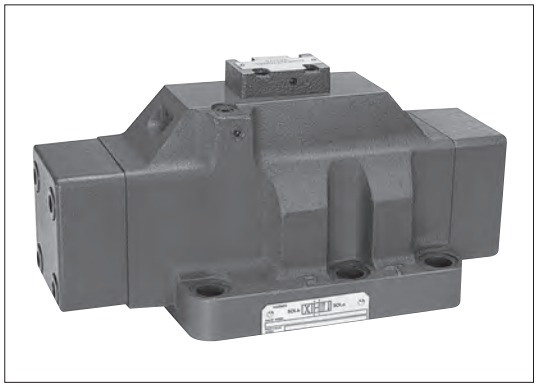
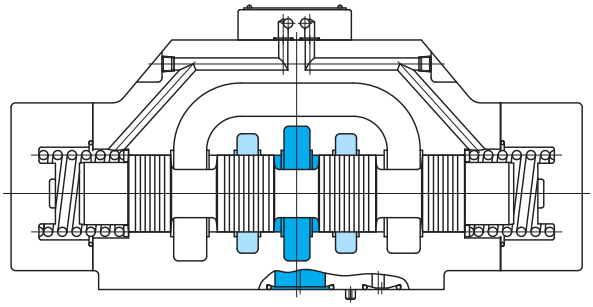
Pilot operated directional control valves
DG3S-10





Model Code

(F3)-DG3S-10-2A-JA-10(-LH)-M

1 | 2 | 3 | 4 | 5 | 6 | 7

1 Hydraulic fluid
Omit: mineral oil based fluid, water-glycol based fluid
F3: Phosphate ester

2 Pilot operated directional control valve (gasket mounting)

3 Mounting dimensions
10: ISO 4401-AF-10-4-A

4 Spool type
See page E19-2

5 Spool/spring arrangement
A: Spring offset
C: Spring centered
D: Pressure centered
Omit: no spring

6 Design no.

7 Cover build orientation (only for spring offset type)
Omit: standard (when offset, P to A, B to T)
LH: Left hand build (when offset, P to B, A to T)

Specifications

Model Code	Size	Max. Working Pressure MPa	Max. Flow L/min	Allowable T (Tank) Port Back Pressure MPa	Min. Pilot Pressure MPa	Max. Pilot Pressure MPa	Weight kg
DG3S-10	10	21	See "Pressure-Flow Characteristics"	21	See Min. Pilot Pressure Curves	21	40

Spool Types and Pressure-Flow Characteristics

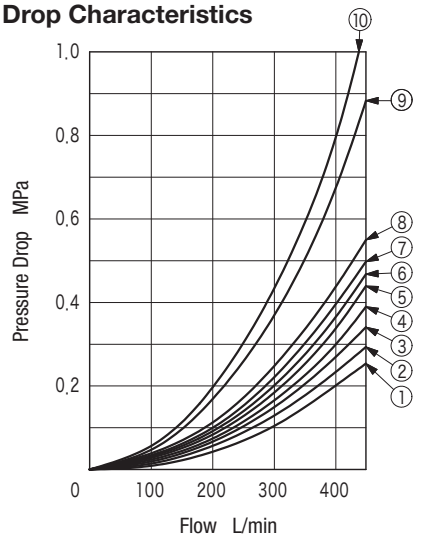
Spool Center Position	Model Code, Functional Symbol		Max. Flow L/min		Pressure Drop Curve Number				
	Spring Centered	Pressure Centered Type			Switched Condition				Neutral
	− C −	− D −	C Type	D Type	P→A	B→T	P→B	A→T	P→T
0	DG3S-10-0C	DG3S-10-0D	600	800	①	⑤	①	③	③
2	DG3S-10-2C	DG3S-10-2D	600	800	②	⑥	②	④	—
3	DG3S-10-3C	DG3S-10-3D	600	800	②	⑧	③	③	—
4	DG3S-10-4C	DG3S-10-4D	600	800	⑥	⑨	⑦	⑩	⑥
6	DG3S-10-6C	DG3S-10-6D	600	800	②	④	②	③	—
8	DG3S-10-8C	DG3S-10-8D	600	800	④	⑨	⑤	⑩	⑥
9	DG3S-10-9C	DG3S-10-9D	* 570	800	②	④	②	③	—
33	DG3S-10-33C	DG3S-10-33D	600	800	②	⑥	②	⑥	—

Spool Transient Condition	Model Code, Functional Symbol			Max. Flow L/min		Pressure Drop Curve Number			
	2 Position					Switched Condition			
	Spring Offset		No Spring	A Type, A-LH Type	No Spring	P→A	B→T	P→B	A→T
	−A−	−A−LH−							
0	DG3S-10-0A	DG3S-10-0A-LH	DG3S-10-0	600	800	①	⑤	①	③
2	DG3S-10-2A	DG3S-10-2A-LH	DG3S-10-2	600	800	②	⑥	②	④
6	DG3S-10-6A	DG3S-10-6A-LH	DG3S-10-6	600	800	②	④	②	③

Note: • Max. flow refers to limit flow without valve malfunction for valve switching.
• * mark indicates max. flow at 7 MPa working pressure. At 21 MPa, it is 320 L/min.

Characteristics Curve (viscosity 20 mm²/s, specific gravity 0.87) (typical examples)

Pressure Drop Characteristics



1. For pressure drops ($\triangle P_1$) of viscosities other than 20 mm²/s, calculate using multiplier coefficients shown in below table.
2. The formula to calculate pressure drops ($\triangle P_1$) for specific gravities other than 0.87 is as follows.

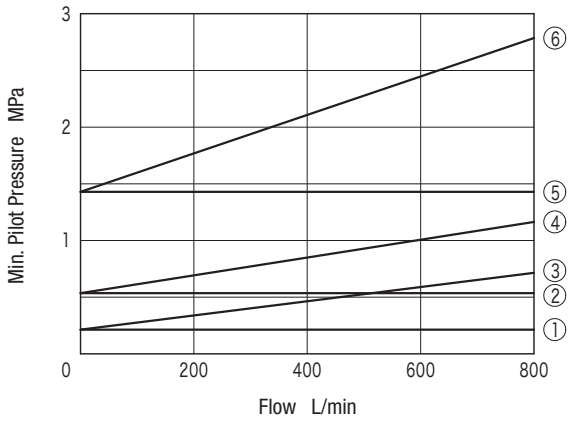
$\triangle P_1 = \triangle P \times G_1 / G$

$\triangle P$ ..... Values according to characteristics curve
G 0.87
G_1 .....Desired specific gravity value

Viscosity mm²/s	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Coefficient	0. 85	1. 00	1. 09	1. 17	1. 24	1. 29	1. 34	1. 38	1. 42	1. 46	1. 49	1. 52	1. 56	1. 59	1. 62

Characteristics Curve

Minimum Pilot Pressure



Min. Pilot Pressure Curve No.

Spool/Spring Arrangement	Spool Type	No.
No Spring	0, 9	①
	2, 6	③
A, A–LH, C	0, 4, 8, 9	②
	2, 3, 6, 33	④
D	0, 4, 8, 9	⑤
	2, 3, 6, 33	⑥

Notes on Operation

- Pilot
  Supply of pilot pressure to pilot ports X, Y may differ by spool/spring arrangement. Pilot circuit should be designed according to the reference table below (for spool types 4 and 8, pilot port X and Y relationship will be reversed).

Valve Switched Condition	P→A, B→T		Neutral		P→B, A→T	
Pilot Port	X	Y	X	Y	X	Y
Spring Offset, A Type	D	D	—	—	P	D
Spring Offset, A-LH Type	D	P	—	—	D	D
Spring Centered, C Type	D	P	D	D	P	D
Pressure Centered, D Type	D	P	P	P	P	D
No Spring	D	P	—	—	P	D

P: Pilot pressure supplied
D: Drained to tank

- Minimum Pilot Pressure
  For valve switching, differential pressure between X port and Y port must be higher than the minimum pilot pressure. Therefore when there is back pressure in the drain side port, pilot pressure supplied must be higher than the minimum pilot pressure + drain port back pressure. For spring centered, spring offset, and pressure centered types, when pressure falls below minimum pilot pressure, spool will be returned to the prescribed position by spring force. With no spring types, spool positioning is unstable. Always maintain minimum pilot pressure during valve switching.
- Drain
  Y port of spring offset type, X port of spring offset (LH) type, and W port of pressure centered type are the drain ports. Do not merge with other tank lines and pipe directly to tank.
- Mounting orientation
  As long as minimum pilot pressure is maintained, there is no restriction in mounting direction.

Mounting Bolts (JIS B 1176, Strength Class 12.9)

Hex Socket Bolts	Qty
M20 × 65	6

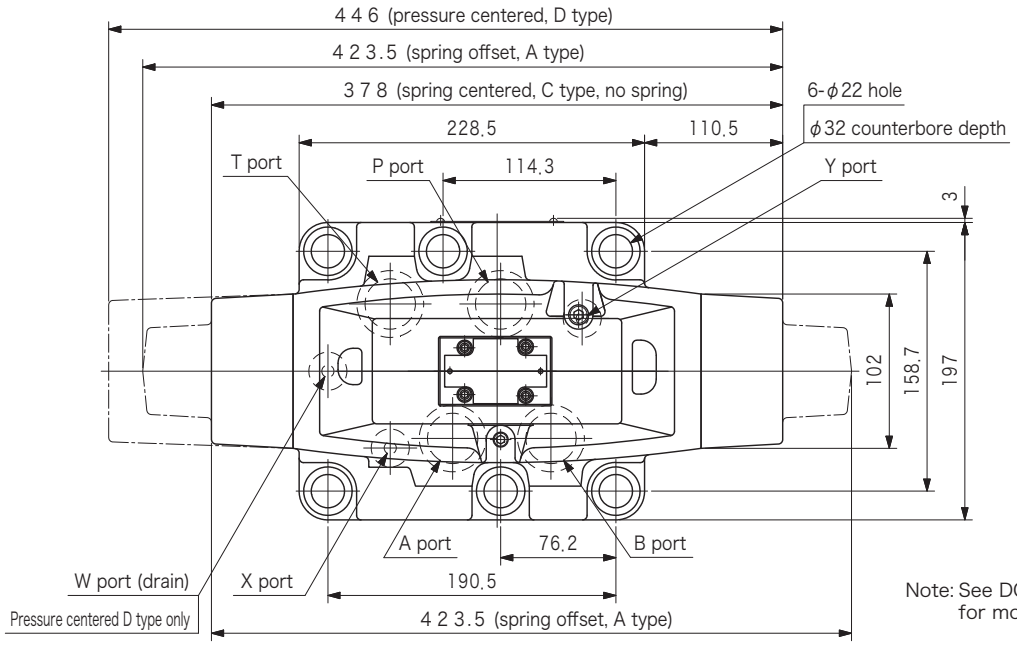
- Mounting bolts must be ordered separately.
- Tightening torque of mounting bolts: 230 to 290 N·m

Subplate

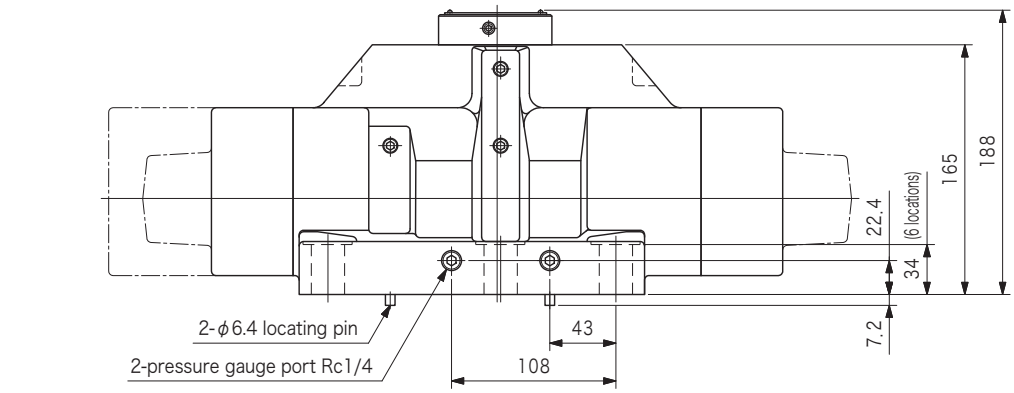
Subplate	Connection Port Dia. Rc	
	P, T, A, B	X, Y, W
DGSM–10– (D) –11–JA–M	1–1/4	3/8
DGSM–10X– (D) –11–JA–M	1–1/2	
DGSM–10Y– (D) –11–JA–M	2	

- DGSM-10*-D-11-JA-M used for pressure center type.
- Subplate must be ordered separately.
- Subplates are supplied with hex socket bolts for mounting valve.
- See page R6-5 for dimensions.

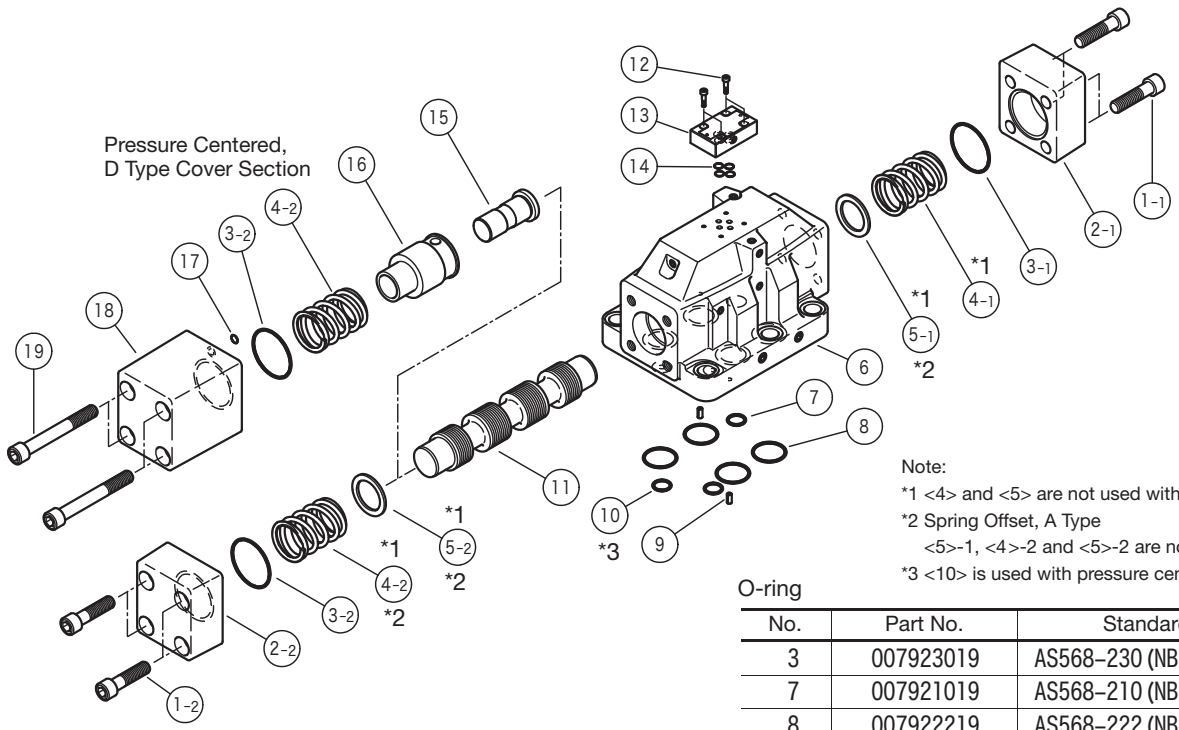
Dimensions



Note: See DG5S-10 (page E5-5) for mounting dimensions.



Construction



Note:
*1 <4> and <5> are not used with no spring types.
*2 Spring Offset, A Type
<5>-1, <4>-2 and <5>-2 are not used.
*3 <10> is used with pressure centered D type only.

O-ring

No.	Part No.	Standard	Qty
3	007923019	AS568–230 (NBR, Hs90)	2
7	007921019	AS568–210 (NBR, Hs90)	2
8	007922219	AS568–222 (NBR, Hs90)	4
10	007921019	AS568–210 (NBR, Hs90)	1
14	007901217	AS568–012 (NBR, Hs70)	4
17	007901317	AS568–013 (NBR, Hs70)	1