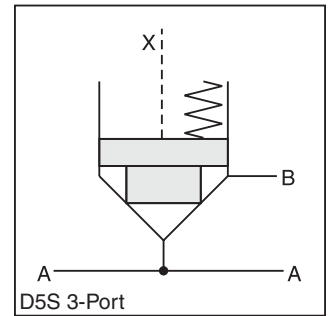
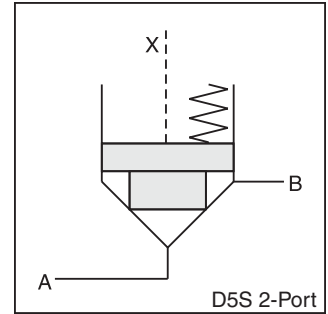


General Description

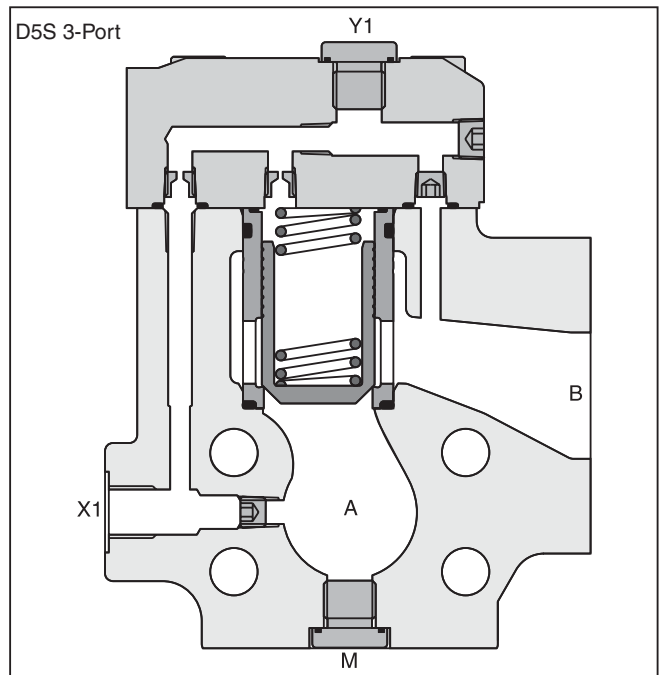
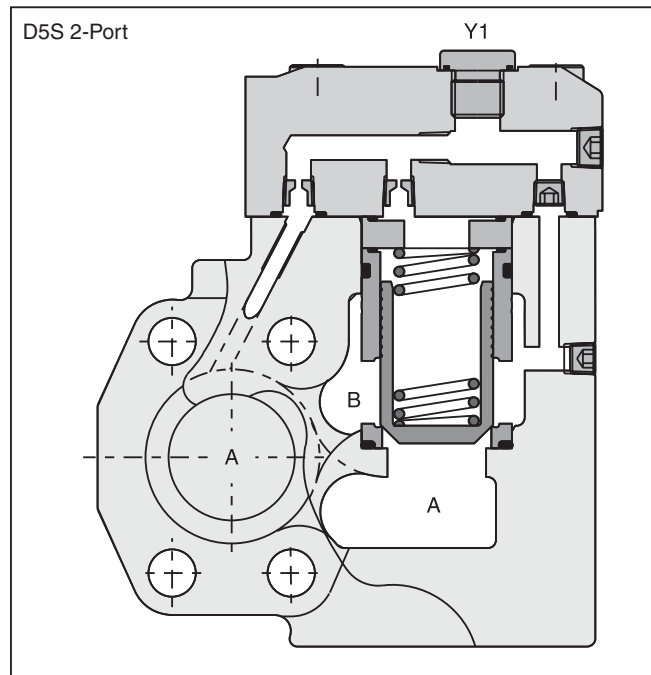
Series D5S seat valves are designed for directional control functions. They enable individual hydraulic solutions for nominal flow up to 800 LPM (211.6 GPM) due to a large variety of poppets, springs and covers, including shuttle valves, stroke limiters, solenoid valves (VV01) and position control.

Features

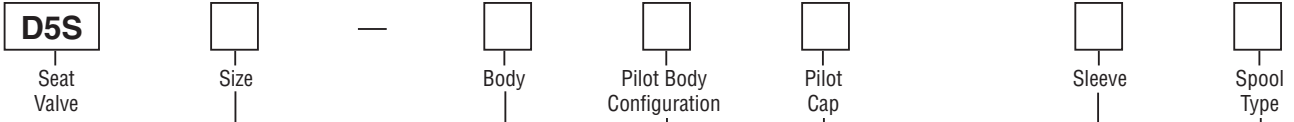
- Leak-free seat valve design.
- 2- and 3-port bodies.
- SAE61 flange.
- Numerous pilot options.
- 6 poppet types.
- 4 sizes (SAE 3/4", 1", 1 1/4", 1 1/2").



A



A



Code	Description
06	SAE 3/4"
08	SAE 1"
10	SAE 1-1/4"
12*	SAE 1-1/2"

* D5S 3-Port only

Code	Body	Ports
9	3-Port	Seat entry, A; X1, Y1, M = SAE 4
1	2-Port	Seat entry, A; X1, Y1, M = SAE 4
2	2-Port	Annular entry, B; X1, Y1, M = SAE 4

Code	Pilot Oil Line in Body
1	Internal from A
2	Internal from B
3	Internal from A and B
4	External from X1
5	Internal from B, External from X1

Code	Description
1	AA=95%, AB=5%
3	AA=60%, AB=40%

Code	Body	Ports	X	Y	Z	X-Y	X1	Y1	VV01
Standard									
1	2 and 3-Port	Pilot Oil = Pilot Drain	●	●	●	○	-	●	-
2	2 and 3-Port	Pilot Oil = Pilot Drain	●	●	●	○	-	●	-
3	2-Port	Pilot Oil = Pilot Drain	●	●	●	○	○	●	-
With Solenoid Valve (VV01)									
4	2 and 3-Port	Internal to B	●	○	●	●	-	●	○
5	2-Port	Internal to B	●	○	●	●	○	●	○
6	2 and 3-Port	External Out of Cap	●	○	●	●	-	○	●
7	2-Port	External Out of Cap	●	○	●	●	○	○	●
With Stroke Limiter (not for D5S06)									
A	2 and 3-Port	Pilot Oil = Pilot Drain	●	●	●	-	●	-	-
B	2 and 3-Port	Pilot Oil = Pilot Drain	●	●	-	-	●	-	-
C	2-Port	Pilot Oil = Pilot Drain	●	●	●	-	○	-	-

Code	Size	Poppet Type	Sleeve
1	06, 08, 10, 12	With closed bottom and 15° chamfer (pZ max. = pA +20 Bar (290 PSI))	1
2	06	With 0.8 dia. orifice at the bottom and 15° chamfer	1
	08, 10	With 1.2 dia. orifice at the bottom and 15° chamfer	1
4	06, 08, 10, 12	With closed bottom and 45° chamfer	1, 3
A*	08, 10, 12	Safety spool (for end position control only)	3
B*	08, 10, 12	Throttle spool, 10° chamfer	3
C*	08, 10, 12	Throttle spool, 3° chamfer	3

Key: ○ Open Bore ● Closed Bore ● Orifice ∅ 1.2
Note: Combination examples provided on pages A238-A242.

* Springs 2, 3 and 6 only.

D5S.indd, dd



Spring

Switching Type

Solenoid Voltage

B
Design Series

Seal

Options

Code	Description
Omit	Standard w/o vent function
G0R	12V
G0Q	24V
GAR	98V
GAG	205V
W30	110V 50Hz / 120V 60Hz
W31	220V 50Hz / 240V 60Hz

Code	Description
1	Nitrile
5	Fluorocarbon

Code	Description
Omit	Standard
013	Position Control with Protection

Code	Description	
omit	Standard without Vent Function	
09	VV01 with Manual Override	De-energized; power comp. open
10	VV01 without Manual Override	De-energized; power comp. open
11	VV01 with Manual Override	De-energized; power comp. closed
12	VV01 without Manual Override	De-energized; power comp. closed
CA	Shuttle Valve	
DA	Shuttle Valve	
CB	VV01 Code 09 and Shuttle Valve Code CA	
CD	VV01 Code 11 and Shuttle Valve Code CA	
DB	VV01 Code 09 and Shuttle Valve Code DA	
DD	VV01 Code 11 and Shuttle Valve Code DA	
BH	VV01 Code 10 and Shuttle Valve Code CA and Position Control* with Amplifier	
BK	VV01 Code 12 and Shuttle Valve Code CA and Position Control* with Amplifier	
BN	VV01 Code 10 and Shuttle Valve Code DA and Position Control* with Amplifier	
BQ	VV01 Code 12 and Shuttle Valve Code DA and Position Control* with Amplifier	
BC	VV01 Code 10 and Position Control* with Amplifier	
BE	VV01 Code 12 and Position Control* with Amplifier	
BA	Position Control* with Amplifier	
BF	Position Control* with Amplifier and Shuttle Valve Code CA	
BL	Position Control* with Amplifier and Shuttle Valve Code DA	

Weight:	D5S 2-Port	D5S 3-Port
D5S06	3.6 kg (7.9 lbs)	3.4 kg (7.5 lbs)
D5S08	4.1 kg (9.0 lbs)	4.4 kg (9.7 lbs)
D5S10	5.4 kg (11.9 lbs)	5.0 kg (11.0 lbs)
D5S12	—	7.8 kg (17.2 lbs)

* Position control for D5S08/10 only.
 Spring 2 or 4. Spool A and sleeve 3.

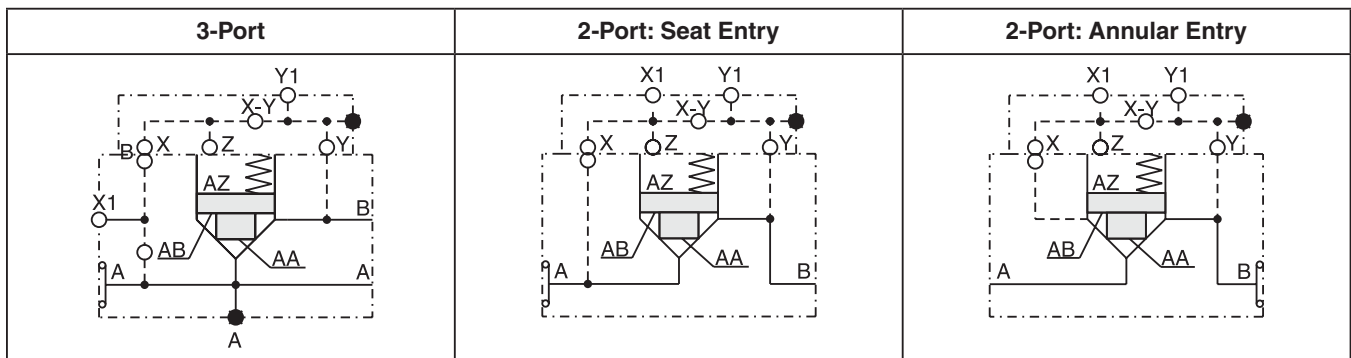
Code	Spring — Approx. Cracking Pressure in Bar (PSI)					
	Sleeve Code 1			Sleeve Code 3		
	A -> B		A -> B		B -> A	
	D5S06	D5S08/12	D5S06	D5S08/12	D5S06	D5S08/12
1	2.8 (40.6)	3.5 (50.8)	6.5 (94.3)	6.5 (94.3)	9.5 (137.8)	11.0 (159.5)
2	0.5 (7.3)	0.5 (7.3)	1.0 (14.5)	1.0 (14.5)	1.5 (21.8)	1.7 (24.7)
3	0.3 (4.4)	0.3 (4.4)	0.6 (8.7)	0.6 (8.7)	0.9 (13.1)	1.0 (14.5)
4	2.2 (31.9)	2.2 (31.9)	4.0 (58.0)	3.5 (50.8)	5.5 (79.8)	6.0 (87.0)
5	—	9.0 (130.5)	—	16.0 (232.0)	—	28.0 (406.0)
6	1.2 (17.4)	1.2 (17.4)	2.0 (29.0)	2.2 (31.9)	3.0 (43.5)	3.8 (55.1)
7	3.0 (43.5)	—	8.0 (116.0)	—	12.0 (174.0)	—

Specifications

A

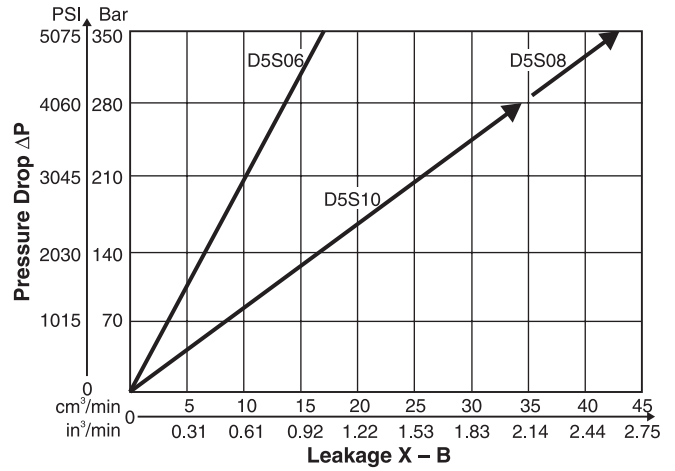
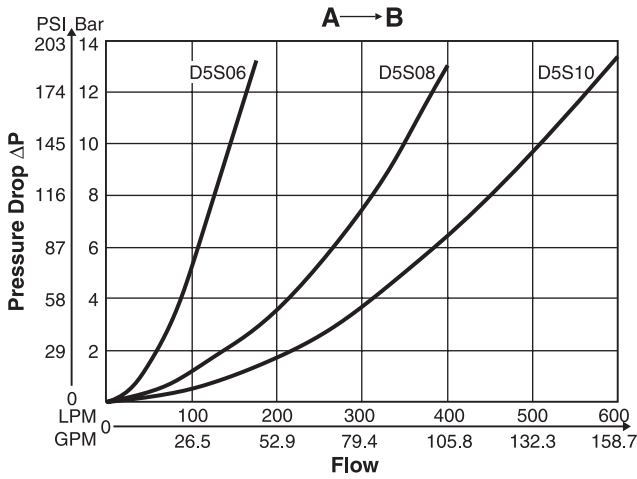
General		06	08	10	12	
Size						
Mounting	Flanged according to SAE 61					
Mounting Position	Unrestricted					
Ambient Temperature Range	-20°C to +50°C (-4°F to +122°F)					
Hydraulic						
Maximum Operating Pressure	SAE 61 Ports A, B	350 Bar (5075 PSI)	350 Bar (5075 PSI)	280 Bar (4060 PSI)	210 Bar (3045 PSI)	
	Port Y1	30 Bar (435 PSI)	30 Bar (435 PSI)	30 Bar (435 PSI)	30 Bar (435 PSI)	
Nominal Flow		180 LPM (47.6 GPM)	360 LPM (95.2 GPM)	600 LPM (158.7 GPM)	800 LPM (211.6 GPM)	
Fluid	Hydraulic oil as per DIN 51524 ... 51525					
Fluid Temperature	-20°C to +80°C (-4°F to +176°F)					
Viscosity	Permitted Recommended	10 to 650 cSt / mm ² /s (46 to 3013 SSU) 30 cSt / mm ² /s (139 SSU)				
Filtration	ISO Class 4406 (1999) 18/16/13 (acc. NAS 1638: 7)					
Electrical (Solenoid)						
Duty Ratio	100%					
Response Time	Energized / De-energized AC 20/18ms, DC 46/27 ms					
Protection Class	IP65 in accordance with EN60529 (plugged and mounted)					
	Code	G0R	G0Q	GAR	GAG	W30 W31
Supply Voltage		12V	24V	98V	205V	110V at 50Hz 120V at 60 Hz 220V at 50Hz/ 240V at 60Hz
Tolerance Supply Voltage		+5 to -10	+5 to -10	+5 to -10	+5 to -10	±5 to -10 ±5 to -10
Power Consumption	Hold	31W	31W	31W	31W	78W 78W
	In Rush	31W	31W	31W	31W	264W 264W
Maximum Switching Frequency	AC up to 7200; DC up to 16,000 switchings/hour					
Solenoid Connection	Connector as per EN175301-803					
Protection Class	IP65 in accordance with EN 60529 (plugged and mounted)					
Coil Insulation Class	H (180°C) (356°F)					

D5S Pilot Configuration

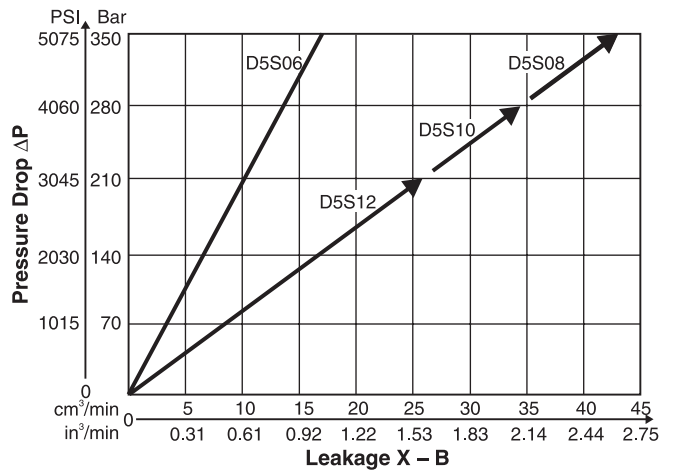
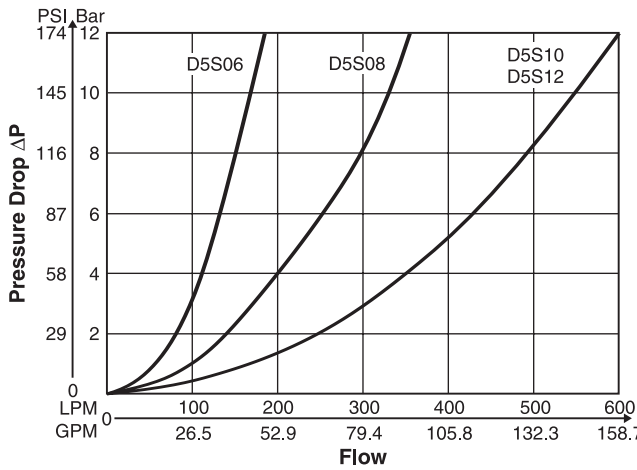


Performance Curves

D5S 2-Port*



D5S 3-Port*



*Fluid viscosity 38cSt at 50°C (122°F)

Selection of Cartridges

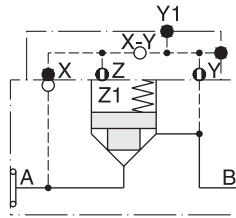
Sleeve 1, Poppet 1	Sleeve 1, Poppet 2	Sleeve 1, Poppet 4	Sleeve 3, Poppet 4	Sleeve 3, Poppet A	Sleeve 3, Poppet B/C
1 : 1.05 A _A = 0.95 A _C A _B = 0.95 A _C 15° chamfer	1 : 1.05 A _A = 0.95 A _C A _B = 0.95 A _C 15° chamfer orifice	1 : 1.05 A _A = 0.95 A _C A _B = 0.95 A _C 45° chamfer	1 : 1.67 A _A = 0.6 A _C A _B = 0.4 A _C 45° chamfer	1 : 1.67 A _A = 0.6 A _C A _B = 0.4 A _C 45° chamfer safety spool	1 : 1.67 A _A = 0.6 A _C A _B = 0.4 A _C 45° chamfer throttle spool

D5S.indd, dd

D5S 2-Port Examples

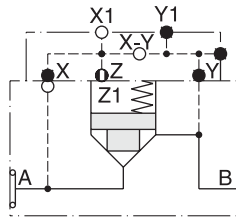
A

Seat Entry



D5S...-722

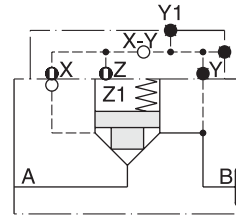
Pilot oil: internal from B



D5S...-743

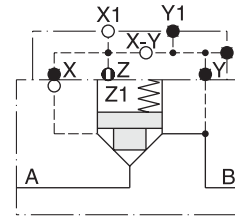
Pilot oil: external from X1

Annular Entry



D5S...-821

Pilot oil: internal from B

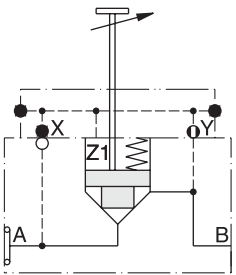


D5S...-843

Pilot oil: external from X1

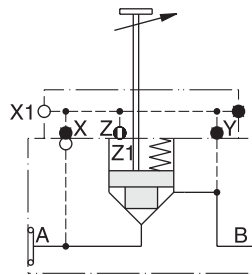
Stroke Limiter D5S 2-Port Examples

Seat Entry



D5S08-72B
10

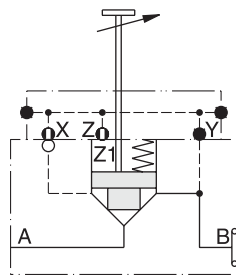
Pilot oil: internal from B



D5S08-74C
10

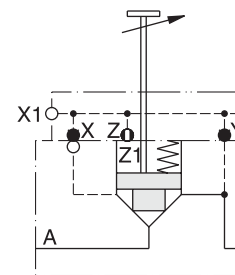
Pilot oil: external from X1

Annular Entry



D5S08-82A
10

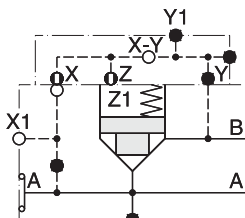
Pilot oil: internal from B



D5S08-84C
10

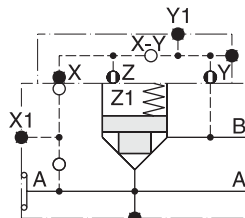
Pilot oil: external from X1

D5S 3-Port Examples



D5S ...-541

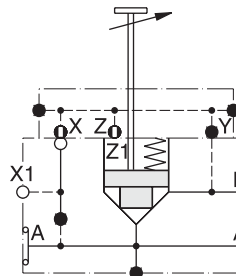
Pilot oil: external from X1



D5S ...-522

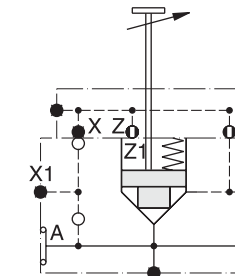
Pilot oil: internal from B

Stroke Limiter D5S 3-Port Examples



D5S08-54A
10
12

Pilot oil: external from X1



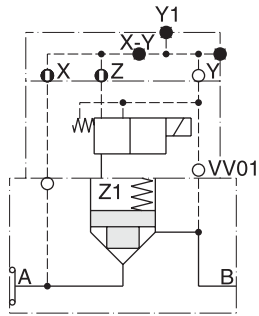
D5S08-52B
10
12

Pilot oil: internal from B

D5S 2-Port with Solenoid Valve VV01 Examples

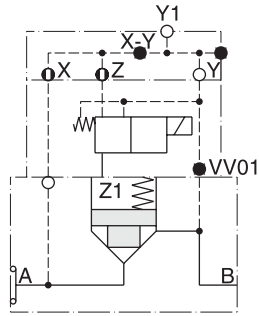
Seat Entry

Annular Entry



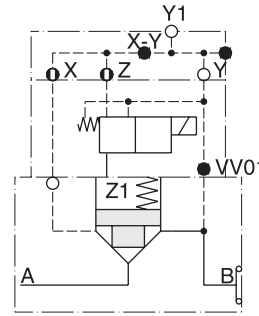
D5S..-714...09
 10
 11
 12

Pilot oil: internal from A
 Pilot drain: internal to B



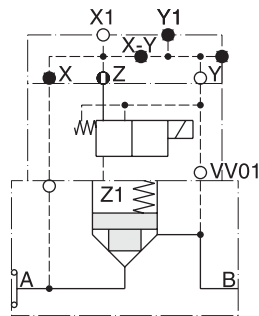
D5S..-716...09
 10
 11
 12

Pilot oil: internal from A
 Pilot drain: external out of Y1



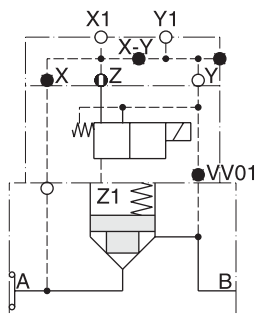
D5S..-826...09
 10
 11
 12

Pilot oil: internal from B
 Pilot drain: external out of Y1



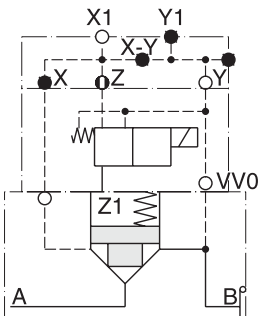
D5S..-745...09
 10
 11
 12

Pilot oil: internal from X1
 Pilot drain: internal to B



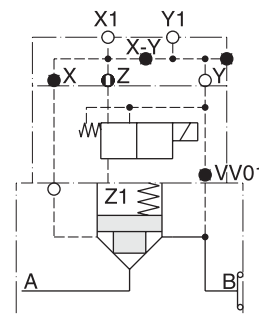
D5S..-747...09
 10
 11
 12

Pilot oil: internal from X1
 Pilot drain: external out of Y1



D5S..-845...09
 10
 11
 12

Pilot oil: internal from X1



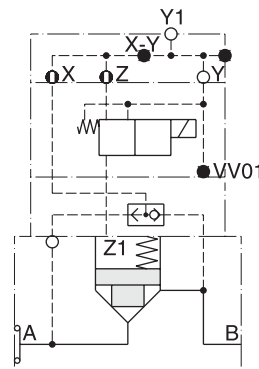
D5S..-847...09
 10
 11
 12

Pilot oil: internal from X1
 Pilot drain: external out of Y1

D5S 2-Port with Solenoid Valve VV01 and Shuttle Valve Examples

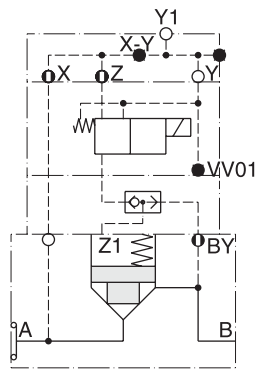
Seat Entry

Annular Entry



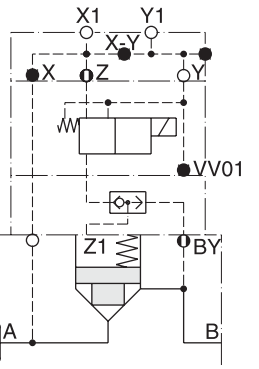
D5S..-736...CB
 CD

Pilot oil: internal from A +
 internal from B
 Pilot drain: external out of Y1



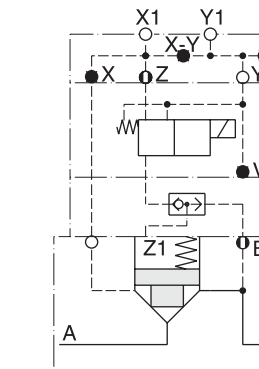
D5S..-736...DB
 DD

Pilot oil: internal from A +
 internal from B
 Pilot drain: external out of Y1



D5S..-757...DB
 DD

Pilot oil: external from X1 +
 internal from B
 Pilot drain: external out of Y1

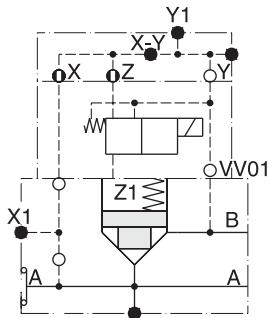


D5S..-857...DB
 DD

Pilot oil: external from X1 +
 internal from B
 Pilot drain: external out of Y1

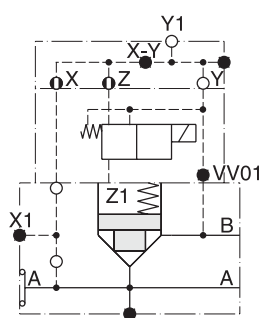
D5S 3-Port with Solenoid Valve VV01 Examples

A



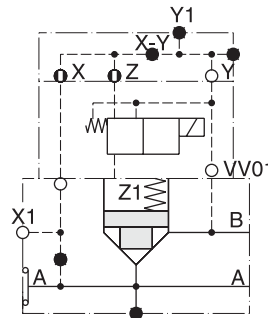
D5S ..-514...09
 10
 11
 12

Pilot oil: internal from A
 Pilot drain: internal to B



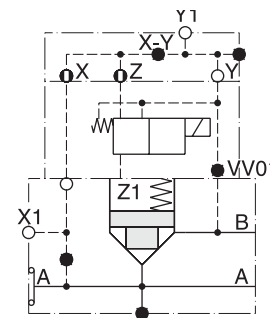
D5S ..-516...09
 10
 11
 12

Pilot oil: internal from A
 Pilot drain: external out of Y1



D5S ..-544...09
 10
 11
 12

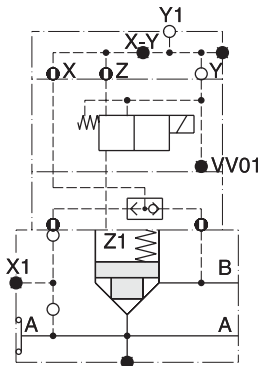
Pilot oil: external from X1
 Pilot drain: internal to B



D5S ..-546...09
 10
 11
 12

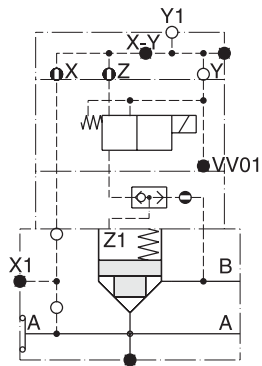
Pilot oil: external from X1
 Pilot drain: external out of Y1

D5S 3-Port with Solenoid Valve VV01 and Shuttle Valve Examples



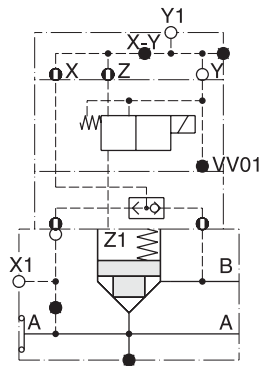
D5S ..-536...CB
 CD

Pilot oil: internal from A +
 internal from B
 Pilot drain: external out of Y1



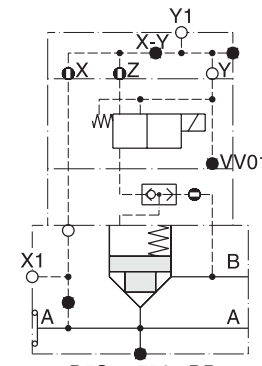
D5S ..-536...DB
 DD

Pilot oil: internal from A +
 internal from B
 Pilot drain: external out of Y1



D5S ..-556...CB
 CD

Pilot oil: internal from X1 +
 internal from B
 Pilot drain: external out of Y1

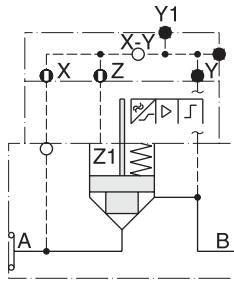


D5S ..-556...DB
 DD

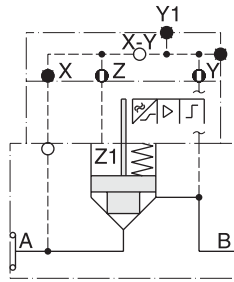
Pilot oil: external from X1 +
 internal from B
 Pilot drain: external out of Y1

D5S 2-Port Position Control Examples

Seat Entry

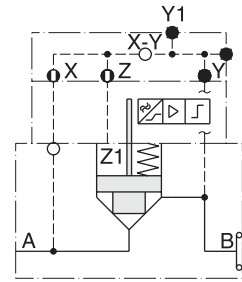


D5S08-7113A.BA
 D5S10
 Pilot oil: internal from A

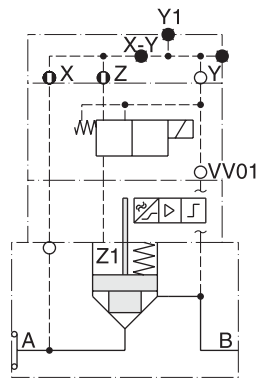


D5S08-7223A.BA
 D5S10
 Pilot oil: internal from B

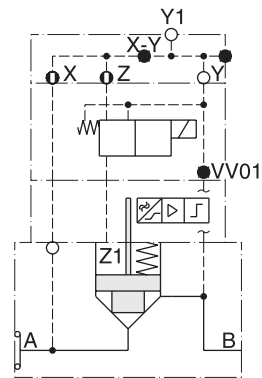
Annular Entry



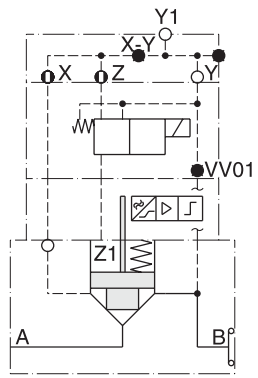
D5S08-8213A.BA
 D5S10
 Pilot oil: internal from B



D5S08-7143A.BC
 D5S10 BE
 Pilot oil: internal from A
 Pilot drain: internal to B

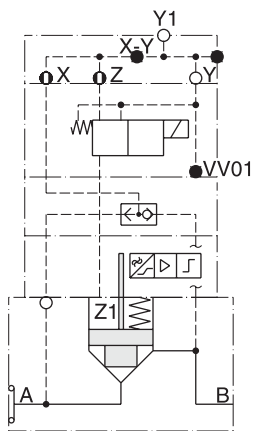


D5S08-7163A.BC
 D5S10 BE
 Pilot oil: internal from A
 Pilot drain: external out of Y1

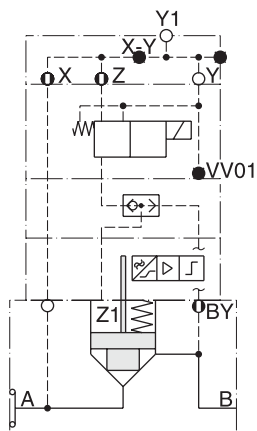


D5S08-8263A.BC
 D5S10 BE
 Pilot oil: internal from B
 Pilot drain: external out of Y1

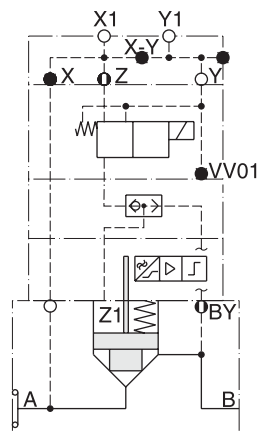
Seat Entry



D5S ...-736...BH
 BK
 Pilot oil: internal from A +
 internal from B
 Pilot drain: external out of Y1

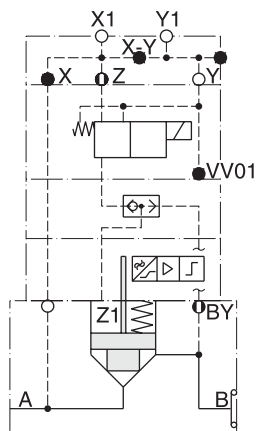


D5S ...-736...BN
 BQ
 Pilot oil: internal from A +
 internal from B
 Pilot drain: external out of Y1



D5S ...-757...BN
 BQ
 Pilot oil: external from X1 +
 internal from B
 Pilot drain: external out of Y1

Annular Entry



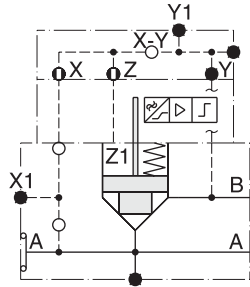
D5S ...-857...BN
 BQ
 Pilot oil: external from X1 +
 internal from B
 Pilot drain: external out of Y1



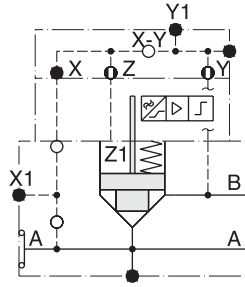
D5S 3-Port Position Control Examples

Seat Entry

A

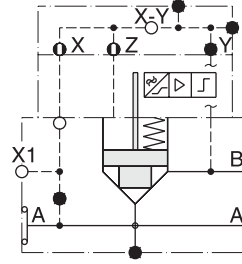


D5S08-5113A.BA
 10
 12
 Pilot oil: internal from A

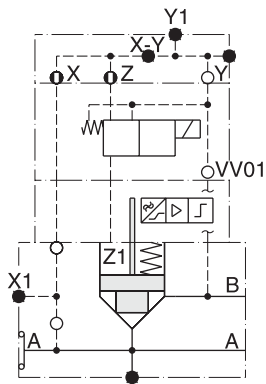


D5S08-5223A.BA
 10
 12
 Pilot oil: internal from B

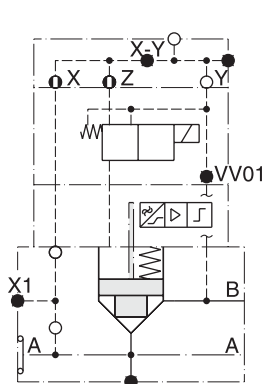
Annular Entry



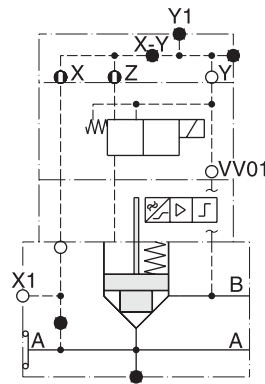
D5S08-5213A.BA
 10
 12
 Pilot oil: external from X1



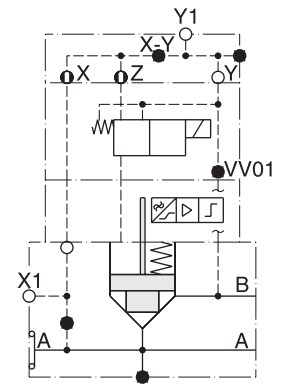
D5S08-5143A.BC
 10 BE
 12
 Pilot oil: internal from A
 Pilot drain: internal to B



D5S08-5163A.BC
 10 BE
 12
 Pilot oil: internal from A
 Pilot drain: external out of Y1

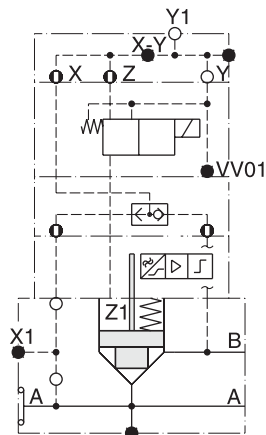


D5S08-5443A.BC
 10 BE
 12
 Pilot oil: external from X1
 Pilot drain: internal to B

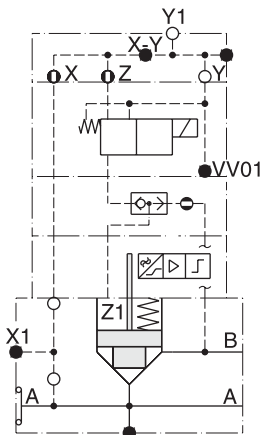


D5S08-5463A.BC
 10 BE
 12
 Pilot oil: external from X1
 Pilot drain: external out of Y1

Seat Entry

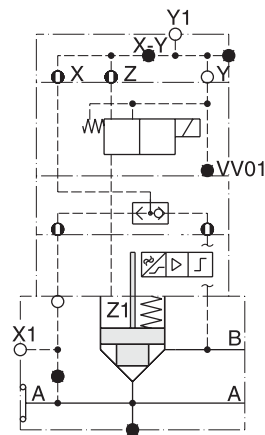


D5S08-5363A.BH
 10 BE
 12
 Pilot oil: internal from A +
 internal from B
 Pilot drain: external out of Y1

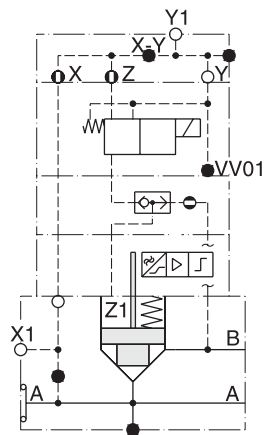


D5S08-5363A.BN
 10 BQ
 12
 Pilot oil: internal from A +
 internal from B
 Pilot drain: external out of Y1

Annular Entry

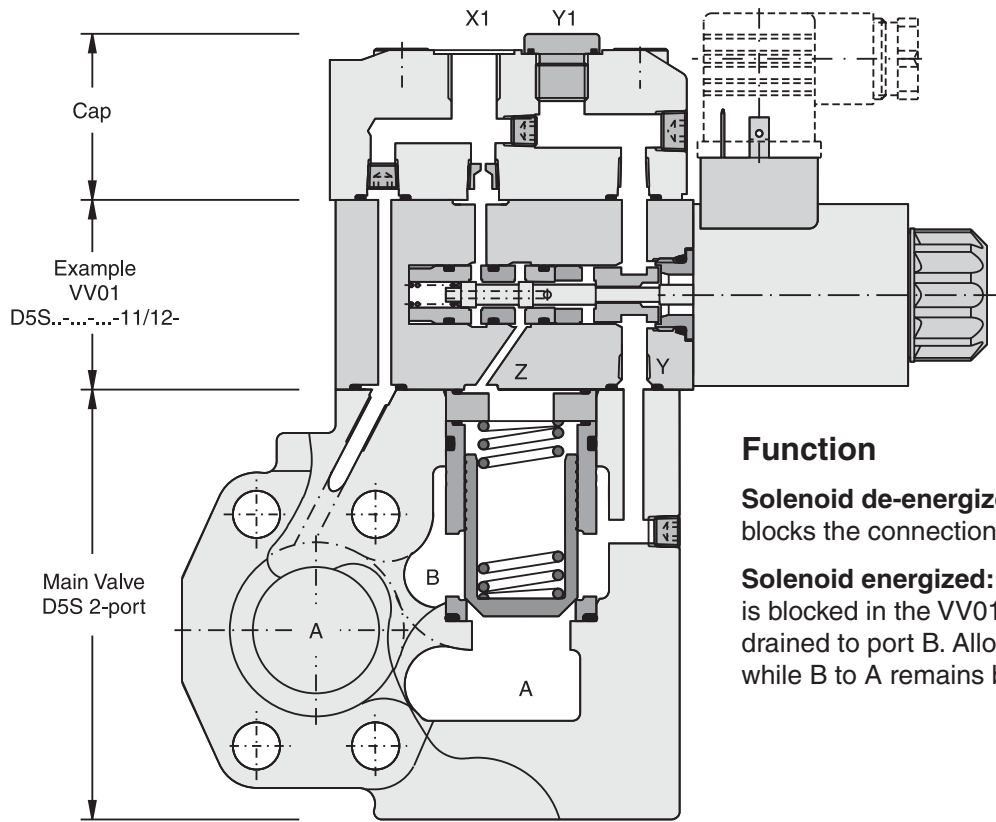


D5S08-5563A.BH
 10 BK
 12
 Pilot oil: external from X1 +
 internal from B
 Pilot drain: external out of Y1



D5S08-5563A.BN
 10 BQ
 12
 Pilot oil: external from X1 +
 internal from B
 Pilot drain: external out of Y1

Example Pilot Oil External from X1, Pilot Drain Internal Out of B with Vent Valve



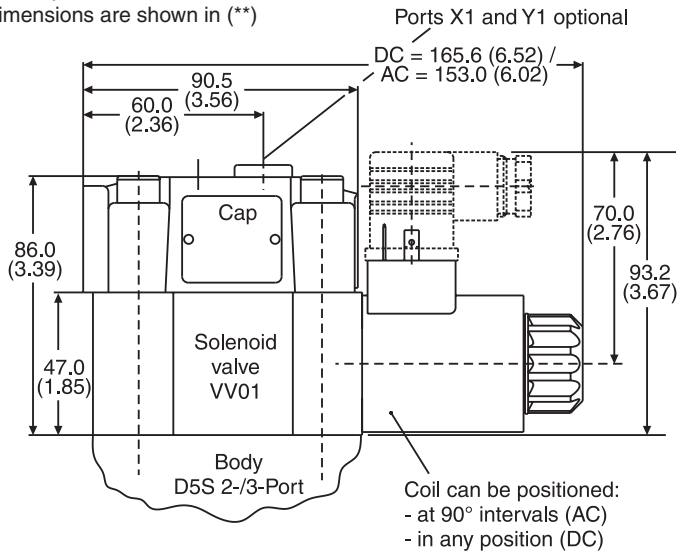
Function

Solenoid de-energized: Pilot oil from X1 to Z blocks the connection from A to B or B to A.

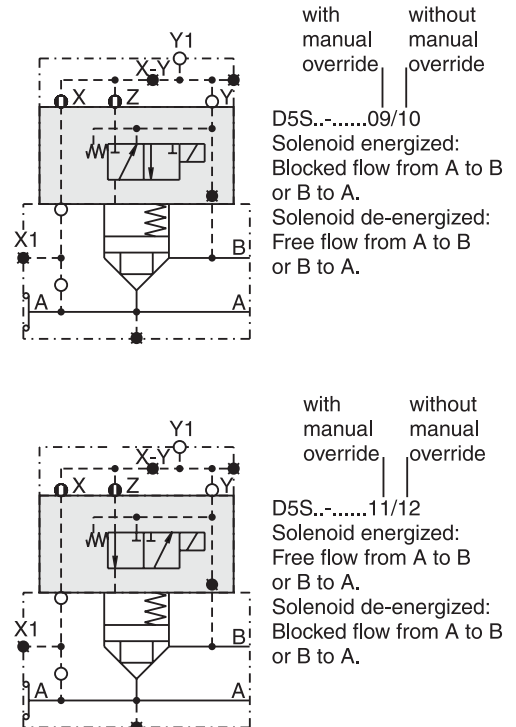
Solenoid energized: Pilot pressure from X1 is blocked in the VV01. The oil in Z is internally drained to port B. Allowing flow from A to B, while B to A remains blocked.

Dimensions — D5S with VV01

Inch equivalents for millimeter dimensions are shown in (**)



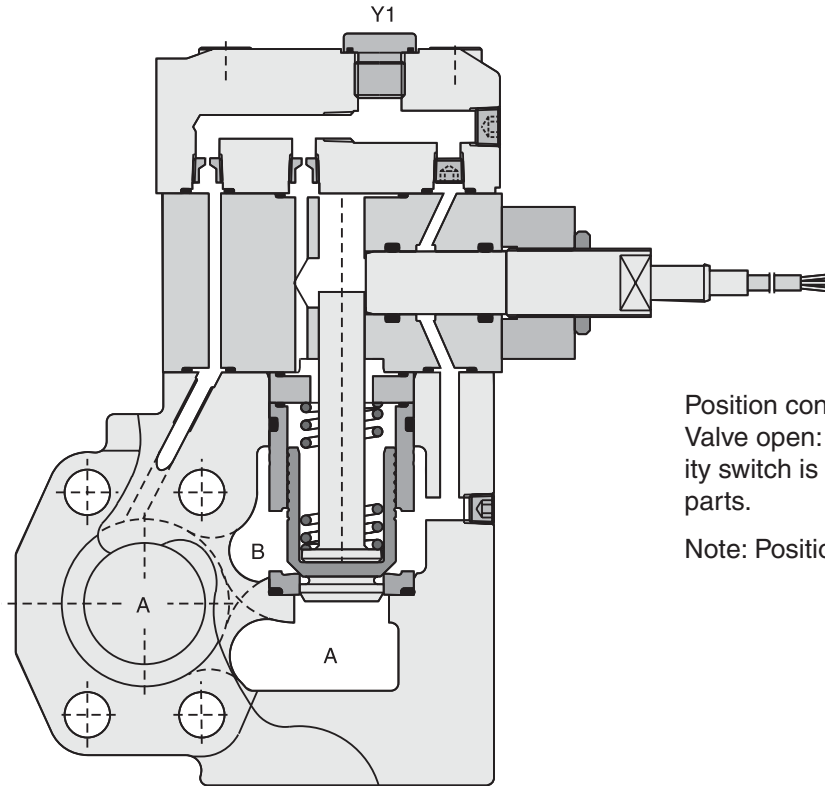
VV01 Seal Kits	
Nitrile	Fluorocarbon
DC Solenoid	
S26-58515-0	S26-58515-5
AC Solenoid	
S26-35237-0	S26-35237-5



D5S.indd, dd

Example Pilot Oil External from X1, Pilot Drain Internal Out of B with Position Control

A

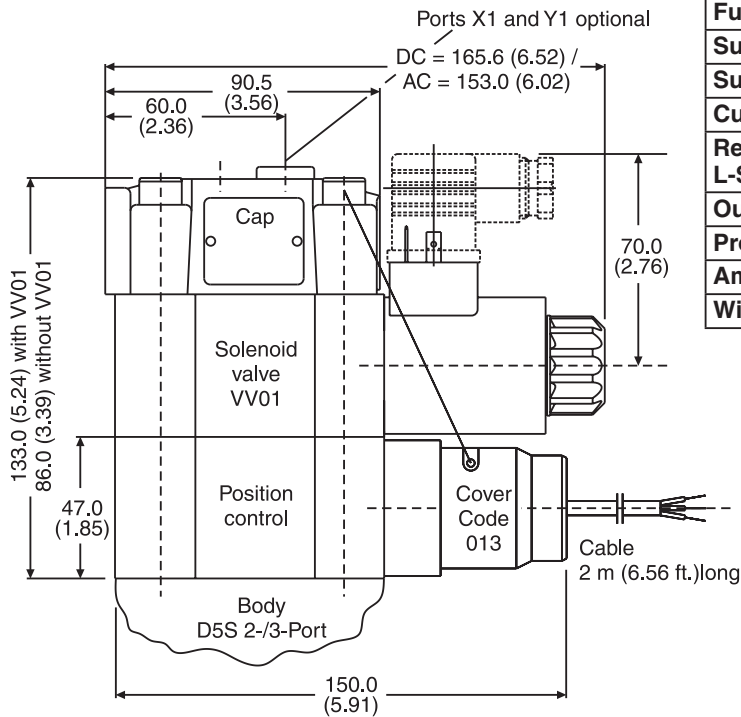


Position control by proximity switch (incl. amplifier). Valve open: proximity switch activated. This proximity switch is pressure proof and has no wearing parts.

Note: Position control for D5S08 and D5S10 only.

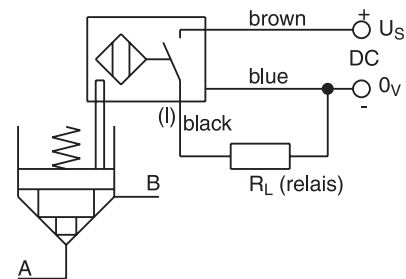
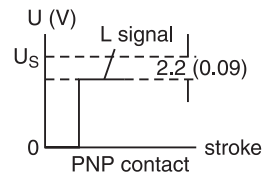
Dimensions — D5S with Position Control

Inch equivalents for millimeter dimensions are shown in (**)



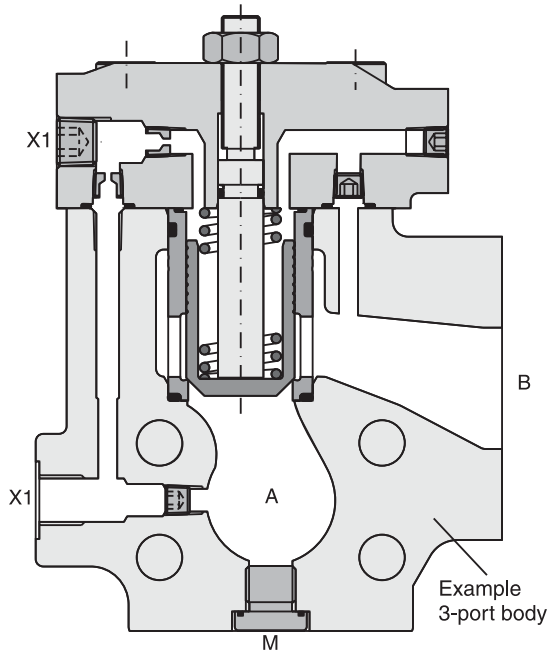
Technical Data (Proximity Switch)

Function	PNP, contact
Supply Voltage	10 - 30VDC
Supply Voltage Ripple	≤10%
Current Consumption	8mA Maximum
Residual Voltage L-Signal	U _s - 2.2V at I _{max}
Output Current	≤200 mA
Protection Class	IP67
Ambient Temperature	-25°C to +70°C (-13°F to +158°F)
Wire Cross Section	3 x 0.5 mm ²



Inch equivalents for millimeter dimensions are shown in (**)

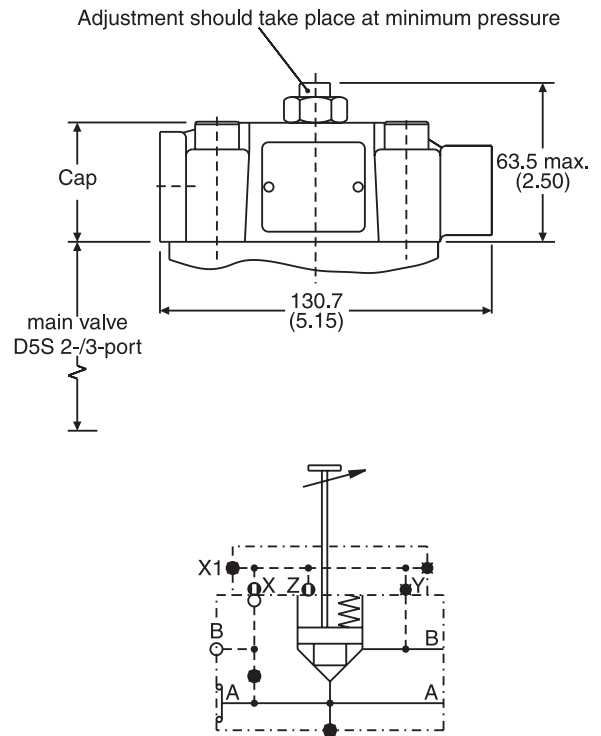
D5S Stroke Limiter



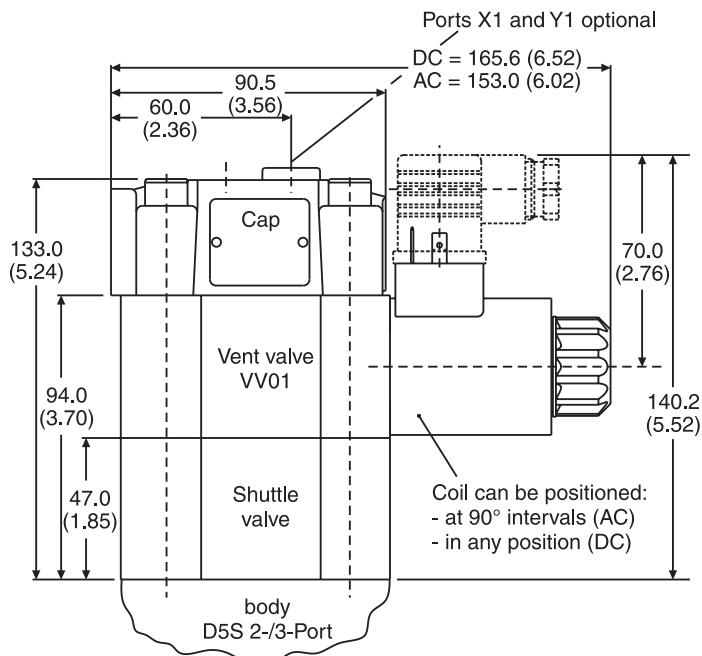
X1 = external pilot-oil (optional)

Note: Stroke limiter not for use with D5S06, solenoid valve VV01, shuttle valve and position control.

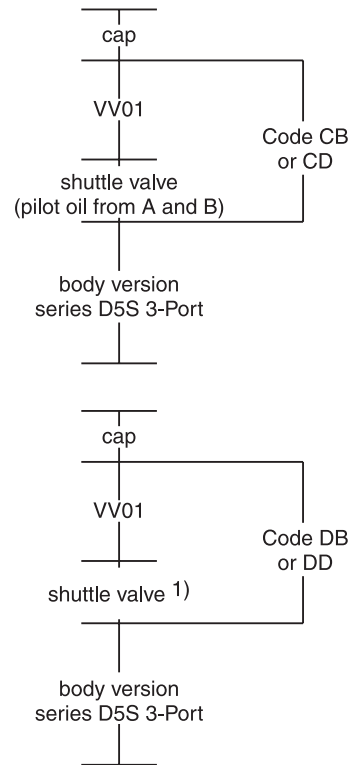
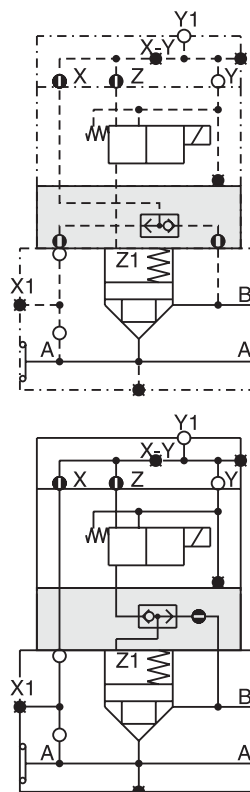
D5S Stroke Limiter Dimensions



D5S with Shuttle Valve Dimensions



Shuttle valve only in connection with vent valve VV01.



1) pilot oil from A and B, from B to A check valve function

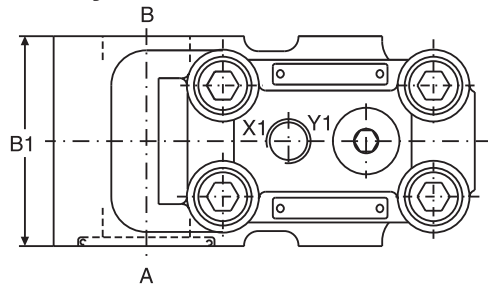


Inch equivalents for millimeter dimensions are shown in (**)

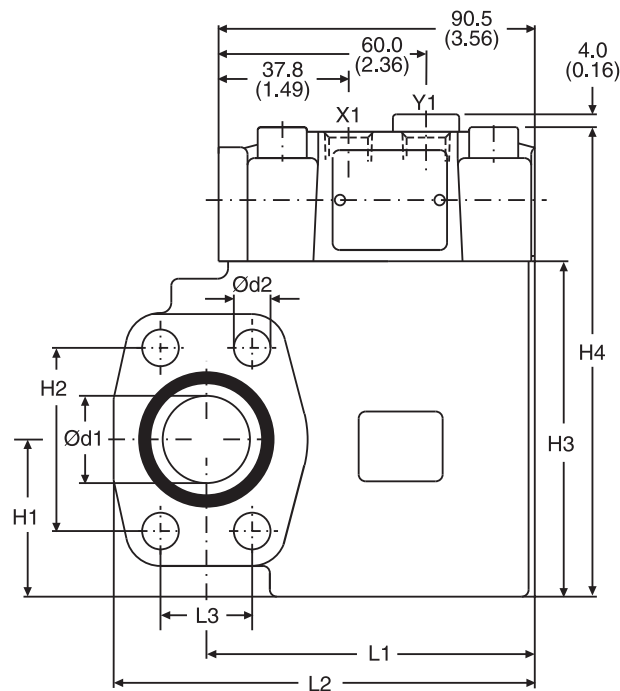
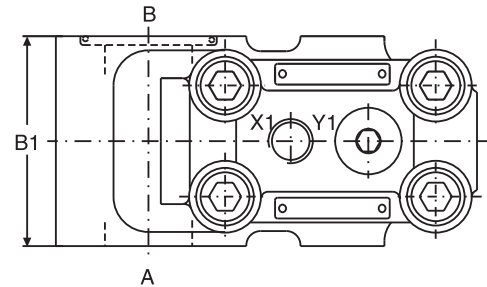
2-Port

A

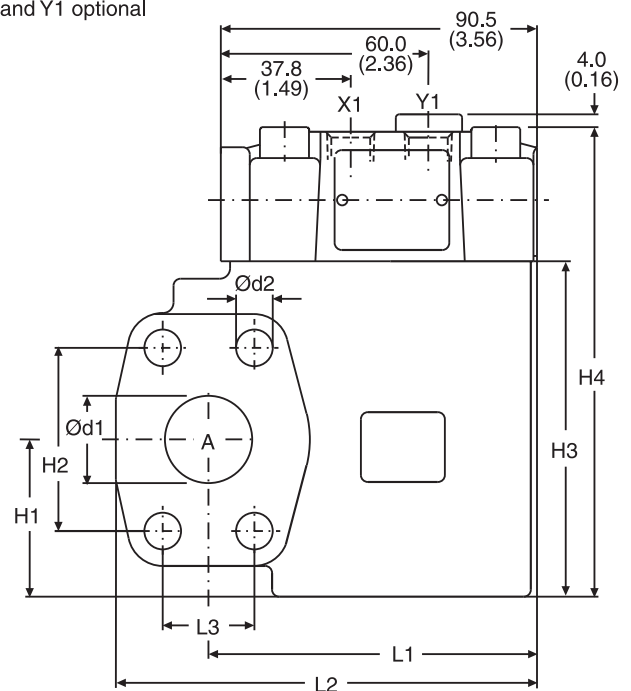
Seat Entry



Annular Entry



Ports X1 and Y1 optional



Seal Kits		
Size	Nitrile	Fluorocarbon
06	S16-91850-0	S16-91850-5
08	S16-91851-0	S16-91851-5
10	S16-91852-0	S16-91852-5

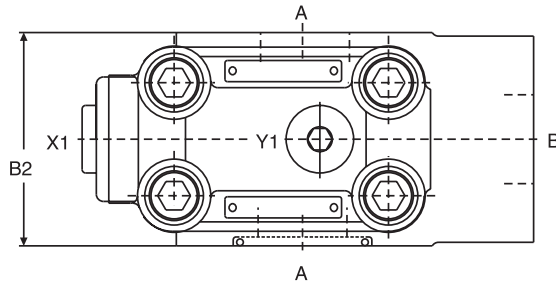
Size	l1	l2	l3	b1	h1	h2	h3	h4	d1	d2
06	77.0 (3.03)	101.0 (3.98)	22.2 (0.87)	60.0 (2.36)	37.0 (1.46)	47.6 (1.87)	90.0 (3.54)	127.6 (5.02)	19.0 (0.75)	10.5 (0.41)
08	94.0 (3.70)	120.5 (4.74)	26.2 (1.03)	60.0 (2.36)	45.0 (1.77)	52.4 (2.06)	96.0 (3.78)	133.6 (5.26)	25.0 (0.98)	10.5 (0.41)
10	94.0 (3.70)	128.0 (5.04)	30.2 (1.19)	75.0 (2.95)	48.0 (1.89)	58.7 (2.31)	109.0 (4.29)	146.6 (5.77)	32.0 (1.26)	12.5 (0.49)

Ports	Function	Port size		
		D5S06	D5S08	D5S10
A	Inlet or outlet	3/4" SAE 61	1" SAE 61	1-1/4" SAE 61
B	Outlet or inlet	3/4" SAE 61	1" SAE 61	1-1/4" SAE 61
X1	External pilot port	SAE 4		
Y1	External pilot drain			

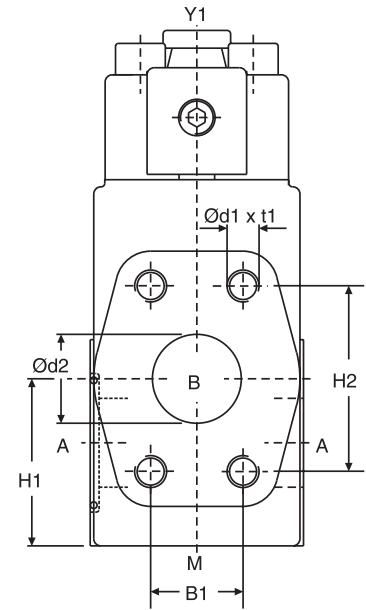
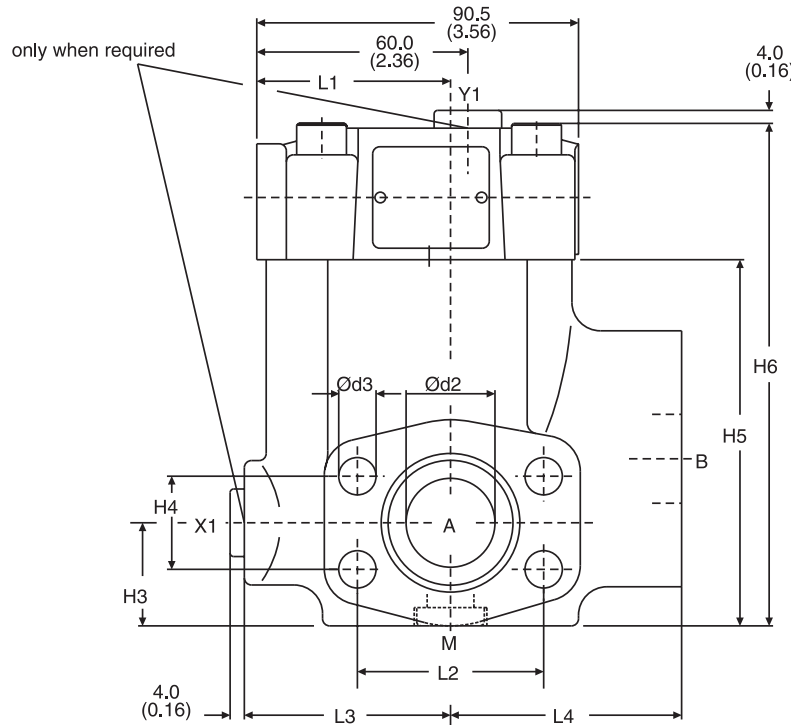
D5S.indd, dd

Inch equivalents for millimeter dimensions are shown in (**)

3-Port



Seal Kits		
Size	Nitrile	Fluorocarbon
06	S16-91850-0	S16-91850-5
08	S16-91851-0	S16-91851-5
10	S16-91852-0	S16-91852-5
12	S26-27421-0	S26-27421-5



Size	I1	I2	I3	I4	b1	b2	h1	h2	h3	h4	h5	h6	d1	t1	d2	d3
06	49.0 (1.93)	47.6 (1.87)	56.0 (2.20)	63.0 (2.48)	22.2 (0.87)	60.0 (2.36)	41.0 (1.61)	47.6 (1.87)	28.0 (1.10)	22.2 (0.87)	82.0 (3.23)	119.0 (4.69)	3/8" UNC	20.0 (0.79)	19.0 (0.75)	10.5 (0.41)
08	55.0 (2.17)	52.4 (2.06)	58.0 (2.28)	65.0 (2.56)	26.2 (1.03)	60.0 (2.36)	47.0 (1.85)	52.4 (2.06)	29.0 (1.14)	26.2 (1.03)	103.0 (4.06)	141.0 (5.55)	3/8" UNC	23.0 (0.91)	25.0 (0.98)	10.5 (0.41)
10	57.0 (2.24)	58.7 (2.31)	64.0 (2.52)	61.0 (2.40)	30.2 (1.19)	75.0 (2.95)	65.0 (2.56)	58.7 (2.31)	36.0 (1.42)	30.2 (1.19)	113.0 (4.45)	150.0 (5.91)	7/16" UNC	22.0 (0.87)	32.0 (1.26)	12.5 (0.49)
12	37.0 (1.46)	69.8 (2.75)	55.0 (2.17)	93.0 (3.66)	35.7 (1.41)	80.0 (3.15)	73.0 (2.87)	69.8 (2.75)	72.0 (2.83)	35.7 (1.41)	140.0 (5.51)	178.0 (7.01)	1/2" UNC	27.0 (1.06)	38.0 (1.50)	13.5 (0.53)

Ports	Function	Port size			
		D5S06	D5S08	D5S10	D5S12
A (2x)	Inlet or outlet	3/4" SAE 61	1" SAE 61	1 1/4" SAE 61	1 1/2" SAE 61
B	Outlet or inlet	3/4" SAE 61	1" SAE 61	1 1/4" SAE 61	1 1/2" SAE 61
X1*	External pilot port	SAE 4			
Y1	External pilot drain				
M	Pressure gauge				

* closed when supplied.

D5S.indd, dd

