

## Seat Valves On / Off In-Line SAE Flanges Sizes $\frac{3}{4}$ "', 1"', 1 $\frac{1}{4}$ "'

Series D5S-2 Port



## Features

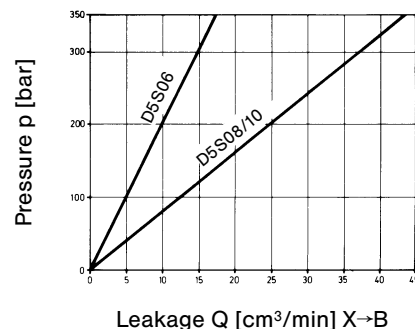
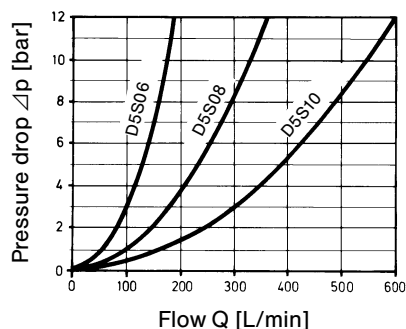
- Flange mounted valves according to S.A.E. 61 – bolt on or bolt together – can form complete hydraulic control systems.
- Flange mounted valves eliminate costly piping.
- **Functional Options:** A variety of standard combinations of internal components are provided as well as additional options to suit special circuitry. Typical of more than sixty options / additions are:
  - Poppet stroke limiters – to control maximum flow rate.
  - Vent valve sandwich – to electrically control poppet operation.
  - Seat area changes – to vary operational characteristics.
  - Shuttle valves – to take pilot oil from A and B.
  - End position control – to control the spool position electrically.
- These seat valves are used for a variety of functions:
  - Either singly or in a combination as a leak proof directional control.
  - As a pressure control for the adjustment or limitation of pressure.
  - As a check valve to obtain unidirectional flow.
  - As a throttle valve to control and limit the rate of flow.
- The 2 Port In-Line flange mounted seat valves illustrated in this bulletin increase the range of flange mounted valves and supplement the 3 Port flange mounted pressure controls shown in bulletin 3-EN 290.
- Each valve is factory tested prior to delivery.
- Worldwide Denison service and support.

Item	Characteristics	Symbol of quantity	Symbol of SI unit	Technical Data		
<b>1.</b>	<b>General</b>					
1.1	Type of unit	-	-	Seat valve		
1.2	Model number	-	-	See ordering code		
1.3	Design	-	-	Poppet type		
1.4	Type of mounting	-	-	2 Port In-Line Flange Mounting		
1.5	Type of port	-	-	Threads, SAE 61 flanges		
1.6	Port sizes	-	-	3/4", 1", 1 1/4"		
1.7	Dimensions of unit	-	mm	See pages 5...11		
1.8	Weight	-	kg	See pages 5...11		
1.9	Mounting position	-	-	Optional		
1.10	Direction of flow	-	-	A → B or B → A		
1.11	Ambient temperature range	θ	°C	- 20 min		
		θ	°C	+ 60 max		
1.12	Suitability for special working conditions	-	-	Consult Denison		
<b>2.</b>	<b>Hydraulic Characteristics</b>					
2.1	Operating pressure range			0		
2.1.1	Port A, B and X	p min	bar	350 for sizes 06/08. 280 for size 10 only		
		p max	bar	0 (Without pressure to tank)		
2.1.2	Port Y	p	bar	0 (Without pressure to tank)		
2.2	Fluid	-	-	Mineral oil according to DIN 51524 & 51525		
2.2.1	Fluid temperature range	θ	°C	- 18 min		
		θ	°C	+ 80 max		
2.2.2	Filtration	-	-	Max. permissible contamination level according to NAS 1638 Class 8 (Class 9 for 15 Micron and smaller) or ISO 17/14		
2.3	Viscosity range	ν min	cSt	10		
		ν max	cSt	650		
2.3.1	Recommended operating viscosity	ν	cSt	30		
				D5S06 (3/4")	D5S08 (1")	D5S10 (1 1/4")
2.4	Nominal flow	Q	L/min	150	270	450
2.4.1	Max. flow	Q	L/min	180	360	600

**If the performance characteristics outlined above do not meet your requirements, please consult your local Denison Office.**

Control-Volume V <sub>x</sub>	D5S06	D5S08, D5S10
Sleeve – 95% seat area Spool – 15° chamfer	1.00 cm <sup>3</sup>	4.75 cm <sup>3</sup>
Sleeve – 95% seat area Spool – 45° chamfer	1.11 cm <sup>3</sup>	5.60 cm <sup>3</sup>
Sleeve – 60% seat area Spool – 45° chamfer	0.77 cm <sup>3</sup>	3.75 cm <sup>3</sup>

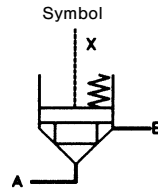
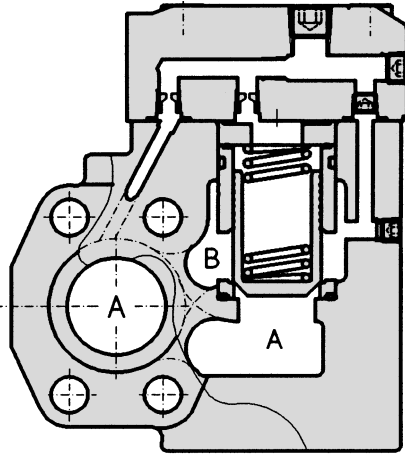
## Diagrams



Oil temperature 50 °C; oil viscosity 40 cSt

## Description

Denison Seat valves are hydraulically operated poppet type cartridges designed to control flow direction either from Port A to Port B or vice versa depending upon the control circuit.



The basic element is the main cartridge comprising poppet, spool, sleeve and spring. For more than 25 years Denison have led the field in the incorporation of this cartridge principle in their medium and high pressure range of pressure controls and the extensive application experience gained is incorporated in this modern range of seat valves. The wide range of optional combinations are based on an integrated system which affords easy modification to existing circuits incorporating the Denison seat valve/cartridge modules. Close manufacturing tolerances permit simple change or addition without special fitting.

Due to the special design features and compact dimensions, the sleeve, poppet and spring arrangements afford fast response and rapid frequency of operation even at the highest flow.

Denison seat valves can incorporate direct flow from Port A to Port B or vice versa and their operation is dependent upon the effective pressure area and spring force on the poppet. The cracking pressure is proportional to the ratio of control area to seat or ring area.

Pilot pressure at Port X acting on the control area closes the seat valve, thus, forces generated by cylinders or hydraulic motors can be decelerated to zero by controlling the differential pressure. Acceleration or deceleration of the fluid which the seat valve is controlling will take place whilst the valve is opening or closing and the time normally necessary to overcome overlap in conventional spool valves is eliminated. In addition to this improved response time the action also ensures that the seat valve functions without introducing system pressure peaks or shock and therefore machine cycle times may be reduced without detriment.

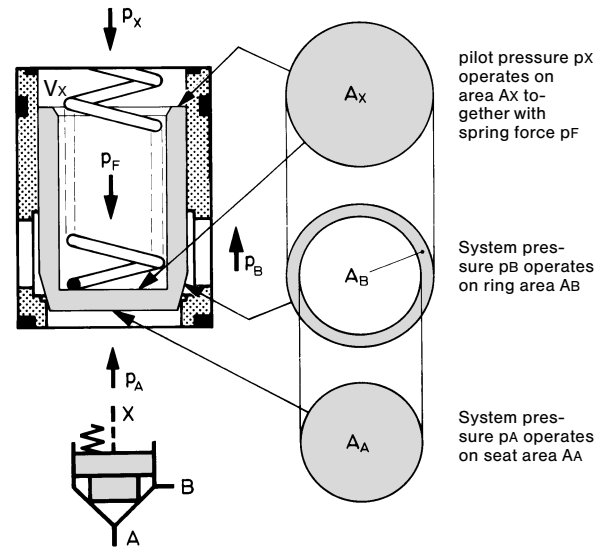
### Cracking Pressure depends on the area ratio of individual combination of spool and sleeve:

**Example:** With a ratio of 95 % seat area to 5 % ring area and a spring pressure = 2.2 bars then the following cracking pressures apply.

Direction of flow		supposed pilot pressure $p_x$ [bar]						
		0	9	15	30	100	250	330
$p_A$	A→B	2.2	11.7	18	34	108	265	350
$p_B$	B→A	42	222	342	>350 646	>350 2052	>350 5035	>350 6650

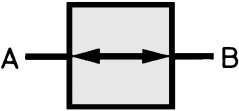
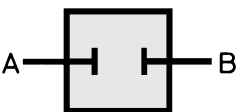

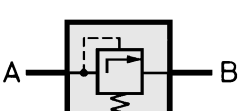
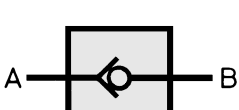
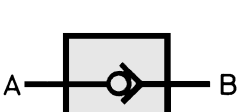
It is obvious that with flow direction B to A and a control (pilot pressure) at X of 15 bars – pressure in excess of maximum valve rating would be exceeded before the valve would open.

Under static conditions the valve would still remain leak-proof even at substantially higher pressures.

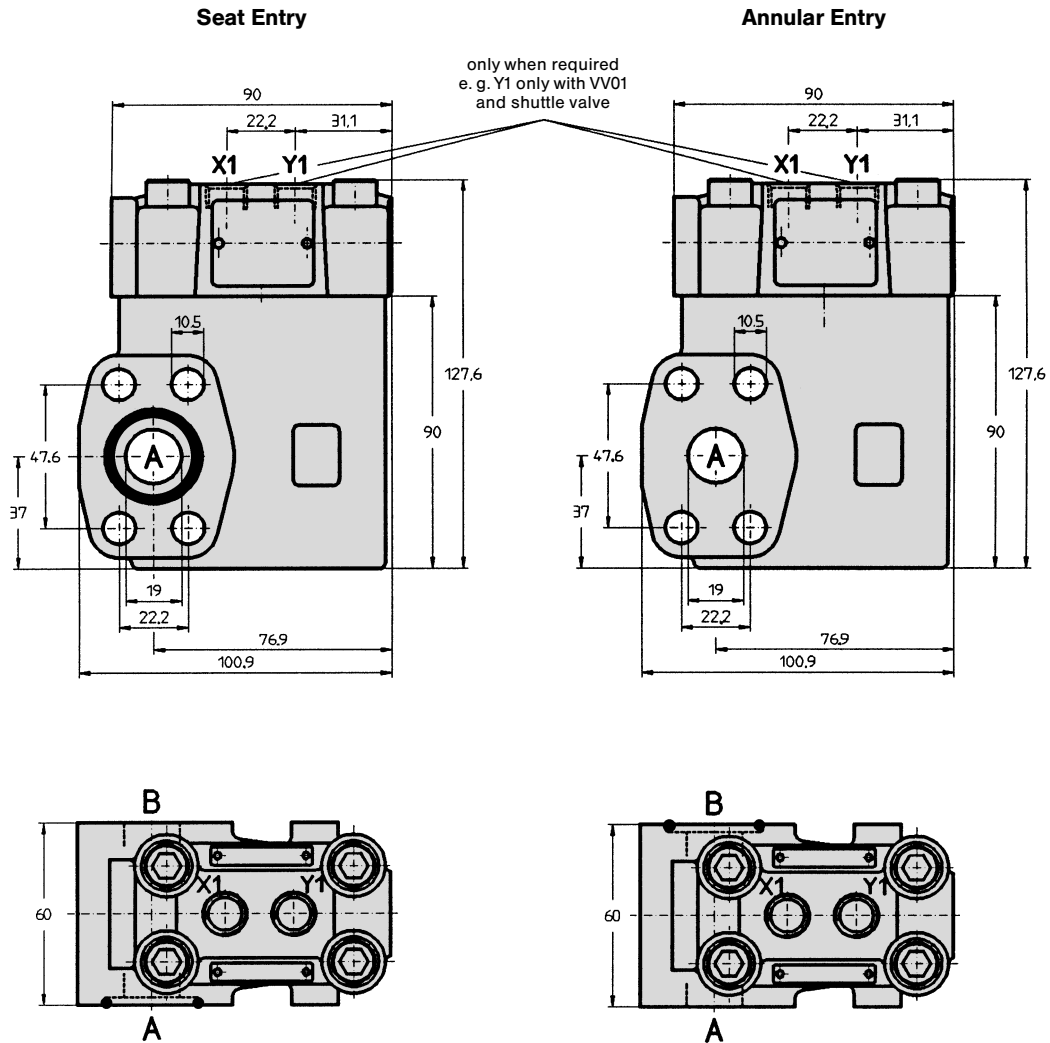


## Control functions available

The following are typical for the functions which can be achieved in a circuit incorporating single or multiple seat valves.

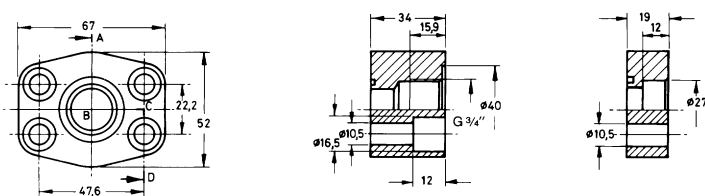
Function	Port X	$p_x$	Direction of flow	Notes
 Way function	vented	$= 0$	A → B B → A	Port X may be vented through a Denison type VV01 solenoid operated three way vent valve. Cracking pressure would then occur when $p_A$ or $p_B$ applied to the corresponding area equals the spring force.
 Way function	connected with port A and B	$= p_A$ or $= p_B$	A and B blocked	Port X may be connected to both ports A and B through a shuttle valve. Then pressure at X will be equal to pressure A or B depending upon which is greater.
 Flow function	vented	$= 0$	A → B B → A	Adjustable limiting stops can be fitted to limit spool opening and this produces a flow restriction in either direction.
 Pressure function	external pilot pressure	$> 0$	A → B	Valve opening (cracking) can be controlled by application of external pilot pressure $p_x$ .
 Check function	connected with port B	$= p_B$	A → B blocked to A	Plug may be fitted between A and X leaving X connected to B (leakproof check valve function A).
 Check function	connected with port A	$= p_A$	B → A blocked to B	Plug may be fitted between B and X leaving X connected to A (check valve function B) not leakproof.

Further control functions on request.



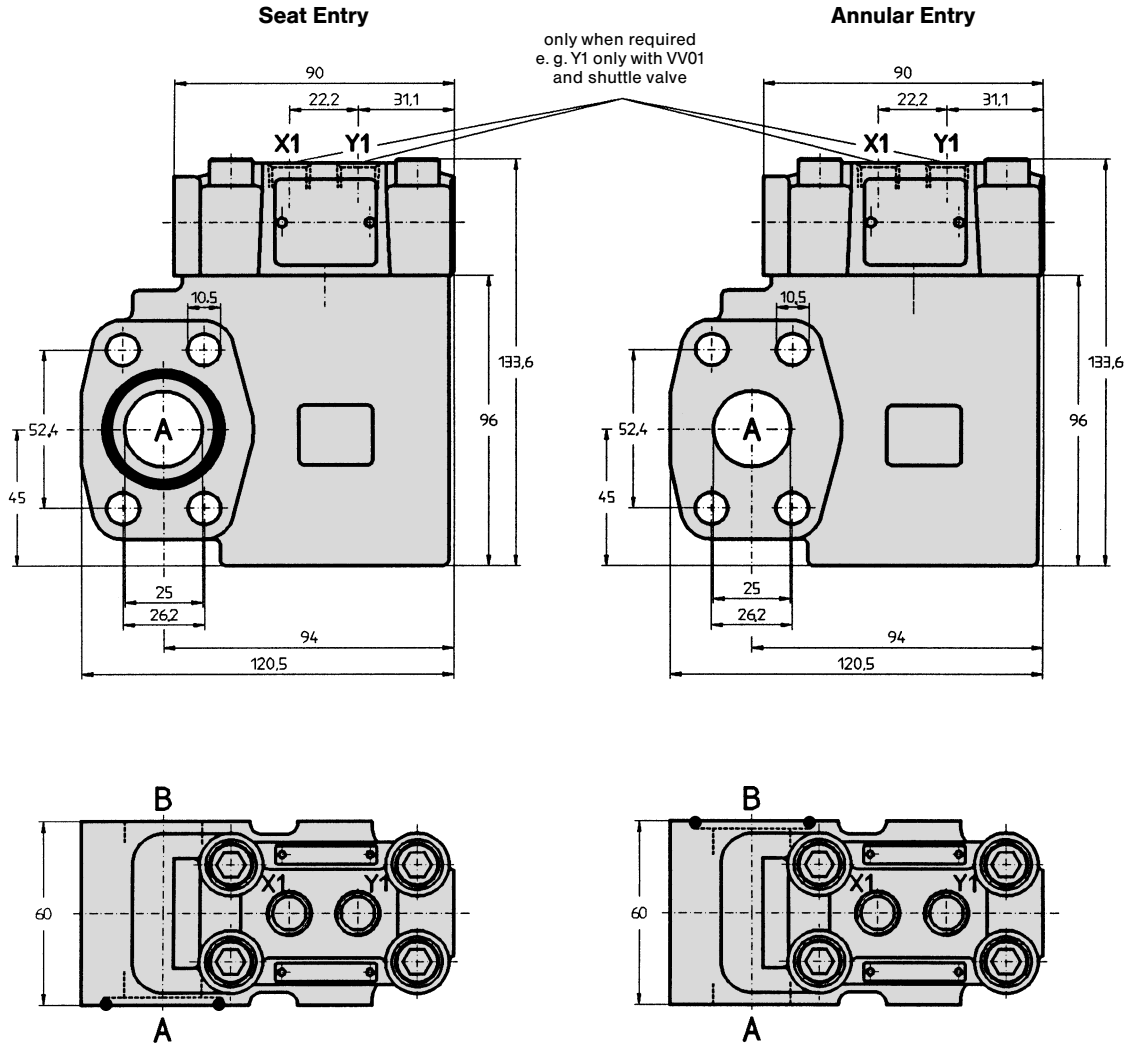
Ports	Function	Port sizes
A	inlet or outlet	3/4" SAE 61
B	outlet or inlet	3/4" SAE 61
X1	external pilot port	G 1/4" / SAE-4
Y1	external pilot drain	G 1/4" / SAE-4

3/4" SAE 61-Flanges (Port B)



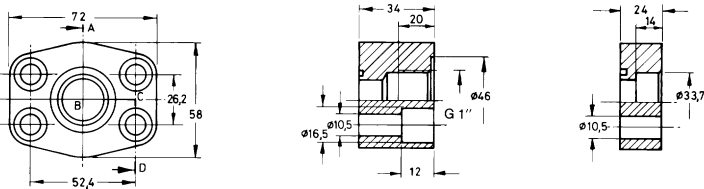
Port sizes	Flange* Port B with O-Ring	Counter Flange* Port A w/o O-Ring
	Order no.	Order no.
G 3/4"	S16-86529	S16-86520
3/4" socket weld	S16-86528	S16-86519

\* see page 17 for screws



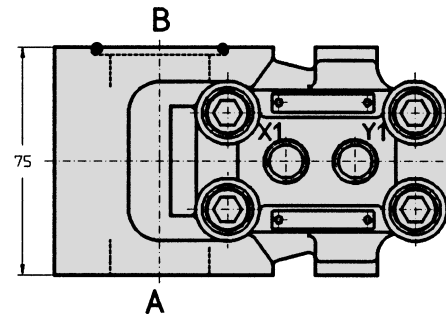
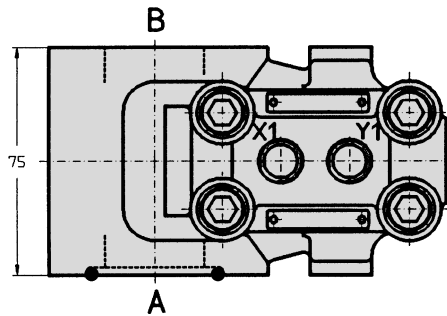
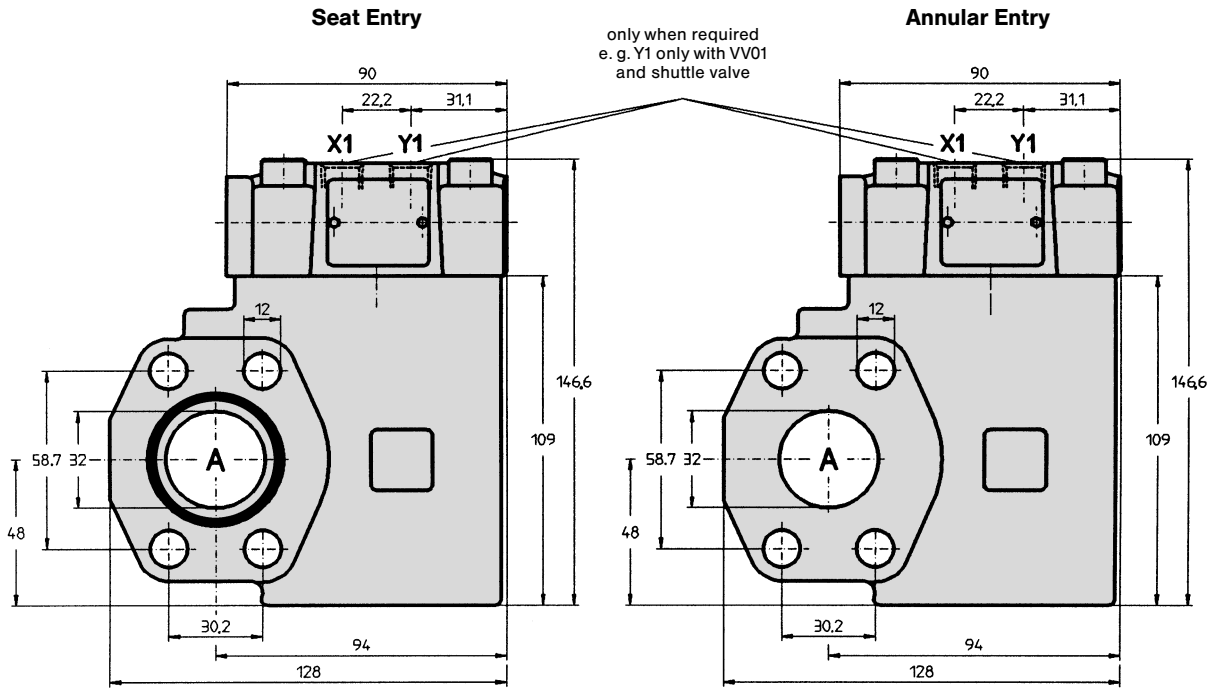
Ports	Function	Port sizes
A	inlet or outlet	1" SAE 61
B	outlet or inlet	1" SAE 61
X1	external pilot port	G 1/4" / SAE-4
Y1	external pilot drain	G 1/4" / SAE-4

**1" SAE 61-Flanges (Port B)**



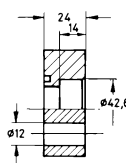
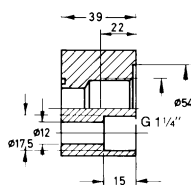
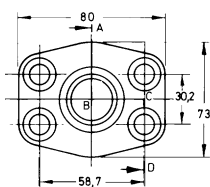
Port sizes	Flange* Port B with O-Ring	Counter Flange* Port A w/o O-Ring
	Order no.	Order no.
G 1"	S16-86532	S16-86523
1" socket weld	S16-86531	S16-86522

\* see page 17 for screws



Ports	Function	Port sizes
A	inlet or outlet	1 1/4" SAE 61
B	outlet or inlet	1 1/4" SAE 61
X1	external pilot port	G 1/4" / SAE-4
Y1	external pilot drain	G 1/4" / SAE-4

1 1/4" SAE 61-Flanges (Port B)

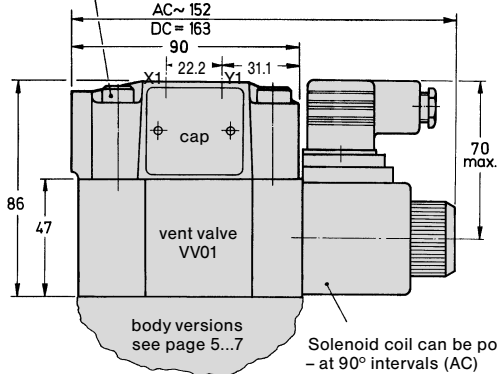


Port sizes	Flange* Port B with O-Ring	Counter Flange* Port A w/o O-Ring
	Order no.	Order no.
G 1 1/4"	S16-86535	S16-86526
1 1/4" socket weld	S16-86534	S16-86525

\* see page 17 for screws

Screws for additional installation:  
 4 x 3/8"-24 UNF x 3 1/2"  
 Order-no. 359-15340-0

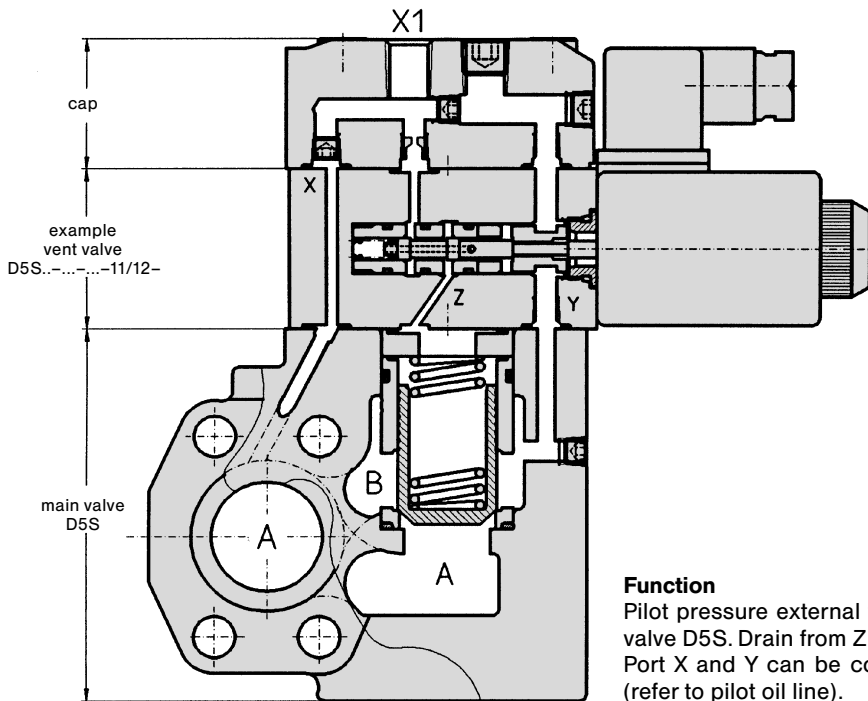
X1 = external pilot oil (optional)  
 Y1 = external drain



Nominal voltage	Refer to ordering code page 15/16
Permissible voltage difference	+ 5...-10 %
Max. coil temperature (temperature class F)	+ 180 °C, class H
Input power P <sub>20</sub>	31 W
Holding	78 VA
Inrush	264 VA
Relative operating period	100 %
Type of protection	IP 65

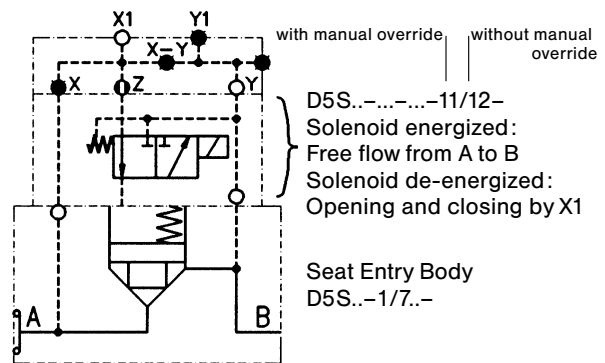
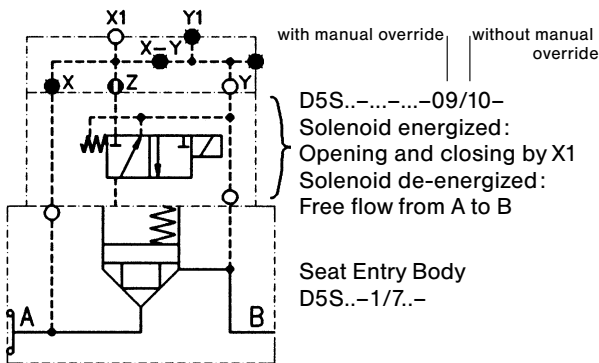
**Note:**  
 Further details for vent valve VV01 see information 3-EN 215.

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



**Function**

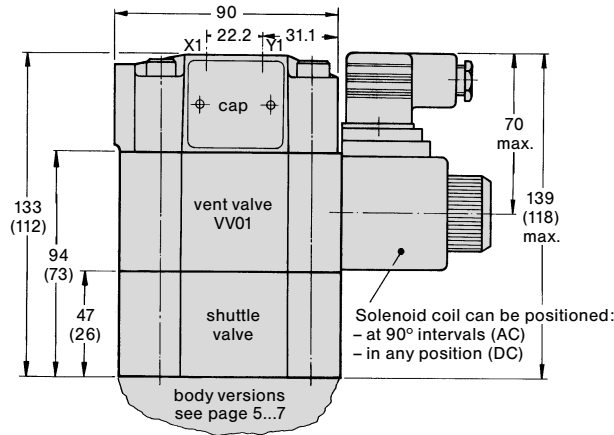
Pilot pressure external from X1 to Z blocks the 2/2-way valve D5S. Drain from Z to Y effects free flow from A to B. Port X and Y can be connected internally or externally (refer to pilot oil line).



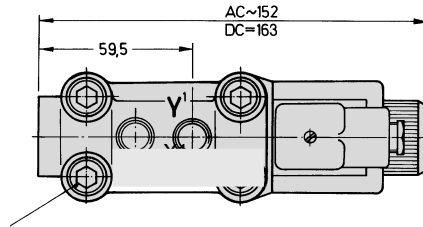


**Note:**  
Shuttle valves only use in connection  
with vent valve VV01

X1 = external pilot oil (optional)  
Y1 = external drain only out of the cap

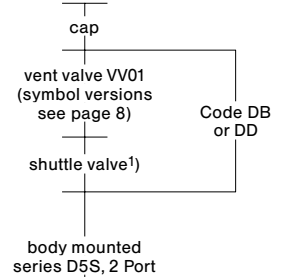
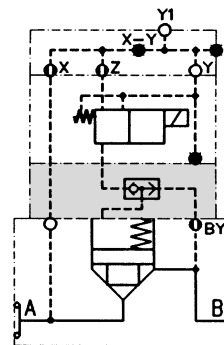
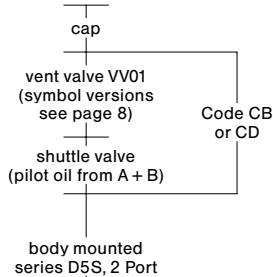
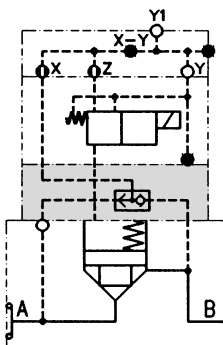


( ) Dimensions in brackets are for version VV01 with shuttle valve Code DB or DD.



Screws for additional installation:  
4 x 3/8"-24 UNF x 5 1/2" lg. = Code CB or CD  
Order-no. 359-15420-8  
4 x 3/8"-24 UNF x 4 1/2" lg. = Code DB or DD  
Order-no. 359-15380-8

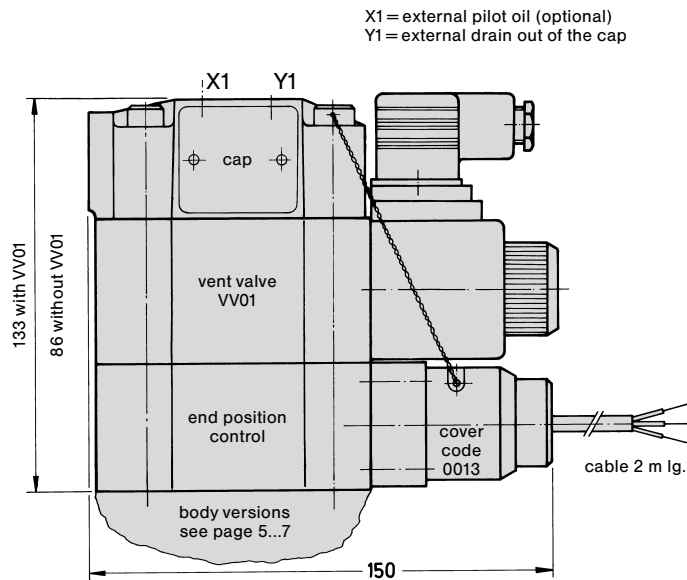
**Examples with Shuttle Valves:** Pilot oil internal from A + B  
Pilot drain external out of Y1



1) Pilot oil from A + B.  
From B → A check valve function with orifice in BY.

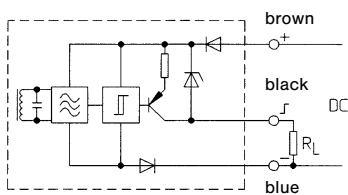
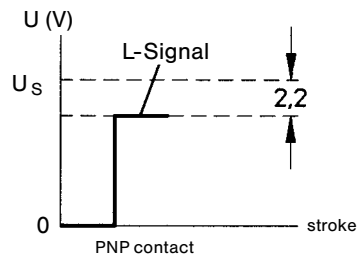
by proximity switch (incl. amplifier). Valve open: proximity switch damped.  
This proximity switch is pressure proof and has no wearing parts.

**Note:** End position control for D5S08 and D5S10 only.

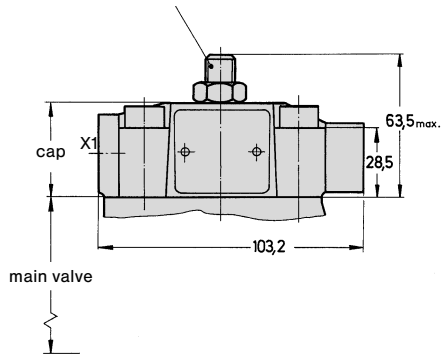


**Technical Data (Proximity switch):**

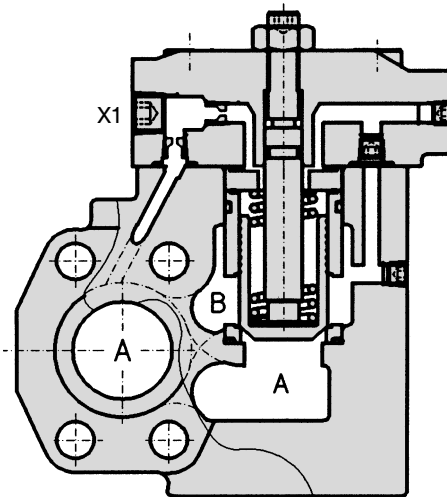
- Function: PNP, Contact
- Supply voltage (U<sub>s</sub>): 10...30 VDC
- Supply voltage ripple: ≤ 10 %
- Current consumption: max. 8 mA
- Residual voltage L-Signal: U<sub>s</sub> - 2.2 V at I<sub>max</sub>
- Output current (I): ≤ 200 mA
- Type of protection: IP 67
- Ambient temperature: -25 ... + 70 °C
- Wire cross-sectional area: 3 × 0.5 mm<sup>2</sup>



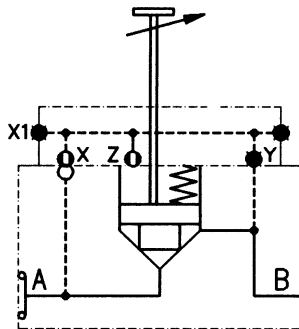
Stroke limiter (Adjustment should take place at minimum pressure).



X1 = external pilot oil (optional)



Example: D5S<sub>10</sub><sup>08</sup>-11A-...



Ports	Function	Port sizes
A	inlet or outlet	1", 1 1/4" SAE 61
B	outlet or inlet	1", 1 1/4" SAE 61
X1	external pilot port	G 1/4" / SAE-4

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

Recommended Spring, Spool, Sleeve Combinations for Series D5S

Spring  
Spool  
Sleeve

D5S\*\*\_\*\*\*-    ↓    ↓    ↓

+ spool 1 & 2: spring side pressure must not exceed pressure at A-Port by more than 20 bar.

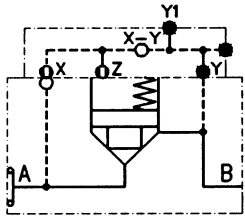
Directional and flow control function Flow A→B		<table border="0"> <tr><td>←</td><td>1</td><td>4</td><td>4</td><td></td></tr> <tr><td></td><td>1</td><td>2+</td><td>4</td><td>▶</td></tr> </table>	←	1	4	4			1	2+	4	▶		Pressure unloading function
←	1	4	4											
	1	2+	4	▶										
Directional and flow control function Flow A→B or B→A		<table border="0"> <tr><td>←</td><td>3</td><td>4</td><td>4</td><td></td></tr> <tr><td></td><td>1</td><td>4</td><td>*</td><td>▶</td></tr> </table>	←	3	4	4			1	4	*	▶		Check valve function
←	3	4	4											
	1	4	*	▶										
Pressure control function		<table border="0"> <tr><td>←</td><td>1</td><td>1+</td><td>4</td><td></td></tr> <tr><td></td><td>3</td><td>4</td><td>*</td><td>▶</td></tr> </table>	←	1	1+	4			3	4	*	▶		Pilot operated check valve function
←	1	1+	4											
	3	4	*	▶										
Flow control function with throttle spool B (10°) or C (3°) for D5S08 & D5S10 only)		<table border="0"> <tr><td>←</td><td>3</td><td>B(C)</td><td>*</td><td></td></tr> <tr><td></td><td>3</td><td>A</td><td>2(4)</td><td>▶</td></tr> </table>	←	3	B(C)	*			3	A	2(4)	▶		Directional control function with safety spool (for end position control, for D5S08 & D5S10 only)
←	3	B(C)	*											
	3	A	2(4)	▶										

\*spring as per requested cracking pressure

# Model Code Explanation

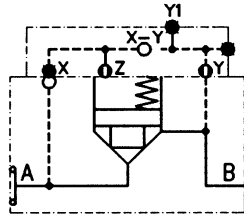
## Cap

### Seat Entry



D5S..-111-  
7

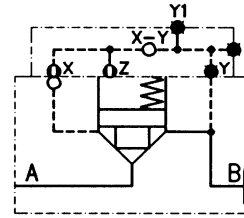
Pilot oil: internal from A



D5S..-122-  
7

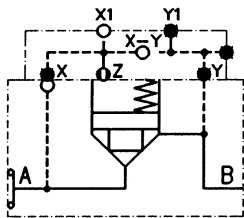
Pilot oil: internal from B

### Annular Entry



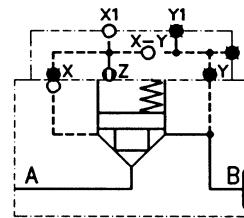
D5S..-221-  
8

Pilot oil: internal from B



D5S..-143-  
7

Pilot oil: external from X1

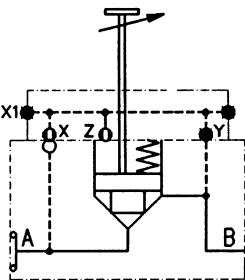


D5S..-243-  
8

Pilot oil: external from X1

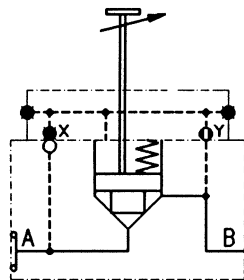
## Stroke Limiter

### Seat Entry



D5S08-11A-  
10 7

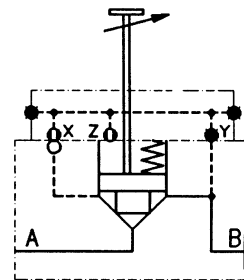
Pilot oil: internal from A



D5S08-12B-  
10 7

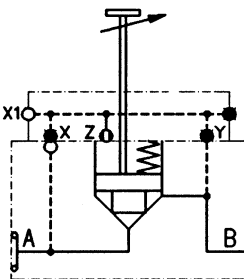
Pilot oil: internal from B

### Annular Entry



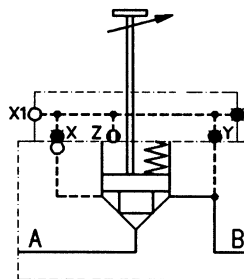
D5S08-22A-  
10 8

Pilot oil: internal from B



D5S08-14C-  
10 7

Pilot oil: external from X1



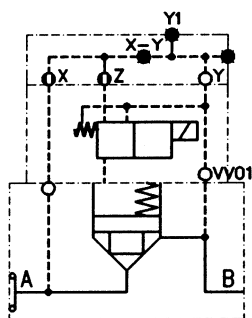
D5S08-24C-  
10 8

Pilot oil: external from X1

# Model Code Explanation

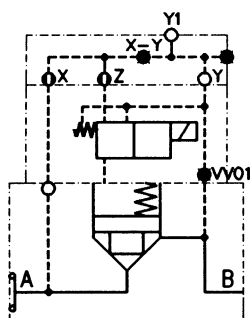
## with Vent Valve VV01

### Seat Entry



D5S...-114-...-09-  
7 10  
11  
12

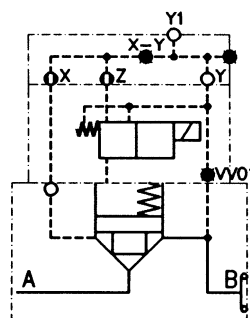
Pilot oil: internal from A  
Pilot drain: internal to B



D5S...-116-...-09-  
7 10  
11  
12

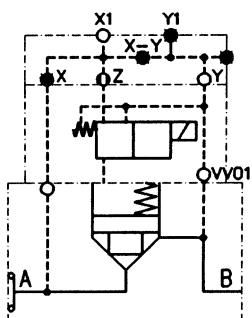
Pilot oil: internal from A  
Pilot drain: external out of Y1

### Annular Entry



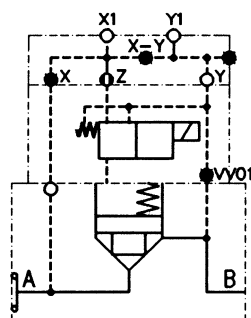
D5S...-226-...-09-  
8 10  
11  
12

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



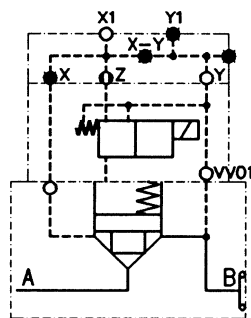
D5S...-145-...-09-  
7 10  
11  
12

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



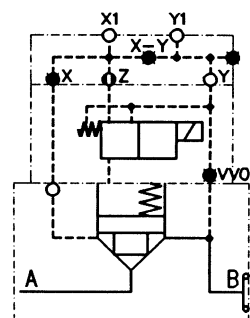
D5S...-147-...-09-  
7 10  
11  
12

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



D5S...-245-...-09-  
8 10  
11  
12

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

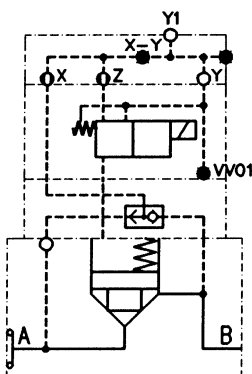


D5S...-247-...-09-  
8 10  
11  
12

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

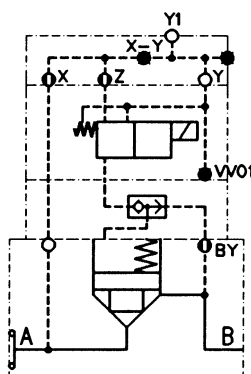
## with VV01 + Shuttle Valve

### Seat Entry



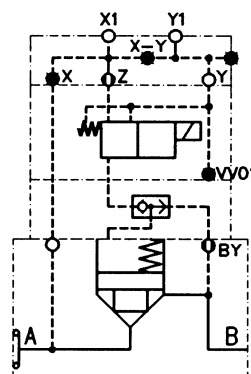
D5S...-136-...-CB-  
7 CD

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



D5S...-136-...-DB-  
7 DD

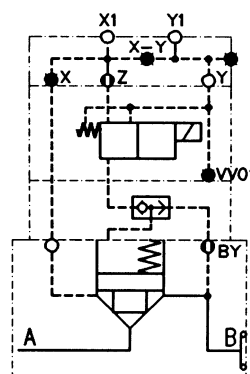
Pilot oil: internal from A +  
internal from B  
Pilot drain: external out of Y1



D5S...-157-...-DB-  
7 DD

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

### Annular Entry



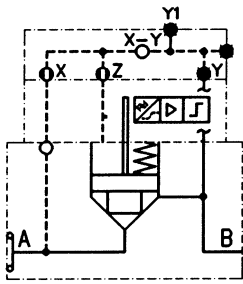
D5S...-857-...-DB-  
2 DD

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

# Model Code Explanation

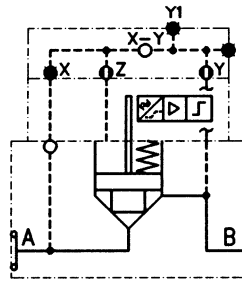
## Examples for End Position Control

Seat Entry



D5S08-111-3A.-BA-  
D5S10 7

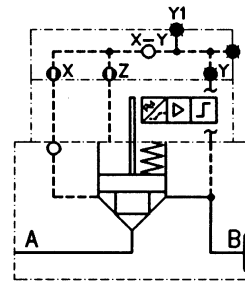
Pilot oil: internal from A



D5S08-122-3A.-BA-  
D5S10 7

Pilot oil: internal from B

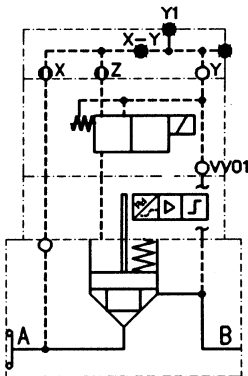
Annular Entry



D5S08-221-3A.-BA-  
D5S10 8

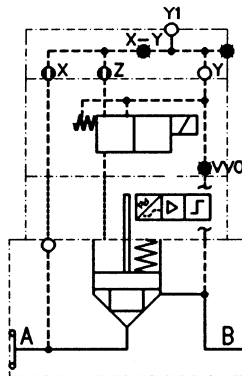
Pilot oil: internal from B

Seat Entry



D5S08-114-3A.-BC-  
D5S10 7 BE

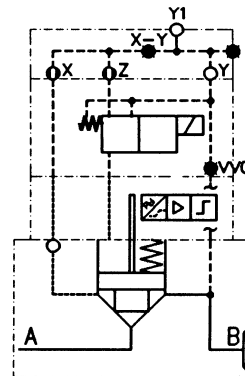
Pilot oil: internal from A  
Pilot drain: internal to B



D5S08-116-3A.-BC-  
D5S10 7 BE

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

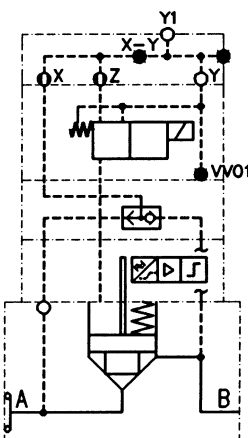
Annular Entry



D5S08-226-3A.-BC-  
D5S10 8 BE

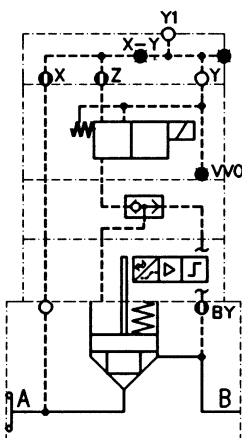
Pilot oil: internal from B  
Pilot drain: external out of Y1

Seat Entry



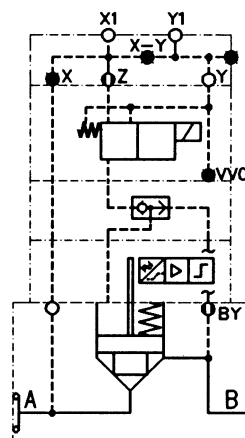
D5S...-136-...-BH-  
7 BK

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



D5S...-136-...-BN-  
7 BQ

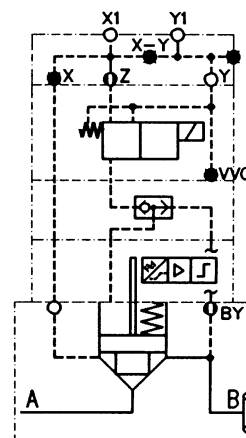
Pilot oil: internal from A +  
internal from B  
Pilot drain: external out of Y1



D5S...-157-...-BN-  
7 BQ

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

Annular Entry



D5S...-857-...-BN-  
2 BQ

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

**Ordering Code – Series D5S, 2 Ports In-Line Valves, Flange Mounted**

**Model Number:**

D5S . . . . . B 1 -

**Series**

D5S = 2/2-Seat-Way-Valve (Body Mounted Flange SAE 61)

**Size**

06 = 3/4" (CAR4 built in)  
08 = 1" (CAR2 built in)  
10 = 1 1/4" (CAR2 built in)

**Body mounting**

1 = Seat Entry, A; X1, Y1 Ports = SAE-4 (7/16"-20 UNF)  
2 = Annular Entry, B; X1, Y1 Ports = SAE-4 (7/16"-20 UNF)  
7 = Seat Entry, A; X1, Y1 Ports = G 1/4"  
8 = Annular Entry, B; X1, Y1 Ports = G 1/4"

max. pressure  
see page 2

**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

**Cap Version, Pilot Oil Line in the Cap**

1 = Pilot Oil = Pilot Drain X = ● 1.2 ; Y = ● ; Z = ● 1.2 ; X-Y = ○ ; Y1 = ●  
2 = Pilot Oil = Pilot Drain X = ● ; Y = ● 1.2 ; Z = ● 1.2 ; X-Y = ○ ; Y1 = ●  
3 = Pilot Oil = Pilot Drain X = ● ; Y = ● ; Z = ● 1.2 ; X-Y = ○ ; X1 = ○ ; Y1 = ●  
4 = Internal to B X = ● 1.2 ; Y = ○ ; Z = ● 1.2 ; X-Y = ● ; Y1 = ● ; VV01 = ○  
5 = Internal to B X = ● ; Y = ○ ; Z = ● 1.2 ; X-Y = ● ; X1 = ○ ; Y1 = ● ; VV01 = ○  
6 = External out of cap X = ● 1.2 ; Y = ○ ; Z = ● 1.2 ; X-Y = ● ; Y1 = ○ ; VV01 = ●  
7 = External out of cap X = ● ; Y = ○ ; Z = ● 1.2 ; X-Y = ● ; X1 = ○ ; Y1 = ○ ; VV01 = ●  
A = Pilot Oil = Pilot Drain X = ● 1.2 ; Y = ● ; Z = ● 1.2 ; X1 = ●  
B = Pilot Oil = Pilot Drain X = ● ; Y = ● 1.2 ; X1 = ●  
C = Pilot Oil = Pilot Drain X = ● ; Y = ● ; Z = ● 1.2 ; X1 = ○

with VV01  
only

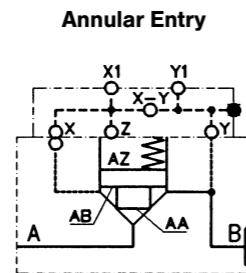
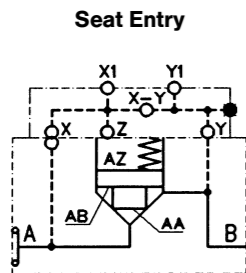
stroke limiter only  
D5S08 and D5S10

**Sleeve**

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

**Legend:**

○ open bore  
● closed bore  
● orifice  $\phi$  1.2



**Note:** Ensure that flanges meet pressure requirements.  
Denison's supply meet rated pressure specified in this leaflet.

omit for version  
without  
accessories

**Modifications**

0013 = Cover for end position control (see page 10)

**Seal class**

1 = Standard (for special fluids consult Denison)

**Design letter**

**Solenoid voltage and current (for vent valve VV01)**

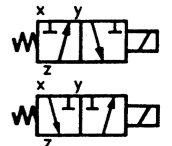
W01 = 115 V / 60 Hz  
W02 = 230 V / 60 Hz  
W06 = 115 V / 50 Hz  
W07 = 230 V / 50 Hz

G0R = 12 V  
G0Q = 24 V  
G0H = 48 V

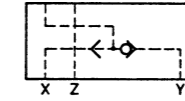
AC } DC

**Accessories**

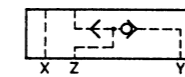
09 = VV01 with manual override } de-energized: power component open  
10 = VV01 without manual override }  
11 = VV01 with manual override } de-energized: power component closed  
12 = VV01 without manual override }



CA = Shuttle valve



DA = Shuttle valve



CB = VV01 code 09 } and shuttle valve code CA  
CD = VV01 code 11 }  
DB = VV01 code 09 } and shuttle valve code DA  
DD = VV01 code 11 }  
BH = VV01 code 10 } and shuttle valve code CA and end position control<sup>1</sup> with amplifier  
BK = VV01 code 12 }  
BN = VV01 code 10 } and shuttle valve code DA and end position control<sup>1</sup> with amplifier  
BQ = VV01 code 12 }  
BC = VV01 code 10 and end position control<sup>1</sup> with amplifier  
BE = VV01 code 12 and end position control<sup>1</sup> with amplifier  
BA = End position control<sup>1</sup> with amplifier  
BF = End position control<sup>1</sup> with amplifier and shuttle valve code CA  
BL = End position control<sup>1</sup> with amplifier and shuttle valve code DA

<sup>1</sup>) end position control  
for D5S08/10 only.  
Spring 2 or 4.  
Spool A and sleeve 3.

**Spring (approx. cracking pressure, bar)**

	Sleeve 1 (AA=95%, AB=5%)		Sleeve 3 (AA=60%, AB=40%)			
	A→B		A→B		B→A	
	D5S06	D5S08/10	D5S06	D5S08/10	D5S06	D5S08/10
1 =	2.8	3.5	6.5	6.5	9.5	11.0
2 =	0.5	0.5	1.0	1.0	1.5	1.7
3 =	0.3	0.3	0.6	0.6	0.9	1.0
4 =	2.2	2.2	4.0	3.5	5.5	6.0
5 =	-	9.0	-	16.0	-	28.0
6 =	1.2	1.2	2.0	2.2	3.0	3.8
7 =	3.0	-	8.0	-	12.0	-

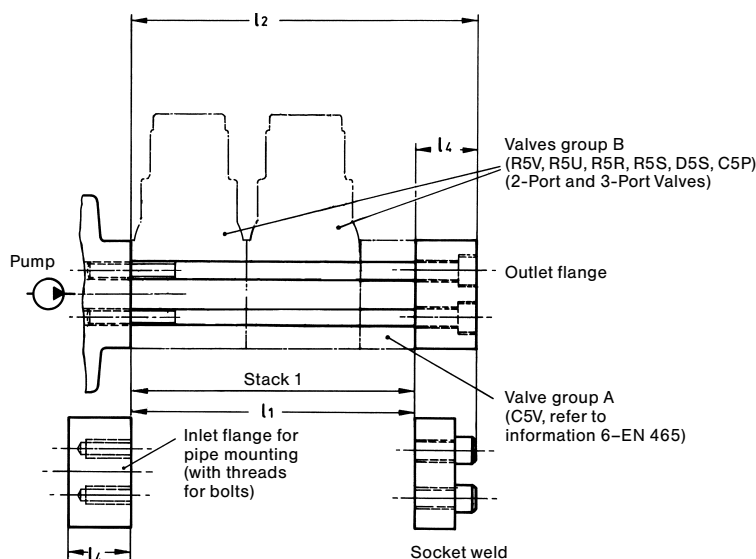
**Spool**

1 = with closed bottom and 15° chamfer ( $p_z \max = p_A + 20 \text{ bar}$ )  
2 = with 0.8 mm dia. orifice at the bottom and 15° chamfer (only D5S06)  
with 1.2 mm dia. orifice at the bottom and 15° chamfer (only D5S08, D5S10) } with sleeve 1 only  
4 = with closed bottom and 45° chamfer  
A = Safety spool (for end position control only)  
B = Throttle spool (10° chamfer)  
C = Throttle spool ( 3° chamfer) } D5S08, D5S10 & Sleeve 3 & Springs 2, 3, 6 only

See also Model Code Explanations  
pages 12, 13 and 14  
For 2 Port Pressure Valves R5\* see bulletin 3-EN 285.  
For 2 Port Check Valves C5P see bulletin 6-EN 470.

# Mounting Instruction

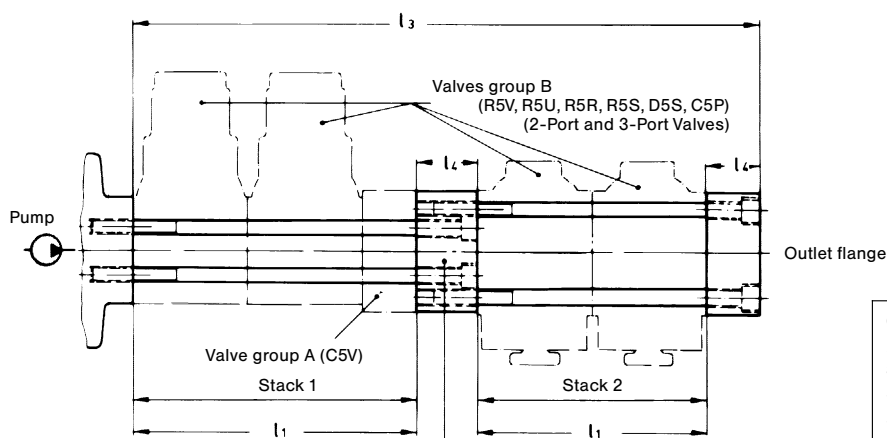
## Example – Single Stack



### Note:

Each stack 1 and 2 can consist of any number of valves from 1 to 3. The valves selected for each stack may consist of any desired combination. 2 stack in-line arrangements are displaced 90° to each other.

## Example – Double Stack



Coupling plate  
separate order no. only:  
3/4" = S16-86554  
1" = S16-86555  
1 1/4" = S16-86556

	Qty. of valves and group for each stack	Fixing screws	Order no. for screws	l <sub>1</sub>	l <sub>2</sub>	l <sub>3</sub>	l <sub>4</sub>
3/4"	1 x A	3/8" UNC x 2 1/4"	358-16260-0	25.4	59.4	118.8	34.0
	1 x B	3/8" UNC x 3 3/4"	358-16350-0	60.0	94.0	188.0	
	(1 x A) + (1 x B)	3/8" UNC x 4 3/4"	358-16390-0	85.4	119.4	238.8	
	2 x B	3/8" UNC x 6"	358-16440-0	120.0	154.0	308.0	
	(1 x A) + (2 x B)	3/8" UNC x 7"	358-16480-0	145.4	179.4	358.8	
1"	3 x B	3/8" UNC x 8 1/2"	358-16540-0	180.0	214.0	428.0	34.0
	1 x A	3/8" UNC x 2 3/4"	358-16300-0	30.7	64.7	129.4	
	1 x B	3/8" UNC x 3 3/4"	358-16350-0	60.0	94.0	188.0	
	(1 x A) + (1 x B)	3/8" UNC x 5"	358-16400-0	90.7	124.7	249.4	
	2 x B	3/8" UNC x 6 1/4"	358-16450-0	120.0	154.0	308.0	
1 1/4"	(1 x A) + (2 x B)	3/8" UNC x 7 1/2"	358-16500-0	150.7	184.7	369.4	39.0
	3 x B	3/8" UNC x 8 1/2"	358-16540-0	180.0	214.0	428.0	
	1 x A	7/16" UNC x 3"	358-18320-0	35.0	74.0	148.0	
	1 x B	7/16" UNC x 4 1/2"	358-18380-0	75.0	114.0	228.0	
	(1 x A) + (1 x B)	7/16" UNC x 6"	358-18440-0	110.0	149.0	298.0	
1 1/4"	2 x B	7/16" UNC x 7 1/2"	358-18500-0	150.0	189.0	378.0	39.0
	(1 x A) + (2 x B)	7/16" UNC x 9"	358-18560-0	185.0	224.0	448.0	
1 1/4"	3 x B	7/16" UNC x 10 1/2"	358-18590-0	225.0	264.0	528.0	

Tightening Torque:  
3/8" UNC = 34 Nm  
7/16" UNC = 54 Nm