |  |                            |  |      |     |  |  |         |        |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |                           |  |                         |  |      |     |  |  |        |       |                         |   |        |       |                         |   |         |       |                          |   |  |  |                           |    |  |           |  |                              |   |            |  |                     |   |   |          |  |            |   |             |    |                            |    |              |   |

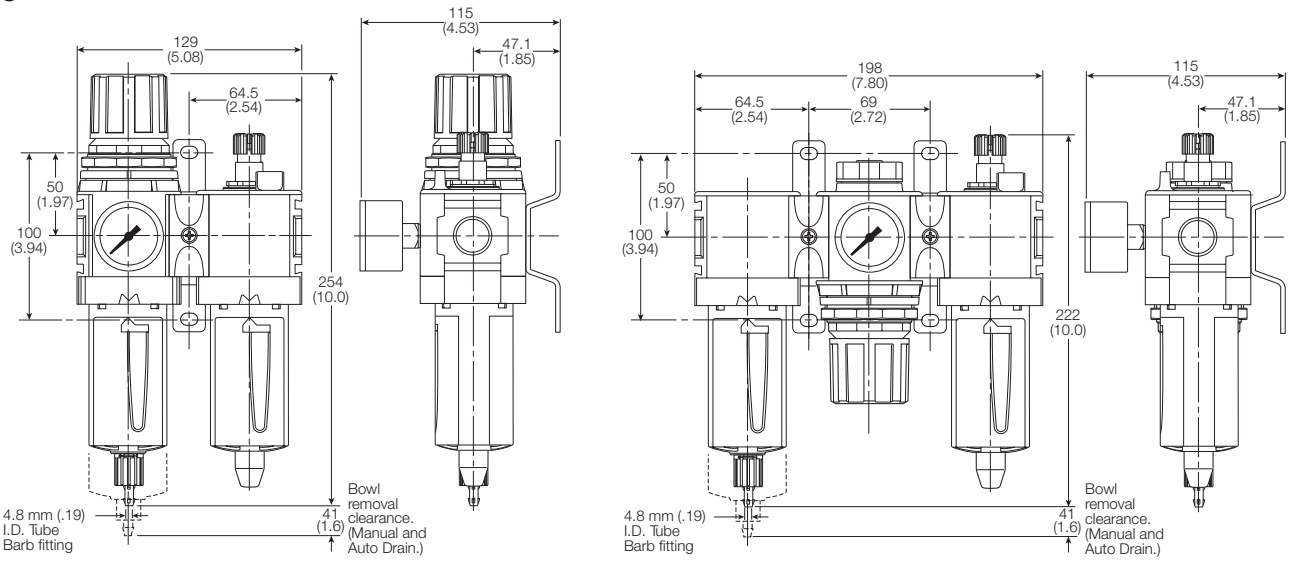
|                          |                          |
|--------------------------|--------------------------|
| E                        | Global Modular           |
| Air Preparation Products | Air Preparation Products |
| Particulate              | Filters                  |
| Coalescing               | Filters                  |
| Regulators               | Regulators               |
| Filter /                 | Regulators               |
| Lubricators              | Lubricators              |
| Combinations             | Combinations             |
| Electronic               | Proportional             |
| Soft Start /             | Dump Valves              |
| Solenoid                 | Operators                |
| Accessories              | Flow Charts              |



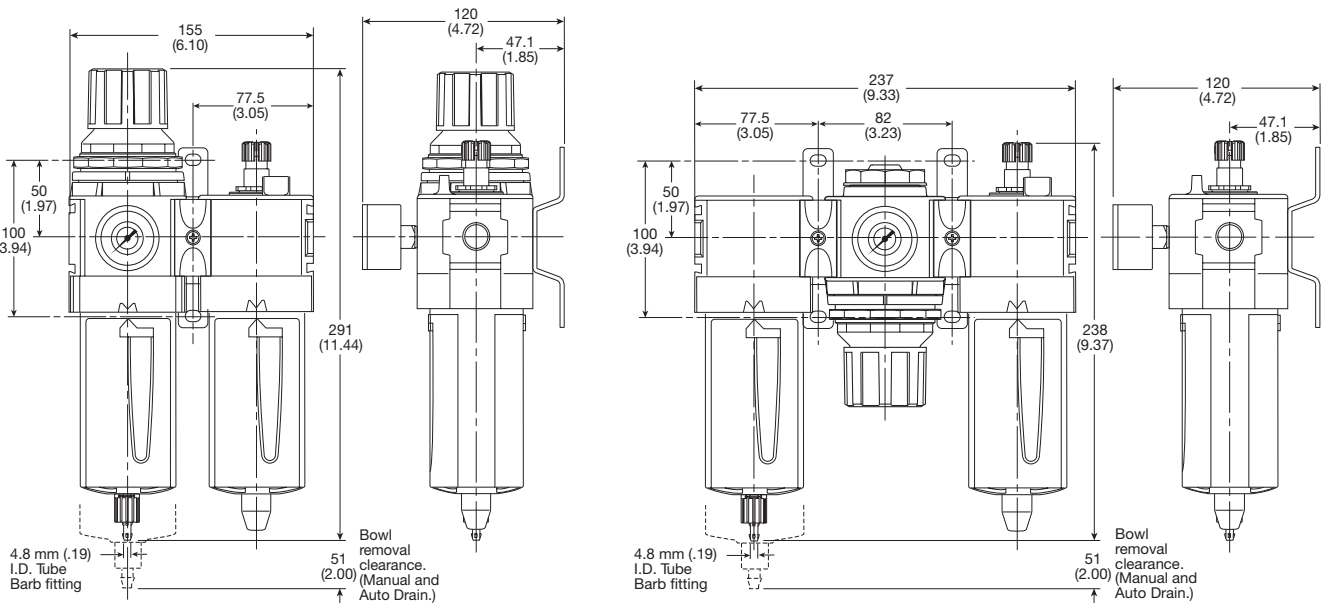
**P31C**



**P32C**



**P33C**



|                          |   |
|--------------------------|---|
|                          | Global Modular Air Preparation Products |
| Particulate Filters      |   |
| Coalescing Filters       |   |
| Regulators               |   |
| Filter / Regulators      |   |
| Lubricators              |   |
| Combinations             |   |
| Electronic Proportional  |   |
| Soft Start / Dump Valves |   |
| Solenoid Operators       |   |
| Accessories              |   |
| Flow Charts              |   |



- Very fast response times
- Accurate output pressure
- Micro parameter settings
- Selectable I/O parameters
- Quick, full flow exhaust
- LED display indicates output pressure
- No air consumption in steady state
- Multiple mounting options
- Protection to IP65
- P31P flows to 19 dm<sup>3</sup>/s (40 SCFM)
- P32P flows to 57 dm<sup>3</sup>/s (120 SCFM)



**P31PA Series**  
Bottom exhaust



**P32PA Series**  
Bottom exhaust

**Ordering information**

|                               |              |  |          |  |                                |   |                          |                        |                    |  |
|-------------------------------|--------------|--|----------|--|--------------------------------|---|--------------------------|------------------------|--------------------|--|
| <b>P31PA</b>                  |              | <b>9</b>                                       | <b>2</b> | <b>A</b>   | <b>Z</b>                       | <b>2</b>  | <b>V</b>                 | <b>D</b>               | <b>1</b>           |  |
| <b>Body size</b>              |              | <b>Thread type</b>                             |          | <b>Power supply</b>  |                                | <b>Control signal</b>   |                          | <b>Input Connector</b> |                    |  |
| Global modular mini (1/4")    | <b>P31PA</b> | BSPP   | <b>1</b> | 2  | 24 volts                       | V   | <b>0-10V<sup>†</sup></b> | 1                      | <b>M12 (4-pin)</b> |  |
| Global modular compact (1/2") | <b>P32PA</b> | BSPT   | 2        | <b>Pressure range</b>  |                                | <b>Output signal</b>  |                          |                        |                    |  |
|                               |              | NPT  | <b>9</b> | Z  | <b>0 - 2 bar (0-29 PSIG)</b>   | D Digital, PNP  |                          |                        |                    |  |
| <b>Port size</b>              |              | <b>Version</b>                                 |          | D  | <b>0 - 10 bar (0-145 PSIG)</b> | P Digital PNP and analogue 0-10V outputs selectable, by means of parameter 6. (Factory default 0-10V) |                          |                        |                    |  |
| Global modular mini (1/4")    | <b>2</b>     | Bottom ported exhaust (NC)                     | <b>A</b> | † When the supply voltage is lost the unit will automatically exhaust the regulated pressure to 0 bar (atmospheric pressure) |                                |   |                          |                        |                    |  |
| Global modular compact (1/2") | <b>4</b>     | Bottom ported forced exhaust (NO) <sup>†</sup> | <b>E</b> | D) Digital PNP output only, no analog output selectable  |                                |   |                          |                        |                    |  |
|                               |              |  |          | P) Digital PNP and analogue 0-10V outputs selectable, by means of parameter 6. (Factory default 0-10V)                       |                                |   |                          |                        |                    |  |
|                               |              |  |          | N) Digital NPN and analogue 0-10 V outputs selectable by means of parameter 6. (Factory default 0-10V)                       |                                |   |                          |                        |                    |  |
|                               |              |  |          | M) Analog 4-20mA output only. Note: On all analog outputs the F.S. value can be adjusted by means of parameter 8.            |                                |   |                          |                        |                    |  |
|                               |              |  |          | ‡ Factory setting is 0-10 V control signal. 4-20 mA control signal available via parameter 4 on keypad.                      |                                |   |                          |                        |                    |  |

**Bold items are most common.**

**P31P mounting brackets**

| Description               | Part number      |
|---------------------------|------------------|
| L-bracket mounting kit    | <b>P3HKA00ML</b> |
| Foot bracket mounting kit | <b>P3HKA00MC</b> |

**P32P mounting brackets**

| Description               | Part number      |
|---------------------------|------------------|
| L-bracket mounting kit    | <b>P3KKA00ML</b> |
| Foot bracket mounting kit | <b>P3KKA00MC</b> |

**Cables**

| Part number         | Description  |
|---------------------|--|
| <b>CB-M12-4P-2M</b> | 2 mtr. cable with moulded straight M12x1 connector |

Most popular.

For Flow Curve Charts please see page E39.



**Technical information**

**Working medium**

Compressed air or inert gasses, filtered to 40µ.

**Supply pressure**

Max. operating pressure:

2 bar unit: .....3 bar (43.5 PSIG)

10 bar unit: .....10.5 bar (152 PSIG)

Min. Operating Pressure ..... P2 pressure + 0.5 bar (7.3 PSIG)

**Pressure control range**

Available in three pressure ranges, 0-2 bar (0-29 PSIG), 0-7 bar (0-101.5 PSIG) or 0-10 bar (0-145 PSIG). Pressure range can be changed through the software at all times. (parameter 19)

**Temperature range**

0°C up to +50°C (32°F up to 122°F)

**Weights:**

P31P = 0.291 kg (0.64 lbs)

P32P = 0.645 kg (1.42 lbs)

**Air consumption**

No consumption in stable regulated situation.

**Display**

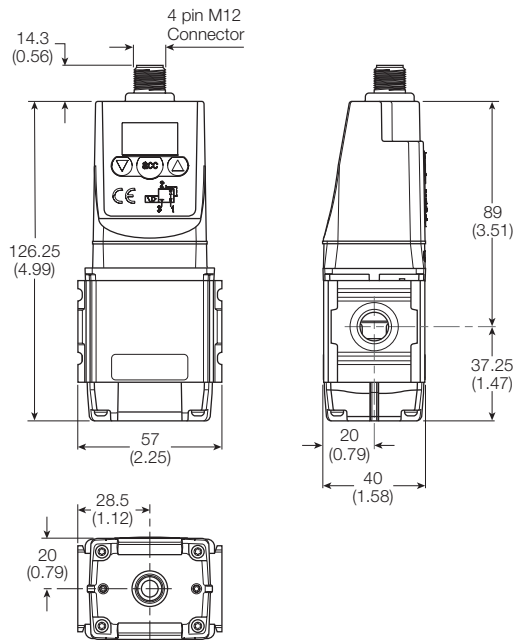
The regulator is provided with a digital display, indicating the output pressure, either in bar or PSIG.

The factory setting is as indicated on the label, can be changed through to software at all times (parameter 14)

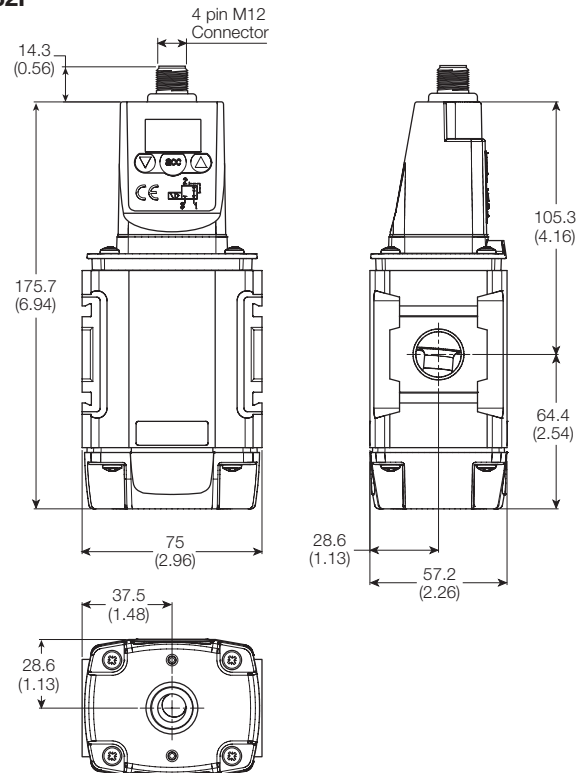
**⚠ WARNING**

**Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.**

**P31P**



**P32P**



**Supply voltage**

24 VDC +/- 10%

**Power consumption**

Max. 1.1W with unloaded signal outputs

**Control signals**

The electronic pressure regulator can be externally controlled through an analogue control signal of either 0-10V or 4-20mA. (parameter 4).

**Output signals**

As soon as the output pressure is within the signal band a signal is given of 24VDC, PNP Ri = 1 kOhm  
 Outside the signal band this connection is 0V.

**Connections**

**(In case of output signal (Option D))**

Central M12 connector 4-pole

The electrical connections are as follows:

| Pin No. | Function               | Color   |       |
|---------|------------------------|---|-------|
| 1       | 24 V                   | Supply  | Brown |
| 2       | 0 to 10 V<br>4 to 20mA | Control Signal Ri = 100k Ω<br>Control Signal Ri = 500 Ω | White |
| 3       | 0 V (GND)              | Supply  | Blue  |
| 4       | 24 V                   | Alarm Output Signal                                     | Black |

- Modular design with 1/4" or 1/2" integral ports (NPT, BSPP & BSPT)
- The 3-way, 2-position function automatically dumps downstream pressure on the loss of pilot signal
- Adjustable slow start
- Solenoid or air pilot options
- High flow & exhaust capability
- Silencer included



**P31TA Series shown**  
**Bottom exhaust**



**P32TA Series shown**  
**Bottom exhaust**

**Operating information**

|                              |            |                                 |
|------------------------------|------------|---------------------------------|
| Operating pressure (max):    | Solenoid   | 10 bar (150 PSIG)               |
|                              | Air pilot  | 17 bar (250 PSIG)               |
| Operating pressure (min):    |            | 3 bar (44 PSIG)                 |
| Operating temperature (max): | Solenoid   | 50°C (122°F)                    |
|                              | Air pilot  | 80°C (176°F)                    |
| Flow Capacity*:              | P31 Series | 17 dm <sup>3</sup> /s (36 SCFM) |
|                              | P32 Series | 48 dm <sup>3</sup> /s (97 SCFM) |

\*Inlet pressure 6.3 bar (91.3 PSIG), pressure drop 1 bar (14.5 PSIG).  
 For technical information see CD. For Flow Curve Charts please see page E39.

**Ordering information**

**P31TA 9 2 S G N C 1FN**

| Body size                                     | Actuator interface                             | Solenoid voltage  |
|---|--|---|
| Combined soft start / dump valve (1/4") P31TA | <b>0</b> Internal Pilot                        | <b>2CN</b> 24VDC non locking manual override                    |
| Combined soft start / dump valve (1/2") P32TA | <b>G</b> 15mm solenoid (P31 only)              | <b>3GN</b> 120VAC non locking manual override                   |
| Dump valve (1/4") P31DA                       | <b>C</b> 30mm solenoid                         | <b>1FN</b> 120VAC non locking manual override (P31 series only) |
| Dump valve (1/2") P32DA                       | <b>P*</b> Threaded air pilot                   |   |
| Soft start P31SA                              | * Only available on P31SA & P32SA Dump Valves. |   |
| Soft start P32SA                              |  |   |

| Thread type   | Pilot type                                     | Solenoid type  |
|---------------|--|--|
| <b>BSPP</b> 1 | <b>P</b> External air pilot                    | <b>C</b> 15mm (P31 series only)                      |
| BSPT 2        | <b>S</b> Solenoid pilot                        | <b>A</b> 30mm CNOMO coil (P32 only)                  |
| <b>NPT</b> 9  | <b>Y*</b> Internal air pilot                   | <b>D</b> 30mm CNOMO coil (M12 connection) (P32 only) |
|               | * Only available on P31SA & P32SA Dump Valves. |  |

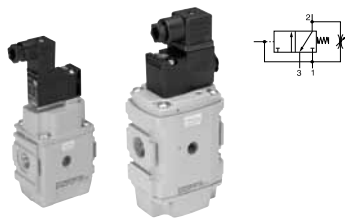
  

| Port size                              |
|--|
| <b>Global modular mini (1/4")</b> 2    |
| <b>Global modular compact (1/2")</b> 4 |

**Note:**  
 P32 unit used for both P32 & P33 series  
**Bold items are most common.**

|  |
|--|
| E  |
| Global Modular<br>Air Preparation Products |
| Particulate<br>Filters                     |
| Coalescing<br>Filters                      |
| Regulators                                 |
| Filter /<br>Regulators                     |
| Lubricators                                |
| Combinations                               |
| Electronic<br>Proportional                 |
| Soft Start /<br>Dump Valves                |
| Solenoid<br>Operators                      |
| Accessories<br>Flow Charts                 |

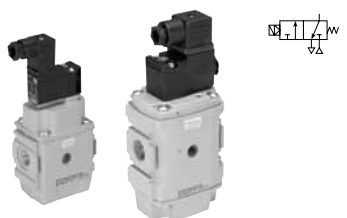
**Combined soft start / Dump valves (P31T / P32T)**



| Port size | Description                            | Part number           |
|-----------|--|-----------------------|
| 1/4"      | 120VAC Solenoid & cable plug           | <b>P31TA92SGNC1FN</b> |
| 1/4"      | 24VDC Solenoid & cable plug            | <b>P31TA92SGNC2CN</b> |
| 1/4"      | External air pilot operated            | <b>P31TA92PPN</b>     |
| 1/2"      | 120VAC 30mm coil & cable plug included | <b>P32TA94SCNA3GN</b> |
| 1/2"      | 24VDC 30mm coil & cable plug included  | <b>P32TA94SCNA2CN</b> |
| 1/2"      | External air pilot operated            | <b>P32TA94PPN</b>     |

**Note:** Includes exhaust silencer. Flow with 6.3 bar (91.3) PSIG inlet and 1 bar (14.5 PSIG) pressure drop.

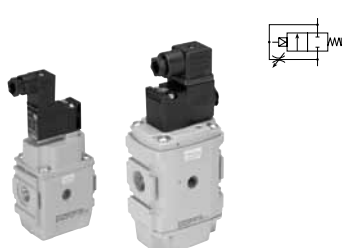
**Dump valves (P31D / P32D)**



| Port size | Description                            | Part number           |
|-----------|--|-----------------------|
| 1/4"      | 120VAC Solenoid & cable plug           | <b>P31DA92SGNC1FN</b> |
| 1/4"      | 24VDC Solenoid & cable plug            | <b>P31DA92SGNC2CN</b> |
| 1/4"      | External air pilot operated            | <b>P31DA92PPN</b>     |
| 1/2"      | 120VAC 30mm coil & cable plug included | <b>P32DA94SCNA3GN</b> |
| 1/2"      | 24VDC 30mm coil & cable plug included  | <b>P32DA94SCNA2CN</b> |
| 1/2"      | External air pilot operated            | <b>P32DA94PPN</b>     |

**Note:** Includes exhaust silencer.

**Soft starts (P31S / P32S)**

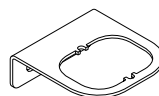


| Port size | Description                            | Part number           |
|-----------|--|-----------------------|
| 1/4"      | 120VAC Solenoid & cable plug           | <b>P31SA92SGNC1FN</b> |
| 1/4"      | 24VDC Solenoid & cable plug            | <b>P31SA92SGNC2CN</b> |
| 1/4"      | Internal air pilot operated            | <b>P31SA92Y0N</b>     |
| 1/4"      | External air pilot operated            | <b>P31SA92PPN</b>     |
| 1/2"      | 120VAC 30mm coil & cable plug included | <b>P32SA94SCNA3GN</b> |
| 1/2"      | Internal air pilot operated            | <b>P32SA92Y0N</b>     |
| 1/2"      | 24VDC 30mm coil & cable plug included  | <b>P32SA94SCNA2CN</b> |
| 1/2"      | External air pilot operated            | <b>P32SA94PPN</b>     |

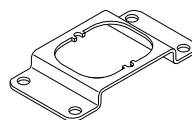
**Material specifications**

|            |             |
|------------|-------------|
| Body       | Aluminum    |
| Body cover | Polyester   |
| Seals      | Nitrile NBR |

**P31P mounting brackets**



L-bracket



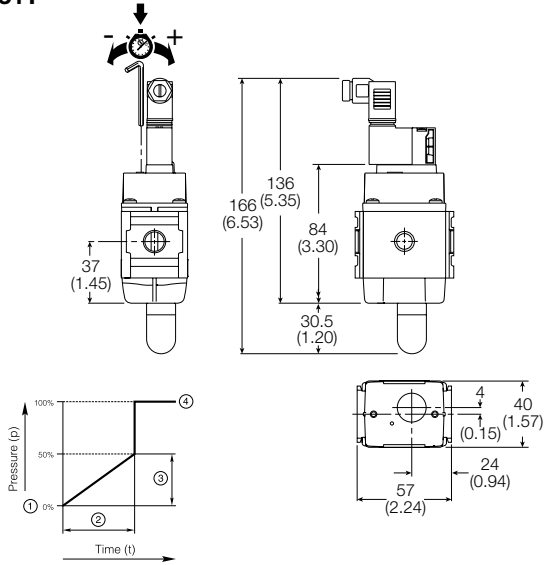
Foot bracket

| Description               | Part number      |
|---------------------------|------------------|
| L-bracket mounting kit    | <b>P3HKA00ML</b> |
| Foot bracket mounting kit | <b>P3HKA00MC</b> |

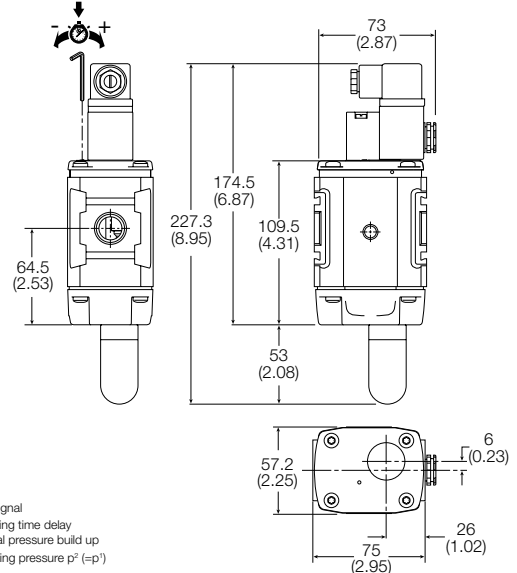
**Note:** For solenoid operators and cable plugs (connectors) see pages E28 to E29.

Most popular.

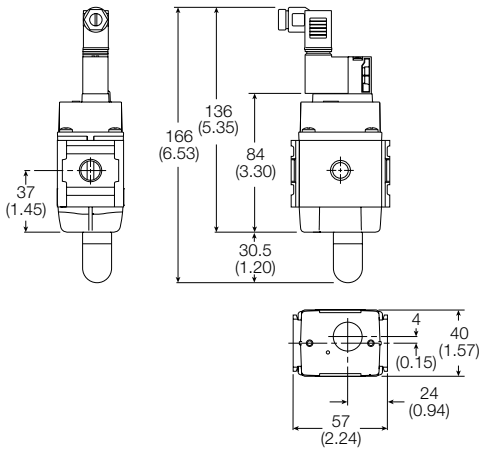
**P31T**



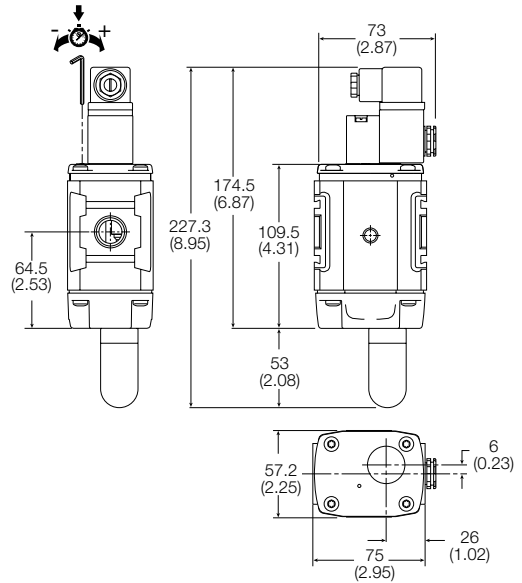
**P32T**



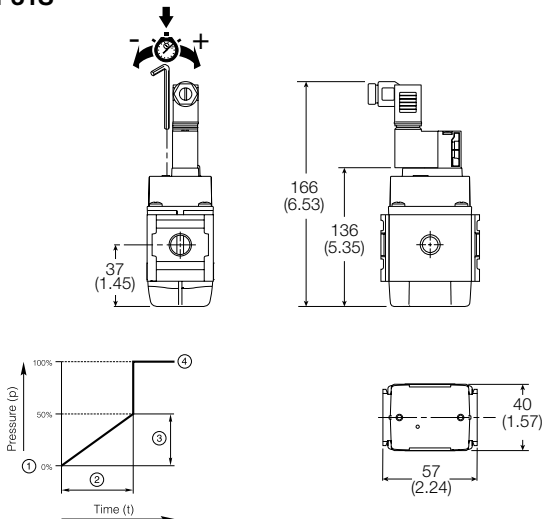
**P31D**



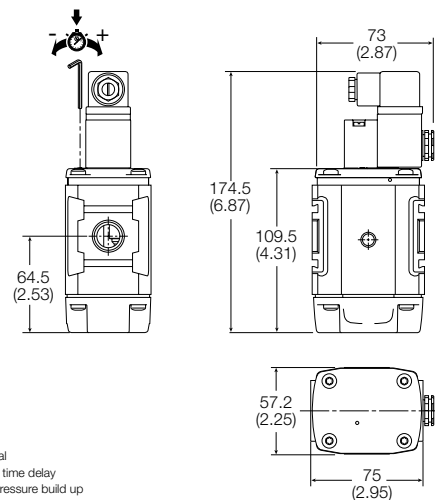
**P32D**



**P31S**



**P32S**



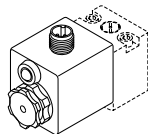
**Solenoid Operators - CNOMO**

**Technical data -  
 Solenoid operators, coil combinations**

|                     | NC Normal Operator<br>with 22 x 30<br>standard coil | NC Normal Operator<br>with 30 x 30<br>standard coil |
|---------------------|---|---|
| Working pressure    | 0 to 10 bar   | 0 to 10 bar   |
| Ambient temperature | -10°C to 60°C *                                     | -10°C to 60°C *                                     |
| Power (DC)          | 4.8W  | 2.7W  |
| Power (AC)          | 8.5VA   | 4.9VA   |
| Voltage tolerance   | +/-10%  | +/-10%  |
| Duty cycle          | 100%  | 100%  |
| Insulation class    | F   | F   |
| Electric connection | B Industrial  | DIN 43650A  |
| Protection          | IP65  | IP65  |
| Approval            |   | UL/CSA  |
| Working media       | All neutral media such as compressed air            |   |

\* Limited to 50°C if use with 100% duty cycle

**Solenoid Coils with M12 Connection**



| Voltage        | Order code      | Weight (Kg) |
|----------------|-----------------|-------------|
| Direct current |                 |             |
| 24VDC          | <b>P2FC6449</b> | 0.065       |

**Transients**

Interrupting the current through the solenoid coil produces momentary voltage peaks which, under unfavourable conditions, can amount to several hundred times the rated operating voltage. Normally, these transients do not cause problems, but to achieve the Maximum life of relays in the circuit (and particularly of transistors, thyristors and integrated circuits) it is desirable to provide protection by means of voltage-dependent resistors (varistors). All connectors/cable plugs EN175301-803 with LED's include this type of circuit protection.

**Materials**

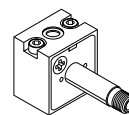
**Pilot Valve**

|                 |                                 |
|-----------------|---------------------------------|
| Body:           | Polyamide                       |
| Armature tube:  | Brass                           |
| Plunger & core: | Corrosion resistant Cr-Ni steel |
| Seals:          | Fluorocarbon                    |
| Screws:         | Stainless steel                 |

**Coil**

|                         |   |
|-------------------------|---|
| Encapsulation material: | Thermoplastic as standard<br>Duroplast for M12 connection |
|-------------------------|---|

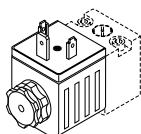
**Spare Base Solenoid Pilot Operator  
 CNOMO NC**



| Description   | Order code<br>non-lock<br>manual<br>override | Weight<br>(Kg) |
|---------------|--|----------------|
| Standard Duty | <b>P2FP23N4B</b>                             | 0.065          |
| No Override   | <b>P2FP23N4A</b>                             | 0.065          |

**Note:** Solenoid pilot operators are fitted to the Global range. Order the above part numbers for spares. The operators are supplied with mounting screws and interface 'O' rings. Coils and connectors must be ordered separately.

**Solenoid Coils with DIN A or Industrial B Connection**



| Voltage              | 22mm x 30mm<br>Order code<br>B industrial<br>standard | Weight<br>(Kg) | 30mm x 30mm<br>Order code<br>DIN 43650A<br>standard | Weight<br>(Kg) |
|----------------------|---|----------------|---|----------------|
| Direct current       |   |                |   |                |
| 24VDC                | <b>P2FCB449</b>                                       | 0.093          | <b>P2FCA449</b>                                     | 0.105          |
| Alternative current  |   |                |   |                |
| 110V 50Hz, 120V 60Hz | <b>P2FCB453</b>                                       | 0.093          | <b>P2FCA453</b>                                     | 0.105          |

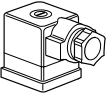
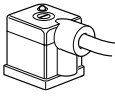
Most popular.



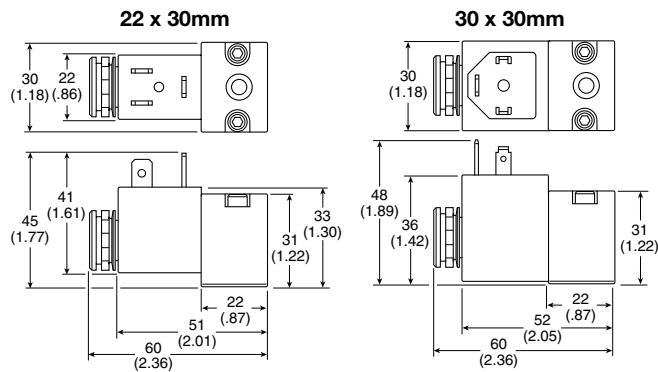
|  |
|--|
| Global Modular<br>Air Preparation Products |
| Particulate<br>Filters                     |
| Coalescing<br>Filters                      |
| Regulators                                 |
| Filter /<br>Regulators                     |
| Lubricators                                |
| Combinations                               |
| Electronic<br>Proportional                 |
| Soft Start /<br>Dump Valves                |
| Solenoid<br>Operators                      |
| Accessories<br>Flow Charts                 |



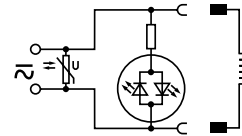
**Solenoid Connectors / Cable Plugs EN175301-803**

|   | Description                                 | Order code<br>22mm Form B<br>Industrial | Order code<br>30mm Form A<br>DIN 43650A |
|---|---|---|---|
|  | With standard screw                         | <b>PS2429BP</b>                         | <b>PS2028BP</b>                         |
|   | With LED and protection 24VAC/DC            | <b>PS243079BP</b>                       | <b>PS203279BP</b>                       |
|   | With LED and protection 110VAC              | <b>PS243083BP</b>                       | <b>PS203283BP</b>                       |
|  | With cable                                  | <b>PS2429JBP</b>                        | <b>PS2028JCP</b>                        |
|   | Standard with 2m cable IP65                 | <b>PS2430J79BP</b>                      | <b>PS2032J79CP</b>                      |
|   | 24VAC/DC, 2m cable LED and protection IP65  | <b>PS2430J83BP</b>                      | <b>PS2032J83CP</b>                      |
|   | 110VAC/DC, 2m cable LED and protection IP65 | <b>PS2430J83BP</b>                      | <b>PS2032J83CP</b>                      |

**Solenoid coil dimensions mm (inches)**



**Electrical schematics**

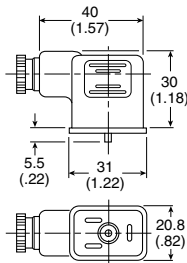


|                    |                    |
|--------------------|--------------------|
| <b>PS243079BP</b>  | <b>PS203279BP</b>  |
| <b>PS2430J79BP</b> | <b>PS2032J79CP</b> |
| <b>PS243083BP</b>  | <b>PS203283BP</b>  |
| <b>PS2430J83BP</b> | <b>PS2032J83CP</b> |
| <b>PS294679BP</b>  | <b>PS294683BP</b>  |
| <b>PS2946J79BP</b> | <b>PS2946J83BP</b> |

**Cable plug dimensions mm (inches)**

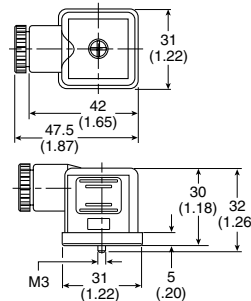
22mm Form B Industrial  
Cable plugs

**PS2429BP**






30mm DIN 43650A  
Cable plugs

**PS2028BP**






 Most popular.

**Safety Lockout Valves**

|   | Model type | Port size | Thread type | Flow dm <sup>3</sup> /s (SCFM) | Part number<br>Flow from left to right | Part number<br>Flow from right to left |
|---|------------|-----------|-------------|--------------------------------|--|--|
|  | P31        | 1/4"      | NPT         | 47.2 (100)                     | <b>P31VA92LSAN</b>                     |  |
|  | P32        | 1/4"      | NPT         | 66.5 (141)                     | <b>P32VA92LSAN</b>                     | <b>P32VA92LSBN</b>                     |
|   |            | 3/8"      | NPT         | 101.9 (216)                    | <b>P32VA93LSAN</b>                     | <b>P32VA93LSBN</b>                     |
|   |            | 1/2"      | NPT         | 128.4 (272)                    | <b>P32VA94LSAN</b>                     | <b>P32VA94LSBN</b>                     |
|  | P33        | 1/2"      | NPT         | 136.9 (290)                    | <b>P33VA94LSAN</b>                     | <b>P33VA94LSBN</b>                     |
|   |            | 3/4"      | NPT         | 141.6 (300)                    | <b>P33VA96LSAN</b>                     | <b>P33VA96LSBN</b>                     |




For thread type: BSPP 1, BSPT 2, NPT 9

**Modular Ball Valve**

|   | Model type | Port size | Exhaust port | Thread type | Flow dm <sup>3</sup> /s (SCFM) | Part number<br>Flow from left to right |
|---|------------|-----------|--------------|-------------|--------------------------------|--|
|    | P31        | 1/4"      | 1/4"         | NPT         | 20 (42.4)                      | <b>P31VB92LBNN</b>                     |
|   | P32        | 3/8"      | 1/4"         | NPT         | 90 (190.7)                     | <b>P32VB93LBNN</b>                     |
|   |            | 1/2"      | 1/4"         | NPT         | 122 (258.5)                    | <b>P32VB94LBNN</b>                     |
|  | P33        | 1/2"      | 1/2"         | NPT         | 265 (561.5)                    | <b>P33VB94LBNN</b>                     |
|   |            | 3/4"      | 1/2"         | NPT         | 320 (678)                      | <b>P33VB96LBNN</b>                     |

For thread type: BSPP 1, BSPT 2, NPT 9

**Manifold Blocks**







|   | Model type | In / Out port size | Auxiliary port size top | Auxiliary port size bottom | Thread type | Part number        |
|---|------------|--------------------|-------------------------|----------------------------|-------------|--------------------|
|  | P31        | 1/4"               | 1/4"                    | 1/4"                       | NPT         | <b>P31MA92022N</b> |
|  | P32        | 1/2"               | 1/4"                    | 1/2"                       | NPT         | <b>P32MA94024N</b> |
|  | P33        | 3/4"               | 1/4"                    | 1/2"                       | NPT         | <b>P33MA96024N</b> |

For thread type: BSPP 1, BSPT 2, NPT 9



 Most popular. For technical information see CD

**Global Modular**  
**Air Preparation Products**  
**Particulate Filters**  
**Coalescing Filters**  
**Regulators**  
**Filter / Regulators**  
**Lubricators**  
**Combinations**  
**Electronic Proportional**  
**Soft Start / Dump Valves**  
**Solenoid Operators**  
**Accessories Flow Charts**





**P31 Series Accessories**

| Description   | Port size  | Part number      |
|---|--|------------------|
|  C-bracket<br>(Fits to filter and lubricator body)                     | —  | <b>P31KA00MW</b> |
|  T-bracket w/<br>body connector  | —  | <b>P31KA00MT</b> |
|  Body connector  | —  | <b>P31KA00CB</b> |
|  Port block kit  | 1/8 NPT  | <b>P31KA91CP</b> |
|   | 1/4 NPT  | <b>P31KA92CP</b> |
|   | 3/8 NPT  | <b>P31KA93CP</b> |
|   | 1/8 BSPP   | <b>P31KA11CP</b> |
|   | 1/4 BSPP   | <b>P31KA12CP</b> |
|   | 3/8 BSPP   | <b>P31KA13CP</b> |
|   | 1/8 BSPT   | <b>P31KA21CP</b> |
|   | 1/4 BSPT   | <b>P31KA22CP</b> |
|   | 3/8 BSPT   | <b>P31KA23CP</b> |
|   |  Port block kit<br>with T-bracket | 1/8 NPT          |
| 1/4 NPT   |  | <b>P31KA92CN</b> |
| 3/8 NPT   |  | <b>P31KA93CN</b> |
| 1/8 BSPP  |  | <b>P31KA11CN</b> |
| 1/4 BSPP  |  | <b>P31KA12CN</b> |
| 3/8 BSPP  |  | <b>P31KA13CN</b> |
| 1/8 BSPT  |  | <b>P31KA21CN</b> |
| 1/4 BSPT  |  | <b>P31KA22CN</b> |
| 3/8 BSPT  | <b>P31KA23CN</b>   |                  |
|  Angle bracket<br>(Fits to regulator and filter /<br>regulator body) | —  | <b>P31KA00MR</b> |



**P32 Series Accessories**

| Description   | Part number      |
|---|------------------|
|  Angle bracket<br>(Fits to regulator and filter /<br>regulator body) | <b>P32KA00MR</b> |
|  L-bracket<br>(Fits to filter and lubricator body)                   | <b>P32KA00ML</b> |

**P32 & P33 Series Accessories**

| Description   | Port size | Part number      |
|---|-----------|------------------|
|  T-bracket with<br>body connector                            | —         | <b>P32KA00MT</b> |
|  Body connector  | —         | <b>P32KA00CB</b> |
|  Port block kit  | 1/4 NPT   | <b>P32KA92CP</b> |
|   | 3/8 NPT   | <b>P32KA93CP</b> |
|   | 1/2 NPT   | <b>P32KA94CP</b> |
|   | 3/4 NPT   | <b>P32KA96CP</b> |
|   | 1/4 BSPP  | <b>P32KA12CP</b> |
|   | 3/8 BSPP  | <b>P32KA13CP</b> |
|   | 1/2 BSPP  | <b>P32KA14CP</b> |
|   | 3/4 BSPP  | <b>P32KA16CP</b> |
|   | 1/4 BSPT  | <b>P32KA22CP</b> |
|   | 3/8 BSPT  | <b>P32KA23CP</b> |
|  T-bracket<br>(fits to body<br>connector or<br>port block) | 1/2 BSPT  | <b>P32KA24CP</b> |
|   | 3/4 BSPT  | <b>P32KA26CP</b> |
|   | —         | <b>P32KA00MB</b> |

**P33 Series Accessories**

| Description   | Part number      |
|---|------------------|
|  Angle bracket<br>(Fits to regulator and filter /<br>regulator body) | <b>P33KA00MR</b> |
|  L-bracket<br>(Fits to filter and lubricator body)                   | <b>P33KA00ML</b> |

**PPS1 Pressure Switch**

| Thread size | Part number         |
|-------------|---------------------|
| 1/4 NPT     | <b>PPS1-1C3-RHM</b> |
| 1/8 NPT     | <b>PPS1-2C3-RHM</b> |
| 1/4" NPT    | <b>PPS1-1C3-RWL</b> |
| 1/8" NPT    | <b>PPS1-2C3-RWL</b> |

 Most popular. For technical information see CD



**P**

Global Modular  
Air Preparation Products

Particulate  
Filters

Coalescing  
Filters

Regulators

Filter/  
Regulators

Lubricators

Combinations

Electronic  
Proportional

Soft Start /  
Dump Valves

Solenoid  
Operators







Accessories  
Flow Charts

**Kits**

|  | Description                               | P31               | P32               | P33               |
|--|---|-------------------|-------------------|-------------------|
| Global Modular<br>Air Preparation Products | Panel mount (plastic)                     | <b>P31KA00MP</b>  | <b>P32KA00MP</b>  | <b>P33KA00MP</b>  |
|  | Panel mount nut (aluminum)                | <b>P31KA00MM</b>  | <b>P32KA00MM</b>  | <b>P33KA00MM</b>  |
| Particulate<br>Filters                     | 5µ element kit                            | <b>P31KA00ESE</b> | <b>P32KA00ESE</b> | <b>P33KA00ESE</b> |
|  | 1µ element kit                            | <b>P31KA00ES9</b> | <b>P32KA00ES9</b> | <b>P33KA00ES9</b> |
| Coalescing<br>Filters                      | 0.01µ element kit                         | <b>P31KA00ESC</b> | <b>P32KA00ESC</b> | <b>P33KA00ESC</b> |
|  | Adsorber element kit                      | <b>P31KA00ESA</b> | <b>P32KA00ESA</b> | <b>P33KA00ESA</b> |
| Regulators                                 | Auto drain kit                            |                   | <b>P32KA00DA</b>  | <b>P32KA00DA</b>  |
|  | Differential pressure indicator kit       |                   | <b>P32KA00RQ</b>  | <b>P32KA00RQ</b>  |
| Filter /<br>Regulators                     | Fill plug kit                             | <b>P31KA00PL</b>  | <b>P32KA00PL</b>  | <b>P32KA00PL</b>  |
|  | Drip control assembly kit                 | <b>P32KA00PG</b>  | <b>P32KA00PG</b>  | <b>P32KA00PG</b>  |
| Lubricators                                | Plastic bowl w/ bowl guard & manual drain | <b>P31KA00BGM</b> | <b>P32KA00BGM</b> | <b>P33KA00BGM</b> |
|  |   | <b>P31KA00BGB</b> |                   |                   |
|  |   |                   | <b>P32KA00BGA</b> | <b>P33KA00BGA</b> |
| Combinations                               | Lubricator                                | no drain          | <b>P31KA00BGN</b> | <b>P32KA00BGN</b> |
|  |   | no drain          | <b>P31KA00BMM</b> | <b>P32KA00BMM</b> |
|  |   | no drain          | <b>P31KA00BMB</b> |                   |
| Electronic<br>Proportional                 | Metal bowl w/o sight gauge & manual drain | no drain          |                   | <b>P32KA00BMA</b> |
|  |   | no drain          | <b>P31KA00BMN</b> |                   |
|  |   | no drain          |                   | <b>P32KA00BSM</b> |
| Soft Start /<br>Dump Valves                | Metal bowl w/ sight gauge & manual drain  | no drain          |                   | <b>P32KA00BSA</b> |
|  |   | no drain          |                   | <b>P32KA00BSN</b> |
|  |   | no drain          |                   | <b>P33KA00BSA</b> |
| Solenoid<br>Operators                      | Lubricator                                | no drain          |                   | <b>P33KA00BSN</b> |
|  |   | no drain          |                   |                   |
|  |   | no drain          |                   |                   |

Most popular. For technical information see CD

**Service Kits**

| Port size   | Description   | P31                   | P32                | P33                |
|---|---|-----------------------|--------------------|--------------------|
|   | Regulator - relieving repair kit                              | <b>P31KB00RB</b>      | <b>P32KB00RB</b>   | <b>P33KB00RB</b>   |
|   | Regulator - non relieving repair kit                          | <b>P31KB00RC</b>      | <b>P32KB00RC</b>   | <b>P33KB00RC</b>   |
|   | Regulator - main adjusting spring 0-2 bar (0-30 PSIG) kit     | <b>P31KB00PR</b>      | <b>P32KB00PR</b>   | <b>P33KB00PR</b>   |
|   | Regulator - main adjusting spring 0-4.1 bar (0-60 PSIG) kit   | <b>P31KB00PS</b>      | <b>P32KB00PS</b>   | <b>P33KB00PS</b>   |
|   | Regulator - main adjusting spring 0-8.6 bar (0-125 PSIG) kit  | <b>P31KB00PT</b>      | <b>P32KB00PT</b>   | <b>P33KB00PT</b>   |
|   | Regulator - main adjusting spring 0-17 bar (0-250 PSIG) kit   |                       | <b>P32KB00PV</b>   | <b>P33KB00PV</b>   |
|    | Square flush mount gauge kit                                  | 0-4 bar               | <b>K4511SCR04B</b> |                    |
|   |   | 0-11 bar              | <b>K4511SCR11B</b> |                    |
|   |   | 0-60 PSIG             | <b>K4511SCR060</b> |                    |
|   |   | 0-160 PSIG            | <b>K4511SCR160</b> |                    |
|    | 1.00" round gauge   | 0-60 PSIG / 0-4.1 bar | <b>K4510N18060</b> |                    |
|   |   | 0-160 PSIG / 0-10 bar | <b>K4510N18160</b> |                    |
|   | 40mm round gauge<br>(Not for use with common port regulators) | 0-30 PSIG / 0-2 bar   | <b>K4515N18030</b> |                    |
|   |   | 0-60 PSIG / 0-4.1 bar | <b>K4515N18060</b> |                    |
|   |   | 0-160 PSIG / 0-10 bar | <b>K4515N18160</b> |                    |
|  | 50mm round gauge  | 0-30 PSIG / 0-2 bar   |                    | <b>K4520N14030</b> |
|   |   | 0-60 PSIG / 0-4.1 bar |                    | <b>K4520N14060</b> |
|   |   | 0-160 PSIG / 0-10 bar |                    | <b>K4520N14160</b> |
|   |   | 0-300 PSIG / 0-20 bar |                    | <b>K4520N14300</b> |
|  | Body connector o-ring (spares kit) (pack of 10)               |                       | <b>P31KA00CY</b>   | <b>P32KA00CY</b>   |
|   |   |                       |                    | <b>P33KA00CY</b>   |
|  | Tamperproof knob kit  | <b>P31KB00AL</b>      | <b>P32KB00AL</b>   |                    |

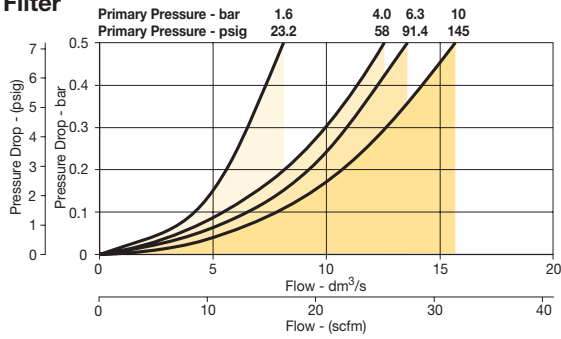
 Most popular. For technical information see CD



- E
- Global Modular Air Preparation Products
- Particulate Filters
- Coalescing Filters
- Regulators
- Filter / Regulators
- Lubricators
- Combinations
- Electronic Proportional
- Soft Start / Dump Valves
- Solenoid Operators
- Accessories

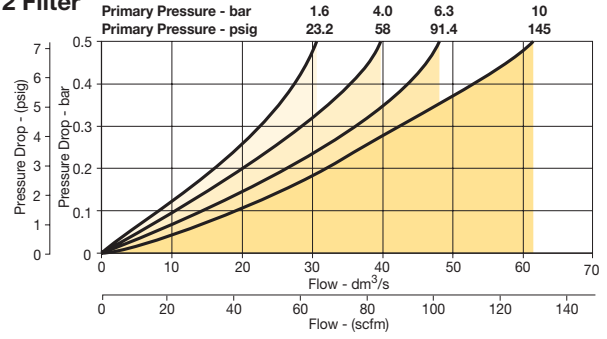
**Mini Particulate Filter - P31**

**1/4 Filter**



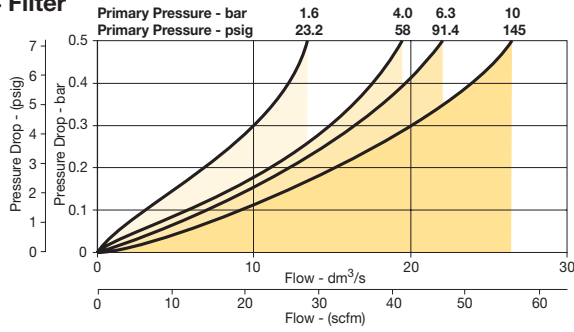
**Standard Particulate Filter - P33**

**1/2 Filter**

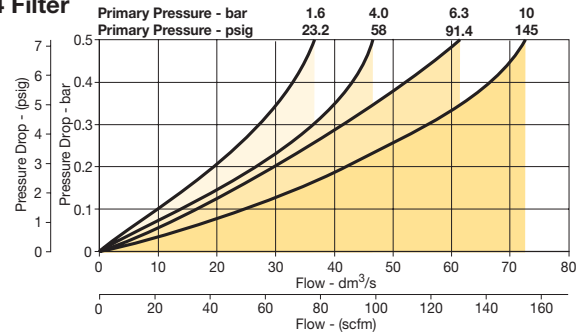


**Compact Particulate Filter - P32**

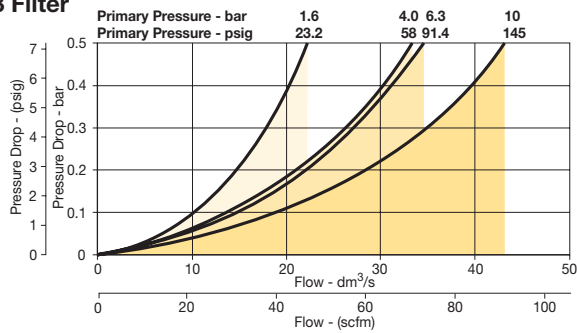
**1/4 Filter**



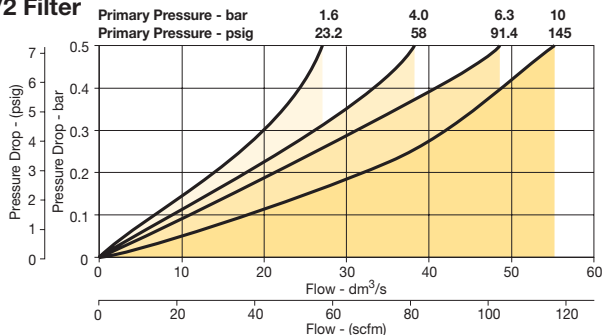
**3/4 Filter**



**3/8 Filter**

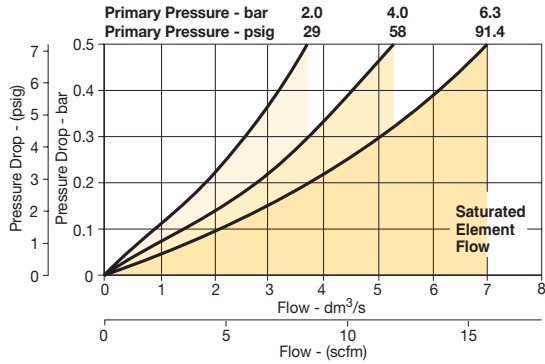


**1/2 Filter**

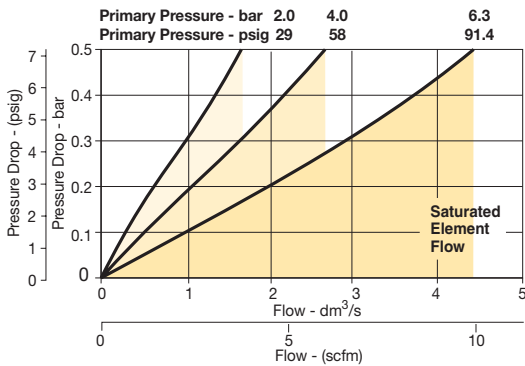


**Mini Coalescing and Adsorber Filters - P31**

**P31 - 1.0 micron flow**

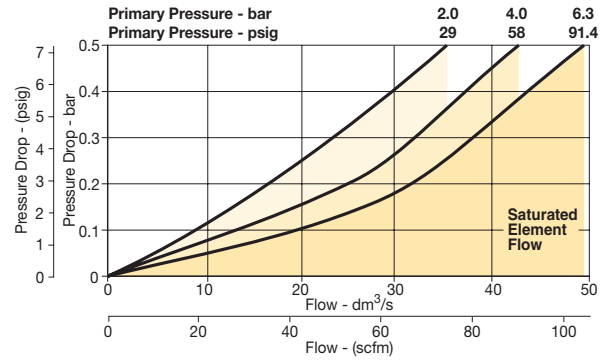


**P31 - 0.01 micron flow**

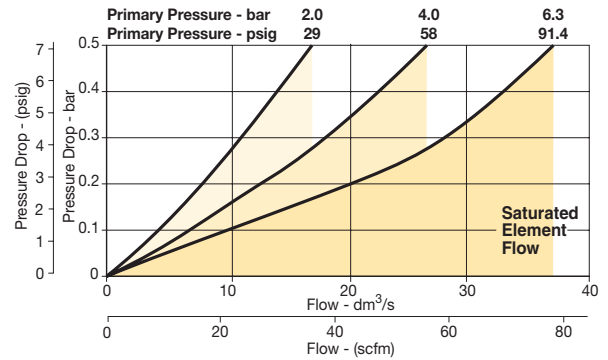


**Standard Coalescing and Adsorber Filter - P33**

**P33 - 1.0 micron flow**

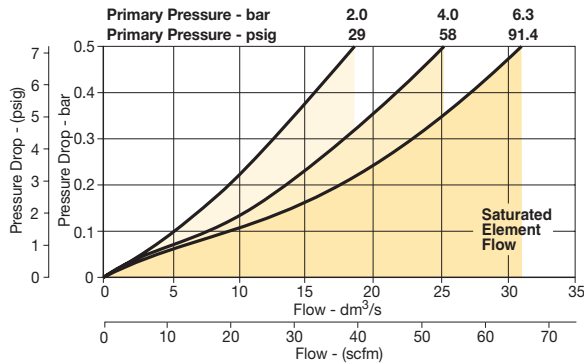


**P33 - 0.01 micron flow**

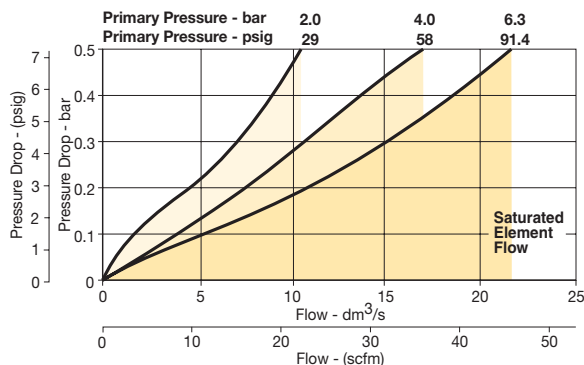


**Compact Coalescing and Adsorber Filter - P32**

**P32 - 1.0 micron flow**



**P32 - 0.01 micron flow**



**F**

Global Modular  
 Air Preparation Products

Particulate  
 Filters

Coalescing  
 Filters

Regulators

Filter/  
 Regulators

Lubricators

Combinations

Electronic  
 Proportional

Soft Start/  
 Dump Valves

Solenoid  
 Operators

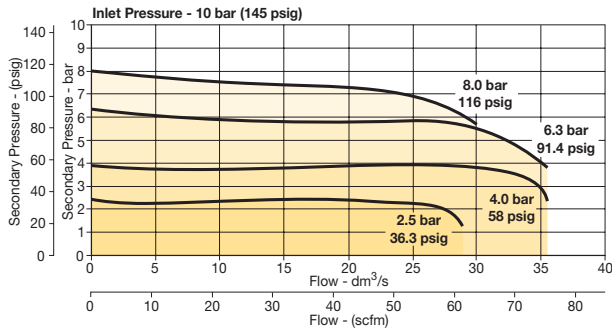
Accessories  
 Flow Charts





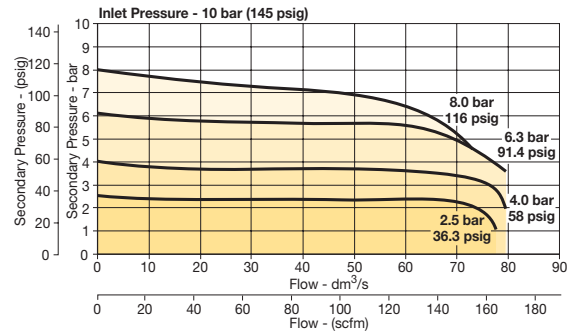
**Mini Regulator - P31**

**1/4 Regulator**



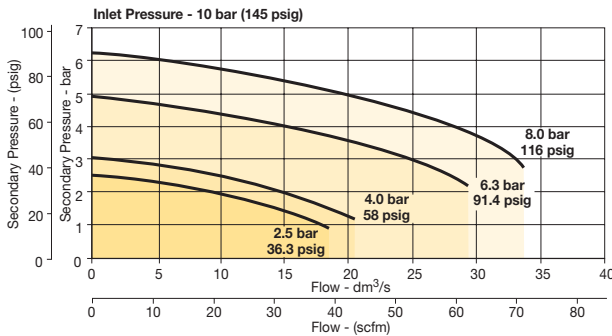
**Compact Regulator - P32**

**1/2 Regulator**



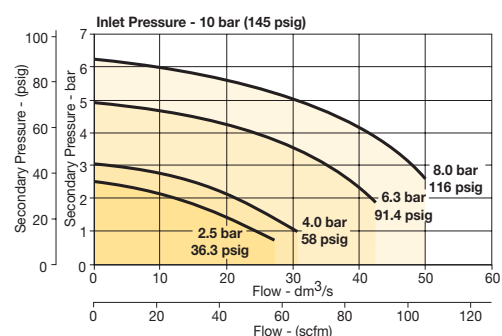
**Mini Common - P1 Regulator - P31**

**1/4 Common Regulator**



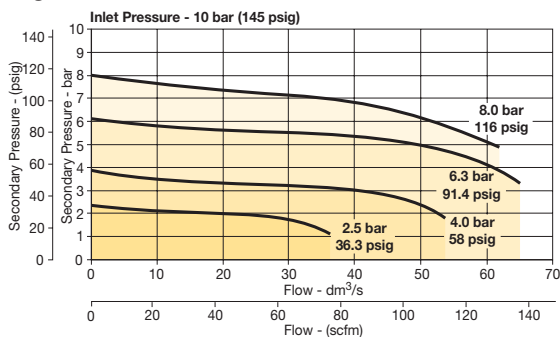
**Compact Common - P1 Regulator - P32**

**1/4, 3/8 or 1/2 Common Regulator**



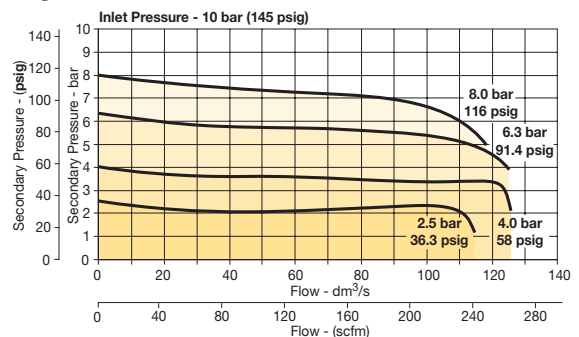
**Compact Regulator - P32**

**1/4 Regulator**

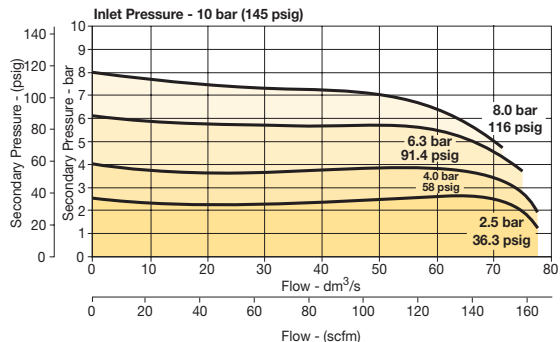


**Standard Regulator - P33**

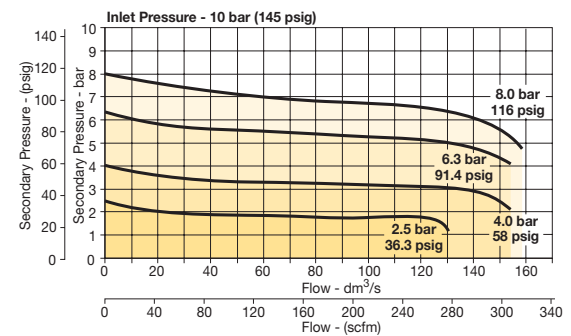
**1/2 Regulator**



**3/8 Regulator**



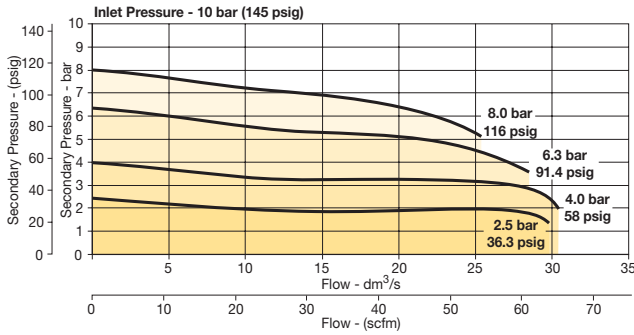
**3/4 Regulator**



|   |
|---|
| Global Modular Air Preparation Products |
| Particulate Filters                     |
| Coalescing Filters                      |
| Regulators                              |
| Filter / Regulators                     |
| Lubricators                             |
| Combinations                            |
| Electronic Proportional                 |
| Soft Start / Dump Valves                |
| Solenoid Operators                      |
| Accessories                             |
| Flow Charts                             |

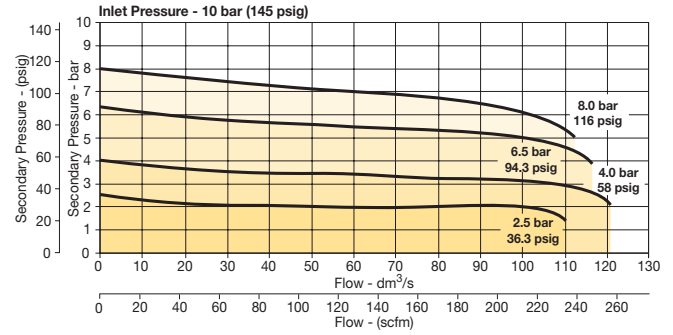
**Mini Filter / Regulator - P31**

**1/4 Filter/Regulator**



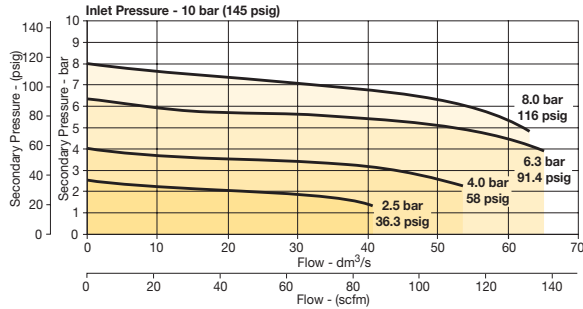
**Standard Filter / Regulator - P33**

**1/2 Filter/Regulator**

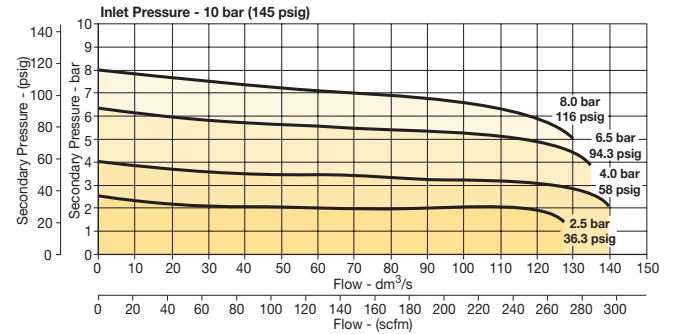


**Compact Filter / Regulator - P32**

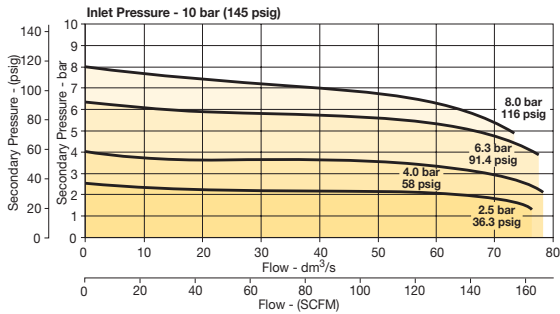
**1/4 Filter/Regulator**



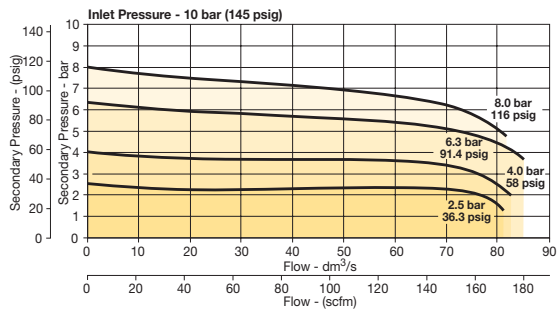
**3/4 Filter/Regulator**



**3/8 Filter/Regulator**



**1/2 Filter/Regulator**



Global Modular  
 Air Preparation Products

Particulate  
 Filters

Coalescing  
 Filters

Regulators

Filter/  
 Regulators

Lubricators

Combinations

Electronic  
 Proportional

Soft Start/  
 Dump Valves

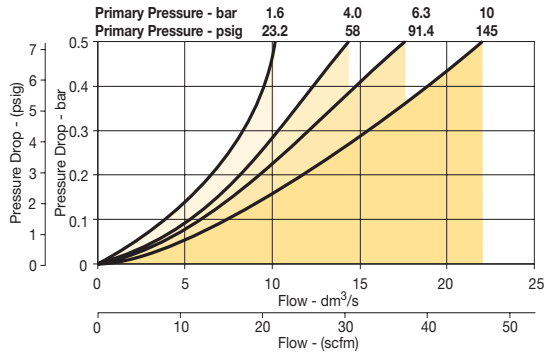
Solenoid  
 Operators

Accessories  
 Flow Charts



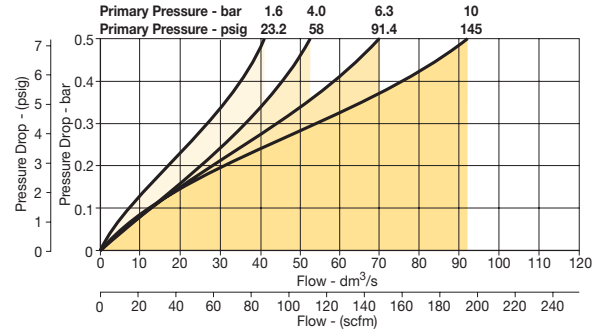
**Mini Lubricator - P31**

**1/4 Lubricator**

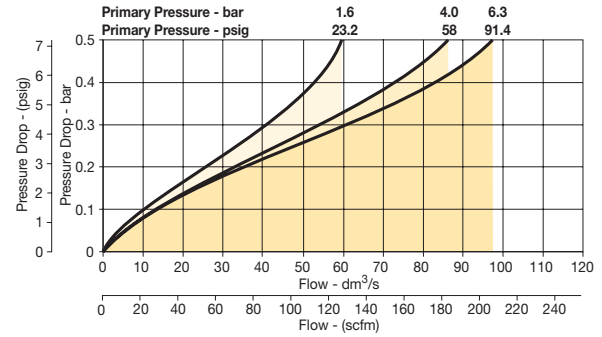


**Standard Lubricator - P33**

**1/2 Lubricator**

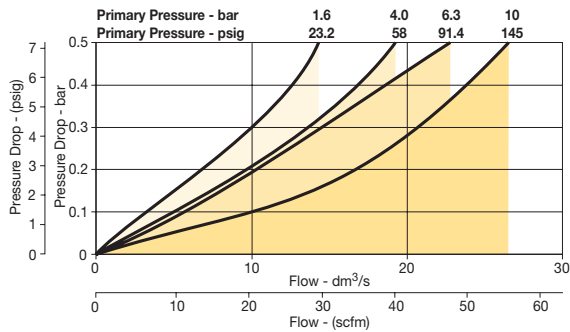


**3/4 Lubricator**

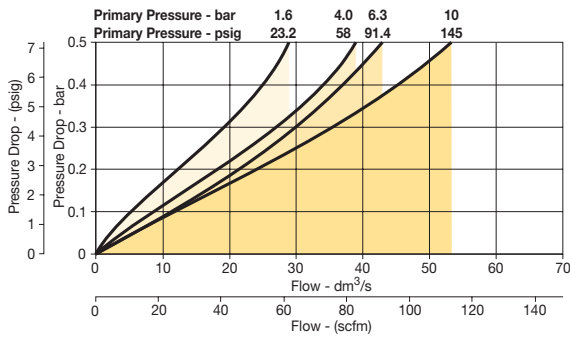


**Compact Lubricator - P32**

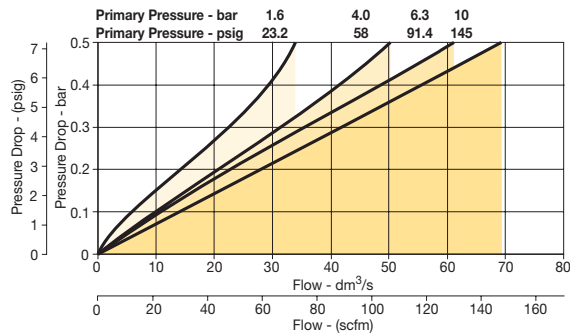
**1/4 Lubricator**



**3/8 Lubricator**



**1/2 Lubricator**

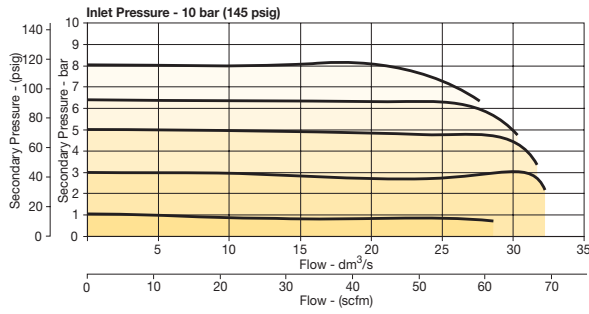


- Global Modular Air Preparation Products
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- Soft Start / Dump Valves
- Solenoid Operators
- Accessories
- Flow Charts

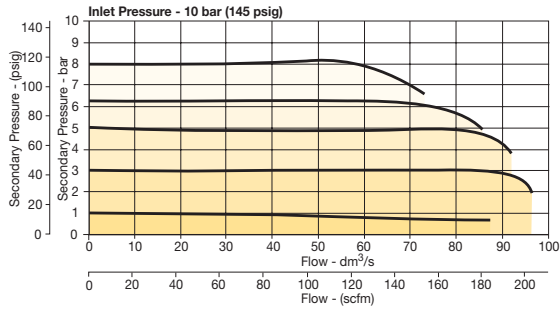


**Proportional Regulators**

**P31P Regulator 1/4" Ports**

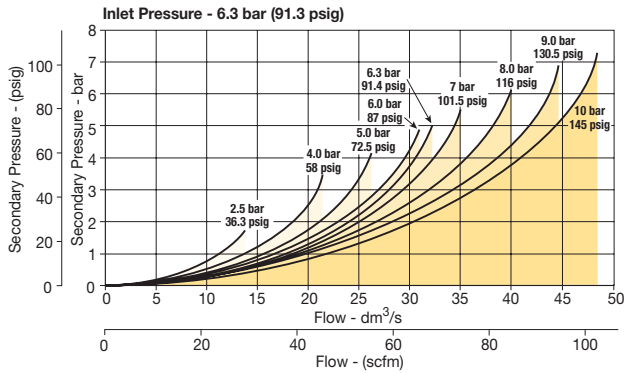


**P32P Regulator 1/2" Ports**

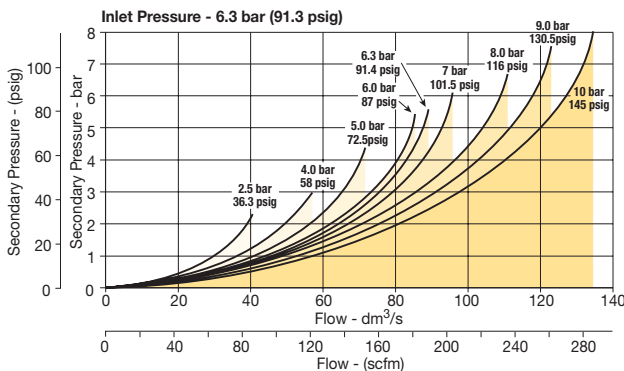


**Combined Soft Start / Dump Valve**

**1/4 Soft Start & Dump Valve**

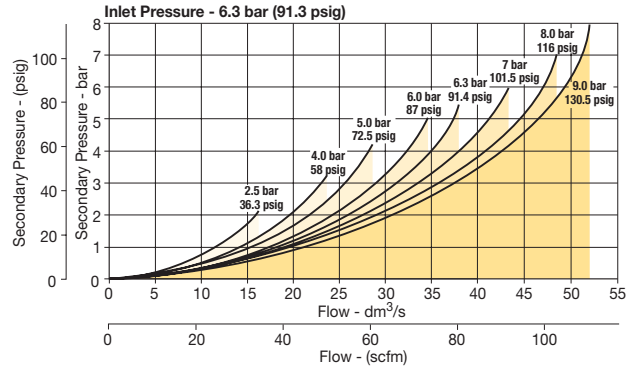


**1/2 Soft Start & Dump Valve**

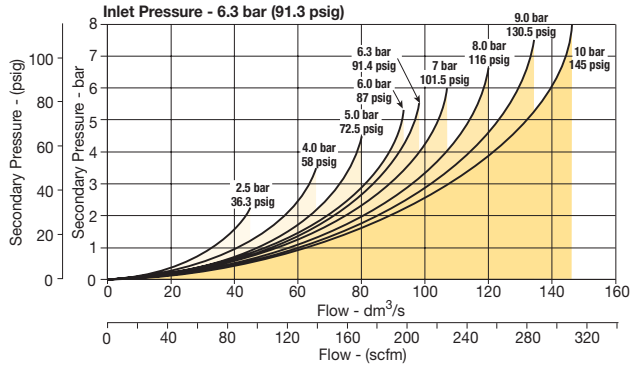


**Dump Valve**

**1/4 Remote Dump Valve**

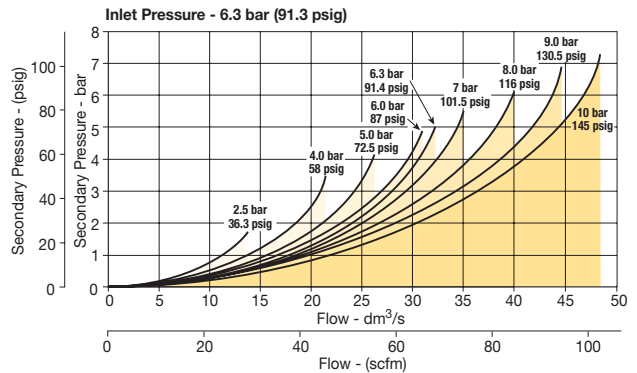


**1/2 Remote Dump Valve**

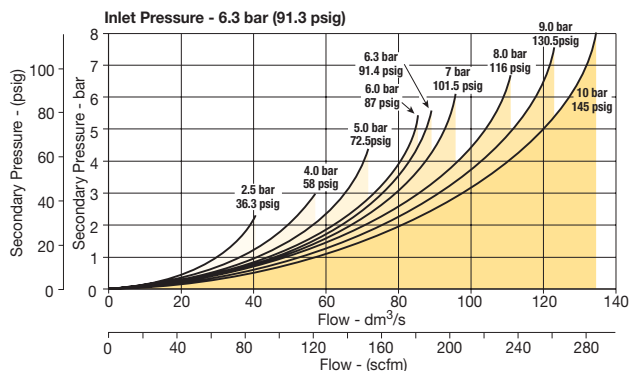


**Soft Start Valve**

**1/4 Soft Start Valve**



**1/2 Soft Start Valve**



Global Modular  
 Air Preparation Products

Particulate  
 Filters

Coalescing  
 Filters

Regulators

Filter/  
 Regulators

Lubricators

Combinations

Electronic  
 Proportional

Soft Start/  
 Dump Valves

Solenoid  
 Operators

Accessories  
 Flow Charts



|                                    |
|------------------------------------|
| <b>General Industrial Products</b> |
| <b>Liquid Separators</b>           |
| <b>Particulate Filters</b>         |
| <b>Coalescing Filters</b>          |
| <b>Regulators</b>                  |
| <b>Pilot Regulators</b>            |
| <b>Filter / Regulators</b>         |
| <b>Micro-Mist Lubricators</b>      |
| <b>Mist Lubricators</b>            |
| <b>Combinations</b>                |

- Tested in accordance with ISO 8573.9
- High liquid removal efficiencies at all flow conditions
- Low pressure losses for low operational costs
- Multiple port sizes for a given flow rate provides increased flexibility during installation
- Suitable for variable flow compressors
- Works with all types of compressor and compressor condensate
- Low maintenance
- Lightweight cast aluminum housing with 1/4" to 3" ports
- External surface epoxy painted for maximum corrosion resistance

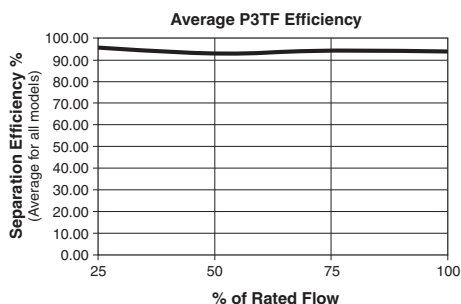


**Applications**

- Bulk liquid removal at any point in a compressed air system
- Protection of refrigeration and heatless regenerative desiccant dryers
- Liquid removal from compressor Inter-coolers / after-coolers
- Liquid separation within refrigeration dryers
- Pre-filtration

**Operating information**

|                                  | <b>P3TF (Bulk Liquid Separator)</b> |
|----------------------------------|-------------------------------------|
| Operating pressure:              | 232 PSIG (16 bar) Max               |
| Operating temperature:           | 35°F to 176°F (1.5°C to 80°C)       |
| For technical information see CD |                                     |



**Material specifications**

| Description      | <b>P3TF (Bulk Liquid Separator)</b> |
|------------------|-------------------------------------|
| Auto float drain | Plastic                             |
| Housing / bowl   | Aluminum                            |
| Seals            | Fluorocarbon                        |

**Service kits**

|       |            |
|-------|------------|
| Drain | <b>EF1</b> |
|-------|------------|

**P3TF Bulk Liquid Separator**

|      | Pipe size | Flow SCFM (L/s) | Weight lb. (kg) | Part number (NPT)  |
|------|-----------|-----------------|-----------------|--------------------|
| P3TF | 1/4"      | 21 (10)         | 0.9 (0.4)       | <b>P3TFA92WAAN</b> |
|      | 3/8"      | 85 (40)         | 2.2 (1.0)       | <b>P3TFA93WBAN</b> |
|      | 1/2"      | 85 (40)         | 2.2 (1.0)       | <b>P3TFA94WCAN</b> |
|      | 3/4"      | 233 (110)       | 4.8 (2.2)       | <b>P3TFA96WDAN</b> |
|      | 1"        | 233 (110)       | 2.6 (5.7)       | <b>P3TFA98WEAN</b> |
|      | 1-1/2"    | 742 (350)       | 5.3 (11.6)      | <b>P3TFA9BWHAN</b> |
|      | 2"        | 742 (350)       | 5.3 (11.6)      | <b>P3TFA9CWHAN</b> |
|      | 3"        | 1695 (800)      | 12.0 (26.4)     | <b>P3TFA9EWKAN</b> |



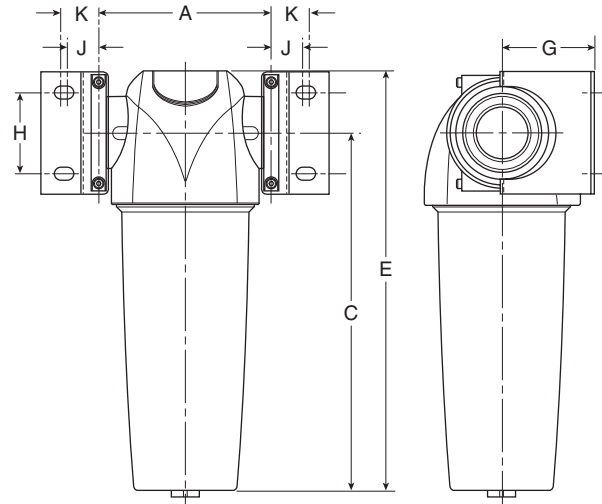
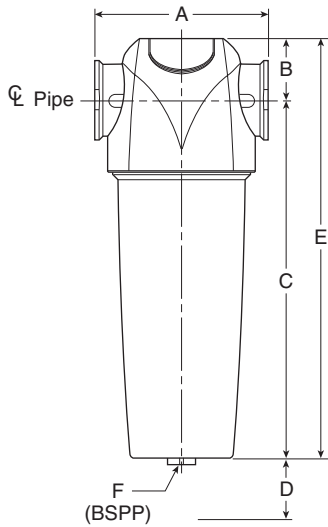
**Pressure differential at rated flow ... 1.0 PSID (0.07 bar)**  
 Stated flows are for operation at 102 PSIG (7 bar) with reference to 20°C, 1 bar (a), 0% relative water vapor pressure.

Note: BSPT threads available upon request.

Most popular.



**P3TF (Bulk Liquid Separator)**



**Dimensions**

| Part number  | Pipe size | A              | B              | C                | D             | E                | BSPP F | G             | H             | J              | K              | Wall mounting bracket kit |
|--------------|-----------|----------------|----------------|------------------|---------------|------------------|--------|---------------|---------------|----------------|----------------|---------------------------|
| P3TFA92WAAN  | 1/4"      | 3.00<br>(76)   | 1.12<br>(28.5) | 6.02<br>(153)    | 1.58<br>(40)  | 7.15<br>(181.5)  | 1/2    | 2.05<br>(50)  | 1.18<br>(30)  | 0.71<br>(18)   | 0.96<br>(24.5) | <b>P3TKA00MWA</b>         |
| P3TFA93WBAN  | 3/8"      | 3.83<br>(97.5) | 1.34<br>(34)   | 7.91<br>(201)    | 1.97<br>(50)  | 9.25<br>(235)    | 1/2    | 2.36<br>(60)  | 1.57<br>(40)  | 0.81<br>(20.5) | 1.00<br>(25.5) | <b>P3TKA00MWB</b>         |
| P3TFA94WCAN  | 1/2"      | 3.83<br>(97.5) | 1.34<br>(34)   | 7.91<br>(201)    | 1.97<br>(50)  | 9.25<br>(235)    | 1/2    | 2.36<br>(60)  | 1.57<br>(40)  | 0.81<br>(20.5) | 1.00<br>(25.5) | <b>P3TKA00MWB</b>         |
| P3TFA96WDAN  | 3/4"      | 5.07<br>(129)  | 1.67<br>(42.5) | 13.09<br>(232.5) | 2.76<br>(70)  | 10.80<br>(275)   | 1/2    | 2.68<br>(68)  | 2.36<br>(60)  | 0.91<br>(23)   | 1.10<br>(28)   | <b>P3TKA00MWD</b>         |
| P3TFA98WEAN  | 1"        | 5.07<br>(129)  | 1.67<br>(42.5) | 12.68<br>(322)   | 2.76<br>(70)  | 14.35<br>(364.5) | 1/2    | 2.68<br>(68)  | 2.36<br>(60)  | 0.91<br>(23)   | 1.10<br>(28)   | <b>P3TKA00MWD</b>         |
| P3TFA9BWWGAN | 1-1/2"    | 6.70<br>(170)  | 1.97<br>(50)   | 18.68<br>(474.5) | 3.94<br>(100) | 20.64<br>(524.5) | 1/2    | 3.62<br>(92)  | 3.31<br>(84)  | 1.26<br>(32)   | 1.54<br>(39)   | <b>P3TKA00MWF</b>         |
| P3TFA9CWWHAN | 2"        | 6.70<br>(170)  | 1.97<br>(50)   | 18.68<br>(474.5) | 3.94<br>(100) | 20.64<br>(524.5) | 1/2    | 3.62<br>(92)  | 3.31<br>(84)  | 1.26<br>(32)   | 1.54<br>(39)   | <b>P3TKA00MWF</b>         |
| P3TFA9EWWKAN | 3"        | 8.07<br>(205)  | 2.36<br>(60)   | 30.39<br>(772)   | 4.72<br>(120) | 32.76<br>(832)   | 1/2    | 5.31<br>(135) | 3.94<br>(100) | 1.40<br>(35.5) | 1.67<br>(42.5) | <b>P3TKA00MWJ</b>         |

Inches (mm)

**Wall Mounting Bracket Kit**

Mounting brackets provide additional support to filters installed in flexible piping systems or OEM equipment.



- Designed in accordance with ASME and CRN
- Connection sizes: 4 inch & 6 inch
- High liquid removal efficiencies at all flow conditions
- Suitable for variable flow compressors
- Works with all types of compressor and compressor condensate
- External surface epoxy painted for maximum corrosion resistance



**P3TF Series**

**Material specifications**

|           |              |
|-----------|--------------|
| Baffle    | Plated steel |
| Body      | Steel        |
| Deflector | Plated steel |
| Seals     | Fluorocarbon |
| Stud      | Plated steel |

**Operating information**


| P3TF Series            |                               |
|------------------------|-------------------------------|
| Operating Pressure:    | 232 PSIG (16 bar)             |
| Operating Temperature: | 35°F to 150°F (1.5°C to 66°C) |

**Inlet air pressure correction**

For pressures above 232 PSIG (16 bar), use manual drain.

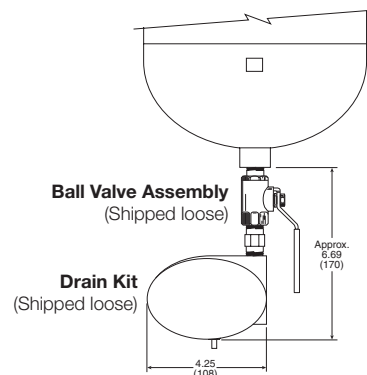
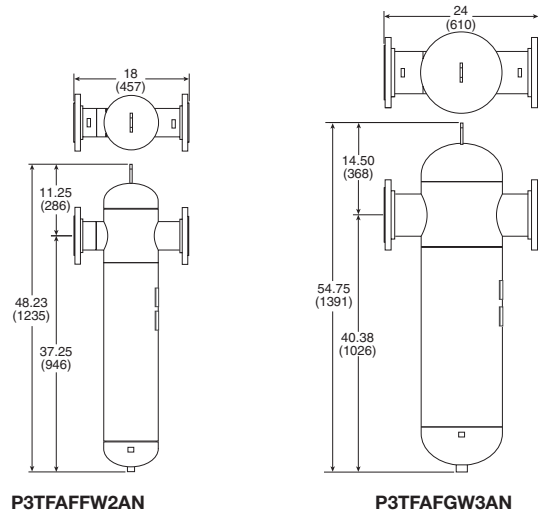
|        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|--------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| PSI    | 15   | 29   | 44   | 58   | 73   | 87   | 100  | 116  | 131  | 145  | 160  | 174  | 189  | 203  | 218  | 232  | 247  | 261  | 275  | 290  |
| bar    | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   |
| Factor | 2.65 | 1.87 | 1.53 | 1.32 | 1.18 | 1.08 | 1.00 | 0.94 | 0.88 | 0.84 | 0.80 | 0.76 | 0.73 | 0.71 | 0.68 | 0.66 | 0.64 | 0.62 | 0.61 | 0.59 |

**Bulk Liquid Separators**

|   | Port size | Flow SCFM | Element type | Number of elements | Part number        |
|---|-----------|-----------|--------------|--------------------|--------------------|
|  | 4" Flange | 2119      | 0.01 micron  | 4                  | <b>P3TFAFFW2AN</b> |
|   | 6" Flange | 3814      | 1.0 micron   | 6                  | <b>P3TFAFGW3AN</b> |

**Service kits**

| Description              | P3TF Series          |
|--------------------------|----------------------|
| DP gauge replacement kit | <b>DPG-Kit</b>       |
| Drain kit - 1/2" NPT     | <b>HDF-120-NPT-A</b> |



 Most popular.





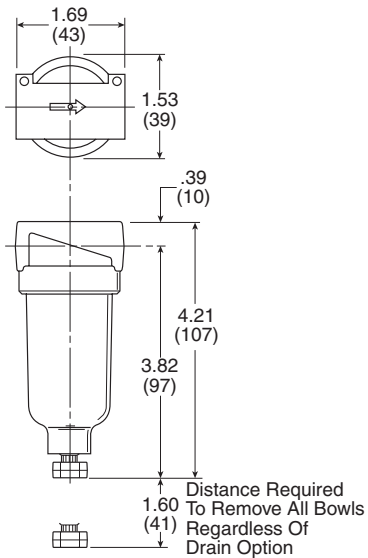
- Excellent water removal efficiency
- 5 micron element standard on 14F
- Integral 1/8", 1/4" ports (NPT, BSPP & BSPT)

**Material specifications**

| Description                       | 14F (Mini)                    |                    |
|-----------------------------------|-------------------------------|--------------------|
| Body                              | Zinc                          |                    |
| Bowl                              | Polycarbonate                 |                    |
| Deflector, element holder, baffle | Plastic                       |                    |
| Drains – Twist                    | Body & stem                   | Plastic            |
|                                   | Seals                         | Nitrile            |
| Drains – Auto pulse               | Piston & seals                | Nitrile            |
|                                   | Stem, seat, adapter & washers | Aluminum           |
| Filter element –                  | 5 micron (Standard)           | Plastic            |
|                                   | 40 micron (Optional)          | Plastic            |
|                                   | Adsorber (Optional)           | Activated charcoal |
| Seals                             | Nitrile                       |                    |



**14F**



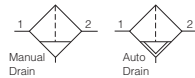
**Operating information**


|                                  |                  | 14F                              |
|----------------------------------|------------------|----------------------------------|
| Operating pressure:              | Poly bowl        | 0 to 150 PSIG (0 to 10.3 bar)    |
|                                  | Metal bowl       | 0 to 250 PSIG (0 to 17.2 bar)    |
| Operating temperature:           | Auto pulse drain | 10 to 250 PSIG (0.7 to 17.2 bar) |
|                                  | Poly bowl        | 32°F to 125°F (0°C to 52°C)      |
|                                  | Metal bowl       | 32°F to 175°F (0°C to 80°C)      |
|                                  | Auto pulse drain | 125°F (52°C) or less             |
| For technical information see CD |                  |                                  |

**Service kits**

| Description          | 14F (Mini)     |                  |                |
|----------------------|----------------|------------------|----------------|
| Bowl Kits            | Poly bowl –    | Auto pulse drain | <b>PS408BP</b> |
|                      |                | Twist drain      | <b>PS404P</b>  |
|                      | Metal bowl –   | Auto drain       | <b>PS451BP</b> |
|                      |                | Twist drain      | <b>PS447BP</b> |
| Filter element kit – | 40 micron      | <b>PS401P</b>    |                |
|                      | 5 micron       | <b>PS403P</b>    |                |
|                      | Adsorber       | <b>PS452P</b>    |                |
| Mounting bracket kit | <b>PS417BP</b> |                  |                |

**14F Particulate Filters**



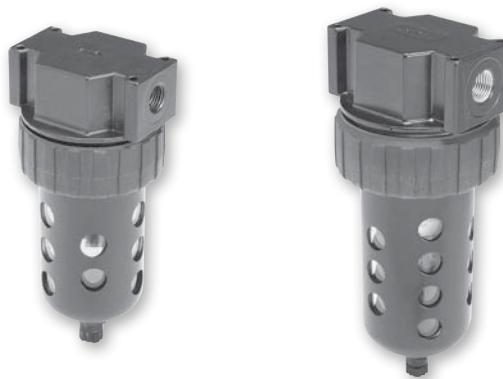
|   | Port size | Bowl type | Sight gauge | Flow SCFM | Part number (NPT) |                       |
|---|-----------|-----------|-------------|-----------|-------------------|-----------------------|
|   |           |           |             |           | Twist drain       | Automatic pulse drain |
| 14F  | 1/8"      | Poly      | No          | 22        | <b>14F01B*</b>    | <b>14F05B*</b>        |
|   | 1/8"      | Metal     | No          | 22        | <b>14F03B*</b>    | <b>14F07B*</b>        |
|   | 1/4"      | Poly      | No          | 24        | <b>14F11B*</b>    | <b>14F15B*</b>        |
|   | 1/4"      | Metal     | No          | 24        | <b>14F13B*</b>    | <b>14F17B*</b>        |

\* Engineering level will be added at factory.

 Most popular.



- Excellent water removal efficiency
- Unique deflector plate and shroud creates a swirling of the air stream ensuring maximum water and dirt separation
- Large filter element surface guarantees low pressure drop and increased element life
- Optional automatic float drain available
- 06F: 1/4", 3/8" & 1/2" ports (NPT & BSPP)
- 07F: 1/2" & 3/4" ports (NPT & BSPP)



**06F**

**07F**

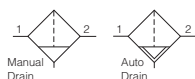
**Material specifications**



|                            |   |
|----------------------------|---|
| Body                       | Zinc  |
| Bowls                      | Transparent polycarbonate or Metal (zinc) with or without sight gauge |
| Bowl guards                | Steel   |
| Collar                     | Plastic (06, 07) or metal (07)  |
| Deflector, shroud & baffle | Plastic   |
| Drain                      | Plastic   |
| Automatic float drain –    |   |
| Housing, float             | Plastic   |
| Seals                      | Nitrile   |
| Springs, push rod          | Stainless steel   |
| Filter elements –          |   |
| 40 Micron (standard)       | Plastic   |
| 5 Micron (optional)        | Plastic   |
| Seals                      | Nitrile   |
| Sight gauge                | Polyamide   |

**Operating information**

| <b>06F &amp; 07F</b>             |                         |  |
|----------------------------------|-------------------------|--|
| Operating pressure:              | Poly bowl<br>Metal bowl | 0 to 150 PSIG (0 to 10.3 bar)<br>0 to 250 PSIG (0 to 17.2 bar) |
| Auto float drain:                | Poly bowl<br>Metal bowl | 15 to 250 PSIG (1.0 to 17.2 bar)                               |
| Operating temperature:           | Poly bowl<br>Metal bowl | 32°F to 125°F (0°C to 52°C)<br>32°F to 175°F (0°C to 80°C)     |
| For technical information see CD |                         |  |

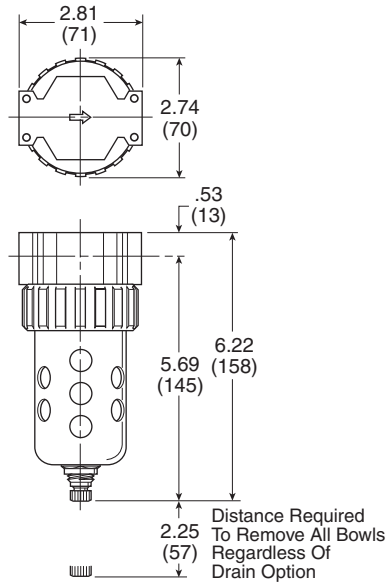
**06F, 07F Particulate Filters**



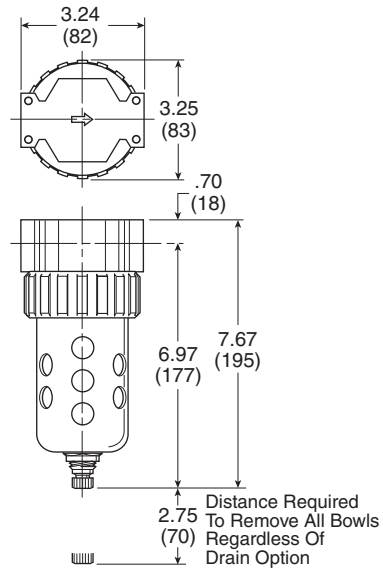
|   | Port size | Bowl type                | Flow SCFM         |  | Part number (NPT) |                       |
|---|-----------|--------------------------|-------------------|--|-------------------|-----------------------|
|   |           |                          | 40 micron element |  | Twist drain       | Automatic float drain |
| 06F  | 1/4"      | Poly bowl / Metal guard  | 53                |  | <b>06F12A*</b>    | <b>06F16A*</b>        |
|   | 1/4"      | Metal bowl / Sight gauge | 53                |  | <b>06F14A*</b>    | <b>06F18A*</b>        |
|   | 3/8"      | Poly bowl / Metal guard  | 80                |  | <b>06F22A*</b>    | <b>06F26A*</b>        |
|   | 3/8"      | Metal bowl / Sight gauge | 80                |  | <b>06F24A*</b>    | <b>06F28A*</b>        |
|   | 1/2"      | Poly bowl / Metal guard  | 85                |  | <b>06F32A*</b>    | <b>06F36A*</b>        |
|   | 1/2"      | Metal bowl / Sight gauge | 85                |  | <b>06F34A*</b>    | <b>06F38A*</b>        |
| 07F  | 1/2"      | Poly bowl / Metal guard  | 75                |  | <b>07F32A*</b>    | <b>07F36A*</b>        |
|   | 1/2"      | Metal bowl / Sight gauge | 75                |  | <b>07F34A*</b>    | <b>07F38A*</b>        |
|   | 3/4"      | Poly bowl / Metal guard  | 80                |  | <b>07F42A*</b>    | <b>07F46A*</b>        |
|   | 3/4"      | Metal bowl / Sight gauge | 80                |  | <b>07F44A*</b>    | <b>07F48A*</b>        |

 Most popular.

**06F (Compact)**



**07F (Standard)**



**Service kits**

| Description                         | 06F (Compact) | 07F (Standard) |
|-------------------------------------|---------------|----------------|
| Bowl guard kit                      | <b>PS705P</b> | <b>PS805P</b>  |
| Bowl Kits –                         |               |                |
| Poly bowl –                         |               |                |
| Auto float drain                    | <b>PS722P</b> | <b>PS822P</b>  |
| Twist drain                         | <b>PS732P</b> | <b>PS832P</b>  |
| Metal bowl –                        |               |                |
| Auto float drain                    | <b>PS726P</b> | <b>PS826P</b>  |
| Twist drain                         | <b>PS734P</b> | <b>PS834P</b>  |
| Sight gauge / automatic float drain | <b>PS723P</b> | <b>PS823P</b>  |
| Sight gauge / twist drain           | <b>PS735P</b> | <b>PS835P</b>  |
| DPI replacement kit                 | <b>PS781P</b> | <b>PS781P</b>  |
| Drain kits –                        |               |                |
| Auto float drain                    | <b>PS506P</b> | <b>PS506P</b>  |
| Semi-auto drain                     | <b>PS511P</b> | <b>PS511P</b>  |
| Twist drain                         | <b>PS512P</b> | <b>PS512P</b>  |
| Push 'N' Drain                      | <b>PS513P</b> | <b>PS513P</b>  |
| Filter element kit –                |               |                |
| 40 micron                           | <b>PS701P</b> | <b>PS801P</b>  |
| 5 micron                            | <b>PS702P</b> | <b>PS802P</b>  |
| Adsorber                            | <b>PS731P</b> | <b>PS831P</b>  |
| Mounting bracket kit                | <b>PS743P</b> | <b>PS843P</b>  |
| Sight gauge kit                     | <b>PS914P</b> | <b>PS914P</b>  |

☐ Most popular.



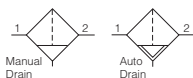
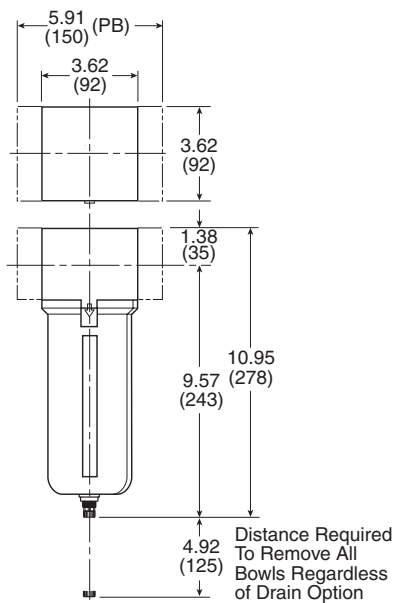
- Excellent water removal efficiency
- Port blocks (PB) available to provide 1-1/2" port extension to 1" ported bodies
- 40 micron element standard
- Metal bowl with sight gauge standard
- 3/4", 1", & 1-1/2" ports (NPT, BSPP & BSPT)

### Material specifications


| Description    | P3NF (Hi-Flow)    |                    |
|----------------|-------------------|--------------------|
| Body           | Aluminum          |                    |
| Bowl           | Aluminum          |                    |
| Deflector      | Plastic           |                    |
| Drain          | Plastic           |                    |
| Filter element | 5 micron          | Plastic            |
|                | 40 micron         | Plastic            |
|                | Adsorber          | Activated charcoal |
| Seals          | Nitrile           |                    |
| Sight gauge    | Polyamide (Nylon) |                    |



### P3NF (Hi-Flow)



### P3NF Particulate Filters

|   | Port size                             | Bowl type | Sight gauge | Flow     | Part number (NPT) |                       |
|---|---------------------------------------|-----------|-------------|----------|-------------------|-----------------------|
|   |                                       |           |             |          | Twist drain       | Automatic float drain |
| <br>P3NF | 3/4"                                  | Metal     | Yes         | 270 SCFM | <b>P3NFA96GSM</b> | <b>P3NFA96GSA</b>     |
|   | 1"                                    | Metal     | Yes         | 300 SCFM | <b>P3NFA98GSM</b> | <b>P3NFA98GSA</b>     |
|   | 1-1/2" #                              | Metal     | Yes         | 310 SCFM | <b>P3NFA9PGSM</b> | <b>P3NFA9PGSA</b>     |
|   | # 1" port body with 1-1/2" port block |           |             |          |                   |                       |

### Operating information

|                                  |                  | P3NF (Hi-Flow)                      |
|----------------------------------|------------------|-------------------------------------|
| Operating pressure:              | Metal bowl       | 0 to 250 PSIG<br>(0 to 17.2 bar)    |
|                                  | Auto float drain | 15 to 250 PSIG<br>(1.0 to 17.2 bar) |
| Operating temperature:           | Metal bowl       | 32°F to 175°F<br>(0°C to 80°C)      |
| For technical information see CD |                  |                                     |

### Service kits

| Description          | P3NF (Hi-Flow)               |                   |
|----------------------|------------------------------|-------------------|
| Bowl Kits –          | Sight gauge / auto float     | <b>P3NKA00BSA</b> |
|                      | Sight gauge / twist drain    | <b>P3NKA00BSM</b> |
|                      | Sight gauge / push 'n' drain | <b>P3NKA00BSP</b> |
| Bowl latch kit       | <b>C11A33</b>                |                   |
| DPI replacement kit  | <b>PS781P</b>                |                   |
| Drain kit –          | Auto drain                   | <b>PS506P</b>     |
|                      | Twist drain                  | <b>PS512P</b>     |
| Filter element kit – | 40 micron                    | <b>P3NKA00ESG</b> |
|                      | 5 micron                     | <b>P3NKA00ESE</b> |
|                      | Adsorber                     | <b>P3NKA00ESA</b> |
| Mounting bracket kit | <b>P3NKA00MW</b>             |                   |
| Sight gauge kit      | <b>P3NKA00PE</b>             |                   |

 Most popular.

- Excellent water removal efficiency
- For heavy duty applications with minimum pressure drop requirement
- Unique deflector plate that creates swirling of the air stream ensuring maximum water and dirt separation
- Large filter element surface guarantees low pressure drop and increased element life
- 40 micron filter element standard, 5 micron available
- Metal bowl with sight gauge standard
- Twist drain as standard, optional auto drain
- Large bowl capacity
- Optional high capacity bowl(s) available



3/4" & 1"



1-1/4" & 1-1/2"

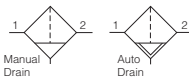
**Material specifications**

| Description    | (Hi-Flow)<br>F602-06W<br>F602-08W<br>F602-06E<br>F602-08E |               | (Hi-Flow)<br>F602-10W<br>F602-12W<br>F602-10E<br>F602-12E |               |
|----------------|---|---------------|---|---------------|
|                | Body  | Zinc          | Zinc  | Zinc          |
| Bowl           | (E) 32 oz   | Aluminum      | Aluminum  | Aluminum      |
|                | (W) 16 oz   | Zinc          | Zinc  | Zinc          |
| Drains         | Housing R   | Acetal        | Acetal  | Acetal        |
|                | Housing Q   | Bronze        | Bronze  | Bronze        |
| Drain - Twist  | Body & stem   | Brass         | Brass   | Brass         |
| Filter element | 5 micron  | Polypropylene | Polypropylene   | Polypropylene |
|                | 40 micron   | Polypropylene | Polypropylene   | Polypropylene |
| Seals          |   | Nitrile       | Nitrile   | Nitrile       |
| Sight gauge    |   | Nylon         | Nylon   | Nylon         |

**Operating information**

|                                  |                              | F602 (Hi-Flow)                      |
|----------------------------------|------------------------------|-------------------------------------|
| Operating pressure:              | Aluminum bowl (E) 32 oz.     | 0 to 300 PSIG<br>(0 to 20.4 bar)    |
|                                  | Zinc (W) 16 oz.              | 0 to 250 PSIG<br>(0 to 17.2 bar)    |
|                                  | With internal auto drain (R) | 20 to 175 PSIG<br>(1.4 to 11.9 bar) |
| Operating temperature:           | With external auto drain (Q) | 0 to 250 PSIG<br>(0 to 17.2 bar)    |
|                                  | Aluminum bowl (E) 32 oz.     | 40°F to 150°F<br>(4.4°C to 65.6°C)  |
|                                  | Zinc (W) 16 oz.              | 40°F to 150°F<br>(4.4°C to 65.6°C)  |
| For technical information see CD | With internal auto drain (R) | 40°F to 125°F<br>(4.4°C to 52°C)    |
|                                  | With external auto drain (Q) | 40°F to 150°F<br>(4.4°C to 65.6°C)  |

**Particulate Filters**



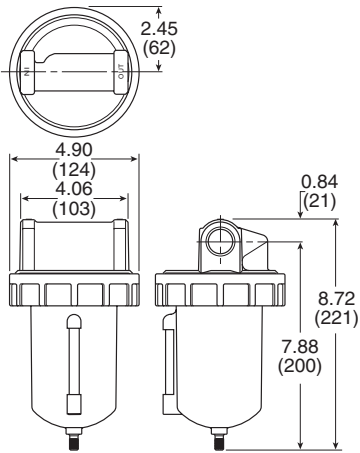
|  | Port size | Bowl type                   | Bowl size | Flow SCFM | Part number (NPT) |                       |
|--|-----------|-----------------------------|-----------|-----------|-------------------|-----------------------|
|  |           |                             |           |           | Twist drain       | Automatic float drain |
|  | 3/4"      | Metal / Sight gauge         | 16 oz     | 270       | <b>F602-06WJ</b>  | <b>F602-06WJR</b>     |
|  | 3/4"      | Metal / Without sight gauge | 32 oz     | 270       | <b>F602-06EJ</b>  | <b>F602-06EJR</b>     |
|  | 1"        | Metal / Sight gauge         | 16 oz     | 300       | <b>F602-08WJ</b>  | <b>F602-08WJR</b>     |
|  | 1"        | Metal / Without sight gauge | 32 oz     | 300       | <b>F602-08EJ</b>  | <b>F602-08EJR</b>     |
|  | 1-1/4"    | Metal / Sight gauge         | 16 oz     | 380       | <b>F602-10WJ</b>  | <b>F602-10WJR</b>     |
|  | 1-1/4"    | Metal / Without sight gauge | 32 oz     | 380       | <b>F602-10EJ</b>  | <b>F602-10EJR</b>     |
|  | 1-1/2"    | Metal / Sight gauge         | 16 oz     | 450       | <b>F602-12WJ</b>  | <b>F602-12WJR</b>     |
|  | 1-1/2"    | Metal / Without sight gauge | 32 oz     | 450       | <b>F602-12EJ</b>  | <b>F602-12EJR</b>     |

Most popular.

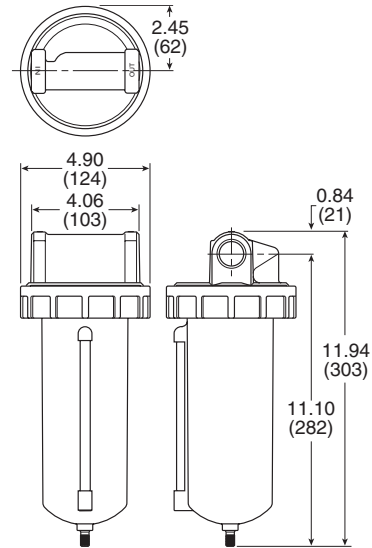


|                                 |
|---------------------------------|
| <b>General Industrial</b>       |
| <b>Air Preparation Products</b> |
| <b>Liquid Separators</b>        |
| <b>Particulate Filters</b>      |
| <b>Coalescing Filters</b>       |
| <b>Regulators</b>               |
| <b>Pilot Regulators</b>         |
| <b>Filter / Regulators</b>      |
| <b>Micro-Mist Lubricators</b>   |
| <b>Mist Lubricators</b>         |
| <b>Combinations</b>             |

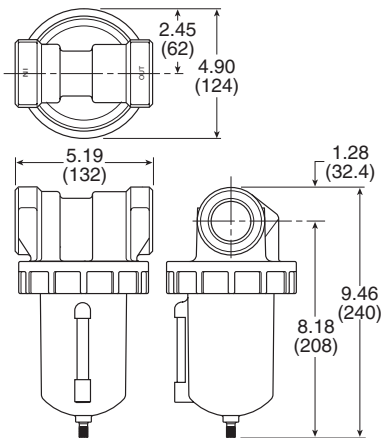
**F602-06W, F602-08W (Hi-Flow)**



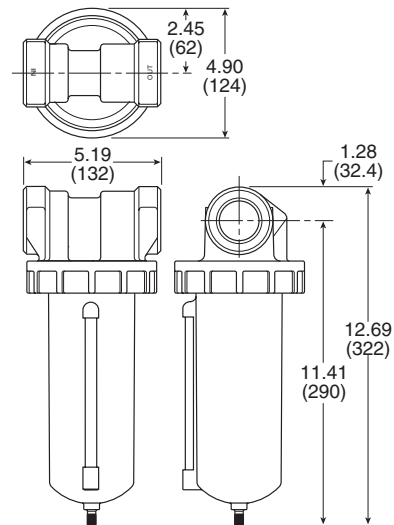
**F602-06E, F602-08E (Hi-Flow)**



**F602-10W, F602-12W (Hi-Flow)**



**F602-10E, F602-12E (Hi-Flow)**



**Service kits**

| Description             |   | (Hi-Flow)<br>F602-06W, F602-08W,<br>F602-06E, F602-08E | (Hi-Flow)<br>F602-10W, F602-12W,<br>F602-10E, F602-12E |
|-------------------------|---|--|--|
| Bowl kits –             | Aluminum (E) 32 oz                      | <b>BK603B</b>  | <b>BK603B</b>  |
|                         | Zinc / sight gauge (W) 16 oz            | <b>BK605WB</b>   | <b>BK605WB</b>   |
| Drain kits –            | Internal auto                           | <b>SA602MD</b>   | <b>SA602MD</b>   |
|                         | Manual                                  | <b>SA600Y7-1</b>                                       | <b>SA600Y7-1</b>                                       |
| Filter element kits –   | 40 micron                               | <b>EK602B</b>  | <b>EK602B</b>  |
|                         | 5 micron                                | <b>EK602VB</b>   | <b>EK602VB</b>   |
| Mounting bracket kits – | 3/4" unit                               | <b>SA200AW57</b>                                       |  |
|                         | 1" unit                                 | <b>SA200CW57</b>                                       |  |
| Repair kits –           | Deflector, baffle assy, & retaining rod | <b>RK602B</b>  | <b>RK602B</b>  |
|                         | External auto drain                     | <b>RK602D</b>  | <b>RK602D</b>  |
|                         | Internal auto drain                     | <b>RK602MD</b>   | <b>RK602MD</b>   |
|                         | Metal bowl / sight gauge                | <b>RKB605WB</b>  | <b>RKB605WB</b>  |

- Heavy-duty cast aluminum housings to withstand operating pressures up to 250 PSIG
- Differential pressure indicator to eliminate the guesswork of element replacement
- Unique drain mounting plate design offers a trouble-free method for interchanging and installing external drains



35F



43F

**Material specifications**



| Description    | 35F, 43F (Hi-Flow) |
|----------------|--------------------|
| Baffle         | Plated steel       |
| Body           | Aluminum           |
| Bowl           | Aluminum           |
| Deflector      | Plated steel       |
| Filter element | Polyethylene       |
| Seals          | Fluorocarbon       |
| Stud           | Plated steel       |

**Operating information**

|                        |                                  | 35F (Hi-Flow)                 | 43F (Hi-Flow)                 |
|------------------------|----------------------------------|-------------------------------|-------------------------------|
| Operating pressure:    | With DP gauge & without DPI      | 250 PSIG (17.2 bar)           | 250 PSIG (17.2 bar)           |
|                        | With DPI                         | 150 PSIG (10.3 bar)           | 150 PSIG (10.3 bar)           |
| Operating temperature: |                                  | 32°F to 150°F (0°C to 65.5°C) | 32°F to 150°F (0°C to 65.5°C) |
|                        | For technical information see CD |                               |                               |

**Particulate Filters**



|   | Port size | Bowl type | Flow SCFM | Element type | Part number (NPT) |
|---|-----------|-----------|-----------|--------------|-------------------|
|   |           |           |           |              | Automatic drain   |
| 35F  | 1-1/2     | Metal     | 1280      | 5 micron     | <b>35F77BAP</b>   |
|   | 2         | Metal     | 1400      | 5 micron     | <b>35F87BAP</b>   |
| 43F  | 3         | Metal     | 2900      | 5 micron     | <b>43FN7BAP</b>   |

 Most popular.

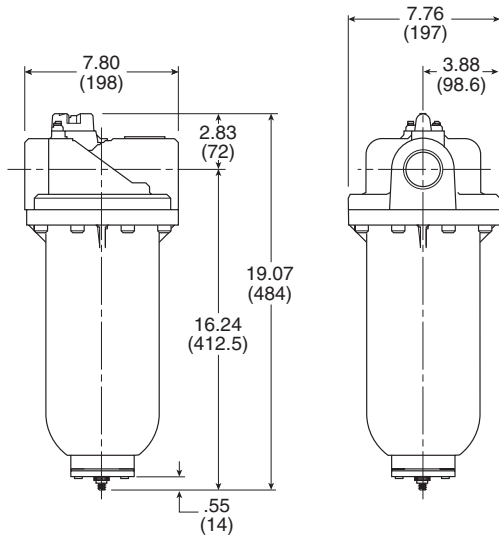


|   |
|---|
| <b>E</b>                                    |
| General Industrial Air Preparation Products |
| Liquid Separators                           |
| Particulate Filters                         |
| Coalescing Filters                          |
| Regulators                                  |
| Pilot Regulators                            |
| Filter / Regulators                         |
| Micro-Mist Lubricators                      |
| Mist Lubricators                            |
| Combinations                                |

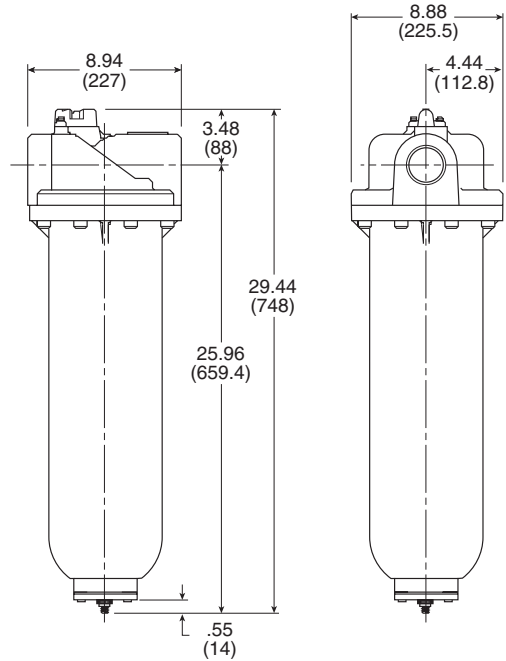


|                                 |
|---------------------------------|
| <b>General Industrial</b>       |
| <b>Air Preparation Products</b> |
| <b>Liquid Separators</b>        |
| <b>Particulate Filters</b>      |
| <b>Coalescing Filters</b>       |
| <b>Regulators</b>               |
| <b>Pilot Regulators</b>         |
| <b>Filter / Regulators</b>      |
| <b>Micro-Mist Lubricators</b>   |
| <b>Mist Lubricators</b>         |
| <b>Combinations</b>             |

**35F (Hi-Flow)**



**43F (Hi-Flow)**



**Service kits**

| Description               |                          | 35F (Hi-Flow)     | 43F (Hi-Flow)     |
|---------------------------|--------------------------|-------------------|-------------------|
| DPI replacement kit       |                          | <b>DP2-02-001</b> | <b>DP2-02-001</b> |
| DPI cap                   | Pressures over 150 PSIG  | <b>GRP-95-022</b> | <b>GRP-95-022</b> |
| DP gauge                  |                          | <b>DP3-01-000</b> | <b>DP3-01-000</b> |
| Automatic float drain kit | Auto internal drain 1/8" | <b>P32KA00DA</b>  | <b>P32KA00DA</b>  |
| Manual drain kit          | with 1/2" drain plate    | <b>GRP-95-392</b> | <b>GRP-95-392</b> |
| Drain plate kit           | 1/2 NPT tapped port      | <b>GRP-95-393</b> | <b>GRP-95-393</b> |
| Filter element kit        | 5 micron                 | <b>FRP-95-505</b> | <b>FRP-95-508</b> |

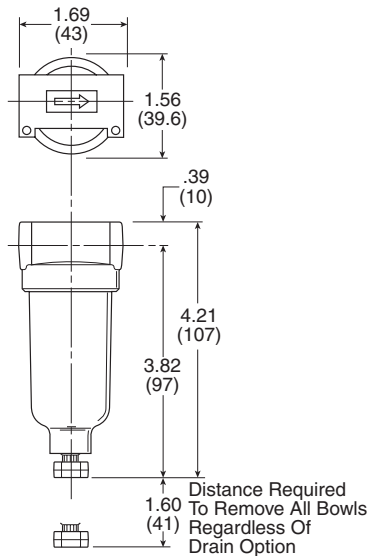
- Removes liquid aerosols and sub-micron particles
- 0.01 micron element standard
- Integral 1/8", 1/4" ports (NPT, BSPP & BSPT)

**Material specifications**

| Description         |                               | 10F (Mini)                       |
|---------------------|-------------------------------|----------------------------------|
| Body                |                               | Zinc                             |
| Bowl                |                               | Polycarbonate                    |
| Drains – Twist      | Body & stem                   | Plastic                          |
|                     | Seals                         | Nitrile                          |
| Drains – Auto Pulse | Piston & seals                | Nitrile                          |
|                     | Stem, seat, adapter & washers | Aluminum                         |
| Element holder      |                               | Plastic                          |
| Filter element      | 1.0 micron                    | Borosilicate & felt glass fibers |
|                     | 0.01 micron                   |                                  |
| Seals               |                               | Nitrile                          |



**10F**



**Coalescing Filters**

|     | Port size | Bowl type | Sight gauge | Flow SCFM | Element type | Part number (NPT) |                       |
|-----|-----------|-----------|-------------|-----------|--------------|-------------------|-----------------------|
|     |           |           |             |           |              | Twist drain       | Automatic pulse drain |
| 10F | 1/8"      | Poly      | No          | 17        | 0.01 micron  | 10F01E*           | 10F05E*               |
|     | 1/8"      | Poly      | No          | 19        | 1.0 micron   | 10F01H*           | 10F05H*               |
|     | 1/8"      | Metal     | No          | 17        | 0.01 micron  | 10F03E*           | 10F07E*               |
|     | 1/8"      | Metal     | No          | 19        | 1.0 micron   | 10F03H*           | 10F07H*               |
|     | 1/4"      | Poly      | No          | 20        | 0.01 micron  | 10F11E*           | 10F15E*               |
|     | 1/4"      | Poly      | No          | 24        | 1.0 micron   | 10F11H*           | 10F15H*               |
|     | 1/4"      | Metal     | No          | 20        | 0.01 micron  | 10F13E*           | 10F17E*               |
|     | 1/4"      | Metal     | No          | 24        | 1.0 micron   | 10F13H*           | 10F17H*               |



\* Engineering level will be added at factory.

Most popular.

**Operating information**

| 10F                    |                  |                                  |
|------------------------|------------------|----------------------------------|
| Operating pressure:    | Poly bowl        | 0 to 150 PSIG (0 to 10.3 bar)    |
|                        | Metal bowl       | 0 to 250 PSIG (0 to 17.2 bar)    |
| Operating temperature: | Auto pulse drain | 10 to 250 PSIG (0.7 to 17.2 bar) |
|                        | Poly bowl        | 32°F to 125°F (0°C to 52°C)      |
|                        | Metal bowl       | 32°F to 175°F (0°C to 80°C)      |
|                        | Auto pulse drain | 125°F (52°C) or less             |

For technical information see CD

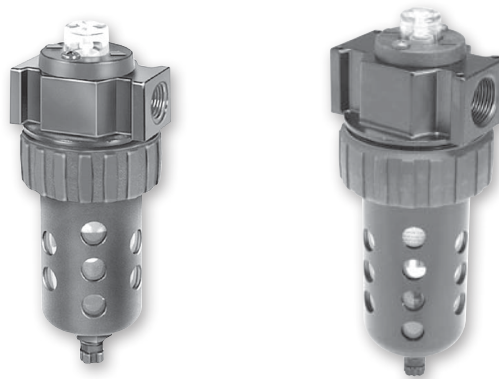
**Service kits**

| Description          |                     |                  | 10F (Mini) |
|----------------------|---------------------|------------------|------------|
| Bowl Kits            | Poly bowl –         | Auto pulse drain | PS408BP    |
|                      |                     | Twist drain      | PS404P     |
|                      | Metal bowl          | Auto drain       | PS451BP    |
|                      |                     | Twist drain      | PS447BP    |
| Filter element kit – | Grade 6 (standard)  | PS446P           |            |
|                      | Grade 10 (optional) | PS456P           |            |
| Mounting bracket kit |                     |                  | PS417BP    |

- Removes liquid aerosols and sub-micron particles
- Liquids gravitate to the bottom of the element and will not re-enter the airstream
- Oil free air for critical applications, such as air gauging and pneumatic instrumentation and controls
- Interchangeable twist and automatic float drains
- Differential pressure indicator standard
- 11F: 1/4", 3/8" & 1/2" ports (NPT & BSPP)
- 12F: 1/2" & 3/4" ports (NPT & BSPP)

**Material specifications**

|  |   |
|--|---|
| Body   | Zinc  |
| Bowls  | Transparent polycarbonate or Metal (zinc) with or without sight gauge |
| Bowl guards  | Steel   |
| Collar   | Plastic (06, 07) or metal (07)  |
| Drain  | Plastic   |
| Automatic float drain –                                |   |
| Housing, float   | Plastic   |
| Seals  | Nitrile   |
| Springs, push rod                                      | Stainless steel   |
| Filter element –                                       |   |
| Borosilicate & felt glass fibers 99.97% DOP efficiency | 0.01 Micron   |
| Largest Aerosol Particle Passed (Grade 6)              |   |
| Largest Solid Particle Passed (Grade 6)                | 0.30 Micron   |
| Seals  | Nitrile   |
| Sight gauge  | Polyamide   |



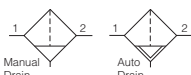
11F



12F

**Operating information**

| 11F & 12F                        |                         |  |
|----------------------------------|-------------------------|--|
| Operating pressure:              | Poly bowl<br>Metal bowl | 0 to 150 PSIG (0 to 10.3 bar)<br>0 to 250 PSIG (0 to 17.2 bar) |
| Auto float drain:                | Poly bowl<br>Metal bowl | 15 to 250 PSIG (1.0 to 17.2 bar)                               |
| Operating temperature:           | Poly bowl<br>Metal bowl | 32°F to 125°F (0°C to 52°C)<br>32°F to 175°F (0°C to 80°C)     |
| For technical information see CD |                         |  |

**Coalescing Filters**

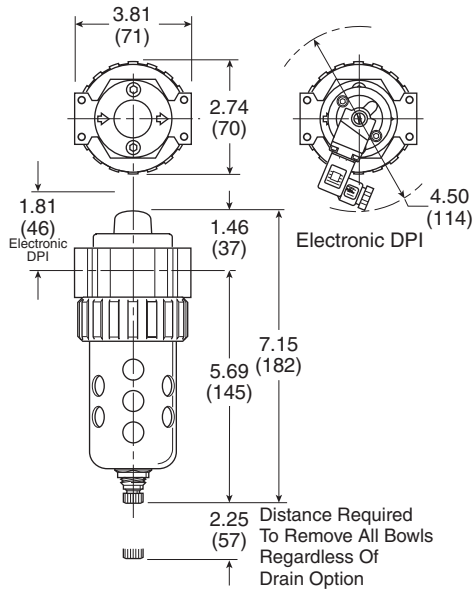


|   | Port size | Bowl type                | Flow SCFM           |                    | Part number (NPT) |                       |
|---|-----------|--------------------------|---------------------|--------------------|-------------------|-----------------------|
|   |           |                          | 0.01 micron element | 1.0 micron element | Twist drain       | Automatic float drain |
| 11F  | 1/4"      | Poly bowl / Metal guard  | 45                  | 60                 | <b>11F12E*</b>    | <b>11F16E*</b>        |
|   | 1/4"      | Metal bowl / Sight gauge | 45                  | 60                 | <b>11F14E*</b>    | <b>11F18E*</b>        |
|   | 3/8"      | Poly bowl / Metal guard  | 48                  | 72                 | <b>11F22E*</b>    | <b>11F26E*</b>        |
|   | 3/8"      | Metal bowl / Sight gauge | 48                  | 72                 | <b>11F24E*</b>    | <b>11F28E*</b>        |
|   | 1/2"      | Poly bowl / Metal guard  | 65                  | 95                 | <b>11F32E*</b>    | <b>11F36E*</b>        |
|   | 1/2"      | Metal bowl / Sight gauge | 65                  | 95                 | <b>11F34E*</b>    | <b>11F38E*</b>        |
| 12F  | 1/2"      | Poly bowl / Metal guard  | 75                  | 125                | <b>12F32E*</b>    | <b>12F36E*</b>        |
|   | 1/2"      | Metal bowl / Sight gauge | 75                  | 125                | <b>12F34E*</b>    | <b>12F38E*</b>        |
|   | 3/4"      | Poly bowl / Metal guard  | 80                  | 160                | <b>12F42E*</b>    | <b>12F46E*</b>        |
|   | 3/4"      | Metal bowl / Sight gauge | 80                  | 160                | <b>12F44E*</b>    | <b>12F48E*</b>        |

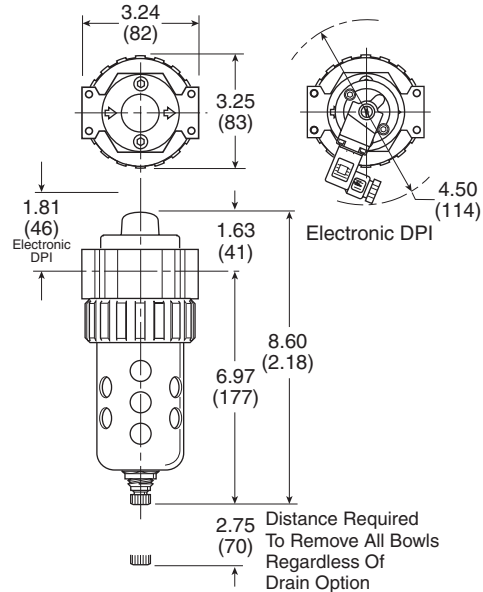
 Most popular.



**11F (Compact)**



**12F (Standard)**



**Service kits**

| Description  | 11F (Compact)    | 12F (Standard)   |
|--|------------------|------------------|
| Bowl guard kit                                     | <b>PS705P</b>    | <b>PS805P</b>    |
| Bowl Kits –  |                  |                  |
| Poly bowl –  |                  |                  |
| Auto float drain                                   | <b>PS722P</b>    | <b>PS822P</b>    |
| Twist drain  | <b>PS732P</b>    | <b>PS832P</b>    |
| Metal bowl –                                       |                  |                  |
| Auto float drain                                   | <b>PS726P</b>    | <b>PS826P</b>    |
| Twist drain  | <b>PS734P</b>    | <b>PS834P</b>    |
| Sight gauge / automatic float drain                | <b>PS723P</b>    | <b>PS823P</b>    |
| Sight gauge / twist drain                          | <b>PS735P</b>    | <b>PS835P</b>    |
| DPI replacement kit                                | <b>PS781P</b>    | <b>PS781P</b>    |
| Drain kits –                                       |                  |                  |
| Auto float drain                                   | <b>PS506P</b>    | <b>PS506P</b>    |
| Semi-auto drain                                    | <b>PS511P</b>    | <b>PS511P</b>    |
| Twist drain  | <b>PS512P</b>    | <b>PS512P</b>    |
| Push 'N' Drain                                     | <b>PS513P</b>    | <b>PS513P</b>    |
| Electronic DPI replacement kit                     | <b>PS764</b>     | <b>PS764</b>     |
| Electrical connector - 15mm, 3-pin DIN, 6 Ft. Cord | <b>PS2932JBP</b> | <b>PS2932JBP</b> |
| Filter element kit –                               |                  |                  |
| Grade 6 (Standard)                                 | <b>PS701P</b>    | <b>PS824P</b>    |
| Grade 10 (Optional)                                | <b>PS702P</b>    | <b>PS830P</b>    |
| Mounting bracket kit                               | <b>PS743P</b>    | <b>PS843P</b>    |
| Sight gauge kit                                    | <b>PS914P</b>    | <b>PS914P</b>    |

Most popular.

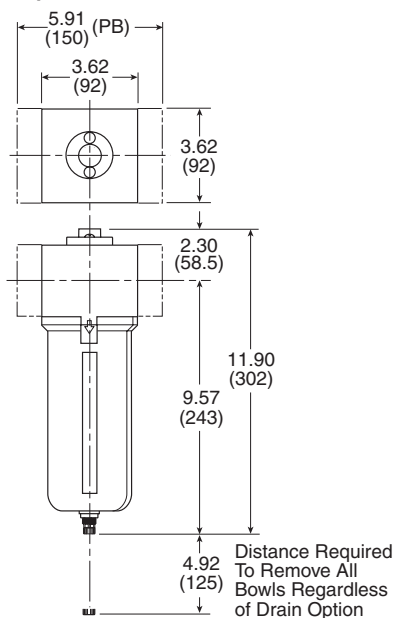


- Removes liquid aerosols and sub-micron particles
- Port blocks (PB) available to provide 1-1/2" port extension to 1" ported bodies
- 0.01 micron element standard
- Metal bowl with sight gauge standard
- 3/4", 1", & 1-1/2" ports (NPT, BSPP & BSPT)


**Material specifications**

| Description      | P3NF (Hi-Flow)    |                                  |
|------------------|-------------------|----------------------------------|
| Body             | Aluminum          |                                  |
| Bowl             | Aluminum          |                                  |
| Deflector        | Plastic           |                                  |
| Drain            | Plastic           |                                  |
| Filter element – | 1.0 micron        | Borosilicate & felt glass fibers |
|                  | 0.01 micron       |                                  |
| Seals            | Nitrile           |                                  |
| Sight gauge      | Polyamide (Nylon) |                                  |

**P3NF (Hi-Flow)**



**Coalescing Filters**

|   | Port size | Bowl type | Sight gauge | Flow SCFM | Element type | Part number (NPT) |                       |
|---|-----------|-----------|-------------|-----------|--------------|-------------------|-----------------------|
|   |           |           |             |           |              | Twist drain       | Automatic float drain |
|  | 3/4"      | Metal     | Yes         | 130       | 0.01 micron  | <b>P3NFA96DSM</b> | <b>P3NFA96DSA</b>     |
|   | 3/4"      | Metal     | Yes         | 195       | 1.0 micron   | <b>P3NFA96QSM</b> | <b>P3NFA96QSA</b>     |
|   | 1"        | Metal     | Yes         | 140       | 0.01 micron  | <b>P3NFA98DSM</b> | <b>P3NFA98DSA</b>     |
|   | 1"        | Metal     | Yes         | 215       | 1.0 micron   | <b>P3NFA98QSM</b> | <b>P3NFA98QSA</b>     |
|   | 1-1/2" #  | Metal     | Yes         | 225       | 0.01 micron  | <b>P3NFA9PDSM</b> | <b>P3NFA9PDSA</b>     |
|   | 1-1/2" #  | Metal     | Yes         | 150       | 1.0 micron   | <b>P3NFA9PQSM</b> | <b>P3NFA9PQSA</b>     |

# 1" port body with 1-1/2" port block

 Most popular.



**Operating information**

|                        |                                  | P3NF (Hi-Flow)                   |
|------------------------|----------------------------------|----------------------------------|
| Operating pressure:    | Metal bowl                       | 0 to 250 PSIG (0 to 17.2 bar)    |
|                        | Auto float drain                 | 15 to 250 PSIG (1.0 to 17.2 bar) |
| Operating temperature: | Metal bowl                       | 32°F to 175°F (0°C to 80°C)      |
|                        | For technical information see CD |                                  |

**Service kits**

| Description          | P3NF (Hi-Flow)               |                    |
|----------------------|------------------------------|--------------------|
| Bowl Kits –          | Sight gauge / auto float     | <b>P3NKA00BSA</b>  |
|                      | Sight gauge / twist drain    | <b>P3NKA00BSM</b>  |
|                      | Sight gauge / push 'n' drain | <b>P3NKA00BSP</b>  |
| Bowl latch kit       | <b>C11A33</b>                |                    |
| DPI replacement kit  | <b>PS781P</b>                |                    |
| Drain kit –          | Auto drain                   | <b>PS506P</b>      |
|                      | Twist drain                  | <b>PS512P</b>      |
| Filter element kit – | Grade 6 (standard)           | <b>P3NKA00ESCB</b> |
|                      | Grade 10 (optional)          | <b>P3NKA00ES9</b>  |
| Mounting bracket kit | <b>P3NKA00MW</b>             |                    |
| Sight gauge kit      | <b>P3NKA00PE</b>             |                    |

- Removes liquid aerosols and sub-micron particles
- Protects pneumatic systems from contamination that standard particulate filters will not catch
- Two different grade elements available
- Differential pressure indicator (pop-up) standard
- Differential pressure gauge optional
- High flow design



### Material specifications

| Description        | F701 (Hi-Flow)  |                            |
|--------------------|-----------------|----------------------------|
| Body & flange ring | Zinc            |                            |
| Bowl               | (E) 32 oz       | Aluminum                   |
|                    | (L) 100 oz      | Aluminum                   |
| Drains             | Housing R       | Acetal                     |
|                    | Housing Q       | Bronze                     |
|                    | Manual          | Brass                      |
| Element end cap    | Urethane        |                            |
| Filter element     | 0.01 micron     | Borosilicate fibers & felt |
|                    | 1.0 micron      |                            |
| Seals & float      | Buna N          |                            |
| Springs            | Stainless steel |                            |


### Operating information

|                      | F701 (Hi-Flow)  |                     |
|----------------------|---|---------------------|
| Maximum pressure:    | "R" drain   | 175 PSIG (12.4 bar) |
|                      | "T" drain   | 250 PSIG (17.2 bar) |
|                      | "Q" drain   | 250 PSIG (17.2 bar) |
| Maximum temperature: | 32°F to 150°F<br>(0°C to 65.6°C)                              |                     |
|                      | Maximum temperature with "T", "R" or "Q" drains: 125°F (52°C) |                     |
| Minimum rated flow:  | 20% or rated flow   |                     |

For technical information see CD

### Coalescing Filters



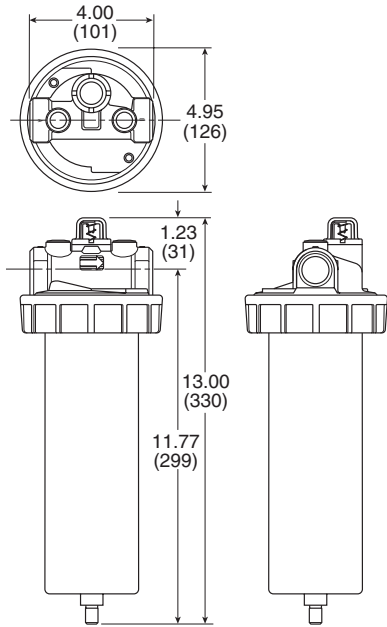
|   | Port size | Bowl type | Bowl size | Flow SCFM | Element type | Part number       |
|---|-----------|-----------|-----------|-----------|--------------|-------------------|
|  | 3/4"      | Metal     | 32 oz     | 95        | 0.01 micron  | <b>F701-06E3P</b> |
|   | 3/4"      | Metal     | 32 oz     | 158       | 1.0 micron   | <b>F701-06E7P</b> |
|   | 3/4"      | Metal     | 100 oz    | 170       | 0.01 micron  | <b>F701-06L3P</b> |
|   | 3/4"      | Metal     | 100 oz    | 285       | 1.0 micron   | <b>F701-06L7P</b> |
|   | 1"        | Metal     | 32 oz     | 95        | 0.01 micron  | <b>F701-08E3P</b> |
|   | 1"        | Metal     | 32 oz     | 158       | 1.0 micron   | <b>F701-08E7P</b> |
|   | 1"        | Metal     | 100 oz    | 170       | 0.01 micron  | <b>F701-08L3P</b> |
|   | 1"        | Metal     | 100 oz    | 285       | 1.0 micron   | <b>F701-08L7P</b> |

 Most popular.

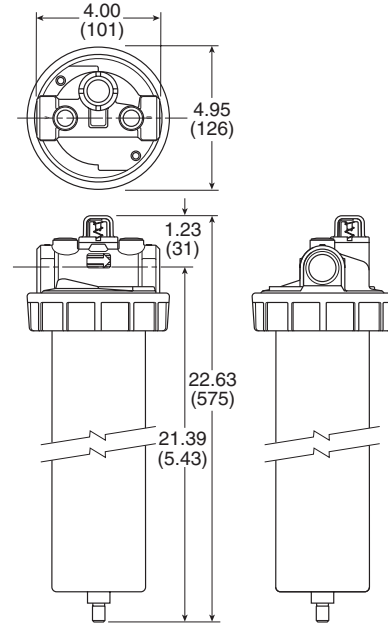
|                        |                          |
|------------------------|--------------------------|
| E                      | General Industrial       |
|                        | Air Preparation Products |
| Liquid Separators      |                          |
| Particulate Filters    |                          |
| Coalescing Filters     |                          |
| Regulators             |                          |
| Pilot Regulators       |                          |
| Filter / Regulators    |                          |
| Micro-Mist Lubricators |                          |
| Mist Lubricators       |                          |
| Combinations           |                          |

|                     |                                 |
|---------------------|---------------------------------|
| <b>U</b>            | <b>General Industrial</b>       |
|                     | <b>Air Preparation Products</b> |
| <b>Liquid</b>       | <b>Separators</b>               |
| <b>Particulate</b>  | <b>Filters</b>                  |
| <b>Coalescing</b>   | <b>Filters</b>                  |
| <b>Regulators</b>   | <b>Regulators</b>               |
| <b>Pilot</b>        | <b>Regulators</b>               |
| <b>Filter /</b>     | <b>Regulators</b>               |
| <b>Micro-Mist</b>   | <b>Lubricators</b>              |
| <b>Mist</b>         | <b>Lubricators</b>              |
| <b>Combinations</b> |                                 |

**F701 - 32 oz. bowl (Hi-Flow)**



**F701 - 100 oz. bowl (Hi-Flow)**



**Service kits**

| Description             |                                     | F701 (Hi-Flow)      |
|-------------------------|-------------------------------------|---------------------|
| Bowl kits               | 3/4, 1 inch (E) 32 oz               | <b>BK603B</b>       |
|                         | 3/4, 1 inch (L) 100 oz              | <b>BK603C</b>       |
| DPI repair kit          |                                     | <b>RK701P</b>       |
| Drain kits –            | Internal auto                       | <b>SA702MD</b>      |
|                         | Manual                              | <b>SA600Y7-1</b>    |
| Filter element kits –   | 0.01 micron, 3/4, 1 inch (E) 32 oz  | <b>F701-C3-0773</b> |
|                         | 0.01 micron, 3/4, 1 inch (E) 100 oz | <b>F701-C3-0774</b> |
|                         | 1.0 micron, 3/4, 1 inch (E) 32 oz   | <b>F701-C7-0773</b> |
|                         | 1.0 micron, 3/4, 1 inch (E) 100 oz  | <b>F701-C7-0773</b> |
| Mounting bracket kits – | 3/4" unit                           | <b>SA200AW57</b>    |
|                         | 1" unit                             | <b>SA200CW57</b>    |



- Heavy-duty cast aluminum housings to withstand operating pressures up to 250 PSIG
- Differential pressure indicator to eliminate the guesswork of element replacement
- Unique drain mounting plate design offers a trouble-free method for interchanging and installing external drains
- 35F: 1-1/2" & 2" ports (NPT & BSPP)
- 43F: 3" ports (NPT & BSPP)



**Material specifications**



| Description    |                   | 35F, 43F (Hi-Flow) |
|----------------|-------------------|--------------------|
| Baffle         |                   | Plated steel       |
| Body           |                   | Aluminum           |
| Bowl           |                   | Aluminum           |
| Deflector      |                   | Plated steel       |
| Filter element | 0.01 & 1.0 micron | Borosilicate cloth |
|                | Adsorber          | Activated carbon   |
| Seals          |                   | Fluorocarbon       |
| Stud           |                   | Plated steel       |

**Operating information**

|                        |                                  | 35F (Hi-Flow)                 | 43F (Hi-Flow)                 |
|------------------------|----------------------------------|-------------------------------|-------------------------------|
| Operating pressure:    | With DP gauge & without DPI      | 250 PSIG (17.2 bar)           | 250 PSIG (17.2 bar)           |
|                        | With DPI                         | 150 PSIG (10.3 bar)           | 150 PSIG (10.3 bar)           |
| Operating temperature: |                                  | 32°F to 150°F (0°C to 65.5°C) | 32°F to 150°F (0°C to 65.5°C) |
|                        | For technical information see CD |                               |                               |

**Coalescing Filters**



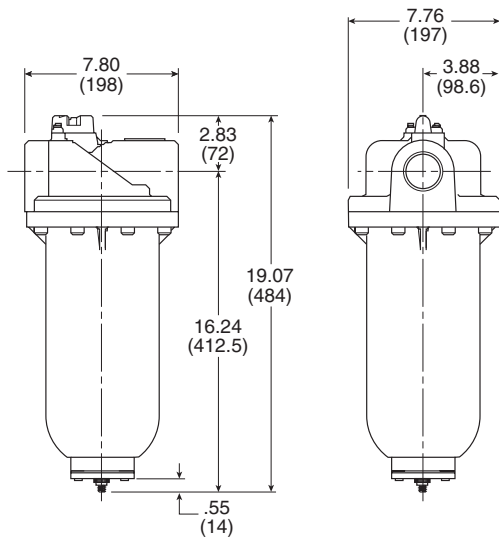
|   | Port size | Bowl type | Flow SCFM | Element type | Part number (NPT) |
|---|-----------|-----------|-----------|--------------|-------------------|
|   |           |           |           |              | Automatic drain   |
| 35F  | 1-1/2     | Metal     | 710       | 0.01 micron  | <b>35F77EAP</b>   |
|   | 1-1/2     | Metal     | 710       | 1.0 micron   | <b>35F77HAP</b>   |
|   | 1-1/2     | Metal     | 710       | Adsorber     | <b>35F77ZAP</b>   |
|   | 2         | Metal     | 710       | 0.01 micron  | <b>35F87EAP</b>   |
|   | 2         | Metal     | 710       | 1.0 micron   | <b>35F87HAP</b>   |
|   | 2         | Metal     | 710       | Adsorber     | <b>35F87ZAP</b>   |
| 43F  | 3         | Metal     | 1770      | 0.01 micron  | <b>43FN7EAP</b>   |
|   | 3         | Metal     | 1770      | 1.0 micron   | <b>43FN7HAP</b>   |
|   | 3         | Metal     | 1770      | Adsorber     | <b>43FN7ZAP</b>   |

 Most popular.

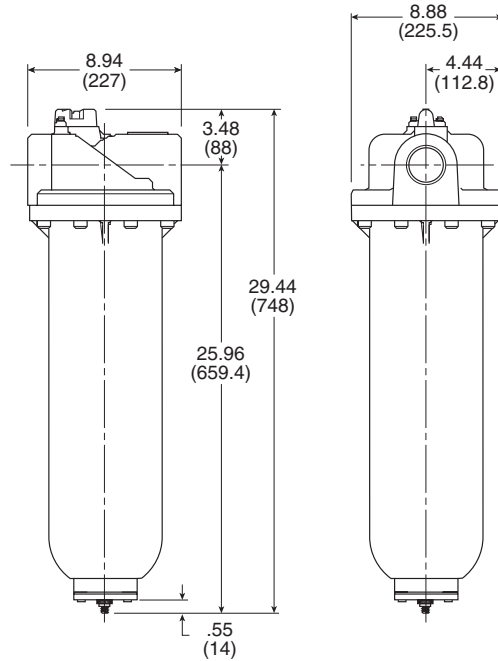


|                                 |
|---------------------------------|
| <b>General Industrial</b>       |
| <b>Air Preparation Products</b> |
| <b>Liquid Separators</b>        |
| <b>Particulate Filters</b>      |
| <b>Coalescing Filters</b>       |
| <b>Regulators</b>               |
| <b>Pilot Regulators</b>         |
| <b>Filter / Regulators</b>      |
| <b>Micro-Mist Lubricators</b>   |
| <b>Mist Lubricators</b>         |
| <b>Combinations</b>             |

**35F (Hi-Flow)**



**43F (Hi-Flow)**



**Service kits**

| Description               |                          | 35F (Hi-Flow)     | 43F (Hi-Flow)     |
|---------------------------|--------------------------|-------------------|-------------------|
| DPI replacement kit       |                          | <b>DP2-02-001</b> | <b>DP2-02-001</b> |
| DPI cap                   | Pressures over 150 PSIG  | <b>GRP-95-022</b> | <b>GRP-95-022</b> |
| DP gauge                  |                          | <b>DP3-01-000</b> | <b>DP3-01-000</b> |
| Automatic float drain kit | Auto internal drain 1/8" | <b>P32KA00DA</b>  | <b>P32KA00DA</b>  |
| Manual drain kit          | with 1/2" drain plate    | <b>GRP-95-392</b> | <b>GRP-95-392</b> |
| Drain plate kit           | 1/2 NPT tapped port      | <b>GRP-95-393</b> | <b>GRP-95-393</b> |
| Filter element kit –      | 0.01 micron              | <b>MTP-95-502</b> | <b>MTP-95-562</b> |
|                           | 1.0 micron               | <b>MSP-95-502</b> | <b>MSP-95-876</b> |
|                           | Adsorber                 | <b>MXP-95-502</b> | <b>MXP-95-565</b> |

- No tie rod element design
- Pleated element technology
- New high efficiency drainage layer
- Designed in accordance with ASME and CRN
- Connection sizes: 4 inch & 6 inch flange
- Acrylic polyurethane coating for corrosion protection

**Material specifications**

|                |                   |                    |
|----------------|-------------------|--------------------|
| Baffle         |                   | Plated steel       |
| Body           |                   | Steel              |
| Deflector      |                   | Plated steel       |
| Filter element | 0.01 & 1.0 micron | Borosilicate cloth |
| Seals          |                   | Fluorocarbon       |
| Stud           |                   | Plated steel       |



**P3TF Series**

**Operating information**

|                        | <b>P3TF Series</b>             |
|------------------------|--------------------------------|
| Operating Pressure:    | 232 PSIG (16 bar)              |
| Operating Temperature: | 35°F to 212°F (1.5°C to 100°C) |

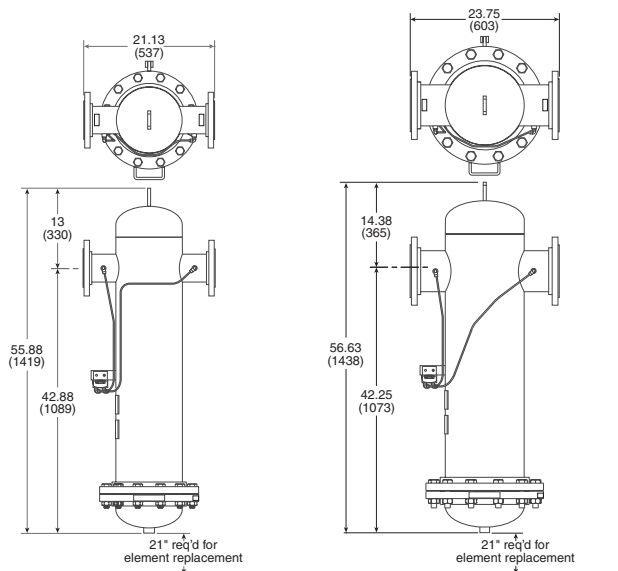
**Inlet air pressure correction**

For pressures above 232 PSIG (16 bar), use manual drain.

|        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|--------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| PSI    | 15   | 29   | 44   | 58   | 73   | 87   | 100  | 116  | 131  | 145  | 160  | 174  | 189  | 203  | 218  | 232  | 247  | 261  | 275  | 290  |
| bar    | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   |
| Factor | 0.38 | 0.53 | 0.65 | 0.76 | 0.85 | 0.93 | 1.00 | 1.07 | 1.13 | 1.19 | 1.25 | 1.31 | 1.36 | 1.41 | 1.46 | 1.51 | 1.56 | 1.60 | 1.65 | 1.70 |

**Flanged filters**

|  | Port size | Flow SCFM | Element type | Number of elements | Part number        |
|--|-----------|-----------|--------------|--------------------|--------------------|
|  | 4" Flange | 2755      | 0.01 micron  | 4                  | <b>P3TFAFFD2AN</b> |
|  | 4" Flange | 2755      | 1.0 micron   | 4                  | <b>P3TFAFFQ2AN</b> |
|  | 6" Flange | 4132      | 0.01 micron  | 6                  | <b>P3TFAFGD3AN</b> |
|  | 6" Flange | 4132      | 1.0 micron   | 6                  | <b>P3TFAFGQ3AN</b> |

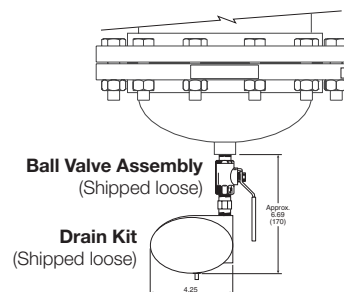


**P3TFAFFD2AN & P3TFAFFQ2AN**  
  Most popular.

**P3TFAFGD3AN & P3TFAFGQ3AN**

**Service kits**

| Description              | Number required | P3TF Series                 |
|--------------------------|-----------------|-----------------------------|
| DP gauge replacement kit |                 | <b>DPG-Kit</b>              |
| Drain kit - 1/2" NPT     |                 | <b>HDF-120-NPT-A</b>        |
| Filter element kit -     | 0.01 micron     | 4 or 6<br><b>PSY1035002</b> |
|                          | 1.0 micron      | 4 or 6<br><b>PSY1035001</b> |



- Unbalanced poppet standard
- Solid control piston with lip seal for extended life
- Non-rising adjusting knob
- Compact, 2.88 inch (73.2mm) high by 1.65 inch (42mm) wide
- Easily serviced
- 14R: 1/8" & 1/4" ports (NPT, BSPP & BSPT)
- 15R: 1/4" & 3/8" ports (NPT, BSPP & BSPT)



**14R**



**15R**

**Material specifications**




|                                     |         |
|-------------------------------------|---------|
| Adjusting nut                       | Brass   |
| Adjusting stem & spring             | Steel   |
| Body                                | Zinc    |
| Bonnet, seat, piston & valve poppet | Plastic |
| Seals                               | Nitrile |

**Operating information**

|                                  | <b>14R (Mini), 15R (Economy)</b> |
|----------------------------------|----------------------------------|
| Pressure rating:                 | 0 to 300 PSIG (0 to 20.4 bar)    |
| Temperature rating:              | 32°F to 125°F (0°C to 52°C)      |
| Low temperature:                 | -4°F to 125°F (-20°C to 52°C)    |
| Secondary pressure ranges –      |                                  |
| Standard pressure                | 2 to 125 PSIG (0 to 8.6 bar)     |
| Medium pressure                  | 1 to 60 PSIG (0 to 4.1 bar)      |
| Medium pressure                  | 1 to 30 PSIG (0 to 2.1 bar)      |
| Low pressure                     | 1 to 15 PSIG (0 to 1 bar)        |
| For technical information see CD |                                  |

**Regulators**



|  | Port size | Pressure range | Flow SCFM | Part number (NPT) |                 |
|--|-----------|----------------|-----------|-------------------|-----------------|
|  |           |                |           | Without gauge     | With gauge      |
| <br>14R | 1/8"      | 30 PSIG        | 13        | <b>14R010F*</b>   | <b>14R015F*</b> |
|  | 1/8"      | 60 PSIG        | 13        | <b>14R011F*</b>   | <b>14R016F*</b> |
|  | 1/8"      | 125 PSIG       | 13        | <b>14R013F*</b>   | <b>14R018F*</b> |
|  | 1/4"      | 30 PSIG        | 15        | <b>14R110F*</b>   | <b>14R115F*</b> |
| <br>14R | 1/4"      | 60 PSIG        | 15        | <b>14R111F*</b>   | <b>14R116F*</b> |
|  | 1/4"      | 125 PSIG       | 15        | <b>14R113F*</b>   | <b>14R118F*</b> |
|  | 1/4"      | 30 PSIG        | 21        | <b>15R110F*</b>   | <b>15R115F*</b> |
| <br>15R | 1/4"      | 60 PSIG        | 21        | <b>15R111F*</b>   | <b>15R116F*</b> |
|  | 1/4"      | 125 PSIG       | 21        | <b>15R113F*</b>   | <b>15R118F*</b> |
|  | 3/8"      | 30 PSIG        | 28        | <b>15R210F*</b>   | <b>15R216F*</b> |
|  | 3/8"      | 60 PSIG        | 28        | <b>15R211F*</b>   | <b>15R215F*</b> |
|  | 3/8"      | 125 PSIG       | 28        | <b>15R213F*</b>   | <b>15R218F*</b> |

\* Engineering level will be added at factory.

**WARNING**

Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

**CAUTION: REGULATOR PRESSURE ADJUSTMENT –**

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

 Most popular.



**General Industrial Products**

**Liquid Separators**

**Particulate Filters**

**Coalescing Filters**

**Regulators**

**Pilot Regulators**

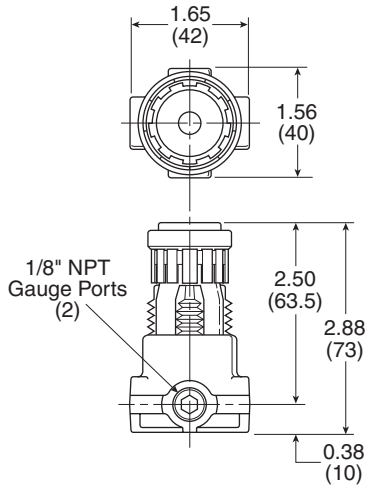
**Filter / Regulators**

**Micro-Mist Lubricators**

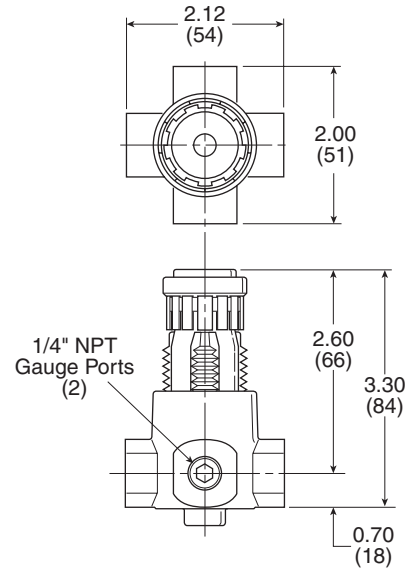
**Mist Lubricators**

**Combinations**

**14R (Mini)**



**15R (Economy)**



**Service kits**

| Description                                     |                                    | 14R (Mini)         | 15R (Economy)      |
|---|------------------------------------|--------------------|--------------------|
| Body service kit – unbalanced                   |                                    |                    | <b>PS424BP</b>     |
| Bonnet assembly kit                             |                                    | <b>L01369</b>      | <b>L01369</b>      |
| Bonnet tamperproof kit                          |                                    | <b>P01265</b>      |                    |
| Gauges –  | 30 PSIG, 1/8" NPT (0 to 2.1 bar)   | <b>K4515N18030</b> | <b>K4515N18030</b> |
|   | 60 PSIG, 1/8" NPT (0 to 4.1 bar)   | <b>K4515N18060</b> | <b>K4515N18060</b> |
|   | 160 PSIG, 1/8" NPT (0 to 11.0 bar) | <b>K4515N18160</b> | <b>K4515N18160</b> |
|   | 60 PSIG, 1/4" NPT (0 to 4.1 bar)   | <b>K4520N14060</b> | <b>K4520N14060</b> |
|   | 160 PSIG, 1/4" NPT (0 to 11.0 bar) | <b>K4520N14160</b> | <b>K4520N14160</b> |
| Mounting bracket kit (includes panel mount nut) |                                    | <b>PS417BP</b>     | <b>PS417BP</b>     |
| Panel mount nuts –                              | Plastic                            | <b>P78652</b>      | <b>P78652</b>      |
|   | Metal                              | <b>P01531</b>      | <b>P01531</b>      |
| Poppet / piston kits –                          | Unbalanced, non-relieving          | <b>PS428P</b>      |                    |
|   | Unbalanced, relieving              | <b>PS426P</b>      |                    |
| Seal kit  | Unbalanced                         |                    | <b>PS454B</b>      |
| Springs –                                       | 1-15 PSIG range (Yellow)           | <b>P01176</b>      | <b>P01176</b>      |
|   | 1-30 PSIG range (Black)            | <b>P01175</b>      | <b>P01175</b>      |
|   | 1-60 PSIG range (White)            | <b>P01174</b>      | <b>P01174</b>      |
|   | 2-125 PSIG range (Gold)            | <b>P01173</b>      | <b>P01173</b>      |



General Industrial  
 Air Preparation Products

Liquid  
 Separators

Particulate  
 Filters

Coalescing  
 Filters

Regulators

Pilot  
 Regulators

Filter /  
 Regulators

Micro-Mist  
 Lubricators

Mist  
 Lubricators

Combinations

**General Industrial**  
**Air Preparation Products**  
**Liquid**  
**Separators**  
**Particulate**  
**Filters**  
**Coalescing**  
**Filters**  
**Regulators**  
**Pilot**  
**Regulators**  
**Filter /**  
**Regulators**  
**Micro-Mist**  
**Lubricators**  
**Mist**  
**Lubricators**  
**Combinations**

- Diaphragm operated for fast operation
- Large Diaphragm to valve area ratio for precise regulation and high flow capacity
- Balanced valve design for precise regulation
- Available in 2 or 4 port design
- Available with a manifold mount to minimize plumbing
- Suitable for low temperature applications
- Non-rising adjusting knob
- 1/8" & 1/4" ports (NPT & BSPP)



**R342/R344**



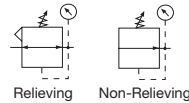
**R342-0MC**

**Material specifications**

| Description       | R34 (Mini) |
|-------------------|------------|
| Body              | Aluminum   |
| Bonnet            | Acetal     |
| Diaphragm & seals | Nitrile    |
| Springs           | Steel      |
| Panel nut         | Acetal     |
| Valve assembly    | Brass      |

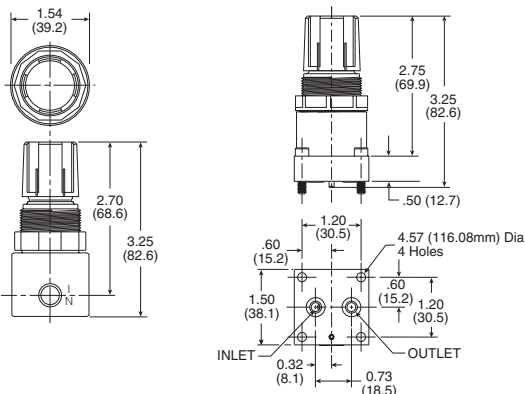
**Operating information**

|                                  | R34 (Mini)                       |
|----------------------------------|----------------------------------|
| Supply pressure:                 | 300 PSIG (20.4 bar) max          |
| Temperature rating:              | -40°F to 150°F (-40°C to 65.5°C) |
| For technical information see CD |                                  |



**R34 Regulator, relieving**

|  | Port size      | Pressure range               | Flow SCFM | Part number     |                  |
|--|----------------|------------------------------|-----------|-----------------|------------------|
|  |                |                              |           | Without gauge   | With gauge       |
|  | 1/8"           | 0 to 30 PSIG (0 to 2.1 bar)  | 17        | <b>R344-01A</b> | <b>R344-01AG</b> |
|  | 1/8"           | 0 to 60 PSIG (0 to 4.1 bar)  | 17        | <b>R344-01B</b> | <b>R344-01BG</b> |
|  | 1/8"           | 0 to 125 PSIG (0 to 8.6 bar) | 17        | <b>R344-01C</b> | <b>R344-01CG</b> |
|  | 1/4"           | 0 to 30 PSIG (0 to 2.1 bar)  | 19        | <b>R344-02A</b> | <b>R344-02AG</b> |
|  | 1/4"           | 0 to 60 PSIG (0 to 4.1 bar)  | 19        | <b>R344-02B</b> | <b>R344-02BG</b> |
|  | 1/4"           | 0 to 125 PSIG (0 to 8.6 bar) | 19        | <b>R344-02C</b> | <b>R344-02CG</b> |
|  | Manifold Mount |                              |           | <b>R342-0MA</b> |                  |
|  | Manifold Mount |                              |           | <b>R342-0MB</b> |                  |
|  | Manifold Mount |                              |           | <b>R342-0MC</b> |                  |



**Service kits**

|   |                                    |                    |
|---|------------------------------------|--------------------|
| Diagram assembly                                | Non-relieving                      | <b>GRP-96-726</b>  |
|   | Relieving                          | <b>GRP-96-725</b>  |
| Gauges –  | 60 PSIG, 1/8" NPT (0 to 4.1 bar)   | <b>K4515N18060</b> |
|   | 160 PSIG, 1/8" NPT (0 to 11.0 bar) | <b>K4515N18160</b> |
| Mounting bracket kit (includes panel mount nut) |                                    | <b>SA161X57</b>    |
| Panel mount nuts                                | Plastic                            | <b>R05X51-P</b>    |
|   | Aluminum                           | <b>R05X51-A</b>    |
| Springs –                                       | 0 to 30 PSIG (0 to 2.1 bar)        | <b>GRP-95-111</b>  |
|   | 0 to 60 PSIG (0 to 4.1 bar)        | <b>GRP-96-718</b>  |
|   | 0 to 125 PSIG (0 to 8.6 bar)       | <b>GRP-96-717</b>  |

**WARNING**

Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

**CAUTION:**

**REGULATOR PRESSURE ADJUSTMENT –**

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular.



- 20R: Rugged brass body for water service
- R24/R25, R45/R46: Constructed with a combination of N.S.F. and F.D.A. approved materials
- Unbalanced poppet standard
- Non-rising, push-to-lock adjusting knob
- Diaphragm operated
- 20R: 1/8" & 1/4" ports (NPT & BSPP)
- R24/R25: 1/8" & 1/4" ports (NPT & BSPP)
- R45/R46: 1/4" & 3/8" ports (NPT & BSPP)

**Material specifications**

|                                     | 20R     | R25/R45   | R24/R46   |
|-------------------------------------|---------|-----------|-----------|
| Adjusting screw                     | Steel   | Steel     | Steel     |
| Body                                |         | Acetal    | Acetal    |
| Body, bottom plug, diaphragm button | Brass   |           |           |
| Bonnet & seat                       | Plastic | Acetal    | Acetal    |
| Diaphragm                           |         | Buna N    | EPDM      |
| Seals                               | Buna N  | Buna N    | EPDM      |
| Springs                             | Steel   | Stainless | Stainless |
| Valve poppet                        | Brass   | Buna N    | EPDM      |



20R



R24/R25






R45/R46

**Operating information**

|                                  | 20R                           |
|----------------------------------|-------------------------------|
| Pressure rating:                 | 0 to 300 PSIG (0 to 20.4 bar) |
| Secondary pressure ranges –      |                               |
| Standard pressure                | 2 to 125 PSIG (0 to 8.6 bar)  |
| Medium pressure                  | 1 to 60 PSIG (0 to 4.1 bar)   |
| Medium pressure                  | 1 to 25 PSIG (0 to 2.1 bar)   |
| Temperature rating:              | 32°F to 125°F (0°C to 52°C)   |
|                                  | R24/R25, R45/R46              |
| Pressure rating:                 | 0 to 150 PSIG (0 to 10 bar)   |
| Temperature rating:              | 40°F to 125°F (4°C to 52°C)   |
| For technical information see CD |                               |

**Regulators**



|  | Port size | Pressure range | Flow                     | Part number (NPT)      |                              |
|--|-----------|----------------|--------------------------|------------------------|------------------------------|
|  |           |                |                          | Air service, relieving | Water service, non-relieving |
| <br>R24/R25 | 1/8"      | 25 PSIG        |                          | <b>R25-01A</b>         | <b>R24-01AK</b>              |
|  | 1/8"      | 60 PSIG        |                          | <b>R25-01B</b>         | <b>R24-01BK</b>              |
|  | 1/8"      | 125 PSIG       |                          | <b>R25-01C</b>         | <b>R24-01CK</b>              |
|  | 1/4"      | 25 PSIG        |                          | <b>R25-02A</b>         | <b>R24-02AK</b>              |
|  | 1/4"      | 60 PSIG        |                          | <b>R25-02B</b>         | <b>R24-02BK</b>              |
|  | 1/4"      | 125 PSIG       |                          | <b>R25-02C</b>         | <b>R24-02CK</b>              |
| <br>R45/R46 | 1/4"      | 25 PSIG        | R45: 35 SCFM; R46: 3 GPM | <b>R45-02A</b>         | <b>R46-02AK</b>              |
|  | 1/4"      | 60 PSIG        | R45: 35 SCFM; R46: 3 GPM | <b>R45-02B</b>         | <b>R46-02BK</b>              |
|  | 1/4"      | 125 PSIG       | R45: 35 SCFM; R46: 3 GPM | <b>R45-02C</b>         | <b>R46-02CK</b>              |
|  | 3/8"      | 25 PSIG        | R45: 35 SCFM; R46: 3 GPM | <b>R45-03A</b>         | <b>R46-03AK</b>              |
|  | 3/8"      | 60 PSIG        | R45: 35 SCFM; R46: 3 GPM | <b>R45-03B</b>         | <b>R46-03BK</b>              |
|  | 3/8"      | 125 PSIG       | R45: 35 SCFM; R46: 3 GPM | <b>R45-03C</b>         | <b>R46-03CK</b>              |
| <br>20R     | 1/8"      | 25 PSIG        | 1.25 GPM                 | <b>20R011F*</b>        | <b>20R011G*</b>              |
|  | 1/8"      | 60 PSIG        | 1.25 GPM                 | <b>20R061F*</b>        | <b>20R061G*</b>              |
|  | 1/8"      | 125 PSIG       | 1.25 GPM                 | <b>20R013F*</b>        | <b>20R013G*</b>              |
|  | 1/4"      | 25 PSIG        | 1.25 GPM                 | <b>20R111F*</b>        | <b>20R111G*</b>              |
|  | 1/4"      | 60 PSIG        | 1.25 GPM                 | <b>20R161F*</b>        | <b>20R161G*</b>              |
|  | 1/4"      | 125 PSIG       | 1.25 GPM                 | <b>20R113F*</b>        | <b>20R113G*</b>              |

NOTE: 1.25 Dia. (32mm) hole required for panel mounting.

\* Engineering level will be added at factory.

**⚠ WARNING**

**Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.**

**CAUTION:**

**REGULATOR PRESSURE ADJUSTMENT –**

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

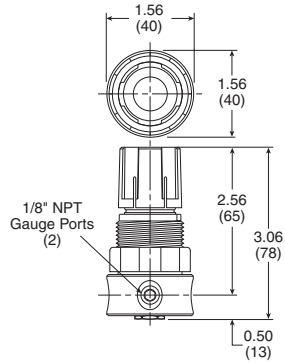
  Most popular.



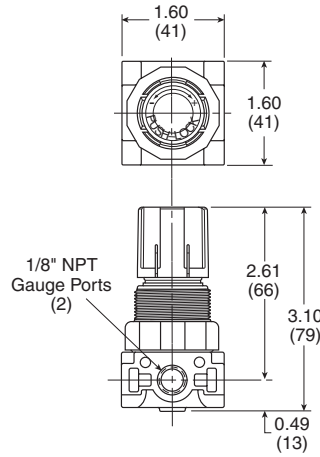


|                                 |
|---------------------------------|
| <b>General Industrial</b>       |
| <b>Air Preparation Products</b> |
| <b>Liquid Separators</b>        |
| <b>Particulate Filters</b>      |
| <b>Coalescing Filters</b>       |
| <b>Regulators</b>               |
| <b>Pilot Regulators</b>         |
| <b>Filter / Regulators</b>      |
| <b>Micro-Mist Lubricators</b>   |
| <b>Mist Lubricators</b>         |
| <b>Combinations</b>             |

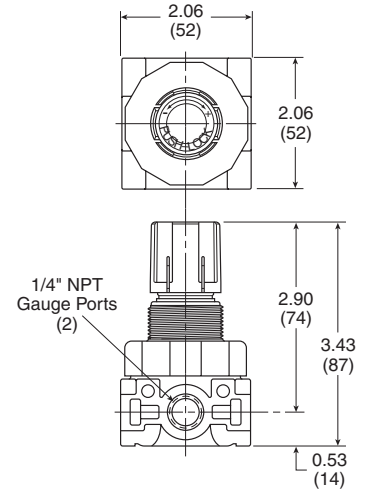
**20R**



**R24/R25**



**R45/R46**



**Service kits**

| Description                                     | 20R             | R24              | R25              | R45             | R46             |
|---|-----------------|------------------|------------------|-----------------|-----------------|
| Bonnet kit                                      | <b>PCKR364Y</b> |                  |                  |                 |                 |
| Bonnet tamperproof kit                          | <b>PCKR364T</b> |                  |                  |                 |                 |
| Mounting bracket kit (includes panel mount nut) | <b>SA161X57</b> | <b>SA161X57</b>  | <b>SA161X57</b>  | <b>SA161X57</b> | <b>SA161X57</b> |
| Panel mount nuts – Plastic                      | <b>R05X51-P</b> | <b>R05X51-P</b>  | <b>R05X51-P</b>  | <b>R05X51-P</b> | <b>R05X51-P</b> |
| Panel mount nuts – Aluminum                     | <b>R05X51-A</b> | <b>R05X51-A</b>  | <b>R05X51-A</b>  | <b>R05X51-A</b> | <b>R05X51-A</b> |
| Repair kits – Non-relieving                     | <b>PRKR163Y</b> | <b>RKR24KY</b>   | <b>RKR25KY</b>   | <b>RKR45KY</b>  | <b>RKR45KY</b>  |
| Repair kits – Relieving                         | <b>PRKR164Y</b> | <b>RKR24Y</b>    | <b>RKR25Y</b>    | <b>RKR45Y</b>   | <b>RKR45Y</b>   |
| Springs – 0 to 25 PSIG (0 to 1.7 bar)           |                 | <b>SPR-375-1</b> | <b>SPR-375-1</b> | <b>SPR-46</b>   | <b>SPR-46</b>   |
| Springs – 0 to 60 PSIG (0 to 4.1 bar)           |                 | <b>SPR-376</b>   | <b>SPR-376</b>   | <b>SPR-47</b>   | <b>SPR-47</b>   |
| Springs – 0 to 125 PSIG (0 to 8.6 bar)          |                 | <b>SPR-377</b>   | <b>SPR-377</b>   | <b>SPR-48</b>   | <b>SPR-48</b>   |

Most popular.



- Secondary aspiration plus balanced poppet provides quick response and accurate pressure regulation
- Rolling diaphragm for extended life
- Two high flow 1/4" gauge ports can be used as additional outlets
- Easily serviced
- Removable non-rising knob for panel mounting and tamper resistance
- 06R: 1/4", 3/8" & 1/2" ports (NPT & BSPP)
- 07R: 1/2" & 3/4" ports (NPT & BSPP)

**Material specifications**

|   |                 |
|---|-----------------|
| Adjusting Stem                          | Steel           |
| Body                                    | Zinc            |
| Bonnet, piston stem, valve poppet & cap | Plastic         |
| Collar, knob                            | Plastic         |
| Diaphragm                               | Nitrile         |
| Seals                                   | Nitrile         |
| Springs – Poppet Control                | Stainless Steel |



**06R**





**07R**

**Operating information**

|                                  |                                      |
|----------------------------------|--------------------------------------|
|                                  | <b>06R (Compact), 07R (Standard)</b> |
| Pressure rating:                 | 250 PSIG (17.2 bar)                  |
| Temperature rating:              | 32°F to 175°F (0°C to 80°C)          |
| Secondary pressure ranges –      |                                      |
| Standard pressure                | 2 to 125 PSIG (0 to 8.6 bar)         |
| Medium pressure                  | 1 to 60 PSIG (0 to 4.1 bar)          |
| High pressure                    | 5 to 250 PSIG (0.4 to 17.2 bar)      |
| For technical information see CD |                                      |

**Regulators**



|   | Port size | Pressure range | Flow SCFM | Part number (NPT) |                    |
|---|-----------|----------------|-----------|-------------------|--------------------|
|   |           |                |           | Without gauge     | With 160 PSI gauge |
| 06R  | 1/4"      | 125 PSIG       | 53        | <b>06R113A*</b>   | <b>06R118A*</b>    |
|   | 3/8"      | 125 PSIG       | 60        | <b>06R213A*</b>   | <b>06R218A*</b>    |
|   | 1/2"      | 125 PSIG       | 75        | <b>06R313A*</b>   | <b>06R318A*</b>    |
| 07R  | 1/2"      | 125 PSIG       | 90        | <b>07R313A*</b>   | <b>07R318A*</b>    |
|   | 3/4"      | 125 PSIG       | 90        | <b>07R413A*</b>   | <b>07R418A*</b>    |

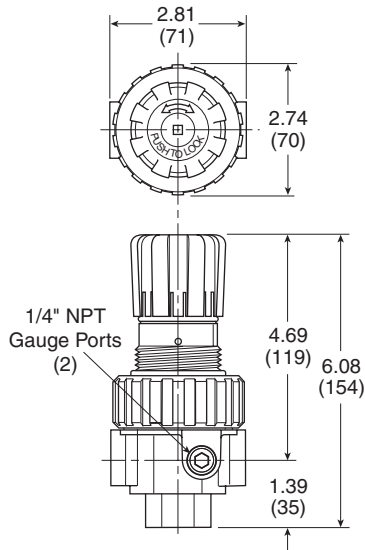
**WARNING**  
 Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

**CAUTION:**  
**REGULATOR PRESSURE ADJUSTMENT –**  
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

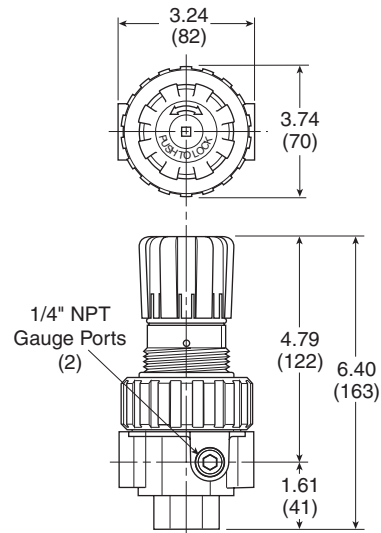
 Most popular.



**06R (Compact)**



**07R (Standard)**



**Service kits**

| Description                                     |                          | 06R (Compact)      | 07R (Standard)     |
|---|--------------------------|--------------------|--------------------|
| Bonnet assembly                                 |                          | <b>PS715P</b>      | <b>PS715P</b>      |
| Control knob                                    |                          | <b>P04069B</b>     | <b>P04069B</b>     |
| Gauges –  | 60 PSIG (0 to 4.1 bar)   | <b>K4520N14060</b> | <b>K4520N14060</b> |
|   | 160 PSIG (0 to 11.0 bar) | <b>K4520N14160</b> | <b>K4520N14160</b> |
|   | 300 PSIG (0 to 20.0 bar) | <b>K4520N14300</b> | <b>K4520N14300</b> |
| Mounting bracket kit (Includes panel mount nut) |                          | <b>PS707P</b>      | <b>PS807P</b>      |
| Panel mount nut –                               | Plastic                  | <b>P04082</b>      | <b>P04079B</b>     |
|   | Metal                    | <b>P04082</b>      | <b>P04079B</b>     |
| Reverse Flow Service Conversion Kit – Relieving |                          | <b>PS708RP</b>     | <b>PS808RP</b>     |
| Springs –                                       | 1-30 PSIG range          | <b>P01698</b>      | <b>P01698</b>      |
|   | 1-60 PSIG range          | <b>P04062</b>      | <b>P04062</b>      |
|   | 2-125 PSIG range         | <b>P04063</b>      | <b>P04063</b>      |
|   | 5-250 PSIG range         | <b>P04064</b>      | <b>P04064</b>      |
| Tamperproof kit                                 |                          | <b>PS737P</b>      | <b>PS7373P</b>     |

Most popular.

**General Industrial**  
**Air Preparation Products**  
**Liquid Separators**  
**Particulate Filters**  
**Coalescing Filters**  
**Regulators**  
**Pilot Regulators**  
**Filter / Regulators**  
**Micro-Mist Lubricators**  
**Mist Lubricators**  
**Combinations**

- Rugged design for the most demanding applications
- Ideal for those installations calling for constant pressure with wide variation in flow
- Diaphragm operated design with balanced poppet design for quick and accurate regulation
- Secondary aspiration plus balanced poppet provides quick response and accurate pressure regulation
- Heavy duty tee handle adjustment
- Reverse flow version available
- Panel mount version available



**R119**

**Operating information**

|                                  |                                 |
|----------------------------------|---------------------------------|
| Supply pressure rating:          | 300 PSIG (20.4 bar)             |
| Reduced pressure range:          | 2 to 125 PSIG (0.15 to 8.5 bar) |
| Temperature rating:              | 40°F to 125°F (4.4°C to 52°C)   |
| For technical information see CD |                                 |

**R119 Standard Regulators**



| Port size | Gauge   | Flow (SCFM) | Part number (NPT), Relieving |
|-----------|---------|-------------|------------------------------|
| 1/4"      | No      | 100         | <b>R119-02C</b>              |
| 3/8"      | No      | 110         | <b>R119-03C</b>              |
| 1/2"      | No      | 150         | <b>R119-04C</b>              |
| 1/4"      | 125 PSI | 100         | <b>R119-02CG</b>             |
| 3/8"      | 125 PSI | 110         | <b>R119-03CG</b>             |
| 1/2"      | 125 PSI | 150         | <b>R119-04CG</b>             |

\* Engineering level will be added at factory.

**Material specifications**

|                          | <b>R119</b> |
|--------------------------|-------------|
| Adjusting screw, springs | Steel       |
| Body, spring cage        | Zinc        |
| Bottom plug              | Brass       |
| Seals                    | Buna N      |

**⚠ WARNING**  
 Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

**CAUTION:**  
**REGULATOR PRESSURE ADJUSTMENT –**

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

☐ Most popular.

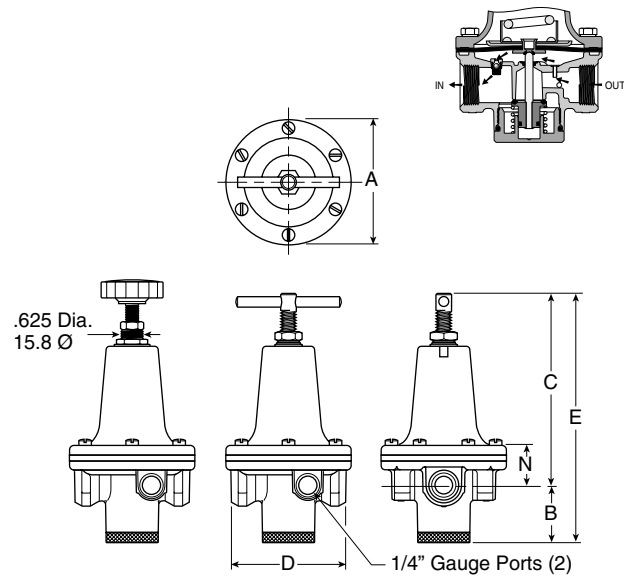


**Dimensions**

**R119 Regulator - Standard**

| A                         | B            | C             | D              | E             | N            |
|---------------------------|--------------|---------------|----------------|---------------|--------------|
| <b>R119-02C, R119-03C</b> |              |               |                |               |              |
| 3.00<br>(76)              | 1.38<br>(35) | 5.29<br>(134) | 2.74<br>(70.5) | 6.67<br>(169) | .90<br>(24)  |
| <b>R119-04C</b>           |              |               |                |               |              |
| 3.56<br>(90)              | 1.56<br>(40) | 5.34<br>(136) | 3.25<br>(83)   | 6.90<br>(175) | 1.45<br>(37) |

inches (mm)



**Service kits**

| Description   | Part number        |
|---|--------------------|
| Gauges –  |                    |
| 2" dial size, 1/4" back connection, 0 to 60 PSIG (0 to 400 kPa)   | <b>K4520N14060</b> |
| 2" dial size, 1/4" back connection, 0 to 160 PSIG (0 to 1100 kPa) | <b>K4520N14160</b> |
| 2" dial size, 1/4" back connection, 0 to 300 PSIG (0 to 2068 kPa) | <b>K4520N14300</b> |
| Mounting bracket kits –   |                    |
| 1/4", 3/8"  | <b>SA15Y57</b>     |
| 1/2"  | <b>18A57</b>       |
| Panel mount conversion kits –                                     |                    |
| 1/4", 3/8"  | <b>4202</b>        |
| 1/2"  | <b>4204</b>        |
| Repair kits –   |                    |
| Non-relieving diaphragm, valve assembly (1/4", 3/8"; All PSIG)    | <b>RK118Y</b>      |
| Relieving diaphragm, valve assembly (1/4", 3/8"; All PSIG)        | <b>RK119Y</b>      |
| Non-relieving diaphragm, valve assembly (1/2"; 25, 60, 125 PSIG)  | <b>RK118A</b>      |
| Non-relieving diaphragm, valve assembly (1/2"; 250 PSIG)          | <b>RK118A250</b>   |
| Relieving diaphragm, valve assembly (1/2"; 25, 60, 125 PSIG)      | <b>RK119A</b>      |
| Relieving diaphragm, valve assembly (1/2"; 250 PSIG)              | <b>RK119A250</b>   |
| Spring cage & t-handle kit  | <b>RKC119Y</b>     |
| Spring cage & insert only kit                                     | <b>SAC18A3/BK</b>  |

For fluorocarbon repair kits, add X64 to kit number suffix.

**P**

General Industrial  
 Air Preparation Products

Liquid  
 Separators

Particulate  
 Filters

Coalescing  
 Filters

Regulators

Pilot  
 Regulators

Filter /  
 Regulators

Micro-Mist  
 Lubricators

Mist  
 Lubricators

Combinations

**P3N**

- Port blocks (PB) available to provide 1-1/2" port extension to 1" ported bodies
- Self relieving feature plus balanced poppet provides quick response and accurate pressure regulation
- Solid control piston for extended life

**R119**

- High flow performance featuring rugged design for the most demanding applications
- Diaphragm operated design with balanced poppet design for quick and accurate regulation
- Heavy duty tee handle adjustment
- Reverse flow version available

**09R**

- Piston design for reduced downtime
- High flow
- Balanced poppet for quick and accurate regulation
- Self relieving piston standard



**P3NR**



**R119**



**09R**

| Operating information            |                             |                                 |                                  |
|----------------------------------|-----------------------------|---------------------------------|----------------------------------|
|                                  | P3NR                        | R119                            | 09R                              |
| Pressure rating, maximum:        | 250 PSIG (17.2 bar)         | 300 PSIG (20.4 bar)             | 300 PSIG (20.4 bar)              |
| Secondary pressure range:        |                             |                                 | 10 to 125 PSIG (0.7 to 8.6 bar)  |
|                                  |                             |                                 | 10 to 180 PSIG (0.7 to 12.4 bar) |
| Reduced pressure range:          |                             | 2 to 125 PSIG (0.15 to 8.5 bar) |                                  |
| Temperature rating:              | 32°F to 175°F (0°C to 80°C) | 40°F to 125°F (4.4°C to 52°C)   | 32°F to 150°F (0°C to 66°C)      |
| For technical information see CD |                             |                                 |                                  |

**P3NR, R119, 09R Hi-Flow Regulators**



| Port size | Gauge   | Flow (SCFM) |      |      | Part number (NPT), Relieving |                  |                 |
|-----------|---------|-------------|------|------|------------------------------|------------------|-----------------|
|           |         | P3NR        | R119 | 09R  | P3NR                         | R119             | 09R             |
| 3/4"      | No      | 200         | 300  |      | <b>P3NRA96BNN</b>            | <b>R119-06C</b>  |                 |
| 1"        | No      | 300         | 400  |      | <b>P3NRA98BNN</b>            | <b>R119-08C</b>  |                 |
| 1-1/4"    | No      |             | 500  |      |                              | <b>R119-10C</b>  |                 |
| 1-1/2"    | No      | 300         | 500  |      | <b>P3NRA9PBNN</b>            | <b>R119-12C</b>  |                 |
| 2"        | No      |             |      | 1000 |                              |                  | <b>09R813B*</b> |
| 3/4"      | 125 PSI | 200         | 300  |      | <b>P3NRA96BNG</b>            | <b>R119-06CG</b> |                 |
| 1"        | 125 PSI | 300         | 400  |      | <b>P3NRA98BNG</b>            | <b>R119-08CG</b> |                 |
| 1-1/4"    | 125 PSI |             | 500  |      |                              | <b>R119-10CG</b> |                 |
| 1-1/2"    | 125 PSI | 300         | 500  |      | <b>P3NRA9PBNG</b>            | <b>R119-12CG</b> |                 |

\* Engineering level will be added at factory.

**Material specifications**

|                            | P3NR     | R119   | 09R       |
|----------------------------|----------|--------|-----------|
| Adjusting screw            | Steel    | Steel  | Steel     |
| Body                       | Aluminum | Zinc   | Zinc      |
| Bonnet                     | Aluminum |        | Aluminum  |
| Bottom plug, inner valve   |          | Brass  |           |
| Knob                       | Plastic  |        |           |
| Piston                     | Plastic  |        | Plastic   |
| Piston stem                |          |        | Aluminum  |
| Poppet assembly            | Brass    |        | Aluminum  |
| Seals                      | Nitrile  | Buna N | Nitrile   |
| Springs – poppet & control | Steel    | Steels | Stainless |

Most popular.

**⚠ WARNING**

Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

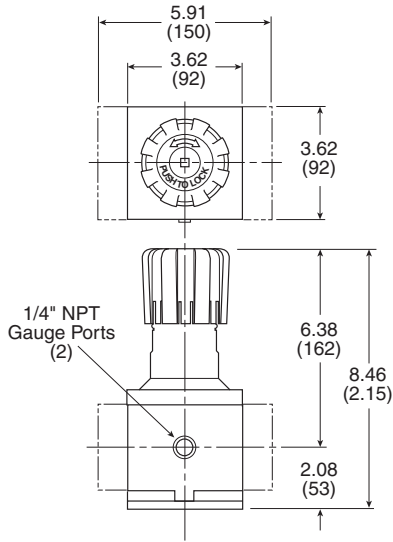
**CAUTION: REGULATOR PRESSURE ADJUSTMENT –**  
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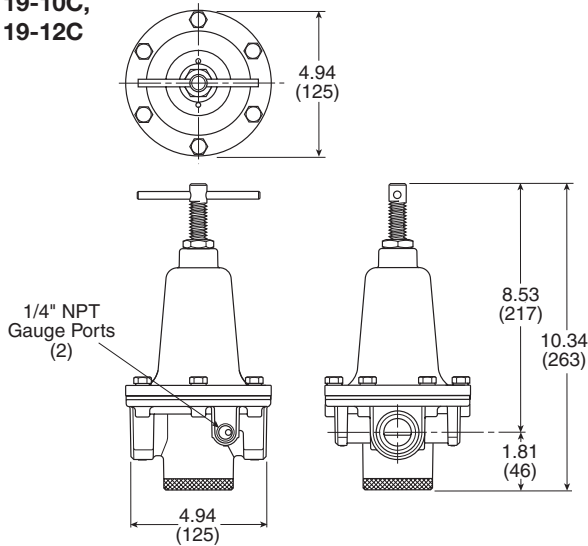
|                        |   |
|------------------------|---|
| E                      | General Industrial Air Preparation Products |
| Liquid Separators      |   |
| Particulate Filters    |   |
| Coalescing Filters     |   |
| Regulators             |   |
| Pilot Regulators       |   |
| Filter / Regulators    |   |
| Micro-Mist Lubricators |   |
| Mist Lubricators       |   |
| Combinations           |   |

|                                 |
|---------------------------------|
| <b>General Industrial</b>       |
| <b>Air Preparation Products</b> |
| <b>Liquid Separators</b>        |
| <b>Particulate Filters</b>      |
| <b>Coalescing Filters</b>       |
| <b>Regulators</b>               |
| <b>Pilot Regulators</b>         |
| <b>Filter / Regulators</b>      |
| <b>Micro-Mist Lubricators</b>   |
| <b>Mist Lubricators</b>         |
| <b>Combinations</b>             |

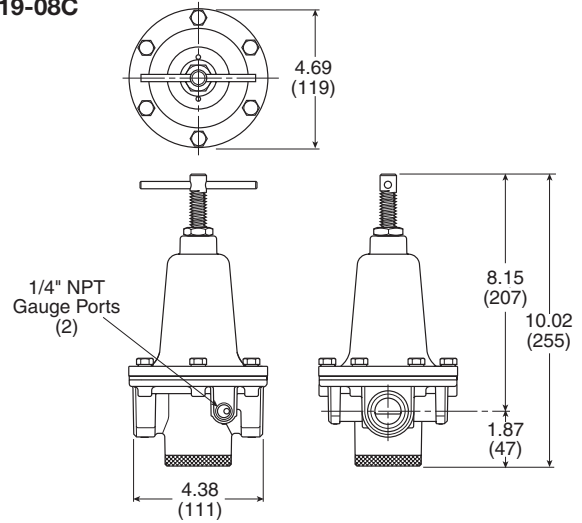
**P3NR**



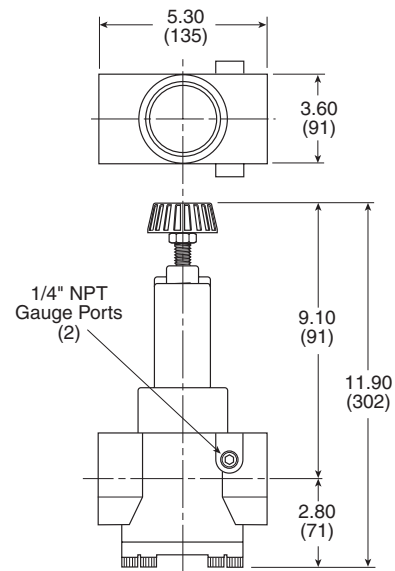
**R119-10C, R119-12C**



**R119-06C, R119-08C**



**09R**



**Service kits**

|                      | P3NR                           | R119               | 09R                |
|----------------------|--------------------------------|--------------------|--------------------|
| Body service kit     |                                |                    | <b>PS603P</b>      |
| Control knob         | <b>P3NKA00PN</b>               |                    |                    |
| Gauges –             | 60 PSIG (0 to 4.1 bar)         | <b>K4520N14060</b> | <b>K4520N14060</b> |
|                      | 160 PSIG (0 to 11.0 bar)       | <b>K4520N14160</b> | <b>K4520N14160</b> |
|                      | 300 PSIG (0 to 20.0 bar)       | <b>K4520N14300</b> | <b>K4520N14300</b> |
| Mounting bracket kit | <b>P3NKA00MW</b>               | <b>18B57</b>       | <b>PS605P</b>      |
| Repair kits –        | Non-relieving                  |                    | <b>PS604P</b>      |
|                      | Non-relieving (1-1/4", 1-1/2") | <b>RK118B</b>      |                    |
|                      | Relieving                      | <b>P3NKA00RR</b>   | <b>PS626P</b>      |
|                      | Relieving (3/4", 1")           | <b>RK119B</b>      |                    |
|                      | Relieving (1-1/4", 1-1/2")     | <b>RK119D</b>      |                    |
| Springs –            | 1-60 PSIG                      | <b>C10A1304</b>    |                    |
|                      | 0 to 125 PSIG                  |                    | <b>PS602P</b>      |
|                      | 2 to 125 PSIG                  | <b>SPR-47</b>      |                    |
|                      | 0 to 180 PSIG                  |                    | <b>PS627</b>       |
|                      | 5 to 250 PSIG                  | <b>SPR-48</b>      |                    |





- Adapted for control by a remote or distant small pilot regulator. Ideal for maximum capacity requirements in applications where units are not readily accessible
- High flow performance featuring rugged design for the most demanding applications
- Ideal for those installations calling for constant pressure with wide variation in flow
- Diaphragm operated design with balanced poppet and constant bleed pilot for quick and accurate regulation.
- Secondary aspiration plus balanced poppet provides quick response and accurate pressure regulation
- Reverse flow available



**R119**

**Operating information**

|                                  |  |
|----------------------------------|--|
| Supply pressure rating:          | 300 PSIG (20.4 bar)  |
| Reduced pressure range:          | Adjustable to within 5 to 7 PSIG of Supply Pressure                |
| Air Consumption:                 | Constant bleed from air pilot chamber: approx. 0.17 SCFM (10 SCFH) |
| Temperature rating:              | 40°F to 125°F (4.4°C to 52°C)                                      |
| For technical information see CD |  |

**R119 Standard Regulators**



| Port size | Gauge | Flow (SCFM) | Part number (NPT), Relieving |
|-----------|-------|-------------|------------------------------|
| 1/4"      | No    | 100         | <b>R119-02J</b>              |
| 3/8"      | No    | 110         | <b>R119-03J</b>              |
| 1/2"      | No    | 150         | <b>R119-04J</b>              |

\* Engineering level will be added at factory.

**Material specifications**

|                       | <b>R119</b> |
|-----------------------|-------------|
| Body, ring, top plate | Zinc        |
| Bottom plug           | Nylon       |
| Innervalve            | Brass       |
| Seals                 | Buna N      |

**⚠ WARNING**  
 Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

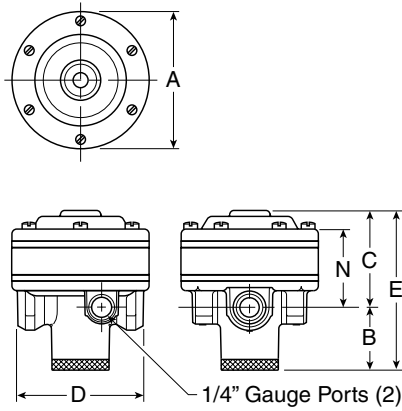
**CAUTION:**  
**REGULATOR PRESSURE ADJUSTMENT –**

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

■ Most popular.



**Dimensions**



**R119 Regulator - Pilot Operated**

| A                         | B            | C            | D            | E            | N            |
|---------------------------|--------------|--------------|--------------|--------------|--------------|
| <b>R119-02J, R119-03J</b> |              |              |              |              |              |
| 3.00<br>(76)              | 1.38<br>(35) | 1.98<br>(50) | 2.74<br>(70) | 3.55<br>(90) | 1.57<br>(40) |
| <b>R119-04J</b>           |              |              |              |              |              |
| 3.56<br>(90)              | 1.56<br>(40) | 2.33<br>(59) | 3.25<br>(83) | 3.90<br>(99) | 1.91<br>(49) |

inches (mm)

**Service kits**

| Description   | Part number        |
|---|--------------------|
| Gauges -  |                    |
| 2" dial size, 1/4" back connection, 0 to 60 PSIG (0 to 400 kPa)   | <b>K4520N14060</b> |
| 2" dial size, 1/4" back connection, 0 to 160 PSIG (0 to 1100 kPa) | <b>K4520N14160</b> |
| 2" dial size, 1/4" back connection, 0 to 300 PSIG (0 to 2068 kPa) | <b>K4520N14300</b> |
| Repair kits -   |                    |
| Non-relieving diaphragm, valve assembly (1/2")                    | <b>RK118X20A</b>   |
| Non-relieving diaphragm, valve assembly (1/4", 3/8")              | <b>RK118X20Y</b>   |
| Relieving diaphragm, valve assembly (1/2")                        | <b>RK119X20A</b>   |
| Relieving diaphragm, valve assembly (1/4", 3/8")                  | <b>RK119X20Y</b>   |

For fluorocarbon repair kits, add X64 to kit number suffix.  
 For Non-Bleed Pilot Repair Kits, add X71 to Kit Number suffix. Specifications

- General Industrial Air Preparation Products
- Liquid Separators
- Particulate Filters
- Coalescing Filters
- Regulators
- Pilot Regulators
- Filter / Regulators
- Micro-Mist Lubricators
- Mist Lubricators
- Combinations

- Balanced poppet provides quick response and accurate pressure regulation
- Pilot controlled regulators can be mounted “out of reach” with pilot regulator installed in a convenient location
- Solid control piston for extended life



11R



12R

**Operating information**

|                     | 11R                              | 12R                              |
|---------------------|----------------------------------|----------------------------------|
| Pressure rating:    | 0 to 250 PSIG<br>(0 to 17.2 bar) | 0 to 250 PSIG<br>(0 to 17.2 bar) |
| Temperature rating: | 32°F to 175°F<br>(0°C to 80°C)   | 32°F to 175°F<br>(0°C to 80°C)   |
| Flow capacity SCFM: | 1/4": 85<br>3/8": 95<br>1/2": 95 | 1/2": 140<br>3/4": 140           |

For technical information see CD

**11R, 12R Pilot Controlled Regulators**



| Port size | Gauge   | Part number (NPT), relieving |                 |
|-----------|---------|------------------------------|-----------------|
|           |         | 11R                          | 12R             |
| 1/4"      | No      | <b>11R115P*</b>              |                 |
| 3/8"      | No      | <b>11R215P*</b>              |                 |
| 1/2"      | No      | <b>11R315P*</b>              | <b>12R315P*</b> |
| 3/4"      | No      |                              | <b>12R415P*</b> |
| 1/4"      | 160 PSI | <b>11R121P*</b>              |                 |
| 3/8"      | 160 PSI | <b>11R221P*</b>              |                 |
| 1/2"      | 160 PSI | <b>11R321P*</b>              | <b>12R321P*</b> |
| 3/4"      | 160 PSI |                              | <b>12R421P*</b> |

\* Engineering level will be added at factory.

**Material specifications**

|                  | 11R     | 12R     |
|------------------|---------|---------|
| Body             | Zinc    | Zinc    |
| Bottom plug      | -       | -       |
| Innervalve       | -       | -       |
| Pilot cap        | Zinc    | Zinc    |
| Piston & poppet  | Plastic | Plastic |
| Seals            | Nitrile | Nitrile |
| Springs – poppet | Steel   | Steel   |

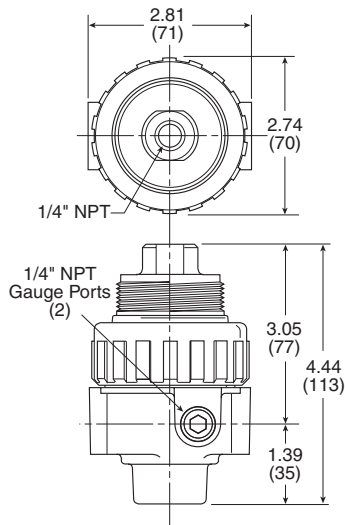
Most popular.

**WARNING**  
 Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

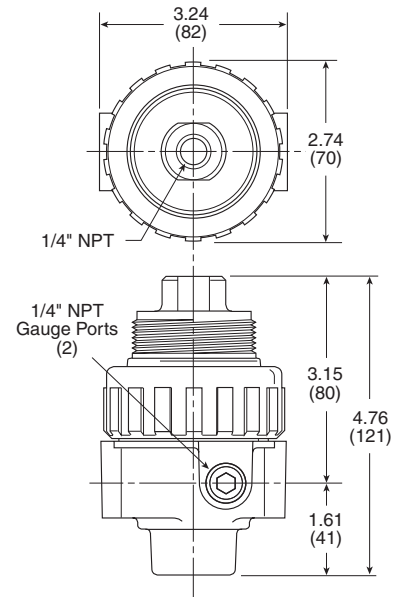
**CAUTION:**  
**REGULATOR PRESSURE ADJUSTMENT –**  
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.



**11R**



**12R**



**Service kits**

|                      |        |                          | 11R                | 12R                |
|----------------------|--------|--------------------------|--------------------|--------------------|
| Body service kit     |        |                          | <b>PS713P</b>      | <b>PS813P</b>      |
| Regulators           | Gauges | 1-1/2" Dial face –       |                    |                    |
|                      |        | 30 PSIG (0 to 2.1 bar)   |                    |                    |
|                      |        | 60 PSIG (0 to 4.1 bar)   | <b>K4520N14060</b> | <b>K4520N14060</b> |
|                      |        | 160 PSIG (0 to 11.0 bar) | <b>K4520N14160</b> | <b>K4520N14160</b> |
| Pilot Regulators     |        | 2" Dial face –           |                    |                    |
|                      |        | 60 PSIG (0 to 4.1 bar)   |                    |                    |
|                      |        | 160 PSIG (0 to 11.0 bar) |                    |                    |
|                      |        | 300 PSIG (0 to 20.0 bar) | <b>K4520N14300</b> | <b>K4520N14300</b> |
| Mounting bracket kit |        |                          | <b>PS707P</b>      | <b>PS807P</b>      |
| Panel mount nut –    |        |                          |                    |                    |
|                      |        |                          | Metal              | <b>P04079B</b>     |
|                      |        |                          | Plastic            | <b>P04082</b>      |
| Pilot conversion kit |        |                          | <b>PS745P</b>      | <b>PS745P</b>      |
| Repair kits –        |        |                          |                    |                    |
|                      |        |                          | Non-relieving      | <b>PS747P</b>      |
|                      |        |                          | Relieving          | <b>PS749P</b>      |

|  |
|--|
| <b>General Industrial Air Preparation Products</b> |
| <b>Liquid Separators</b>                           |
| <b>Particulate Filters</b>                         |
| <b>Coalescing Filters</b>                          |
| <b>Regulators</b>                                  |
| <b>Pilot Regulators</b>                            |
| <b>Filter / Regulators</b>                         |
| <b>Micro-Mist Lubricators</b>                      |
| <b>Mist Lubricators</b>                            |
| <b>Combinations</b>                                |

**P3NR**

- Port blocks (PB) available to provide 1-1/2" port extension to 1" ported bodies
- Self relieving feature plus balanced poppet provides quick response and accurate pressure regulation
- Solid control piston for extended life

**R119**

- Adapted for control by a remote or distant small pilot regulator. Ideal for maximum capacity requirements in applications where units are not readily accessible
- High flow performance featuring rugged design for the most demanding applications
- Ideal for those installations calling for constant pressure with wide variation in flow



**P3NR**



**R119 (06-12)**



**R119 (16-20)**

**Operating information**

|                           | <b>P3NR</b>                         | <b>R119-06J<br/>R119-08J<br/>R119-10J<br/>R119-12J</b> | <b>R119-16J<br/>R119-20J</b>    |
|---------------------------|-------------------------------------|--|---------------------------------|
| Pressure rating, maximum: | 250 PSIG (17.2 bar)                 | 300 PSIG (17.2 bar)                                    | 300 PSIG (17.2 bar)             |
| Temperature rating:       | 32°F to 175°F (0°C to 80°C)         | 40°F to 125°F (4.4°C to 52°C)                          | 40°F to 120°F (4.4°C to 48.9°C) |
| Flow capacity SCFM:       | 3/4"; 300<br>1"; 300<br>1-1/2"; 350 | 3/4"; 300<br>1"; 300<br>1-1/4"; 500<br>1-1/2"; 500     | 2"; 1800<br>2-1/2"; 1800        |

For technical information see CD

**P3NR, R119 Pilot Operated Regulators**



| Port size | Gauge   | Part number (NPT), relieving |   |                               |
|-----------|---------|------------------------------|---|-------------------------------|
|           |         | <b>P3NR</b>                  | <b>R119-06J, R119-08J,<br/>R119-10J, R119-12J<br/>0-125 PSIG reduced pressure</b> | <b>R119-16J,<br/>R119-20J</b> |
| 3/4"      | No      | <b>P3NRA96BPP</b>            | <b>R119-06J</b>   |                               |
| 1"        | No      | <b>P3NRA98BPP</b>            | <b>R119-08J</b>   |                               |
| 1-1/4"    | No      |                              | <b>R119-10J</b>   |                               |
| 1-1/2"    | No      | <b>P3NRA9PBPP</b>            | <b>R119-12J</b>   |                               |
| 2"        | No      |                              |   | <b>R119-16J</b>               |
| 2-1/2"    | No      |                              |   | <b>R119-20J</b>               |
| 3/4"      | 160 PSI | <b>P3NRA96BPG</b>            |   |                               |
| 1"        | 160 PSI | <b>P3NRA98BPG</b>            |   |                               |
| 1-1/2"    | 160 PSI | <b>P3NRA9BPBG</b>            |   |                               |

**Material specifications**

|                          | <b>P3NR</b> | <b>R119-06J, R119-08J,<br/>R119-10J, R119-12J</b> | <b>R119-16J, R119-20J</b> |
|--------------------------|-------------|---|---------------------------|
| Adjusting stem           | Steel       |   |                           |
| Body                     | Aluminum    |   | Aluminum                  |
| Body, ring, top plate    |             | Zinc  |                           |
| Bonnet                   | Aluminum    |   |                           |
| Bottom plug, inner valve |             | Brass   | Brass & Stainless         |
| Piston                   | Plastic     |   | Aluminum                  |
| Poppet assembly          | Brass       |   |                           |
| Seals                    | Nitrile     | Buna N  | Buna N                    |
| Springs – poppet         | Steel       |   |                           |

Most popular.

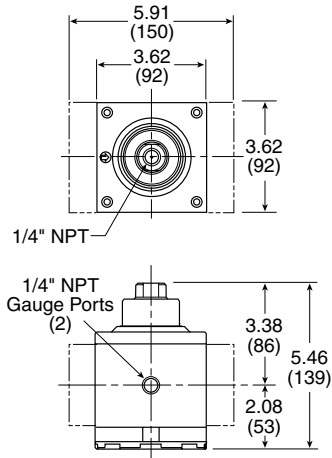
**WARNING**  
 Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

**CAUTION:**  
**REGULATOR PRESSURE ADJUSTMENT –**  
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

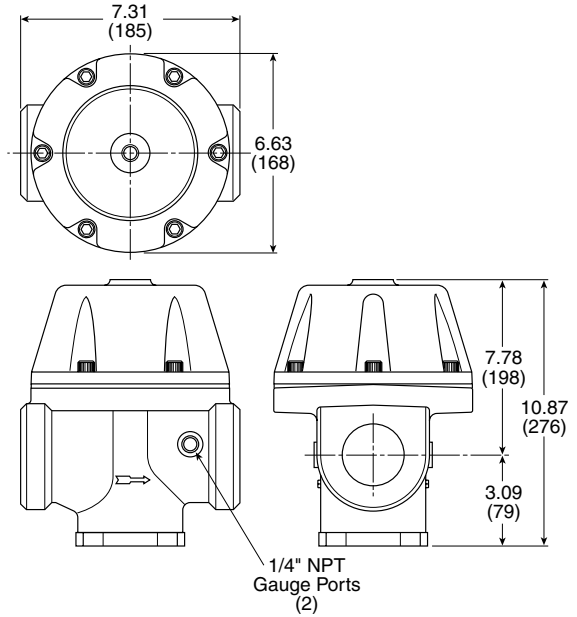


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| <b>P</b>                                       |
| General Industrial<br>Air Preparation Products |
| Liquid<br>Separators                           |
| Particulate<br>Filters                         |
| Coalescing<br>Filters                          |
| Regulators                                     |
| Pilot<br>Regulators                            |
| Filter /<br>Regulators                         |
| Micro-Mist<br>Lubricators                      |
| Mist<br>Lubricators                            |
| Combinations                                   |

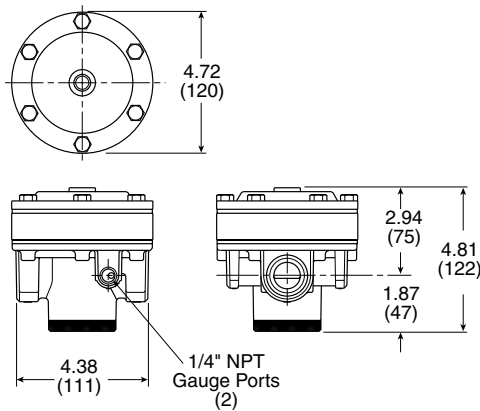
**P3NR**



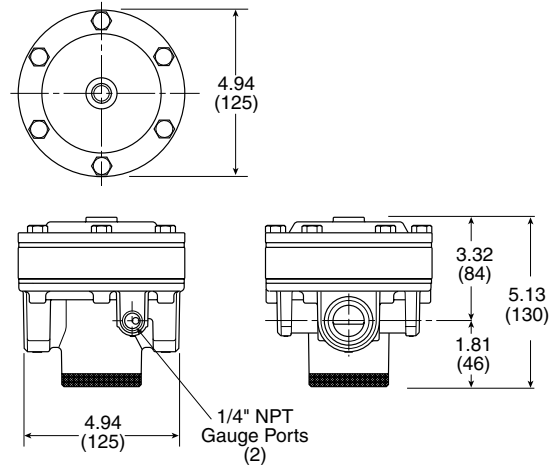
**R119-16J, R119-20J**



**R119-06J, R119-08J**



**R119-10J, R119-12J**



**Service kits**

|                           |                                     | P3NR                     | R119-06J, R119-08J,<br>R119-10J, R119-12J | R119-16J, R119-20J |
|---------------------------|-------------------------------------|--------------------------|---|--------------------|
| Gauges                    | 2" Dial face –                      | 60 PSIG (0 to 4.1 bar)   | <b>K4520N14060</b>                        | <b>K4520N14060</b> |
|                           |                                     | 160 PSIG (0 to 11.0 bar) | <b>K4520N14160</b>                        | <b>K4520N14160</b> |
|                           |                                     | 300 PSIG (0 to 20.0 bar) | <b>K4520N14300</b>                        | <b>K4520N14300</b> |
| Mounting bracket kit      |                                     | <b>P3NKA00MW</b>         |   |                    |
| Repair kits               | Piston type regulation (2", 2-1/2") |                          |   | <b>RK119G</b>      |
| Non-relieving diaphragm – | Valve assembly (3/4", 1")           |                          | <b>RK118X20B</b>                          |                    |
|                           | Valve assembly (1-1/4", 1-1/2")     |                          | <b>RK118X20D</b>                          |                    |
| Relieving diaphragm –     | Valve assembly (3/4", 1")           |                          | <b>RK119X20B</b>                          |                    |
|                           | Valve assembly (1-1/4", 1-1/2")     |                          | <b>RK119X20D</b>                          |                    |
| Repair kits               | Relieving                           | <b>P3NKA00PD</b>         |   |                    |



**14E**

- Excellent water removal efficiency
- Unbalanced poppet standard
- Solid control piston for extended life
- Space saving package offers both filter and regulator features in one integral unit
- Non-rising adjustment knob
- Two full flow 1/8" gauge ports

**B34**

- Excellent water removal efficiency diaphragm operated for fast operation
- Large diaphragm to valve area for precise regulation and high flow capacity
- Balanced valve design for precise regulation
- Space saving package offers both filter and regulator features in one integral unit
- Non-rising adjustment knob



**14E**

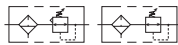




**B34**

**Operating information**

|  | <b>14E</b>   | <b>B34</b>   |
|--|--|--|
| Pressure rating –<br>Polycarbonate bowl<br>Metal bowl    | 0 to 150 PSIG (0 to 10.3 bar)<br>0 to 250 PSIG (0 to 17.2 bar)   | 0 to 150 PSIG (0 to 10.3 bar)<br>0 to 300 PSIG (0 to 17.2 bar)   |
| Secondary pressure ranges:                               | Standard pressure 2 to 125 PSIG (0 to 8.6 bar)<br>Medium pressure 1 to 30 PSIG (0 to 2.1 bar)<br>Medium pressure 1 to 60 PSIG (0 to 4.1 bar)<br>Low pressure 1 to 15 PSIG (0 to 1 bar) | Reduced pressure ranges<br>0 to 25 PSIG (0 to 1.7 bar)<br>1 to 60 PSIG (0 to 4.1 bar)<br>2 to 125 PSIG (0.15 to 8.5 bar) |
| Temperature rating –<br>Polycarbonate bowl<br>Metal bowl | 32°F to 125°F (0°C to 52°C)<br>32°F to 175°F (0°C to 80°C)   | 40°F to 125°F (4.4°C to 52°C)<br>40°F to 125°F (4.4°C to 52°C)   |
| For technical information see CD                         |  |  |

**Miniature Filter / Regulators**



|   | Port size | Bowl type | Drain type | Flow SCFM | Element type | Part number (NPT)      |                   |                   |
|---|-----------|-----------|------------|-----------|--------------|------------------------|-------------------|-------------------|
|   |           |           |            |           |              | Pressure range 30 PSIG | 60 PSIG           | 125 PSIG          |
| <b>14E</b><br> | 1/8"      | Poly      | Twist      | 16        | 5 micron     | <b>14E01B10F*</b>      | <b>14E01B11F*</b> | <b>14E01B13F*</b> |
|   | 1/8"      | Poly      | Auto pulse | 16        | 5 micron     | <b>14E05B10F*</b>      | <b>14E05B11F*</b> | <b>14E05B13F*</b> |
|   | 1/8"      | Metal     | Twist      | 16        | 5 micron     | <b>14E03B10F*</b>      | <b>14E03B11F*</b> | <b>14E03B13F*</b> |
|   | 1/8"      | Metal     | Auto pulse | 16        | 5 micron     | <b>14E07B10F*</b>      | <b>14E07B11F*</b> | <b>14E07B13F*</b> |
|   | 1/4"      | Poly      | Twist      | 18        | 5 micron     | <b>14E11B10F*</b>      | <b>14E11B11F*</b> | <b>14E11B13F*</b> |
|   | 1/4"      | Poly      | Auto pulse | 18        | 5 micron     | <b>14E15B10F*</b>      | <b>14E15B11F*</b> | <b>14E15B13F*</b> |
|   | 1/4"      | Metal     | Twist      | 18        | 5 micron     | <b>14E13B10F*</b>      | <b>14E13B11F*</b> | <b>14E13B13F*</b> |
|   | 1/4"      | Metal     | Auto pulse | 18        | 5 micron     | <b>14E17B10F*</b>      | <b>14E17B11F*</b> | <b>14E17B13F*</b> |
| <b>B34</b><br> | 1/8"      | Poly      | Twist      | 17        | 5 micron     |                        |                   | <b>B344-01AGC</b> |
|   | 1/8"      | Metal     | Twist      | 17        | 5 micron     |                        |                   | <b>B344-01DGC</b> |
|   | 1/4"      | Poly      | Twist      | 19        | 5 micron     |                        |                   | <b>B344-02AGC</b> |
|   | 1/4"      | Metal     | Twist      | 19        | 5 micron     |                        |                   | <b>B344-02DGC</b> |

\* Engineering level will be added at factory.

**⚠ WARNING**  
**Product rupture can cause serious injury.**  
**Do not connect regulator to bottled gas.**  
**Do not exceed maximum primary pressure rating.**

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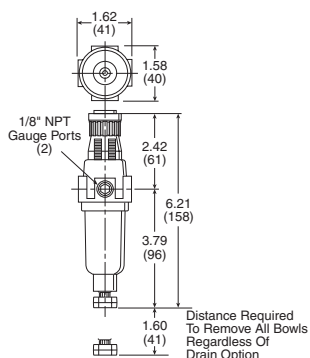
 Most popular.



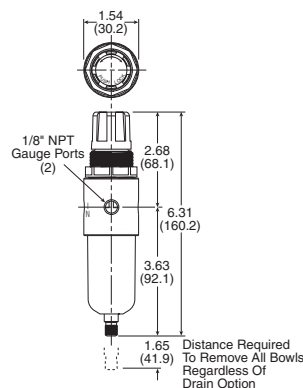


|   |                   |                     |                    |            |                  |                     |                        |                  |              |
|---|-------------------|---------------------|--------------------|------------|------------------|---------------------|------------------------|------------------|--------------|
| General Industrial Air Preparation Products | Liquid Separators | Particulate Filters | Coalescing Filters | Regulators | Pilot Regulators | Filter / Regulators | Micro-Mist Lubricators | Mist Lubricators | Combinations |
|   |                   |                     |                    |            |                  |                     |                        |                  |              |

**14E**



**B34**



**Material specifications**

| Description                                    | 14E (Mini)   | B34   |
|--|--|---|
| Adjusting nut                                  | Brass  |   |
| Adjusting stem & spring                        | Steel  |   |
| Body   | Zinc   | Aluminum  |
| Bonnet, knob, seat, piston, holder & deflector | Plastic  |   |
| Bowls  | Transparent<br>Metal   | Polycarbonate<br>Zinc   |
| Drains   | Manual - twist<br>Automatic - pulse                                | Body & stem<br>Seals<br>Nitrile<br>Piston & seals<br>Nitrile<br>Stem, seat, adapter & washers<br>Aluminum |
| Elastomers                                     |  | Buna N  |
| Filter elements                                | 5 Micron (standard)<br>40 Micron (optional)<br>Adsorber (optional) | Plastic<br>Plastic<br>Activated charcoal  |
| Filter retainer, vane plate                    |  | Acetal  |
| Innervalve, diaphragm, button, drain           |  | Brass   |
| Seals  | Nitrile  |   |

**Service kits**

|  |  |                        |
|--|--|------------------------|
| Adjusting knob                                   |  | <b>RRP-16-005-000</b>  |
| Bonnet tamperproof kit                           | <b>P01265</b>                            |                        |
| Bowl kits  | Poly bowl - Automatic pulse drain        | <b>PS408BP</b>         |
|  | Twist drain                              | <b>PS404P</b>          |
|  | Metal bowl - Automatic drain             | <b>PS451BP</b>         |
|  | Twist drain                              | <b>PS447BP</b>         |
| Drain kits                                       | Automatic pulse drain                    | <b>RK504SY</b>         |
| Filter element kits -                            | 5 Micron                                 | <b>PS403P</b>          |
|  | 40 Micron                                | <b>PS401P</b>          |
|  | Adsorber                                 | <b>PS452P</b>          |
| Gauges -   | 30 PSIG (0 to 2.1 bar)                   | <b>K4515N18030</b>     |
|  | 60 PSIG (0 to 4.1 bar)                   | <b>K4515N18060</b>     |
|  | 160 PSIG (0 to 11.0 bar)                 | <b>K4515N18160</b>     |
| Mounting bracket kit* (includes panel mount nut) | <b>PS417BP</b>                           | <b>SA161X57</b>        |
| Panel mount nuts -                               | Plastic                                  | <b>P78652</b>          |
|  | Aluminum                                 | <b>R05X51-P</b>        |
| Poppet / piston kits -                           | Unbalanced, non-relieving                | <b>PS428P</b>          |
|  | Unbalanced, relieving                    | <b>PS426P</b>          |
| Repair kits -                                    | Non-relieving, diaphragm, valve assembly | <b>GRP-96-726</b>      |
|  | Relieving, diaphragm, valve assembly     | <b>GRP-96-725</b>      |
| Springs -  | 15 PSIG                                  | <b>P01176</b> (yellow) |
|  | 30 PSIG                                  | <b>P01175</b> (black)  |
|  | 60 PSIG                                  | <b>P01174</b> (white)  |
|  | 125 PSIG                                 | <b>P01173</b> (gold)   |

Most popular.



- Space saving package offers both filter and regulator features for optimal performance
- Excellent water removal efficiency
- Rolling diaphragm for extended life
- Quick response, and accurate pressure regulation regardless of changing flow or inlet pressure
- Two high flow 1/4" gauge ports can be used as additional outlets

**Material specifications**

|                        |                             |                                |                 |
|------------------------|-----------------------------|--------------------------------|-----------------|
| Adjusting stem         |                             | Steel                          |                 |
| Body                   |                             | Zinc                           |                 |
| Bonnet, internal parts |                             | Plastic                        |                 |
| Bowls                  | Transparent                 | Polycarbonate                  |                 |
|                        | Metal                       | Zinc                           |                 |
| Bowl guard             |                             | Steel                          |                 |
| Collar                 |                             | Plastic                        |                 |
| Diaphragm              |                             | Nitrile                        |                 |
| Drains                 | Manual twist drain standard | Body & nut                     | Plastic         |
|                        |                             | Automatic float drain optional | Float housing   |
|                        |                             | Seals                          | Nitrile         |
|                        |                             | Springs, push rod              | Stainless steel |
| Filter elements        | 40 Micron (standard)        | Plastic                        |                 |
|                        | 5 Micron (optional)         | Plastic                        |                 |
| Knob                   |                             | Plastic                        |                 |
| Seals                  |                             | Nitrile                        |                 |
| Sight gauge            |                             | Polyamide                      |                 |
| Springs -              | Poppet                      | Stainless                      |                 |
|                        | Control                     | Steel                          |                 |



**Operating information**

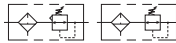
Pressure rating -  
 Polycarbonate bowl 0 to 150 PSIG (0 to 10.4 bar)  
 Metal bowl 0 to 250 PSIG (0 to 17.2 bar)  
 Automatic float drain 15 to 250 PSIG (1.0 to 17.2 bar)

Temperature rating -  
 Polycarbonate bowl 32°F to 125°F (0°C to 52°C)  
 Metal bowl 32°F to 175°F (0°C to 80°C)

Secondary pressure ranges -  
 Standard pressure 2 to 125 PSIG (0 to 8.6 bar)  
 Medium pressure 1 to 60 PSIG (0 to 4.1 bar)  
 High pressure 5 to 250 PSIG (0.4 to 17.2 bar)

For technical information see CD

**06E Compact Filter / Regulators**



|     | Port size | Bowl type           | Drain type | Flow SCFM | Element type | Part number (NPT)              |                   |
|-----|-----------|---------------------|------------|-----------|--------------|--------------------------------|-------------------|
|     |           |                     |            |           |              | Pressure range (Without gauge) |                   |
|     |           |                     |            |           |              | 60 PSIG                        | 125 PSIG          |
| 06E | 1/4"      | Poly / Metal guard  | Twist      | 46        | 5 micron     | <b>06E12A11A*</b>              | <b>06E12A13A*</b> |
|     | 1/4"      | Poly / Metal guard  | Auto float | 46        | 5 micron     | <b>06E16A11A*</b>              | <b>06E16A13A*</b> |
|     | 3/8"      | Poly / Metal guard  | Twist      | 55        | 5 micron     | <b>06E22A11A*</b>              | <b>06E22A13A*</b> |
|     | 3/8"      | Poly / Metal guard  | Auto float | 55        | 5 micron     | <b>06E26A11A*</b>              | <b>06E26A13A*</b> |
|     | 1/2"      | Poly / Metal guard  | Twist      | 61        | 5 micron     | <b>06E32A11A*</b>              | <b>06E32A13A*</b> |
|     | 1/2"      | Poly / Metal guard  | Auto float | 61        | 5 micron     | <b>06E36A11A*</b>              | <b>06E36A13A*</b> |
|     | 1/4"      | Metal / Sight gauge | Twist      | 46        | 5 micron     | <b>06E14A11A*</b>              | <b>06E14A13A*</b> |
|     | 1/4"      | Metal / Sight gauge | Auto float | 46        | 5 micron     | <b>06E18A11A*</b>              | <b>06E18A13A*</b> |
|     | 3/8"      | Metal / Sight gauge | Twist      | 55        | 5 micron     | <b>06E24A11A*</b>              | <b>06E24A13A*</b> |
|     | 3/8"      | Metal / Sight gauge | Auto float | 55        | 5 micron     | <b>06E28A11A*</b>              | <b>06E28A13A*</b> |
|     | 1/2"      | Metal / Sight gauge | Twist      | 61        | 5 micron     | <b>06E34A11A*</b>              | <b>06E34A13A*</b> |
|     | 1/2"      | Metal / Sight gauge | Auto float | 61        | 5 micron     | <b>06E38A11A*</b>              | <b>06E38A13A*</b> |

\* Engineering level will be added at factory.

**WARNING**  
 Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

**CAUTION:**  
**REGULATOR PRESSURE ADJUSTMENT -**  
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular.



General Industrial  
 Air Preparation Products

Liquid  
 Separators

Particulate  
 Filters

Coalescing  
 Filters

Regulators

Pilot  
 Regulators

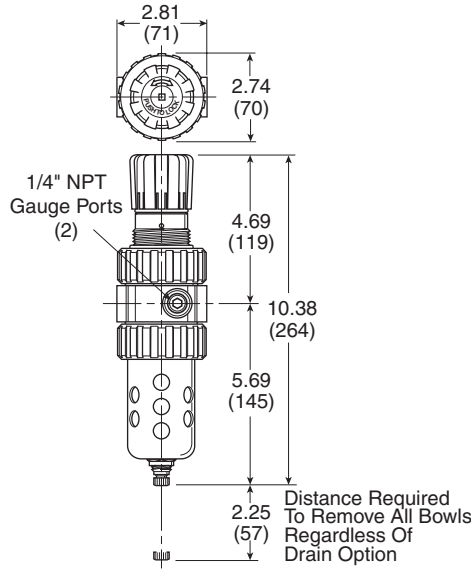
Filter /  
 Regulators

Micro-Mist  
 Lubricators

Mist  
 Lubricators

Combinations

06E



**Service kits**

| Description                                     |                                 |                       | 06E         |
|---|---------------------------------|-----------------------|-------------|
| Bonnet assembly kit                             |                                 |                       | PS715P      |
| Bowl guard kit                                  |                                 |                       | PS705P      |
| Bowl kits                                       | Poly bowl –                     | Automatic float drain | PS722P      |
|   |                                 | Twist drain           | PS732P      |
| Metal bowl –                                    | Automatic float drain           | PS726P                |             |
|   | Semi-auto drain                 | PS794P                |             |
|   | Twist drain                     | PS734P                |             |
|   | Sight gauge / Automatic drain   | PS723P                |             |
|   | Sight gauge / Twist drain       | PS735P                |             |
| Control knob                                    |                                 |                       | P04069B     |
| Drain kits –                                    | Automatic float drain           |                       | PS506P      |
|   | Semi-auto drain                 |                       | PS511P      |
|   | Twist drain                     |                       | PS512P      |
|   | Push 'N' Drain                  |                       | PS513P      |
| Filter element kits –                           | 40 Micron                       |                       | PS701P      |
|   | 5 Micron                        |                       | PS702P      |
|   | Adsorber                        |                       | PS731P      |
| Gauges –  | 60 PSIG (0 to 4.1 bar)          |                       | K4520N14060 |
|   | 160 PSIG (0 to 11.0 bar)        |                       | K4520N14160 |
|   | 300 PSIG (0 to 20.0 bar)        |                       | K4520N14300 |
| Mounting bracket kit (includes panel mount nut) |                                 |                       | PS707P      |
| Panel mount nut                                 |                                 |                       | P04082      |
| Service kits –                                  | Non-relieving (includes poppet) |                       | PS711P      |
|   | Relieving (includes poppet)     |                       | PS710P      |
| Seat insert kit                                 |                                 |                       | PS713P      |
| Springs –                                       | 1- 30 PSIG range                |                       | P01698      |
|   | 1- 60 PSIG range                |                       | P04062      |
|   | 2- 125 PSIG range               |                       | P04063      |
|   | 5- 250 PSIG range               |                       | P04064      |
| Tamperproof kit (key lock)                      |                                 |                       | PS737P      |

  Most popular.



- Space saving package offers both filter and regulator features for optimal performance
- Excellent water removal efficiency
- Rolling diaphragm for extended life
- Quick response, and accurate pressure regulation regardless of changing flow or inlet pressure
- Two high flow 1/4" gauge ports can be used as additional outlets

**Material specifications**

|                        |                             |                                |                  |
|------------------------|-----------------------------|--------------------------------|------------------|
| Adjusting stem         |                             |                                | Steel            |
| Body                   |                             |                                | Zinc             |
| Bonnet, internal parts |                             |                                | Plastic          |
| Bowls                  | Transparent                 |                                | Polycarbonate    |
|                        | Metal                       |                                | Zinc             |
| Bowl guard             |                             |                                | Steel            |
| Collar                 |                             |                                | Plastic or metal |
| Diaphragm              |                             |                                | Nitrile          |
| Drains                 | Manual twist drain standard | Body & nut                     | Plastic          |
|                        |                             | Automatic float drain optional | Float housing    |
|                        |                             | Seals                          | Nitrile          |
|                        |                             | Springs, push rod              | Stainless steel  |
| Filter elements        | 40 Micron (standard)        |                                | Plastic          |
|                        | 5 Micron (optional)         |                                | Plastic          |
| Knob                   |                             |                                | Plastic          |
| Seals                  |                             |                                | Nitrile          |
| Sight gauge            |                             |                                | Polyamide        |
| Springs –              | Poppet                      |                                | Stainless        |
|                        | Control                     |                                | Steel            |



**Operating information**

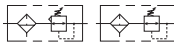
Pressure rating –  
 Polycarbonate bowl 0 to 150 PSIG (0 to 10.4 bar)  
 Metal bowl 0 to 250 PSIG (0 to 17.2 bar)  
 Automatic float drain 15 to 250 PSIG (1.0 to 17.2 bar)


Temperature rating –  
 Polycarbonate bowl 32°F to 125°F (0°C to 52°C)  
 Metal bowl 32°F to 175°F (0°C to 80°C)

Secondary pressure ranges –  
 Standard pressure 2 to 125 PSIG (0 to 8.6 bar)  
 Medium pressure 1 to 60 PSIG (0 to 4.1 bar)  
 High pressure 5 to 250 PSIG (0.4 to 17.2 bar)

For technical information see CD

**07E Standard Filter / Regulators**



|   | Port size | Bowl type           | Drain type | Flow SCFM | Element type | Part number (NPT)              |                   |
|---|-----------|---------------------|------------|-----------|--------------|--------------------------------|-------------------|
|   |           |                     |            |           |              | Pressure range (Without gauge) |                   |
|   |           |                     |            |           |              | 60 PSIG                        | 125 PSIG          |
|  | 1/2"      | Poly / Metal guard  | Twist      | 90        | 5 micron     | <b>07E32A11A*</b>              | <b>07E32A13A*</b> |
|   | 1/2"      | Poly / Metal guard  | Auto float | 90        | 5 micron     | <b>07E36A11A*</b>              | <b>07E36A13A*</b> |
|   | 3/4"      | Poly / Metal guard  | Twist      | 90        | 5 micron     | <b>07E42A11A*</b>              | <b>07E42A13A*</b> |
|   | 3/4"      | Poly / Metal guard  | Auto float | 90        | 5 micron     | <b>07E46A11A*</b>              | <b>07E46A13A*</b> |
|   | 1/2"      | Metal / Sight gauge | Twist      | 90        | 5 micron     | <b>07E34A11A*</b>              | <b>07E34A13A*</b> |
|   | 1/2"      | Metal / Sight gauge | Auto float | 90        | 5 micron     | <b>07E38A11A*</b>              | <b>07E38A13A*</b> |
|   | 3/4"      | Metal / Sight gauge | Twist      | 90        | 5 micron     | <b>07E44A11A*</b>              | <b>07E44A13A*</b> |
|   | 3/4"      | Metal / Sight gauge | Auto float | 90        | 5 micron     | <b>07E48A11A*</b>              | <b>07E48A13A*</b> |

\* Engineering level will be added at factory.

**WARNING**  
 Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

**CAUTION: REGULATOR PRESSURE ADJUSTMENT –**  
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

 Most popular.



General Industrial  
 Air Preparation Products

Liquid  
 Separators

Particulate  
 Filters

Coalescing  
 Filters

Regulators

Pilot  
 Regulators

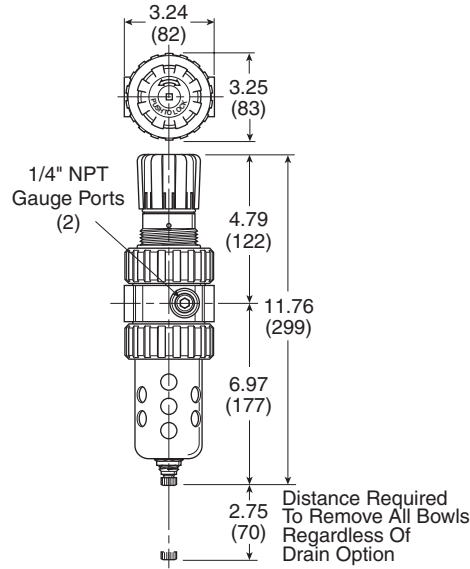
Filter /  
 Regulators

Micro-Mist  
 Lubricators

Mist  
 Lubricators

Combinations

07E



**Service kits**

| Description                                     |                                 |                       | 07E                |
|---|---------------------------------|-----------------------|--------------------|
| Bonnet assembly kit                             |                                 |                       | <b>PS715P</b>      |
| Bowl guard kit                                  |                                 |                       | <b>PS805P</b>      |
| Bowl kits –                                     | Poly bowl –                     | Automatic float drain | <b>PS822P</b>      |
|   |                                 | Twist drain           | <b>PS832P</b>      |
| Metal bowl –                                    | Automatic float drain           | <b>PS826P</b>         |                    |
|   | Semi-auto drain                 | <b>PS894P</b>         |                    |
|   | Twist drain                     | <b>PS834P</b>         |                    |
|   | Sight gauge / Automatic drain   | <b>PS823P</b>         |                    |
|   | Sight gauge / Twist drain       | <b>PS835P</b>         |                    |
| Control knob                                    |                                 |                       | <b>P04069B</b>     |
| Drain kits –                                    | Automatic float drain           |                       | <b>PS506P</b>      |
|   | Semi-auto drain                 |                       | <b>PS511P</b>      |
|   | Twist drain                     |                       | <b>PS512P</b>      |
|   | Push 'N' Drain                  |                       | <b>PS513P</b>      |
| Filter element kits –                           | 40 Micron                       |                       | <b>PS801P</b>      |
|   | 5 Micron                        |                       | <b>PS802P</b>      |
|   | Adsorber                        |                       | <b>PS831P</b>      |
| Gauges –  | 60 PSIG (0 to 4.1 bar)          |                       | <b>K4520N14060</b> |
|   | 160 PSIG (0 to 11.0 bar)        |                       | <b>K4520N14160</b> |
|   | 300 PSIG (0 to 20.0 bar)        |                       | <b>K4520N14300</b> |
| Mounting bracket kit (includes panel mount nut) |                                 |                       | <b>PS807P</b>      |
| Panel mount nut                                 |                                 |                       | <b>P04082</b>      |
| Service kits –                                  | Non-relieving (includes poppet) |                       | <b>PS811P</b>      |
|   | Relieving (includes poppet)     |                       | <b>PS810P</b>      |
| Seat insert kit                                 |                                 |                       | <b>PS813P</b>      |
| Springs –                                       | 1- 30 PSIG range                |                       | <b>P01698</b>      |
|   | 1- 60 PSIG range                |                       | <b>P04062</b>      |
|   | 2- 125 PSIG range               |                       | <b>P04063</b>      |
|   | 5- 250 PSIG range               |                       | <b>P04064</b>      |
| Tamperproof kit (key lock)                      |                                 |                       | <b>PS737P</b>      |

Most popular.



- Port blocks (PB) available to provide 1-1/2" port extension to 1" ported bodies
- Excellent water removal efficiency
- Metal bowl with sight gauge
- Large filter element surface guarantees low pressure drop and increased element life
- Twist drain as standard, optional auto drain
- Self relieving feature plus balanced poppet provides quick response and accurate pressure regulation
- Solid control piston for extended life



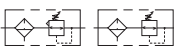
**Material specifications**

|                            |                      |                    |
|----------------------------|----------------------|--------------------|
| Adjusting stem             |                      | Steel              |
| Body, bonnet, bowl         |                      | Aluminum           |
| Drain                      |                      | Plastic            |
| Filter elements –          | 5 micron (standard)  | Plastic            |
|                            | 40 micron (optional) | Plastic            |
|                            | Adsorber (optional)  | Activated charcoal |
| Knob                       |                      | Plastic            |
| Piston                     |                      | Plastic            |
| Polyamide (Nylon)          |                      | Polyamide (nylon)  |
| Springs – poppet & control |                      | Steel              |

**Operating information**

|                                  |                                  |
|----------------------------------|----------------------------------|
| Pressure ratings:                | 0 to 250 PSIG<br>(0 to 17.2 bar) |
| Temperature rating:              | 32°F to 175°F<br>(0°C to 80°C)   |
| For technical information see CD |                                  |

**P3NE Hi-Flow Filter / Regulators**



| Port size | Bowl type           | Drain type | Flow SCFM | Part number (NPT)    |
|-----------|---------------------|------------|-----------|----------------------|
| 3/4"      | Metal / Sight gauge | Twist      | 250       | <b>P3NEA96GSMBNN</b> |
| 3/4"      | Metal / Sight gauge | Auto float | 250       | <b>P3NEA96GSABNN</b> |
| 1"        | Metal / Sight gauge | Twist      | 250       | <b>P3NEA98GSMBNN</b> |
| 1"        | Metal / Sight gauge | Auto float | 250       | <b>P3NEA98GSABNN</b> |
| 1-1/2" #  | Metal / Sight gauge | Twist      | 250       | <b>P3NEA9PGSMBNN</b> |
| 1-1/2" #  | Metal / Sight gauge | Auto float | 250       | <b>P3NEA9PGSABNN</b> |

# 1" port body with 1-1/2" port block

**WARNING**

Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

**CAUTION: REGULATOR PRESSURE ADJUSTMENT –**

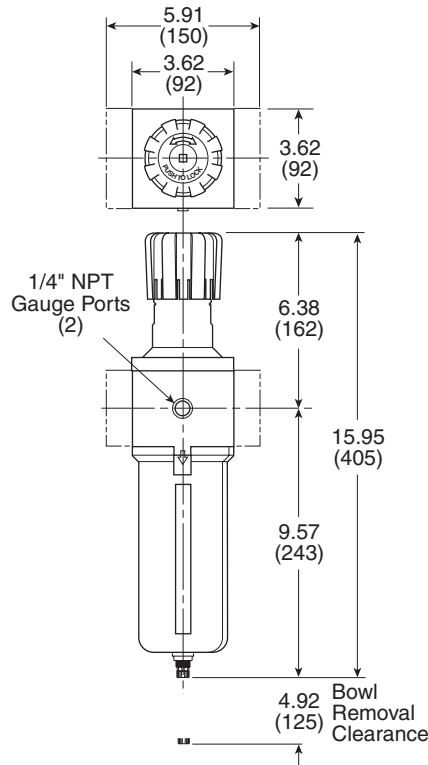
The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular.



|          |  |
|----------|--|
| <b>E</b> | <b>General Industrial Air Preparation Products</b> |
|          | Liquid Separators                                  |
|          | Particulate Filters                                |
|          | Coalescing Filters                                 |
|          | Regulators   |
|          | Pilot Regulators                                   |
|          | Filter / Regulators                                |
|          | Micro-Mist Lubricators                             |
|          | Mist Lubricators                                   |
|          | Combinations                                       |

**P3NE**



**Service kits**

| Description                                      |                          | P3NE               |
|--|--------------------------|--------------------|
| Bowl kits: Metal bowl –                          | Automatic drain          | <b>P3NKA00BSA</b>  |
|  | Twist drain              | <b>P3NKA00BSM</b>  |
|  | Push 'N' Drain           | <b>P3NKA00BSP</b>  |
| Bowl latch kit                                   |                          | <b>C11A33</b>      |
| Control knob                                     |                          | <b>P3NKA00PN</b>   |
| Drain kits –                                     | Automatic float drain    | <b>PS506P</b>      |
|  | Semi-auto drain          | <b>PS511P</b>      |
|  | Twist drain              | <b>PS512P</b>      |
|  | Push 'N' Drain           | <b>PS513P</b>      |
| Filter element kits –                            | 40 Micron                | <b>P3NKA00ESG</b>  |
|  | 5 Micron                 | <b>P3NKA00ESE</b>  |
|  | Adsorber                 | <b>P3NKA00ESA</b>  |
| Gauges –   | 60 PSIG (0 to 4.1 bar)   | <b>K4520N14060</b> |
|  | 160 PSIG (0 to 11.0 bar) | <b>K4520N14160</b> |
|  | 300 PSIG (0 to 17.2 bar) | <b>K4520N14300</b> |
| Mounting bracket kit* (includes panel mount nut) |                          | <b>P3NKA00MW</b>   |
| Service kits –                                   | Non-relieving            | <b>P3NKA00RN</b>   |
|  | Relieving                | <b>P3NKA00RR</b>   |
| Sight gauge kit                                  |                          | <b>P3NKA00PE</b>   |
| Springs –  | 1- 60 PSIG rang)         | <b>C10A1304</b>    |
|  | 2- 125 PSIG range        | <b>C10A1308</b>    |
|  | 5-250 PSIG range (white) | <b>C10A1317</b>    |

**P**

General Industrial  
 Air Preparation Products

Liquid  
 Separators

Particulate  
 Filters

Coalescing  
 Filters

Regulators

Pilot  
 Regulators

Filter /  
 Regulators

Micro-Mist  
 Lubricators

Mist  
 Lubricators

Combinations



- Proportional oil delivery over a wide range of air flows
- Generates oil particles of 5 micron or smaller downstream to lubricate systems having complex piping arrangements
- Precision needle valve assures repeatable oil delivery and provides simple adjustment of delivery rate
- Ideal for low and high flow applications with changing air flow
- Transparent sight dome for 360° visibility
- Yellow fill cap identifies Micro-Mist Lubricator
- 16L: 1/4", 3/8" & 1/2" ports (NPT & BSPP)
- 17L: 1/2" & 3/4" ports (NPT & BSPP)



16L



17L

**Material specifications**

|                                      |                                |
|--------------------------------------|--------------------------------|
| Body                                 | Zinc                           |
| Bowls –                              |                                |
| Transparent                          | Polycarbonate                  |
| Metal                                | Zinc                           |
| Bowl guards                          | Steel                          |
| Collar                               | Plastic (16, 17) or metal (17) |
| Drains, twist / body & nut           | Plastic                        |
| Injector meter block & base assembly | Plastic                        |
| Seals                                | Nitrile                        |
| Sight dome                           | Polycarbonate                  |
| Sight gauge                          | Polyamide (Nylon)              |

**Operating information**

Pressure rating –  
 Polycarbonate bowl 0 to 150 PSIG (0 to 10.4 bar)  
 Metal bowl 0 to 250 PSIG (0 to 17.2 bar)

Temperature rating –  
 Polycarbonate bowl 32°F to 125°F (0°C to 52°C)  
 Metal bowl 32°F to 175°F (0°C to 80°C)



Minimum flow for lubrication: 1 SCFM at 100 PSIG

Suggested lubricant: F442 oil  
 Petroleum based oil of 100 to 200 SSU viscosity at 100°F (38°C) and an aniline point greater than 200°F (93°C)  
 (DO NOT USE OILS WITH ADDITIVES, COMPOUNDED OILS CONTAINING SOLVENTS, GRAPHITE, DETERGENTS, OR SYNTHETIC OILS.)

For technical information see CD

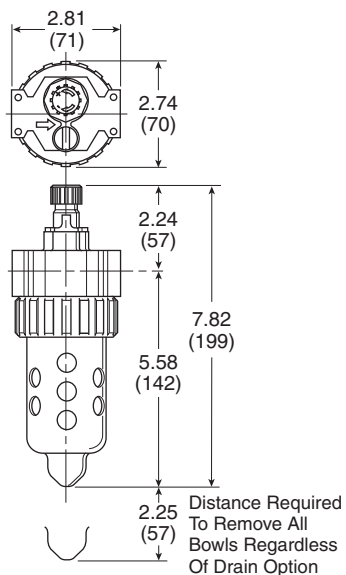
**Compact & Standard Lubricators**



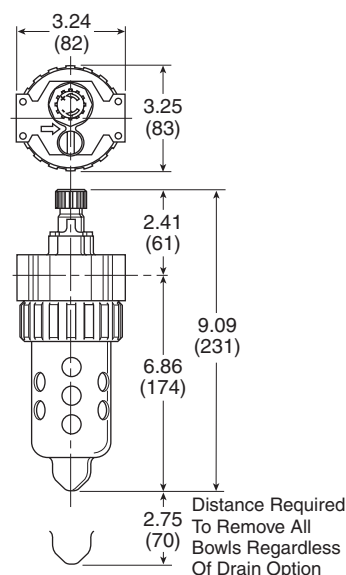
|   | Port size | Bowl type           | Flow SCFM | Part number (NPT) |                |
|---|-----------|---------------------|-----------|-------------------|----------------|
|   |           |                     |           | Twist drain       | No drain       |
|  | 1/4"      | Poly / Metal guard  | 40        |                   | <b>16L12B*</b> |
|   | 1/4"      | Metal / Sight gauge | 40        | <b>16L14B*</b>    |                |
|   | 3/8"      | Poly / Metal guard  | 60        |                   | <b>16L22B*</b> |
|   | 3/8"      | Metal / Sight gauge | 60        | <b>16L24B*</b>    |                |
|   | 1/2"      | Poly / Metal guard  | 90        |                   | <b>16L32B*</b> |
|   | 1/2"      | Metal / Sight gauge | 90        | <b>16L34B*</b>    |                |
|  | 1/2"      | Poly / Metal guard  | 90        |                   | <b>17L32B*</b> |
|   | 1/2"      | Metal / Sight gauge | 90        | <b>17L34B*</b>    |                |
|   | 3/4"      | Poly / Metal guard  | 90        |                   | <b>17L42B*</b> |
|   | 3/4"      | Metal / Sight gauge | 90        | <b>17L44B*</b>    |                |

|                     |                                 |
|---------------------|---------------------------------|
| <b>U</b>            | <b>General Industrial</b>       |
|                     | <b>Air Preparation Products</b> |
| <b>Liquid</b>       | <b>Separators</b>               |
| <b>Particulate</b>  | <b>Filters</b>                  |
| <b>Coalescing</b>   | <b>Filters</b>                  |
| <b>Regulators</b>   | <b>Regulators</b>               |
| <b>Pilot</b>        | <b>Regulators</b>               |
| <b>Filter /</b>     | <b>Regulators</b>               |
| <b>Micro-Mist</b>   | <b>Lubricators</b>              |
| <b>Mist</b>         | <b>Lubricators</b>              |
| <b>Combinations</b> |                                 |

**16L**



**17L**



**Service kits**

| Description               | 16L (Compact)                          | 17L (Standard) |                |
|---------------------------|--|----------------|----------------|
| Adjustment knob           | <b>P04121</b>                          | <b>P04121</b>  |                |
| Bowl guard kit            | <b>PS705P</b>                          | <b>PS805P</b>  |                |
| Bowl Kits:                | Poly bowl – No drain                   | <b>PS746P</b>  | <b>PS846P</b>  |
|                           | Twist drain                            | <b>PS717P</b>  | <b>PS817P</b>  |
|                           | Pressure fill                          | <b>PS719P</b>  | <b>PS819P</b>  |
|                           | Remote fill                            | <b>PS728P</b>  | <b>PS828P</b>  |
|                           | Metal bowl – Sight gauge / Twist drain | <b>PS729P</b>  | <b>PS829P</b>  |
|                           | Sight gauge / Pressure fill            | <b>PS720P</b>  | <b>PS820P</b>  |
| Drain kit                 | Twist drain                            | <b>PS512P</b>  | <b>PS512P</b>  |
| Fill cap kit              |  | <b>PS742P</b>  | <b>PS742P</b>  |
| Lubricator service kit    |  | <b>PS748P</b>  | <b>PS748P</b>  |
| Mounting bracket kit      |  | <b>PS743P</b>  | <b>PS843P</b>  |
| Oil –                     | 1 Gal                                  | <b>F442002</b> | <b>F442002</b> |
|                           | 12 Quart case                          | <b>F442003</b> | <b>F442003</b> |
|                           | 4 Gal case                             | <b>F442005</b> | <b>F442005</b> |
| Pressure fill adapter kit |  | <b>PS716P</b>  | <b>PS716P</b>  |
| Pressure fill button      |  | <b>P11912</b>  | <b>P11912</b>  |
| Remote auto-fill device   |  | <b>PS505CP</b> | <b>PS505CP</b> |
| Sight dome / Fill cap kit |  | <b>PS739P</b>  | <b>PS739P</b>  |
| Sight dome kit            |  | <b>PS740P</b>  | <b>PS740P</b>  |
| Nylon sight dome kit      |  | <b>PS740N</b>  | <b>PS740N</b>  |

- Proportional oil delivery over a wide range of air flows
- Precision needle valve assures repeatable oil delivery and provides simple adjustment of delivery rate
- Ideal for low and high flow applications with changing air flow
- Transparent sight dome for 360° visibility



**Material specifications**

|            |             |               |
|------------|-------------|---------------|
| Body       |             | Zinc          |
| Bowls      | Transparent | Polycarbonate |
|            | Metal       | Zinc          |
| Drains     |             | Plastic       |
| Seals      |             | Nitrile       |
| Sight Dome |             | Polycarbonate |

**Operating information**

Pressure ratings –  
 Polycarbonate bowl 0 to 150 PSIG (0 to 10.3 bar)  
 Metal bowl 0 to 250 PSIG (0 to 17.2 bar)

Temperature rating –  
 Polycarbonate bowl 32°F to 125°F (0°C to 52°C)  
 Metal bowl 32°F to 175°F (0°C to 80°C)

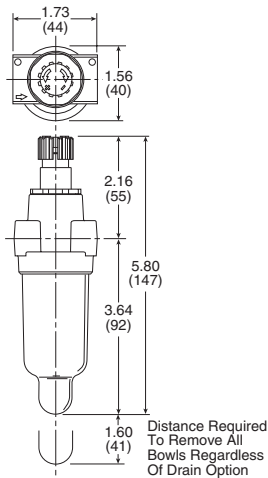
Minimum flow for lubrication: 0.5 SCFM at 100 PSIG  
 For technical information see CD

**04L Miniature Lubricators**



| Port size | Bowl type                 | Drain type | Flow SCFM | Part number (NPT) |
|-----------|---------------------------|------------|-----------|-------------------|
| 1/8"      | Poly                      | None       | 20        | <b>04L00G*</b>    |
| 1/8"      | Metal without sight gauge | Twist      | 20        | <b>04L03G*</b>    |
| 1/4"      | Poly                      | None       | 20        | <b>04L10G*</b>    |
| 1/4"      | Metal without sight gauge | Twist      | 20        | <b>04L13G*</b>    |

\* Engineering level will be added at factory.



**Service kits**

|                      |               |             | 04L (Mini)     |
|----------------------|---------------|-------------|----------------|
| Bowl kits            | Poly bowl     | No drain    | <b>PS421P</b>  |
|                      |               | Twist drain | <b>PS420P</b>  |
|                      | Metal bowl    | Twist drain | <b>PS447BP</b> |
| Mounting bracket kit |               |             | <b>PS4197</b>  |
| Oil                  | 1 Quart       |             | <b>F442001</b> |
|                      | 12 Quart case |             | <b>F442003</b> |
|                      | 4 Gallon case |             | <b>F442005</b> |

- Proportional oil delivery over a wide range of air flows
- Precision needle valve assures repeatable oil delivery and provides simple adjustment of delivery rate
- Bowl can be filled while air line is under pressure
- Transparent sight dome for 360° visibility
- 06L: 1/4", 3/8" & 1/2" ports (NPT & BSPP)
- 07L: 1/2" & 3/4" ports (NPT & BSPP)



06L

07L

**Material specifications**

|                                      |                                |
|--------------------------------------|--------------------------------|
| Body                                 | Zinc                           |
| Bowls –                              |                                |
| Transparent                          | Polycarbonate                  |
| Metal                                | Zinc                           |
| Bowl guards                          | Steel                          |
| Collar                               | Plastic (06, 07) or metal (07) |
| Drain                                | Plastic                        |
| Injector meter block & base assembly | Plastic                        |
| Seals                                | Nitrile                        |
| Sight dome                           | Polycarbonate                  |
| Sight gauge                          | Polyamide (Nylon)              |

**Operating information**

Pressure rating –  
 Polycarbonate bowl           0 to 150 PSIG (0 to 10.4 bar)  
 Metal bowl                    0 to 250 PSIG (0 to 17.2 bar)

Temperature rating –  
 Polycarbonate bowl           32°F to 125°F (0°C to 52°C)  
 Metal bowl                    32°F to 175°F (0°C to 80°C)

Minimum flow for lubrication:   .5 SCFM at 100 PSIG

Suggested lubricant:            F442 oil  
 Petroleum based oil of 100 to 200 SSU viscosity at 100°F (38°C) and an aniline point greater than 200°F (93°C)  
 (DO NOT USE OILS WITH ADDITIVES, COMPOUNDED OILS CONTAINING SOLVENTS, GRAPHITE, DETERGENTS, OR SYNTHETIC OILS.)

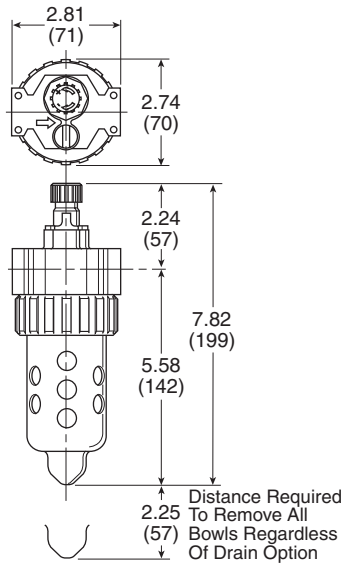
For technical information see CD

**Compact & Standard Lubricators**

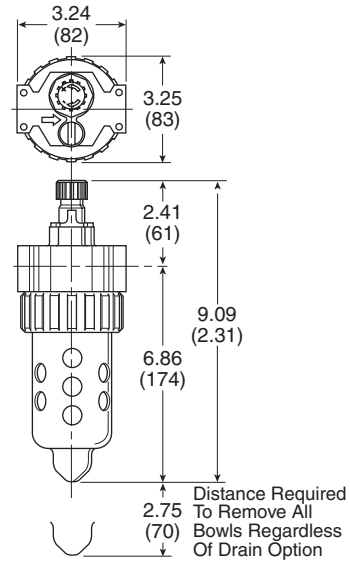


|     | Port size | Bowl type           | Flow SCFM | Part number (NPT) |                |
|-----|-----------|---------------------|-----------|-------------------|----------------|
|     |           |                     |           | Twist drain       | No drain       |
| 06L | 1/4"      | Poly / Metal guard  | 40        |                   | <b>06L12B*</b> |
|     | 1/4"      | Metal / Sight gauge | 40        | <b>06L14B*</b>    |                |
|     | 3/8"      | Poly / Metal guard  | 60        |                   | <b>06L22B*</b> |
|     | 3/8"      | Metal / Sight gauge | 60        | <b>06L24B*</b>    |                |
| 07L | 1/2"      | Poly / Metal guard  | 90        |                   | <b>06L32B*</b> |
|     | 1/2"      | Metal / Sight gauge | 90        | <b>06L34B*</b>    |                |
| 07L | 1/2"      | Poly / Metal guard  | 90        |                   | <b>07L32B*</b> |
|     | 1/2"      | Metal / Sight gauge | 90        | <b>07L34B*</b>    |                |
|     | 3/4"      | Poly / Metal guard  | 90        |                   | <b>07L42B*</b> |
|     | 3/4"      | Metal / Sight gauge | 90        | <b>07L44B*</b>    |                |

**06L**



**07L**



**Service kits**

| Description               | 06L (Compact)               | 07L (Standard) |
|---------------------------|-----------------------------|----------------|
| Adjustment knob           | <b>P04121</b>               | <b>P04121</b>  |
| Bowl guard kit            | <b>PS705P</b>               | <b>PS805P</b>  |
| Bowl Kits – Poly bowl –   | No drain                    | <b>PS746P</b>  |
|                           | Twist drain                 | <b>PS717P</b>  |
|                           | Pressure fill               | <b>PS719P</b>  |
|                           | Remote fill                 | <b>PS728P</b>  |
| Metal bowl –              | Sight gauge / Twist drain   | <b>PS729P</b>  |
|                           | Sight gauge / Pressure fill | <b>PS720P</b>  |
| Drain kit                 | Twist drain                 | <b>PS512P</b>  |
| Fill cap kit              |                             | <b>PS741P</b>  |
| Lubricator service kit    |                             | <b>PS718P</b>  |
| Mounting bracket kit      |                             | <b>PS743P</b>  |
| Oil –                     | 1 Gal                       | <b>F442002</b> |
|                           | 12 Quart case               | <b>F442003</b> |
|                           | 4 Gal case                  | <b>F442005</b> |
| Pressure fill adapter kit |                             | <b>PS716P</b>  |
| Pressure fill button      |                             | <b>P11912</b>  |
| Remote auto-fill device   |                             | <b>PS505CP</b> |
| Sight dome / fill cap kit |                             | <b>PS738P</b>  |
| Sight dome kit            |                             | <b>PS740P</b>  |
| Nylon sight dome kit      |                             | <b>PS740N</b>  |



General Industrial  
 Air Preparation Products

Liquid  
 Separators

Particulate  
 Filters

Coalescing  
 Filters

Regulators

Pilot  
 Regulators

Filter /  
 Regulators

Micro-Mist  
 Lubricators

Mist  
 Lubricators

Combinations

|   |                        |
|---|------------------------|
| General Industrial Air Preparation Products | Liquid Separators      |
|   | Particulate Filters    |
| Coalescing Filters                          | Regulators             |
|   | Pilot Regulators       |
| Filter / Regulators                         | Micro-Mist Lubricators |
|   | Mist Lubricators       |
| Combinations                                |                        |

- Port blocks (PB) available to provide 1-1/2" port extension to 1" ported bodies
- Proportional oil delivery over a wide range of air flows
- Bowl can be filled while air line is under pressure
- Transparent sight dome for 360° visibility
- 3/4", 1" & 1-1/2" ports (NPT, BSPP & BSPT)



**Material specifications**

|                                      |                   |
|--------------------------------------|-------------------|
| Body                                 | Aluminum          |
| Bowls                                | Aluminum          |
| Drains – twist (optional)            | Plastic           |
| Injector meter block & base assembly | Plastic           |
| Seals                                | Nitrile           |
| Sight dome                           | Polycarbonate     |
| Sight gauge                          | Polyamide (Nylon) |

**Operating information**

Pressure ratings: 0 to 250 PSIG (0 to 17.2 bar)  
 Temperature rating: 32°F to 175°F (0°C to 80°C)  
 Flow capacity: 3/4" – 240 SCFM  
 1" – 250 SCFM  
 1-1/2" – 260 SCFM  
 Minimum Flow for Lubrication: 6.6 SCFM at 100 PSIG  
 Suggested lubricant: F442 oil  
 Petroleum based oil of 100 to 200 SSU viscosity at 100°F (38°C) and an aniline point greater than 200°F (93°C)  
 (DO NOT USE OILS WITH ADDITIVES, COMPOUNDED OILS CONTAINING SOLVENTS, GRAPHITE, DETERGENTS, OR SYNTHETIC OILS.)  
 For technical information see CD

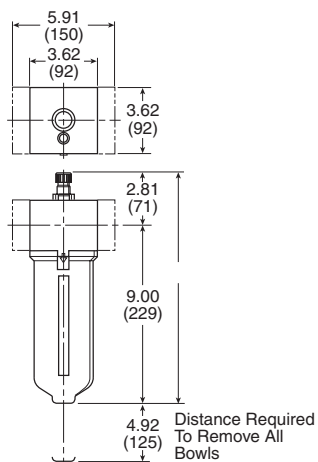
**P3NL Hi-Flow Lubricators**



| Port size                             | Bowl type           | Drain type | Flow SCFM | Part number (NPT) |
|---------------------------------------|---------------------|------------|-----------|-------------------|
| 3/4"                                  | Metal / Sight gauge | None       | 240       | <b>P3NLA96LSN</b> |
| 1"                                    | Metal / Sight gauge | None       | 250       | <b>P3NLA98LSN</b> |
| 1-1/2" #                              | Metal / Sight gauge | None       | 260       | <b>P3NLA9PLSN</b> |
| # 1" port body with 1-1/2" port block |                     |            |           |                   |

**Service kits**

|                           |               | P3NL              |
|---------------------------|---------------|-------------------|
| Adjustment knob           |               | <b>P04121</b>     |
| Bowl kits: Metal bowl –   | No drain      | <b>P3NKA00BSN</b> |
|                           | Twist drain   | <b>P3NKA00BSM</b> |
| Bowl latch kit            |               | <b>C11A33</b>     |
| Drain kit                 | Twist drain   | <b>PS512P</b>     |
| Fill cap kit              |               | <b>P3NKA00PL</b>  |
| Mounting bracket kit      |               | <b>P3NKA00MW</b>  |
| Oil –                     | 1 Quart       | <b>F442001</b>    |
|                           | 12 Quart case | <b>F442003</b>    |
|                           | 4 Gallon case | <b>F442005</b>    |
| Pressure fill adapter kit |               | <b>P3NKA00PK</b>  |
| Service kit               |               | <b>P3NKA00RL</b>  |
| Sight dome kits –         | Polycarbonate | <b>PS740P</b>     |
|                           | Nylon         | <b>PS740N</b>     |
| Sight gauge kit           |               | <b>P3NKA00PE</b>  |



Most popular.



- Metal bowl with sight gauge - standard
- Polycarbonate sight dome
- Bowl can be filled while air line is under pressure
- Proportional oil delivery over a wide range of air flows
- Large capacity bowl
- Optional high capacity bowl(s) available
- Precision needle valve assures repeatable oil delivery and provides simple adjustment of delivery rate
- 3/4", 1", 1-1/4" & 1-1/2" ports (NPT & BSPP)



L606 3/4" & 1"



L606 1-1/4" & 1-1/2"

**Material specifications**

|       |  |
|-------|--|
| Body  | Zinc   |
| Bowl  | (E) 32 oz Aluminum                                 |
|       | (G) 64 oz. Aluminum with polycarbonate sight gauge |
|       | (W) 16 oz Zinc with nylon sight gauge              |
| Seals | Buna N   |

**Operating information**

|   |                          |                                    |
|---|--------------------------|------------------------------------|
| Operating pressure:   | Aluminum bowl (E) 32 oz. | 0 to 300 PSIG<br>(0 to 20.4 bar)   |
|   | Aluminum (G) 64 oz.      | 0 to 150 PSIG<br>(0 to 10.2 bar)   |
|   | Zinc (W) 16 oz.          | 0 to 250 PSIG<br>(0 to 17.2 bar)   |
| Operating temperature:  | Aluminum bowl (E) 32 oz. | 40°F to 150°F<br>(4.4°C to 65.6°C) |
|   | Aluminum (G) 64 oz.      | 40°F to 125°F<br>(4.4°C to 52°C)   |
|   | Zinc (W) 16 oz.          | 40°F to 150°F<br>(4.4°C to 65.6°C) |
| Suggested lubricant:  |                          | F442 oil                           |
| Petroleum based oil of 100 to 200 SSU viscosity at 100°F (38°C) and an aniline point greater than 200°F (93°C)<br>(DO NOT USE OILS WITH ADDITIVES, COMPOUNDED OILS CONTAINING SOLVENTS, GRAPHITE, DETERGENTS, OR SYNTHETIC OILS.) |                          |                                    |
| For technical information see CD  |                          |                                    |

**L606 Lubricators**



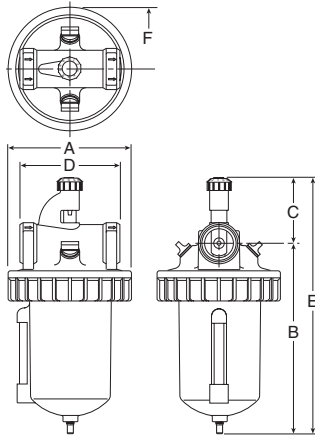
|  | Port size | Bowl type              | Bowl capacity | Drain | Flow SCFM | Part number     |                 |
|--|-----------|------------------------|---------------|-------|-----------|-----------------|-----------------|
|  |           |                        |               |       |           | NPT             | BSPP            |
|  | 3/4"      | Zinc / Sight gauge     | 16 oz         | Yes   | 325       | <b>L606-06W</b> | <b>L606G06W</b> |
|  | 3/4"      | Aluminum               | 32 oz         | Yes   | 325       | <b>L606-06E</b> | <b>L606G06E</b> |
|  | 3/4"      | Aluminum / Sight gauge | 64 oz         | None  | 325       | <b>L606-06G</b> | <b>L606G06G</b> |
|  | 1"        | Zinc / Sight gauge     | 16 oz         | Yes   | 350       | <b>L606-08W</b> | <b>L606G08W</b> |
|  | 1"        | Aluminum               | 32 oz         | Yes   | 350       | <b>L606-08E</b> | <b>L606G08E</b> |
|  | 1"        | Aluminum / Sight gauge | 64 oz         | None  | 350       | <b>L606-08G</b> | <b>L606G08G</b> |
|  | 1-1/4"    | Zinc / Sight gauge     | 16 oz         | Yes   | 325       | <b>L606-10W</b> | <b>L606G10W</b> |
|  | 1-1/4"    | Aluminum               | 32 oz         | Yes   | 325       | <b>L606-10E</b> | <b>L606G10E</b> |
|  | 1-1/4"    | Aluminum / Sight gauge | 64 oz         | None  | 325       | <b>L606-10G</b> | <b>L606G10G</b> |
|  | 1-1/2"    | Zinc / Sight gauge     | 16 oz         | Yes   | 400       | <b>L606-12W</b> | <b>L606G12W</b> |
|  | 1-1/2"    | Aluminum               | 32 oz         | Yes   | 400       | <b>L606-12E</b> | <b>L606G12E</b> |
|  | 1-1/2"    | Aluminum / Sight gauge | 64 oz         | None  | 400       | <b>L606-12G</b> | <b>L606G12G</b> |

Most popular.

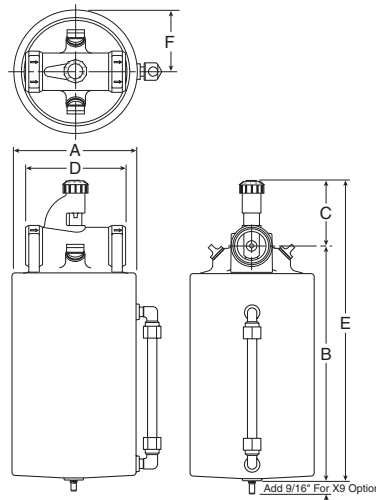




**L606 - 3/4" and 1"**



W & E size bowl



G size bowl

| A | B | C | D | E | F |
|---|---|---|---|---|---|
|---|---|---|---|---|---|

**L606-06W, L606-08W**

|       |       |        |       |       |        |
|-------|-------|--------|-------|-------|--------|
| 4.97  | 7.25  | 2.63   | 4.06  | 9.88  | 2.48   |
| (126) | (184) | (66.7) | (103) | (251) | (63.1) |

**L606-06E, L606-08E**

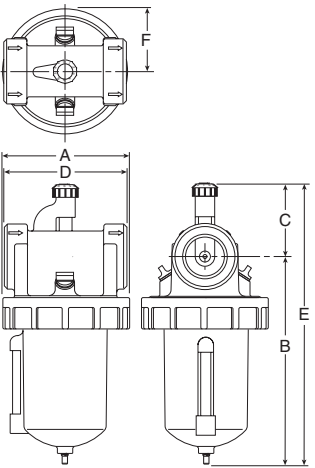
|       |       |        |       |       |        |
|-------|-------|--------|-------|-------|--------|
| 4.97  | 10.75 | 2.63   | 4.06  | 13.38 | 2.48   |
| (126) | (273) | (66.7) | (103) | (340) | (63.1) |

**L606-06G, L606-08G**

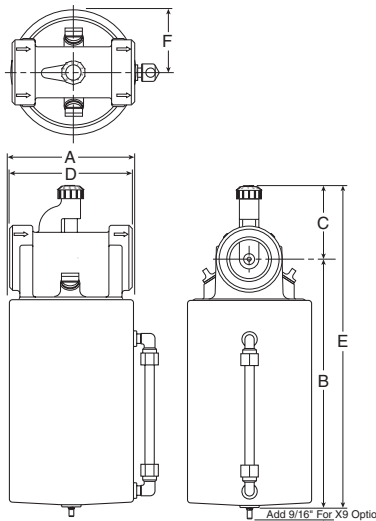
|       |       |      |       |       |      |
|-------|-------|------|-------|-------|------|
| 5.00  | 9.40  | 2.62 | 4.06  | 12.02 | 2.50 |
| (127) | (239) | (66) | (103) | (305) | (64) |

inches (mm)

**L606 - 1-1/4" and 1-1/2"**



W & E size bowl



G size bowl

| A | B | C | D | E | F |
|---|---|---|---|---|---|
|---|---|---|---|---|---|

**L606-10W, L606-12W**

|       |       |        |       |       |        |
|-------|-------|--------|-------|-------|--------|
| 4.97  | 7.63  | 2.84   | 4.81  | 10.47 | 2.48   |
| (126) | (194) | (72.2) | (122) | (266) | (63.1) |

**L606-10E, L606-12E**

|       |       |        |       |       |        |
|-------|-------|--------|-------|-------|--------|
| 4.97  | 11.13 | 2.84   | 4.81  | 13.97 | 2.48   |
| (126) | (283) | (72.2) | (122) | (255) | (63.1) |

**L606-10G, L606-12G**

|       |       |        |       |       |      |
|-------|-------|--------|-------|-------|------|
| 5.00  | 7.99  | 2.84   | 4.81  | 12.80 | 2.50 |
| (127) | (203) | (72.2) | (122) | (325) | (64) |

inches (mm)

**Service kits**

| Description                                | L606   |
|--|--|
| Adjusting knob                             | <b>606Y72</b>  |
| Bowl kits -                                | Aluminum (e) 32 oz<br><b>BK603B</b>                      |
|  | Aluminum (g) 64 oz<br><b>BK606X30B</b>                   |
|  | Zinc / sight gauge (w) 16 oz<br><b>BK609WB</b>           |
| Button head fill fitting (m14 male thread) | <b>L606C14</b>   |
| Dip tube kit                               | <b>DTK606</b>  |
| Drip spout kit                             | <b>RK606SY</b>   |
| Mounting brackets -                        | 3/4 Inch units (2 required per unit)<br><b>SA200AW57</b> |
|  | 1 Inch units (2 required per unit)<br><b>SA200CW57</b>   |
| Oil -                                      | 1 Quart<br><b>F442001</b>                                |
|  | 2 Quart case<br><b>F442003</b>                           |
|  | 4 Gallon case<br><b>F442005</b>                          |
| Repair kits -                              | Needle valve assembly (all)<br><b>RK606Y</b>             |
|  | Sight gauge bowl repair kit (w)<br><b>RKB605WB</b>       |
|  | Sight gauge bowl repair kit (g)<br><b>RKB606X30B</b>     |

- Metal bowl with sight gauge and manual drain – standard
- Transparent sight dome for 360° visibility
- Bowl can be filled while air line is under pressure
- Proportional oil delivery over a wide range of air flows



### Material specifications

Body Zinc alloy, die cast

### Operating information

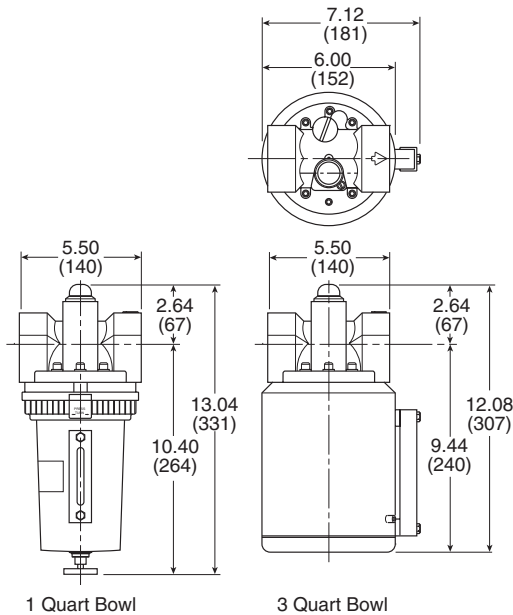
Pressure rating: 0 to 150 PSIG (0 to 10.3 bar)  
 Temperature rating: 32°F to 150°F (0°C to 66°C)  
 Suggested lubricant: F442 oil  
 Petroleum based oil of 100 to 200 SSU viscosity at 100°F (38°C) and an aniline point greater than 200°F (93°C)  
 (DO NOT USE OILS WITH ADDITIVES, COMPOUNDED OILS CONTAINING SOLVENTS, GRAPHITE, DETERGENTS, OR SYNTHETIC OILS.)  
 For technical information see CD

### 09L Lubricator



| Port size | Bowl type           | Bowl capacity | Flow SCFM | Part number (NPT) |
|-----------|---------------------|---------------|-----------|-------------------|
| 2"        | Metal / Sight gauge | 1 quart       | 1000      | <b>09L84B*</b>    |
| 2"        | Metal / Sight gauge | 3 quart       | 1000      | <b>09L8PB*</b>    |

\* Engineering level will be added at factory.



### Service kits

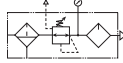
|                        |                                       |                |
|------------------------|---------------------------------------|----------------|
| Bowl kit               | Metal bowl, sight gauge / twist drain | <b>PS612P*</b> |
| Fill cap kit           |                                       | <b>PS610P</b>  |
| Lubricator service kit |                                       | <b>PS607P</b>  |
| Oil                    | 1 Quart                               | <b>F442001</b> |
|                        | 12 Quart case                         | <b>F442003</b> |
|                        | 4 Gallon case                         | <b>F442005</b> |
| Sight dome kit         |                                       | <b>PS613P</b>  |

\* 1 quart bowl.

Most popular.

**Close Nipped Combinations – 14 Miniature Series**

- Regulator can be mounted with knob in up or down position
- 5 micron filter element standard, 40 micron optional
- Manual twist drain
- Relieving regulator

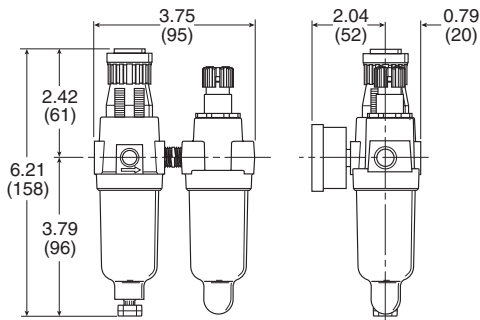


**Close Nipped Combinations**

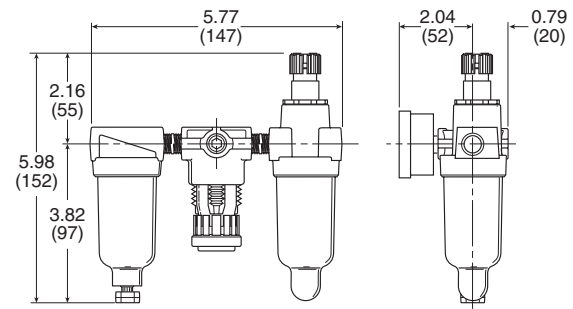
|     | Port size | Bowl type | Element type | Filter drain type | Relief type | Lubricator drain type | Part number (NPT)   |
|-----|-----------|-----------|--------------|-------------------|-------------|-----------------------|---------------------|
| 14G | 1/8"      | Poly      | 5 micron     | Twist             | Relieving   | None                  | <b>14G01B13F0G*</b> |
|     | 1/4"      | Poly      | 5 micron     | Twist             | Relieving   | None                  | <b>14G11B13F0G*</b> |
| 14A | 1/8"      | Poly      | 5 micron     | Twist             | Relieving   | None                  | <b>14A01B13F0G*</b> |
|     | 1/4"      | Poly      | 5 micron     | Twist             | Relieving   | None                  | <b>14A11B13F0G*</b> |

\* Engineering level will be added at factory.

**14G (Close nipped 2-unit)**



**14A (Close nipped 3-unit)**



**Service kits**

|                         |               |                |
|-------------------------|---------------|----------------|
| Mounting bracket kits – | 14E, 14F, 14R | <b>PS417BP</b> |
|                         | 04L           | <b>PS419</b>   |

**WARNING**  
 Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

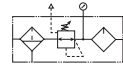
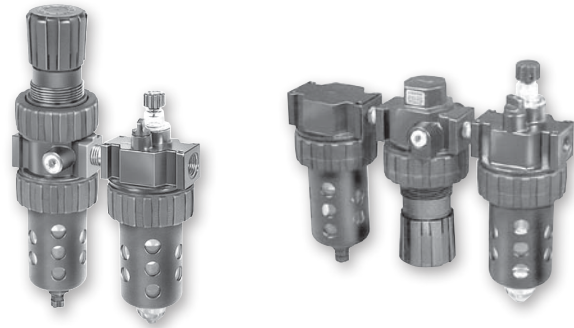
**CAUTION: REGULATOR PRESSURE ADJUSTMENT –**  
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular. For technical information see CD




**Close Nippled Combinations – 06 Compact & 07 Standard Series**

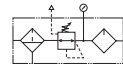
- Regulator can be mounted with knob in up or down position
- 40 micron filter element standard, 5 micron optional
- Manual twist drain
- Relieving regulator




**06G, 16G, 07G, 17G 2-Unit Close Nippled Combinations**

|  | Port | Bowl type          | Element type | Filter drain type | Relief type | Lubricator drain type | Series | Model numbers | Series | Model numbers |
|--|------|--------------------|--------------|-------------------|-------------|-----------------------|--------|---------------|--------|---------------|
| 06G Shown<br> | 1/4" | Poly / Metal guard | 40 micron    | Twist             | Relieving   | None                  | 06G    | 06G12A13A2B*  | 16G    | 16G12A13A2B*  |
|  | 3/8" | Poly / Metal guard | 40 micron    | Twist             | Relieving   | None                  |        | 06G22A13A2B*  |        | 16G22A13A2B*  |
|  | 1/2" | Poly / Metal guard | 40 micron    | Twist             | Relieving   | None                  |        | 06G32A13A2B*  |        | 16G32A13A2B*  |
|  | 1/2" | Poly / Metal guard | 40 micron    | Twist             | Relieving   | None                  | 07G    | 07G32A13A2B*  | 17G    | 17G32A13A2B*  |
|  | 3/4" | Poly / Metal guard | 40 micron    | Twist             | Relieving   | None                  |        | 07G42A13A2B*  |        | 17G42A13A2B*  |

**06A, 16A, 07A, 17A 3-Unit Close Nippled Combinations**



|  | Port | Bowl type          | Element type | Filter drain type | Relief type | Lubricator drain type | Series | Model numbers | Series | Model numbers |
|--|------|--------------------|--------------|-------------------|-------------|-----------------------|--------|---------------|--------|---------------|
| 06A Shown<br> | 1/4" | Poly / Metal guard | 40 micron    | Twist             | Relieving   | None                  | 06A    | 06A12A13A2B*  | 16A    | 16A12A13A2B*  |
|  | 3/8" | Poly / Metal guard | 40 micron    | Twist             | Relieving   | None                  |        | 06A22A13A2B*  |        | 16A22A13A2B*  |
|  | 1/2" | Poly / Metal guard | 40 micron    | Twist             | Relieving   | None                  |        | 06A32A13A2B*  |        | 16A32A13A2B*  |
|  | 1/2" | Poly / Metal guard | 40 micron    | Twist             | Relieving   | None                  | 07A    | 07A32A13A2B*  | 17A    | 17A32A13A2B*  |
|  | 3/4" | Poly / Metal guard | 40 micron    | Twist             | Relieving   | None                  |        | 07A42A13A2B*  |        | 17A42A13A2B*  |

**⚠ WARNING**  
 Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

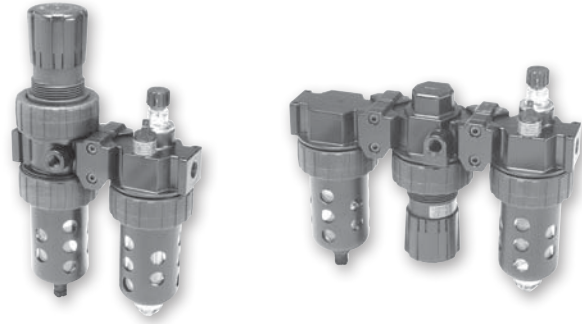
**CAUTION:**  
**REGULATOR PRESSURE ADJUSTMENT –**  
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

  Most popular. For technical information see CD



**Modular Combinations – 06 Compact & 07 Standard Series**

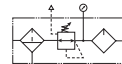
- Regulator can be mounted with knob in up or down position
- 40 micron filter element standard, 5 micron optional
- Manual twist drain
- Relieving regulator



**WARNING**  
 Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

**CAUTION:**  
**REGULATOR PRESSURE ADJUSTMENT –**

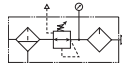
The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.



**06H, 16H, 07H, 17H 2-Unit Modular Combinations**

|  | Port           | Bowl type          | Element type | Filter drain type | Relief type | Lubricator drain type | Series | Model numbers        | Series | Model numbers        |
|--|----------------|--------------------|--------------|-------------------|-------------|-----------------------|--------|----------------------|--------|----------------------|
|  | 06H Shown 1/4" | Poly / Metal guard | 40 micron    | Twist             | Relieving   | None                  |        | <b>06H12A13A2B*</b>  |        | <b>16H12A13A2B*</b>  |
|  | 3/8"           | Poly / Metal guard | 40 micron    | Twist             | Relieving   | None                  | 06H    | <b>06H22A13A2B*</b>  | 16H    | <b>16H22A13A2B*</b>  |
|  | 1/2" *         | Poly / Metal guard | 40 micron    | Twist             | Relieving   | None                  |        | <b>06H32A13A2B*G</b> |        | <b>16H32A13A2B*G</b> |
|  | 1/2"           | Poly / Metal guard | 40 micron    | Twist             | Relieving   | None                  | 07H    | <b>07H32A13A2B*</b>  | 17H    | <b>17H32A13A2B*</b>  |
|  | 3/4"           | Poly / Metal guard | 40 micron    | Twist             | Relieving   | None                  |        | <b>07H42A13A2B*</b>  |        | <b>17H42A13A2B*</b>  |

\* 06 / 16 Available with port blocks only.



**06B, 16B, 07B, 17B 3-Unit Modular Combinations**

|  | Port           | Bowl type          | Element type | Filter drain type | Relief type | Lubricator drain type | Series | Model numbers        | Series | Model numbers        |
|--|----------------|--------------------|--------------|-------------------|-------------|-----------------------|--------|----------------------|--------|----------------------|
|  | 06B Shown 1/4" | Poly / Metal guard | 40 micron    | Twist             | Relieving   | None                  |        | <b>06B12A13A2B*</b>  |        | <b>16B12A13A2B*</b>  |
|  | 3/8"           | Poly / Metal guard | 40 micron    | Twist             | Relieving   | None                  | 06B    | <b>06B22A13A2B*</b>  | 16B    | <b>16B22A13A2B*</b>  |
|  | 1/2" *         | Poly / Metal guard | 40 micron    | Twist             | Relieving   | None                  |        | <b>06B32A13A2B*G</b> |        | <b>16B32A13A2B*G</b> |
|  | 1/2"           | Poly / Metal guard | 40 micron    | Twist             | Relieving   | None                  | 07B    | <b>07B32A13A2B*</b>  | 17B    | <b>17B32A13A2B*</b>  |
|  | 3/4"           | Poly / Metal guard | 40 micron    | Twist             | Relieving   | None                  |        | <b>07B42A13A2B*</b>  |        | <b>17B42A13A2B*</b>  |

\* 06 / 16 available with port blocks only.

**Modular service kits**

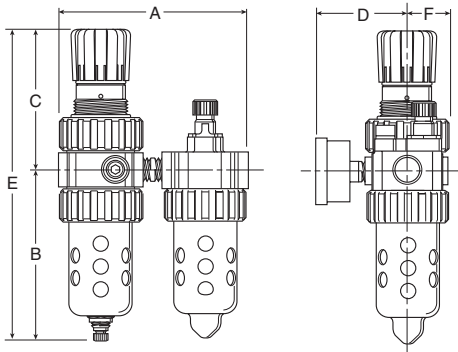
| Description            | 06 Series     | 07 Series     | Description               | Series      | Size | NPT            | BSPP            | BSPT           |
|------------------------|---------------|---------------|---------------------------|-------------|------|----------------|-----------------|----------------|
| Body connectors        | <b>PS754P</b> | <b>PS854P</b> | Port block connector kits | 06 Series – | 1/4" | <b>PS750P</b>  | <b>PS765P†</b>  | <b>PS761P</b>  |
| Lockout valves         | <b>PS756P</b> | <b>PS856P</b> |                           |             | 3/8" | <b>PS751P</b>  | <b>PS766P†</b>  | <b>PS762P</b>  |
| Modular manifold block | <b>PS757P</b> | <b>PS857P</b> |                           |             | 1/2" | <b>PS752P*</b> | <b>PS767P*†</b> | <b>PS799P*</b> |
| Wall mounting kit      | <b>PS755P</b> | <b>PS755P</b> |                           | 07 Series – | 1/4" | <b>PS850P</b>  | <b>PS865P</b>   | <b>PS861P</b>  |
|                        |               |               |                           |             | 3/8" | <b>PS851P</b>  | <b>PS866P</b>   | <b>PS862P</b>  |
|                        |               |               |                           |             | 1/2" | <b>PS852P</b>  | <b>PS867P‡</b>  | <b>PS863P</b>  |
|                        |               |               |                           |             | 3/4" | <b>PS853P</b>  | <b>PS860P</b>   | <b>PS864P</b>  |

Use 1/4 or 3/8 ported bodies. † 1/4, 3/8 & 1/2 inch meet ISO 1179-1 Standard. ‡ 1/2 inch meets ISO 1179-1 Standard.

Most popular. For technical information see CD



**Combination Dimensions – 06 Compact & 07 Standard Series**



**06G, 16G Series**

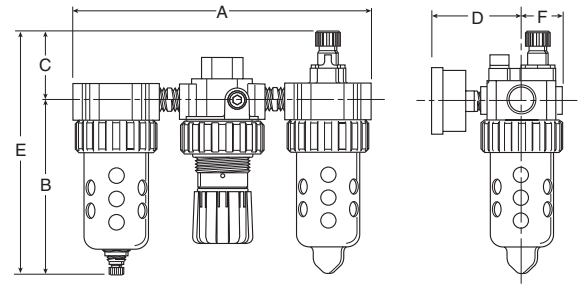
| A     | B     | C     | D    | E     | F    |
|-------|-------|-------|------|-------|------|
| 6.13  | 5.69  | 4.69  | 3.18 | 10.38 | 1.37 |
| (156) | (145) | (119) | (81) | (264) | (35) |

**07G, 17G Series**

| A     | B     | C     | D    | E     | F    |
|-------|-------|-------|------|-------|------|
| 6.99  | 6.97  | 4.79  | 3.44 | 11.76 | 1.63 |
| (178) | (177) | (122) | (87) | (299) | (41) |

Inches (mm)

• All dimensions nominal.



**06A, 16A Series**

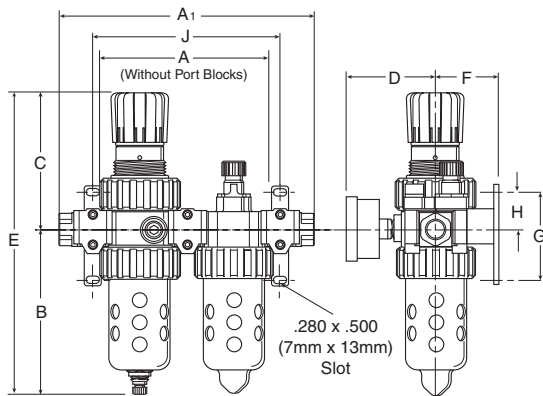
| A     | B     | C    | D    | E     | F    |
|-------|-------|------|------|-------|------|
| 9.45  | 5.69  | 2.24 | 3.18 | 7.93  | 1.37 |
| (240) | (145) | (57) | (81) | (201) | (35) |

**07A, 17A Series**

| A      | B     | C    | D    | E     | F    |
|--------|-------|------|------|-------|------|
| 10.74  | 6.97  | 2.41 | 3.44 | 9.38  | 1.63 |
| (2738) | (177) | (61) | (87) | (238) | (41) |

Inches (mm)

• All dimensions nominal.



**06H, 16H Series**

| A     | A1    | B     | C     | D    | E     |
|-------|-------|-------|-------|------|-------|
| 6.10  | 9.04  | 5.69  | 4.69  | 3.18 | 10.38 |
| (155) | (230) | (145) | (119) | (81) | (264) |

| F    | G    | H    | J     |
|------|------|------|-------|
| 2.00 | 3.58 | 1.40 | 6.65  |
| (51) | (91) | (36) | (169) |

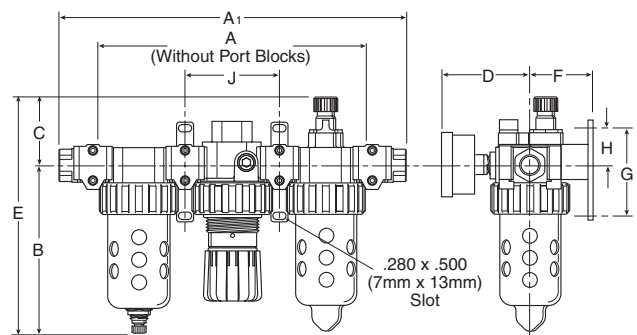
**07H, 17H Series**

| A     | A1    | B     | C     | D    | E     |
|-------|-------|-------|-------|------|-------|
| 7.00  | 10.28 | 6.97  | 4.79  | 3.44 | 11.76 |
| (178) | (261) | (177) | (122) | (87) | (299) |

| F    | G    | H    | J     |
|------|------|------|-------|
| 2.09 | 3.58 | 1.40 | 7.51  |
| (53) | (91) | (36) | (191) |

Inches (mm)

• All dimensions nominal.



**06B, 16B Series**

| A     | A1    | B     | C    | D    | E     |
|-------|-------|-------|------|------|-------|
| 9.46  | 12.39 | 5.69  | 2.24 | 3.18 | 7.93  |
| (240) | (315) | (145) | (57) | (81) | (202) |

| F    | G    | H    | J    |
|------|------|------|------|
| 2.00 | 3.58 | 1.40 | 3.33 |
| (51) | (91) | (36) | (85) |

**07B, 17B Series**

| A     | A1    | B     | C    | D    | E     |
|-------|-------|-------|------|------|-------|
| 10.75 | 14.03 | 6.97  | 2.41 | 3.44 | 9.38  |
| (273) | (356) | (177) | (61) | (87) | (238) |

| F    | G    | H    | J    |
|------|------|------|------|
| 2.18 | 3.58 | 1.40 | 3.76 |
| (55) | (91) | (36) | (95) |

Inches (mm)

• All dimensions nominal.

**E**

General Industrial  
 Air Preparation Products

Liquid  
 Separators

Particulate  
 Filters

Coalescing  
 Filters

Regulators

Pilot  
 Regulators

Filter /  
 Regulators

Micro-Mist  
 Lubricators

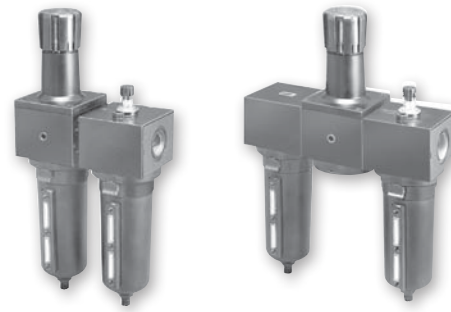
Mist  
 Lubricators

Combinations

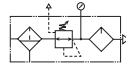




**Combinations – P3N Hi-Flow Series**

- Regulator can be mounted with knob in up or down position
- 40 micron filter element standard, 5 micron optional
- Manual twist drain
- Relieving regulator



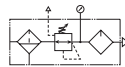
**Close Nipped Combinations**





|   |       | Port size | Bowl type | Element type | Filter drain type | Relief type | Lubricator drain type | Part number (NPT)      |
|---|-------|-----------|-----------|--------------|-------------------|-------------|-----------------------|------------------------|
|  | P3N3A | 3/4"      | Metal     | 40 micron    | Twist             | Relieving   | None                  | <b>P3N3A96SGMNNLNA</b> |
|   |       | 1"        | Metal     | 40 micron    | Twist             | Relieving   | None                  | <b>P3N3A98SGMNNLNA</b> |
|   |       | 1-1/2" #  | Metal     | 40 micron    | Twist             | Relieving   | None                  | <b>P3N3A9PSGMNNLNA</b> |
|  | P3N3B | 3/4"      | Metal     | 40 micron    | Twist             | Relieving   | None                  | <b>P3N3B96SGMNNLNA</b> |
|   |       | 1"        | Metal     | 40 micron    | Twist             | Relieving   | None                  | <b>P3N3B98SGMNNLNA</b> |
|   |       | 1-1/2" #  | Metal     | 40 micron    | Twist             | Relieving   | None                  | <b>P3N3B9PSGMNNLNA</b> |

**Notes:** All combo part numbers are with regulator knob in up position.  
 # 1" Port body with 1-1/2" port block.

**Modular Combinations**



|   |       | Port size | Bowl type | Element type | Filter drain type | Pressure range | Relief type | Lubricator drain type | Part number (NPT)      |
|---|-------|-----------|-----------|--------------|-------------------|----------------|-------------|-----------------------|------------------------|
|  | P3NCA | 3/4"      | Metal     | 40 micron    | Twist             | 0-125          | Relieving   | None                  | <b>P3NCA96SGMNNLNA</b> |
|   |       | 1"        | Metal     | 40 micron    | Twist             | 0-125          | Relieving   | None                  | <b>P3NCA98SGMNNLNA</b> |
|   |       | 1-1/2" #  | Metal     | 40 micron    | Twist             | 0-125          | Relieving   | None                  | <b>P3NCA9PSGMNNLNA</b> |
|  | P3NCB | 3/4"      | Metal     | 40 micron    | Twist             | 0-125          | Relieving   | None                  | <b>P3NCB96SGMNNLNA</b> |
|   |       | 1"        | Metal     | 40 micron    | Twist             | 0-125          | Relieving   | None                  | <b>P3NCB98SGMNNLNA</b> |
|   |       | 1-1/2" #  | Metal     | 40 micron    | Twist             | 0-125          | Relieving   | None                  | <b>P3NCB9PSGMNNLNA</b> |

**Notes:** All combo part numbers are with regulator knob in up position.  
 # 1" Port body with 1-1/2" port block.

**WARNING**

Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

**CAUTION: REGULATOR PRESSURE ADJUSTMENT –**

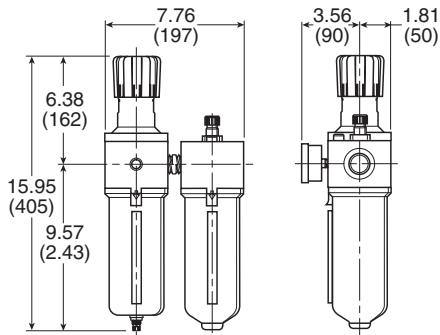
The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular. For technical information see CD

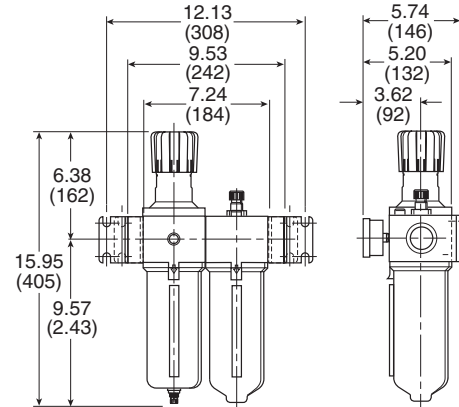




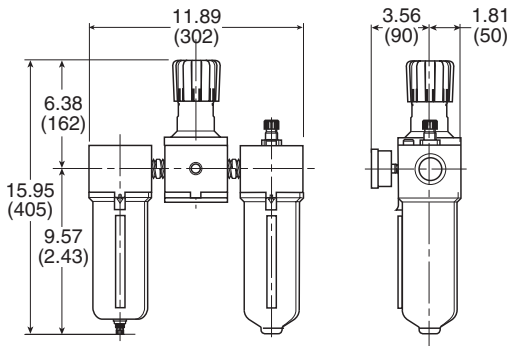
**P3N3A (Close nipped 2-unit)**



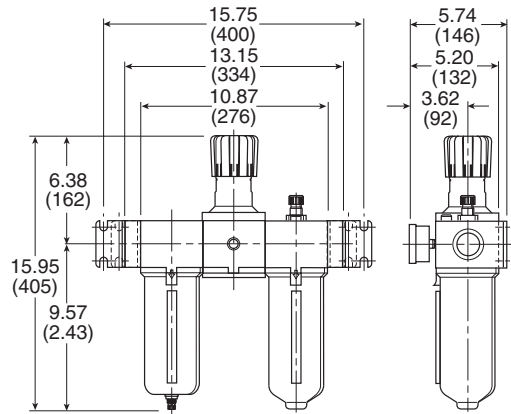
**P3NCA (Modular 2-unit)**



**P3N3B (Close nipped 3-unit)**



**P3N3CB (Modular 3-unit)**



**Service kits**

|  |                  |                  |                  |
|--|------------------|------------------|------------------|
| Mounting bracket kit   | <b>P3NKA00MW</b> |                  |                  |
| Replacement body cover   | <b>P3NKA00PM</b> |                  |                  |
| Port block kits  | <b>3/4"</b>      | <b>1"</b>        | <b>1-1/2"</b>    |
| Individual filters, individual regulators and 2-piece filter and regulator assemblies:   |                  |                  |                  |
| NPT  | <b>P3NKB96CP</b> | <b>P3NKB98CP</b> | <b>P3NKB9BCP</b> |
| BSPP   | <b>P3NKB16CP</b> | <b>P3NKB18CP</b> | <b>P3NKB1BCP</b> |
| 2 and 3 piece combinations including a lubricator (FR/L & FRL), individual lubricators, individual coalescing filters and 2-piece filter and coalescer assemblies: |                  |                  |                  |
| NPT  | <b>P3NKB96CL</b> | <b>P3NKB98CL</b> | <b>P3NKB9BCL</b> |
| BSPP   | <b>P3NKB16CL</b> | <b>P3NKB18CL</b> | <b>P3NKB1BCL</b> |

**E**

General Industrial  
Air Preparation Products

Liquid  
Separators

Particulate  
Filters

Coalescing  
Filters

Regulators

Pilot  
Regulators

Filter /  
Regulators

Micro-Mist  
Lubricators

Mist  
Lubricators

Combinations

- Regulator can be mounted with knob in up or down position
- 40 micron filter element
- Gauges included on combinations
- Manual twist drain
- Relieving regulator



General Industrial  
 Air Preparation Products

Liquid  
 Separators

Particulate  
 Filters

Coalescing  
 Filters

Regulators

Pilot  
 Regulators

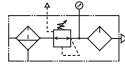
Filter /  
 Regulators

Micro-Mist  
 Lubricators

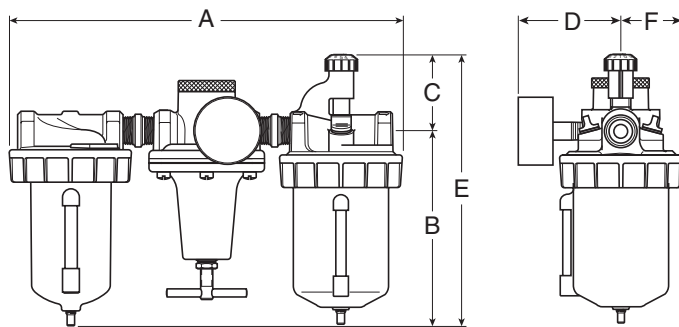
Mist  
 Lubricators

Combinations

**C628 Standard Combinations**



|  | Port size | Bowl type                   | Bowl capacity | Element type | Part number           |
|--|-----------|-----------------------------|---------------|--------------|-----------------------|
|  | 3/4"      | Metal / Sight gauge         | 16 oz         | 40 micron    | <b>C628-06FRLWJCW</b> |
|  | 3/4"      | Metal / Without sight gauge | 32 oz         | 40 micron    | <b>C628-06FRLEJCE</b> |
|  | 1"        | Metal / Sight gauge         | 16 oz         | 40 micron    | <b>C628-08FRLWJCW</b> |
|  | 1"        | Metal / Without sight gauge | 32 oz         | 40 micron    | <b>C628-08FRLEJCE</b> |
|  | 1-1/4"    | Metal / Sight gauge         | 16 oz         | 40 micron    | <b>C628-10FRLWJCW</b> |
|  | 1-1/4"    | Metal / Without sight gauge | 32 oz         | 40 micron    | <b>C628-10FRLEJCE</b> |
|  | 1-1/2"    | Metal / Sight gauge         | 16 oz         | 40 micron    | <b>C628-12FRLWJCW</b> |
|  | 1-1/2"    | Metal / Without sight gauge | 32 oz         | 40 micron    | <b>C628-12FRLEJCE</b> |



| A                             | B             | C             | D            | E              | F            |
|-------------------------------|---------------|---------------|--------------|----------------|--------------|
| <b>C628-06FRL, C628-08FRL</b> |               |               |              |                |              |
| 15.75<br>(400)                | 7.75<br>(197) | 5.25<br>(133) | 3.52<br>(89) | 13.00<br>(330) | 2.48<br>(63) |
| <b>C628-10FRL, C628-12FRL</b> |               |               |              |                |              |
| 16.50<br>(419)                | 8.13<br>(206) | 6.00<br>(152) | 3.86<br>(98) | 14.13<br>(359) | 2.64<br>(67) |

Inches (mm)  
 • All dimensions nominal.

**WARNING**  
 Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

**CAUTION:**  
**REGULATOR PRESSURE ADJUSTMENT –**  
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular. For technical information see CD



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- Fluorocarbon seals standard
- Meets NACE specifications MR-01-75/ISO 15156
- 1/8" female threaded drain



Stainless Steel  
Air Preparation Products

Filters

Regulators

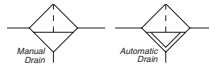
Filter  
Regulators

Lubricators

**Operating information**

|                                  |             | PF504                            | PF10                             | PF501                            | PF11                             |
|----------------------------------|-------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| Operating pressure:              | Twist drain | 0 to 300 PSIG<br>(0 to 20.7 bar) | 0 to 300 PSIG<br>(0 to 20.7 bar) | 0 to 300 PSIG<br>(0 to 20.7 bar) | 0 to 300 PSIG<br>(0 to 20.7 bar) |
|                                  | Auto drain  | 10 to 175 PSIG<br>(0 to 12 bar)  | 10 to 175 PSIG<br>(0 to 12 bar)  | 10 to 175 PSIG<br>(0 to 12 bar)  | 10 to 175 PSIG<br>(0 to 12 bar)  |
| Operating temperature:           | Twist drain | 0°F to 180°F<br>(-18°C to 82°C)  | 0°F to 180°F<br>(-18°C to 82°C)  | 0°F to 180°F<br>(-18°C to 82°C)  | 0°F to 180°F<br>(-18°C to 82°C)  |
|                                  | Auto drain  | 32°F to 150°F<br>(0°C to 66°C)   | 32°F to 150°F<br>(0°C to 66°C)   | 32°F to 150°F<br>(0°C to 66°C)   | 32°F to 150°F<br>(0°C to 66°C)   |
| Flow / SCFM (dm³/s):             |             | 23 (10.85)                       | 70 (33.04)                       | 16 (7.55)                        | 45 (21.24)                       |
| For technical information see CD |             |                                  |                                  |                                  |                                  |

**Particulate Filters**



| Port Size | Flow SCFM (dm³/s) | Standard filtration | Part number manual drain | Part number auto drain |
|-----------|-------------------|---------------------|--------------------------|------------------------|
| 1/4       | 23 (10.85)        | 20 µ                | <b>PF504-02DHSS</b>      | <b>PF504-02DHRSS</b>   |
| 1/2       | 70 (33.04)        | 40 µ                | <b>PF10-04WJSS</b>       | <b>PF10-04WJRSS</b>    |

**Coalescing Filters**



| Port Size | Flow SCFM (dm³/s) | Standard filtration | Part number manual drain | Part number auto drain |
|-----------|-------------------|---------------------|--------------------------|------------------------|
| 1/4       | 16 (7.55)         | .3 µ                | <b>PF501-02DHSS</b>      | <b>PF501-02DHRSS</b>   |
| 1/2       | 45 (21.24)        | .01 µ               | <b>PF11-04WJSS</b>       | <b>PF11-04WJRSS</b>    |

**Service kits**

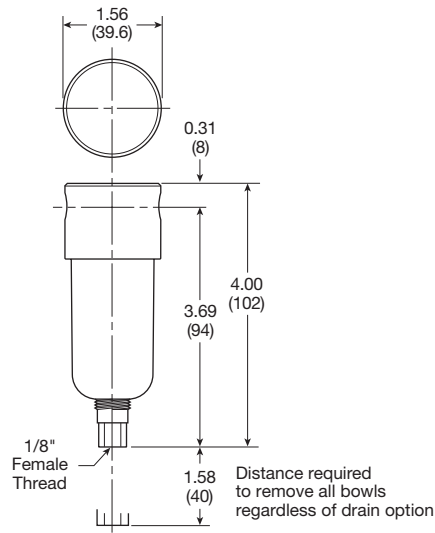
| Description      |                           | PF504              | PF10               | PF501              | PF11            |
|------------------|---------------------------|--------------------|--------------------|--------------------|-----------------|
| Drain kit -      | automatic pulse           | <b>RK504SY-SS</b>  |                    | <b>RK504SY-SS</b>  |                 |
|                  | automatic float           |                    | <b>SA10MDSS</b>    |                    | <b>SA10MDSS</b> |
|                  | manual twist, small (old) | <b>SA600Y7-1SS</b> | <b>SA600Y7-1SS</b> | <b>SA600Y7-1SS</b> |                 |
|                  | manual twist, large (new) | <b>SAP05481</b>    | <b>SAP05481</b>    | <b>SAP05481</b>    |                 |
| Filter element - | 5 micron (particulate)    | <b>EK504VY</b>     | <b>EK55J</b>       |                    |                 |
|                  | 20 micron (particulate)   | <b>EK504Y</b>      |                    |                    |                 |
|                  | 40 micron (particulate)   |                    | <b>EK55G</b>       |                    |                 |
|                  | 0.3 micron (coalescing)   |                    |                    | <b>EK501H</b>      |                 |
|                  | 0.01 micron (coalescing)  |                    |                    |                    | <b>EKF71</b>    |
| Pipe nipple      | <b>616Y28-SS</b>          | <b>616A28-SS</b>   | <b>616Y28-SS</b>   | <b>616A28-SS</b>   |                 |

Most popular.

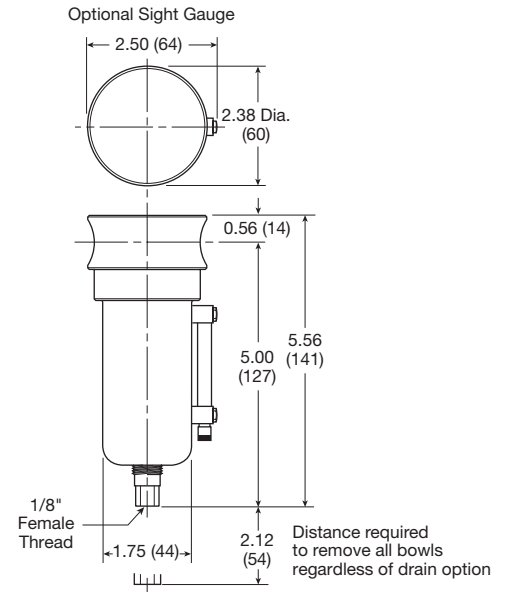


**P**  
**Stainless Steel**  
**Air Preparation Products**  
**Filters**  
**Regulators**  
**Filter Regulators**  
**Lubricators**

**PF504 / PF501**



**PF10 / PF11**



**Specifications**

| Description   | PF504             | PF10              | PF501             | PF11              |
|---------------|-------------------|-------------------|-------------------|-------------------|
| Filter rating | 20 micron         | 40 micron         | 0.3 micron        | 0.01 micron       |
| Port threads  | 1/4               | 1/2               | 1/4               | 1/2               |
| Weight        | 0.6 lb. (0.27 kg) | 1.9 lb. (0.85 kg) | 0.6 lb. (0.27 kg) | 1.9 lb. (0.85 kg) |

**Material specifications**

| Description    | PF504               | PF10                | PF501               | PF11                |
|----------------|---------------------|---------------------|---------------------|---------------------|
| Body           | 316 stainless steel | 316 stainless steel | 316 stainless steel | 316 stainless steel |
| Bowls          | 316 stainless steel | 316 stainless steel | 316 stainless steel | 316 stainless steel |
| Deflector      | Acetal              | Acetal              |                     |                     |
| Drain          | 316 stainless steel | 316 stainless steel | 316 stainless steel | 316 stainless steel |
| Element holder | Acetal              | Acetal              | Acetal              | Acetal              |
| Filter element | Polyethylene        | Polyethylene        | Borosilicate fiber  | Borosilicate fiber  |
| Seals          | Fluorocarbon        | Fluorocarbon        | Fluorocarbon        | Fluorocarbon        |
| Sight gauge    |                     | Isoplast            |                     | Isoplast            |

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| Operating information             |                              |                              |
|-----------------------------------|------------------------------|------------------------------|
|                                   | PR354 & PR11                 | PR364 & PR10                 |
| Operating pressure:               | 300 PSIG Max (20.7 bar)      | 300 PSIG Max (20.7 bar)      |
| Operating temperature:            | 0°F to 180°F (-18°C to 82°C) | 0°F to 150°F (-18°C to 66°C) |
| Flow / SCFM (dm <sup>3</sup> /s): | 12 (5.66)                    | 80 (37.76)                   |
| For technical information see CD  |                              |                              |

**Regulators**

| Port size | Adjustment type   | Flow SCFM (dm <sup>3</sup> /s) | Part number 0 to 125 PSIG |
|-----------|-------------------|--------------------------------|---------------------------|
| 1/4       | Knob version      | 12 (5.66)                      | PR364-02CSS               |
| 1/4       | All metal version | 12 (5.66)                      | PR354-02CSS               |
| 1/2       | Knob version      | 80 (37.76)                     | PR10-04CSS                |
| 1/2       | T-handle version  | 80 (37.76)                     | PR11-04CSS                |

**Service kits**

| Description                                 |                  | PR354         | PR364         | PR10          | PR11          |
|---|------------------|---------------|---------------|---------------|---------------|
| Bonnet Kit                                  |                  | CKR354YSS     | CKR364YSS     | CKR10YSS      | CKR11YSS      |
| Gauge, stainless – 160 PSIG (0 to 1100 kPa) | 1-1/2" Face      | K4515N14160SS | K4515N14160SS |               |               |
|   | 2" Face          |               |               | K4520N14160SS | K4520N14160SS |
| Panel mount bracket (stainless)             |                  | 161X57-SS     | 161X57-SS     | R10Y57-SS     | R10Y57-SS     |
| Panel mount nut –                           | stainless        | R05X51-SS     | R05X51-SS     | R10X51-SS     | R10X51-SS     |
|   | plastic          | R05X51-P      | R05X51-P      | R10X51-P      | R10X51-P      |
| Pipe nipple, 316 stainless steel            |                  | 616Y28-SS     | 616Y28-SS     | 616A28-SS     | 616A28-SS     |
| Service Kit –                               | relieving        | RKR364YSS     | RKR364YSS     | RKR10YSS      | RKR10YSS      |
|   | non-relieving    | RKR364KYSS    | RKR364KYSS    | RKR10KYSS     | RKR10KYSS     |
| Springs –                                   | 0-25 PSIG range  | SPR-375-2-SS  | SPR-375-2-SS  | SPR-388-1-SS  | SPR-388-1-SS  |
|   | 0-60 PSIG range  | SPR-376-1-SS  | SPR-376-1-SS  | SPR-389-1-SS  | SPR-389-1-SS  |
|   | 0-125 PSIG range | SPR-377-1-SS  | SPR-377-1-SS  | SPR-390-1-SS  | SPR-390-1-SS  |

Most popular.

**P**

Stainless Steel  
 Air Preparation Products

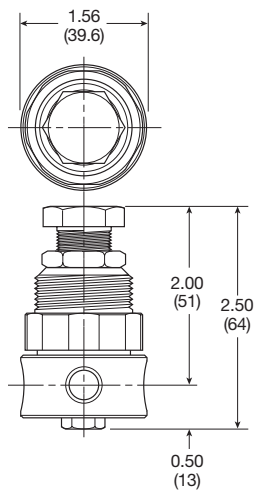
Filters

Regulators

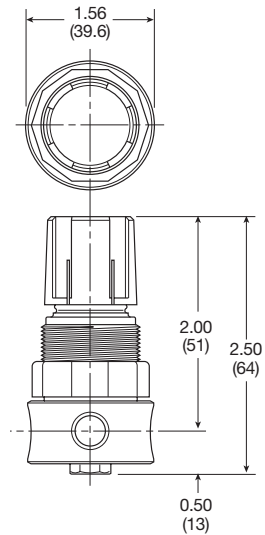
Filter  
 Regulators

Lubricators

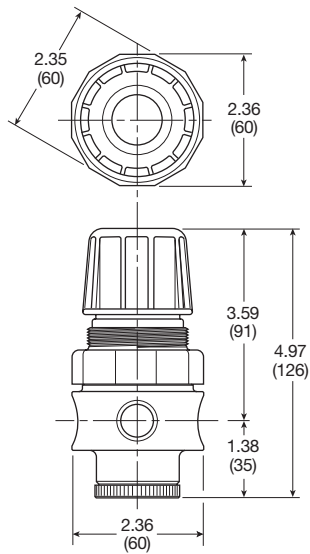
**PR354**



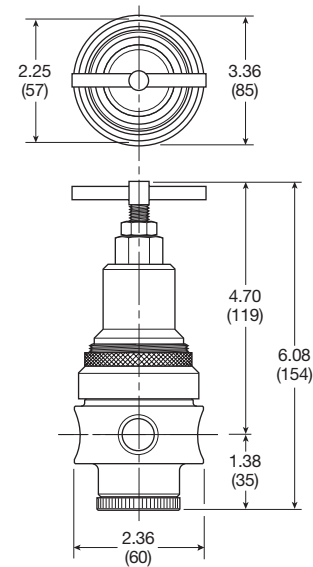
**PR364**



**PR10**



**PR11**



**Specifications**

| Description  | PR354                  | PR364                  | PR10                   | PR11                   |
|--------------|------------------------|------------------------|------------------------|------------------------|
| Gauge port   | 1/4                    | 1/4                    | 1/4                    | 1/4                    |
| Operation    | Fluorocarbon diaphragm | Fluorocarbon diaphragm | Fluorocarbon diaphragm | Fluorocarbon diaphragm |
| Port threads | 1/4                    | 1/4                    | 1/2                    | 1/2                    |
| Weight       | 0.5 lb. (0.23 kg)      | 0.5 lb. (0.23 kg)      | 1.79 lb. (0.81 kg)     | 1.79 lb. (0.81 kg)     |

**Material specifications**

| Description                     | PR354               | PR364               | PR10                | PR11                |
|---------------------------------|---------------------|---------------------|---------------------|---------------------|
| Adjustment mechanism / springs: | 316 stainless steel | 316 stainless steel | 316 stainless steel | 316 stainless steel |
| Adjusting knob                  | 316 stainless steel | Polypropylene       |                     |                     |
| Body / poppet                   | 316 stainless steel | 316 stainless steel | 316 stainless steel | 316 stainless steel |
| Bonnet                          | 316 stainless steel | Acetal              | Acetal              | 316 stainless steel |
| Bottom plug                     | 316 stainless steel | 316 stainless steel | 316 stainless steel | 316 stainless steel |
| Seals                           | Fluorocarbon        | Fluorocarbon        | Fluorocarbon        | Fluorocarbon        |



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| Operating information             |  |  |
|-----------------------------------|--|--|
|                                   | PB548 & PB558  | PB11 & PB12  |
| Operating pressure:               | 300 PSIG max (20.7 bar)  | 300 PSIG max (20.7 bar)  |
| Operating temperature:            | <b>PB548:</b> 0°F to 150°F (-18°C to 66°C)<br><b>PB558:</b> 0°F to 180°F (-18°C to 82°C) | <b>PB11:</b> 0°F to 150°F (-18°C to 66°C)<br><b>PB12:</b> 0°F to 180°F (-18°C to 82°C) |
| Flow / SCFM (dm <sup>3</sup> /s): | 12 (5.66)  | 72 (33.98)   |
| For technical information see CD  |  |  |

**Filter / Regulators**

|  | Port size | Adjustment type   | Drain type   | Flow SCFM (dm <sup>3</sup> /s) ft/min@100 PSI | Part number 0 to 125 PSIG |
|--|-----------|-------------------|--------------|---|---------------------------|
|  | 1/4       | Knob version      | Manual twist | 12 (5.66)                                     | <b>PB548-02DHCSS</b>      |
|  | 1/4       | All metal version | Manual twist | 12 (5.66)                                     | <b>PB558-02DHCSS</b>      |
|  | 1/2       | Knob version      | Manual twist | 72 (33.98)                                    | <b>PB11-04WJCSS</b>       |
|  | 1/2       | Knob version      | Auto float   | 72 (33.98)                                    | <b>PB11-04WJCRSS</b>      |
|  | 1/2       | T-handle version  | Manual twist | 72 (33.98)                                    | <b>PB12-04WJCSS</b>       |
|  | 1/2       | T-handle version  | Auto float   | 72 (33.98)                                    | <b>PB12-04WJCRSS</b>      |

**Service kits**

| Description                               |                           | PB548                | PB558                | PB11                 | PB12                 |
|---|---------------------------|----------------------|----------------------|----------------------|----------------------|
| Bonnet kit                                |                           | <b>CKR364YSS</b>     | <b>CKR354YSS</b>     | <b>CKR10YSS</b>      | <b>CKR11YSS</b>      |
| Drain kit -                               | automatic pulse           | <b>RK504SY-SS</b>    | <b>RK504SY-SS</b>    |                      |                      |
|   | automatic float           |                      |                      | <b>SA10MDSS</b>      | <b>SA10MDSS</b>      |
|   | manual twist, small (old) | <b>SA600Y7-1SS</b>   | <b>SA600Y7-1SS</b>   | <b>SA600Y7-1SS</b>   | <b>SA600Y7-1SS</b>   |
|   | manual twist, large (new) | <b>SAP05481</b>      | <b>SAP05481</b>      | <b>SAP05481</b>      | <b>SAP05481</b>      |
| Filter element kits particulate           | 5 micron                  | <b>EK504VY</b>       | <b>EK504VY</b>       | <b>EKF10VY</b>       | <b>EKF10VY</b>       |
|   | 20 micron                 | <b>EK504Y</b>        | <b>EK504Y</b>        |                      |                      |
|   | 40 micron                 |                      |                      | <b>EKF10Y</b>        | <b>EKF10Y</b>        |
| Gauge, stainless 160 PSIG (0 to 1100 kPa) | 1-1/2" Face               | <b>K4515N14160SS</b> | <b>K4515N14160SS</b> |                      |                      |
|   | 2" Face                   |                      |                      | <b>K4520N14160SS</b> | <b>K4520N14160SS</b> |
| Panel mount bracket (stainless)           |                           | <b>161X57-SS</b>     | <b>161X57-SS</b>     | <b>R10Y57-SS</b>     | <b>R10Y57-SS</b>     |
| Panel mount nut -                         | stainless                 | <b>R05X51-SS</b>     | <b>R05X51-SS</b>     | <b>R10X51-SS</b>     | <b>R10X51-SS</b>     |
|   | plastic                   | <b>R05X51-P</b>      | <b>R05X51-P</b>      | <b>R10X51-P</b>      | <b>R10X51-P</b>      |
| Pipe nipple, 316 stainless steel          |                           | <b>616Y28-SS</b>     | <b>616Y28-SS</b>     | <b>616A28-SS</b>     | <b>616A28-SS</b>     |
| Service kit -                             | relieving                 | <b>RK549YSS</b>      | <b>RK549YSS</b>      | <b>RKR10YSS</b>      | <b>RKR10YSS</b>      |
|   | non-relieving             | <b>RK548YSS</b>      | <b>RK548YSS</b>      | <b>RKR10KYSS</b>     | <b>RKR10KYSS</b>     |
| Springs -                                 | 0-25 PSIG range           | <b>SPR-375-2-SS</b>  | <b>SPR-375-2-SS</b>  |                      |                      |
|   | 0-60 PSIG range           | <b>SPR-376-1-SS</b>  | <b>SPR-376-1-SS</b>  | <b>SPR-388-1-SS</b>  | <b>SPR-388-1-SS</b>  |
|   | 0-125 PSIG range          | <b>SPR-377-1-SS</b>  | <b>SPR-377-1-SS</b>  | <b>SPR-389-1-SS</b>  | <b>SPR-389-1-SS</b>  |
|   | 0-250 PSIG range          |                      |                      | <b>SPR-390-1-SS</b>  | <b>SPR-390-1-SS</b>  |

Most popular.



Stainless Steel  
 Air Preparation Products

Filters

Regulators

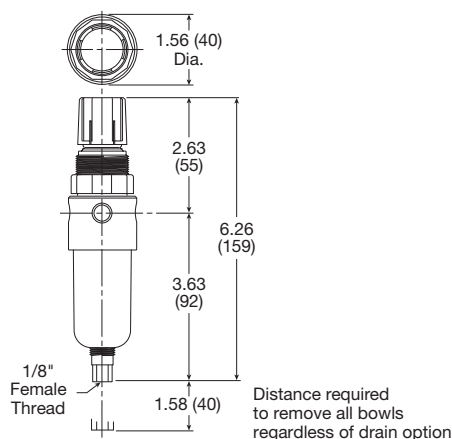
Filter  
 Regulators

Lubricators

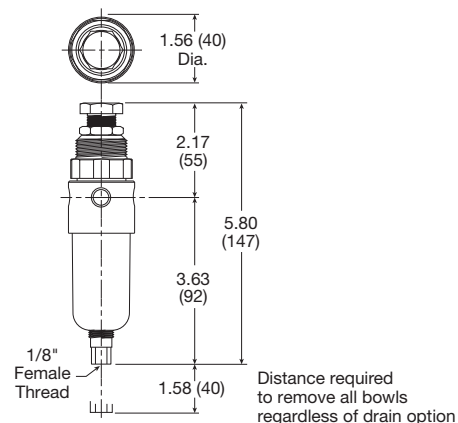


|   |                      |
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| Stainless Steel<br>Air Preparation Products | Filters              |
|   | Regulators           |
| Regulators                                  | Filter<br>Regulators |
| Lubricators                                 |                      |

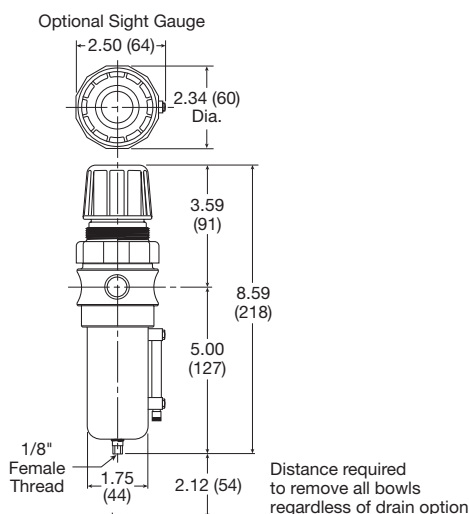
**PB548**



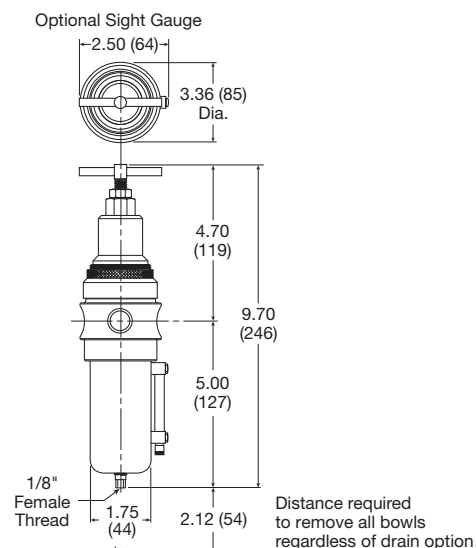
**PB588**



**PB11**



**PB12**



**Specifications**

| Description   | PB548                  | PB588                  | PB11                   | PB12                   |
|---------------|------------------------|------------------------|------------------------|------------------------|
| Filter rating | 20 micron              | 20 micron              | 40 micron              | 40 micron              |
| Gauge port    | 1/4                    | 1/4                    | 1/4                    | 1/4                    |
| Operation     | Fluorocarbon diaphragm | Fluorocarbon diaphragm | Fluorocarbon diaphragm | Fluorocarbon diaphragm |
| Port threads  | 1/4                    | 1/4                    | 1/2                    | 1/2                    |
| Weight        | 0.6 lb. (0.27 kg)      | 0.6 lb. (0.27 kg)      | 2.42 lb. (1.09 kg)     | 2.42 lb. (1.09 kg)     |

**Material specifications**

| Description                    | PB548               | PB588               | PB11                | PB12                |
|--------------------------------|---------------------|---------------------|---------------------|---------------------|
| Adjustment mechanism / springs | 316 stainless steel | 316 stainless steel | 316 stainless steel | 316 stainless steel |
| Adjusting knob                 | Polypropylene       | 316 stainless steel | Acetal              | 316 stainless steel |
| Body / poppet                  | 316 stainless steel | 316 stainless steel | 316 stainless steel | 316 stainless steel |
| Bonnet                         | Acetal              | 316 stainless steel | Acetal              | 316 stainless steel |
| Bottom plug                    | 316 stainless steel | 316 stainless steel | 316 stainless steel | 316 stainless steel |
| Seals                          | Fluorocarbon        | Fluorocarbon        | Fluorocarbon        | Fluorocarbon        |
| Sight gauge                    |                     |                     | Isoplast            | Isoplast            |



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- Fluorocarbon seals standard
- Meets NACE specifications MR-01-75/ISO 15156
- 1/8" female threaded drain
- Fillable under pressure



**Operating information**

|                                   |                               |
|-----------------------------------|-------------------------------|
| Operating pressure –              |                               |
| no sight gauge                    | 0 to 300 PSIG (0 to 20.7 bar) |
| with sight gauge                  | 0 to 250 PSIG (0 to 17.2 bar) |
| Operating temperature:            | 0°F to 150°F (-18°C to 66°C)  |
| Flow / SCFM (dm <sup>3</sup> /s): | 100 (47.19)                   |
| For technical information see CD  |                               |

**Lubricators**



| Port size | Flow SCFM (dm <sup>3</sup> /s) | Part number metal bowl with sight gauge |
|-----------|--------------------------------|---|
| 1/2       | 100 (47.19)                    | <b>PL10-04WSS</b>                       |

**Service kits**

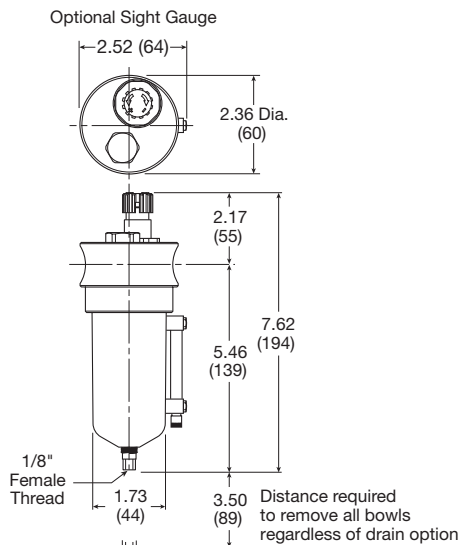
| Description                                 | Part number        |
|---|--------------------|
| Drain kit - manual twist drain, small (old) | <b>SA600Y7-1SS</b> |
|   | large (new)        |
| Pipe nipple, 316 Stainless Steel            | <b>616A28-SS</b>   |
| Sight dome kit - old                        | <b>RKL10SS</b>     |
|   | new                |

**Specifications**

| Description   | PL10              |
|---------------|-------------------|
| Bowl capacity | 4.0 ounces        |
| Port threads  | 1/2               |
| Weight        | 1.9 lb. (0.85 kg) |

**Material specifications**

| Description                  | PL10                |
|------------------------------|---------------------|
| Body                         | 316 stainless steel |
| Bowls                        | 316 stainless steel |
| Dip tube / drain / fill plug | 316 stainless steel |
| Seals                        | Fluorocarbon        |
| Sight dome                   | Nylon               |
| Sight gauge                  | Isoplast            |



Most popular.



**P**  
**Precision / Proportional**  
**Air Preparation Products**  
**Regulators**  
**Dial**  
**P3EA32**  
**P3BA45**  
**P3RA102**  
**P3RA171**  
**Electronic**  
**Proportional**

**51R**

- Pressure reference indicating dial face
- Non-rising, pressure-adjustment dial
- Self-relieving
- Full pressure adjustment in less than one full turn
- Recommended for pilot-air applications

**52R, 53R, 54R**

- Balanced poppet design
- Non-rising, pressure-adjusting dial
- High-relief flow (3/16" relief orifice)
- Two 1/4" gauge ports
- Piston operated



**Operating information**

Adjusting range pressure: 2 to 40 PSIG (0 to 2.8 bar)  
 5 to 160 PSIG (0 to 11.0 bar)  
 Max supply pressure: 300 PSIG (20.7 bar)  
 Max operating temperature: 150°F (65.5°C)

For technical information see CD

**Dial Regulators, relieving**



| Port size | Flow capacity*<br>SCFM (dm <sup>3</sup> /s) | Part number                                  |   |
|-----------|---|--|---|
|           |   | Low pressure<br>2 to 40 PSIG (0.14 to 3 bar) | Standard pressure<br>5 to 160 PSIG (0.34 to 11 bar) |
| 1/4       | 0.7 (.3)                                    | <b>51R125R</b>                               | <b>51R126R</b>                                      |
| 1/4       | 117 (55)                                    | <b>52R125R</b>                               | <b>52R126R</b>                                      |
| 3/8       | 180 (85)                                    | <b>52R225R</b>                               | <b>52R226R</b>                                      |
| 1/2       | 195 (92)                                    | <b>52R325R</b>                               | <b>52R326R</b>                                      |
| 3/4       | 220 (104)                                   | <b>52R425R</b>                               | <b>52R426R</b>                                      |
| 3/4       | 400 (189)                                   | <b>53R425R</b>                               | <b>53R426R</b>                                      |
| 1         | 650 (307)                                   | <b>53R525R</b>                               | <b>53R526R</b>                                      |
| 1-1/4     | 700 (330)                                   | <b>53R625R</b>                               | <b>53R626R</b>                                      |
| 1-1/2     | 1,600 (755)                                 | <b>54R725R</b>                               | <b>54R726R</b>                                      |
| 2         | 1,600 (755)                                 | <b>54R825R</b>                               | <b>54R826R</b>                                      |

\* SCFM = Standard cubic feet per minute at 100 PSIG (6.9 bar) inlet, 90 PSIG (6.2 bar) no-flow secondary setting and 25 PSIG pressure drop.

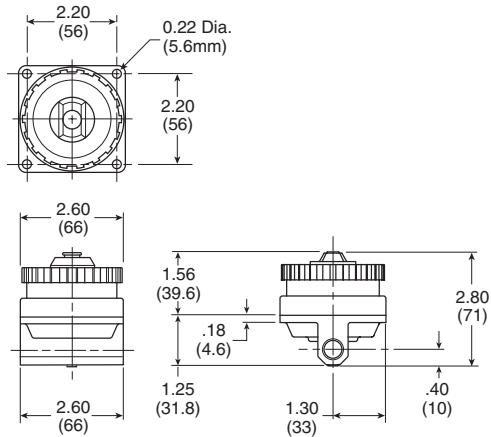
**Service kits**

| Description                               | 51R               | 52R               | 53R               | 54R               |
|---|-------------------|-------------------|-------------------|-------------------|
| Adjustment dial knob                      | <b>RRP-16-024</b> | <b>RRP-16-024</b> | <b>RRP-16-024</b> | <b>RRP-16-024</b> |
| O-ring, repair kit                        | <b>GRP-95-260</b> | <b>GRP-95-260</b> | <b>GRP-95-261</b> | <b>GRP-95-262</b> |
| Piston and bonnet repair kit              | <b>RRP-95-765</b> | <b>RRP-95-766</b> | <b>RRP-95-766</b> | <b>RRP-95-766</b> |
| Piston bottom and o-ring seal             |                   | <b>RRP-95-192</b> | <b>RRP-95-192</b> | <b>RRP-95-192</b> |
| Spring, regulation, belleville washer –   |                   |                   |                   |                   |
| 2 to 40 PSIG (2.8 bar)                    | <b>RRP-95-906</b> | <b>RRP-95-906</b> | <b>RRP-95-906</b> | <b>RRP-95-906</b> |
| 5 to 160 PSIG (11.0 bar)                  | <b>RRP-95-905</b> | <b>RRP-95-905</b> | <b>RRP-95-905</b> | <b>RRP-95-905</b> |
| Spring, main valve                        |                   |                   |                   | <b>RRP-95-024</b> |
| Tamper resistant kit                      | <b>RRP-95-585</b> | <b>RRP-95-585</b> | <b>RRP-95-585</b> | <b>RRP-95-585</b> |
| Valve, main with u-cup seal & bottom plug |                   | <b>RRP-95-914</b> |                   |                   |
| Valve, main with u-cup seal               |                   | <b>RRP-95-151</b> |                   |                   |
| Valve, main with o-ring seal              |                   |                   | <b>RRP-95-152</b> | <b>RRP-95-153</b> |
| Valve, pilot with o-ring and valve spring | <b>RRP-96-934</b> | <b>RRP-96-934</b> | <b>RRP-96-935</b> | <b>RRP-96-935</b> |

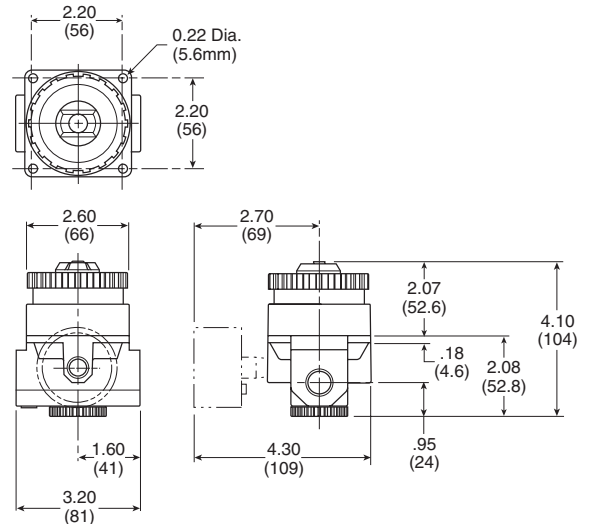
Most popular.



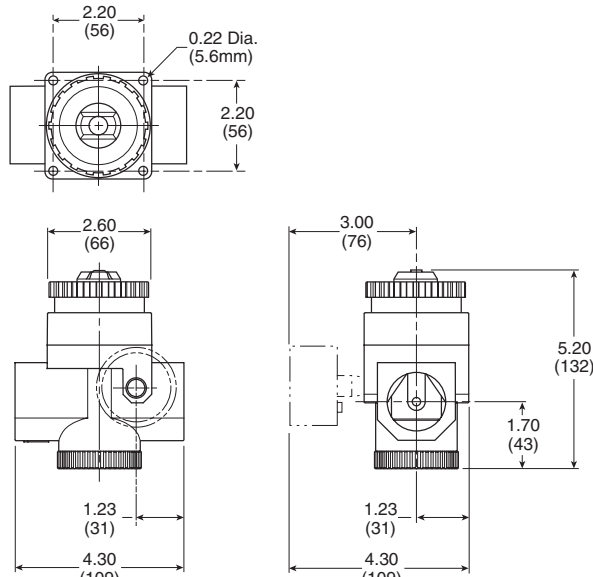
**51R**



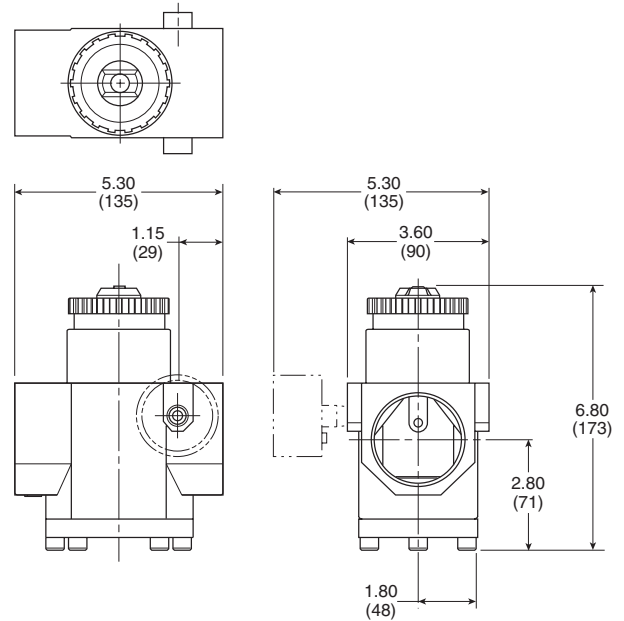
**52R**



**53R**



**54R**



**Specifications**

| Description  | 51R              | 52R                | 53R              | 54R            |
|--------------|------------------|--------------------|------------------|----------------|
| Bleed rate   | 0.05 SCFM        | 0.05 SCFM          | 0.05 SCFM        | 0.05 SCFM      |
| Gauge port   | —                | Two ports 1/4      | Two ports 1/4    | Two ports 1/4  |
| Port threads | 1/4              | 1/4, 3/8, 1/2, 3/4 | 3/4, 1, 1-1/4    | 1-1/2, 2       |
| Weight       | 1.3 lb. (0.5 kg) | 2.3 lb. (1.04 kg)  | 4.0 lb. (1.8 kg) | 9 lb. (4.1 kg) |

**Material specifications**

| Description    |                          |
|----------------|--------------------------|
| Body           | Zinc                     |
| Bonnet         | Zinc / brass             |
| Piston         | Acetal                   |
| Seals          | Nitrile                  |
| Springs        | Steel                    |
| Valve assembly | Brass / nitrile / acetal |

**WARNING**  
 Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

**CAUTION:**  
**REGULATOR PRESSURE ADJUSTMENT –**  
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.



**U**  
 Precision / Proportional  
 Air Preparation Products  
 Regulators  
 Dial  
 P3EA632  
 P3BA45  
 P3RA102  
 P3RA171  
 Electronic  
 Proportional

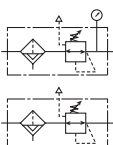
- The no-brass construction is well suited to harsh environments
- Internal and external epoxy finish for superior corrosion resistance
- Non-bleed design to reduce consumption
- Integral relief valve
- A gauge port provides convenient pressure gauge mounting
- The standard 5-micron filter minimizes internal contamination
- The filter dripwell contains a drain plug to easily drain trapped liquids
- Standard tapped exhaust
- Soft relief seat minimizes air loss



**P3EA632 Series**

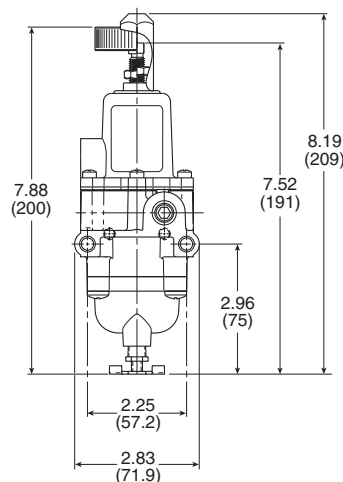
| Operating information            |   |
|----------------------------------|---|
| Supply pressure:                 | 250 PSIG (17.2 bar), (1700 kPa) max   |
| Temperature range:               | -10°F to 160°F (-23°C to 71°C)  |
| Sensitivity:                     | 1.0" (.036 PSIG) (2.54 cm) water column   |
| Flow capacity:                   | 25 SCFM (42.5 m <sup>3</sup> /HR) @ 100 PSIG, (7 bar), (700 kPa) supply and 20 PSIG, (1.5 bar), (150 kPa) setpoint  |
| Exhaust capacity:                | 0.8 (1.36 m <sup>3</sup> /HR) where downstream pressure is 5 PSIG, (.35 bar) (35 kPa) above 20 PSIG (1.5 bar), (150 kPa) setpoint (0.8 SCFM for 120 # unit) |
| Consumption:                     | Undetectable  |
| Supply pressure effect:          | Less than 1.25 PSIG, (.09 bar), (9 kPa) change for 100 PSIG, (7.0 bar), (700 kPa) change in supply pressure (1.90 PSIG for 120 # unit)                      |
| For technical information see CD |   |

**P3EA632  
 Precision Filter / Regulator**



| Port size | Spring        | Part number        |
|-----------|---------------|--------------------|
| 1/4"      | 1 to 60 PSIG  | <b>P3EA63242NS</b> |
| 1/4"      | 2 to 120 PSIG | <b>P3EA63252NS</b> |

**Note:** Other spring ranges, port sizes, and options available. Please consult factory.



**Service kits**

|                      |                        |                   |
|----------------------|------------------------|-------------------|
| Service kit          | 1 to 60, 2 to 120 PSIG | <b>PS19968-NR</b> |
| Tamper resistant kit |                        | <b>PS12165</b>    |

**Material specifications**

|                  |                                      |
|------------------|--------------------------------------|
| Body and housing | Epoxy coated aluminum                |
| Elastomers       | Nitrile                              |
| Trim             | Stainless steel, nickel plated steel |

**⚠ WARNING**  
 Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

**CAUTION:**  
**REGULATOR PRESSURE ADJUSTMENT –**  
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular.



- The P3BA208 uses a pneumatic input signal to accurately control output pressure based on a predetermined ratio
- A balanced supply valve minimizes the effects of supply pressure variation
- An aspirator tube compensates downstream pressure droop under flowing conditions
- A separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- Unit construction allows servicing without removal



**P3BA208 Series**  
 1/4" port size

| Operating information  | Signal : Output | 1:1                               | 1:2                               | 1:3                               |
|--|-----------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Output pressure, maximum:  |                 | 150 PSIG (10 bar)                 | 150 PSIG (10 bar)                 | 150 PSIG (10 bar)                 |
| Supply pressure, maximum:  |                 | 250 PSIG (17 bar)                 | 250 PSIG (17 bar)                 | 250 PSIG (17 bar)                 |
| Flow capacity –<br>100 PSIG, (7 bar), supply 20 PSIG, (1.5 bar) output                                     |                 | 45 SCFM (76.5 m <sup>3</sup> /HR) | 45 SCFM (76.5 m <sup>3</sup> /HR) | 45 SCFM (76.5 m <sup>3</sup> /HR) |
| Exhaust capacity –<br>Downstream pressure 5 PSIG (.35 bar)<br>above 20 PSIG (1.5 bar) setpoint             |                 | 11 SCFM (18.7 m <sup>3</sup> /HR) | 11 SCFM (18.7 m <sup>3</sup> /HR) | 11 SCFM (18.7 m <sup>3</sup> /HR) |
| Sensitivity, water column:   |                 | .250" (.64 cm)                    | .500" (1.27 cm)                   | .750" (1.9 cm)                    |
| Ratio accuracy –<br>% of 100 PSIG (7 bar) output span<br>% of output span with 100 PSIG (7 bar) input span |                 | 1.0<br>—                          | 1.0<br>—                          | 1.0<br>—                          |
| Supply pressure effect –<br>for change of 100 PSIG (7 bar)   |                 | 0.10 PSIG (.007 bar)              | 0.20 PSIG (.014 bar)              | 0.30 PSIG (.021 bar)              |
| Ambient temperature:   |                 | -40°F to 200°F<br>(-40°C to 93°C) | -40°F to 200°F<br>(-40°C to 93°C) | -40°F to 200°F<br>(-40°C to 93°C) |
| For technical information see CD   |                 |                                   |                                   |                                   |

**P3BA208**  
**Precision Pneumatic Input Signal Amplifier**



| Port size | Pilot ratio | Part number      |
|-----------|-------------|------------------|
| 1/4"      | 1:1         | <b>P3BA20812</b> |
| 1/4"      | 1:2         | <b>P3BA20822</b> |
| 1/4"      | 1:3         | <b>P3BA20823</b> |

**Note:** Other spring ranges, port sizes, and options available. Please consult factory.

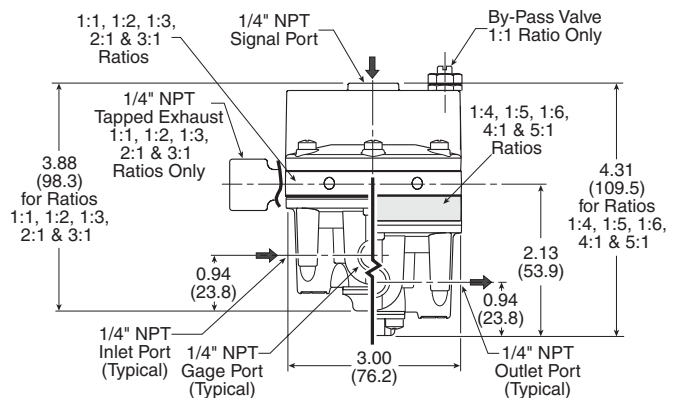
**Service kits**

|                            |                   |
|----------------------------|-------------------|
| 1:1 ratio                  | <b>PS19513-11</b> |
| 1:1 ratio w/ by-pass valve | <b>PS19513-11</b> |
| 1:2 ratio                  | <b>PS19513-12</b> |
| 1:3 ration                 | <b>PS19513-13</b> |
| Mounting bracket           | <b>PS09921</b>    |

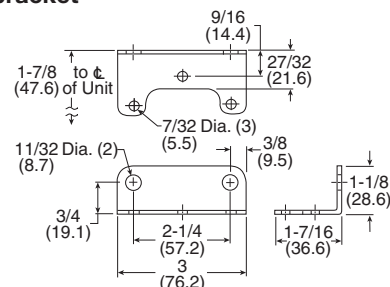
**Material specifications**

|                  |                          |
|------------------|--------------------------|
| Body and housing | Aluminum                 |
| Elastomers       | Nitrile on dacron fabric |
| Trim             | Zinc plated steel, brass |

Most popular.



**Mounting bracket**



- Five signal to output ratios meet most control element requirements
- Control sensitivity of water column allows use in precision applications
- Large supply and exhaust Valves provide high forward and exhaust flows
- Soft supply and exhaust Valve seats minimize air consumption
- A balanced supply valve minimizes the effect of supply pressure variation
- An aspirator tube compensates downstream pressure droop under flow conditions
- A separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- Unit construction lets you service the P3BA45 without removing it from the line



**P3BA45 Series**  
 1/2" & 3/4" port size

| Operating information  |  | Signal : Output 1:1   | 1:2                               | 1:3                               |
|--|--|---|-----------------------------------|-----------------------------------|
| Output pressure, maximum:  |  | 150 PSIG (10 bar)   | 150 PSIG (10 bar)                 | 150 PSIG (10 bar)                 |
| Supply pressure, maximum:  |  | 250 PSIG (17 bar)   | 250 PSIG (17 bar)                 | 250 PSIG (17 bar)                 |
| Flow capacity –<br>100 PSIG, (7 bar), supply 20 PSIG, (1.5 bar) output                                     |  | 150 SCFM (255 m <sup>3</sup> /HR)   | 150 SCFM (255 m <sup>3</sup> /HR) | 150 SCFM (255 m <sup>3</sup> /HR) |
| Exhaust capacity –<br>Downstream pressure 5 PSIG (.35 bar)<br>above 20 PSIG (1.5 bar) setpoint             |  | 40 SCFM (62.5 m <sup>3</sup> /HR)   | 40 SCFM (62.5 m <sup>3</sup> /HR) | 40 SCFM (62.5 m <sup>3</sup> /HR) |
| Sensitivity, water column:   |  | 1.0" (2.54 cm)  | 2.0" (5.08 cm)                    | 3.0" (7.62 cm)                    |
| Ratio Accuracy –<br>% of 100 PSIG (7 bar) output span<br>% of output span with 100 PSIG (7 bar) input span |  | 3.0<br>—  | 3.0<br>—                          | 3.0<br>—                          |
| Supply pressure effect –<br>for change of 100 PSIG (7 bar)   |  | 0.10 PSIG (.007 bar)  | 0.20 PSIG (.014 bar)              | 0.30 PSIG (.021 bar)              |
| Ambient temperature:   |  | -40°F to 200°F<br>(-40°C to 93°C)   | -40°F to 200°F<br>(-40°C to 93°C) | -40°F to 200°F<br>(-40°C to 93°C) |
| Hazardous locations:   |  | Acceptable for use in zones 1 and 2 for gas atmospheres; Groups IIA and IIB and zones 21 and 22 for dust atmospheres. |                                   |                                   |
| For technical information see CD   |  |   |                                   |                                   |

**P3BA45**  
**Precision Pneumatic Input Signal Amplifier**



| Port size | Pilot ratio | Part number      |
|-----------|-------------|------------------|
| 1/2"      | 1:1         | <b>P3BA4514A</b> |
| 1/2"      | 1:2         | <b>P3BA4524A</b> |
| 1/2"      | 1:3         | <b>P3BA4534A</b> |
| 3/4"      | 1:1         | <b>P3BA4516A</b> |
| 3/4"      | 1:2         | <b>P3BA4526A</b> |
| 3/4"      | 1:3         | <b>P3BA4536A</b> |

**Note:** Other spring ranges, port sizes, and options available. Please consult factory.

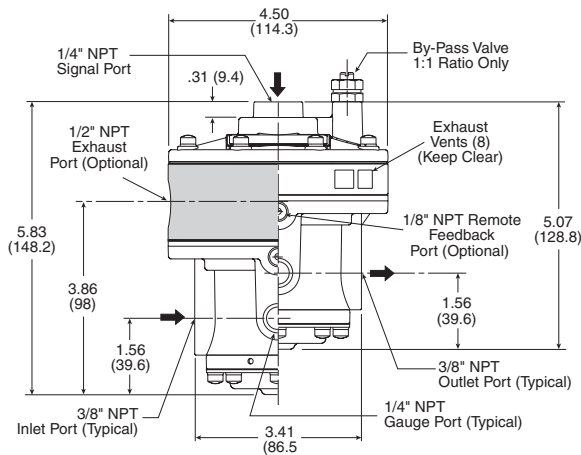
**Service kits**

|                                 |                    |
|---------------------------------|--------------------|
| 1:1 ratio                       | <b>PS19549-1</b>   |
| 1:1 ratio w/ tapped exhaust     | <b>PS19549-1E</b>  |
| 1:2 ratio                       | <b>PS19549-2</b>   |
| 1:3 ratio                       | <b>PS19549-3</b>   |
| 1:1 w/ tapped exhaust, I option | <b>PS19549-20E</b> |

Most popular.

**Material specifications**

|                  |                          |
|------------------|--------------------------|
| Body and housing | Aluminum                 |
| Diaphragm        | Nitrile on dacron fabric |
| Trim             | Zinc plated steel, brass |





- Control sensitivity of .250" (.010 PSIG) (.64 cm) water column variation allows use in precision applications
- A compensating diaphragm lets the regulator remain unaffected by supply pressure changes
- Flow of up to 40 SCFM with 100 PSIG supply allows use in applications with high flow requirements
- An aspirator tube compensates downstream pressure droop under flow conditions
- A separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- Unit construction lets you service the regulator without removing it from the line



**P3RA302 Series**

**Operating information**

|                                  |   |
|----------------------------------|---|
| Supply pressure:                 | 250 PSIG (17.2 bar), (1700 kPa) max   |
| Ambient temperature:             | -40°F to 200°F (-40°C to 93°C)  |
| Sensitivity:                     | .250" (.010 PSIG) (.64 cm) water column   |
| Flow capacity:                   | 40 SCFM (68 m <sup>3</sup> /HR) @ 100 PSIG, (7.0 bar), (700 kPa) supply and 20 PSIG, (1.5 bar), (150 kPa) setpoint                      |
| Exhaust capacity:                | 2.0 SCFM (3.4 m <sup>3</sup> /HR) where downstream pressure is 5 PSIG, (.35 bar), (35 kPa) above 20 PSIG, (1.5 bar), (150 kPa) setpoint |
| Supply pressure effect:          | Less than 0.2 PSIG, (.014 bar), (.14 kPa) for 100 PSIG, (7.0 bar), (700 kPa) change in supply pressure                                  |
| Hazardous locations:             | Acceptable for use in zones 1 and 2 for gas atmosphere:<br>Groups IIA and IIB and zones 21 and 22 for dust atmospheres                  |
| For technical information see CD |   |

**P3RA302**  
**Compact High Precision Regulator**



| Port size | Spring         | Part number      |
|-----------|----------------|------------------|
| 1/4"      | 0.5 to 30 PSIG | <b>P3RA30232</b> |
| 1/4"      | 1 to 60 PSIG   | <b>P3RA30242</b> |
| 1/4"      | 2 to 100 PSIG  | <b>P3RA30252</b> |

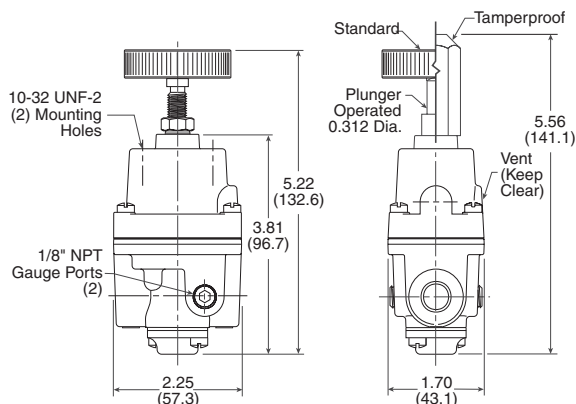
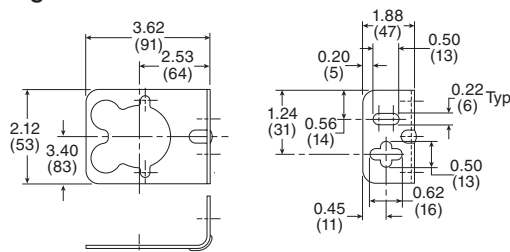
**Service kits**

|                      |                        |                   |
|----------------------|------------------------|-------------------|
| Service kit          | Nitrile, standard      | <b>PS16116-13</b> |
|                      | Nitrile, non-relieving | <b>PS16116-14</b> |
| Tamper resistant kit |                        | <b>PS12163</b>    |
| Mounting bracket kit |                        | <b>PS417BP</b>    |

**Material specifications**

|                  |                   |
|------------------|-------------------|
| Body and housing | Aluminum          |
| Diaphragms       | Nitrile on dacron |
| Trim             | Brass             |

**Mounting bracket**



**WARNING**

Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

**CAUTION:**  
**REGULATOR PRESSURE ADJUSTMENT –**

The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular.



**P**  
 Precision / Proportional  
 Air Preparation Products  
 Regulators  
 Dial  
 P3EA32  
 P3BA45  
 P3RA102  
 P3RA171  
 Electronic  
 Proportional

- Control sensitivity of .125" (.005 PSIG) (.32 cm) water column allows use in precision processes
- Pressure balanced supply valve prevents supply pressure changes from affecting the setpoint
- Optional check valve permits dumping of downstream pressure when supply is opened to atmosphere
- Separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- An aspirator tube compensates downstream pressure droop under flow conditions



**P3RA102 Series**

**Operating information**

|                                  |  |
|----------------------------------|--|
| Supply pressure:                 | 500 PSIG (35 bar), (3500 kPa) max  |
| Ambient temperature:             | -40°F to 200°F (-40°C to 93°C)   |
| Sensitivity:                     | .125" (.005 PSIG) (.32 cm) water column  |
| Flow capacity:                   | 40 SCFM (68 m <sup>3</sup> /HR) @ 100 PSIG, (7.0 bar), (700 kPa) supply and 20 PSIG, (1.5 bar), (150 kPa) setpoint                       |
| Exhaust capacity:                | 5.5 SCFM (9.35 m <sup>3</sup> /HR) where downstream pressure is 5 PSIG, (.35 bar), (35 kPa) above 20 PSIG, (1.5 bar), (150 kPa) setpoint |
| Supply pressure effect:          | Less than 0.1 PSIG, (.007 bar), (.7 kPa) for 100 PSIG, (7.0 bar), (700 kPa) change in supply pressure                                    |
| Hazardous locations:             | Acceptable for use in zones 1 and 2 for gas atmosphere:<br>Groups IIA and IIB and zones 21 and 22 for dust atmospheres                   |
| For technical information see CD |  |

**P3RA102 Standard High Precision Regulator**



| Port size | Spring         | Part number      |
|-----------|----------------|------------------|
| 1/4"      | 0.5 to 30 PSIG | <b>P3RA10232</b> |
| 1/4"      | 1 to 60 PSIG   | <b>P3RA10242</b> |
| 1/4"      | 2 to 150 PSIG  | <b>P3RA10262</b> |

**Service kits**

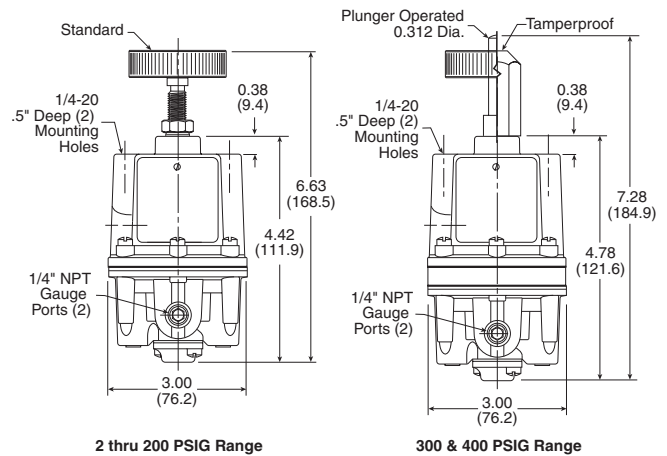
|             |   |                  |
|-------------|---|------------------|
| Service kit | 0 to 200 PSIG, relieving                | <b>PS12125-1</b> |
|             | 0 to 200 PSIG, non-relieving            | <b>PS12125-4</b> |
|             | Tamper resistant kit                    | <b>PS12165</b>   |
|             | Mounting bracket kit, zinc plated steel | <b>PS09921</b>   |

**Material specifications**

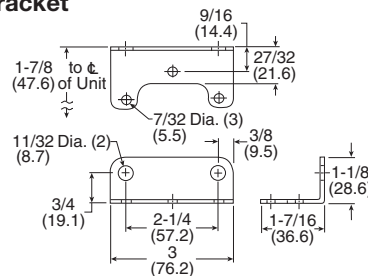
|                                 |                          |
|---------------------------------|--------------------------|
| Body and housing                | Aluminum                 |
| Diaphragms (standard unit only) | Buna N on dacron         |
| Trim                            | Brass, zinc plated steel |

**⚠ WARNING**  
 Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

Most popular.



**Mounting bracket**



**CAUTION: REGULATOR PRESSURE ADJUSTMENT –**  
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.



- Control sensitivity of .125" (.005 PSIG) (.32 cm) water column allows use in precision applications
- A separate control chamber and Aspirator Tube isolate the diaphragm from the main flow to eliminate hunting and buzzing
- Unit construction lets you service without removing it from the line
- Mounting bracket is available



**P3RA102BP Series**

**E**

Precision / Proportional  
 Air Preparation Products

Dial  
 Regulators

P3BA208

P3RA302

P3RA102BP

Electronic  
 Proportional

**Operating information**

|  |  |
|--|--|
| Setpoint range –<br>2 to 200 PSIG (0.15 to 14 bar)<br>(15 to 1400 kPa) | System pressure (maximum)<br>300 PSIG (21 bar), (2100 kPa) max                   |
| 300 to 400 PSIG (21 to 28 bar)<br>(2100 to 2800 kPa)                   | 500 PSIG (35 bar), (3500 kPa) max  |
| Ambient temperature:   | -40°F to 200°F (-40°C to 93°C)   |
| Sensitivity:   | .125" (.005 PSIG) (.32 cm) water column  |
| Flow capacity:   | 40 SCFM (68 m <sup>3</sup> /HR) @ 100 PSIG, (7.0 bar), (700 kPa) system pressure |
| For technical information see CD                                       |  |

**P3RA102BP  
 High Precision Relief Valve**



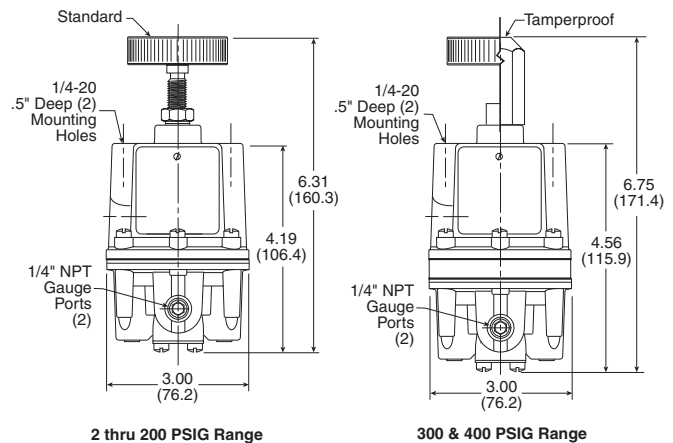
| Port size | Spring         | Part number        |
|-----------|----------------|--------------------|
| 1/4"      | 0.5 to 30 PSIG | <b>P3RA10232BP</b> |
| 1/4"      | 1 to 60 PSIG   | <b>P3RA10242BP</b> |
| 1/4"      | 2 to 150 PSIG  | <b>P3RA10262BP</b> |

**Service kits**

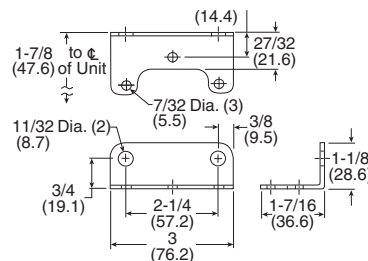
|   |                  |
|---|------------------|
| Service kit 0 to 200 PSIG, standard     | <b>PS12127-1</b> |
| Tamper resistant kit                    | <b>PS12165</b>   |
| Mounting bracket kit, zinc plated steel | <b>PS09921</b>   |

**Material specifications**

|                  |                          |
|------------------|--------------------------|
| Body and housing | Aluminum                 |
| Nozzle           | Nitrile on dacron        |
| Trim             | Zinc plated steel, brass |



**Mounting bracket**



**CAUTION:**  
**REGULATOR PRESSURE ADJUSTMENT –**  
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular.



|  |            |
|--|------------|
| Precision / Proportional<br>Air Preparation Products | Dial       |
|  | Regulators |
| P3EA632  | P3EA632    |
|  | P3BA45     |
| P3RA102  | P3RA102    |
|  | P3RA171    |
| Electronic<br>Proportional                           | P3RA171    |

- Control sensitivity of .125" (.005 PSIG) (.32 cm) water column allows use in precision applications
- Balanced supply valve minimizes effects of vacuum variation
- Aspirator tube compensates for downstream pressure droop under flow conditions
- Separate control chamber isolates the diaphragm from the main flow to eliminate hunting and buzzing
- Construction allows servicing without removing from the line



**P3RA171 Series**

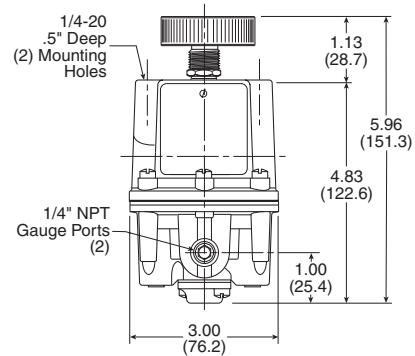
**Operating information**

|                                  |  |
|----------------------------------|--|
| Vacuum supply:                   | 29.92 Hg (760 torr) max  |
| Ambient temperature:             | -40°F to 200°F (-40°C to 93°C)   |
| Sensitivity:                     | .125" (.005 PSIG) (.32 cm) water column                                    |
| Flow capacity:                   | 3 SCFM @ 650 torr supply, 250 torr setpoint                                |
| Vacuum supply effect:            | Less than 1 torr for 100 torr (.04 Hg for 3.94 Hg) change in vacuum supply |
| For technical information see CD |  |

**P3RA171  
 High Precision Vacuum Regulator**



| Port size | Spring     | Part number          |
|-----------|------------|----------------------|
| 1/4"      | 0 to 30 Hg | <b>P3RA17132NNKN</b> |



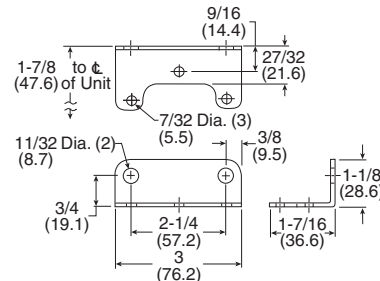
**Service kits**

|   |   |                  |
|---|---|------------------|
| Service kit                             | Includes diaphragm, valve, seat assemblies and gasket | <b>PS20966-9</b> |
| Tamper resistant kit                    |   | <b>PS20967-1</b> |
| Mounting bracket kit, zinc plated steel |   | <b>PS09921</b>   |

**Material specifications**

|                  |                          |
|------------------|--------------------------|
| Body and housing | Aluminum                 |
| Elastomers       | Nitrile                  |
| Trim             | Zinc plated steel, brass |

**Mounting bracket**



**WARNING**  
 Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.

**CAUTION:  
 REGULATOR PRESSURE ADJUSTMENT -**  
 The working range of knob adjustment is designed to permit outlet pressures within their full range. Pressure adjustment beyond this range is also possible because the knob is not a limiting device. This is a common characteristic of most industrial regulators, and limiting devices may be obtained only by special design. For best performance, regulated pressure should always be set by increasing the pressure up to the desired setting.

Most popular.



- Very fast response times
- Accurate output pressure
- Micro parameter settings
- Selectable I/O parameters
- Quick, full flow exhaust
- LED display indicates output pressure
- No air consumption in steady state
- Multiple mounting options
- Protection to IP65
- P31P flows to 19 dm<sup>3</sup>/s (40 SCFM)
- P32P flows to 57 dm<sup>3</sup>/s (120 SCFM)



**P31P Series**  
**Bottom exhaust**



**P32P Series**  
**Bottom exhaust**

**Ordering information**

|              |  |          |          |          |          |          |          |          |          |  |
|--------------|--|----------|----------|----------|----------|----------|----------|----------|----------|--|
| <b>P31PA</b> |  | <b>9</b> | <b>2</b> | <b>A</b> | <b>Z</b> | <b>2</b> | <b>V</b> | <b>D</b> | <b>1</b> |  |
|--------------|--|----------|----------|----------|----------|----------|----------|----------|----------|--|

| Body size                     |              |
|-------------------------------|--------------|
| Global modular mini (1/4")    | <b>P31PA</b> |
| Global modular compact (1/2") | <b>P32PA</b> |

| Thread type |          |
|-------------|----------|
| BSPP        | <b>1</b> |
| BSPT        | <b>2</b> |
| NPT         | <b>9</b> |

| Port size                     |          |
|-------------------------------|----------|
| Global modular mini (1/4")    | <b>2</b> |
| Global modular compact (1/2") | <b>4</b> |

| Version  |          |
|--|----------|
| Bottom ported exhaust (NC)                     | <b>A</b> |
| Bottom ported forced exhaust (NO) <sup>†</sup> | <b>E</b> |

| Power supply |                 |
|--------------|-----------------|
| <b>2</b>     | <b>24 volts</b> |

| Control signal |                          |
|----------------|--------------------------|
| <b>V</b>       | <b>0-10V<sup>‡</sup></b> |

<sup>‡</sup> Factory setting is 0-10 V control signal. 4-20 mA control signal available via parameter 4 on keypad.

| Pressure range |                                |
|----------------|--------------------------------|
| <b>Z</b>       | <b>0 - 2 bar (0-29 PSIG)</b>   |
| <b>D</b>       | <b>0 - 10 bar (0-145 PSIG)</b> |

| Input Connector |                    |
|-----------------|--------------------|
| <b>1</b>        | <b>M12 (4-pin)</b> |

| Output signal |                     |
|---------------|---------------------|
| <b>D</b>      | <b>Digital, PNP</b> |
| <b>P</b>      | <b>PNP or 0-10V</b> |
| <b>N</b>      | <b>NPN or 0-10V</b> |
| <b>M</b>      | <b>4-20mA fixed</b> |

D) Digital PNP output only, no analog output selectable  
P) Digital PNP and analogue 0-10V outputs selectable, by means of parameter 6. (Factory default 0-10V)  
N) Digital NPN and analogue 0-10 V outputs selectable by means of parameter 6. (Factory default 0-10V)  
M) Analog 4-20mA output only.  
Note: On all analog outputs the F.S. value can be adjusted by means of parameter 8.

<sup>†</sup> When the supply voltage is lost the unit will automatically exhaust the regulated pressure to 0 bar (atmospheric pressure)

**Bold items are most common.**

**P31P mounting brackets**

| Part number      | Description               |
|------------------|---------------------------|
| <b>P3HKA00ML</b> | L-bracket mounting kit    |
| <b>P3HKA00MC</b> | Foot bracket mounting kit |

L-bracket

Foot bracket

**P32P mounting brackets**

| Part number      | Description               |
|------------------|---------------------------|
| <b>P3KKA00ML</b> | L-bracket mounting kit    |
| <b>P3KKA00MC</b> | Foot bracket mounting kit |

L-bracket

Foot bracket

**Cables**

| Part number         | Description  |
|---------------------|--|
| <b>CB-M12-4P-2M</b> | 2 mtr. cable with moulded straight M12x1 connector |

Most popular.



**Technical information**

**Working medium**

Compressed air or inert gasses, filtered to 40µ.

**Supply pressure**

Max. operating pressure:

2 bar unit.....3 bar (43.5 PSIG)

10 bar unit..... 10.5 bar (152 PSIG)

Min. Operating Pressure ..... P2 pressure + 0.5 bar (7.3 PSIG)

**Pressure control range**

Available in three pressure ranges, 0-2 bar (0-29 PSIG), 0-7 bar (0-101.5 PSIG) or 0-10 bar (0-145 PSIG). Pressure range can be changed through the software at all times. (parameter 19)

**Temperature range**

0°C up to +50°C (32°F up to 122°F)

**Weights:**

P31P = 0.291 kg (0.64 lbs)

P32P = 0.645 kg (1.42 lbs)

**Air consumption**

No consumption in stable regulated situation.

**Display**

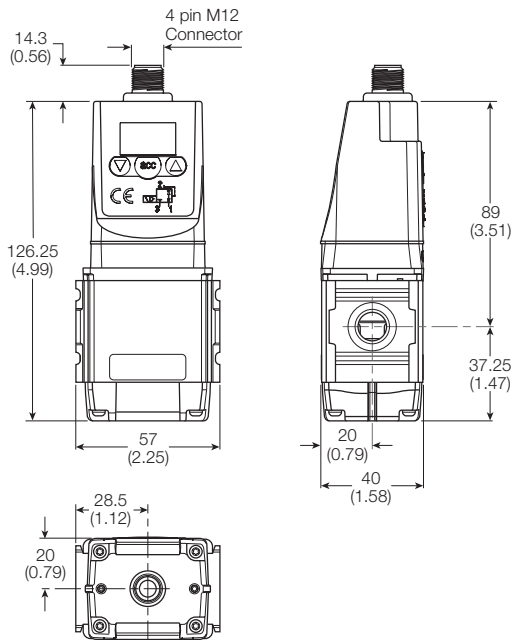
The regulator is provided with a digital display, indicating the output pressure, either in bar or PSIG.

The factory setting is as indicated on the label, can be changed through to software at all times (parameter 14)

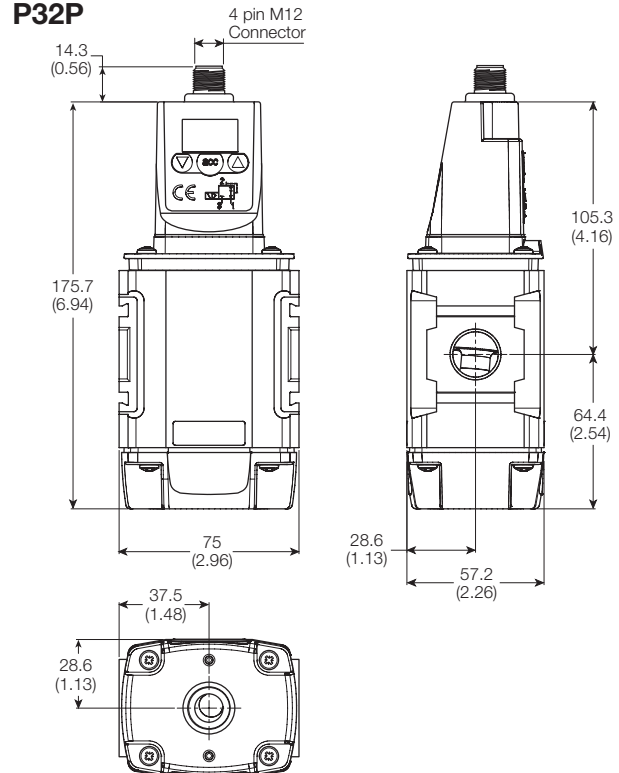
**⚠ WARNING**

**Product rupture can cause serious injury.  
 Do not connect regulator to bottled gas.  
 Do not exceed maximum primary pressure rating.**

**P31P**



**P32P**



**Supply voltage**

24 VDC +/- 10%

**Power consumption**

Max. 1.1W with unloaded signal outputs

**Control signals**

The electronic pressure regulator can be externally controlled through an analogue control signal of either 0-10V or 4-20mA. (parameter 4).

**Output signals**

As soon as the output pressure is within the signal band a signal is given of 24VDC, PNP Ri = 1 kOhm  
 Outside the signal band this connection is 0V.

**Connections**

**(In case of output signal (Option D))**

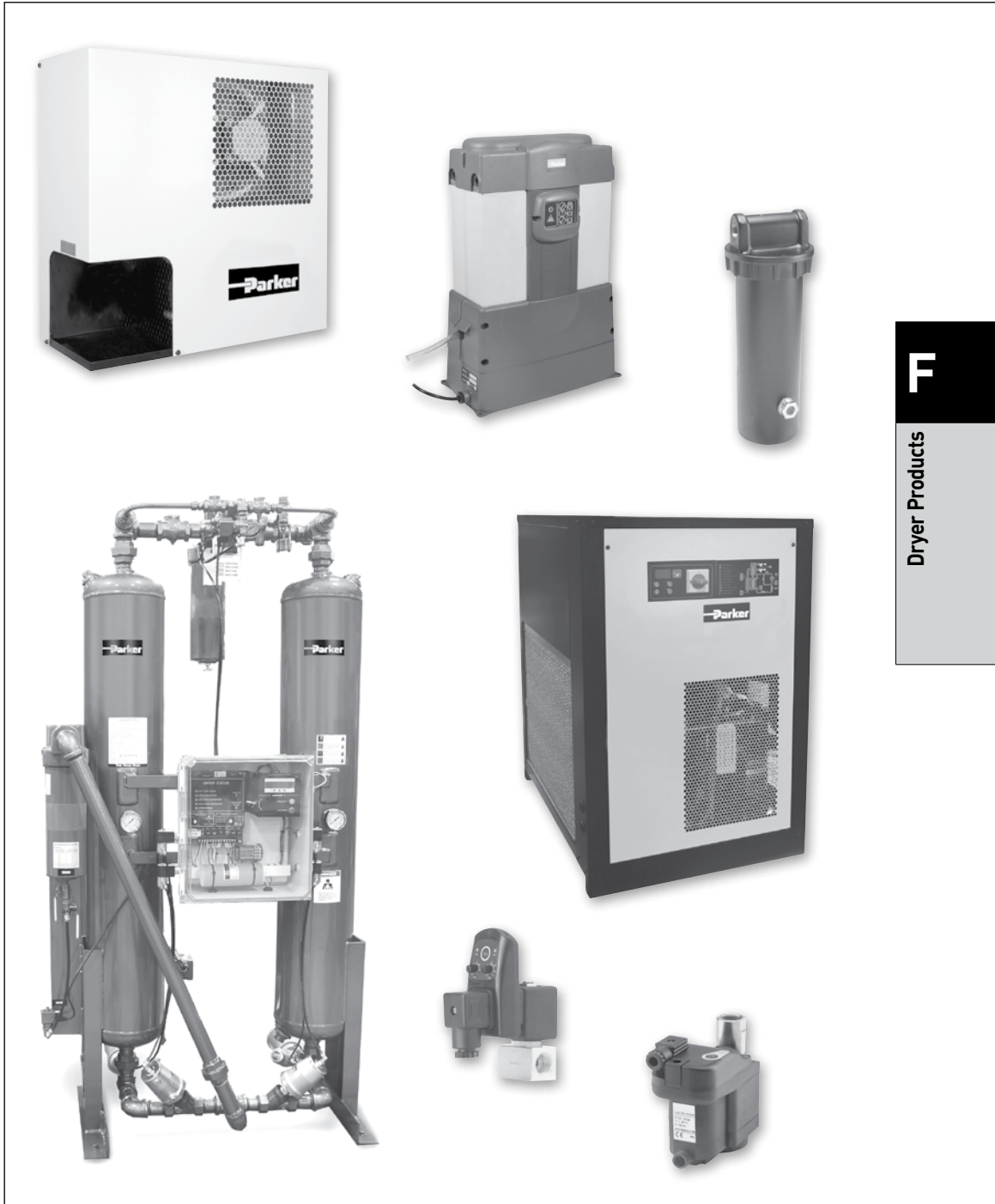
Central M12 connector 4-pole

The electrical connections are as follows:

| Pin number | Function  | Color                      |       |
|------------|-----------|----------------------------|-------|
| 1          | 24 V      | Supply                     | Brown |
| 2          | 0 to 10 V | Control Signal Ri = 100k Ω | White |
|            | 4 to 20mA | Control Signal Ri = 500k Ω |       |
| 3          | 0 V (GND) | Supply                     | Blue  |
| 4          | 24 V      | Alarm Output Signal        | Black |

**P**  
 Precision / Proportional  
 Air Preparation Products  
 Regulators  
 Dial  
 P3EA32  
 P3BA45  
 P3RA102  
 P3RA171  
 Electronic  
 Proportional





**F**  
Dryer Products

# Dryer Products



## Dryer Products

### Dryer Products



- Refrigeration (10-2400 SCFM)
- Inline desiccant (15-60 SCFM)
- Regenerative desiccant (3-800 SCFM)
- Heatless desiccant dryers
- Zero loss & timer drains
- Auto electrical drain valves

F3

| Product   | Page                  |
|---|-----------------------|
| <a href="#">PRD Refrigeration Dryers</a>            | <a href="#">F3-F4</a> |
| <a href="#">DD Inline Desiccant Dryers</a>          | <a href="#">F5</a>    |
| <a href="#">P3TJA Regenerative Desiccant Dryers</a> | <a href="#">F6</a>    |
| <a href="#">PTW Heatless Desiccant Dryers</a>       | <a href="#">F7-F8</a> |
| <a href="#">ED Zero Air Loss Condensate Drains</a>  | <a href="#">F9</a>    |
| <a href="#">WDV3-G Auto Electrical Drain Valves</a> | <a href="#">F10</a>   |





**PRD10 - PRD250**

- “Plug & Play” design for easy installation and operation (PRD10 - PRD125)
- Small space saving design
- Oversized demister separator resulting in excellent liquid removal over all operating conditions
- Low pressure differential across the dryer (1.45 PSIG average)
- Oversized condenser to operate in ambients to 122°F (50°C)
- All models incorporate a dewpoint indicator

**PRD325 - PRD2400**

- Optimum dewpoint levels for highest system performance
- Advanced patented design solutions
- High reliability, easy to use and maintain
- Unique 4-in-1 SmartPack heat exchanger
- Integral drain
- Extremely low pressure drop design
- SmartControl energy saving function
- Excellent dewpoint performances
- Advanced compliant scroll compressor

**PRD Series**

| Capacity<br>CFM @ 100 PSIG<br>(m³/min @ 6.9 bar) | Primary voltage                  | Part number                                  | Pipe size    | Recommended filtration |                              |                               |
|--|----------------------------------|--|--------------|------------------------|------------------------------|-------------------------------|
|  |                                  |  |              | Bulk separator         | Pre-filter (5µ particulate)* | Post-filter (.01µ coalescing) |
| 10 (17)  | 115V/1ph/60Hz                    | <b>PRD10-115160</b>                          | 1/2" NPT-F   | <b>P3TFA94WCAN</b>     | <b>P32FA94ESAN</b>           | <b>P32FA94DSAN</b>            |
| 15 (26)  | 115V/1ph/60Hz                    | <b>PRD15-115160</b>                          | 1/2" NPT-F   | <b>P3TFA94WCAN</b>     | <b>P32FA94ESAN</b>           | <b>P32FA94DSAN</b>            |
| 25 (43)  | 115V/1ph/60Hz                    | <b>PRD25-115160</b>                          | 1/2" NPT-F   | <b>P3TFA94WCAN</b>     | <b>P32FA94ESAN</b>           | <b>P32FA94DSAN</b>            |
| 35 (60)  | 115V/1ph/60Hz                    | <b>PRD35-115160</b>                          | 1/2" NPT-F   | <b>P3TFA94WCAN</b>     | <b>P32FA94ESAN</b>           | <b>P32FA94DSAN</b>            |
| 50 (85)  | 115V/1ph/60Hz                    | <b>PRD50-115160</b>                          | 3/4" NPT-F   | <b>P3TFA96WDAN</b>     | <b>P33FA96ESAN</b>           | <b>P33FA96DSAN</b>            |
| 75 (127)   | 115V/1ph/60Hz                    | <b>PRD75-115160</b>                          | 3/4" NPT-F   | <b>P3TFA96WDAN</b>     | <b>P33FA96ESAN</b>           | <b>P33FA96DSAN</b>            |
| 100 (170)  | 115V/1ph/60Hz                    | <b>PRD100-115160</b>                         | 3/4" NPT-F   | <b>P3TFA96WDAN</b>     | <b>P3NFA96ESA</b>            | <b>P3NFA96DSA</b>             |
| 125 (212)  | 115V/1ph/60Hz &<br>230V/1ph/60Hz | <b>PRD125-115160</b><br><b>PRD125-230160</b> | 1-1/2" NPT-F | <b>P3TFA9BWGAN</b>     | <b>P3NFA9PESA</b>            | <b>P3NFA9PDSA</b>             |
| 150 (255)  | 115V/1ph/60Hz &<br>230V/1ph/60Hz | <b>PRD150-115160</b><br><b>PRD150-230160</b> | 1-1/2" NPT-F | <b>P3TFA9BWGAN</b>     | <b>P3NFA9PESA</b>            | <b>P3NFA9PDSA</b>             |
| 175 (297)  | 115V/1ph/60Hz                    | <b>PRD175-230160</b>                         | 1-1/2" NPT-F | <b>P3TFA9BWGAN</b>     | <b>35F77BAP</b>              | <b>35F77EAP</b>               |
| 200 (425)  | 230V/1ph/60Hz                    | <b>PRD200-230160</b>                         | 1-1/2" NPT-F | <b>P3TFA9BWGAN</b>     | <b>35F77BAP</b>              | <b>35F77EAP</b>               |
| 250 (425)  | 230V/3ph/60Hz &<br>460V/3ph/60Hz | <b>PRD250-230360</b><br><b>PRD250-460360</b> | 1-1/2" NPT-F | <b>P3TFA9BWGAN</b>     | <b>35F77BAP</b>              | <b>35F77EAP</b>               |
| 325 (552)  | 230V/3ph/60Hz &<br>460V/3ph/60Hz | <b>PRD325-230360</b><br><b>PRD325-460360</b> | 2" NPT-F     | <b>P3TFA9CWHAN</b>     | <b>35F87BAP</b>              | <b>35F87EAP</b>               |
| 400 (680)  | 230V/3ph/60Hz &<br>460V/3ph/60Hz | <b>PRD400-230360</b><br><b>PRD400-460360</b> | 2" NPT-F     | <b>P3TFA9CWHAN</b>     | <b>35F87BAP</b>              | <b>35F87EAP</b>               |
| 500 (849)  | 230V/3ph/60Hz &<br>460V/3ph/60Hz | <b>PRD500-230360</b><br><b>PRD500-460360</b> | 2" NPT-F     | <b>P3TFA9CWHAN</b>     | <b>35F87BAP</b>              | <b>35F87EAP</b>               |
| 700 (1189)                                       | 230V/3ph/60Hz &<br>460V/3ph/60Hz | <b>PRD700-230360</b><br><b>PRD700-460360</b> | 3" NPT-M     | <b>P3TFA9EWKAN</b>     | <b>43FN7BAP</b>              | <b>43FN7EAP</b>               |
| 800 (1359)                                       | 230V/3ph/60Hz &<br>460V/3ph/60Hz | <b>PRD800-230360</b><br><b>PRD800-460360</b> | 3" NPT-M     | <b>P3TFA9EWKAN</b>     | <b>43FN7BAP</b>              | <b>43FN7EAP</b>               |
| 1000 (1700)                                      | 460V/3ph/60Hz                    | <b>PRD1000-460360</b>                        | 3" NPT-M     | <b>P3TFA9EWKAN</b>     | <b>43FN7BAP</b>              | <b>43FN7EAP</b>               |
| 1200 (2039)                                      | 460V/3ph/60Hz                    | <b>PRD1200-460360</b>                        | 3" NPT-M     | <b>P3TFA9EWKAN</b>     | <b>43FN7BAP</b>              | <b>43FN7EAP</b>               |
| 1600 (2718)                                      | 460V/3ph/60Hz                    | <b>PRD1600-460360</b>                        | 4" Flg.      | <b>P3TFAFFW2AN</b>     | <b>P3TFAFFQ2AN*</b>          | <b>P3TFAFFD2AN</b>            |
| 2000 (3400)                                      | 460V/3ph/60Hz                    | <b>PRD2000-460360</b>                        | 6" Flg.      | <b>P3TFAFGW3AN</b>     | <b>P3TFAFGQ3AN*</b>          | <b>P3TFAFGD3AN</b>            |
| 2400 (4078)                                      | 460V/3ph/60Hz                    | <b>PRD2400-460360</b>                        | 6" Flg.      | <b>P3TFAFGW3AN</b>     | <b>P3TFAFGQ3AN*</b>          | <b>P3TFAFGD3AN</b>            |

☐ Most popular.

\* 1µ coalescing

**Dryer Products**

PRD Series

DD Series

P3TJA Series

PTW Series

ED Series

WDV3-G Series



**Operating information**

|                                  |                   | PRD10-PRD175      | PRD200-PRD250     | PRD325-PRD2400    |
|----------------------------------|-------------------|-------------------|-------------------|-------------------|
| Temperature:                     | Ambient (maximum) | 122°F (50°C)      | 122°F (50°C)      | 122°F (50°C)      |
|                                  | Ambient (minimum) | 41°F (5°C)        | 41°F (5°C)        | 41°F (5°C)        |
|                                  | Inlet (maximum)   | 149°F (65°C)      | 140°F (60°C)      | 140°F (60°C)      |
| Pressure (maximum):              |                   | 232 PSIG (16 bar) | 203 PSIG (14 bar) | 203 PSIG (14 bar) |
| Refrigerant:                     |                   | R134a             | R407C             | R407C             |
| For technical information see CD |                   |                   |                   |                   |

**Flow correction factors**

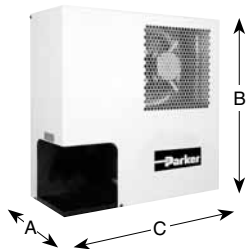
Capacities are based upon:  
 Ambient temperature - 100°F (38°C); inlet temperature - 100°F (38°C);  
 and working pressure - 100 PSIG (7 bar g).

To obtain dryer capacity at new conditions, multiply nominal capacity x C1 x C2 x C3

|                                 |  | PRD10 - PRD175 |      |      |      |      |      |      | PRD200 - PRD250 |      |      |      |      |      |      | PRD325 - PRD2400 |      |      |      |      |      |      |      |  |  |  |  |  |  |
|---------------------------------|--|----------------|------|------|------|------|------|------|-----------------|------|------|------|------|------|------|------------------|------|------|------|------|------|------|------|--|--|--|--|--|--|
| <b>Ambient temperature (C1)</b> |  |                |      |      |      |      |      |      |                 |      |      |      |      |      |      |                  |      |      |      |      |      |      |      |  |  |  |  |  |  |
| °F                              |  | 60             | 70   | 80   | 89   | 100  | 110  | 120  |                 | 70   | 80   | 90   | 100  | 110  | 120  | 122              |      | 90   | 100  | 110  | 120  | 122  |      |  |  |  |  |  |  |
| °C                              |  | 16             | 21   | 27   | 32   | 38   | 43   | 49   |                 | 21   | 27   | 32   | 38   | 43   | 49   | 50               |      | 32   | 38   | 43   | 49   | 50   |      |  |  |  |  |  |  |
| Factor                          |  | 1.34           | 1.26 | 1.17 | 1.09 | 1.00 | 0.91 | 0.82 |                 | 1.22 | 1.15 | 1.05 | 1.00 | 0.94 | 0.79 | 0.71             |      | 1.05 | 1.00 | 0.94 | 0.79 | 0.71 |      |  |  |  |  |  |  |
| <b>Inlet temperature (C2)</b>   |  |                |      |      |      |      |      |      |                 |      |      |      |      |      |      |                  |      |      |      |      |      |      |      |  |  |  |  |  |  |
| °F                              |  | 90             | 100  | 110  | 120  | 140  | 149  |      | 90              | 100  | 110  | 120  | 130  | 140  |      | 90               | 100  | 110  | 120  | 130  | 140  |      |      |  |  |  |  |  |  |
| °C                              |  | 32             | 38   | 43   | 49   | 60   | 65   |      | 32              | 38   | 43   | 49   | 54   | 60   |      | 32               | 38   | 43   | 49   | 54   | 60   |      |      |  |  |  |  |  |  |
| Factor                          |  | 1.24           | 1.00 | 0.81 | 0.67 | 0.45 | 0.43 |      | 1.24            | 1.00 | 0.82 | 0.68 | 0.56 | 0.40 |      | 1.22             | 1.00 | 0.82 | 0.68 | 0.56 | 0.46 |      |      |  |  |  |  |  |  |
| <b>Inlet pressure (C3)</b>      |  |                |      |      |      |      |      |      |                 |      |      |      |      |      |      |                  |      |      |      |      |      |      |      |  |  |  |  |  |  |
| PSIG                            |  | 60             | 80   | 100  | 125  | 150  | 175  | 200  | 230             | 50   | 80   | 100  | 125  | 150  | 174  | 203              | 50   | 80   | 100  | 125  | 150  | 174  | 203  |  |  |  |  |  |  |
| bar                             |  | 4              | 6    | 7    | 9    | 10   | 12   | 14   | 16              | 3    | 6    | 7    | 9    | 10   | 12   | 14               | 3    | 6    | 7    | 9    | 10   | 12   | 14   |  |  |  |  |  |  |
| Factor                          |  | 0.83           | 0.93 | 1.00 | 1.07 | 1.12 | 1.16 | 1.19 | 1.22            | 0.77 | 0.93 | 1.00 | 1.07 | 1.12 | 1.15 | 1.18             | 0.77 | 0.93 | 1.00 | 1.07 | 1.12 | 1.15 | 1.18 |  |  |  |  |  |  |

**Dimensions**

|                       | A           | B           | C           | Weight (kg) | Part number    |
|-----------------------|-------------|-------------|-------------|-------------|----------------|
| <b>PRD10-PRD250</b>   | 8.3 (210)   | 17 (430)    | 17.7 (450)  | 42 (19)     | <b>PRD10</b>   |
|                       | 8.3 (210)   | 17 (430)    | 17.7 (450)  | 42 (19)     | <b>PRD15</b>   |
|                       | 8.3 (210)   | 19.9 (505)  | 19.7 (500)  | 52 (24)     | <b>PRD25</b>   |
|                       | 8.3 (210)   | 19.9 (505)  | 19.7 (500)  | 52 (24)     | <b>PRD35</b>   |
|                       | 8.9 (225)   | 22.3 (565)  | 20.5 (520)  | 58 (27)     | <b>PRD50</b>   |
|                       | 8.9 (225)   | 22.3 (565)  | 20.5 (520)  | 68 (31)     | <b>PRD75</b>   |
|                       | 8.9 (225)   | 22.3 (565)  | 20.5 (520)  | 77 (35)     | <b>PRD100</b>  |
|                       | 16.7 (425)  | 23.8 (605)  | 21.8 (555)  | 115 (52)    | <b>PRD125</b>  |
|                       | 16.7 (425)  | 23.8 (605)  | 21.8 (555)  | 128 (58)    | <b>PRD150</b>  |
|                       | 16.7 (425)  | 23.8 (605)  | 21.8 (555)  | 132 (60)    | <b>PRD175</b>  |
|                       | 28.0 (711)  | 37.0 (940)  | 22.0 (559)  | 183 (83)    | <b>PRD200</b>  |
|                       | 28.0 (711)  | 42.0 (1067) | 41.0 (1041) | 287 (130)   | <b>PRD250</b>  |
| <b>PRD325-PRD2400</b> | 28.0 (711)  | 42.0 (1067) | 41.0 (1041) | 320 (145)   | <b>PRD325</b>  |
|                       | 28.0 (711)  | 42.0 (1067) | 41.0 (1041) | 320 (145)   | <b>PRD400</b>  |
|                       | 28.0 (711)  | 42.0 (1067) | 41.0 (1041) | 342 (155)   | <b>PRD500</b>  |
|                       | 32.0 (813)  | 52.0 (1321) | 46.0 (1168) | 529 (240)   | <b>PRD700</b>  |
|                       | 32.0 (813)  | 52.0 (1321) | 46.0 (1168) | 529 (240)   | <b>PRD800</b>  |
|                       | 32.0 (813)  | 52.0 (1321) | 46.0 (1168) | 551 (250)   | <b>PRD1000</b> |
|                       | 40.0 (1016) | 67.0 (1702) | 43.0 (1092) | 816 (370)   | <b>PRD1200</b> |
|                       | 40.0 (1016) | 68.0 (1727) | 71.0 (1803) | 1279 (580)  | <b>PRD1600</b> |
|                       | 40.0 (1016) | 68.0 (1727) | 71.0 (1803) | 1477 (670)  | <b>PRD2000</b> |
|                       | 40.0 (1016) | 68.0 (1727) | 71.0 (1803) | 1521 (690)  | <b>PRD2400</b> |



Inches (mm)



**Inline Desiccant Dryer – DD15, DD30, DD60**

- Inline desiccant dryers are a convenient and cost effective means of ensuring your sensitive intermittent pneumatic applications are never exposed to damaging moisture
- Compact size for point-of-use applications
- Drying efficiency down to -40°F pressure dew point
- Easily and quickly serviced
- Sightglass in bowl to monitor desiccant
- Built-in particulate after filter prevents downstream dust
- No electricity needed
- Low pressure drop
- No purge air lost as with other dryer types
- Check valve required on inlet
- Desiccant must be ordered separately



**Inline Desiccant Dryers**

| Port size        | Part number<br>SCFM / desiccant capacity <sup>1</sup> |                     |                      |
|------------------|---|---------------------|----------------------|
|                  | 15 SCFM /<br>2.5 lb.                                  | 30 SCFM /<br>5 lbs. | 60 SCFM /<br>10 lbs. |
| 1/4 <sup>2</sup> | <b>DD15-02</b>  |                     |                      |
| 3/8 <sup>2</sup> | <b>DD15-03</b>  |                     |                      |
| 1/2 <sup>2</sup> | <b>DD15-04</b>  | <b>DD30-04</b>      | <b>DD60-04</b>       |
| 3/4              | <b>DD15-06</b>  | <b>DD30-06</b>      | <b>DD60-06</b>       |
| 1                |   | <b>DD30-08</b>      | <b>DD60-08</b>       |

**Notes:**

1. Desiccant must be ordered separately.
2. These units supplied with reducer bushings.

**Service kits**

| Description                                       | Part number           |
|---|-----------------------|
| Desiccant - silica gel                            |                       |
| DD15  | <b>DRP-14-447/003</b> |
| DD30  | <b>DRP-14-447/006</b> |
| DD60  | <b>DRP-14-447/012</b> |
| Mounting brackets (pair of pipe mounted brackets) |                       |
| 1 inch Pipe Size                                  | <b>SA200CW57</b>      |

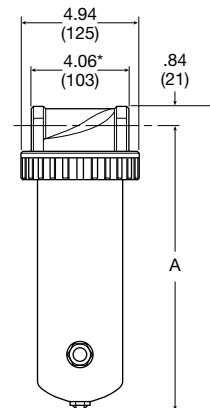
**Specifications**

| Desiccant Capacity (Desiccant must be ordered separately) |                  |
|---|------------------|
| DD15  | 2.5 lb. (1.1 kg) |
| DD30  | 5 lb. (2.3 kg)   |
| DD60  | 10 lb. (4.5 kg)  |

**Operating information**

|                              |                             |
|------------------------------|-----------------------------|
| Optimum working temperature: | Below 100°F                 |
| Operating temperature:       | 32°F to 180°F (0°C to 82°C) |
| Operating pressure:          | 0 to 300 PSIG Max (21 bar)  |

For technical information see CD



|      | A              | B              |
|------|----------------|----------------|
| DD15 | 12.69<br>(322) | 13.5<br>(343)  |
| DD30 | 22.44<br>(570) | 23.25<br>(591) |
| DD60 | 29.44<br>(748) | 30.25<br>(768) |

\* Dimension does not include reducer bushings for 1/4", 3/8", 1/2" versions.

Inches (mm)

**Material specifications**

|                               |      |                 |
|-------------------------------|------|-----------------|
| <b>Bowl</b>                   | DD15 | Aluminum        |
|                               | DD30 | Aluminum        |
|                               | DD60 | Steel           |
| <b>Flow tube</b>              |      | CPVC            |
| <b>Filter element</b>         |      | Sintered bronze |
| <b>Head &amp; flange ring</b> |      | Zinc            |
| <b>Other hardware</b>         |      | Brass           |
| <b>Seals</b>                  |      | Buna-N          |
| <b>Sight glass</b>            |      | Glass & steel   |

Most popular.



**Regenerative Desiccant Dryer – P3TJA**

- Point of use application bringing clean dry air just where you need it
- Approved to international standards designed in accordance with ASME VIII Div.1, approved to CSA/UL/CRN and fully CE Marked (PED, EMC, LVD) as standard
- Simple to install - flexible installation utilising the multiple in-line inlet & outlet connection ports
- Compact and lightweight - can be floor, bench or wall / canopy mounted
- Very quiet operation - noise level less than 70dB(A)
- Can be installed almost anywhere, IP66 / NEMA 4 protection as standard
- Audible alarm - indicating service interval for optimal performance
- Simple & easy to maintain - due to the quick release top cap arrangement, which does NOT require the inlet / outlet ports to be disconnected as with traditional systems, maintenance can be achieved in under 15 minutes

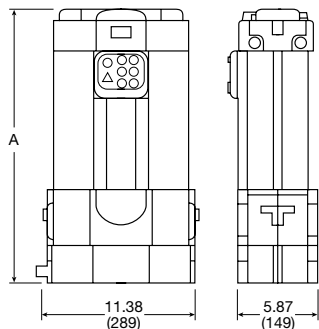
The P3TJA is the reliable, cost effective and flexible way to provide clean dry air exactly where needed.



| Operating information            |   |
|----------------------------------|---|
| Operating temperature:           | 35°F (1.5°C) max.   |
| Inlet temperature:               | 122°F (50°C) max.   |
| Operating pressure:              | 58 to 175 PSIG (4 to 21 bar)                                    |
| Flow range:                      | 3 SCFM to 20 SCFM @ 100 PSIG<br>(85 L/min to 567 L/min @ 7 bar) |
| Noise level (Average):           | 70dB(A)   |
| Pressure dewpoint –              |   |
| Standard                         | -40°F (-40°C) pdp   |
| Standard electrical supply:      | 115/1ph/60Hz (Tolerance +/- 10%)                                |
| Controls:                        | Electronic control timer  |
| Connections:                     | 3/8 NPT   |
| For technical information see CD |   |

**Regenerative Desiccant Dryer**

|              | A           | Weight (kg) | SCFM | Part number        | Maintenance kit   |
|--------------|-------------|-------------|------|--------------------|-------------------|
| <b>P3TJA</b> | 16.6 (422)  | 24.2 (11)   | 3    | <b>P3TJA93A1JN</b> | <b>P3TKA00JA1</b> |
|              | 19.7 (500)  | 28.7 (13)   | 5    | <b>P3TJA93A2JN</b> | <b>P3TKA00JA2</b> |
|              | 24.2 (616)  | 35.3 (16)   | 8    | <b>P3TJA93A3JN</b> | <b>P3TKA00JA3</b> |
|              | 27.2 (692)  | 39.7 (18)   | 10   | <b>P3TJA93A4JN</b> | <b>P3TKA00JA4</b> |
|              | 33.3 (847)  | 44.1 (20)   | 13   | <b>P3TJA93A5JN</b> | <b>P3TKA00JA5</b> |
|              | 35.7 (906)  | 50.7 (23)   | 15   | <b>P3TJA93A6JN</b> | <b>P3TKA00JA6</b> |
|              | 43.2 (1098) | 61.7 (28)   | 20   | <b>P3TJA93A7JN</b> | <b>P3TKA00JA7</b> |



Inches (mm)

**Service kits**

| Description      | Part number      |
|------------------|------------------|
| Mounting Bracket |                  |
| Fixed wall       | <b>P3TKA00MJ</b> |
| 45° tilt wall    | <b>P3TKA00MK</b> |

**Sizing chart (correction)**

| Minimum inlet pressure    |      |      |      |      |      |      |      |      |      |  |
|---------------------------|------|------|------|------|------|------|------|------|------|--|
| PSIG                      | 58   | 73   | 87   | 100  | 116  | 135  | 145  | 160  | 175  |  |
| bar g                     | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   |  |
| Maximum inlet temperature |      |      |      |      |      |      |      |      |      |  |
| 95°F (35°C)               | 0.63 | 0.75 | 0.88 | 1.00 | 0.97 | 1.08 | 1.18 | 1.29 | 1.40 |  |
| 104°F (40°C)              | 0.61 | 0.73 | 0.85 | 0.97 | 0.94 | 1.05 | 1.14 | 1.25 | 1.36 |  |
| 113°F (45°C)              | 0.55 | 0.66 | 0.77 | 0.88 | 0.85 | 0.95 | 1.04 | 1.14 | 1.23 |  |
| 122°F (50°C)              | 0.46 | 0.55 | 0.64 | 0.73 | 0.71 | 0.79 | 0.86 | 0.94 | 1.02 |  |

Most popular.



**Heatless Desiccant Air Dryer – PTW Series**

Parker PTW Series Heatless Desiccant Air Dryers remove water vapor from compresses air through a process known as pressure swing adsorption. Pressure dewpoints ranging from -40°F (-40°C) to -100°F (-70°C) are attained by directing the flow of saturated compressed air over a bed of desiccant.

**Features**

- Pre-filter and after filters included with dryers
- Solid state controller
- CycleLoc™ demand control
- Variable cycle control (models PTW75 - PTW800 SCFM)
- Purge Flow indicator
- Purge flow regulator (models PTW75 - PTW800 SCFM)
- Repressurization circuit (models PTW75 - PTW800 SCFM)
- Control air filter (models PTW75 - PTW800 SCFM)
- Safety valves
- Pressure equalization
- 150 PSIG design standard
- Moisture indicator (models PTW75 - PTW800 SCFM)

**Options**

- DDS Light / DDS (dewpoint dependent switching)



**Operating information**

|                                   |                             |
|-----------------------------------|-----------------------------|
| Inlet or ambient air temperature: | 120°F (49°C) maximum        |
| Operating pressure:               | 50 PSIG (3.5 bar) minimum   |
| Working pressure:                 | 150 PSIG (10.5 bar) maximum |
| Pressure drop at rated flow:      | less than 5 PSI (0.34 bar)  |

For technical information see CD

**Heatless Desiccant Air Dryers**

| Capacity<br>CFM @ 100 PSIG<br>(m³/min @ 6.9 bar) | Approximate<br>purge SCFM<br>(Nm³/min) | Primary<br>voltage | Part<br>number | Port<br>size | Filtration package included with dryer |                    |                    |
|--|--|--------------------|----------------|--------------|--|--------------------|--------------------|
|  |  |                    |                |              | Pre-filter (5µ)                        | Pre-filter (.01µ)  | After-filter (1µ)  |
| 25 (.70)   | 4 (.11)                                | 120V/1ph/60Hz      | <b>PTW25*</b>  | 1/2          | <b>P32FA94FSAN</b>                     | <b>P32FA94DSAN</b> | <b>P32FA94QSAN</b> |
| 42 (1.19)  | 6 (.19)                                | 120V/1ph/60Hz      | <b>PTW40*</b>  | 1/2          | <b>P33FA94FSAN</b>                     | <b>P33FA94DSAN</b> | <b>P33FA94QSAN</b> |
| 60 (1.70)  | 9 (.25)                                | 120V/1ph/60Hz      | <b>PTW55*</b>  | 3/4          | <b>P33FA94FSAN</b>                     | <b>P33FA94DSAN</b> | <b>P33FA94QSAN</b> |
| 75 (2.13)  | 11 (.31)                               | 120V/1ph/60Hz      | <b>PTW75*</b>  | 3/4          | <b>P3NFA96FSA</b>                      | <b>P3NFA96DSA</b>  | <b>P3NFA96QSA</b>  |
| 107 (3.03)                                       | 16 (.45)                               | 120V/1ph/60Hz      | <b>PTW100*</b> | 1            | <b>P3NFA98FSA</b>                      | <b>P3NFA98DSA</b>  | <b>P3NFA98QSA</b>  |
| 135 (3.82)                                       | 20 (.56)                               | 120V/1ph/60Hz      | <b>PTW130*</b> | 1            | <b>P3NFA98FSA</b>                      | <b>P3NFA98DSA</b>  | <b>P3NFA98QSA</b>  |
| 200 (5.66)                                       | 30 (.84)                               | 120V/1ph/60Hz      | <b>PTW200*</b> | 1-1/2        | <b>35F77BAP</b>                        | <b>35F77EAP</b>    | <b>35F77HAP</b>    |
| 250 (7.07)                                       | 38 (1.07)                              | 120V/1ph/60Hz      | <b>PTW250*</b> | 1/1/2        | <b>35F77BAP</b>                        | <b>35F77EAP</b>    | <b>35F77HAP</b>    |
| 300 (8.49)                                       | 45 (1.27)                              | 120V/1ph/60Hz      | <b>PTW300*</b> | 1-1/2        | <b>35F77BAP</b>                        | <b>35F77EAP</b>    | <b>35F77HAP</b>    |
| 400 (11.32)                                      | 60 (1.69)                              | 120V/1ph/60Hz      | <b>PTW400*</b> | 2            | <b>35F87BAP</b>                        | <b>35F87EAP</b>    | <b>35F87HAP</b>    |
| 500 (14.44)                                      | 77 (2.18)                              | 120V/1ph/60Hz      | <b>PTW500*</b> | 2            | <b>35F87BAP</b>                        | <b>35F87EAP</b>    | <b>35F87HAP</b>    |
| 600 (18.40)                                      | 98 (2.77)                              | 120V/1ph/60Hz      | <b>PTW600*</b> | 2            | <b>35F87BAP</b>                        | <b>35F87EAP</b>    | <b>35F87HAP</b>    |
| 800 (22.65)                                      | 120 (3.39)                             | 120V/1ph/60Hz      | <b>PTW800*</b> | 2            | <b>35F87BAP</b>                        | <b>35F87EAP</b>    | <b>35F87HAP</b>    |

\* Options: Dewpoint dependent switching (DDS).

DDS Light includes: energy saving purge cycle control with high humidity alarm and indicator light. When ordering use -DL as suffix.

DDS includes: energy saving purge cycle control with high humidity alarm and digital dewpoint display. When ordering use -DS as suffix

Most popular.



**Flow correction factors**

Capacities are based upon:

- Pressure drop at rated flow less than 5 PSI (0.34 bar)
- Maximum inlet air or ambient air temperature 120°F (49°C)
- Maximum working pressure: 150 PSIG (10.5 bar g) standard units for high maximum working pressure are available
- Minimum operating pressure: 50 PSIG (3.5 bar g)

**Inlet air pressure correction**

| PSI    | 50  | 60  | 70  | 80  | 90  | 100  | 110  | 120  | 130  | 140  | 150  |
|--------|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| bar    | 3.5 | 4.1 | 4.9 | 5.5 | 6.2 | 6.9  | 7.6  | 8.3  | 9.0  | 9.7  | 10.3 |
| Factor | .56 | .65 | .74 | .83 | .91 | 1.00 | 1.09 | 1.18 | 1.27 | 1.37 | 1.43 |

**Inlet air temperature correction**

| °F     | 90   | 95   | 100  | 105 | 110 | 115 | 120 |
|--------|------|------|------|-----|-----|-----|-----|
| °C     | 32   | 35   | 38   | 41  | 43  | 46  | 49  |
| Factor | 1.35 | 1.16 | 1.00 | .85 | .74 | .64 | .56 |

**Heatless Desiccant Air Dryers**

|                   | A (length) | B (width) | C (height) | Weight lbs. (kg) | Part number    |
|-------------------|------------|-----------|------------|------------------|----------------|
| <b>PTW series</b> | 19 (483)   | 16 (406)  | 64 (1626)  | 156 (71)         | <b>PTW25*</b>  |
|                   | 21 (533)   | 17 (432)  | 48 (1219)  | 190 (86)         | <b>PTW40*</b>  |
|                   | 21 (533)   | 20 (508)  | 67 (1702)  | 230 (104)        | <b>PTW55*</b>  |
|                   | 35 (889)   | 27 (686)  | 80 (2032)  | 384 (174)        | <b>PTW75*</b>  |
|                   | 35 (889)   | 27 (686)  | 80 (2032)  | 468 (212)        | <b>PTW100*</b> |
|                   | 35 (899)   | 21 (533)  | 70 (1778)  | 496 (225)        | <b>PTW130*</b> |
|                   | 44 (1118)  | 28 (711)  | 78 (1981)  | 692 (314)        | <b>PTW200*</b> |
|                   | 44 (1118)  | 30 (762)  | 78 (1981)  | 776 (352)        | <b>PTW250*</b> |
|                   | 44 (1118)  | 30 (762)  | 78 (1981)  | 796 (361)        | <b>PTW300*</b> |
|                   | 74 (1880)  | 41 (1041) | 84 (2134)  | 1626 (738)       | <b>PTW400*</b> |
|                   | 74 (1880)  | 41 (1041) | 85 (2159)  | 1735 (787)       | <b>PTW500*</b> |
|                   | 74 (1880)  | 41 (1041) | 86 (2184)  | 1740 (789)       | <b>PTW600*</b> |
|                   | 74 (1880)  | 41 (1041) | 91 (2311)  | 2120 (962)       | <b>PTW800*</b> |

Inch (mm)

\* Options: Dewpoint dependent switching (DDS).

DDS Light includes: energy saving purge cycle control with high humidity alarm and indicator light. When ordering use -DL as suffix.

DDS includes: energy saving purge cycle control with high humidity alarm and digital dewpoint display. When ordering use -DS as suffix.

**Service kits**

**Element kits**

|             | 5µ                | 0.01µ              | 1.0µ              |
|-------------|-------------------|--------------------|-------------------|
| <b>P32</b>  | <b>P32KA00ESE</b> | <b>P32KA00ESC</b>  | <b>P32KA00ES9</b> |
| <b>P33</b>  | <b>P33KA00ESE</b> | <b>P33KA00ESC</b>  | <b>P33KA00ES9</b> |
| <b>P3NF</b> | <b>P3NKA00ESE</b> | <b>P3NKA00ESCB</b> | <b>P3KNA00ES9</b> |
| <b>35F</b>  | <b>FRP-95-505</b> | <b>MTP-95-502</b>  | <b>MSP-95-502</b> |

Most popular.





**Zero Air Loss Condensate Drains**

Zero air loss condensate drains are designed for economical removal of unwanted water, oil emulsions, and other liquids. These drains will only open when liquid is present and will not allow any compressed air to escape from the system.



**Operating information**

|                                  |                               |
|----------------------------------|-------------------------------|
| Maximum pressure:                | 232 PSIG (16 bar)             |
| Ambient operating temperature:   | 35°F to 140°F (1.6°C to 60°C) |
| Voltages optional –              |                               |
| NPT                              | 115/50-60Hz, standard         |
| BSPP ports                       | 230/50-60Hz & 24VDC           |
| For technical information see CD |                               |

**Zero Air Loss Condensate Drains**

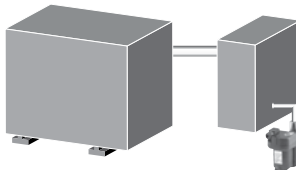
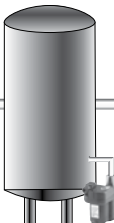

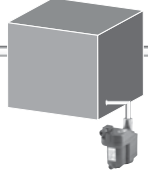
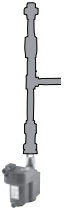
| Port size (NPT)             | Compressor aftercooler (SCFM)* | Capacity refrigeration dryer (SCFM)** | Filter (SCFM) | Drain capacity per day (gal/liter) | Model number        | Service kit         |
|-----------------------------|--------------------------------|---------------------------------------|---------------|------------------------------------|---------------------|---------------------|
| 1 @ 3/8 (in), 1 @ 3/8 (out) | —                              | —                                     | 424           | 6 (22.7)                           | <b>ED3002N115-K</b> | <b>SKED3000N115</b> |
| 1 @ 1/2 (in), 1 @ 3/8 (out) | 141                            | 282                                   | 1,413         | 13 (49.2)                          | <b>ED3004N115-K</b> | <b>SKED3000N115</b> |
| 2 @ 1/2 (in), 1 @ 3/8 (out) | 247                            | 494                                   | 2,472         | 23 (87.1)                          | <b>ED3007N115-K</b> | <b>SKED3000N115</b> |
| 2 @ 1/2 (in), 1 @ 3/8 (out) | 1,059                          | 2,119                                 | 10,594        | 100 (378.5)                        | <b>ED3030N115-K</b> | <b>SKED3000N115</b> |
| 2 @ 1/2 (in), 1 @ 3/8 (out) | 3,532                          | 7,063                                 | 35,315        | 330 (1,249.2)                      | <b>ED3100N115-K</b> | <b>SKED3000N115</b> |

\* Based on 100 PSI working pressure, air compressor inlet at 77°F (25°C) at 60% RH, air discharge temperature of 95°F (35°C) following the aftercooler, pressure dewpoint of 37°F (2.8°C) after the refrigerated dryer.

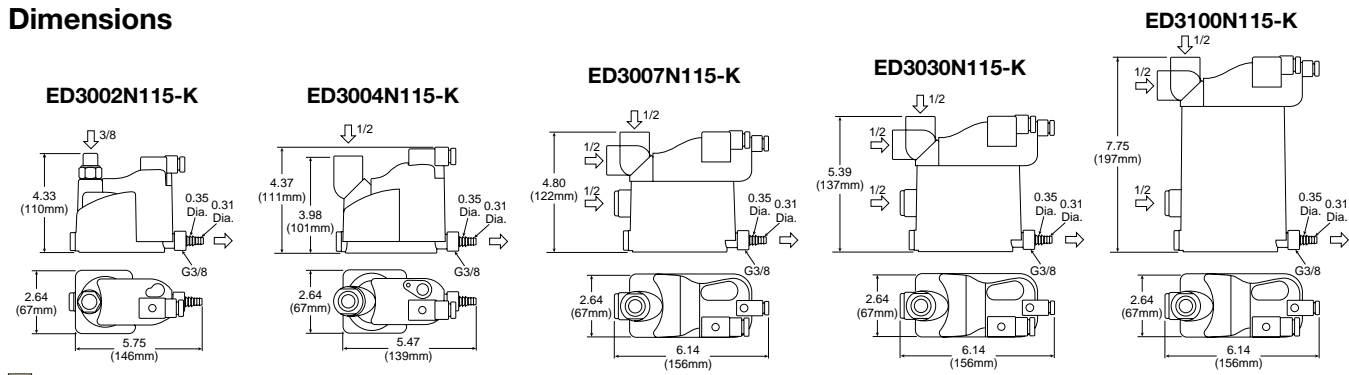
\*\* Condensate from aftercooler or refrigerated dryer to be drained upstream – only for residual oil content or small quantities of condensate.

Note: A 6 ft. line cord will be included with each drain.

**Where Are Condensate Drains Used?**

|   |   |   |   |  |
|---|---|---|---|--|
|  |      |  |  |   |
| <b>Compressor with Aftercooler</b>  | <b>Receiver Tank</b>  | <b>Filter</b>   | <b>Air Dryer</b>  | <b>Drip Leg</b>  |
| Removes the condensate that is collected after the air cools in the aftercooler     | Removes the condensate that is collected when the air cools inside of the receiver tank | Removes the condensate that is collected in the filter bowl                         | Removes the condensate that is collected in the air dryer                             | Point-of-use applications: removes the condensate from compressed air pipes in a plant |

**Dimensions**



 Most popular.

**P**

Dryer Products

PRD Series

DD Series

P3TJA Series

PTW Series

ED Series

WDV3-G Series

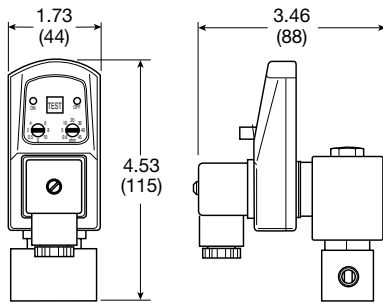


**Automatic Electrical Drain Valve – WDV3-G**

The WDV3 Electrical Drain is designed to remove condensate from compressors, compressed air dryers and receivers up to any size, type or manufacturer.

**Benefits**

- Does not air-lock during operation
- Compressed air systems up to any size
- The direct acting valve is serviceable
- Suitable for all types of compressors
- Test (micro-switch) feature
- High time cycle accuracy
- Large (4.5mm) valve orifice



**Automatic Electrical Drain Valve**

| Port size | Primary voltage | Weight (kg)  | Model number      |
|-----------|-----------------|--------------|-------------------|
| 1/4       | 120VAC          | 1.8 (0.8 kg) | <b>WDV3-G12BL</b> |
| 1/4       | 230VAC          | 1.8 (0.8 kg) | <b>WDV3-G22BL</b> |
| 3/8       | 120VAC          | 1.8 (0.8 kg) | <b>WDV3-G13BL</b> |
| 3/8       | 230VAC          | 1.8 (0.8 kg) | <b>WDV3-G23BL</b> |
| 1/2       | 120VAC          | 1.8 (0.8 kg) | <b>WDV3-G14BL</b> |
| 1/2       | 230VAC          | 1.8 (0.8 kg) | <b>WDV3-G24BL</b> |
| 1/2       | 24VDC           | 1.8 (0.8 kg) | <b>WDV3-G34BL</b> |

**Operating information**

|                                  |                               |
|----------------------------------|-------------------------------|
| Operating pressure:              | 230 PSIG (16 bar)             |
| Ambient operating temperature:   | 34°F to 130°F (1.1°C to 54°C) |
| Voltages:                        | 115VAC, 230/50-60Hz, 24VDC    |
| Coil insulation:                 | Class H, 340°F (171.1°C)      |
| Current rating:                  | 4mA maximum                   |
| Timer –                          |                               |
| Open time                        | .5 to 10 sec., adjustable     |
| Cycle time                       | .5 to 45 min., adjustable     |
| For technical information see CD |                               |

**Material specifications**

| Description               |                         |
|---------------------------|-------------------------|
| Valve body                | Brass / stainless steel |
| Enclosure (IP65 / NEMA 4) | ABS plastic             |
| Internal parts            | Brass / stainless steel |
| Valve seals               | FPM (Fluorocarbon)      |

**P**

Dryer Products

PRD Series

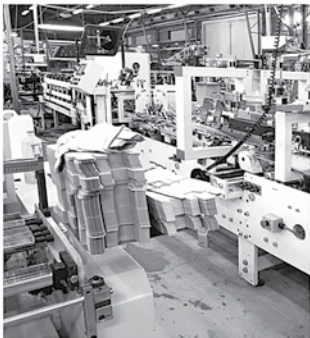
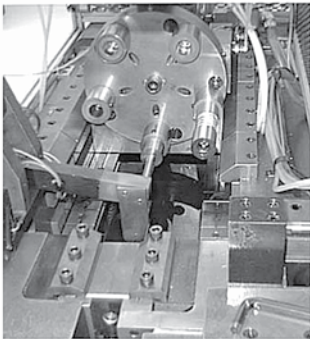
DD Series

P3TJA Series

PTW Series

ED Series

WDV3-G Series



**G**  
Accessories

# Accessories

## Accessories

### Ball Valves / Plug Valves



- Forged brass, general purpose, industrial ball valves
- Stainless steel, general purpose, industrial ball valves
- One piece extruded brass body plug valves

G3

### Hose & Fittings



- 801 General purpose hose
- Push-on hose barb fittings

G4

### Integrated Fittings



- Flow control regulators
- Inline check valves
- Blocking valves
- Threshold sensors

G5

## Accessories – continued

### Miscellaneous Accessories



- Tank valves & air chucks
- Mufflers & silencers
- Relief valves
- Quick exhaust / shuttle valves
- Pressure switches
- Blow guns
- Ports from M5 through 3/4 inch

G10

### Quick Couplings



- Industrial interchange nipples  
–1/4" to 3/4" body size
- Sleevematic couplers  
–1/4" to 1/2" body size
- Saffromatic couplers  
–1/4" to 3/4" body size
- Economatic quick connect couplings  
–1/4" body size

G14

### Tubing & Fittings



- Polyethylene tubing
- Nylon tubing
- Polyurethane tubing
- Push-to-connect, Prestolok composite fittings
- Push-to-connect, Prestolok metal fittings
- Pipe fittings

G17

G

Pictorial Index

**Parker Pneumatic**

**Female-Female Pipe Ends XV500P**



| Pipe thread | Flow dia. | Part number      |
|-------------|-----------|------------------|
| 1/4         | .375      | <b>XV500P-4</b>  |
| 3/8         | .375      | <b>XV500P-6</b>  |
| 1/2*        | .500      | <b>XV500P-8</b>  |
| 3/4**       | .685      | <b>XV500P-12</b> |
| 1**         | .875      | <b>XV500P-16</b> |

**Female Pipe Ends, Lever Handle, Mini Ball Valve MV200**



| Pipe thread | Flow dia. | Part number    |
|-------------|-----------|----------------|
| 1/8         | .31       | <b>MV200-2</b> |
| 1/4         | .31       | <b>MV200-4</b> |
| 3/8         | .31       | <b>MV200-6</b> |
| 1/2         | .39       | <b>MV200-8</b> |

**Male-Female Pipe Ends, Compact Handle, Mini Ball Valve MV608**



| Pipe thread | Flow dia. | Part number    |
|-------------|-----------|----------------|
| 1/8         | .20       | <b>MV608-2</b> |
| 1/4         | .31       | <b>MV608-4</b> |
| 3/8         | .31       | <b>MV608-6</b> |
| 1/2         | .39       | <b>MV608-8</b> |

**Female Pipe Ends, Compact Handle, Mini Ball Valve MV609**



| Pipe thread | Flow dia. | Part number      |
|-------------|-----------|------------------|
| 1/8         | .24       | <b>MV609-2</b>   |
| 1/4         | .31       | <b>MV609-4</b>   |
| 3/8         | .31       | <b>MV609-6</b>   |
| 1/2         | .39       | <b>MV609-8</b>   |
| 3/8x1/4     | .31       | <b>MV609-6-4</b> |

**Female Pipe Ends, Panel Mount XV502SS**



| Pipe thread | Flow dia. | Part number       |
|-------------|-----------|-------------------|
| 1/4         | .380      | <b>XV502SS-4</b>  |
| 3/8         | .380      | <b>XV502SS-6</b>  |
| 1/2         | .500      | <b>XV502SS-8</b>  |
| 3/4         | .790      | <b>XV502SS-12</b> |
| 1           | 1.000     | <b>XV502SS-16</b> |
| 1-1/4       | 1.250     | <b>XV502SS-20</b> |
| 1-1/2       | 1.500     | <b>XV502SS-24</b> |
| 2           | 2.000     | <b>XV502SS-32</b> |

Most popular. For technical information see CD

**Accessories**

**Ball and Plug Valves, Drain Cocks**

**Male Pipe to Male Pipe Plug Valve PV607**



| Pipe thread | Flow dia. | Part number    |
|-------------|-----------|----------------|
| 1/8         | .200      | <b>PV607-2</b> |
| 1/4         | .200      | <b>PV607-4</b> |

**Female Pipe to Male Pipe Plug Valve PV608**



| Pipe thread | Flow dia. | Part number    |
|-------------|-----------|----------------|
| 1/8         | .200      | <b>PV608-2</b> |
| 1/4         | .200      | <b>PV608-4</b> |

**Female Pipe to Female Pipe Plug Valve PV609**



| Pipe thread | Flow dia. | Part number    |
|-------------|-----------|----------------|
| 1/8         | .200      | <b>PV609-2</b> |
| 1/4         | .200      | <b>PV609-4</b> |

**Internal Seal Drain Cock DC602**

Temperature Range: -65° to 250°F



| Pipe thread | Part number    |
|-------------|----------------|
| 1/8         | <b>DC602-2</b> |
| 1/4         | <b>DC602-4</b> |

**External Seal Drain Cock DC604**

Temperature Range: -25° to 250°F



| Pipe thread | Part number     |
|-------------|-----------------|
| 1/8         | <b>DC604-2*</b> |
| 1/4         | <b>DC604-4</b>  |
| 3/8         | <b>DC604-6*</b> |

\* When assembled handle wings are down facing





**Hose & Fittings**

**801 Push-Lok Plus General Purpose Hose**

| Hose I.D. Inch | Hose O.D. Inch | Reel length | General part number* | Continuous part number |
|----------------|----------------|-------------|----------------------|------------------------|
| 1/4            | 0.50           | 600 feet    | <b>801-4-***-RL</b>  | <b>801-4-***-7200</b>  |
| 3/8            | 0.63           | 450 feet    | <b>801-6-***-RL</b>  | <b>801-6-***-5400</b>  |
| 1/2            | 0.78           | 300 feet    | <b>801-8-***-RL</b>  | <b>801-8-***-3600</b>  |
| 5/8            | 0.91           | 250 feet    | <b>801-10-***-RL</b> | <b>801-10-***-3000</b> |
| 3/4            | 1.03           | 200 feet    | <b>801-12-***-RL</b> | <b>801-12-***-2400</b> |
| 1              | 1.28           | 200 feet    | <b>801-16-***-RL</b> | <b>801-16-***-2400</b> |



\*\*\* Available Colors

GRA = gray  
 BLU = blue  
 RED = red  
 GRN = green  
 YEL = yellow  
 BLK = black

\* General reels have no more than 3 lengths per reel, each no less than 20 feet.

**30182 Push-on Hose Barb to Male Pipe**

| Thread (in) | Hose size (in) | Part number         |
|-------------|----------------|---------------------|
| 1/8 x 27    | 1/4            | <b>30182-2-4B</b>   |
| 1/4 x 18    | 1/4            | <b>30182-4-4B</b>   |
| 1/4 x 18    | 3/8            | <b>30182-4-6B</b>   |
| 3/8 x 18    | 3/8            | <b>30182-6-6B</b>   |
| 1/2 x 14    | 3/8            | <b>30182-8-6B</b>   |
| 3/8 x 18    | 1/2            | <b>30182-6-8B</b>   |
| 1/2 x 14    | 1/2            | <b>30182-8-8B</b>   |
| 1/2 x 14    | 5/8            | <b>30182-8-10B</b>  |
| 3/4 x 14    | 1/2            | <b>30182-12-8B</b>  |
| 3/4 x 14    | 3/4            | <b>30182-12-12B</b> |



**30282 Push-on Hose Barb to Female Pipe**

| Thread (in) | Hose size (in) | Part number       |
|-------------|----------------|-------------------|
| 1/4 x 18    | 1/4            | <b>30282-4-4B</b> |
| 3/8 x 18    | 3/8            | <b>30282-6-6B</b> |
| 1/2 x 14    | 1/2            | <b>30282-8-8B</b> |



**31382 Push-on Hose Barb to Male Pipe Swivel**

| Thread (in) | Hose size (in) | Part number       |
|-------------|----------------|-------------------|
| 1/4 x 18    | 1/4            | <b>31382-4-4</b>  |
| 3/8 x 18    | 3/8            | <b>31382-6-6</b>  |
| 1/2 x 14    | 1/2            | <b>31382-8-8*</b> |



\* Steel

**38282 Push-on Hose Barb Union**

| Hose size (in) | Part number       |
|----------------|-------------------|
| 1/4            | <b>38282-4-4B</b> |
| 3/8            | <b>38282-6-6B</b> |
| 1/2            | <b>38282-8-8B</b> |



Most popular. For technical information see CD

**30482 Push-on Hose Barb to Male SAE 45°**

| Thread (in) | Hose size (in) | Part number       |
|-------------|----------------|-------------------|
| 7/16 x 20   | 1/4            | <b>30482-4-4B</b> |
| 1/2 x 20    | 1/4            | <b>30482-5-4B</b> |
| 5/8 x 18    | 3/8            | <b>30482-6-6B</b> |
| 3/4 x 16    | 1/2            | <b>30482-8-8B</b> |



**30682 Push-on Hose Barb to Female SAE JIC 37° Swivel**

| Thread (in) | Hose size (in) | Part number         |
|-------------|----------------|---------------------|
| 7/16 x 20   | 1/4            | <b>30682-4-4B</b>   |
| 1/2 x 12    | 1/4            | <b>30682-5-4B</b>   |
| 9/16 x 18   | 1/4            | <b>30682-6-6B</b>   |
| 3/4 x 16    | 3/8            | <b>30682-8-6B</b>   |
| 3/4 x 16    | 1/2            | <b>30682-8-8B</b>   |
| 7/8 x 14    | 1/2            | <b>30682-10-8B</b>  |
| 7/8 x 14    | 5/8            | <b>30682-10-10B</b> |
| 1-1/16 x 12 | 3/4            | <b>30682-12-12B</b> |



**30882 Push-on Hose Barb to Female SAE 45° Swivel**

| Thread (in) | Hose size (in) | Part number         |
|-------------|----------------|---------------------|
| 7/16 x 20   | 1/4            | <b>30882-4-4B</b>   |
| 1/2 x 20    | 1/4            | <b>30882-5-4B</b>   |
| 5/8 x 18    | 3/8            | <b>30882-6-6B</b>   |
| 3/4 x 16    | 3/8            | <b>30882-8-6B</b>   |
| 3/4 x 16    | 1/2            | <b>30882-8-8B</b>   |
| 7/8 x 14    | 1/2            | <b>30882-10-8B</b>  |
| 7/8 x 14    | 5/8            | <b>30882-10-10B</b> |
| 1-1/16 x 14 | 3/4            | <b>30882-12-12B</b> |



**37G82 Push-on Hose Barb to Female Pipe (NPSM) Swivel with Gasket**

| Thread (in) | Hose size (in) | Gasket | Part number        |
|-------------|----------------|--------|--------------------|
| 1/4- 18     | 1/4            | 07G-4  | <b>37G82-4-4</b>   |
| 1/4- 18     | 3/8            | 07G-4  | <b>37G82-4-6</b>   |
| 3/8- 18     | 3/8            | 07G-6  | <b>37G82-6-6</b>   |
| 1/2- 14     | 1/2            | 07G-8  | <b>37G82-8-8</b>   |
| 1/2- 14     | 5/8            | 07G-8  | <b>37G82-8-10</b>  |
| 3/4- 14     | 3/4            | 07G-12 | <b>37G82-12-12</b> |



**G**  
 Accessories  
 Ball / Plug Valves  
 Hose & Fittings  
 Integrated Fittings  
 Misc. Accessories  
 Quick Couplings  
 Tubing & Fittings



**FCC731 Compact Meter Out**



| Tube size (in) | NPT | Part number          |
|----------------|-----|----------------------|
| 5/32           | 1/8 | <b>FCC731-5/32-2</b> |
| 5/32           | 1/4 | <b>FCC731-5/32-4</b> |
| 1/4            | 1/8 | <b>FCC731-4-2</b>    |
| 1/4            | 1/4 | <b>FCC731-4-4</b>    |
| 3/8            | 1/4 | <b>FCC731-6-4</b>    |
| 3/8            | 3/8 | <b>FCC731-6-6</b>    |

**FCC731 Compact Meter Out - BSPP**



| Tube size (mm) | BSPP | Part number          |
|----------------|------|----------------------|
| 4              | 1/8  | <b>FCC731-4M-2G</b>  |
| 6              | 1/8  | <b>FCC731-6M-2G</b>  |
| 6              | 1/4  | <b>FCC731-6M-4G</b>  |
| 8              | 1/8  | <b>FCC731-8M-2G</b>  |
| 8              | 1/4  | <b>FCC731-8M-4G</b>  |
| 8              | 3/8  | <b>FCC731-8M-6G</b>  |
| 10             | 1/4  | <b>FCC731-10M-4G</b> |
| 10             | 3/8  | <b>FCC731-10M-6G</b> |
| 12             | 3/8  | <b>FCC731-12M-6G</b> |
| 12             | 1/2  | <b>FCC731-12M-8G</b> |

**FCCB731 Compact Bi-Directional Flow Control**



| Tube size (in) | NPT | Part number           |
|----------------|-----|-----------------------|
| 5/32           | 1/8 | <b>FCCB731-5/32-2</b> |
| 1/4            | 1/8 | <b>FCCB731-4-2</b>    |
| 1/4            | 1/4 | <b>FCCB731-4-4</b>    |

**FCCB731 Compact Bi-directional Flow Control - BSPP**



| Tube size (mm) | BSPP | Part number          |
|----------------|------|----------------------|
| 4              | 1/8  | <b>FCCB731-4M-2G</b> |
| 6              | 1/8  | <b>FCCB731-6M-2G</b> |
| 6              | 1/4  | <b>FCCB731-6M-4G</b> |
| 8              | 1/8  | <b>FCCB731-8M-2G</b> |
| 8              | 1/4  | <b>FCCB731-8M-4G</b> |
| 8              | 3/8  | <b>FCCB731-8M-6G</b> |

**FCKC731 Knobless Meter Out Flow Control**



| Tube size (in) | NPT / UNF | Part number           |
|----------------|-----------|-----------------------|
| 1/8            | 10-32     | <b>FCKC731-2-0</b>    |
| 1/8            | 1/8       | <b>FCKC731-2-2</b>    |
| 5/32           | 10-32     | <b>FCKC731-5/32-0</b> |
| 5/32           | 1/8       | <b>FCKC731-5/32-2</b> |
| 1/4            | 10-32     | <b>FCKC731-4-0</b>    |
| 1/4            | 1/8       | <b>FCKC731-4-2</b>    |
| 1/4            | 1/4       | <b>FCKC731-4-4</b>    |
| 5/16           | 1/8       | <b>FCKC731-5-2</b>    |
| 5/16           | 1/4       | <b>FCKC731-5-4</b>    |
| 3/8            | 1/4       | <b>FCKC731-6-4</b>    |
| 3/8            | 3/8       | <b>FCKC731-6-6</b>    |

**FCKC731 Knobless Compact Flow Control - BSPP**



| Tube size (mm) | BSPP   | Part number           |
|----------------|--------|-----------------------|
| 4              | M5x0.8 | <b>FCKC731-4M-M5</b>  |
| 4              | 1/8    | <b>FCKC731-4M-2G</b>  |
| 6              | M5x0.8 | <b>FCKC731-6M-M5</b>  |
| 6              | 1/8    | <b>FCKC731-6M-2G</b>  |
| 6              | 1/4    | <b>FCKC731-6M-4G</b>  |
| 8              | 1/8    | <b>FCKC731-8M-2G</b>  |
| 8              | 1/4    | <b>FCKC731-8M-4G</b>  |
| 8              | 3/8    | <b>FCKC731-8M-6G</b>  |
| 10             | 1/4    | <b>FCKC731-10M-4G</b> |
| 10             | 3/8    | <b>FCKC731-10M-6G</b> |
| 10             | 1/2    | <b>FCKC731-10M-8G</b> |
| 12             | 3/8    | <b>FCKC731-12M-6G</b> |
| 12             | 1/2    | <b>FCKC731-12M-8G</b> |

**FCKCB731 Knobless Bi-directional Flow Control - BSPP**



| Tube size (mm) | BSPP / M5 | Part number           |
|----------------|-----------|-----------------------|
| 4              | M5x0.8    | <b>FCKCB731-4M-M5</b> |
| 4              | 1/8       | <b>FCKCB731-4M-2G</b> |
| 6              | M5x0.8    | <b>FCKCB731-6M-M5</b> |
| 6              | 1/8       | <b>FCKCB731-6M-2G</b> |
| 6              | 1/4       | <b>FCKCB731-6M-4G</b> |
| 8              | 1/8       | <b>FCKCB731-8M-2G</b> |
| 8              | 1/4       | <b>FCKCB731-8M-4G</b> |
| 8              | 3/8       | <b>FCKCB731-8M-6G</b> |

**FCM731 Miniature Meter Out Flow Control**



| Tube size (in) | NPT   | Part number          |
|----------------|-------|----------------------|
| 1/8            | 10-32 | <b>FCM731-2-0</b>    |
| 1/8            | 1/8   | <b>FCM731-2-2</b>    |
| 5/32           | 10-32 | <b>FCM731-5/32-0</b> |
| 5/32           | 1/8   | <b>FCM731-5/32-2</b> |
| 1/4            | 10-32 | <b>FCM731-4-0</b>    |
| 1/4            | 1/8   | <b>FCM731-4-2</b>    |
| 1/4            | 1/4   | <b>FCM731-4-4</b>    |

**FCM731 Miniature Flow Control - BSPP**



| Tube size (mm) | BSPP   | Part number         |
|----------------|--------|---------------------|
| 3              | M3x0.5 | <b>FCM731-3M-M3</b> |
| 3              | M5x0.8 | <b>FCM731-3M-M5</b> |
| 4              | M3x0.5 | <b>FCM731-4M-M3</b> |
| 4              | M5x0.8 | <b>FCM731-4M-M5</b> |
| 4              | 1/8    | <b>FCM731-4M-2G</b> |
| 6              | M5x0.8 | <b>FCM731-6M-M5</b> |
| 6              | 1/8    | <b>FCM731-6M-2G</b> |
| 6              | 1/4    | <b>FCM731-6M-4G</b> |
| 8              | 1/8    | <b>FCM731-8M-2G</b> |
| 8              | 1/4    | <b>FCM731-8M-4G</b> |
| 8              | 3/8    | <b>FCM731-8M-6G</b> |

Most popular. For technical information see CD





**Parker Pneumatic**

**FCMB731 Miniature Bi-directional Flow Control - BSPP**



| Tube size (mm) | BSPP   | Part number          |
|----------------|--------|----------------------|
| 4              | M5x0.8 | <b>FCMB731-4M-M5</b> |
| 4              | 1/8    | <b>FCMB731-4M-2G</b> |
| 6              | M5x0.8 | <b>FCMB731-6M-M5</b> |
| 6              | 1/8    | <b>FCMB731-6M-2G</b> |
| 6              | 1/4    | <b>FCMB731-6M-4G</b> |

**FCMK731 Knobless Mini Meter Out Flow Control**



| Tube size (in) | NPT   | Part number           |
|----------------|-------|-----------------------|
| 1/8            | 10-32 | <b>FCMK731-2-0</b>    |
| 1/8            | 1/8   | <b>FCMK731-2-2</b>    |
| 5/32           | 10-32 | <b>FCMK731-5/32-0</b> |
| 5/32           | 1/8   | <b>FCMK731-5/32-2</b> |
| 1/4            | 10-32 | <b>FCMK731-4-0</b>    |
| 1/4            | 1/8   | <b>FCMK731-4-2</b>    |
| 1/4            | 1/4   | <b>FCMK731-4-4</b>    |

**FCCS731 Compact Swivel Outlet Flow Control**



| Tube size (in) | NPT | Part number        |
|----------------|-----|--------------------|
| 1/4            | 1/8 | <b>FCCS731-4-2</b> |
| 1/4            | 1/4 | <b>FCCS731-4-4</b> |
| 3/8            | 1/4 | <b>FCCS731-6-4</b> |
| 3/8            | 3/8 | <b>FCCS731-6-6</b> |

**FCMS731 Mini Swivel Outlet Flow Control**



| Tube size (in) | NPT   | Part number           |
|----------------|-------|-----------------------|
| 5/32           | 10-32 | <b>FCMS731-5/32-0</b> |
| 5/32           | 1/8   | <b>FCMS731-5/32-2</b> |

**FCMS731 Miniature Swivel Outlet - BSPP**



| Tube size (mm) | NPT    | Part number          |
|----------------|--------|----------------------|
| 4              | M5x0.8 | <b>FCMS731-4M-M5</b> |
| 4              | 1/8    | <b>FCMS731-4M-2G</b> |
| 6              | M5x0.8 | <b>FCMS731-6M-M5</b> |
| 6              | 1/8    | <b>FCMS731-6M-2G</b> |

**FCCS731 Compact Swivel Outlet - BSPP**



| Tube size (mm) | BSPP | Part number           |
|----------------|------|-----------------------|
| 6              | 1/8  | <b>FCCS731-6M-2G</b>  |
| 6              | 1/4  | <b>FCCS731-6M-4G</b>  |
| 8              | 1/8  | <b>FCCS731-8M-2G</b>  |
| 8              | 1/4  | <b>FCCS731-8M-4G</b>  |
| 10             | 3/8  | <b>FCCS731-8M-6G</b>  |
| 10             | 1/4  | <b>FCCS731-10M-4G</b> |
| 10             | 3/8  | <b>FCCS731-10M-6G</b> |
| 12             | 3/8  | <b>FCCS731-12M-6G</b> |
| 12             | 1/2  | <b>FCCS731-12M-8G</b> |

Most popular. For technical information see CD

**Accessories Integrated Fittings**

**FCMSP731 Plug-In Mini Flow Control**



| Tube size (in) | Part number          |
|----------------|----------------------|
| 1/8            | <b>FCMSP731-2</b>    |
| 5/32           | <b>FCMSP731-5/32</b> |
| 1/4            | <b>FCMSP731-4</b>    |

**FCMSP701 Plug-In Miniature Flow Control**



| Tube size (mm) | Part number        |
|----------------|--------------------|
| 4              | <b>FCMSP701-4M</b> |
| 6              | <b>FCMSP701-6M</b> |

**FCCSP731 Plug-In Compact Flow Control**



| Tube size (mm) | Part number         |
|----------------|---------------------|
| 6              | <b>FCCSP731-6M</b>  |
| 8              | <b>FCCSP731-8M</b>  |
| 10             | <b>FCCSP731-10M</b> |
| 12             | <b>FCCSP731-12M</b> |

**FC832 In-Line Flow Control**



| Tube size (in) | Part number       |
|----------------|-------------------|
| 5/32           | <b>FC832-5/32</b> |
| 1/4            | <b>FC832-4</b>    |
| 5/16           | <b>FC832-5</b>    |
| 3/8            | <b>FC832-6</b>    |
| 1/2            | <b>FC832-8</b>    |

**FC832 In-Line Flow Control**



| Tube size (mm) | Part number      |
|----------------|------------------|
| 4              | <b>FC832-4M</b>  |
| 6              | <b>FC832-6M</b>  |
| 8              | <b>FC832-8M</b>  |
| 10             | <b>FC832-10M</b> |
| 12             | <b>FC832-12M</b> |

**FCB832 In-Line Bi-directional Flow Control**



| Tube size (in) | Part number        |
|----------------|--------------------|
| 5/32           | <b>FCB832-5/32</b> |
| 1/4            | <b>FCB832-4</b>    |
| 5/16           | <b>FCB832-5</b>    |

**FCB832 In-Line Bi-directional Flow Control**



| Tube size (mm) | Part number      |
|----------------|------------------|
| 4              | <b>FCB832-4M</b> |
| 6              | <b>FCB832-6M</b> |
| 8              | <b>FCB832-8M</b> |

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 Accessories  
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 Quick Couplings  
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**Parker Pneumatic**

**Accessories**

**Integrated Fittings**

**FCPM832 In-Line Panel Mountable Flow Control**



| Tube size (mm) | Part number        |
|----------------|--------------------|
| 4              | <b>FCPM832-4M</b>  |
| 6              | <b>FCPM832-6M</b>  |
| 8              | <b>FCPM832-8M</b>  |
| 10             | <b>FCPM832-10M</b> |
| 12             | <b>FCPM832-12M</b> |

**FC836 Threaded In-Line Flow Control**



| Port size (in) | Part number    |
|----------------|----------------|
| 1/8            | <b>FC836-2</b> |
| 1/4            | <b>FC836-4</b> |
| 3/8            | <b>FC836-6</b> |
| 1/2            | <b>FC836-8</b> |

**FC836 Threaded In-Line Flow Control - BSPP**



| Port size BSPP | Part number     |
|----------------|-----------------|
| 1/8            | <b>FC836-2G</b> |
| 1/4            | <b>FC836-4G</b> |
| 3/8            | <b>FC836-6G</b> |
| 1/2            | <b>FC836-8G</b> |

**337 Micrometer Flow Control Valves**



| Port size (in) | Part number       |
|----------------|-------------------|
| 1/8            | <b>00337 1000</b> |
| 1/4            | <b>00337 1001</b> |
| 3/8            | <b>00337 1002</b> |
| 1/2            | <b>00337 1003</b> |
| 3/4            | <b>00337 1004</b> |

**337 Micrometer Flow Control Valves - BSPP**



| Port size (in) | Part number       |
|----------------|-------------------|
| 1/8            | <b>00337G1000</b> |
| 1/4            | <b>00337G1001</b> |

**338 Bi-directional Flow Control Valves**



| Port size (in) | Part number       |
|----------------|-------------------|
| 1/8            | <b>00338 1100</b> |
| 1/4            | <b>00338 1101</b> |
| 3/8            | <b>00338 1102</b> |
| 1/2            | <b>00338 1103</b> |
| 3/4            | <b>00338 1104</b> |

**338 Bi-directional Flow Control Valves - BSPP**



| Port size (in) | Part number       |
|----------------|-------------------|
| 1/8            | <b>00338G1100</b> |
| 1/4            | <b>00338G1101</b> |

**3250 Flow Control Valves**



| Port size (in) | Part number       |
|----------------|-------------------|
| 1/8            | <b>03250 0119</b> |
| 1/4            | <b>03250 0219</b> |
| 3/8            | <b>03250 0319</b> |
| 1/2            | <b>03250 0419</b> |
| 3/4            | <b>03250 0519</b> |

**3250 Flow Control Valves - BSPP**



| Port size (in) | Part number      |
|----------------|------------------|
| 1/8            | <b>3250G0119</b> |
| 1/4            | <b>3250G0219</b> |
| 3/8            | <b>3250G0319</b> |
| 1/2            | <b>3250G0419</b> |
| 3/4            | <b>3250G0519</b> |

**3250 Flow Control Valves**



| Port size (in) | Part number      |
|----------------|------------------|
| 1              | <b>3250 1000</b> |
| 1-1/4          | <b>3250 1250</b> |
| 1-1/2          | <b>3250 1500</b> |

**3250 Flow Control Valves - BSPP**



| Port size (in) | Part number      |
|----------------|------------------|
| 1              | <b>3250G1000</b> |
| 1-1/4          | <b>3250G1250</b> |
| 1-1/2          | <b>3250G1500</b> |

Most popular. For technical information see CD



### 3251 Series Flow Control Valves



| Thread (NPT) Male | Thread (NPT) Female | Right angle flow control valves |
|-------------------|---------------------|---------------------------------|
| 1/8               | 1/8                 | <b>03251 0125</b>               |
| 1/4               | 1/4                 | <b>03251 0250</b>               |
| 3/8               | 3/8                 | <b>03251 0375</b>               |
| 1/2               | 1/2                 | <b>03251 0500</b>               |



| With Prestolok fittings |      |                   |
|-------------------------|------|-------------------|
| 1/8                     | 5/32 | <b>03251 1215</b> |
| 1/8                     | 1/4  | <b>03251 1225</b> |
| 1/4                     | 1/4  | <b>03251 2525</b> |
| 1/4                     | 3/8  | <b>03251 2538</b> |
| 3/8                     | 3/8  | <b>03251 3838</b> |

**CAUTION:** If it is possible that the ambient temperature may fall below freezing, the medium must be moisture-free to prevent internal damage or unpredictable behavior.

### FC705 Push-to-Connect Metal Flow Control



| Tube size (in) | NPT | Part number         |
|----------------|-----|---------------------|
| 5/32           | 1/8 | <b>FC705-5/32-2</b> |
| 1/4            | 1/8 | <b>FC705-4-2</b>    |
| 1/4            | 1/4 | <b>FC705-4-4</b>    |
| 3/8            | 1/4 | <b>FC705-6-4</b>    |
| 3/8            | 3/8 | <b>FC705-6-6</b>    |

### FC701 Push-to-Connect Metal Flow Control - BSPP



| Tube Size (mm) | BSPP | Part number         |
|----------------|------|---------------------|
| 4              | 1/8  | <b>FC701-4M-2G</b>  |
| 6              | 1/8  | <b>FC701-6M-2G</b>  |
| 6              | 1/4  | <b>FC701-6M-4G</b>  |
| 8              | 1/8  | <b>FC701-8M-2G</b>  |
| 8              | 1/4  | <b>FC701-8M-4G</b>  |
| 8              | 3/8  | <b>FC701-8M-6G</b>  |
| 10             | 1/4  | <b>FC701-10M-4G</b> |
| 10             | 3/8  | <b>FC701-10M-6G</b> |
| 12             | 3/8  | <b>FC701-12M-6G</b> |
| 12             | 1/2  | <b>FC701-12M-8G</b> |
| 14             | 1/2  | <b>FC701-14M-8G</b> |

### FC708 Threaded Port Meter Out Flow Control



| Port size (in) | Part number    |
|----------------|----------------|
| 1/8            | <b>FC708-2</b> |
| 1/4            | <b>FC708-4</b> |
| 3/8            | <b>FC708-6</b> |
| 1/2            | <b>FC708-8</b> |

Most popular. For technical information see CD

### FC702 Threaded Port Metal Flow Control - BSPP



| Port size BSPP | Part number     |
|----------------|-----------------|
| 1/8            | <b>FC702-2G</b> |
| 1/4            | <b>FC702-4G</b> |
| 3/8            | <b>FC702-6G</b> |
| 1/2            | <b>FC702-8G</b> |

### 32PLCK In-Line Check Valve



| Tube size (in) | Part number        |
|----------------|--------------------|
| 5/32           | <b>32PLCK-5/32</b> |
| 1/4            | <b>32PLCK-4</b>    |
| 5/16           | <b>32PLCK-5</b>    |
| 3/8            | <b>32PLCK-6</b>    |

### 32PLCK In-Line Check Valve



| Tube size (mm) | Part number       |
|----------------|-------------------|
| 4              | <b>32PLCK-4M</b>  |
| 6              | <b>32PLCK-6M</b>  |
| 8              | <b>32PLCK-8M</b>  |
| 10             | <b>32PLCK-10M</b> |
| 12             | <b>32PLCK-12M</b> |

### W68PLCK Male Check Valve



| Tube size (in) | NPT / UNF | Part number           |
|----------------|-----------|-----------------------|
| 5/32           | 10-32     | <b>68PLCK-5/32-0</b>  |
| 5/32           | 1/8       | <b>W68PLCK-5/32-2</b> |
| 1/4            | 1/8       | <b>W68PLCK-4-2</b>    |
| 1/4            | 1/4       | <b>W68PLCK-4-4</b>    |
| 3/8            | 1/4       | <b>W68PLCK-6-4</b>    |
| 3/8            | 3/8       | <b>W68PLCK-6-6</b>    |

### W68PLCKI Male Check Valve - Meter In



| Tube size (in) | NPT / UNF | Part number            |
|----------------|-----------|------------------------|
| 5/32           | 10-32     | <b>68PLCKI-5/32-0</b>  |
| 5/32           | 1/8       | <b>W68PLCKI-5/32-2</b> |
| 1/4            | 1/8       | <b>W68PLCKI-4-2</b>    |
| 1/4            | 1/4       | <b>W68PLCKI-4-4</b>    |
| 3/8            | 1/4       | <b>W68PLCKI-6-4</b>    |
| 3/8            | 3/8       | <b>W68PLCKI-6-6</b>    |

**G**  
 Accessories  
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 Integrated Fittings  
 Misc. Accessories  
 Quick Couplings  
 Tubing & Fittings



**Parker Pneumatic**

**68PLCK Male Check Valve Meter Out - BSPP**



| Tube size (mm) | BSPP   | Part number         |
|----------------|--------|---------------------|
| 4              | M5x0.8 | <b>68PLCK-4M-M5</b> |
| 4              | 1/8    | <b>68PLCK-4M-2G</b> |
| 6              | 1/8    | <b>68PLCK-6M-2G</b> |
| 6              | 1/4    | <b>68PLCK-6M-4G</b> |
| 8              | 1/8    | <b>68PLCK-8M-2G</b> |
| 8              | 1/4    | <b>68PLCK-8M-4G</b> |

**68PLCKI Male Check Valve Meter In - BSPP**



| Tube size (mm) | BSPP   | Part number           |
|----------------|--------|-----------------------|
| 4              | M5x0.8 | <b>68PLCKI-4M-M5</b>  |
| 6              | 1/8    | <b>68PLCKI-6M-2G</b>  |
| 8              | 1/8    | <b>68PLCKI-8M-2G</b>  |
| 8              | 1/4    | <b>68PLCKI-8M-4G</b>  |
| 10             | 3/8    | <b>68PLCKI-10M-6G</b> |
| 12             | 3/8    | <b>68PLCKI-12M-6G</b> |
| 12             | 1/2    | <b>68PLCKI-12M-8G</b> |

**VC – Check Valve**



| Tube size (in) | O.D. | Part number     |
|----------------|------|-----------------|
| 1/4            | .66  | <b>A4VC4-MG</b> |
| 5/16           | .70  | <b>A5VC5-MG</b> |
| 3/8            | .80  | <b>A6VC6-MG</b> |

**339 Check Valve**



| Port size | Part number       |
|-----------|-------------------|
| 1/8"      | <b>00339 3000</b> |
| 1/4"      | <b>00339 3001</b> |
| 3/8"      | <b>00339 3002</b> |
| 1/2"      | <b>00339 3003</b> |
| 3/4"      | <b>00339 3004</b> |

**339 Check Valve - BSPP**



| Port size | Part number       |
|-----------|-------------------|
| 1/8"      | <b>00339G3000</b> |
| 1/4"      | <b>00339G3001</b> |

**3047 Check Valve**



| Pipe thread | Part number       |
|-------------|-------------------|
| 1/4"        | <b>03047 0099</b> |

**Accessories  
Integrated Fittings**

**FC601 Push-to-Connect Lock Out Valves**



| Tube size (in) | NPT | Part number      |
|----------------|-----|------------------|
| 1/4            | 1/8 | <b>FC601-4-2</b> |
| 1/4            | 1/4 | <b>FC601-4-4</b> |
| 3/8            | 3/8 | <b>FC601-6-6</b> |
| 1/2            | 1/2 | <b>FC601-8-8</b> |

**FC601 Push-to-Connect Lock-Out Valve - BSPP**



| Tube size (mm) | BSPP | Part number         |
|----------------|------|---------------------|
| 6              | 1/8  | <b>FC601-6M-2G</b>  |
| 6              | 1/4  | <b>FC601-6M-4G</b>  |
| 8              | 1/4  | <b>FC601-8M-4G</b>  |
| 8              | 3/8  | <b>FC601-8M-6G</b>  |
| 10             | 3/8  | <b>FC601-10M-6G</b> |
| 12             | 1/2  | <b>FC601-12M-8G</b> |

**FC602 Threaded Port Lock Out Valves**



| NPT 1 | NPT 2 | Part number    |
|-------|-------|----------------|
| 1/4   | 1/8   | <b>FC602-2</b> |
| 1/4   | 1/4   | <b>FC602-4</b> |
| 3/8   | 3/8   | <b>FC602-6</b> |
| 1/2   | 1/2   | <b>FC602-8</b> |

**FC608 Threaded Port Lock-Out Valve - BSPP**



| BSPP 1 | BSPP 2 | Part number        |
|--------|--------|--------------------|
| 1/8    | 1/4    | <b>FC608-4G-2G</b> |
| 1/4    | 1/4    | <b>FC608-4G-4G</b> |
| 3/8    | 3/8    | <b>FC608-6G-6G</b> |
| 1/2    | 1/2    | <b>FC608-8G-8G</b> |

**PSBJ731 Pneumatic Threshold Sensor - 5/32 Pilot**



| NPT / UNF | Part number      |
|-----------|------------------|
| 10-32     | <b>PSBJ731-0</b> |
| 1/8       | <b>PSBJ731-2</b> |
| 1/4       | <b>PSBJ731-4</b> |
| 3/8       | <b>PSBJ731-6</b> |
| 1/2       | <b>PSBJ731-8</b> |

**PSBJ731 Pneumatic Threshold Sensor - 4mm Pilot**




| BSPP   | Part number       |
|--------|-------------------|
| M5x0.8 | <b>PSBJ731-M5</b> |
| 1/8    | <b>PSBJ731-2G</b> |
| 1/4    | <b>PSBJ731-4G</b> |
| 3/8    | <b>PSBJ731-6G</b> |
| 1/2    | <b>PSBJ731-8G</b> |

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**Parker Pneumatic**

**PSPJ731 Pneumatic Threshold Sensor - 10-32 Pilot**

|  | NPT | Part number      |
|---|-----|------------------|
|   | 1/8 | <b>PSPJ731-2</b> |
|   | 1/4 | <b>PSPJ731-4</b> |
|   | 3/8 | <b>PSPJ731-6</b> |


**PSBJ708 Pneumatic Threshold Sensor - M5 Pilot**

|  | BSPP | Part number       |
|---|------|-------------------|
|   | 1/8  | <b>PSBJ708-2G</b> |
|   | 1/4  | <b>PSBJ708-4G</b> |

Accessories


**Integrated Fittings, Tank Valves, Air Chucks**

**PSPE731 Pneumatic / Electric Threshold Sensor - BSPP**


|  | BSPP   | Part number       |
|---|--------|-------------------|
|   | M5x0.8 | <b>PSPE731-M5</b> |
|   | 1/8    | <b>PSPE731-2G</b> |
|   | 1/4    | <b>PSPE731-4G</b> |
|   | 3/8    | <b>PSPE731-6G</b> |
|   | 1/2    | <b>PSPE731-8G</b> |

**Tank Valves & Air Chucks**


**09166 0060**  
1/8" pipe thread, dome shaped cap

|  | Thread size | Part number       |
|--|-------------|-------------------|
|  | 1/8         | <b>09166 0060</b> |


**05499 0000**  
1/4" female port, ball-foot air chuck

|  | Thread size | Part number       |
|--|-------------|-------------------|
|  | 1/4         | <b>05499 0000</b> |


**00645 0060**  
1/8" pipe thread at bottom, screwdriver type cap

|  | Thread size | Part number       |
|---|-------------|-------------------|
|   | 1/8         | <b>00645 0060</b> |

**06739 0000**  
1/4" port, ball-foot air chuck with clip

|  | Thread size | Part number       |
|--|-------------|-------------------|
|  | 1/4         | <b>06739 0000</b> |

**01468 0006**  
1/8" pipe thread part way up the stem, screwdriver type cap

|  | Thread size | Part number       |
|---|-------------|-------------------|
|   | 1/8         | <b>01468 0006</b> |

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**G**  
 Accessories  
 Ball / Plug Valves  
 Hose & Fittings  
 Integrated Fittings  
 Misc. Accessories  
 Quick Couplings  
 Tubing & Fittings



**Mufflers / Silencers**

**EM Sintered Bronze Muffler / Filters**



| Thread size | Part number  |
|-------------|--------------|
| M5          | <b>EMM5</b>  |
| 1/8         | <b>EM12</b>  |
| 1/4         | <b>EM25</b>  |
| 3/8         | <b>EM37</b>  |
| 1/2         | <b>EM50</b>  |
| 3/4         | <b>EM75</b>  |
| 1           | <b>EM100</b> |
| 1-1/4       | <b>EM125</b> |
| 1-1/2       | <b>EM150</b> |

**Muffler / Flow Controls**



| Thread size | Part number       |
|-------------|-------------------|
| 1/8         | <b>04502 0002</b> |
| 1/4         | <b>04504 0004</b> |
| 3/8         | <b>04506 0060</b> |
| 1/2         | <b>04508 0080</b> |
| 3/4         | <b>04512 0012</b> |
| 1           | <b>04516 0016</b> |

**Breather Vents**



| Thread size | Part number       |
|-------------|-------------------|
| 1/8         | <b>04702 0002</b> |
| 1/4         | <b>04704 0004</b> |
| 3/8         | <b>04706 0006</b> |
| 1/2         | <b>04708 0008</b> |
| 3/4         | <b>04712 0012</b> |
| 1           | <b>04716 0016</b> |
| 1-1/4       | <b>04720 0020</b> |
| 1-1/2       | <b>04724 0024</b> |

NOTE: Breather vents should not be used as exhaust mufflers.

**ES Silencer**



| Thread size | Part number    |
|-------------|----------------|
| 1/8         | <b>ES12MC</b>  |
| 1/4         | <b>ES25MC</b>  |
| 3/8         | <b>ES37MC</b>  |
| 1/2         | <b>ES50MC</b>  |
| 3/4         | <b>ES75MC</b>  |
| 1           | <b>ES100MC</b> |
| 1-1/4       | <b>ES125MC</b> |
| 1-1/2       | <b>ES150MC</b> |

Most popular. For technical information see CD

**ASN Air Line Silencer, Plastic**



| Thread size | Part number   |
|-------------|---------------|
| M5          | <b>AS-5</b>   |
| 1/8         | <b>ASN-6</b>  |
| 1/4         | <b>ASN-8</b>  |
| 3/8         | <b>ASN-10</b> |
| 1/2         | <b>ASN-15</b> |

**P6M G Thread, Air Line Silencer, Plastic**



| Thread size | Part number     |
|-------------|-----------------|
| M5          | <b>P6M-PAC5</b> |
| G1/8        | <b>P6M-PAB1</b> |
| G1/4        | <b>P6M-PAB2</b> |
| G3/8        | <b>P6M-PAB3</b> |
| G1/2        | <b>P6M-PAB4</b> |
| G3/4        | <b>P6M-PAB6</b> |
| G1          | <b>P6M-PAB8</b> |

**ECS Reclassifier, Air Line Muffler**

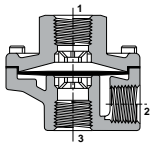


| Thread size | Part number |
|-------------|-------------|
| 1/2         | <b>ECS3</b> |
| 1           | <b>ECS5</b> |



**OR Quick Exhaust**

| Port 1                         | Port 2 | Port 3 | Flow (SCFM) | Part number with panel nut |
|--------------------------------|--------|--------|-------------|----------------------------|
| <b>Standard version</b>        |        |        |             |                            |
| 1/4                            | 1/4    | 3/8    | 150         | <b>OR25NB</b>              |
| 1/4                            | 3/8    | 3/8    | 240         | <b>OR25PB</b>              |
| 3/8                            | 3/8    | 3/8    | 240         | <b>OR37B</b>               |
| 1/2                            | 1/2    | 1/2    | 450         | <b>OR50B</b>               |
| 3/4                            | 3/4    | 3/4    | 550         | <b>OR75B</b>               |
| <b>Nitrile diaphragms</b>      |        |        |             |                            |
| 1/8                            | 1/8    | 1/8    | 70          | <b>OR12B</b>               |
| 1/8                            | 1/8    | 1/4    | 70          | <b>OR12NB</b>              |
| 1/4                            | 1/4    | 1/4    | 90          | <b>OR25B</b>               |
| 1/4                            | 1/4    | 3/8    | 90          | <b>OR25NFB</b>             |
| 3/8                            | 3/8    | 3/8    | 240         | <b>OR37FB</b>              |
| 3/4                            | 3/4    | 3/4    | 550         | <b>OR75FB</b>              |
| <b>Fluorocarbon diaphragms</b> |        |        |             |                            |
| 1/8                            | 1/8    | 1/8    | 70          | <b>OR12VB</b>              |
| 1/8                            | 1/8    | 1/4    | 70          | <b>OR12NVB</b>             |
| 1/4                            | 1/4    | 1/4    | 90          | <b>OR25VB</b>              |
| 3/8                            | 3/8    | 3/8    | 240         | <b>OR37VB</b>              |
| 1/2                            | 1/2    | 1/2    | 450         | <b>OR50VB</b>              |
| 3/4                            | 3/4    | 3/4    | 550         | <b>OR75VB</b>              |
| <b>PTFE diaphragms</b>         |        |        |             |                            |
| 3/8                            | 3/8    | 3/8    | 240         | <b>OR37TB</b>              |



**RV Relief Valve**



| Pressure (PSI) | Part number      |
|----------------|------------------|
| ***            | <b>RV01AN***</b> |

\*\*\* 010 through 200 psi

**130 Relief Valve**



| Spring range | Part number no panel nut | Part number with panel nut |
|--------------|--------------------------|----------------------------|
| 0-15 PSIG    | <b>130-02AA</b>          | <b>130-02AAP</b>           |
| 0-25 PSIG    | <b>130-02A</b>           | <b>130-02AP</b>            |
| 0-50 PSIG    | <b>130-02B</b>           | <b>130-02BP</b>            |
| 0-100 PSIG   | <b>130-02C</b>           | <b>130-02CP</b>            |

**134 Relief Valve**



| Spring range | Part number no panel nut | Part number with panel nut |
|--------------|--------------------------|----------------------------|
| 0-15 PSIG    | <b>134-02AA</b>          | <b>134-02AAP</b>           |
| 0-25 PSIG    | <b>134-02A</b>           | <b>134-02AP</b>            |
| 0-50 PSIG    | <b>134-02B</b>           | <b>134-02BP</b>            |
| 0-100 PSIG   | <b>134-02C</b>           | <b>134-02CP</b>            |

**N164 Shuttle Valve**



| Thread size | Part number      |
|-------------|------------------|
| 1/8         | <b>N164 1001</b> |
| 1/4         | <b>N164 2003</b> |
| 3/8         | <b>N164 3003</b> |

**G**

Accessories

Ball / Plug Valves

Hose & Fittings

Integrated Fittings

Misc. Accessories

Quick Couplings

Tubing & Fittings

Most popular. For technical information see CD





**Parker Pneumatic**

**Brass Nozzle Blow Gun**



| Inlet port      | Part number |
|-----------------|-------------|
| Lever operated  |             |
| 1/4             | 00475 0010  |
| Button operated |             |
| 1/4             | 00470 0010  |

**Brass Nozzle Blow Gun**



| Inlet port      | Part number |
|-----------------|-------------|
| Lever operated  |             |
| 1/4             | 00475 0900  |
| Button operated |             |
| 1/4             | 00470 0900  |

**Self-Regulating Blow Gun**



| Inlet port     | Part number |
|----------------|-------------|
| Lever operated |             |
| 1/4            | 00475 2900  |

**Pistol Grip Blow Gun**



| Inlet port | Part number |
|------------|-------------|
| 1/4        | BG441-NBL   |

**Brass Nozzle**



| Part number |
|-------------|
| 00470 7020  |

**Accessories**

**Blow Guns and Drip Leg Drain**

**Automatic Drip Leg Drain**



| Thread size | Part number |
|-------------|-------------|
| 1/4         | 06D1NA      |
| 1/2         | 06D3NA      |

**PPS1 Pressure Switch**



| Thread size | Part number  |
|-------------|--------------|
| 1/4 NPT     | PPS1-1C3-RHM |
| 1/8 NPT     | PPS1-2C3-RHM |
| 1/4" NPT    | PPS1-1C3-RWL |
| 1/8" NPT    | PPS1-2C3-RWL |

Most popular. For technical information see CD



**Parker Pneumatic**

**Industrial Interchange Nipples**

Hardened wear points and solid barstock construction provide long service life. Precision machined surfaces and hardened load-bearing areas resist the effects of mechanical shock in the most rugged applications. Industrial interchange nipples conform to MIL-C4109 and are for use with either Sleeveomatic or Saffromatic couplers.

**Female Pipe Thread**



| Body size (inches) | Thread size | Part number Steel |
|--------------------|-------------|-------------------|
| 1/4                | 1/8-27      | <b>H1C</b>        |
| 1/4                | 1/4-18      | <b>H3C</b>        |
| 1/4                | 3/8-18      | <b>H3C-E</b>      |
| 3/8                | 1/4-18      | <b>H1E</b>        |
| 3/8                | 3/8-18      | <b>H3E</b>        |
| 3/8                | 1/2-14      | <b>H3E-F</b>      |
| 1/2                | 3/8-18      | <b>H1F</b>        |
| 1/2                | 1/2-14      | <b>H3F</b>        |
| 1/2                | 3/4-14      | <b>H3F-G</b>      |
| 3/4                | 1/2-14      | <b>H3G-F</b>      |
| 3/4                | 3/4-14      | <b>H3G</b>        |
| 3/4                | 1-11½       | <b>H3G-J</b>      |

**Male Pipe Thread**



| Body size (inches) | Thread size | Part number Steel |
|--------------------|-------------|-------------------|
| 1/4                | 1/8-27      | <b>H0C</b>        |
| 1/4                | 1/4-18      | <b>H2C</b>        |
| 1/4                | 3/8-18      | <b>H2C-E</b>      |
| 3/8                | 1/8-27      | <b>H00E</b>       |
| 3/8                | 1/4-18      | <b>H0E</b>        |
| 3/8                | 3/8-18      | <b>H2E</b>        |
| 3/8                | 1/2-14      | <b>H2E-F</b>      |
| 1/2                | 3/8-18      | <b>H0F</b>        |
| 1/2                | 1/2-14      | <b>H2F</b>        |
| 1/2                | 3/4-14      | <b>H2F-G</b>      |
| 3/4                | 1/2-14      | <b>H2G-F</b>      |
| 3/4                | 3/4-14      | <b>H2G</b>        |
| 3/4                | 1-11½       | <b>H2G-J</b>      |

**Accessories**

**Industrial Interchange Nipples**

**Standard Hose Barb**



| Body size (inches) | Hose I.D. | Part number Steel |
|--------------------|-----------|-------------------|
| 1/4                | 1/4       | <b>H8C</b>        |
| 1/4                | 5/16      | <b>H8C-D</b>      |
| 1/4                | 3/8       | <b>H9C</b>        |
| 3/8                | 3/8       | <b>H5E</b>        |
| 3/8                | 1/2       | <b>H6E</b>        |
| 1/2                | 3/8       | <b>H4F</b>        |
| 1/2                | 1/2       | <b>H5F</b>        |
| 1/2                | 3/4       | <b>H5F-G</b>      |
| 3/4                | 1/2       | <b>H5G-F</b>      |
| 3/4                | 3/4       | <b>H5G</b>        |
| 3/4                | 1         | <b>H5G-J</b>      |

**Push-Lok Hose Barb\***



| Body size (inches) | Hose I.D. | Part number Steel |
|--------------------|-----------|-------------------|
| 1/4                | 1/4       | <b>H8CP</b>       |
| 1/4                | 3/8       | <b>H9CP</b>       |
| 3/8                | 1/4       | <b>H4EP</b>       |
| 3/8                | 3/8       | <b>H5EP</b>       |
| 3/8                | 1/2       | <b>H6EP</b>       |
| 1/2                | 3/8       | <b>H4FP</b>       |
| 1/2                | 1/2       | <b>H5FP</b>       |
| 1/2                | 1/2       | <b>H6FP</b>       |

\* Push-Lok hose barbs are designed for use with a push-lok hose and do not require clamps.

|          |                     |
|----------|---------------------|
| <b>G</b> | <b>Accessories</b>  |
|          | Ball / Plug Valves  |
|          | Hose & Fittings     |
|          | Integrated Fittings |
|          | Misc. Accessories   |
|          | Quick Couplings     |
|          | Tubing & Fittings   |

☐ Most popular. For technical information see CD



**Parker Pneumatic**

**Sleevmatic Couplers**

**Female Pipe Thread**



| Body size (inches) | Thread size | Part number |            |
|--------------------|-------------|-------------|------------|
|                    |             | Brass       | Steel      |
| 1/4                | 1/8-27      | <b>B23A</b> | —          |
| 1/4                | 1/4-18      | <b>B23</b>  | —          |
| 1/4                | 3/8-18      | <b>B23E</b> | —          |
| 3/8                | 1/4-18      | —           | <b>25C</b> |
| 3/8                | 3/8-18      | —           | <b>25</b>  |
| 3/8                | 1/2-14      | —           | <b>25F</b> |
| 1/2                | 3/8-18      | —           | <b>17E</b> |
| 1/2                | 1/2-14      | —           | <b>17</b>  |
| 1/2                | 3/4-14      | —           | <b>17G</b> |

**Male Pipe Thread**



| Body size (inches) | Thread size | Part number |            |
|--------------------|-------------|-------------|------------|
|                    |             | Brass       | Steel      |
| 1/4                | 1/4-18      | <b>B22</b>  | —          |
| 1/4                | 3/8-18      | <b>B22E</b> | —          |
| 3/8                | 1/4-18      | —           | <b>24C</b> |
| 3/8                | 3/8-18      | —           | <b>24</b>  |
| 3/8                | 1/2-14      | —           | <b>24F</b> |
| 1/2                | 3/8-18      | —           | <b>16E</b> |
| 1/2                | 1/2-14      | —           | <b>16</b>  |
| 1/2                | 3/4-14      | —           | <b>16G</b> |

**Standard Hose Barb**



| Body size (inches) | Hose I.D. | Part number   |              |
|--------------------|-----------|---------------|--------------|
|                    |           | Brass         | Steel        |
| 1/4                | 1/4       | <b>B20-3B</b> | —            |
| 1/4                | 5/16      | <b>B20-4B</b> | —            |
| 1/4                | 3/8       | <b>B20-5B</b> | —            |
| 3/8                | 3/8       | —             | <b>24-5B</b> |
| 3/8                | 1/2       | —             | <b>24-6B</b> |
| 1/2                | 3/8       | —             | <b>16-5B</b> |
| 1/2                | 1/2       | —             | <b>16-6B</b> |
| 1/2                | 3/4       | —             | <b>16-7B</b> |

**Push-Lok Hose Barb\***



| Body size (inches) | Hose I.D. | Part number    |               |
|--------------------|-----------|----------------|---------------|
|                    |           | Brass          | Steel         |
| 1/4                | 3/8       | <b>B20-5BP</b> | —             |
| 3/8                | 3/8       | —              | <b>24-5BP</b> |
| 1/2                | 3/8       | —              | <b>16-5BP</b> |
| 1/2                | 1/2       | —              | <b>16-6BP</b> |

\* Push-Lok hose barbs are designed for use with push-lok hose and do not require clamps.

**Accessories**

**Sleevmatic and Saflomatic Couplers**

**Saflomatic Couplers**

**Female Pipe Thread**



| Body size (inches) | Thread size | Part number |       |
|--------------------|-------------|-------------|-------|
|                    |             | Brass       | Steel |
| 1/4                | 1/8-27      | <b>B33A</b> | —     |
| 1/4                | 1/4-18      | <b>B33</b>  | —     |
| 1/4                | 3/8-18      | <b>B33E</b> | —     |
| 3/8                | 1/4-18      | <b>B35C</b> | —     |
| 3/8                | 3/8-18      | <b>B35</b>  | —     |
| 3/8                | 1/2-14      | <b>B35F</b> | —     |
| 1/2                | 3/8-18      | <b>B37E</b> | —     |
| 1/2                | 1/2-14      | <b>B37</b>  | —     |
| 1/2                | 3/4-14      | <b>B37G</b> | —     |
| 3/4                | 1/2-14      | <b>B39F</b> | —     |
| 3/4                | 3/4-14      | <b>B39</b>  | —     |
| 3/4                | 1-11½       | <b>B39J</b> | —     |

**Male Pipe Thread**



| Body size (inches) | Thread size | Part number |       |
|--------------------|-------------|-------------|-------|
|                    |             | Brass       | Steel |
| 1/4                | 1/8-27      | <b>B32A</b> | —     |
| 1/4                | 1/4-18      | <b>B32</b>  | —     |
| 1/4                | 3/8-18      | <b>B32E</b> | —     |
| 3/8                | 1/4-18      | <b>B34C</b> | —     |
| 3/8                | 3/8-18      | <b>B34</b>  | —     |
| 3/8                | 1/2-14      | <b>B34F</b> | —     |
| 1/2                | 3/8-18      | <b>B36E</b> | —     |
| 1/2                | 1/2-14      | <b>B36</b>  | —     |
| 1/2                | 3/4-14      | <b>B36G</b> | —     |
| 3/4                | 3/4-14      | <b>B38</b>  | —     |
| 3/4                | 1-11½       | <b>B38J</b> | —     |

**Standard Hose Barb**



| Body size (inches) | Hose I.D. | Part number   |       |
|--------------------|-----------|---------------|-------|
|                    |           | Brass         | Steel |
| 1/4                | 1/4       | <b>B30-3B</b> | —     |
| 1/4                | 5/16      | <b>B30-4B</b> | —     |
| 1/4                | 3/8       | <b>B30-5B</b> | —     |
| 3/8                | 3/8       | <b>B34-5B</b> | —     |
| 3/8                | 1/2       | <b>B34-6B</b> | —     |
| 1/2                | 1/2       | <b>B36-6B</b> | —     |
| 1/2                | 3/4       | <b>B36-7B</b> | —     |
| 3/4                | 3/4       | <b>B38-7B</b> | —     |
| 3/4                | 1         | <b>B38-8B</b> | —     |

**Push-Lok Hose Barb\***



| Body size (inches) | Thread size | Part number    |       |
|--------------------|-------------|----------------|-------|
|                    |             | Brass          | Steel |
| 1/4                | 1/4         | <b>B30-3BP</b> | —     |
| 1/4                | 3/8         | <b>B30-5BP</b> | —     |
| 3/8                | 3/8         | <b>B34-5BP</b> | —     |
| 1/2                | 1/2         | <b>B36-6BP</b> | —     |


\* Push-Lok hose barbs are designed for use with push-lok hose and do not require clamps.

Most popular. For technical information see CD




## Parker Pneumatic


### Couplers Female Pipe Thread

|  | Body size (inches) | Thread size | Part number<br>Brass |
|---|--------------------|-------------|----------------------|
|   | 1/4                | 1/4-18 NPTF | <b>B53</b>           |
| 1/4   | 3/8-18 NPTF        | <b>B53E</b> |                      |

### Couplers Male Pipe Thread

|  | Body size (inches) | Thread size | Part number<br>Brass |
|---|--------------------|-------------|----------------------|
|   | 1/4                | 1/4-18      | <b>B52</b>           |
| 1/4   | 3/8-18             | <b>B52E</b> |                      |

### Couplers Push-Lok Hose Barb\*


|  | Body size (inches) | Hose I.D.       | Part number<br>Brass |
|---|--------------------|-----------------|----------------------|
|   | 1/4                | 1/4             | <b>B50-03BP</b>      |
| 1/4   | 3/8                | <b>B50-05BP</b> |                      |

\* Push-Lok hose barbs are designed for use with push-lok hose and do not require clamps.


## Accessories

### Economatic Quick Connect Couplers


### Nipples Female Pipe Thread

|  | Body size (inches) | Thread size | Part number<br>Steel |
|---|--------------------|-------------|----------------------|
|   | 1/4                | 1/4-18      | <b>A3C</b>           |


### Nipples Male Pipe Thread

|  | Body size (inches) | Thread size | Part number<br>Steel |
|---|--------------------|-------------|----------------------|
|   | 1/4                | 1/4-18      | <b>A2C</b>           |

### Nipples Standard Hose Barb

|  | Body size (inches) | Hose I.D. | Part number<br>Steel |
|--|--------------------|-----------|----------------------|
|  | 1/4                | 1/4       | <b>A8C</b>           |

### Nipples Push-Lok Hose Barb\*

|  | Body size (inches) | Thread size | Part number<br>Steel |
|---|--------------------|-------------|----------------------|
|   | 1/4                | 1/4         | <b>A8CP</b>          |

\* Push-Lok barbs are designed for use with push-lok hose and do not require clamps.

**G**

Accessories

Ball / Plug Valves

Hose & Fittings

Integrated Fittings

Misc. Accessories

Quick Couplings

Tubing & Fittings

Most popular. For technical information see CD



**Polyethylene Tubing**

| O.D. | I.D. | Reel length (feet) | Color   | Part number        |
|------|------|--------------------|---------|--------------------|
| 1/4  | .170 | 100                | Natural | <b>E-43-0100</b>   |
| 1/4  | .170 | 500                | Natural | <b>E-43-0500</b>   |
| 1/4  | .170 | 1000               | Natural | <b>E-43-1000</b>   |
| 1/4  | .170 | 100                | Black   | <b>EB-43-0100</b>  |
| 1/4  | .170 | 500                | Black   | <b>EB-43-0500</b>  |
| 1/4  | .170 | 1000               | Black   | <b>EB-43-1000</b>  |
| 1/4  | .170 | 100                | Red     | <b>E-43-R-0100</b> |
| 1/4  | .170 | 500                | Red     | <b>E-43-R-0500</b> |
| 1/4  | .170 | 100                | Blue    | <b>E-43-B-0100</b> |
| 1/4  | .170 | 500                | Blue    | <b>E-43-B-0500</b> |
| 1/4  | .170 | 500                | Orange  | <b>E-43-O-0500</b> |
| 1/4  | .170 | 500                | Yellow  | <b>E-43-Y-0500</b> |
| 1/4  | .170 | 500                | Purple  | <b>E-43-P-0500</b> |
| 1/4  | .170 | 500                | Green   | <b>E-43-G-0500</b> |
| 5/16 | .187 | 500                | Natural | <b>E-53-0500</b>   |
| 5/16 | .187 | 500                | Black   | <b>EB-53-0500</b>  |
| 3/8  | .250 | 100                | Natural | <b>E-64-0100</b>   |
| 3/8  | .250 | 500                | Natural | <b>E-64-0500</b>   |
| 3/8  | .250 | 100                | Black   | <b>EB-64-0100</b>  |
| 3/8  | .250 | 500                | Black   | <b>EB-64-0500</b>  |
| 3/8  | .250 | 500                | Red     | <b>E-64-R-0500</b> |
| 3/8  | .250 | 500                | Blue    | <b>E-64-B-0500</b> |
| 3/8  | .250 | 500                | Orange  | <b>E-64-O-0500</b> |
| 3/8  | .250 | 500                | Yellow  | <b>E-64-Y-0500</b> |
| 3/8  | .250 | 500                | Purple  | <b>E-64-P-0500</b> |
| 3/8  | .250 | 500                | Green   | <b>E-64-G-0500</b> |
| 1/2  | .375 | 100                | Natural | <b>E-86-0100</b>   |
| 1/2  | .375 | 100                | Black   | <b>EB-86-0100</b>  |
| 5/8  | .500 | 100                | Natural | <b>E-108-0100</b>  |
| 5/8  | .500 | Coil               | Black   | <b>EB-108-0100</b> |



Most popular. For technical information see CD

**Polyethelene Tubing**

| O.D. | I.D. | Reel length (feet) | Part number          |
|------|------|--------------------|----------------------|
| 5/32 | .096 | 500                | <b>PEFR-2.5-0500</b> |
| 1/4  | .170 | 500                | <b>PEFR-4-0500</b>   |
| 1/4  | .170 | 1000               | <b>PEFR-4-1000</b>   |
| 3/8  | .250 | 500                | <b>PEFR-6-0500</b>   |
| 1/2  | .375 | 250                | <b>PEFR-8-0250</b>   |



**Polyurethane Tubing**

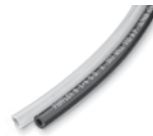
| O.D. | I.D. | Reel length (feet) | Part number*         |
|------|------|--------------------|----------------------|
| 1/8  | 1/16 | 500                | <b>U-21-xxx-0500</b> |
|      |      | 250                | <b>U-21-xxx-0250</b> |
| 1/4  | 1/8  | 500                | <b>U-42-xxx-0500</b> |
|      |      | 250                | <b>U-42-xxx-0250</b> |
| 3/8  | 1/4  | 250                | <b>U-64-xxx-0250</b> |
|      |      | 100 (coil)         | <b>U-64-xxx-0100</b> |
| 1/2  | 3/8  | 250                | <b>U-86-xxx-0250</b> |
|      |      | 100 (coil)         | <b>U-86-xxx-0100</b> |



\* xxx = Colors: Clear-Blank, Black-BLK, Green-GRN, Red-RED, Yellow-YEL, Blue-BLU, Orange-ORG, Gray-GRA (Example: U-21-BLK-0250)

**Nylon Tubing**

| O.D. | I.D. | Reel length (feet) | Color   | Part number       |
|------|------|--------------------|---------|-------------------|
| 1/8  | .093 | 250                | Natural | <b>NN-2-016</b>   |
| 1/8  | .093 | 250                | Black   | <b>NB-2-016</b>   |
| 1/8  | .064 | 250                | Natural | <b>NN-2-031</b>   |
| 1/8  | .064 | 250                | Black   | <b>NB-2-031</b>   |
| 5/32 | .106 | 250                | Natural | <b>NN-2.5-025</b> |
| 5/32 | .106 | 250                | Black   | <b>NB-2.5-025</b> |
| 3/16 | .138 | 250                | Natural | <b>NN-3-025</b>   |
| 3/16 | .138 | 250                | Black   | <b>NB-3-025</b>   |
| 3/16 | .096 | 250                | Natural | <b>NN-3-046</b>   |
| 3/16 | .096 | 250                | Black   | <b>NB-3-046</b>   |
| 1/4  | .180 | 250                | Natural | <b>NN-4-035</b>   |
| 1/4  | .180 | 250                | Black   | <b>NB-4-035</b>   |
| 1/4  | .170 | 250                | Natural | <b>NN-4-040</b>   |
| 1/4  | .170 | 250                | Black   | <b>NB-4-040</b>   |
| 1/4  | .127 | 250                | Natural | <b>NN-4-062</b>   |
| 1/4  | .127 | 250                | Black   | <b>NB-4-062</b>   |
| 5/16 | .233 | 250                | Natural | <b>NN-5-040</b>   |
| 5/16 | .233 | 250                | Black   | <b>NB-5-040</b>   |
| 3/8  | .275 | 250                | Natural | <b>NN-6-050</b>   |
| 3/8  | .275 | 250                | Black   | <b>NB-6-050</b>   |
| 3/8  | .190 | 250                | Natural | <b>NN-6-093</b>   |
| 3/8  | .190 | 250                | Black   | <b>NB-6-093</b>   |
| 1/2  | .375 | 250                | Natural | <b>NN-8-062</b>   |
| 1/2  | .375 | 250                | Black   | <b>NB-8-062</b>   |
| 1/2  | .253 | 250                | Natural | <b>NN-8-124</b>   |
| 1/2  | .253 | 250                | Black   | <b>NB-8-124</b>   |



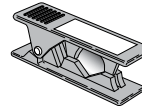
\*Suggested working pressure is 1/4 of burst pressure.

**Nylon Tubing**

| O.D. | I.D. | Reel length (feet) | Color   | Part number      |
|------|------|--------------------|---------|------------------|
| 1/8  | .091 | 500                | Natural | <b>NNR-2-017</b> |
| 1/8  | .091 | 500                | Black   | <b>NBR-2-017</b> |
| 1/8  | .073 | 500                | Natural | <b>NNR-2-026</b> |
| 1/8  | .073 | 500                | Black   | <b>NBR-2-026</b> |
| 3/16 | .140 | 500                | Natural | <b>NNR-3-024</b> |
| 3/16 | .140 | 500                | Black   | <b>NBR-3-024</b> |
| 3/16 | .110 | 500                | Natural | <b>NNR-3-039</b> |
| 3/16 | .110 | 500                | Black   | <b>NBR-3-039</b> |
| 1/4  | .180 | 250                | Natural | <b>NNR-4-035</b> |
| 1/4  | .180 | 250                | Black   | <b>NBR-4-035</b> |
| 1/4  | .150 | 250                | Natural | <b>NNR-4-050</b> |
| 1/4  | .150 | 250                | Black   | <b>NBR-4-050</b> |
| 5/16 | .233 | 250                | Natural | <b>NNR-5-040</b> |
| 5/16 | .233 | 250                | Black   | <b>NBR-5-040</b> |
| 3/8  | .279 | 250                | Natural | <b>NNR-6-048</b> |
| 3/8  | .279 | 250                | Black   | <b>NBR-6-048</b> |
| 3/8  | .225 | 250                | Natural | <b>NNR-6-075</b> |
| 3/8  | .225 | 250                | Black   | <b>NBR-6-075</b> |
| 1/2  | .376 | 250                | Natural | <b>NNR-8-062</b> |
| 1/2  | .376 | 250                | Black   | <b>NBR-8-062</b> |
| 1/2  | .350 | 250                | Natural | <b>NNR-8-075</b> |
| 1/2  | .350 | 250                | Black   | <b>NBR-8-075</b> |



**Plastic Tube Cutter**



|                |
|----------------|
| Part number    |
| <b>PTC-001</b> |

**Replacement Blades**



|                  |
|------------------|
| Part number      |
| <b>PTC-001RB</b> |

\*Suggested working pressure is 1/4 of burst pressure.

|          |                     |
|----------|---------------------|
| <b>G</b> | Accessories         |
|          | Ball / Plug Valves  |
|          | Hose & Fittings     |
|          | Integrated Fittings |
|          | Misc. Accessories   |
|          | Quick Couplings     |
|          | Tubing & Fittings   |

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**W369PLP Male Elbow Swivel 90°**



| Tube size (in.) | Thread NPT / UNF | Part number           |
|-----------------|------------------|-----------------------|
| 1/8             | 10-32            | <b>369PLP-2-0</b>     |
| 1/8             | 1/16             | <b>W369PLP-2-1</b>    |
| 1/8             | 1/8              | <b>W369PLP-2-2</b>    |
| 1/8             | 1/4              | <b>W369PLP-2-4</b>    |
| 5/32            | 10-32            | <b>369PLP-5/32-0</b>  |
| 5/32            | 1/8              | <b>W369PLP-5/32-2</b> |
| 5/32            | 1/4              | <b>W369PLP-5/32-4</b> |
| 3/16            | 1/8              | <b>W369PLP-3-2</b>    |
| 1/4             | 10-32            | <b>369PLP-4-0</b>     |
| 1/4             | 1/8              | <b>W369PLP-4-2</b>    |
| 1/4             | 1/4              | <b>W369PLP-4-4</b>    |
| 1/4             | 3/8              | <b>W369PLP-4-6</b>    |
| 5/16            | 1/8              | <b>W369PLP-5-2</b>    |
| 5/16            | 1/4              | <b>W369PLP-5-4</b>    |
| 5/16            | 3/8              | <b>W369PLP-5-6</b>    |
| 3/8             | 1/8              | <b>W369PLP-6-2</b>    |
| 3/8             | 1/4              | <b>W369PLP-6-4</b>    |
| 3/8             | 3/8              | <b>W369PLP-6-6</b>    |
| 3/8             | 1/2              | <b>W369PLP-6-8</b>    |
| 1/2             | 1/4              | <b>W369PLP-8-4</b>    |
| 1/2             | 3/8              | <b>W369PLP-8-6</b>    |
| 1/2             | 1/2              | <b>W369PLP-8-8</b>    |

**W369PLPX Extended Male Elbow**



| Tube size (in.) | Thread NPT / UNF | Part number            |
|-----------------|------------------|------------------------|
| 1/8             | 10-32            | <b>369PLPX-2-0</b>     |
| 1/8             | 1/8              | <b>W369PLPX-2-2</b>    |
| 1/8             | 1/4              | <b>W369PLPX-2-4</b>    |
| 5/32            | 10-32            | <b>369PLPX-5/32-0</b>  |
| 5/32            | 1/8              | <b>W369PLPX-5/32-2</b> |
| 5/32            | 1/4              | <b>W369PLPX-5/32-4</b> |
| 1/4             | 10-32            | <b>369PLPX-4-0</b>     |
| 1/4             | M7               | <b>369PLPX-4-M7</b>    |
| 1/4             | 1/8              | <b>W369PLPX-4-2</b>    |
| 1/4             | 1/4              | <b>W369PLPX-4-4</b>    |
| 1/4             | 3/8              | <b>W369PLPX-4-6</b>    |
| 5/16            | 1/8              | <b>W369PLPX-5-2</b>    |
| 5/16            | 1/4              | <b>W369PLPX-5-4</b>    |
| 3/8             | 1/8              | <b>W369PLPX-6-2</b>    |
| 3/8             | 1/4              | <b>W369PLPX-6-4</b>    |
| 3/8             | 3/8              | <b>W369PLPX-6-6</b>    |

**W379PLP Male Elbow 45°**



| Tube size (in.) | Thread NPT / UNF | Part number         |
|-----------------|------------------|---------------------|
| 1/8             | 10-32            | <b>379PLP-2-0</b>   |
| 1/8             | 1/8              | <b>W379PLP-2-2</b>  |
| 1/4             | 1/8              | <b>W379PLP-4-2</b>  |
| 1/4             | 1/4              | <b>W379PLP-4-4</b>  |
| 1/4             | M7               | <b>W379PLP-4-M7</b> |
| 3/8             | 1/4              | <b>W379PLP-6-4</b>  |
| 3/8             | 3/8              | <b>W379PLP-6-6</b>  |

**W372PLP Male Branch Tee Swivel**



| Tube size (in.) | Thread NPT / UNF | Part number           |
|-----------------|------------------|-----------------------|
| 1/8             | 10-32            | <b>372PLP-2-0</b>     |
| 1/8             | 1/16             | <b>W372PLP-2-1</b>    |
| 1/8             | 1/8              | <b>W372PLP-2-2</b>    |
| 1/8             | 1/4              | <b>W372PLP-2-4</b>    |
| 5/32            | 10-32            | <b>372PLP-5/32-0</b>  |
| 5/32            | 1/8              | <b>W372PLP-5/32-2</b> |
| 5/32            | 1/4              | <b>W372PLP-5/32-4</b> |
| 3/16            | 1/8              | <b>W372PLP-3-2</b>    |
| 1/4             | 1/8              | <b>W372PLP-4-2</b>    |
| 1/4             | 1/4              | <b>W372PLP-4-4</b>    |
| 1/4             | 3/8              | <b>W372PLP-4-6</b>    |
| 5/16            | 1/8              | <b>W372PLP-5-2</b>    |
| 5/16            | 1/4              | <b>W372PLP-5-4</b>    |
| 5/16            | 3/8              | <b>W372PLP-5-6</b>    |
| 3/8             | 1/8              | <b>W372PLP-6-2</b>    |
| 3/8             | 1/4              | <b>W372PLP-6-4</b>    |
| 3/8             | 3/8              | <b>W372PLP-6-6</b>    |
| 3/8             | 1/2              | <b>W372PLP-6-8</b>    |
| 1/2             | 1/4              | <b>W372PLP-8-4</b>    |
| 1/2             | 3/8              | <b>W372PLP-8-6</b>    |
| 1/2             | 1/2              | <b>W372PLP-8-8</b>    |

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**W371PLP Male Run Tee Swivel**

| Tube size (in.) | Thread NPT / UNF | Part number           |
|-----------------|------------------|-----------------------|
| 1/8             | 10-32            | <b>371PLP-2-0</b>     |
| 1/8             | 1/16             | <b>W371PLP-2-1</b>    |
| 1/8             | 1/8              | <b>W371PLP-2-2</b>    |
| 5/32            | 10-32            | <b>371PLP-5/32-0</b>  |
| 5/32            | 1/8              | <b>W371PLP-5/32-2</b> |
| 5/32            | 1/4              | <b>W371PLP-5/32-4</b> |
| 3/16            | 1/8              | <b>W371PLP-3-2</b>    |
| 1/4             | 1/8              | <b>W371PLP-4-2</b>    |
| 1/4             | 1/4              | <b>W371PLP-4-4</b>    |
| 1/4             | 3/8              | <b>W371PLP-4-6</b>    |
| 5/16            | 1/8              | <b>W371PLP-5-2</b>    |
| 5/16            | 1/4              | <b>W371PLP-5-4</b>    |
| 5/16            | 3/8              | <b>W371PLP-5-6</b>    |
| 3/8             | 1/8              | <b>W371PLP-6-2</b>    |
| 3/8             | 1/4              | <b>W371PLP-6-4</b>    |
| 3/8             | 3/8              | <b>W371PLP-6-6</b>    |
| 3/8             | 1/2              | <b>W371PLP-6-8</b>    |
| 1/2             | 1/4              | <b>W371PLP-8-4</b>    |
| 1/2             | 3/8              | <b>W371PLP-8-6</b>    |
| 1/2             | 1/2              | <b>W371PLP-8-8</b>    |



**32PLP Equal Union**

| Tube Size (in.) | Part number       |
|-----------------|-------------------|
| 1/8             | <b>32PLP-2</b>    |
| 5/32            | <b>32PLP-5/32</b> |
| 3/16            | <b>32PLP-3</b>    |
| 1/4             | <b>32PLP-4</b>    |
| 5/16            | <b>32PLP-5</b>    |
| 3/8             | <b>32PLP-6</b>    |
| 1/2             | <b>32PLP-8</b>    |



**365PLP Union Elbow**

| Tube Size (in.) | Part number        |
|-----------------|--------------------|
| 1/8             | <b>365PLP-2</b>    |
| 5/32            | <b>365PLP-5/32</b> |
| 3/16            | <b>365PLP-3</b>    |
| 1/4             | <b>365PLP-4</b>    |
| 5/16            | <b>365PLP-5</b>    |
| 3/8             | <b>365PLP-6</b>    |
| 1/2             | <b>365PLP-8</b>    |



**364PLP Union Tee**

| Tube Size (in.) | Part number        |
|-----------------|--------------------|
| 1/8             | <b>364PLP-2</b>    |
| 5/32            | <b>364PLP-5/32</b> |
| 3/16            | <b>364PLP-3</b>    |
| 1/4             | <b>364PLP-4</b>    |
| 5/16            | <b>364PLP-5</b>    |
| 3/8             | <b>364PLP-6</b>    |
| 1/2             | <b>364PLP-8</b>    |



**362PLP Union Y Connector**

| 1 Tube size (in.) | 2 Tube size (in.) | Part number          |
|-------------------|-------------------|----------------------|
| 1/8               | 1/8               | <b>362PLP-2</b>      |
| 1/8               | 1/4               | <b>362PLP-2-4</b>    |
| 5/32              | 5/32              | <b>362PLP-5/32</b>   |
| 5/32              | 1/4               | <b>362PLP-5/32-4</b> |
| 1/4               | 1/4               | <b>362PLP-4</b>      |
| 1/4               | 3/8               | <b>362PLP-4-6</b>    |
| 5/16              | 5/16              | <b>362PLP-5</b>      |
| 3/8               | 3/8               | <b>362PLP-6</b>      |



**W68PLPSP Male Standpipe**

| Tube size (in.) | Thread NPT / UNF | Part number            |
|-----------------|------------------|------------------------|
| 5/32            | 10-32            | <b>68PLPSP-5/32-0</b>  |
| 5/32            | 1/8              | <b>W68PLPSP-5/32-2</b> |
| 5/32            | 1/4              | <b>W68PLPSP-5/32-4</b> |
| 1/4             | 1/8              | <b>W68PLPSP-4-2</b>    |
| 1/4             | 1/4              | <b>W68PLPSP-4-4</b>    |
| 5/16            | 1/8              | <b>W68PLPSP-5-2</b>    |
| 5/16            | 1/4              | <b>W68PLPSP-5-4</b>    |
| 3/8             | 1/8              | <b>W68PLPSP-6-2</b>    |
| 3/8             | 1/4              | <b>W68PLPSP-6-4</b>    |
| 3/8             | 3/8              | <b>W68PLPSP-6-6</b>    |
| 1/2             | 3/8              | <b>W68PLPSP-8-6</b>    |
| 1/2             | 1/2              | <b>W68PLPSP-8-8</b>    |



**W368PLP Male Y Connector**

| Tube size (in.) | Thread NPT / UNF | Part number           |
|-----------------|------------------|-----------------------|
| 5/32            | 1/8              | <b>W368PLP-5/32-2</b> |
| 5/32            | 1/4              | <b>W368PLP-5/32-4</b> |
| 1/4             | 1/8              | <b>W368PLP-4-2</b>    |
| 1/4             | 1/4              | <b>W368PLP-4-4</b>    |
| 3/8             | 1/4              | <b>W368PLP-6-4</b>    |
| 3/8             | 3/8              | <b>W368PLP-6-6</b>    |



**362PLPD Double Y Connector**

| 1 Tube size (in.) | 2 Tube size (in.) | Part number           |
|-------------------|-------------------|-----------------------|
| 5/32              | 5/32              | <b>362PLPD-5/32</b>   |
| 5/32              | 1/4               | <b>362PLPD-5/32-4</b> |



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**G**  
 Accessories  
 Ball / Plug Valves  
 Hose & Fittings  
 Integrated Fittings  
 Misc. Accessories  
 Quick Couplings  
 Tubing & Fittings



### 24PLP Multiple Tee



| 1 Tube size (in.) | 2 Tube size (in.) | Part number         |
|-------------------|-------------------|---------------------|
| 1/4               | 5/32              | <b>24PLP-4-5/32</b> |
| 1/4               | 1/4               | <b>24PLP-4-4</b>    |
| 5/16              | 5/32              | <b>24PLP-5-5/32</b> |
| 3/8               | 1/4               | <b>24PLP-6-4</b>    |

### 24PLPD Double Multiple Tee



| 1 Tube size (in.) | 2 Tube size (in.) | Part number          |
|-------------------|-------------------|----------------------|
| 1/4               | 5/32              | <b>24PLPD-4-5/32</b> |
| 1/4               | 1/4               | <b>24PLPD-4-4</b>    |
| 5/16              | 5/32              | <b>24PLPD-5-5/32</b> |
| 3/8               | 1/4               | <b>24PLPD-6-4</b>    |

### 347PLP Equal Cross



| Tube Size (in.) | Part number        |
|-----------------|--------------------|
| 5/32            | <b>347PLP-5/32</b> |
| 1/4             | <b>347PLP-4</b>    |
| 5/16            | <b>347PLP-5</b>    |

### 32PLPRC Connector for 2 Tubes



| Tube Size (in.) | Part number         |
|-----------------|---------------------|
| 5/32            | <b>32PLPRC-5/32</b> |
| 1/4             | <b>32PLPRC-4</b>    |
| 5/16            | <b>32PLPRC-5</b>    |

### 32PLPDRC Connector for 3 Tubes



| Tube Size (in.) | Part number          |
|-----------------|----------------------|
| 5/32            | <b>32PLPDRC-5/32</b> |
| 5/16            | <b>32PLPDRC-5</b>    |

### 377PLP Female Branch Tee Swivel



| Tube size (in.) | Thread NPT / UNF | Part number          |
|-----------------|------------------|----------------------|
| 1/8             | 1/8              | <b>377PLP-2-2</b>    |
| 5/32            | 1/8              | <b>377PLP-5/32-2</b> |
| 5/32            | 1/4              | <b>377PLP-5/32-4</b> |
| 1/4             | 1/8              | <b>377PLP-4-2</b>    |
| 1/4             | 1/4              | <b>377PLP-4-4</b>    |
| 5/16            | 1/8              | <b>377PLP-5-2</b>    |
| 5/16            | 1/4              | <b>377PLP-5-4</b>    |
| 3/8             | 1/4              | <b>377PLP-6-4</b>    |
| 1/2             | 3/8              | <b>377PLP-8-6</b>    |

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### 370PLP Female Elbow Swivel



| Tube size (in.) | Thread NPT | Part number          |
|-----------------|------------|----------------------|
| 1/8             | 1/8        | <b>370PLP-2-2</b>    |
| 5/32            | 1/8        | <b>370PLP-5/32-2</b> |
| 5/32            | 1/4        | <b>370PLP-5/32-4</b> |
| 1/4             | 1/8        | <b>370PLP-4-2</b>    |
| 1/4             | 1/4        | <b>370PLP-4-4</b>    |
| 5/16            | 1/8        | <b>370PLP-5-2</b>    |
| 5/16            | 1/4        | <b>370PLP-5-4</b>    |
| 3/8             | 1/4        | <b>370PLP-6-4</b>    |
| 1/2             | 3/8        | <b>370PLP-8-6</b>    |

### 32PLPBH Bulkhead Union



| Tube Size (in.) | Part number         |
|-----------------|---------------------|
| 1/8             | <b>32PLPBH-2</b>    |
| 5/32            | <b>32PLPBH-5/32</b> |
| 1/4             | <b>32PLPBH-4</b>    |
| 5/16            | <b>32PLPBH-5</b>    |
| 3/8             | <b>32PLPBH-6</b>    |
| 1/2             | <b>32PLPBH-8</b>    |

### 365PLPBH Equal Bulkhead Elbow



| Tube size (in.) | Thread NPT / UNF | Part number          |
|-----------------|------------------|----------------------|
| 1/8             | 13               | <b>365PLPBH-2</b>    |
| 5/32            |                  | <b>365PLPBH-5/32</b> |
| 1/4             | 18               | <b>365PLPBH-4</b>    |
| 5/16            |                  | <b>365PLPBH-5</b>    |
| 3/8             | 22               | <b>365PLPBH-6</b>    |
| 1/2             | 29               | <b>365PLPBH-8</b>    |

### 369PLPSP Plug-In Elbow



| 1 Tube size (in.) | 2 Tube size (in.) | Part number            |
|-------------------|-------------------|------------------------|
| 1/8               | 1/8               | <b>369PLPSP-2</b>      |
| 5/32              | 5/32              | <b>369PLPSP-5/32</b>   |
| 5/32              | 1/4               | <b>369PLPSP-5/32-4</b> |
| 1/4               | 1/4               | <b>369PLPSP-4</b>      |
| 1/4               | 3/8               | <b>369PLPSP-4-6</b>    |
| 5/16              | 5/16              | <b>369PLPSP-5</b>      |
| 3/8               | 3/8               | <b>369PLPSP-6</b>      |
| 1/2               | 1/2               | <b>369PLPSP-8</b>      |



**369PLPSPX Extended Plug-In Elbow**



| 1 Tube size (in.) | 2 Tube size (in.) | Part number           |
|-------------------|-------------------|-----------------------|
| 1/8               | 1/8               | <b>369PLPSPX-2</b>    |
| 5/32              | 5/32              | <b>369PLPSPX-5/32</b> |
| 1/4               | 1/4               | <b>369PLPSPX-4</b>    |
| 5/16              | 5/16              | <b>369PLPSPX-5</b>    |
| 3/8               | 3/8               | <b>369PLPSPX-6</b>    |

**379PLPSP 45° Plug-In Elbow**



| 1 Tube size (in.) | 2 Tube size (in.) | Part number          |
|-------------------|-------------------|----------------------|
| 1/8               | 1/8               | <b>379PLPSP-2</b>    |
| 5/32              | 5/32              | <b>379PLPSP-5/32</b> |
| 1/4               | 1/4               | <b>379PLPSP-4</b>    |
| 5/16              | 5/16              | <b>379PLPSP-5</b>    |
| 3/8               | 3/8               | <b>379PLPSP-6</b>    |

**372PLPSP Plug-In Branch Tee**



| 1 Tube size (in.) | 2 Tube size (in.) | Part number          |
|-------------------|-------------------|----------------------|
| 1/8               | 1/8               | <b>372PLPSP-2</b>    |
| 5/32              | 5/32              | <b>372PLPSP-5/32</b> |
| 1/4               | 1/4               | <b>372PLPSP-4</b>    |
| 5/16              | 5/16              | <b>372PLPSP-5</b>    |
| 3/8               | 3/8               | <b>372PLPSP-6</b>    |
| 1/2               | 1/2               | <b>372PLPSP-8</b>    |

**371PLPSP Plug-In Run Tee**



| 1 Tube size (in.) | 2 Tube size (in.) | Part number          |
|-------------------|-------------------|----------------------|
| 5/32              | 5/32              | <b>371PLPSP-5/32</b> |
| 1/4               | 1/4               | <b>371PLPSP-4</b>    |
| 5/16              | 5/16              | <b>371PLPSP-5</b>    |
| 3/8               | 3/8               | <b>371PLPSP-6</b>    |
| 1/2               | 1/2               | <b>371PLPSP-8</b>    |

**362PLPSP Plug-In Y**



| 1 Tube size (in.) | 2 Tube size (in.) | Part number          |
|-------------------|-------------------|----------------------|
| 1/8               | 1/8               | <b>362PLPSP-2</b>    |
| 5/32              | 5/32              | <b>362PLPSP-5/32</b> |
| 1/4               | 1/4               | <b>362PLPSP-4</b>    |
| 5/16              | 5/16              | <b>362PLPSP-5</b>    |
| 3/8               | 3/8               | <b>362PLPSP-6</b>    |

**67PLP Tube End Reducer**



| 1 Tube size (in.) | 2 Tube size (in.) | Part number         |
|-------------------|-------------------|---------------------|
| 1/8               | 5/32              | <b>67PLP-2-5/32</b> |
| 1/8               | 3/16              | <b>67PLP-2-3</b>    |
| 1/8               | 1/4               | <b>67PLP-2-4</b>    |
| 5/32              | 3/16              | <b>67PLP-5/32-3</b> |
| 5/32              | 1/4               | <b>67PLP-5/32-4</b> |
| 5/32              | 5/16              | <b>67PLP-5/32-5</b> |
| 5/32              | 3/8               | <b>67PLP-5/32-6</b> |
| 3/16              | 5/16              | <b>67PLP-3-5</b>    |
| 3/16              | 1/4               | <b>67PLP-3-4</b>    |
| 1/4               | 5/16              | <b>67PLP-4-5</b>    |
| 1/4               | 3/8               | <b>67PLP-4-6</b>    |
| 1/4               | 1/2               | <b>67PLP-4-8</b>    |
| 5/16              | 3/8               | <b>67PLP-5-6</b>    |
| 5/16              | 1/2               | <b>67PLP-5-8</b>    |
| 3/8               | 1/2               | <b>67PLP-6-8</b>    |

**32PLPSP Tube Expander**



| 1 Tube size (in.) | 2 Tube size (in.) | Part number           |
|-------------------|-------------------|-----------------------|
| 1/4               | 1/8               | <b>32PLPSP-4-2</b>    |
| 1/4               | 6M                | <b>32PLPSP-4-6M</b>   |
| 1/4               | 5/32              | <b>32PLPSP-4-5/32</b> |
| 1/4               | 3/16              | <b>32PLPSP-4-3</b>    |
| 3/8               | 1/4               | <b>32PLPSP-6-4</b>    |

**322PLPSP Barbed Connector**



| OD 1 | OD 2 | OD 3 | Part No.                |
|------|------|------|-------------------------|
| 5/32 | 0.12 | 0.20 | <b>322PLPSP-2-5/32</b>  |
| 5/32 | 0.20 | 0.28 | <b>322PLPSP-5M-5/32</b> |
| 1/4  | 3/16 |      | <b>322PLPSP-3-4</b>     |
| 5/16 | 0.25 | 0.34 | <b>322PLPSP-4-5</b>     |
| 3/8  | 0.32 | 0.39 | <b>322PLPSP-5-5</b>     |
| 3/8  | 0.32 | 0.39 | <b>322PLPSP-5-6</b>     |

**63PLP Double Male Union**



| Tube size (in.) | Part number       |
|-----------------|-------------------|
| 5/32            | <b>63PLP-5/32</b> |
| 1/4             | <b>63PLP-4</b>    |
| 5/16            | <b>63PLP-5</b>    |
| 3/8             | <b>63PLP-6</b>    |
| 1/2             | <b>63PLP-8</b>    |

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### 639PLP Plug



| Tube size (in.) | Part number |
|-----------------|-------------|
| 1/8             | 639PLP-2    |
| 5/32            | 639PLP-5/32 |
| 3/16            | 639PLP-3    |
| 1/4             | 639PLP-4    |
| 5/16            | 639PLP-5    |
| 3/8             | 639PLP-6    |
| 1/2             | 639PLP-8    |

### W369PLP Male Elbow



| Tube size (mm) | Thread NPT | Part number   |
|----------------|------------|---------------|
| 4              | 1/8        | W369PLP-4M-2  |
| 4              | 1/4        | W369PLP-4M-4  |
| 6              | 1/8        | W369PLP-6M-2  |
| 6              | 1/4        | W369PLP-6M-4  |
| 8              | 1/8        | W369PLP-8M-2  |
| 8              | 1/4        | W369PLP-8M-4  |
| 8              | 3/8        | W369PLP-8M-6  |
| 10             | 1/4        | W369PLP-10M-4 |
| 10             | 3/8        | W369PLP-10M-6 |
| 10             | 1/2        | W369PLP-10M-8 |
| 12             | 3/8        | W369PLP-12M-6 |
| 12             | 1/2        | W369PLP-12M-8 |

### W372PLP Male Branch Tee Swivel



| Tube size (in.) | Thread NPT / UNF | Part number    |
|-----------------|------------------|----------------|
| 1/8             | 10-32            | 372PLP-2-0     |
| 1/8             | 1/16             | W372PLP-2-1    |
| 1/8             | 1/8              | W372PLP-2-2    |
| 1/8             | 1/4              | W372PLP-2-4    |
| 5/32            | 10-32            | 372PLP-5/32-0  |
| 5/32            | 1/8              | W372PLP-5/32-2 |
| 5/32            | 1/4              | W372PLP-5/32-4 |
| 3/16            | 1/8              | W372PLP-3-2    |
| 1/4             | 1/8              | W372PLP-4-2    |
| 1/4             | 1/4              | W372PLP-4-4    |
| 1/4             | 3/8              | W372PLP-4-6    |
| 5/16            | 1/8              | W372PLP-5-2    |
| 5/16            | 1/4              | W372PLP-5-4    |
| 5/16            | 3/8              | W372PLP-5-6    |
| 3/8             | 1/8              | W372PLP-6-2    |
| 3/8             | 1/4              | W372PLP-6-4    |
| 3/8             | 3/8              | W372PLP-6-6    |
| 3/8             | 1/2              | W372PLP-6-8    |
| 1/2             | 1/4              | W372PLP-8-4    |
| 1/2             | 3/8              | W372PLP-8-6    |
| 1/2             | 1/2              | W372PLP-8-8    |

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### 32PLP Union



| Tube size (mm) | Part number |
|----------------|-------------|
| 3              | 32PLP-3M    |
| 4              | 32PLP-4M    |
| 6              | 32PLP-6M    |
| 8              | 32PLP-8M    |
| 10             | 32PLP-10M   |
| 12             | 32PLP-12M   |
| 14             | 32PLP-14M   |

### 365PLP Union Elbow



| Tube size (mm) | Part number |
|----------------|-------------|
| 4              | 365PLP-4M   |
| 6              | 365PLP-6M   |
| 8              | 365PLP-8M   |
| 10             | 365PLP-10M  |
| 12             | 365PLP-12M  |
| 14             | 365PLP-14M  |

### 364PLP Union Tee



| Tube size (mm) | Part number |
|----------------|-------------|
| 3              | 364PLP-3M   |
| 4              | 364PLP-4M   |
| 6              | 364PLP-6M   |
| 8              | 364PLP-8M   |
| 10             | 364PLP-10M  |
| 12             | 364PLP-12M  |
| 14             | 364PLP-14M  |

### 362PLP Union Y Connector



| 1 Tube size (mm) | 2 Tube size (mm) | Part number    |
|------------------|------------------|----------------|
| 4                | 4                | 362PLP-4M      |
| 6                | 6                | 362PLP-6M      |
| 8                | 8                | 362PLP-8M      |
| 10               | 10               | 362PLP-10M     |
| 12               | 12               | 362PLP-12M     |
| 4                | 6                | 362PLP-4M-6M   |
| 6                | 8                | 362PLP-6M-8M   |
| 8                | 10               | 362PLP-8M-10M  |
| 10               | 12               | 362PLP-10M-12M |

### 362PLPD Double Y Connector



| 1 Tube size (mm) | 2 Tube size (mm) | Part number   |
|------------------|------------------|---------------|
| 4                | 4                | 362PLPD-4M    |
| 6                | 6                | 362PLPD-6M    |
| 4                | 6                | 362PLPD-4M-6M |
| 6                | 8                | 362PLPD-6M-8M |

**24PLP Multiple Tee**



| 1 Tube size (mm) | 2 Tube size (mm) | Part number  |
|------------------|------------------|--------------|
| 6                | 4                | 24PLP-6M-4M  |
| 8                | 4                | 24PLP-8M-4M  |
| 8                | 6                | 24PLP-8M-6M  |
| 10               | 6                | 24PLP-10M-6M |
| 10               | 8                | 24PLP-10M-8M |

**24PLPD Double Multiple Tee**



| 1 Tube size (mm) | 2 Tube size (mm) | Part number   |
|------------------|------------------|---------------|
| 6                | 4                | 24PLPD-6M-4M  |
| 8                | 4                | 24PLPD-8M-4M  |
| 8                | 6                | 24PLPD-8M-6M  |
| 10               | 6                | 24PLPD-10M-6M |
| 10               | 8                | 24PLPD-10M-8M |

**347PLP Equal Cross**



| Tube size (mm) | Part number |
|----------------|-------------|
| 4              | 347PLP-4M   |
| 6              | 347PLP-6M   |
| 8              | 347PLP-8M   |

**32PLPRC Connector for 2 Tubes**



| Tube size (mm) | Part number |
|----------------|-------------|
| 4              | 32PLPRC-4M  |
| 6              | 32PLPRC-6M  |
| 8              | 32PLPRC-8M  |

**32PLPDRC Connector for 3 Tubes**



| Tube size (mm) | Part number |
|----------------|-------------|
| 4              | 32PLPDRC-4M |
| 6              | 32PLPDRC-6M |
| 8              | 32PLPDRC-8M |

**32PLPBH Bulkhead Union**



| Tube size (mm) | Part number |
|----------------|-------------|
| 4              | 32PLPBH-4M  |
| 6              | 32PLPBH-6M  |
| 8              | 32PLPBH-8M  |
| 10             | 32PLPBH-10M |
| 12             | 32PLPBH-12M |
| 14             | 32PLPBH-14M |

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**365PLPBH Equal Bulkhead Elbow**



| Tube size (mm) | Part number  |
|----------------|--------------|
| 4              | 365PLPBH-4M  |
| 6              | 365PLPBH-6M  |
| 8              | 365PLPBH-8M  |
| 10             | 365PLPBH-10M |
| 12             | 365PLPBH-12M |

**370PLP Female Elbow - BSPP**



| Tube size (mm) | BSPP | Part number   |
|----------------|------|---------------|
| 4              | 1/8  | 370PLP-4M-2G  |
| 4              | 1/4  | 370PLP-4M-4G  |
| 6              | 1/8  | 370PLP-6M-2G  |
| 6              | 1/4  | 370PLP-6M-4G  |
| 8              | 1/8  | 370PLP-8M-2G  |
| 8              | 1/4  | 370PLP-8M-4G  |
| 8              | 3/8  | 370PLP-8M-6G  |
| 10             | 1/4  | 370PLP-10M-4G |
| 10             | 3/8  | 370PLP-10M-6G |
| 10             | 1/2  | 370PLP-10M-8G |
| 12             | 1/4  | 370PLP-12M-4G |
| 12             | 3/8  | 370PLP-12M-6G |
| 12             | 1/2  | 370PLP-12M-8G |

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**369PLP Male Elbow - BSPP**

| Tube size (mm) | BSPP    | Part number          |
|----------------|---------|----------------------|
| 3              | M3x0.5  | <b>369PLP-3M-M3</b>  |
| 3              | M5x0.8  | <b>369PLP-3M-M5</b>  |
| 4              | M3x0.5  | <b>369PLP-4M-M3</b>  |
| 4              | M5x0.8  | <b>369PLP-4M-M5</b>  |
| 4              | M7x1    | <b>369PLP-4M-M7</b>  |
| 4              | 1/8     | <b>369PLP-4M-2G</b>  |
| 4              | 1/4     | <b>369PLP-4M-4G</b>  |
| 6              | M5x0.8  | <b>369PLP-6M-M5</b>  |
| 6              | M7x1    | <b>369PLP-6M-M7</b>  |
| 6              | M10x1   | <b>369PLP-6M-M10</b> |
| 6              | M12x1.5 | <b>369PLP-6M-M12</b> |
| 6              | 1/8     | <b>369PLP-6M-2G</b>  |
| 6              | 1/4     | <b>369PLP-6M-4G</b>  |
| 6              | 3/8     | <b>369PLP-6M-6G</b>  |
| 6              | 1/2     | <b>369PLP-6M-8G</b>  |
| 8              | M10x1   | <b>369PLP-8M-M10</b> |
| 8              | M12x1.5 | <b>369PLP-8M-M12</b> |
| 8              | 1/8     | <b>369PLP-8M-2G</b>  |
| 8              | 1/4     | <b>369PLP-8M-4G</b>  |
| 8              | 3/8     | <b>369PLP-8M-6G</b>  |
| 8              | 1/2     | <b>369PLP-8M-8G</b>  |
| 10             | 1/4     | <b>369PLP-10M-4G</b> |
| 10             | 3/8     | <b>369PLP-10M-6G</b> |
| 10             | 1/2     | <b>369PLP-10M-8G</b> |
| 12             | 1/4     | <b>369PLP-12M-4G</b> |
| 12             | 3/8     | <b>369PLP-12M-6G</b> |
| 12             | 1/2     | <b>369PLP-12M-8G</b> |
| 14             | 3/8     | <b>369PLP-14M-6G</b> |
| 14             | 1/2     | <b>369PLP-14M-8G</b> |



**369PLPX Male Elbow - BSPP**

| Tube size (mm) | BSPP   | Part number           |
|----------------|--------|-----------------------|
| 4              | M5x0.8 | <b>369PLPX-4M-M5</b>  |
| 4              | M7x1   | <b>369PLPX-4M-M7</b>  |
| 4              | 1/8    | <b>369PLPX-4M-2G</b>  |
| 4              | 1/4    | <b>369PLPX-4M-4G</b>  |
| 6              | M5x0.8 | <b>369PLPX-6M-M5</b>  |
| 6              | M7x1   | <b>369PLPX-6M-M7</b>  |
| 6              | 1/8    | <b>369PLPX-6M-2G</b>  |
| 6              | 1/4    | <b>369PLPX-6M-4G</b>  |
| 8              | 1/8    | <b>369PLPX-8M-2G</b>  |
| 8              | 1/4    | <b>369PLPX-8M-4G</b>  |
| 8              | 3/8    | <b>369PLPX-8M-6G</b>  |
| 10             | 1/4    | <b>369PLPX-10M-4G</b> |
| 10             | 3/8    | <b>369PLPX-10M-6G</b> |
| 10             | 1/2    | <b>369PLPX-10M-8G</b> |
| 12             | 1/4    | <b>369PLPX-12M-4G</b> |
| 12             | 3/8    | <b>369PLPX-12M-6G</b> |
| 12             | 1/2    | <b>369PLPX-12M-8G</b> |
| 14             | 3/8    | <b>369PLPX-14M-6G</b> |
| 14             | 1/2    | <b>369PLPX-14M-8G</b> |



**379PLP 45° Male Elbow - BSPP**

| Tube size (mm) | BSPP / M5 | Part number          |
|----------------|-----------|----------------------|
| 4              | M5x0.8    | <b>379PLP-4M-M5</b>  |
| 4              | 1/8       | <b>379PLP-4M-2G</b>  |
| 6              | M5x0.8    | <b>379PLP-6M-M5</b>  |
| 6              | 1/8       | <b>379PLP-6M-2G</b>  |
| 6              | 1/4       | <b>379PLP-6M-4G</b>  |
| 8              | 1/8       | <b>379PLP-8M-2G</b>  |
| 8              | 1/4       | <b>379PLP-8M-4G</b>  |
| 8              | 3/8       | <b>379PLP-8M-6G</b>  |
| 10             | 1/4       | <b>379PLP-10M-4G</b> |
| 10             | 3/8       | <b>379PLP-10M-6G</b> |
| 10             | 1/2       | <b>379PLP-10M-8G</b> |
| 12             | 1/4       | <b>379PLP-12M-4G</b> |
| 12             | 3/8       | <b>379PLP-12M-6G</b> |
| 12             | 1/2       | <b>379PLP-12M-8G</b> |



**372PLP Male Branch Tee - BSPP**

| Tube size (mm) | BSPP / M5 | Part number          |
|----------------|-----------|----------------------|
| 4              | M5x0.8    | <b>372PLP-4M-M5</b>  |
| 4              | 1/8       | <b>372PLP-4M-2G</b>  |
| 4              | 1/4       | <b>372PLP-4M-4G</b>  |
| 6              | M5x0.8    | <b>372PLP-6M-M5</b>  |
| 6              | 1/8       | <b>372PLP-6M-2G</b>  |
| 6              | 1/4       | <b>372PLP-6M-4G</b>  |
| 8              | 1/8       | <b>372PLP-8M-2G</b>  |
| 8              | 1/4       | <b>372PLP-8M-4G</b>  |
| 8              | 3/8       | <b>372PLP-8M-6G</b>  |
| 10             | 1/4       | <b>372PLP-10M-4G</b> |
| 10             | 3/8       | <b>372PLP-10M-6G</b> |
| 10             | 1/2       | <b>372PLP-10M-8G</b> |
| 12             | 1/4       | <b>372PLP-12M-4G</b> |
| 12             | 3/8       | <b>372PLP-12M-6G</b> |
| 12             | 1/2       | <b>372PLP-12M-8G</b> |
| 14             | 3/8       | <b>372PLP-14M-6G</b> |
| 14             | 1/2       | <b>372PLP-14M-8G</b> |



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**371PLP Male Run Tee - BSPP**



| Tube size (mm) | BSPP   | Part number          |
|----------------|--------|----------------------|
| 4              | M5x0.8 | <b>371PLP-4M-M5</b>  |
| 4              | 1/8    | <b>371PLP-4M-2G</b>  |
| 4              | 1/4    | <b>371PLP-4M-4G</b>  |
| 6              | M5x0.8 | <b>371PLP-6M-M5</b>  |
| 6              | 1/8    | <b>371PLP-6M-2G</b>  |
| 6              | 1/4    | <b>371PLP-6M-4G</b>  |
| 8              | 1/8    | <b>371PLP-8M-2G</b>  |
| 8              | 1/4    | <b>371PLP-8M-4G</b>  |
| 8              | 3/8    | <b>371PLP-8M-6G</b>  |
| 10             | 1/4    | <b>371PLP-10M-4G</b> |
| 10             | 3/8    | <b>371PLP-10M-6G</b> |
| 10             | 1/2    | <b>371PLP-10M-8G</b> |
| 12             | 1/4    | <b>371PLP-12M-4G</b> |
| 12             | 3/8    | <b>371PLP-12M-6G</b> |
| 12             | 1/2    | <b>371PLP-12M-8G</b> |
| 14             | 3/8    | <b>371PLP-14M-6G</b> |
| 14             | 1/2    | <b>371PLP-14M-8G</b> |

**368PLP Male Y Connector - BSPP**



| Tube size (mm) | BSPP / M5 | Part number          |
|----------------|-----------|----------------------|
| 4              | M5x0.8    | <b>368PLP-4M-M5</b>  |
| 4              | 1/8       | <b>368PLP-4M-2G</b>  |
| 4              | 1/4       | <b>368PLP-4M-4G</b>  |
| 6              | M5x0.8    | <b>368PLP-6M-M5</b>  |
| 6              | 1/8       | <b>368PLP-6M-2G</b>  |
| 6              | 1/4       | <b>368PLP-6M-4G</b>  |
| 8              | 1/8       | <b>368PLP-8M-2G</b>  |
| 8              | 1/4       | <b>368PLP-8M-4G</b>  |
| 8              | 3/8       | <b>368PLP-8M-6G</b>  |
| 10             | 1/4       | <b>368PLP-10M-4G</b> |
| 10             | 3/8       | <b>368PLP-10M-6G</b> |
| 10             | 1/2       | <b>368PLP-10M-8G</b> |
| 12             | 3/8       | <b>368PLP-12M-6G</b> |
| 12             | 1/2       | <b>368PLP-12M-8G</b> |

**368PLPD Double Y Male Connector - BSPP**



| Tube size (mm) | BSPP | Part number          |
|----------------|------|----------------------|
| 4              | 1/8  | <b>368PLPD-4M-2G</b> |
| 4              | 1/4  | <b>368PLPD-4M-4G</b> |
| 6              | 1/8  | <b>368PLPD-6M-2G</b> |
| 6              | 1/4  | <b>368PLPD-6M-4G</b> |

**68PLPSP Male Standpipe - BSPP**



| Tube size (mm) | BSPT   | Part number           |
|----------------|--------|-----------------------|
| 4              | M5x0.8 | <b>68PLPSP-4M-M5</b>  |
| 4              | 1/8    | <b>68PLPSP-4M-2G</b>  |
| 4              | 1/4    | <b>68PLPSP-4M-4G</b>  |
| 6              | 1/8    | <b>68PLPSP-6M-2G</b>  |
| 6              | 1/4    | <b>68PLPSP-6M-4G</b>  |
| 8              | 1/8    | <b>68PLPSP-8M-2G</b>  |
| 8              | 1/4    | <b>68PLPSP-8M-4G</b>  |
| 8              | 3/8    | <b>68PLPSP-8M-6G</b>  |
| 10             | 1/4    | <b>68PLPSP-10M-4G</b> |
| 10             | 3/8    | <b>68PLPSP-10M-6G</b> |
| 10             | 1/2    | <b>68PLPSP-10M-8G</b> |
| 12             | 3/8    | <b>68PLPSP-12M-6G</b> |
| 12             | 1/2    | <b>68PLPSP-12M-8G</b> |
| 14             | 3/8    | <b>68PLPSP-14M-6G</b> |
| 14             | 1/2    | <b>68PLPSP-14M-8G</b> |

**369PLPSP Plug-In Elbow**



| 1 Tube size (mm) | 2 Tube size (mm) | Part number             |
|------------------|------------------|-------------------------|
| 4                | 4                | <b>369PLPSP-4M</b>      |
| 6                | 6                | <b>369PLPSP-6M</b>      |
| 8                | 8                | <b>369PLPSP-8M</b>      |
| 10               | 10               | <b>369PLPSP-10M</b>     |
| 12               | 12               | <b>369PLPSP-12M</b>     |
| 4                | 6                | <b>369PLPSP-4M-6M</b>   |
| 6                | 4                | <b>369PLPSP-6M-4M</b>   |
| 6                | 8                | <b>369PLPSP-6M-8M</b>   |
| 8                | 10               | <b>369PLPSP-8M-10M</b>  |
| 10               | 12               | <b>369PLPSP-10M-12M</b> |

|                     |
|---------------------|
| <b>G</b>            |
| Accessories         |
| Ball / Plug Valves  |
| Hose & Fittings     |
| Integrated Fittings |
| Misc. Accessories   |
| Quick Couplings     |
| Tubing & Fittings   |

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**369PLXSP Extended Plug-In Elbow**



| 1 Tube size (mm) | 2 Tube size (mm) | Part number             |
|------------------|------------------|-------------------------|
| 4                | 4                | <b>369PLXSP-4M</b>      |
| 6                | 6                | <b>369PLXSP-6M</b>      |
| 8                | 8                | <b>369PLXSP-8M</b>      |
| 10               | 10               | <b>369PLXSP-10M</b>     |
| 12               | 12               | <b>369PLXSP-12M</b>     |
| 4                | 6                | <b>369PLXSP-4M-6M</b>   |
| 6                | 8                | <b>369PLXSP-6M-8M</b>   |
| 8                | 10               | <b>369PLXSP-8M-10M</b>  |
| 10               | 12               | <b>369PLXSP-10M-12M</b> |

**362PLPSP Plug-In Y**



| 1 Tube size (mm) | 2 Tube size (mm) | Part number             |
|------------------|------------------|-------------------------|
| 4                | 4                | <b>362PLPSP-4M</b>      |
| 6                | 6                | <b>362PLPSP-6M</b>      |
| 8                | 8                | <b>362PLPSP-8M</b>      |
| 10               | 10               | <b>362PLPSP-10M</b>     |
| 12               | 12               | <b>362PLPSP-12M</b>     |
| 4                | 6                | <b>362PLPSP-4M-6M</b>   |
| 6                | 8                | <b>362PLPSP-6M-8M</b>   |
| 8                | 10               | <b>362PLPSP-8M-10M</b>  |
| 10               | 12               | <b>362PLPSP-10M-12M</b> |

**379PLPSP 45° Plug-In Elbow**



| 1 Tube size (mm) | 2 Tube size (mm) | Part number         |
|------------------|------------------|---------------------|
| 4                | 4                | <b>379PLPSP-4M</b>  |
| 6                | 6                | <b>379PLPSP-6M</b>  |
| 8                | 8                | <b>379PLPSP-8M</b>  |
| 10               | 10               | <b>379PLPSP-10M</b> |
| 12               | 12               | <b>379PLPSP-12M</b> |

**362PLPDSP Plug-In Multiple Y**



| 1 Tube size (mm) | 2 Tube size (mm) | Part number            |
|------------------|------------------|------------------------|
| 6                | 4                | <b>362PLPDSP-6M-4M</b> |
| 8                | 4                | <b>362PLPDSP-8M-4M</b> |
| 8                | 6                | <b>362PLPDSP-8M-6M</b> |

**372PLPSP Plug-In Branch Tee**



| 1 Tube size (mm) | 2 Tube size (mm) | Part number             |
|------------------|------------------|-------------------------|
| 4                | 4                | <b>372PLPSP-4M</b>      |
| 6                | 6                | <b>372PLPSP-6M</b>      |
| 8                | 8                | <b>372PLPSP-8M</b>      |
| 10               | 10               | <b>372PLPSP-10M</b>     |
| 12               | 12               | <b>372PLPSP-12M</b>     |
| 4                | 6                | <b>372PLPSP-4M-6M</b>   |
| 6                | 8                | <b>372PLPSP-6M-8M</b>   |
| 8                | 10               | <b>372PLPSP-8M-10M</b>  |
| 10               | 12               | <b>372PLPSP-10M-12M</b> |

**67PLP Tube Reducer**



| 1 Tube size (mm) | 2 Tube size (mm) | Part number          |
|------------------|------------------|----------------------|
| 6                | 4                | <b>67PLP-6M-4M</b>   |
| 8                | 4                | <b>67PLP-8M-4M</b>   |
| 8                | 6                | <b>67PLP-8M-6M</b>   |
| 10               | 4                | <b>67PLP-10M-4M</b>  |
| 10               | 6                | <b>67PLP-10M-6M</b>  |
| 10               | 8                | <b>67PLP-10M-8M</b>  |
| 12               | 10               | <b>67PLP-12M-10M</b> |
| 12               | 6                | <b>67PLP-12M-6M</b>  |
| 12               | 8                | <b>67PLP-12M-8M</b>  |
| 14               | 10               | <b>67PLP-14M-10M</b> |
| 14               | 12               | <b>67PLP-14M-12M</b> |
| 14               | 6                | <b>67PLP-14M-6M</b>  |
| 14               | 8                | <b>67PLP-14M-8M</b>  |

**371PLPSP Plug-In Run Tee**



| 1 Tube size (mm) | 2 Tube size (mm) | Part number             |
|------------------|------------------|-------------------------|
| 4                | 4                | <b>371PLPSP-4M</b>      |
| 6                | 6                | <b>371PLPSP-6M</b>      |
| 8                | 8                | <b>371PLPSP-8M</b>      |
| 10               | 10               | <b>371PLPSP-10M</b>     |
| 12               | 12               | <b>371PLPSP-12M</b>     |
| 4                | 6                | <b>371PLPSP-4M-6M</b>   |
| 6                | 8                | <b>371PLPSP-6M-8M</b>   |
| 8                | 10               | <b>371PLPSP-8M-10M</b>  |
| 10               | 12               | <b>371PLPSP-10m-12M</b> |

**32PLPSP Tube Expander**



| 1 Tube size (mm) | 2 Tube size (mm) | Part number            |
|------------------|------------------|------------------------|
| 6                | 4                | <b>32PLPSP-6M-4M</b>   |
| 8                | 6                | <b>32PLPSP-8M-6M</b>   |
| 10               | 8                | <b>32PLPSP-10M-8M</b>  |
| 12               | 10               | <b>32PLPSP-12M-10M</b> |

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**G**

Accessories

Ball / Plug Valves

Hose & Fittings

Integrated Fittings

Misc. Accessories

Quick Couplings

Tubing & Fittings

**322PLPSP Barbed Connector**



| OD 1 | OD 2 | OD 3 | Part number            |
|------|------|------|------------------------|
| 4    | 3.2  | 5.0  | <b>322PLPSP-3M-4M</b>  |
| 4    | 5.0  | 7.0  | <b>322PLPSP-5M-4M</b>  |
| 6    | 5.0  | 7.0  | <b>322PLPSP-5M-6M</b>  |
| 8    | 6.3  | 8.5  | <b>322PLPSP-6M-8M</b>  |
| 8    | 8.0  | 10.0 | <b>322PLPSP-8M-8M</b>  |
| 10   | 6.3  | 8.0  | <b>322PLPSP-6M-10M</b> |
| 10   | 8.0  | 10.0 | <b>322PLPSP-8M-10M</b> |
| 12   | 8.0  | 10.0 | <b>322PLPSP-8M-12M</b> |
| 12   | 10.0 | 12.0 | <b>322PLPSP-1012M</b>  |
| 12   | 12.5 | 14.5 | <b>322PLPSP-1212M</b>  |
| 14   | 12.5 | 14.5 | <b>322PLPSP-1214M</b>  |
| 14   | 14.0 | 16.0 | <b>322PLPSP-1414M</b>  |

**Push-to-Connect, Prestolok Metal**

**W68PLP Male Connector**



| Tube size (in.) | Pipe thd (NPTF) | Part number            |
|-----------------|-----------------|------------------------|
| 1/8             | 1/16            | <b>W68PLP-2-1</b>      |
| 1/8             | 1/8             | <b>W68PLP-2-2</b>      |
| 1/8             | 1/4             | <b>W68PLP-2-4</b>      |
| 3/16            | 1/8             | <b>W68PLP-3-2</b>      |
| 3/16            | 1/4             | <b>W68PLP-3-4</b>      |
| 5/32            | 1/16            | <b>W68PLP-5/32-1</b>   |
| 5/32            | 1/8             | <b>W68PLP-5/32-2</b>   |
| 5/32            | 1/4             | <b>W68PLP-5/32-4</b>   |
| 1/4             | 1/16            | <b>W68PLP-4-1</b>      |
| 1/4             | 1/8             | <b>W68PLP-4-2</b>      |
| 1/4             | 1/4             | <b>W68PLP-4-4</b>      |
| 1/4             | 3/8             | <b>W68PLP-4-6</b>      |
| 5/16            | 1/8             | <b>W68PLP-5-2</b>      |
| 5/16            | 1/4             | <b>W68PLP-5-4</b>      |
| 5/16            | 3/8             | <b>W68PLP-5-6</b>      |
| 3/8             | 1/8             | <b>W68PLP-6-2</b>      |
| 3/8             | 1/4             | <b>W68PLP-6-4</b>      |
| 3/8             | 3/8             | <b>W68PLP-6-6</b>      |
| 3/8             | 1/2             | <b>W68PLP-6-8</b>      |
| 1/2             | 1/4             | <b>W68PLP-8-4</b>      |
| 1/2             | 3/8             | <b>W68PLP-8-6</b>      |
| 1/2             | 1/2             | <b>W68PLP-8-8</b>      |
| 5/32            | 1/4-28          | <b>68PLP-5/32-4LT*</b> |

\*SAE-LT Threads

Most popular. For technical information see CD

**W68PLPR Round Body Male Connector**



| Tube size (in.) | Thread size NPTF | Part number           |
|-----------------|------------------|-----------------------|
| 5/32            | 1/16             | <b>W68PLPR-5/32-1</b> |
| 5/32            | 1/8              | <b>W68PLPR-5/32-2</b> |
| 1/4             | 1/16             | <b>W68PLPR-4-1</b>    |
| 1/4             | 1/8              | <b>W68PLPR-4-2</b>    |
| 1/4             | 1/4              | <b>W68PLPR-4-4</b>    |

\*10-32 seal is neoprene

**W68PW Male Connector (Nickel Plated)**



| Tube size (in.) | Thread size NPTF | Part number      |
|-----------------|------------------|------------------|
| 1/4             | 1/8              | <b>W68PW-4-2</b> |
| 1/4             | 1/4              | <b>W68PW-4-4</b> |
| 1/4             | 3/8              | <b>W68PW-4-6</b> |
| 5/16            | 1/8              | <b>W68PW-5-2</b> |
| 5/16            | 1/4              | <b>W68PW-5-4</b> |
| 5/16            | 3/8              | <b>W68PW-5-6</b> |
| 3/8             | 1/8              | <b>W68PW-6-2</b> |
| 3/8             | 1/4              | <b>W68PW-6-4</b> |
| 3/8             | 3/8              | <b>W68PW-6-6</b> |
| 3/8             | 1/2              | <b>W68PW-6-8</b> |
| 1/2             | 1/4              | <b>W68PW-8-4</b> |
| 1/2             | 3/8              | <b>W68PW-8-6</b> |
| 1/2             | 1/2              | <b>W68PW-8-8</b> |

**G**

Accessories

Ball / Plug Valves

Hose & Fittings

Integrated Fittings

Misc. Accessories

Quick Couplings

Tubing & Fittings



**W169PLP Male Elbow Swivel 90°**

| Tube size (in.) | Pipe thread (NPTF) | Part number    |
|-----------------|--------------------|----------------|
| 1/8             | 1/16               | W169PLP-2-1    |
| 1/8             | 1/8                | W169PLP-2-2    |
| 1/8             | 10-32              | 169PLP-2-0*    |
| 1/8             | 1/4                | W169PLP-2-4    |
| 3/16            | 1/8                | W169PLP-3-2    |
| 5/32            | 1/16               | W169PLP-5/32-1 |
| 5/32            | 1/8                | W169PLP-5/32-2 |
| 5/32            | 1/4                | W169PLP-5/32-4 |
| 5/32            | 10-32              | 169PLP-5/32-0* |
| 1/4             | 1/16               | W169PLP-4-1    |
| 1/4             | 1/8                | W169PLP-4-2    |
| 1/4             | 1/4                | W169PLP-4-4    |
| 1/4             | 3/8                | W169PLP-4-6    |
| 1/4             | 10-32              | 169PLP-4-0*    |
| 5/16            | 1/8                | W169PLP-5-2    |
| 5/16            | 1/4                | W169PLP-5-4    |
| 3/8             | 1/8                | W169PLP-6-2    |
| 3/8             | 1/4                | W169PLP-6-4    |
| 3/8             | 3/8                | W169PLP-6-6    |
| 3/8             | 1/2                | W169PLP-6-8    |
| 1/2             | 1/4                | W169PLP-8-4    |
| 1/2             | 3/8                | W169PLP-8-6    |
| 1/2             | 1/2                | W169PLP-8-8    |



\*10-32 seal is neoprene

**W169PLPNS Male Elbow 90°**

| Tube size (in.) | Pipe thread (NPTF) | Part number      |
|-----------------|--------------------|------------------|
| 1/8             | 1/8                | W169PLPNS-2-2    |
| 5/32            | 1/8                | W169PLPNS5/32-2  |
| 5/32            | 1/4                | W169PLPNS5/32-4  |
| 1/4             | 1/8                | W169PLPNS-4-2    |
| 1/4             | 1/4                | W169PLPNS-4-4    |
| 5/16            | 1/8                | W169PLPNS-5-2    |
| 5/16            | 1/4                | W169PLPNS-5-4    |
| 3/8             | 1/4                | W169PLPNS-6-4    |
| 3/8             | 3/8                | W169PLPNS-6-6    |
| 3/8             | 1/2                | W169PLPNS-6-8    |
| 1/2             | 3/8                | W169PLPNS-8-6    |
| 1/2             | 1/2                | W169PLPNS-8-8    |
| 5/32            | 1/4-28             | 169PLPNS532-4LT* |



\* SAE-LT Threads

**W169PW Male Elbow Swivel 90° (Nickel Plated)**

| Tube size (in.) | Thread (NPTF) | Part number |
|-----------------|---------------|-------------|
| 1/4             | 1/8           | W169PW-4-2  |
| 1/4             | 1/4           | W169PW-4-4  |
| 1/4             | 3/8           | W169PW-4-6  |
| 5/16            | 1/8           | W169PW-5-2  |
| 5/16            | 1/4           | W169PW-5-4  |
| 3/8             | 1/8           | W169PW-6-2  |
| 3/8             | 1/4           | W169PW-6-4  |
| 3/8             | 3/8           | W169PW-6-6  |
| 3/8             | 1/2           | W169PW-6-8  |
| 1/2             | 1/4           | W169PW-8-4  |
| 1/2             | 3/8           | W169PW-8-6  |
| 1/2             | 1/2           | W169PW-8-8  |



**W171PLP Male Run Tee Swivel**

| Tube size (in.) | Pipe thread (NPTF) | Part number    |
|-----------------|--------------------|----------------|
| 1/8             | 1/8                | W171PLP-2-2    |
| 5/32            | 1/8                | W171PLP-5/32-2 |
| 1/4             | 1/8                | W171PLP-4-2    |
| 1/4             | 1/4                | W171PLP-4-4    |
| 1/4             | 3/8                | W171PLP-4-6    |
| 5/16            | 1/8                | W171PLP-5-2    |
| 5/16            | 1/4                | W171PLP-5-4    |
| 3/8             | 1/4                | W171PLP-6-4    |
| 3/8             | 3/8                | W171PLP-6-6    |
| 1/2             | 3/8                | W171PLP-8-6    |
| 1/2             | 1/2                | W171PLP-8-8    |



**W171PW Male Run Tee Swivel (Nickel Plated)**

| Tube size (in.) | Pipe thread (NPTF) | Part number |
|-----------------|--------------------|-------------|
| 1/4             | 1/8                | W171PW-4-2  |
| 1/4             | 1/4                | W171PW-4-4  |
| 1/4             | 3/8                | W171PW-4-6  |
| 5/16            | 1/8                | W171PW-5-2  |
| 5/16            | 1/4                | W171PW-5-4  |
| 3/8             | 1/4                | W171PW-6-4  |
| 3/8             | 3/8                | W171PW-6-6  |
| 1/2             | 3/8                | W171PW-8-6  |
| 1/2             | 1/2                | W171PW-8-8  |



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**W172PLP Male Branch Tee Swivel**



| Tube size (in.) | Pipe thread (NPTF) | Part number    |
|-----------------|--------------------|----------------|
| 1/8             | 1/8                | W172PLP-2-2    |
| 3/16            | 1/8                | W172PLP-3-2    |
| 5/32            | 1/8                | W172PLP-5/32-2 |
| 1/4             | 1/8                | W172PLP-4-2    |
| 1/4             | 1/4                | W172PLP-4-4    |
| 1/4             | 3/8                | W172PLP-4-6    |
| 5/16            | 1/8                | W172PLP-5-2    |
| 5/16            | 1/4                | W172PLP-5-4    |
| 3/8             | 1/4                | W172PLP-6-4    |
| 3/8             | 3/8                | W172PLP-6-6    |
| 1/2             | 1/4                | W172PLP-8-4    |
| 1/2             | 3/8                | W172PLP-8-6    |
| 1/2             | 1/2                | W172PLP-8-8    |

**W172PW Male Branch Tee Swivel (Nickel Plated)**



| Tube size (in.) | Thread (NPTF) | Part number |
|-----------------|---------------|-------------|
| 1/4             | 1/8           | W172PW-4-2  |
| 1/4             | 1/4           | W172PW-4-4  |
| 1/4             | 3/8           | W172PW-4-6  |
| 5/16            | 1/8           | W172PW-5-2  |
| 5/16            | 1/4           | W172PW-5-4  |
| 3/8             | 1/4           | W172PW-6-4  |
| 3/8             | 3/8           | W172PW-6-6  |
| 1/2             | 1/4           | W172PW-8-4  |
| 1/2             | 3/8           | W172PW-8-6  |
| 1/2             | 1/2           | W172PW-8-8  |

**62PLP Union**



| Tube size (in.) | Part number |
|-----------------|-------------|
| 1/8             | 62PLP-2     |
| 3/16            | 62PLP-3     |
| 5/32            | 62PLP-5/32  |
| 1/4             | 62PLP-4     |
| 5/16            | 62PLP-5     |
| 3/8             | 62PLP-6     |
| 1/2             | 62PLP-8     |

**62PW Union (Nickel Plated)**



| Tube size (in.) | Part number |
|-----------------|-------------|
| 1/4             | 62PW-4      |
| 5/16            | 62PW-5      |
| 3/8             | 62PW-6      |
| 1/2             | 62PW-8      |

Most popular. For technical information see CD

**164PLP Union Tee**



| Tube size (in.) | Part number |
|-----------------|-------------|
| 1/8             | 164PLP-2    |
| 3/16            | 164PLP-3    |
| 5/32            | 164PLP-5/32 |
| 1/4             | 164PLP-4    |
| 5/16            | 164PLP-5    |
| 3/8             | 164PLP-6    |
| 1/2             | 164PLP-8    |

**164PW Union Tee (Nickel Plated)**



| Tube size (in.) | Part number |
|-----------------|-------------|
| 1/4             | 164PW-4     |
| 5/16            | 164PW-5     |
| 3/8             | 164PW-6     |
| 1/2             | 164PW-8     |

**165PLP Union Elbow**



| Tube size (in.) | Part number |
|-----------------|-------------|
| 1/8             | 165PLP-2    |
| 5/32            | 165PLP-5/32 |
| 3/16            | 165PLP-3    |
| 1/4             | 165PLP-4    |
| 5/16            | 165PLP-5    |
| 3/8             | 165PLP-6    |
| 1/2             | 165PLP-8    |

**165PW Union Elbow (Nickel Plated)**



| Tube size (in.) | Part number |
|-----------------|-------------|
| 1/4             | 165PW-4     |
| 5/16            | 165PW-5     |
| 3/8             | 165PW-6     |
| 1/2             | 165PW-8     |

**G**  
 Accessories  
 Ball / Plug Valves  
 Hose & Fittings  
 Integrated Fittings  
 Misc. Accessories  
 Quick Couplings  
 Tubing & Fittings



### 66PLP Female Connector



| Tube size (in.) | Pipe thread (NPTF) | Part number         |
|-----------------|--------------------|---------------------|
| 1/8             | 1/8                | <b>66PLP-2-2</b>    |
| 1/8             | 1/4                | <b>66PLP-2-4</b>    |
| 3/16            | 1/8                | <b>66PLP-3-2</b>    |
| 5/32            | 1/8                | <b>66PLP-5/32-2</b> |
| 5/32            | 1/4                | <b>66PLP-5/32-4</b> |
| 1/4             | 1/8                | <b>66PLP-4-2</b>    |
| 1/4             | 1/4                | <b>66PLP-4-4</b>    |
| 5/16            | 1/8                | <b>66PLP-5-2</b>    |
| 5/16            | 1/4                | <b>66PLP-5-4</b>    |
| 3/8             | 1/4                | <b>66PLP-6-4</b>    |
| 3/8             | 3/8                | <b>66PLP-6-6</b>    |

### 66PW Female Connector (Nickel Plated)



| Tube size (in.) | Pipe thread (NPTF) | Part number     |
|-----------------|--------------------|-----------------|
| 1/4             | 1/8                | <b>66PW-4-2</b> |
| 1/4             | 1/4                | <b>66PW-4-4</b> |
| 5/16            | 1/8                | <b>66PW-5-2</b> |
| 5/16            | 1/4                | <b>66PW-5-4</b> |
| 3/8             | 1/4                | <b>66PW-6-4</b> |
| 3/8             | 3/8                | <b>66PW-6-6</b> |

### 62PLPBH Bulkhead Union



| Tube size (in.) | Part number         |
|-----------------|---------------------|
| 1/8             | <b>62PLPBH-2</b>    |
| 5/32            | <b>62PLPBH-5/32</b> |
| 1/4             | <b>62PLPBH-4</b>    |
| 5/16            | <b>62PLPBH-5</b>    |
| 3/8             | <b>62PLPBH-6</b>    |
| 1/2             | <b>62PLPBH-8</b>    |

### 66PLPBH Female Bulkhead



| Tube size (in.) | Pipe thd (NPTF) | Part number           |
|-----------------|-----------------|-----------------------|
| 5/32            | 1/4             | <b>66PLPBH-5/32-4</b> |
| 1/4             | 1/4             | <b>66PLPBH-4-4</b>    |
| 3/8             | 3/8             | <b>66PLPBH-6-6</b>    |
| 1/2             | 3/8             | <b>66PLPBH-8-6</b>    |

### 62PWBH Bulkhead Union (Nickel Plated)



| Tube Size (in.) | Bulkhead Hole Dia. B | Part No.        |
|-----------------|----------------------|-----------------|
| 1/4             | 9/16                 | <b>62PWBH-4</b> |
| 5/16            | 5/8                  | <b>62PWBH-5</b> |
| 3/8             | 3/4                  | <b>62PWBH-6</b> |
| 1/2             | 7/8                  | <b>62PWBH-8</b> |

### 66PWBH Female Bulkhead (Nickel Plated)



| Tube size (in.) | Thread (NPTF) | Bulkhead hole dia. | Part number       |
|-----------------|---------------|--------------------|-------------------|
| 1/4             | 1/4           | 9/16               | <b>66PWBH-4-4</b> |
| 3/8             | 3/8           | 7/8                | <b>66PWBH-6-6</b> |
| 1/2             | 3/8           | 1                  | <b>66PWBH-8-6</b> |

### PLPHBF4-B Male Connector BSPP



| Tube size (in.) | Pipe thd BSPP | Part number           |
|-----------------|---------------|-----------------------|
| 3/16            | 1/8-28        | <b>3-1/8PLPHBF4-B</b> |
| 3/16            | 1/4-19        | <b>3-1/4PLPHBF4-B</b> |
| 1/4             | 1/8-28        | <b>4-1/8PLPHBF4-B</b> |
| 1/4             | 1/4-19        | <b>4-1/4PLPHBF4-B</b> |
| 1/4             | 3/8-19        | <b>4-3/8PLPHBF4-B</b> |
| 3/8             | 1/4-19        | <b>6-1/4PLPHBF4-B</b> |
| 3/8             | 3/8-19        | <b>6-3/8PLPHBF4-B</b> |
| 3/8             | 1/2-14        | <b>6-1/2PLPHBF4-B</b> |
| 1/2             | 3/8-19        | <b>8-3/8PLPHBF4-B</b> |
| 1/2             | 1/2-14        | <b>8-1/2PLPHBF4-B</b> |

### DB Dust / Weld Spatter Boot



| Tube size (in.) | Part number |
|-----------------|-------------|
| 1/4             | <b>DB-4</b> |
| 3/8             | <b>DB-6</b> |
| 1/2             | <b>DB-8</b> |

Most popular. For technical information see CD



**Parker Pneumatic**

**FPB Male Connector NPT**



| Tube size (mm) | NPT    | Part number          |
|----------------|--------|----------------------|
| 4              | 1/8-27 | <b>W68PLP-5/32-2</b> |
| 4              | 1/4-18 | <b>W68PLP-5/32-4</b> |
| 6              | 1/8-27 | <b>FPB6-1/8</b>      |
| 6              | 1/4-18 | <b>FPB6-1/4</b>      |
| 10             | 1/4-18 | <b>FPB10-1/4</b>     |
| 10             | 3/8-18 | <b>FPB10-3/8</b>     |
| 12             | 3/8-18 | <b>FPB12-3/8</b>     |

**C6PB Adjustable Male Elbow NPT**



| Tube size (mm) | NPT    | Part number       |
|----------------|--------|-------------------|
| 6              | 1/4-18 | <b>C6PB6-1/4</b>  |
| 6              | 3/8-18 | <b>C6PB6-3/8</b>  |
| 10             | 1/4-18 | <b>C6PB10-1/4</b> |
| 10             | 3/8-18 | <b>C6PB10-3/8</b> |
| 12             | 1/2-14 | <b>C6PB12-1/2</b> |

**HPB Equal Union**



| Tube size (mm) | Part number  |
|----------------|--------------|
| 4              | <b>HPB4</b>  |
| 5              | <b>HPB5</b>  |
| 6              | <b>HPB6</b>  |
| 8              | <b>HPB8</b>  |
| 10             | <b>HPB10</b> |
| 12             | <b>HPB12</b> |
| 14             | <b>HPB14</b> |

**JPB Union Tee**



| Tube size (mm) | Part number  |
|----------------|--------------|
| 4              | <b>JPB4</b>  |
| 5              | <b>JPB5</b>  |
| 6              | <b>JPB6</b>  |
| 8              | <b>JPB8</b>  |
| 10             | <b>JPB10</b> |
| 12             | <b>JPB12</b> |
| 14             | <b>JPB14</b> |

**EPB 90° Union Elbow**



| Tube size (mm) | Part number  |
|----------------|--------------|
| 4              | <b>EPB4</b>  |
| 5              | <b>EPB5</b>  |
| 6              | <b>EPB6</b>  |
| 8              | <b>EPB8</b>  |
| 10             | <b>EPB10</b> |
| 12             | <b>EPB12</b> |
| 14             | <b>EPB14</b> |

Most popular. For technical information see CD

**Accessories**

**Push-to-Connect, Prestolok Metal**

**WBMPB Mixed Bulkhead Union**



| Tube 1 size (mm) | Tube 2 size (mm) | Bulkhead hole dia. | Part number    |
|------------------|------------------|--------------------|----------------|
| 4                | 4                | 8mm                | <b>WBMPB4</b>  |
| 6                | 6                | 10mm               | <b>WBMPB6</b>  |
| 8                | 8                | 12mm               | <b>WBMPB8</b>  |
| 10               | 10               | 14mm               | <b>WBMPB10</b> |
| 12               | 12               | 16mm               | <b>WBMPB12</b> |
| 14               | 14               | 18mm               | <b>WBMPB14</b> |

**WPB Bulkhead Union**



| Tube Size (mm) | Bulkhead hole dia. | Part number  |
|----------------|--------------------|--------------|
| 4              | 11mm               | <b>WPB4</b>  |
| 6              | 13mm               | <b>WPB6</b>  |
| 8              | 16mm               | <b>WPB8</b>  |
| 10             | 18mm               | <b>WPB10</b> |
| 12             | 23mm               | <b>WPB12</b> |
| 14             | 24mm               | <b>WPB14</b> |

Jam nut is supplied loose in box

**WE6PB Adjustable Bulkhead Union Elbow**



| Tube Size (mm) | Bulkhead hole dia. | Part number    |
|----------------|--------------------|----------------|
| 4              | 11mm               | <b>WE6PB4</b>  |
| 6              | 13mm               | <b>WE6PB6</b>  |
| 8              | 15mm               | <b>WE6PB8</b>  |
| 10             | 18mm               | <b>WE6PB10</b> |
| 12             | 23mm               | <b>WE6PB12</b> |

**G4PB Female Connector BSPP**



| Tube size (mm) | BSPP | Part number      |
|----------------|------|------------------|
| 4              | 1/8  | <b>G4PB4-1/8</b> |
| 6              | 1/8  | <b>G4PB6-1/8</b> |
| 6              | 1/4  | <b>G4PB6-1/4</b> |
| 8              | 1/8  | <b>G4PB8-1/8</b> |
| 8              | 1/4  | <b>G4PB8-1/4</b> |

**G**  
 Accessories  
 Ball / Plug Valves  
 Hose & Fittings  
 Integrated Fittings  
 Misc. Accessories  
 Quick Couplings  
 Tubing & Fittings



**WG4PB Bulkhead Union Female BSPP**



| Tube size (mm) | BSPP | Part number |
|----------------|------|-------------|
| 4              | G1/8 | WG4PB4-1/8  |
| 6              | G1/8 | WG4PB6-1/8  |
| 6              | G1/4 | WG4PB6-1/4  |
| 8              | G1/8 | WG4PB8-1/8  |
| 8              | G1/4 | WG4PB8-1/4  |
| 10             | G3/8 | WG4PB10-3/8 |
| 12             | G3/8 | WG4PB12-3/8 |
| 12             | G1/2 | WG4PB12-1/2 |

**F4PB Compact Male Connector BSPP**



| Tube size (mm) | BSPP | Part number |
|----------------|------|-------------|
| 4              | 1/8  | F4PB4-1/8   |
| 4              | 1/4  | F4PB4-1/4   |
| 6              | 1/8  | F4PB6-1/8   |
| 6              | 1/4  | F4PB6-1/4   |
| 8              | 1/4  | F4PB8-1/4   |
| 8              | 1/8  | F4PB8-1/8   |
| 8              | 3/8  | F4PB8-3/8   |
| 10             | 1/4  | F4PB10-1/4  |
| 10             | 3/8  | F4PB10-3/8  |
| 10             | 1/2  | F4PB10-1/2  |
| 12             | 1/4  | F4PB12-1/4  |
| 12             | 3/8  | F4PB12-3/8  |
| 12             | 1/2  | F4PB12-1/2  |
| 14             | 3/8  | F4PB14-3/8  |
| 14             | 1/2  | F4PB14-1/2  |

**C64PB Adjustable Male Elbow BSPP**



| Tube size (mm) | BSPP | Part number |
|----------------|------|-------------|
| 4              | 1/8  | C64PB4-1/8  |
| 4              | 1/4  | C64PB4-1/4  |
| 6              | 1/8  | C64PB6-1/8  |
| 6              | 1/4  | C64PB6-1/4  |
| 8              | 1/8  | C64PB8-1/8  |
| 8              | 1/4  | C64PB8-1/4  |
| 8              | 3/8  | C64PB8-3/8  |
| 10             | 1/4  | C64PB10-1/4 |
| 10             | 3/8  | C64PB10-3/8 |
| 12             | 1/4  | C64PB12-1/4 |
| 12             | 3/8  | C64PB12-3/8 |
| 12             | 1/2  | C64PB12-1/2 |
| 14             | 3/8  | C64PB14-3/8 |
| 14             | 1/2  | C64PB14-1/2 |

**R64PB Swivel Male Branch Run Tee BSPP**



| Tube size (mm) | BSPP | Part number |
|----------------|------|-------------|
| 4              | 1/8  | R64PB4-1/8  |
| 4              | 1/4  | R64PB4-1/4  |
| 6              | 1/8  | R64PB6-1/8  |
| 6              | 1/4  | R64PB6-1/4  |
| 8              | 1/8  | R64PB8-1/8  |
| 8              | 1/4  | R64PB8-1/4  |
| 8              | 3/8  | R64PB8-3/8  |
| 10             | 1/4  | R64PB10-1/4 |
| 10             | 3/8  | R64PB10-3/8 |
| 12             | 1/4  | R64PB12-1/4 |
| 12             | 3/8  | R64PB12-3/8 |
| 14             | 3/8  | R64PB14-3/8 |
| 14             | 1/2  | R64PB14-1/2 |

**C64SPB Compact Adjustable Male Elbow BSPP**



| Tube size (mm) | BSPP | Part number  |
|----------------|------|--------------|
| 4              | 1/8  | C64SPB4-1/8  |
| 6              | 1/8  | C64SPB6-1/8  |
| 6              | 1/4  | C64SPB6-1/4  |
| 8              | 1/8  | C64SPB8-1/8  |
| 8              | 1/4  | C64SPB8-1/4  |
| 8              | 3/8  | C64SPB8-3/8  |
| 10             | 1/4  | C64SPB10-1/4 |
| 10             | 3/8  | C64SPB10-3/8 |
| 12             | 1/8  | C64SPB12-1/4 |
| 12             | 3/8  | C64SPB12-3/8 |
| 12             | 1/2  | C64SPB12-1/2 |

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**G**

Accessories

Ball / Plug Valves

Hose & Fittings

Integrated Fittings

Misc. Accessories

Quick Couplings

Tubing & Fittings



### S64PB Swivel Male Branch Tee BSPP



| Tube size (mm) | BSPP | Part number |
|----------------|------|-------------|
| 4              | 1/8  | S64PB4-1/8  |
| 4              | 1/4  | S64PB4-1/4  |
| 6              | 1/8  | S64PB6-1/8  |
| 6              | 1/4  | S64PB6-1/4  |
| 8              | 1/8  | S64PB8-1/8  |
| 8              | 1/4  | S64PB8-1/4  |
| 8              | 3/8  | S64PB8-3/8  |
| 10             | 1/4  | S64PB10-1/4 |
| 10             | 3/8  | S64PB10-3/8 |
| 12             | 1/4  | S64PB12-1/4 |
| 12             | 3/8  | S64PB12-3/8 |
| 14             | 3/8  | S64PB14-3/8 |
| 14             | 1/2  | S64PB14-1/2 |

### C68PB Adjustable Male Elbow Metric Straight Thread



| Tube size (mm) | Thread (mm) | Part number |
|----------------|-------------|-------------|
| 4              | M5x0.8      | C68PB4M5    |
| 6              | M5x0.8      | C68PB6M5    |

### C68SPB Compact Adjustable Male Elbow Metric Straight Thread



| Tube size (mm) | Thread (mm) | Part number |
|----------------|-------------|-------------|
| 4              | M5x0.8      | C68SPB4M5   |
| 6              | M5x0.8      | C68SPB6M5   |

### F28PB Male Connector Metric Straight Thread



| Tube size (mm) | Thread (mm) | Part number |
|----------------|-------------|-------------|
| 4              | M3x0.5      | F28PB4M3    |
| 4              | M5x0.8      | F28PB4M5    |
| 6              | M5x0.8      | F28PB6M5    |

This fitting has been designed for use where space is at a premium. It is assembled using the internal hexagon and an allen key.

### F8PB Male Connector Metric Straight Thread



| Tube size (mm) | Thread (mm) | Part number |
|----------------|-------------|-------------|
| 4              | M5x0.8      | F8PB4M5     |
| 4              | M10x1       | F8PB4M10    |
| 6              | M5x0.8      | F8PB6M5     |
| 6              | M10x1       | F8PB6M10    |
| 6              | M12x1.5     | F8PB6M12    |
| 8              | M12x1.5     | F8PB8M12    |
| 8              | M16x1.5     | F8PB8M16    |
| 8              | M22x1.5     | F8PB8M22    |

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### R68PB Adjustable Male Run Tee Metric Straight Thread



| Tube size (mm) | Thread (mm) | Part number |
|----------------|-------------|-------------|
| 4              | M3x0.5      | R68PB4M3    |
| 4              | M5x0.8      | R68PB4M5    |
| 6              | M5x0.8      | R68PB6M5    |

### S68PB Adjustable Male Branch Tee Metric Straight Thread



| Tube size (mm) | Thread (mm) | Part number |
|----------------|-------------|-------------|
| 4              | M3x0.5      | S68PB4M3    |
| 4              | M5x0.8      | S68PB4M5    |
| 6              | M5x0.8      | S68PB6M5    |

### FNPB Plug



| Tube size (mm) | Part number |
|----------------|-------------|
| 4              | FNPB4       |
| 6              | FNPB6       |
| 8              | FNPB8       |
| 10             | FNPB10      |
| 12             | FNPB12      |
| 14             | FNPB14      |

### TEPB Tube End Expander



| Tube 1 Size (mm) | Tube 2 Size (mm) | Part number |
|------------------|------------------|-------------|
| 4                | 6                | TEPB4-6     |

### TRPB Tube End Reducer




| Tube 1 size (mm) | Tube 2 size (mm) | Part number |
|------------------|------------------|-------------|
| 6                | 4                | TRPB6-4     |
| 8                | 4                | TRPB8-4     |
| 8                | 6                | TRPB8-6     |
| 10               | 4                | TRPB10-4    |
| 10               | 6                | TRPB10-6    |
| 10               | 8                | TRPB10-8    |
| 12               | 6                | TRPB12-6    |
| 12               | 8                | TRPB12-8    |
| 12               | 10               | TRPB12-10   |
| 14               | 8                | TRPB14-8    |
| 14               | 10               | TRPB14-10   |
| 14               | 12               | TRPB14-12   |

**G**  
 Accessories  
 Ball / Plug Valves  
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 Quick Couplings  
 Tubing & Fittings




**207ACBH Anchor Coupling**



| Female pipe thread | Straight thread | Max. bulkhead | Part number        |
|--------------------|-----------------|---------------|--------------------|
| 1/8                | 5/8-18          | .89           | <b>207ACBH-2</b>   |
| 1/8                | 5/8-18          | .35           | <b>207ACBHS-2</b>  |
| 1/4                | 3/4-16          | .81           | <b>207ACBH-4</b>   |
| 1/4                | 3/4-16          | .26           | <b>207ACBHS-4</b>  |
| 3/8                | 1-14            | .62           | <b>207ACBH-6</b>   |
| 1/2                | 1-1/8-14        | .75           | <b>207ACBH-8</b>   |
| 3/4                | 1-5/16-12       | .65           | <b>207ACBH-12</b>  |
| 1                  | 1-5/8-14        | 1.00          | <b>207ACBH-16*</b> |


\*Lock washer not available

**207P Coupling**




| Pipe thread | C Hex  | Part number    |
|-------------|--------|----------------|
| 1/8         | 9/16   | <b>207P-2</b>  |
| 1/4         | 3/4    | <b>207P-4</b>  |
| 3/8         | 7/8    | <b>207P-6</b>  |
| 1/2         | 1-1/16 | <b>207P-8</b>  |
| 3/4         | 1-3/8  | <b>207P-12</b> |

**208P Reducer Coupling**



| 1 Pipe thread | 2 Pipe thread | C Hex  | Part number      |
|---------------|---------------|--------|------------------|
| 1/4           | 1/8           | 3/4    | <b>208P-4-2</b>  |
| 3/8           | 1/4           | 7/8    | <b>208P-6-4</b>  |
| 1/2           | 1/4           | 1-1/16 | <b>208P-8-4</b>  |
| 1/2           | 3/8           | 1-1/16 | <b>208P-8-6</b>  |
| 3/4           | 3/8           | 1-3/8  | <b>208P-12-6</b> |
| 3/4           | 1/2           | 1-3/8  | <b>208P-12-8</b> |


**209P Bushing**



| 1 Pipe thread | 2 Pipe thread | C Hex | Part number       |
|---------------|---------------|-------|-------------------|
| 1/8           | 1/4           | 9/16  | <b>209P-4-2</b>   |
| 1/8           | 3/8           | 11/16 | <b>209P-6-2</b>   |
| 1/4           | 3/8           | 3/4   | <b>209P-6-4</b>   |
| 1/8           | 1/2           | 7/8   | <b>209P-8-2</b>   |
| 1/4           | 1/2           | 7/8   | <b>209P-8-4</b>   |
| 3/8           | 1/2           | 7/8   | <b>209P-8-6</b>   |
| 1/8           | 3/4           | 1-1/8 | <b>209P-12-2</b>  |
| 1/4           | 3/4           | 1-1/8 | <b>209P-12-4</b>  |
| 3/8           | 3/4           | 1-1/8 | <b>209P-12-6</b>  |
| 1/2           | 3/4           | 1-1/8 | <b>209P-12-8</b>  |
| 1/2           | 1             | 1-3/8 | <b>209P-16-8</b>  |
| 3/4           | 1             | 1-3/8 | <b>209P-16-12</b> |


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**210P Lock Nut**




| Pipe thread | C Hex | Part number   |
|-------------|-------|---------------|
| 1/8 NPSL    | 11/16 | <b>210P-2</b> |
| 1/4 NPSL    | 7/8   | <b>210P-4</b> |
| 3/8 NPSL    | 1     | <b>210P-6</b> |
| 1/2 NPSL    | 1-1/8 | <b>210P-8</b> |

**211P Square-Head Plug**




| Pipe thread | Part number    |
|-------------|----------------|
| 1/8         | <b>211P-2</b>  |
| 1/4         | <b>211P-4</b>  |
| 3/8         | <b>211P-6</b>  |
| 1/2         | <b>211P-8</b>  |
| 3/4         | <b>211P-12</b> |

**212P Union**




| Pipe thread | C Hex  | Part number   |
|-------------|--------|---------------|
| 1/4         | 1-3/16 | <b>212P-4</b> |
| 3/8         | 1-1/4  | <b>212P-6</b> |

**213P Cap**



| Pipe thread | C Hex  | Part number    |
|-------------|--------|----------------|
| 1/8         | 9/16   | <b>213P-2</b>  |
| 1/4         | 11/16  | <b>213P-4</b>  |
| 3/8         | 13/16  | <b>213P-6</b>  |
| 1/2         | 1-1/16 | <b>213P-8</b>  |
| 3/4         | 1-1/4  | <b>213P-12</b> |

**215PN Close Nipple**



| Pipe thread | Part number     |
|-------------|-----------------|
| 1/8         | <b>215PN-2</b>  |
| 1/4         | <b>215PN-4</b>  |
| 3/8         | <b>215PN-6</b>  |
| 1/2         | <b>215PN-8</b>  |
| 3/4         | <b>215PN-12</b> |

**215PNL Long Nipple**

| Pipe thread | Part number        |
|-------------|--------------------|
| 1/8         | <b>215PNL-2-15</b> |
| 1/4         | <b>215PNL-4-15</b> |
| 3/8         | <b>215PNL-6-15</b> |
| 1/2         | <b>215PNL-8-15</b> |
| 1/8         | <b>215PNL-2-20</b> |
| 1/4         | <b>215PNL-4-20</b> |
| 3/8         | <b>215PNL-6-20</b> |
| 1/2         | <b>215PNL-8-20</b> |
| 1/8         | <b>215PNL-2-25</b> |
| 1/4         | <b>215PNL-4-25</b> |
| 3/8         | <b>215PNL-6-25</b> |
| 1/2         | <b>215PNL-8-25</b> |
| 1/8         | <b>215PNL-2-30</b> |
| 1/4         | <b>215PNL-4-30</b> |
| 3/8         | <b>215PNL-6-30</b> |
| 1/2         | <b>215PNL-8-30</b> |
| 1/8         | <b>215PNL-2-35</b> |
| 1/4         | <b>215PNL-4-35</b> |
| 3/8         | <b>215PNL-6-35</b> |
| 1/2         | <b>215PNL-8-35</b> |



**220P Slotted-Head Plug**

| Pipe thread | Part number   |
|-------------|---------------|
| 1/8         | <b>220P-2</b> |
| 1/4         | <b>220P-4</b> |
| 3/8         | <b>220P-6</b> |



**222P Adapter**

| 1 Pipe thread | 2 Pipe thread | C Hex  | Part number       |
|---------------|---------------|--------|-------------------|
| 1/8           | 1/8           | 9/16   | <b>222P-2-2</b>   |
| 1/4           | 1/8           | 3/4    | <b>222P-4-2</b>   |
| 1/4           | 1/4           | 3/4    | <b>222P-4-4</b>   |
| 3/8           | 1/8           | 7/8    | <b>222P-6-2</b>   |
| 3/8           | 1/4           | 7/8    | <b>222P-6-4</b>   |
| 3/8           | 3/8           | 7/8    | <b>222P-6-6</b>   |
| 1/2           | 1/4           | 1      | <b>222P-8-4</b>   |
| 1/2           | 3/8           | 1-1/16 | <b>222P-8-6</b>   |
| 1/2           | 1/2           | 1-1/16 | <b>222P-8-8</b>   |
| 3/4           | 3/8           | 1-3/8  | <b>222P-12-6</b>  |
| 3/4           | 1/2           | 1-3/8  | <b>222P-12-8</b>  |
| 3/4           | 3/4           | 1-3/8  | <b>222P-12-12</b> |



**216P Hex Nipple**

| Pipe thread | C Hex  | Part number    |
|-------------|--------|----------------|
| 1/8         | 7/16   | <b>216P-2</b>  |
| 1/4         | 9/16   | <b>216P-4</b>  |
| 3/8         | 11/16  | <b>216P-6</b>  |
| 1/2         | 7/8    | <b>216P-8</b>  |
| 3/4         | 1-1/16 | <b>216P-12</b> |



**1200P-2200P 90° Union Elbow**

| Pipe thread | Part number      |
|-------------|------------------|
| 1/8         | <b>1200P-2-2</b> |
| 1/8         | <b>2200P-2-2</b> |
| 1/4         | <b>1200P-4-4</b> |
| 1/4         | <b>2200P-4-4</b> |
| 3/8         | <b>1200P-6-6</b> |
| 3/8         | <b>2200P-6-6</b> |
| 1/2         | <b>2200P-8-8</b> |



**218P Hex-Head Plug**

| Pipe thread | C Hex  | Part number    |
|-------------|--------|----------------|
| 1/8         | 7/16   | <b>218P-2</b>  |
| 1/4         | 9/16   | <b>218P-4</b>  |
| 3/8         | 11/16  | <b>218P-6</b>  |
| 1/2         | 7/8    | <b>218P-8</b>  |
| 3/4         | 1-1/16 | <b>218P-12</b> |



**1202P-2202P 90° Street Elbow**

| 1 Pipe thread | 2 Pipe thread | Part number        |
|---------------|---------------|--------------------|
| 1/8           | 1/8           | <b>1202P-2-2</b>   |
| 1/8           | 1/8           | <b>2202P-2-2</b>   |
| 1/8           | 1/8           | <b>2202PA-2-2*</b> |
| 1/4           | 1/8           | <b>2202P-4-2</b>   |
| 1/4           | 1/4           | <b>1202P-4-4</b>   |
| 1/4           | 1/4           | <b>2202P-4-4</b>   |
| 1/4           | 1/4           | <b>2202PA-4-4*</b> |
| 1/4           | 3/8           | <b>2202P-4-6</b>   |
| 3/8           | 1/4           | <b>1202P-6-4</b>   |
| 3/8           | 3/8           | <b>1202P-6-6</b>   |
| 3/8           | 3/8           | <b>2202P-6-6</b>   |
| 3/8           | 3/8           | <b>2202PA-6-6*</b> |



**219P Countersunk Hex-Head Plug**

| Pipe thread | C Hex | Part number    |
|-------------|-------|----------------|
| 1/8         | 3/16  | <b>219P-2</b>  |
| 1/4         | 1/4   | <b>219P-4</b>  |
| 3/8         | 5/16  | <b>219P-6</b>  |
| 1/2         | 3/8   | <b>219P-8</b>  |
| 3/4         | 9/16  | <b>219P-12</b> |



Most popular. For technical information see CD

\*Meets SAE Dimensions

**G**  
 Accessories  
 Ball / Plug Valves  
 Hose & Fittings  
 Integrated Fittings  
 Misc. Accessories  
 Quick Couplings  
 Tubing & Fittings



**Parker Pneumatic**

**1203P-2203P Union Tee**



| Pipe thread | Part number |
|-------------|-------------|
| 1/8         | 1203P-2     |
| 1/8         | 2203P-2     |
| 1/4         | 1203P-4     |
| 1/4         | 2203P-4     |
| 3/8         | 2203P-6     |
| 1/2         | 1203P-8     |
| 1/2         | 2203P-8     |
| 3/4         | 2203P-12    |

**1204P Male Elbow**



| Pipe thread | Part number |
|-------------|-------------|
| 1/8         | 1204P-2     |
| 1/4         | 1204P-4     |
| 3/8         | 1204P-6     |
| 1/2         | 1204P-8     |

**2224P Male Branch Tee**



| Pipe thread | Part number |
|-------------|-------------|
| 1/8         | 2224P-2     |
| 1/4         | 2224P-4     |
| 3/8         | 2224P-6     |
| 1/2         | 2224P-8     |
| 3/4         | 2224P-12    |

**2225P Street Tee**



| Pipe thread | Part number |
|-------------|-------------|
| 1/8         | 2225P-2     |
| 1/4         | 2225P-4     |
| 3/8         | 2225P-6     |
| 1/2         | 2225P-8     |
| 3/4         | 2225P-12    |

**Accessories  
Pipe Fittings**

**1201P-2201P 45° Female Elbow**



1201P



2201P

| Pipe thread | Part number |
|-------------|-------------|
| 1/8         | 2201P-2-2   |
| 1/2         | 1201P-8-8   |

**2205P Cross**



| Pipe thread | Part number |
|-------------|-------------|
| 1/8         | 2205P-2     |
| 1/4         | 2205P-4     |
| 3/8         | 2205P-6     |
| 1/2         | 2205P-8     |
| 3/4         | 2205P-12    |

**2214P 45° Street Elbow**



| Pipe thread | Part number |
|-------------|-------------|
| 1/8         | 2214P-2-2   |
| 1/4         | 2214P-4-4   |
| 3/8         | 2214P-6-6   |
| 1/2         | 2214P-8-8   |

Most popular. For technical information see CD



**Parker Pneumatic**

Accessories

**Metric Adapters BSPP**

**DD44 Pipe 90° Elbow BSPP**



| BSPP | C Hex | Part number     |
|------|-------|-----------------|
| 1/8  | 14    | <b>1/8DD44B</b> |
| 1/4  | 17    | <b>1/4DD44B</b> |
| 3/8  | 22    | <b>3/8DD44B</b> |
| 1/2  | 27    | <b>1/2DD44B</b> |

**KMMOO4 Pipe Cross BSPP**



| BSPP | C Hex | Part number       |
|------|-------|-------------------|
| 1/8  | 14    | <b>1/8KMMOO4B</b> |
| 1/4  | 17    | <b>1/4KMMOO4B</b> |
| 3/8  | 22    | <b>3/8KMMOO4B</b> |
| 1/2  | 27    | <b>1/2KMMOO4B</b> |

**FF44 Pipe Nipples BSPP**



| BSPP | C Hex | Part number     |
|------|-------|-----------------|
| 1/8  | 14    | <b>1/8FF44B</b> |
| 1/4  | 17    | <b>1/4FF44B</b> |
| 3/8  | 22    | <b>3/8FF44B</b> |
| 1/2  | 27    | <b>1/2FF44B</b> |

**MMO444 Pipe Tee BSPP**



| BSPP | C Hex | Part number       |
|------|-------|-------------------|
| 1/8  | 14    | <b>1/8MMO444B</b> |
| 1/4  | 17    | <b>1/4MMO444B</b> |
| 3/8  | 22    | <b>3/8MMO444B</b> |
| 1/2  | 27    | <b>1/2MMO444B</b> |
| 3/4  | 32    | <b>3/4MMO444B</b> |
| 1    | 40    | <b>1MMO444B</b>   |

**FHG4 Adapter Male NPTF BSPP**



| BSPP 1 | NPTF 2 | C Hex | Part No.         |
|--------|--------|-------|------------------|
| 1/8    | 1/8    | 0.562 | <b>1/8FHG4-B</b> |
| 1/4    | 1/4    | 0.750 | <b>1/4FHG4-B</b> |
| 3/8    | 3/8    | 0.875 | <b>3/8FHG4-B</b> |
| 1/2    | 1/2    | 1.062 | <b>1/2FHG4-B</b> |

**WGG44 Bulkhead Female Union BSPP**



| BSPP | Straight thread | C Hex | Part number      |
|------|-----------------|-------|------------------|
| 1/8  | M16x1.5         | 19    | <b>1/8WGG44B</b> |
| 1/4  | M20x1.5         | 24    | <b>1/4WGG44B</b> |
| 3/8  | M23x1.5         | 27    | <b>3/8WGG44B</b> |
| 1/2  | M27x1.5         | 32    | <b>1/2WGG44B</b> |
| 3/4  | M34x1.5         | 41    | <b>3/4WGG44B</b> |
| 1    | M45x2           | 55    | <b>1WGG44B</b>   |

**GG44 Pipe Connector BSPP**



| BSPP | C Hex | Part number     |
|------|-------|-----------------|
| 1/8  | 14    | <b>1/8GG44B</b> |
| 1/4  | 17    | <b>1/4GG44B</b> |
| 3/8  | 22    | <b>3/8GG44B</b> |
| 1/2  | 27    | <b>1/2GG44B</b> |
| 3/4  | 32    | <b>3/4GG44B</b> |
| 1    | 41    | <b>1GG44B</b>   |

Most popular. For technical information see CD

|          |                     |
|----------|---------------------|
| <b>G</b> | Accessories         |
|          | Ball / Plug Valves  |
|          | Hose & Fittings     |
|          | Integrated Fittings |
|          | Misc. Accessories   |
|          | Quick Couplings     |
|          | Tubing & Fittings   |



**Air Preparation Units**

| Symbol | Description  |
|--------|--|
|        | Filter / Separator with manual drain                               |
|        | Filter / Separator with automatic drain                            |
|        | Oil Removal Filter   |
|        | Automatic Drain  |
|        | Lubricator less drain  |
|        | Lubricator with manual drain                                       |
|        | Lubricator with automatic filling                                  |
|        | Air Line Pressure Regulator adjustable, relieving                  |
|        | Air Line Pressure Regulator pilot controlled, relieving            |
|        | Filter / Regulator (piggyback) manual drain relieving (with gauge) |
|        | Filter / Regulator (piggyback) auto drain relieving                |
|        | Air Line Combo F-R-L simplified                                    |

**Pneumatic Valves**

| Symbol | Description                |
|--------|----------------------------|
|        | Check                      |
|        | Flow Control               |
|        | Relief Valve               |
|        | 2-Position, 2-Way          |
|        | 2-Position, 3-Way          |
|        | 2-Position, 4-Way          |
|        | 2-Position, 4-Way 5-Ported |

**Pneumatic Valves**

| Symbol | Description  |
|--------|--|
|        | 3-Position, 4-Way, APB ports closed, center pos.                                 |
|        | 3-Position, 4-Way, CE 5-Ported cylinder ports open to exhaust in center position |
|        | 3-Position, 4-Way, PC 5-Ported pressure ports open to exhaust in center position |
|        | Quick Exhaust  |
|        | Shuttle  |

**Valve Actuators**

| Symbol | Description  |
|--------|--|
|        | Manual general symbol  |
|        | Push Button  |
|        | Lever  |
|        | Pedal or Treadle   |
|        | Mechanical cam, toggle, etc.                                       |
|        | Spring   |
|        | Detent line indicates which detent is in use                       |
|        | Piezo  |
|        | Solenoid   |
|        | Internal Pilot Supply  |
|        | Remote Pilot Supply complete                                       |
|        | Remote Pilot Supply simplified                                     |
|        | And / Or Composite solenoid and pilot or manual override           |
|        | And / Or Composite solenoid and pilot or manual override and pilot |

**Cylinders**

| Symbol | Description            |
|--------|------------------------|
|        | Standard double acting |
|        | Single Acting          |
|        | Double Rod             |
|        | Spring Return          |
|        | Ram Type               |
|        | Telescope              |
|        | Tandem                 |
|        | Duplex                 |

**Lines and Functions**

| Symbol | Description                                     |
|--------|---|
|        | Solid Line - Main Line                          |
|        | Dashed Line - Pilot Line                        |
|        | Dotted Line - Exhaust or Drain Line             |
|        | Center Line - Enclosure Outline                 |
|        | Lines Crossing (90° intersection not necessary) |
|        | Lines Joining (90° intersection not necessary)  |
|        | Lines Joining                                   |
|        | Flow Direction hydraulic medium                 |
|        | Flow Direction gaseous medium                   |
|        | Energy Source                                   |
|        | Line with Fixed Restriction                     |
|        | Line with Adjustable Restriction                |
|        | Flexible Line                                   |
|        | Plugged Port, Test Station, Power Take-off      |
|        | Quick Disconnect Without Checks                 |
|        | Quick Disconnect With Checks                    |
|        | Quick Disconnect With One Check                 |

Valve Technical Information

Vacuum Technical Information

Actuator Technical Information

Fluid Power Graphic Symbols

H

Technical Data

## Design Torque

Design torque represents the maximum torque that an actuator must supply in an application. This maximum is the greater of the Demand Torque or the Cushion Torque. If the demand torque exceeds what the actuator can supply, the actuator will either move too slowly or stall. If the cushion torque is too high, the actuator may be damaged by excessive pressure. Demand torque and cushion torque are defined below in terms of load, friction, and acceleration torque.

Equations for calculating demand torque and cushion torque for some general applications are provided on the following pages.

### T - Torque

The amount of turning effort exerted by a rotary actuator.

TD - Demand Torque

This is the torque required from the actuator to do the job and is the sum of the load torque, friction torque, and acceleration torque, multiplied by an appropriate design factor. Design factors vary with the applications and the designers' knowledge.

$$\text{Equation 4-3) } TD = Ta + Tf + TL$$

### TL - Load torque

This is the torque required to equal the weight or force of the load. For example, in Fig. 4-8a, the load torque is 563 Nm (5000 lb-in.); in Fig. 4-8b the load torque is zero; in Fig. 4-8c the load torque is 563 Nm (5000 lb-in.). The load torque term is intended to encompass all torque components that aren't included in the friction or acceleration terms.

### Tf - Friction torque

This is the torque required to overcome friction between any moving parts, especially bearing surfaces. In Fig. 4-8a, the friction torque is zero for the hanging load; in Fig. 4-8b the friction torque is 775 Nm (6880 lb-in) for the sliding load; in Fig. 4-8c the friction torque is zero for the clamp.

$$\text{Equation 4-4) } Tf = mWr$$

### Ta - Acceleration Torque

This is the torque required to overcome the inertia of the load in order to provide a required acceleration or deceleration. In Fig. 4-8a the load is suspended motionless so there is no acceleration. In Fig. 4-8b, the load is accelerated from 0 to some specified angular velocity. If the mass moment of inertia about the axis of rotation is I and the angular acceleration is a, the acceleration torque is equal to Ia. In Fig. 4-8c there is no acceleration.

Some values for mass moment of inertia are given in Table 4. Some useful equations for determining a are listed in Table 5. Equation 5 below shows the general equation for acceleration torque.

$$\text{Equation 4-5) } Ta = Ia$$

## TC - Cushion Torque

This is the torque that the actuator must apply to provide a required deceleration. This torque is generated by restricting the flow out of the actuator (meter-out) so as to create a back pressure which decelerates the load. This back pressure (deceleration) often must overcome both the inertia of the load and the driving pressure (system pressure) from the pump. See applications.

$$\text{Equation 4-6) } Tc = Ta + \frac{PrV}{\theta} - Tf \pm TL$$

The friction torque Tf reduces the torque the actuator must apply to stop the load. The load torque TL may add to, or subtract from the torque required from the actuator, depending upon the orientation of the load torque. For example, a weight being swung upward would result in a load torque that is subtracted.

**Warning: Rapid deceleration can cause high pressure intensification at the outlet of the actuator. Always insure that cushion pressure does not exceed the manufacturer's pressure rating for the actuator.**

## KE - Kinetic Energy (1/2 Jmω<sup>2</sup>)

This is the amount of energy that a rotating load has. The rotator must be able to stop the load. All products have kinetic energy rating tables. Choose the appropriate deceleration option (i.e., bumper, cushions, shock absorbers, etc.) that meets or exceeds the kinetic energy of the load.

Valve Technical Information

Vacuum Technical Information

Actuator Technical Information

Fluid Power Graphic Symbols

**H**

Technical Data



**Rotary Actuator Torque Requirements**  
**Demand Torque Examples**

**A) Example of load torque**

The load is held motionless as shown.

$$T_D = T_\alpha + T_f + T_L$$

$$T_\alpha = 0$$

$$T_f = 0$$

$$T_L = (500 \text{ lb})(10 \text{ in}) = 5,000 \text{ lb-in}$$

$$T_D = 5,000 \text{ lb-in}$$

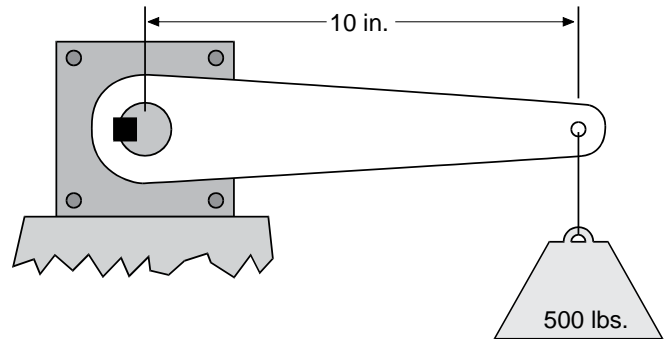


Figure 4-8a

**B) Due to friction and acceleration**

The 500 lb rotating index table is supported by bearings with a coefficient of friction of 0.25. The table's acceleration  $a$  is 2 rad/sec<sup>2</sup>. The table's mass moment of inertia  $I$  is 2,330 lb-in-sec<sup>2</sup>.

$$T_D = T_\alpha + T_f + T_L$$

$$T_\alpha = I\alpha = (2,330 \text{ lb-in-sec}^2)(2/\text{sec}^2) = 4,660 \text{ lb-in}$$

$$T_f = \mu W r_b = 0.25 (500 \text{ lb})(55 \text{ in}) = 6,880 \text{ lb-in}$$

$$T_L = 0$$

$$T_D = 4,660 \text{ lb-in} + 6,880 \text{ lb-in} = 11,540 \text{ lb-in}$$

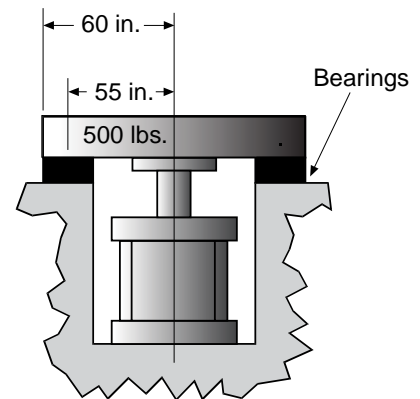


Figure 4-8b

**C) Load torque example**

$$T_D = T_\alpha + T_f + T_L$$

$$T_\alpha = 0$$

$$T_f = 0$$

$$T_L = (500 \text{ lb})(10 \text{ in}) = 5,000 \text{ lb-in}$$

$$T_D = 5,000 \text{ lb-in}$$

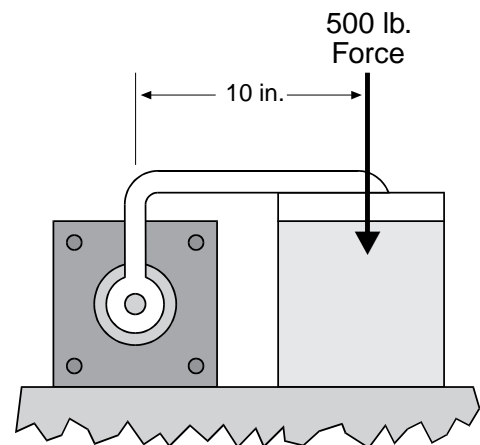
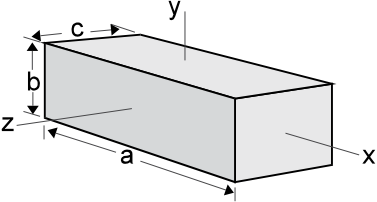
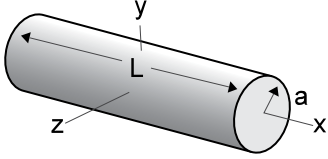
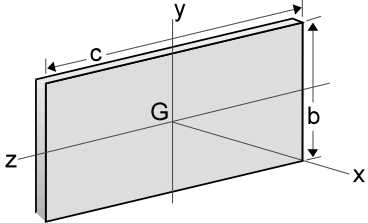
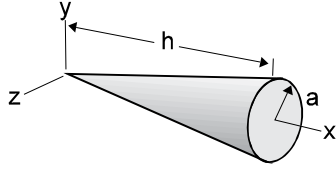
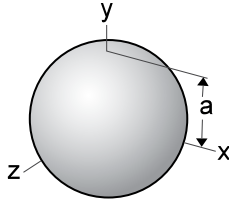
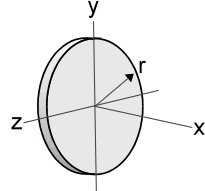
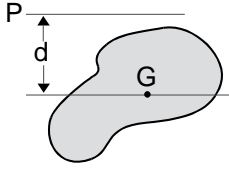


Figure 4-8c

|                                |
|--------------------------------|
| Valve Technical Information    |
| Vacuum Technical Information   |
| Actuator Technical Information |
| Fluid Power Graphic Symbols    |
| <b>H</b>                       |
| Technical Data                 |

**Rotary Actuator Moments of Inertia**  
**Table 4: Mass Moments of Inertia**

Valve Technical Information  
 Vacuum Technical Information  
 Actuator Technical Information  
 Fluid Power Graphic Symbols  
**H**  
 Technical Data

|   |  |
|---|--|
| <p>Rectangular prism</p> $I_x = \frac{1}{12}m(b^2 + c^2)$ $I_y = \frac{1}{12}m(c^2 + a^2)$ $I_z = \frac{1}{12}m(a^2 + b^2)$    | <p>Circular cylinder</p> $I_x = \frac{1}{2}ma^2$ $I_y = I_z = \frac{1}{12}m(3a^2 + L^2)$    |
| <p>Thin rectangular plate</p> $I_x = \frac{1}{12}m(b^2 + c^2)$ $I_y = \frac{1}{12}mc^2$ $I_z = \frac{1}{12}mb^2$   | <p>Circular cone</p> $I_x = \frac{3}{10}ma^2$ $I_y = I_z = \frac{3}{5}m\left(\frac{1}{4}a^2 + h^2\right)$   |
| <p>Sphere</p> $I_x = I_y = I_z = \frac{2}{5}ma^2$    | <p>Thin disk</p> $I_x = \frac{1}{2}mr^2$ $I_y = I_z = \frac{1}{4}mr^2$    |
| <p>Parallel Axis Theorem:</p> $I_p = I + md^2$   | <p><math>I_p</math> = Mass moment of inertia about an axis parallel to a centroidal axis<br/> <math>I</math> = Mass moment of inertia about a centroidal axis<br/> <math>m</math> = Mass<br/> <math>d</math> = Distance between axes</p>   |
| <p>When acceleration is constant:</p> $\theta = \omega_0 t + \frac{1}{2} \alpha t^2$ $\alpha = \frac{2\theta}{t^2}$ $\theta = \omega_0 t + \frac{1}{2} \omega_t t$ $\alpha = \frac{(\omega_t - \omega_0)^2}{2\theta}$ $\omega = \omega_0 + \alpha t$ $\alpha = \frac{(\omega_t - \omega_0)}{t}$ | <p>When velocity is constant:</p> $\theta = \omega t$ <p><math>t</math> = time<br/> <math>\theta</math> = angular position<br/> <math>\omega_t</math> = angular velocity at time = <math>t</math><br/> <math>\omega_0</math> = angular velocity at time = <math>0</math><br/> <math>\alpha</math> = angular acceleration</p> |

**Rotary Actuator Basic Equations**  
**Basic Velocity, Acceleration, Kinetic Energy And Torque Equations**

*Equations below are based on triangular velocity profile.*

$$\omega_{\max} = .035 \times \frac{\Theta}{t}$$

$$\alpha = \frac{\omega_{\max}^2}{\left(\frac{\Theta}{57.3}\right)^2}$$

$$\alpha = \frac{\omega_{\max}}{(t/2)}$$

$$K.E. = 1/2 J_m \omega^2$$

$$T_a = \alpha \times J_m$$

$$T_f = W \times U_s \times \left( \text{Distance from pivot point to center of external bearings} \right)$$

$$T_L = \left( \text{Torque arm length to C.G. of load} \right) \times WL \times \cos(\phi)$$

Where  $\phi$  = Angle between torque arm and horizontal plane

Where:

$\Theta$  = Angle of Rotation (Degrees)

t = Time to rotate through  $\Theta$  (sec)

$\omega$  = Angular velocity, radians/sec

$\alpha$  = Angular accelerations (radians/sec<sup>2</sup>)

WL = Weight of load (lbf)

T<sub>a</sub> = Torque to accelerate load (lb-in)

U<sub>s</sub> = Coefficient of static friction

J<sub>m</sub>\* = Rotational mass moment of inertia (lb-in-sec<sup>2</sup>)

T<sub>f</sub> = Torque to overcome friction (lb-in)

T<sub>L</sub> = Torque to overcome effects of gravity

\*Use "I" values from Table 4.

**Coefficients of Friction**

| Material*                   | $\mu_s$ | $\mu_k$ |
|-----------------------------|---------|---------|
| Steel on Steel              | 0.80    | 0.40    |
| Steel on Steel (lubricated) | 0.16    | 0.03    |
| Aluminum on Steel           | 0.45    | 0.30    |
| Copper on Steel             | 0.22    | 0.22    |
| Brass on Steel              | 0.35    | 0.19    |
| Teflon on Steel             | 0.04    | 0.04    |

\*dry contact unless noted

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**Selecting the proper vacuum cup**

**CAUTION:**  
 Selecting the type of vacuum cup, material, and size suitable for an application is important to the overall vacuum system. Calculating the forces involved for each application is recommended to determine the vacuum cup size. It should be noted that these calculations are basic theoretical guidelines and each application must be tested for actual results. With all vacuum applications, certain practical assumptions concerning cup materials, environmental conditions, and product characteristics to name a few, may not be consistent with the performance. Again, the user should determine the efficiency, performance, and safety factor of the cup selection.

**Calculating pad diameter and forces**

**Mass**

The term mass is a quantity of matter and its ability to resist motion when acted on by an external force. The magnitude of an object is represented as a certain number of kilograms (kg) and is symbolized as “m”. The easiest way to determine the mass of an object is to measure the weight with a scale within the earth’s gravitational field ( $a_g = 9.81\text{m/sec}^2$ ). Likewise, outside of any gravitational field, a mass could potentially be weightless.

**Forces**

For vacuum applications, force is a vector quantity in a defined direction either horizontal or vertical. The standard international unit of force is measured in Newtons (N) which is the equivalent of ( $\text{kgm/sec}^2$ ). The force can be calculated by measuring the effect of a change in acceleration on a mass.

Newton’s Law:  $F(N) = \text{mass}(\text{kg}) \times a_g(\text{m/sec}^2)$

Consider an object with a mass of 10kg. The gravitational force on this object would be:

$$F(N) = 10\text{kg} \times 9.81\text{m/sec}^2 = 98.1 \text{ N}$$

**Acceleration**

Acceleration is the change in velocity of a moving object. Acceleration is a vector, a directional quantity expressed in units of meters per second squared ( $\text{m/sec}^2$ ) and symbolized as “a”. To explain the magnitude of acceleration consider an object with a change in velocity of 2 meters per second ( $\text{m/sec}$ ) over a 4 second time frame. The acceleration can be calculated with:

$$a = \frac{\Delta \text{ velocity}}{\text{time}} \quad a = \frac{6\text{m/sec}}{2 \text{ sec}} \quad a = 3\text{m/sec}^2$$

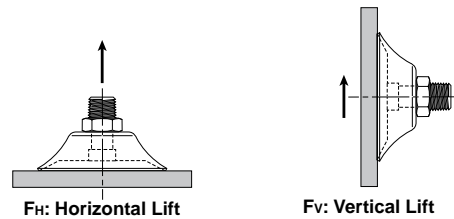
This is considered an average acceleration.

**Coefficient of friction**

Certain values for coefficient of friction should be taken into consideration when calculating the combined forces in motion. Actual values between suction cups and surfaces are difficult to determine. Therefore, coefficient of friction values from published charts, should be used as a reference to adjust the safety factors accordingly.

**Lifting forces**

When calculating lifting forces, safety factors of 2 for horizontal lifts and 4 for vertical lifts are minimum values. Applications with irregular shapes, difficult surfaces, and backward motions will require increased safety factors.



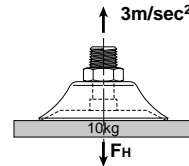
**Horizontal lifting force**

Apply Newton’s Law to calculate the force on a 10kg mass with a change in acceleration of  $3\text{m/sec}^2$  and a safety factor of 2.

$$F_H(N) = \text{mass}(\text{kg}) \times (a_g + a) \times \text{SH}$$

$$F_H(N) = 10\text{kg} \times (9.81\text{m/sec}^2 + 3\text{m/sec}^2) \times 2$$

$$F_H = 256.2 \text{ N}$$



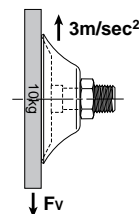
**Vertical lifting force**

Apply Newton’s Law to calculate the force on a 10kg mass with a dry surface, a change in acceleration of  $3\text{m/sec}^2$  and a safety factor of 4.

$$F_V(N) = \text{mass}(\text{kg}) \times (a_g + a) \times S_v$$

$$F_V(N) = 10\text{kg} \times (9.81\text{m/sec}^2 + 3\text{m/sec}^2) \times 4$$

$$F_V = 512.4 \text{ N}$$



**Combined vertical lift and horizontal motion**

Calculate the force on a 10kg mass with a dry surface, a change in acceleration of  $3\text{m/sec}^2$ , and a change in travel acceleration of  $2\text{m/sec}^2$ .

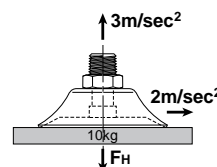
$$F_M(N) = \sqrt{F_V^2 + F_H^2}$$

$$F_M(N) = \sqrt{[(10\text{kg} \times 2\text{m/sec}^2) \times 4]^2 + [10\text{kg} \times (9.81\text{m/sec}^2 + 3\text{m/sec}^2) \times 2]^2}$$

$$F_M(N) = \sqrt{(80\text{kgm/sec}^2)^2 + [256\text{kgm/sec}^2]^2}$$

$$F_M(N) = \sqrt{6400\text{kgm/sec}^2 + 65,536\text{kgm/sec}^2}$$

$$F_M = 268.2 \text{ N}$$



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**Analyze the forces**

Using the previous examples, consider an application where 4 cups have been selected to transfer the product.

Take the Horizontal Lifting Force (FH) of 256.2 N and divide by the number of cups (4) to obtain the individual force for each cup.

$$\frac{256.2 \text{ (N)}}{4} = 64.05 \text{ N / Cup}$$

Referring to the chart below, at 60% vacuum, select a force greater than 64.05 N. The appropriate selection is a 40mm diameter cup which has a theoretical lifting force of 76.9 N.

The same calculation can be applied to the Vertical Lifting Force and the Forces in Motion examples to determine the cup diameter.

**To convert Pounds (lbf) to Newton (N), multiply lbf x 4.4.**

**Theoretical lifting force per cup lbf (N)**

| Cup         |                      | Vacuum level  |               |               |                |                |                |                |                |                |
|-------------|----------------------|---------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Diameter mm | Area cm <sup>2</sup> | 3 inHg        | 6 inHg        | 9 inHg        | 12 inHg        | 15 inHg        | 18 inHg        | 21 inHg        | 24 inHg        | 27 inHg        |
|             |                      | -1.5 PSIG     | -3 PSIG       | -4.5 PSIG     | -6 PSIG        | -7.5 PSIG      | -9 PSIG        | -10.5 PSIG     | -12 PSIG       | -13.5 PSIG     |
|             |                      | 10.2 kPa      | 20.3 kPa      | 30.5 kPa      | 40.6 kPa       | 50.8 kPa       | 61 kPa         | 71.1 kPa       | 81.3 kPa       | 91.4 kPa       |
|             |                      | 10%           | 20%           | 30%           | 40%            | 50%            | 60%            | 70%            | 80%            | 90%            |
| 1.5         | 0.01                 | 0.004 (0.02)  | 0.008 (0.04)  | 0.008 (0.04)  | 0.014 (0.06)   | 0.018 (0.08)   | 0.022 (0.10)   | 0.026 (0.12)   | 0.032 (0.14)   | 0.032 (0.14)   |
| 2           | 0.03                 | 0.007 (0.03)  | 0.013 (0.06)  | 0.022 (0.10)  | 0.029 (0.13)   | 0.036 (0.16)   | 0.043 (0.19)   | 0.049 (0.22)   | 0.056 (0.25)   | 0.063 (0.28)   |
| 3.5         | 0.10                 | 0.022 (0.10)  | 0.045 (0.20)  | 0.065 (0.29)  | 0.088 (0.39)   | 0.110 (0.49)   | 0.133 (0.59)   | 0.155 (0.69)   | 0.175 (0.78)   | 0.198 (0.88)   |
| 5           | 0.20                 | 0.045 (0.20)  | 0.090 (0.40)  | 0.135 (0.60)  | 0.180 (0.80)   | 0.225 (1.00)   | 0.270 (1.20)   | 0.315 (1.40)   | 0.360 (1.60)   | 0.405 (1.80)   |
| 6           | 0.28                 | 0.065 (0.29)  | 0.130 (0.58)  | 0.196 (0.87)  | 0.270 (1.20)   | 0.315 (1.40)   | 0.382 (1.70)   | 0.450 (2.00)   | 0.517 (2.30)   | 0.585 (2.60)   |
| 7           | 0.39                 | 0.088 (0.39)  | 0.175 (0.78)  | 0.265 (1.18)  | 0.360 (1.60)   | 0.450 (2.00)   | 0.540 (2.40)   | 0.607 (2.70)   | 0.697 (3.10)   | 0.787 (3.50)   |
| 8           | 0.50                 | 0.117 (0.52)  | 0.229 (1.02)  | 0.346 (1.54)  | 0.450 (2.00)   | 0.585 (2.60)   | 0.697 (3.10)   | 0.809 (3.60)   | 0.922 (4.10)   | 1.034 (4.60)   |
| 10          | 0.79                 | 0.180 (0.80)  | 0.360 (1.60)  | 0.540 (2.40)  | 0.719 (3.20)   | 0.899 (4.00)   | 1.079 (4.80)   | 1.259 (5.60)   | 1.439 (6.40)   | 1.619 (7.20)   |
| 15          | 1.77                 | 0.404 (1.80)  | 0.809 (3.60)  | 1.216 (5.41)  | 1.619 (7.20)   | 2.023 (9.00)   | 2.428 (10.8)   | 2.833 (12.6)   | 2.237 (14.4)   | 3.642 (16.2)   |
| 18          | 2.55                 | 0.585 (2.60)  | 1.169 (5.20)  | 1.751 (7.79)  | 2.338 (10.4)   | 2.923 (13.0)   | 3.507 (15.6)   | 4.069 (18.1)   | 4.676 (20.8)   | 5.238 (23.3)   |
| 20          | 3.14                 | 0.719 (3.20)  | 1.439 (6.40)  | 2.158 (9.60)  | 2.878 (12.8)   | 3.597 (16.0)   | 4.316 (19.2)   | 5.036 (22.4)   | 5.755 (25.6)   | 6.474 (28.8)   |
| 25          | 4.91                 | 1.124 (5.00)  | 2.248 (10.0)  | 3.372 (15.0)  | 4.496 (20.0)   | 5.620 (25.0)   | 6.744 (30.0)   | 7.868 (35.0)   | 8.992 (40.0)   | 10.116 (45.0)  |
| 30          | 7.07                 | 1.619 (7.20)  | 3.237 (14.4)  | 4.856 (21.6)  | 6.474 (28.8)   | 8.093 (36.0)   | 9.712 (43.2)   | 11.330 (50.4)  | 12.949 (57.6)  | 14.568 (64.8)  |
| 35          | 9.62                 | 2.203 (9.80)  | 4.406 (19.6)  | 5.598 (29.4)  | 8.813 (39.2)   | 11.016 (49.0)  | 13.241 (58.9)  | 15.422 (68.6)  | 17.648 (78.5)  | 19.828 (88.2)  |
| 40          | 12.6                 | 2.900 (12.9)  | 5.755 (25.6)  | 8.655 (38.5)  | 11.510 (51.2)  | 14.388 (64.0)  | 17.288 (76.9)  | 20.143 (89.6)  | 23.155 (103)   | 25.853 (115)   |
| 50          | 19.6                 | 4.519 (20.1)  | 8.992 (40.0)  | 13.511 (60.1) | 17.985 (80.0)  | 22.481 (100)   | 26.977 (120)   | 31.473 (140)   | 35.969 (160)   | 40.466 (180)   |
| 60          | 28.3                 | 6.497 (28.9)  | 12.949 (57.6) | 19.446 (86.5) | 25.853 (115)   | 32.372 (144)   | 38.892 (173)   | 45.411 (202)   | 51.931 (231)   | 58.226 (259)   |
| 75          | 44.2                 | 10.161 (45.2) | 20.233 (90.0) | 30.349 (135)  | 40.466 (180)   | 50.582 (225)   | 60.698 (270)   | 70.815 (315)   | 80.931 (360)   | 91.048 (405)   |
| 80          | 50.3                 | 11.555 (51.4) | 22.931 (102)  | 34.621 (154)  | 46.086 (205)   | 57.551 (256)   | 69.241 (308)   | 80.706 (359)   | 92.172 (410)   | 103.637 (461)  |
| 90          | 63.6                 | 14.635 (65.1) | 29.225 (130)  | 43.838 (195)  | 58.226 (259)   | 72.838 (324)   | 87.451 (389)   | 102.063 (454)  | 116.676 (519)  | 131.064 (583)  |
| 95          | 70.9                 | 16.299 (72.5) | 32.372 (144)  | 48.784 (217)  | 64.970 (289)   | 81.156 (361)   | 97.567 (434)   | 113.753 (506)  | 129.940 (578)  | 146.126 (650)  |
| 110         | 95.0                 | 21.851 (97.2) | 43.613 (194)  | 65.419 (291)  | 87.001 (387)   | 108.808 (484)  | 130.614 (581)  | 152.421 (678)  | 174.227 (775)  | 195.809 (871)  |
| 120         | 113.1                | 26.078 (116)  | 51.706 (230)  | 77.784 (346)  | 103.637 (461)  | 129.490 (576)  | 155.568 (692)  | 181.421 (807)  | 207.274 (922)  | 233.127 (1037) |
| 150         | 176.7                | 40.690 (181)  | 80.931 (360)  | 121.622 (541) | 161.862 (720)  | 202.328 (900)  | 243.019 (1081) | 283.259 (1260) | 323.950 (1441) | 364.191 (1620) |
| 200         | 314.2                | 72.164 (321)  | 143.878 (640) | 216.041 (961) | 287.531 (1279) | 359.919 (1601) | 432.083 (1922) | 503.797 (2241) | 575.961 (2562) | 647.449 (2880) |

**Calculate the diameter of the cup**

Calculate the cup diameter for horizontal lift at 60% of full vacuum using the information from the previous page.

$$D = 35.7 \sqrt{\frac{m (a_g + a) \times S}{P_v \times n}}$$

D (mm) = Diameter of Cup  
 m (kg) = Mass

$a_g = 9.81 \text{ m/sec}^2$

a = Motion Acceleration

S = Safety Factor

$P_v$  (kPa) = Operating Vacuum Pressure

n = number of Cups

$$D = 35.7 \sqrt{\frac{10 (9.81 + 3) \times 2}{61 \times 4}}$$

D = 36.58 mm

Referring to the chart below, at 60% vacuum, select a cup diameter equal to or greater than 37mm. The appropriate selection is a 40mm diameter cup which has a theoretical lifting force of 76.9 N.

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### Selecting a generator size

The choice of Generator Series depends on the system requirements for components and overall performance for the application. Inline Generators offer the basic function for creating vacuum flow. Adding integrated components such as automatic blow off Controls, Vacuum and Blow-off Solenoids, Pressure Sensors, Check Valves and Filters are options that can reduce overall mounting space, reduce cycle time and can offer air conservation functions as well as emergency stop modes. For guidelines on selecting Vacuum Generators by features, consult the highlight features in the Generator Index section for each Series Section.

A vacuum source can only achieve and hold a degree of vacuum that sustains the amount of leakage into the vacuum system. In most cases, it is the leakage through the product and by of the cup seal that limits the system degree of vacuum. Products with high product leakage are Porous Applications. The degree of vacuum that can be obtained with this type of product can vary and tends to be below 10 inHg. Products with low or no leakage are called Non-Porous Applications. It can be assumed that the maximum degree of vacuum of the system is the maximum degree of the vacuum generator. Due to design cycle time and safety requirements, a lower degree of vacuum is generally chosen other than the maximum obtainable degree of vacuum. Chart 1 lists different units of measure for vacuum with typical application levels. The system degree of vacuum must be determined by product testing.

### Evacuation time

The size of the generator generally refers to either the Evacuation Time or the Vacuum Flow Rates of the generator and varies by the size of the nozzle / diffuser.

Evacuation Time is the time required to evacuate the air out of a vacuum system to specific degree of vacuum. Typically, this degree of vacuum is a value where it is safe to move a product in a pick and place application and is determined by the design engineer. Evacuation Time can also be considered response time of the system.

A typical Evacuation Time chart for a generator series is shown in Chart 2. The time to achieve a given degree of vacuum in a 1 cubic foot volume is listed in seconds for each Generator.

### Chart 2: evacuation time

| Series / nozzle diameter | Air supply pressure<br>PSI | Air consumption<br>SCFM | Evacuation time in sec / ft <sup>3</sup> * to reach different vacuum levels (inHg) |      |       |       |       |       |       |       |       |
|--------------------------|----------------------------|-------------------------|--|------|-------|-------|-------|-------|-------|-------|-------|
|                          |                            |                         | 3  | 6    | 9     | 12    | 15    | 18    | 21    | 24    | 27    |
| CV-05HS                  | 70                         | 0.46                    | 24.3   | 57.3 | 101.0 | 160.5 | 231.1 | 305.1 | 433.1 | 597.7 | —     |
| CV-05LS                  | 70                         | 0.46                    | 11.0   | 23.4 | 40.0  | 64.4  | 110.2 | —     | —     | —     | —     |
| CV-10HS                  | 70                         | 1.55                    | 4.8  | 9.9  | 16.0  | 24.9  | 35.9  | 51.4  | 77.4  | 117.5 | 226.0 |
| CV-10LS                  | 70                         | 1.55                    | 3.7  | 7.6  | 13.0  | 20.3  | 33.1  | —     | —     | —     | —     |
| CV-15HS                  | 70                         | 3.53                    | 2.5  | 4.8  | 7.0   | 11.0  | 15.5  | 22.0  | 31.9  | 46.6  | 112.1 |
| CV-15LS                  | 70                         | 3.53                    | 2.0  | 3.1  | 5.0   | 7.6   | 12.1  | —     | —     | —     | —     |
| CV-20HS                  | 70                         | 6.36                    | 1.7  | 2.8  | 5.0   | 6.5   | 9.0   | 13.0  | 18.9  | 27.4  | 60.7  |
| CV-20LS                  | 70                         | 6.36                    | 1.3  | 2.5  | 4.0   | 5.9   | 11.3  | —     | —     | —     | —     |

\* 1 ft<sup>3</sup> = 28.31 liters

### Chart 1: Basic vacuum pressure measurements units

| Negative gauge pressure<br>PSIG                 | Absolute pressure<br>PSIA | Inches of mercury<br>inHg |
|---|---------------------------|---------------------------|
| 0   | 14.7                      | 0                         |
| <b>Atmospheric pressure at sea level</b>        |                           |                           |
| -1.5  | 13.2                      | 3                         |
| -3.0  | 11.7                      | 6                         |
| -4.5  | 10.2                      | 9                         |
| <b>Typical porous vacuum level</b>              |                           |                           |
| -6.0  | 8.7                       | 12                        |
| -7.5  | 7.2                       | 15                        |
| -9.0  | 5.7                       | 18                        |
| -10.5   | 4.2                       | 21                        |
| <b>Typical non-porous vacuum level</b>          |                           |                           |
| -12.0   | 2.7                       | 24                        |
| -13.5   | 1.2                       | 27                        |
| -14.7   | 0                         | 29.92                     |
| <b>Perfect vacuum (zero reference pressure)</b> |                           |                           |

Example: A pick and place application requires a 0.25 secs for creation of 18 inHg of vacuum in the vacuum system. The vacuum system volume, which includes tubing and cups, is 0.002 ft<sup>3</sup>.

The evacuation time charts are given for a 1 cubic foot (ft<sup>3</sup>) volume. To use these charts, convert the time requirement of the system to an equivalent time for a 1 cubic foot (ft<sup>3</sup>) volume. In this example, 1 cubic foot (ft<sup>3</sup>) is 500 times the system volume of 0.002 ft<sup>3</sup>. Multiply the system time requirement by 500 (500 x 0.25 secs = 125 seconds). Any generator with a evacuation time of less than 125 seconds to attain 18 inHg can be chosen for this application. A CV-15-HS will meet the requirements for this application. A (-) listed means the generator will not obtain a higher degree of vacuum than the level of the first (-).

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**Vacuum flow**

A typical Vacuum Flow chart for a generator series is listed in Chart 3. The vacuum flow rate at given degree of vacuum is listed in SCFM for each Generator. This chart is generally used to determine the change of degree of vacuum given a change in vacuum flow rate of a generator.

Example. A CV-15HS can only obtain 9 inHg. The vacuum flow rate at 9 inHg is 1.50 SCFM. This means that the cup

seal and product leaks 1.50 SCFM of air. This generator can maintain the leak rate of 1.50 SCFM. Choosing a generator with more flow at 9 inHg will increase the degree of vacuum in the system because the generator can overcome more leakage. In this case, the vacuum flow rates are linear since this CV generator is a single stage venturi generator. Replacing a CV-15HS with CV-20HS will increase the degree of vacuum in the system to approximately 16.2 inHg. The CV-20HS now maintains 16.2 inHg at a flow rate of 1.50 SCFM.

**Chart 3: Vacuum flow (SCFM)**

| Nozzle diameter | inHg |      |      |      |      |      |      |     |     |     |    |
|-----------------|------|------|------|------|------|------|------|-----|-----|-----|----|
|                 | 0    | 3    | 6    | 9    | 12   | 15   | 18   | 21  | 24  | 27  | 30 |
| CV-05HS         | .21  | .19  | .17  | .15  | .13  | .11  | .09  | .07 | .05 | .03 | —  |
| CV-05LS         | .32  | .27  | .22  | .17  | .12  | .06  | —    | —   | —   | —   | —  |
| CV-10HS         | .95  | .85  | .75  | .65  | .55  | .45  | .35  | .25 | .15 | .05 | —  |
| CV-10LS         | 1.27 | 1.05 | .83  | .59  | .38  | .17  | —    | —   | —   | —   | —  |
| CV-15HS         | 2.22 | 1.98 | 1.74 | 1.5  | 1.26 | 1.01 | .76  | .51 | .25 | .10 | —  |
| CV-15LS         | 3.35 | 2.79 | 2.23 | 1.67 | 1.10 | .53  | —    | —   | —   | —   | —  |
| CV-20HS         | 3.88 | 3.45 | 3.02 | 2.59 | 2.16 | 1.73 | 1.30 | .87 | .44 | .25 | —  |
| CV-20LS         | 5.85 | 5.09 | 4.03 | 2.97 | 1.91 | .85  | —    | —   | —   | —   | —  |

**Tubing reference**

| Tubing ID |      | Tubing length (L) |      |
|-----------|------|-------------------|------|
| SAE       | mm   | In.               | M    |
| 5/64      | 2    | 18                | .457 |
| 3/32      | 2.38 | 24                | .610 |
| 1/8       | 3.17 | 30                | .762 |
| 5/32      | 4    | 36                | .914 |
| 3/16      | 4.76 | 42                | 1.07 |
| 1/4       | 6.35 | 48                | 1.22 |
| 5/16      | 8    | 54                | 1.37 |
| 3/8       | 9.52 | 60                | 1.52 |
| 7/16      | 11.1 | 66                | 1.67 |

SAE x 25.4 = mm      In. x 25.4 = M

**Pad volume reference (pv)**

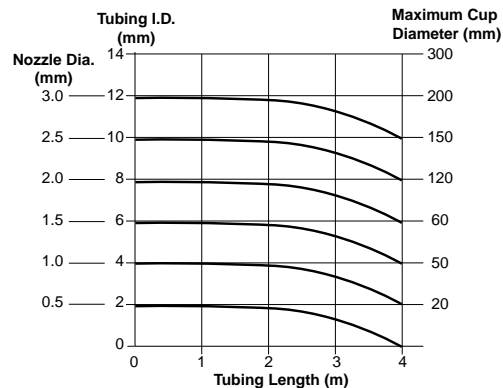
| PFG |        |          | PBG |        |       | PCG |        |        |
|-----|--------|----------|-----|--------|-------|-----|--------|--------|
| Ø   | Cu in. | L        | Ø   | Cu in. | L     | Ø   | Cu in. | L      |
| 2   | .00004 | .0000006 | 10  | .013   | .0002 | 5   | .002   | .00003 |
| 3.5 | .0001  | .000002  | 15  | .045   | .0007 | 7   | .003   | .00004 |
| 5   | .0003  | .000005  | 20  | .070   | .001  | 10  | .010   | .0001  |
| 6   | .00048 | .000008  | 30  | .28    | .004  | 15  | .060   | .0009  |
| 8   | .002   | .00003   | 40  | .56    | .009  | 18  | .082   | .001   |
| 10  | .004   | .00007   | 50  | 1.60   | .026  | 20  | .123   | .002   |
| 15  | .012   | .0002    | 75  | 4.63   | .076  | 30  | .595   | .009   |
| 20  | .03    | .0005    | 110 | 6.77   | .111  | 40  | 1.15   | .018   |
| 25  | .067   | .0011    | 150 | 15.86  | .26   | 60  | 4.40   | .072   |
| 30  | .067   | .0011    |     |        |       | 90  | 10.00  | .1639  |
| 35  | .14    | .0023    |     |        |       |     |        |        |
| 40  | .18    | .003     |     |        |       |     |        |        |
| 50  | .25    | .0042    |     |        |       |     |        |        |
| 60  | .57    | .0094    |     |        |       |     |        |        |
| 80  | 1.28   | .021     |     |        |       |     |        |        |
| 95  | 1.95   | .032     |     |        |       |     |        |        |
| 110 | 5.00   | .082     |     |        |       |     |        |        |
| 150 | 10.80  | .177     |     |        |       |     |        |        |
| 200 | 23.24  | .381     |     |        |       |     |        |        |

1 ft³ = 28.31 liters  
 1 ft³ = 1728 in³

**Nozzle diameter to tubing diameter to cup diameter reference**

For each application, the size of the nozzle diameter, vacuum tubing I.D., and maximum cup diameter must be practical in relationship to each other. The chart to the right is a quick reference to aid in selecting the vacuum tubing I.D. and nozzle diameter given the maximum cup diameter.

As an example, one 60mm cup with 2 meters in tubing length would require a minimum 6mm I.D. vacuum tube and a 1.5mm nozzle. The same 60mm cup with 3.5 meters in tubing length would require a minimum 8mm I.D. vacuum tube and a 2.0mm nozzle to achieve an equivalent performance.





**Saving Money and Space by Sizing Your Valves Properly**

This catalog gives you a flow rating (Cv) for each valve in the Parker Hannifin line. You can “plug” your requirements into the following simple formula, and determine the Cv needed to do the job. By not oversizing, you’ll save space and money, and you’ll ensure the valve you select will do the job.

**Converting the Job Requirements Into Cv**

(Capacity Co-efficient).

$$Cv = \frac{\text{Cylinder Area (Sq. In.)} \times \text{Cylinder Stroke (In.)} \times \text{Compression Factor (Table 2)} \times \text{“A” Constant (Table 2)}}{\text{Stroke Time (sec.)} \times 28.8}$$

Let’s work through an example:

We want to extend a 3-1/4" bore cylinder which has a 12" stroke in one second, and we have a supply pressure of 80 PSI to do the work. Here’s what we know:

- Cylinder Area for a 3-1/4" Bore, from Table 1 .....8.30 sq. in.
- Cylinder Stroke ..... 12 in.
- Stroke Time Required in Seconds..... 1 sec.
- Compression Factor at 80 PSI, from Table 2..... 6.4
- “A” Constant for 80 PSI, from Table 2..... .048

Substituting in the formula, we have:

$$Cv = \frac{8.30 \times 12 \times 6.4 \times .048}{1 \times 28.8} = 1.06$$

Any valve, therefore, which has a Cv of at least 1.06, will extend our cylinder the specified distance in the required time.

**Choosing the Valve “Series”**

Your next step is to choose a basic valve design to do the job. For a quick guide to valve designs, see Table 3.

Having selected the basic valve design, consult the Capacity Co-efficient (Cv) tables which describe the individual valve capacities.

**Selecting the Valve Model, Options and Accessories**

Having determined Cv, series, port size, flow-path configuration (pre-determined by circuit design), and actuation method, you’re ready to choose the exact valve model number.

Read the pertinent catalog pages; note the exact model numbers, options and accessories you want. Then phone or write your Parker Hannifin air valve distributor. They will give you prompt, accurate service.

Note: Need circuit design help? Contact your local Parker Hannifin distributor. They are backed up by our regional Sales Engineers and offices. Between them, you’ll find answers to all of your questions.

**Table 1**  
**Effective Square-Inch Areas for Standard-Bore-Size Cylinders**

| Bore Size | Cylinder Area (Sq. In.) | Bore Size | Cylinder Area (Sq. In.) |
|-----------|-------------------------|-----------|-------------------------|
| 3/4"      | .44                     | 4"        | 12.57                   |
| 1"        | .79                     | 4-1/2"    | 15.90                   |
| 1-1/8"    | .99                     | 5"        | 19.64                   |
| 1-1/4"    | 1.23                    | 6"        | 28.27                   |
| 1-1/2"    | 1.77                    | 7"        | 38.48                   |
| 1-3/4"    | 2.41                    | 8"        | 50.27                   |
| 2"        | 3.14                    | 10"       | 78.54                   |
| 2-1/2"    | 4.91                    | 12"       | 113.10                  |
| 3-1/4"    | 8.30                    | 14"       | 153.94                  |
| 3-5/8"    | 10.32                   |           |                         |

**Table 2**  
**Compression Factors and “A” Constants**

| Inlet Pressure (PSIG) | Compression Factor | “A” Constants for Various Pressure Drop* |          |           |
|-----------------------|--------------------|--|----------|-----------|
|                       |                    | 2 PSI ΔP                                 | 5 PSI ΔP | 10 PSI ΔP |
| 10                    | 1.6                | .152                                     | .103     |           |
| 20                    | 2.3                | .126                                     | .084     | .065      |
| 30                    | 3.0                | .111                                     | .073     | .055      |
| 40                    | 3.7                | .100                                     | .065     | .048      |
| 50                    | 4.4                | .091                                     | .059     | .044      |
| 60                    | 5.1                | .085                                     | .055     | .040      |
| 70                    | 5.7                | .079                                     | .051     | .037      |
| 80                    | 6.4                | .075                                     | .048     | .035      |
| 90                    | 7.1                | .071                                     | .046     | .033      |
| 100                   | 7.8                | .068                                     | .044     | .032      |
| 110                   | 8.5                | .065                                     | .042     | .030      |
| 120                   | 9.2                | .063                                     | .040     | .029      |
| 130                   | 9.9                | .061                                     | .039     | .028      |
| 140                   | 10.6               | .058                                     | .037     | .027      |
| 150                   | 11.2               | .057                                     | .036     | .026      |
| 160                   | 11.9               | .055                                     | .035     | .025      |
| 170                   | 12.6               | .053                                     | .034     | .024      |
| 180                   | 13.3               | .052                                     | .033     | .024      |
| 190                   | 14.0               | .051                                     | .032     | .023      |
| 200                   | 14.7               | .050                                     | .032     | .023      |

Note: Use “A” constant at 5 PSI rP for most applications. On very critical applications, use “A” at 2 PSI rP. You will find in many cases, a 10 PSI rP is not detrimental, and can save money and mounting space.

\* Tabulated values are the solution of  $\frac{1}{22.48} \sqrt{\frac{GT}{(P_1 - P_2) P_2}}$  where T is for 68°F and G = 1 for Air.

**Table 3**  
**Characteristics of the Major Valve Designs**

|  |  |
|--|--|
| <b>A. Poppet</b><br>3-Way and 4-Way                                | 1. High flow capacities<br>2. Minimum lubrication requirements<br>3. Fast response<br>4. Self-cleaning poppet seats<br>5. Pressures of 15 to 150 PSIG (modifications for vacuum to 250 PSIG)   |
| <b>B. Spool Valves (WCS)</b><br>3-Way and 4-Way                    | 1. Low friction<br>2. Lower operating pressures<br>3. Fast response<br>4. Less wear<br>5. Long Cycle Life - Under pressure, radial expansion of the seal occurs to maintain sealing contact with the valve bore<br>6. Non-Lube Service - No lubrication required for continuous valve shifting<br>7. Bi-Directional Spool Seals - Common spool used for any pressure, including vacuum |
| <b>C. Packed Bore</b><br>4-Way                                     | 1. Wide range of flow capacities<br>2. Wide range of flow-path configurations<br>3. Pilot-operated models available<br>4. Pressures of vacuum to 150 PSIG  |
| <b>D. Rotary Or Reciprocating Disc</b><br>4-Way, manually operated | 1. Inexpensive<br>2. Versatility in manual actuation   |

**Cv – Capacity Co-efficients** (sometimes called Flow Factors). Each flow path through the valve has its own Cv value. All Cv ratings for each valve cataloged on this page are listed on the front side of this sheet.

$$Cv = \frac{Q}{22.48} \sqrt{\frac{GT}{(P_1 - P_2) P_2}}$$

Q = Flow in Standard Cubic Feet per minute (14.7 PSIA at 60°F)  
 P<sub>1</sub> = Inlet Absolute Pressure (gauge pressure + 14.7)  
 P<sub>2</sub> = Outlet Absolute Pressure (gauge pressure + 14.7)  
 Note: P<sub>2</sub> must be greater than .53 x P<sub>1</sub>  
 G = Specific Gravity of flowing medium (Air, G = 1)  
 T = Absolute Temperature of Air (460 + °F)

Cv = Q x “A” (Table 2)

Valve Technical Information

Vacuum Technical Information

Actuator Technical Information

Fluid Power Graphical Symbols



Technical Data



## Safety Guide for Selecting and Using Hydraulic, Pneumatic Cylinders and Their Accessories

**WARNING: ⚠ FAILURE OF THE CYLINDER, ITS PARTS, ITS MOUNTING, ITS CONNECTIONS TO OTHER OBJECTS, OR ITS CONTROLS CAN RESULT IN:**

- Unanticipated or uncontrolled movement of the cylinder or objects connected to it.
- Falling of the cylinder or objects held up by it.
- Fluid escaping from the cylinder, potentially at high velocity.

**THESE EVENTS COULD CAUSE DEATH OR PERSONAL INJURY BY, FOR EXAMPLE, PERSONS FALLING FROM HIGH LOCATIONS, BEING CRUSHED OR STRUCK BY HEAVY OR FAST MOVING OBJECTS, BEING PUSHED INTO DANGEROUS EQUIPMENT OR SITUATIONS, OR SLIPPING ON ESCAPED FLUID.**

Before selecting or using Parker (The Company) cylinders or related accessories, it is important that you read, understand and follow the following safety information. Training is advised before selecting and using The Company's products.

### 1.0 General Instructions

**1.1 Scope** – This safety guide provides instructions for selecting and using (including assembling, installing, and maintaining) cylinder products. This safety guide is a supplement to and is to be used with the specific Company publications for the specific cylinder products that are being considered for use.

**1.2 Fail Safe** – Cylinder products can and do fail without warning for many reasons. All systems and equipment should be designed in a fail-safe mode so that if the failure of a cylinder product occurs people and property won't be endangered.

**1.3 Distribution** – Provide a free copy of this safety guide to each person responsible for selecting or using cylinder products. Do not select or use The Company's cylinders without thoroughly reading and understanding this safety guide as well as the specific Company publications for the products considered or selected.

**1.4 User Responsibility** – Due to very wide variety of cylinder applications and cylinder operating conditions, The Company does not warrant that any particular cylinder is suitable for any specific application. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The hydraulic and pneumatic cylinders outlined in this catalog are designed to The Company's design guidelines and do not necessarily meet the design guideline of other agencies such as American Bureau of Shipping, ASME Pressure Vessel Code etc. The user, through its own analysis and testing, is solely responsible for:

- Making the final selection of the cylinders and related accessories.
- Determining if the cylinders are required to meet specific design requirements as required by the Agency(s) or industry standards covering the design of the user's equipment.
- Assuring that the user's requirements are met, OSHA requirements are met, and safety guidelines from the applicable agencies such as but not limited to ANSI are followed and that the use presents no health or safety hazards.
- Providing all appropriate health and safety warnings on the equipment on which the cylinders are used.

**1.5 Additional Questions** – Call the appropriate Company technical service department if you have any questions or require any additional information. See the Company publication for the product being considered or used, or call 1-800-CPARKER, or go to [www.parker.com](http://www.parker.com), for telephone numbers of the appropriate technical service department.

### 2.0 Cylinder and Accessories Selection

**2.1 Seals** – Part of the process of selecting a cylinder is the selection of seal compounds. Before making this selection, consult the "seal information page(s)" of the publication for the series of cylinders of interest. The application of cylinders may allow fluids such as cutting fluids, wash down fluids etc. to come in contact with the external area of the cylinder. These fluids may attack the piston rod wiper and or the primary seal and must be taken into account when selecting and specifying seal compounds.

Dynamic seals will wear. The rate of wear will depend on many operating factors. Wear can be rapid if a cylinder is mis-aligned or if the cylinder has been improperly serviced. The user must take seal wear into consideration in the application of cylinders.

**2.2 Piston Rods** – Possible consequences of piston rod failure or separation of the piston rod from the piston include, but are not limited to are:

- Piston rod and or attached load thrown off at high speed.
- High velocity fluid discharge.
- Piston rod extending when pressure is applied in the piston retract mode.

Piston rods or machine members attached to the piston rod may move suddenly and without warning as a consequence of other conditions occurring to the machine such as, but not limited to:

- Unexpected detachment of the machine member from the piston rod.
- Failure of the pressurized fluid delivery system (hoses, fittings, valves, pumps, compressors) which maintain cylinder position.
- Catastrophic cylinder seal failure leading to sudden loss of pressurized fluid.
- Failure of the machine control system.

Follow the recommendations of the "Piston Rod Selection Chart and Data" in the publication for the series of cylinders of interest. The suggested piston rod diameter in these charts must be followed in order to avoid piston rod buckling.

Piston rods are not normally designed to absorb bending moments or loads which are perpendicular to the axis of piston rod motion. These additional loads can cause the piston rod to fail. If these types of additional loads are expected to be imposed on the piston rod, their magnitude should be made known to our engineering department.

The cylinder user should always make sure that the piston rod is securely attached to the machine member.

On occasion cylinders are ordered with double rods (a piston rod extended from both ends of the cylinder). In some cases a stop is threaded on to one of the piston rods and used as an external stroke adjuster. On occasions spacers are attached to the machine member connected to the piston rod and also used as a stroke adjuster. In both cases the stops will create a pinch point and the user should consider appropriate use of guards. If these external stops are not perpendicular to the mating contact surface, or if debris is trapped between the contact surfaces, a bending moment will be placed on the piston rod, which can lead to piston rod failure. An external stop will also negate the effect of cushioning and will subject the piston rod to impact loading. Those two (2) conditions can cause piston rod failure. Internal stroke adjusters are available with and without cushions. The use of external stroke adjusters should be reviewed with our engineering department.

The piston rod to piston and the stud to piston rod threaded connections are secured with an anaerobic adhesive. The strength of the adhesive decreases with increasing temperature. Cylinders which can be exposed to temperatures above +250°F (+121°C) are to be ordered with a non studded piston rod and a pinned piston to rod joint.

**2.3 Cushions** – Cushions should be considered for cylinder applications when the piston velocity is expected to be over 4 inches/second.

Cylinder cushions are normally designed to absorb the energy of a linear applied load. A rotating mass has considerably more energy than the same mass moving in a linear mode. Cushioning for a rotating mass application should be reviewed by our engineering department.

**2.4 Cylinder Mountings** – Some cylinder mounting configurations may have certain limitations such as but not limited to minimum stroke for side or foot mounting cylinders or pressure de-ratings for certain mounts. Carefully review the catalog for these types of restrictions.

Always mount cylinders using the largest possible high tensile alloy steel socket head cap screws that can fit in the cylinder mounting holes and torque them to the manufacturer's recommendations for their size.

**2.5 Port Fittings** – Hydraulic cylinders applied with meter out or deceleration circuits are subject to intensified pressure at piston rod end.

The rod end pressure is approximately equal to:

$$\frac{\text{operating pressure} \times \text{effective cap end area}}{\text{effective rod end piston area}}$$

Contact your connector supplier for the pressure rating of individual connectors.

### 3.0 Cylinder and Accessories Installation and Mounting

#### 3.1 Installation

**3.1.1** – Cleanliness is an important consideration, and cylinders are shipped with the ports plugged to protect them from contaminants entering the ports. These plugs should not be removed until the piping is to be installed. Before making the connection to the cylinder ports, piping should be thoroughly cleaned to remove all chips or burrs which might have resulted from threading or flaring operations.

**3.1.2** – Cylinders operating in an environment where air drying materials are present such as fast-drying chemicals, paint, or weld splatter, or other hazardous conditions such as excessive heat, should have shields installed to prevent damage to the piston rod and piston rod seals.

**3.1.3** – Proper alignment of the cylinder piston rod and its mating component on the machine should be checked in both the extended and retracted positions. Improper alignment will result in excessive rod gland and/or cylinder bore wear. On fixed mounting cylinders attaching the piston rod while the rod is retracted will help in achieving proper alignment.

**3.1.4** – Sometimes it may be necessary to rotate the piston rod in order to thread the piston rod into the machine member. This operation must always be done with zero pressure being applied to either side of the piston. Failure to follow this procedure may result in loosening the piston to rod-threaded connection. In some rare cases the turning of the piston rod may rotate a threaded piston rod gland and loosen it from the cylinder head. Confirm that this condition is not occurring. If it does, re-tighten the piston rod gland firmly against the cylinder head.

For double rod cylinders it is also important that when attaching or detaching the piston rod from the machine member that the torque be applied to the piston rod end of the cylinder that is directly attaching to the machine member with the opposite end unrestrained. If the design of the machine is such that only the rod end of the cylinder opposite to where the rod attaches to the machine member can be rotated, consult the factory for further instructions.

### 3.2 Mounting Recommendations

**3.2.1** – Always mount cylinders using the largest possible high tensile alloy steel socket head screws that can fit in the cylinder mounting holes and torque them to the manufacturer's recommendations for their size.

**3.2.2** – Side-Mounted Cylinders – In addition to the mounting bolts, cylinders of this type should be equipped with thrust keys or dowel pins located so as to resist the major load.

**3.2.3** – Tie Rod Mounting – Cylinders with tie rod mountings are recommended for applications where mounting space is limited. The standard tie rod extension is shown as BB in dimension tables. Longer or shorter extensions can be supplied. Nuts used for this mounting style should be torqued to the same value as the tie rods for that bore size.

**3.2.4** – Flange Mount Cylinders – The controlled diameter of the rod gland extension on head end flange mount cylinders can be used as a pilot to locate the cylinders in relation to the machine. After alignment has been obtained, the flanges may be drilled for pins or dowels to prevent shifting.

**3.2.5** – Trunnion Mountings – Cylinders require lubricated bearing blocks with minimum bearing clearances. Bearing blocks should be carefully aligned and rigidly mounted so the trunnions will not be subjected to bending moments. The rod end should also be pivoted with the pivot pin in line and parallel to axis of the trunnion pins.

**3.2.6** – Clevis Mountings – Cylinders should be pivoted at both ends with centerline of pins parallel to each other. After cylinder is mounted, be sure to check to assure that the cylinder is free to swing through its working arc without interference from other machine parts.

## 4.0 Cylinder and Accessories Maintenance, Troubleshooting and Replacement

**4.1 Storage** – At times cylinders are delivered before a customer is ready to install them and must be stored for a period of time. When storage is required the following procedures are recommended.

**4.1.1** – Store the cylinders in an indoor area which has a dry, clean and noncorrosive atmosphere. Take care to protect the cylinder from both internal corrosion and external damage.

**4.1.2** – Whenever possible cylinders should be stored in a vertical position (piston rod up). This will minimize corrosion due to possible condensation which could occur inside the cylinder. This will also minimize seal damage.

**4.1.3** – Port protector plugs should be left in the cylinder until the time of installation.

**4.1.4** – If a cylinder is stored full of hydraulic fluid, expansion of the fluid due to temperature changes must be considered. Installing a check valve with free flow out of the cylinder is one method.

**4.1.5** – When cylinders are mounted on equipment that is stored outside for extended periods, exposed unpainted surfaces, e.g. piston rod, must be coated with a rust-inhibiting compound to prevent corrosion.

### 4.2 Cylinder Trouble Shooting

### 4.2.1 – External Leakage

**4.2.1.1** – Rod seal leakage can generally be traced to worn or damaged seals. Examine the piston rod for dents, gouges or score marks, and replace piston rod if surface is rough.

Rod seal leakage could also be traced to gland wear. If clearance is excessive, replace rod bushing and seal. Rod seal leakage can also be traced to seal deterioration. If seals are soft or gummy or brittle, check compatibility of seal material with lubricant used if air cylinder, or operating fluid if hydraulic cylinder. Replace with seal material, which is compatible with these fluids. If the seals are hard or have lost elasticity, it is usually due to exposure to temperatures in excess of 165°F. (+74°C). Shield the cylinder from the heat source to limit temperature to 350°F. (+177°C.) and replace with fluorocarbon seals.

**4.2.1.2** – Cylinder body seal leak can generally be traced to loose tie rods. Torque the tie rods to manufacturer's recommendation for that bore size.

Excessive pressure can also result in cylinder body seal leak. Determine maximum pressure to rated limits. Replace seals and retorqued tie rods as in paragraph above. Excessive pressure can also result in cylinder body seal leak. Determine if the pressure rating of the cylinder has been exceeded. If so, bring the operating pressure down to the rating of the cylinder and have the tie rods replaced.

Pinched or extruded cylinder body seal will also result in a leak. Replace cylinder body seal and retorqued as in paragraph above.

Cylinder body seal leakage due to loss of radial squeeze which shows up in the form of flat spots or due to wear on the O.D. or I.D. – Either of these are symptoms of normal wear due to high cycle rate or length of service. Replace seals as per paragraph above.

### 4.2.2 – Internal Leakage

**4.2.2.1** – Piston seal leak (by-pass) 1 to 3 cubic inches per minute leakage is considered normal for piston ring construction. Virtually no static leak with lipseal type seals on piston should be expected. Piston seal wear is a usual cause of piston seal leakage. Replace seals as required.

**4.2.2.2** – With lipseal type piston seals excessive back pressure due to over-adjustment of speed control valves could be a direct cause of rapid seal wear. Contamination in a hydraulic system can result in a scored cylinder bore, resulting in rapid seal wear. In either case, replace piston seals as required.

**4.2.2.3** – What appears to be piston seal leak, evidenced by the fact that the cylinder drifts, is not always traceable to the piston. To make sure, it is suggested that one side of the cylinder piston be pressurized and the fluid line at the opposite port be disconnected. Observe leakage. If none is evident, seek the cause of cylinder drift in other component parts in the circuit.

### 4.2.3 – Cylinder Fails to Move the Load

**4.2.3.1** – Pneumatic or hydraulic pressure is too low. Check the pressure at the cylinder to make sure it is to circuit requirements.

**4.2.3.2** – Piston Seal Leak – Operate the valve to cycle the cylinder and observe fluid flow at valve exhaust ports at end of cylinder stroke. Replace piston seals if flow is excessive.

**4.2.3.3** – Cylinder is undersized for the load – Replace cylinder with one of a larger bore size.

### 4.3 Erratic or Chatter Operation

**4.3.1** – Excessive friction at rod gland or piston bearing due to load misalignment – Correct cylinder-to-load alignment.

**4.3.2** – Cylinder sized too close to load requirements – Reduce load or install larger cylinder.

**4.3.3** – Erratic operation could be traced to the difference between static and kinetic friction. Install speed control valves to provide a back pressure to control the stroke.

**4.4 Cylinder Modifications, Repairs, or Failed Component** – Cylinders as shipped from the factory are not to be disassembled and or modified. If cylinders require modifications, these modifications must be done at company locations or by The Company's certified facilities. The Cylinder Division Engineering Department must be notified in the event of a mechanical fracture or permanent deformation of any cylinder component (excluding seals). This includes a broken piston rod, tie rod, mounting accessory or any other cylinder component. The notification should include all operation and application details. This information will be used to provide an engineered repair that will prevent recurrence of the failure.

It is allowed to disassemble cylinders for the purpose of replacing seals or seal assemblies. However, this work must be done by strictly following all the instructions provided with the seal kits.

# Safety Guide For Selecting And Using Pneumatic Division Products And Related Accessories

## WARNING:

**FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF PNEUMATIC DIVISION PRODUCTS, ASSEMBLIES OR RELATED ITEMS ("PRODUCTS") CAN CAUSE DEATH, PERSONAL INJURY, AND PROPERTY DAMAGE. POSSIBLE CONSEQUENCES OF FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THESE PRODUCTS INCLUDE BUT ARE NOT LIMITED TO:**

- Unintended or mistimed cycling or motion of machine members or failure to cycle
- Work pieces or component parts being thrown off at high speeds.
- Failure of a device to function properly for example, failure to clamp or unclamp an associated item or device.
- Explosion
- Suddenly moving or falling objects.
- Release of toxic or otherwise injurious liquids or gasses.

Before selecting or using any of these Products, it is important that you read and follow the instructions below.

## 1. GENERAL INSTRUCTIONS

- 1.1. Scope:** This safety guide is designed to cover general guidelines on the installation, use, and maintenance of Pneumatic Division Valves, FRLs (Filters, Pressure Regulators, and Lubricators), Vacuum products and related accessory components.
- 1.2. Fail-Safe:** Valves, FRLs, Vacuum products and their related components can and do fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so that failure of associated valves, FRLs or Vacuum products will not endanger persons or property.
- 1.3. Relevant International Standards:** For a good guide to the application of a broad spectrum of pneumatic fluid power devices see: ISO 4414:1998, Pneumatic Fluid Power – General Rules Relating to Systems. See [www.iso.org](http://www.iso.org) for ordering information.
- 1.4. Distribution:** Provide a copy of this safety guide to each person that is responsible for selection, installation, or use of Valves, FRLs or Vacuum products. Do not select, or use Parker valves, FRLs or vacuum products without thoroughly reading and understanding this safety guide as well as the specific Parker publications for the products considered or selected.
- 1.5. User Responsibility:** Due to the wide variety of operating conditions and applications for valves, FRLs, and vacuum products Parker and its distributors do not represent or warrant that any particular valve, FRL or vacuum product is suitable for any specific end use system. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The user, through its own analysis and testing, is solely responsible for:
  - Making the final selection of the appropriate valve, FRL, Vacuum component, or accessory.
  - Assuring that all user's performance, endurance, maintenance, safety, and warning requirements are met and that the application presents no health or safety hazards.
  - Complying with all existing warning labels and / or providing all appropriate health and safety warnings on the equipment on which the valves, FRLs or Vacuum products are used; and,
  - Assuring compliance with all applicable government and industry standards.
- 1.6. Safety Devices:** Safety devices should not be removed, or defeated.
- 1.7. Warning Labels:** Warning labels should not be removed, painted over or otherwise obscured.
- 1.8. Additional Questions:** Call the appropriate Parker technical service department if you have any questions or require any additional information. See the Parker publication for the product being considered or used, or call 1-800-CPARKER, or go to [www.parker.com](http://www.parker.com), for telephone numbers of the appropriate technical service department.

## 2. PRODUCT SELECTION INSTRUCTIONS

- 2.1. Flow Rate:** The flow rate requirements of a system are frequently the primary consideration when designing any pneumatic system. System components need to be able to provide adequate flow and pressure for the desired application.
- 2.2. Pressure Rating:** Never exceed the rated pressure of a product. Consult product labeling, Pneumatic Division catalogs or the instruction sheets supplied for maximum pressure ratings.
- 2.3. Temperature Rating:** Never exceed the temperature rating of a product. Excessive heat can shorten the life expectancy of a product and result in complete product failure.
- 2.4. Environment:** Many environmental conditions can affect the integrity and suitability of a product for a given application. Pneumatic Division products are designed for use in general purpose industrial applications. If these products are to be used in unusual circumstances such as direct sunlight and/or corrosive or caustic environments, such use can shorten the useful life and lead to premature failure of a product.
- 2.5. Lubrication and Compressor Carryover:** Some modern synthetic oils can and will attack nitrile seals. If there is any possibility of synthetic oils or greases migrating into the pneumatic components check for compatibility with the seal materials used. Consult the factory or product literature for materials of construction.
- 2.6. Polycarbonate Bowls and Sight Glasses:** To avoid potential polycarbonate bowl failures:
  - Do not locate polycarbonate bowls or sight glasses in areas where they could be subject to direct sunlight, impact blow, or temperatures outside of the rated range.
  - Do not expose or clean polycarbonate bowls with detergents, chlorinated hydro-carbons, keytones, esters or certain alcohols.
  - Do not use polycarbonate bowls or sight glasses in air systems where compressors are lubricated with fire resistant fluids such as phosphate ester and di-ester lubricants.



- 2.7. Chemical Compatibility:** For more information on plastic component chemical compatibility see Pneumatic Division technical bulletins Tec-3, Tec-4, and Tec-5
- 2.8. Product Rupture:** Product rupture can cause death, serious personal injury, and property damage.
- Do not connect pressure regulators or other Pneumatic Division products to bottled gas cylinders.
  - Do not exceed the maximum primary pressure rating of any pressure regulator or any system component.
  - Consult product labeling or product literature for pressure rating limitations.

### 3. PRODUCT ASSEMBLY AND INSTALLATION INSTRUCTIONS

- 3.1. Component Inspection:** Prior to assembly or installation a careful examination of the valves, FRLs or vacuum products must be performed. All components must be checked for correct style, size, and catalog number. DO NOT use any component that displays any signs of nonconformance.
- 3.2. Installation Instructions:** Parker published Installation Instructions must be followed for installation of Parker valves, FRLs and vacuum components. These instructions are provided with every Parker valve or FRL sold, or by calling 1-800-CPARKER, or at [www.parker.com](http://www.parker.com).
- 3.3. Air Supply:** The air supply or control medium supplied to Valves, FRLs and Vacuum components must be moisture-free if ambient temperature can drop below freezing

### 4. VALVE AND FRL MAINTENANCE AND REPLACEMENT INSTRUCTIONS

- 4.1. Maintenance:** Even with proper selection and installation, valve, FRL and vacuum products service life may be significantly reduced without a continuing maintenance program. The severity of the application, risk potential from a component failure, and experience with any known failures in the application or in similar applications should determine the frequency of inspections and the servicing or replacement of Pneumatic Division products so that products are replaced before any failure occurs. A maintenance program must be established and followed by the user and, at minimum, must include instructions 4.2 through 4.10.
- 4.2. Installation and Service Instructions:** Before attempting to service or replace any worn or damaged parts consult the appropriate Service Bulletin for the valve or FRL in question for the appropriate practices to service the unit in question. These Service and Installation Instructions are provided with every Parker valve and FRL sold, or are available by calling 1-800-CPARKER, or by accessing the Parker web site at [www.parker.com](http://www.parker.com).
- 4.3. Lockout / Tagout Procedures:** Be sure to follow all required lockout and tagout procedures when servicing equipment. For more information see: OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – (Lockout / Tagout)
- 4.4. Visual Inspection:** Any of the following conditions requires immediate system shut down and replacement of worn or damaged components:
- Air leakage: Look and listen to see if there are any signs of visual damage to any of the components in the system. Leakage is an indication of worn or damaged components.
  - Damaged or degraded components: Look to see if there are any visible signs of wear or component degradation.
  - Kinked, crushed, or damaged hoses. Kinked hoses can result in restricted air flow and lead to unpredictable system behavior.
  - Any observed improper system or component function: Immediately shut down the system and correct malfunction.
  - Excessive dirt build-up: Dirt and clutter can mask potentially hazardous situations.
- Caution: Leak detection solutions should be rinsed off after use.
- 4.5. Routine Maintenance Issues:**
- Remove excessive dirt, grime and clutter from work areas.
  - Make sure all required guards and shields are in place.
- 4.6. Functional Test:** Before initiating automatic operation, operate the system manually to make sure all required functions operate properly and safely.
- 4.7. Service or Replacement Intervals:** It is the user's responsibility to establish appropriate service intervals. Valves, FRLs and vacuum products contain components that age, harden, wear, and otherwise deteriorate over time. Environmental conditions can significantly accelerate this process. Valves, FRLs and vacuum components need to be serviced or replaced on routine intervals. Service intervals need to be established based on:
- Previous performance experiences.
  - Government and / or industrial standards.
  - When failures could result in unacceptable down time, equipment damage or personal injury risk.
- 4.8. Servicing or Replacing of any Worn or Damaged Parts:** To avoid unpredictable system behavior that can cause death, personal injury and property damage:
- Follow all government, state and local safety and servicing practices prior to service including but not limited to all OSHA Lockout Tagout procedures (OSHA Standard – 29 CFR, Part 1910.147, Appendix A, The Control of Hazardous Energy – Lockout / Tagout).
  - Disconnect electrical supply (when necessary) before installation, servicing, or conversion.
  - Disconnect air supply and depressurize all air lines connected to system and Pneumatic Division products before installation, service, or conversion.
  - Installation, servicing, and / or conversion of these products must be performed by knowledgeable personnel who understand how pneumatic products are to be applied.
  - After installation, servicing, or conversions air and electrical supplies (when necessary) should be connected and the product tested for proper function and leakage. If audible leakage is present, or if the product does not operate properly, do not put product or system into use.
  - Warnings and specifications on the product should not be covered or painted over. If masking is not possible, contact your local representative for replacement labels.
- 4.9. Putting Serviced System Back into Operation:** Follow the guidelines above and all relevant Installation and Maintenance Instructions supplied with the valve FRL or vacuum component to insure proper function of the system.

The items described in this document and other documents and descriptions provided by Parker Hannifin Corporation, its subsidiaries and its authorized distributors ("Seller") are hereby offered for sale at prices to be established by Seller. This offer and its acceptance by any customer ("Buyer") shall be governed by all of the following Terms and Conditions. Buyer's order for any item described in its document, when communicated to Seller verbally, or in writing, shall constitute acceptance of this offer. All goods or work described will be referred to as "Products".

- 1. Terms and Conditions.** Seller's willingness to offer Products, or accept an order for Products, to or from Buyer is subject to these Terms and Conditions or any newer version of the terms and conditions found on-line at [www.parker.com/saleterms/](http://www.parker.com/saleterms/). Seller objects to any contrary or additional terms or conditions of Buyer's order or any other document issued by Buyer.
- 2. Price Adjustments; Payments.** Prices stated on Seller's quote or other documentation offered by Seller are valid for 30 days, and do not include any sales, use, or other taxes unless specifically stated. Unless otherwise specified by Seller, all prices are F.C.A. Seller's facility (INCOTERMS 2010). Payment is subject to credit approval and is due 30 days from the date of invoice or such other term as required by Seller's Credit Department, after which Buyer shall pay interest on any unpaid invoices at the rate of 1.5% per month or the maximum allowable rate under applicable law.
- 3. Delivery Dates; Title and Risk; Shipment.** All delivery dates are approximate and Seller shall not be responsible for any damages resulting from any delay. Regardless of the manner of shipment, title to any products and risk of loss or damage shall pass to Buyer upon placement of the products with the shipment carrier at Seller's facility. Unless otherwise stated, Seller may exercise its judgment in choosing the carrier and means of delivery. No deferment of shipment at Buyer's request beyond the respective dates indicated will be made except on terms that will indemnify, defend and hold Seller harmless against all loss and additional expense. Buyer shall be responsible for any additional shipping charges incurred by Seller due to Buyer's acts or omissions.
- 4. Warranty.** Seller warrants that the Products sold hereunder shall be free from defects in material or workmanship for a period of twelve months from the date of delivery to Buyer or 2,000 hours of normal use, whichever occurs first. The prices charged for Seller's products are based upon the exclusive limited warranty stated above, and upon the following disclaimer: **DISCLAIMER OF WARRANTY: THIS WARRANTY COMPRISES THE SOLE AND ENTIRE WARRANTY PERTAINING TO PRODUCTS PROVIDED HEREUNDER. SELLER DISCLAIMS ALL OTHER WARRANTIES, EXPRESS AND IMPLIED, INCLUDING DESIGN, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**
- 5. Claims; Commencement of Actions.** Buyer shall promptly inspect all Products upon delivery. No claims for shortages will be allowed unless reported to the Seller within 10 days of delivery. No other claims against Seller will be allowed unless asserted in writing within 30 days after delivery. Buyer shall notify Seller of any alleged breach of warranty within 30 days after the date the defect is or should have been discovered by Buyer. Any action based upon breach of this agreement or upon any other claim arising out of this sale (other than an action by Seller for an amount due on any invoice) must be commenced within 12 months from the date of the breach without regard to the date breach is discovered.
- 6. LIMITATION OF LIABILITY.** UPON NOTIFICATION, SELLER WILL, AT ITS OPTION, REPAIR OR REPLACE A DEFECTIVE PRODUCT, OR REFUND THE PURCHASE PRICE. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR AS THE RESULT OF, THE SALE, DELIVERY, NON-DELIVERY, SERVICING, USE OR LOSS OF USE OF THE PRODUCTS OR ANY PART THEREOF, OR FOR ANY CHARGES OR EXPENSES OF ANY NATURE INCURRED WITHOUT SELLER'S WRITTEN CONSENT, EVEN IF SELLER HAS BEEN NEGLIGENT, WHETHER IN CONTRACT, TORT OR OTHER LEGAL THEORY. IN NO EVENT SHALL SELLER'S LIABILITY UNDER ANY CLAIM MADE BY BUYER EXCEED THE PURCHASE PRICE OF THE PRODUCTS.
- 7. User Responsibility.** The user, through its own analysis and testing, is solely responsible for making the final selection of the system and Product and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application and follow applicable industry standards and Product information. If Seller provides Product or system options, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the Products or systems.
- 8. Loss to Buyer's Property.** Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two consecutive years have elapsed without Buyer ordering the items manufactured using such property. Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.
- 9. Special Tooling.** A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture Products. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the Products, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.
- 10. Buyer's Obligation; Rights of Seller.** To secure payment of all sums due or otherwise, Seller shall retain a security interest in the goods delivered and this agreement shall be deemed a Security Agreement under the Uniform Commercial Code. Buyer authorizes Seller as its attorney to execute and file on Buyer's behalf all documents Seller deems necessary to perfect its security interest.
- 11. Improper use and Indemnity.** Buyer shall indemnify, defend, and hold Seller harmless from any claim, liability, damages, lawsuits, and costs (including attorney fees), whether for personal injury, property damage, patent, trademark or copyright

- infringement or any other claim, brought by or incurred by Buyer, Buyer's employees, or any other person, arising out of: (a) improper selection, improper application or other misuse of Products purchased by Buyer from Seller; (b) any act or omission, negligent or otherwise, of Buyer; (c) Seller's use of patterns, plans, drawings, or specifications furnished by Buyer to manufacture Product; or (d) Buyer's failure to comply with these terms and conditions. Seller shall not indemnify Buyer under any circumstance except as otherwise provided.
- 12. Cancellations and Changes.** Orders shall not be subject to cancellation or change by Buyer for any reason, except with Seller's written consent and upon terms that will indemnify, defend and hold Seller harmless against all direct, incidental and consequential loss or damage. Seller may change product features, specifications, designs and availability with notice to Buyer.
  - 13. Limitation on Assignment.** Buyer may not assign its rights or obligations under this agreement without the prior written consent of Seller.
  - 14. Force Majeure.** Seller does not assume the risk and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter "Events of Force Majeure") Events of Force Majeure shall include without limitation: accidents, strikes or labor disputes, acts of any government or government agency, acts of nature, delays or failures in delivery from carriers or suppliers, shortages of materials, or any other cause beyond Seller's reasonable control.
  - 15. Waiver and Severability.** Failure to enforce any provision of this agreement will not waive that provision nor will any such failure prejudice Seller's right to enforce that provision in the future. Invalidation of any provision of this agreement by legislation or other rule of law shall not invalidate any other provision herein. The remaining provisions of this agreement will remain in full force and effect.
  - 16. Termination.** Seller may terminate this agreement for any reason and at any time by giving Buyer thirty (30) days written notice of termination. Seller may immediately terminate this agreement, in writing, if Buyer: (a) commits a breach of any provision of this agreement (b) appoints a trustee, receiver or custodian for all or any part of Buyer's property (c) files a petition for relief in bankruptcy on its own behalf, or by a third party (d) makes an assignment for the benefit of creditors, or (e) the dissolves or liquidates all or a majority of its assets.
  - 17. Governing Law.** This agreement and the sale and delivery of all Products hereunder shall be deemed to have taken place in and shall be governed and construed in accordance with the laws of the State of Ohio, as applicable to contracts executed and wholly performed therein and without regard to conflicts of laws principles. Buyer irrevocably agrees and consents to the exclusive jurisdiction and venue of the courts of Cuyahoga County, Ohio with respect to any dispute, controversy or claim arising out of or relating to this agreement.
  - 18. Indemnity for Infringement of Intellectual Property Rights.** Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Section. Seller will defend and indemnify Buyer against allegations of infringement of U.S. patents, U.S. trademarks, copyrights, trade dress and trade secrets ("Intellectual Property Rights"). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that a Product sold pursuant to this Agreement infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If a Product is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using the Product, replace or modify the Product so as to make it noninfringing, or offer to accept return of the Product and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to Products delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any Product sold hereunder. The foregoing provisions of this Section shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.
  - 19. Entire Agreement.** This agreement contains the entire agreement between the Buyer and Seller and constitutes the final, complete and exclusive expression of the terms of sale. All prior or contemporaneous written or oral agreements or negotiations with respect to the subject matter are herein merged.
  - 20. Compliance with Law, U. K. Bribery Act and U.S. Foreign Corrupt Practices Act.** Buyer agrees to comply with all applicable laws and regulations, including both those of the United Kingdom and the United States of America, and of the country or countries of the Territory in which the Buyer may operate, including without limitation the U. K. Bribery Act, the U.S. Foreign Corrupt Practices Act ("FCPA") and the U.S. Anti-Kickback Act (the "Anti-Kickback Act"), and agrees to indemnify and hold harmless Seller from the consequences of any violation of such provisions by Buyer, its employees or agents. Buyer acknowledges that they are familiar with the provisions of the U. K. Bribery Act, the FCPA and the Anti-Kickback Act, and certifies that Buyer will adhere to the requirements thereof. In particular, Buyer represents and agrees that Buyer shall not make any payment or give anything of value, directly or indirectly to any governmental official, any foreign political party or official thereof, any candidate for foreign political office, or any commercial entity or person, for the purpose of influencing such person to purchase products or otherwise benefit the business of Seller.



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