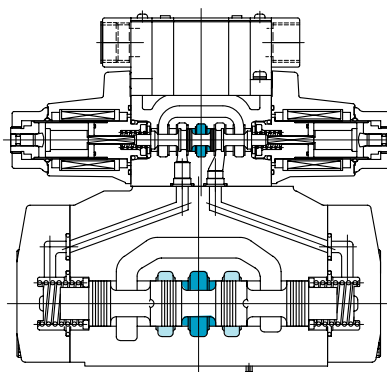


Fine Current Signal Solenoid Controlled Pilot Operated Directional Control Valves

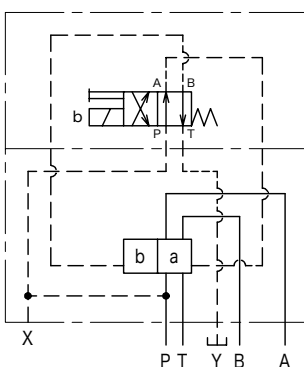
DG5VC-7 / DG5VC-H8



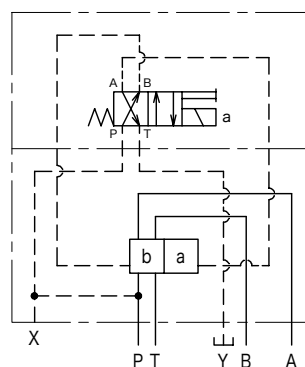
- Integrated solid state relay.
- Valve can be directly driven by connecting signal terminal to PLC, etc.
- Incorporates DG4VC-3, 56 design pilot valves.

Functional Symbols
(Internal Pilot, External Drain Types)

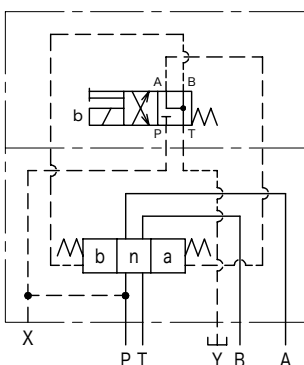
DG5VC-7/H8-*A
Spring Offset, A Type



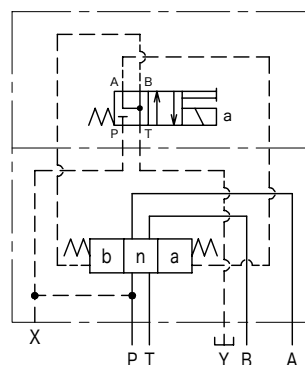
DG5VC-7/H8-*AL
Spring Offset, AL Type



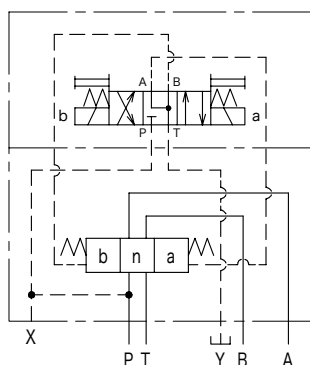
DG5VC-7/H8-*B
Spring Offset, B Type



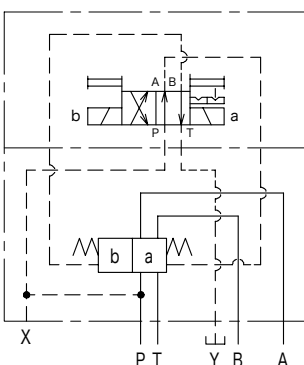
DG5VC-7/H8-*BL
Spring Offset, BL Type



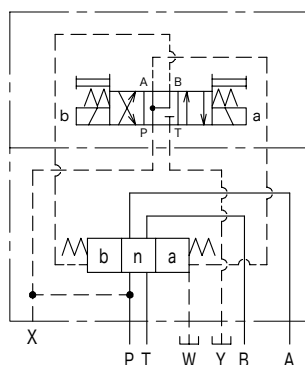
DG5VC-7/H8-*C
Spring Centered Type



DG5VC-7/H8-*N
No Spring Detented Type



DG5VC-7/H8-*D
Pressure Centered Type



Model Code

(F3) - DG5VC - 7-2A (L) - (1) - (E) -(T)- PS2- H - 86-JA

1 2 3 4 5 6 7 8 9 10 11 12

- [illegible]

Specifications

Model	Size	Max.Operating Pressure MPa	Max. Flow L/min	Allowable T (Tank) Port Back Pressure MPa	Minimum Pilot Pressure MPa	Maximum Pilot Pressure MPa	Weight kg	
							Single Solenoid	Double Solenoid
DG5VC-7	04	31. 5	See Press.-Flow Charac.	20. 6	See Min. Pilot Pressure Curves	31. 5	8. 6	9. 1
DG5VC-H8	06	31. 5	See Press.-Flow Charac.	20. 6	See Min. Pilot Pressure Curves	31. 5	16. 7	17. 2

Solenoid Specifications and Pilot Solenoid Directional Valve

Contact Point Input Type	Voltage Code	Supply Voltage	Holding Current	Power Consump.	Solenoid		Allowable Contact Voltage		Contact Current	
						Allow. Temp.	Solenoid OFF	Solenoid ON	Solenoid OFF	Solenoid ON
PS2	H	DC24V±10%	1.16A	28W	Insul. Class	180 °C	DC24V	0V±0.1V	Less than 100μA	10mA
PN2							0V±0.1V or Open	DC2~24V	Less than 100μA	15mA

Note : • Current values and power consumption varies according to temperature conditions. Table at left are based on valves at 30°C.

DG4VC-3 solenoid valve used as pilot. Following spool/spring arrangement valves are used.

Spring Offset, type A:	DG4VC-3-2A-M-**-7-56	Spring Offset, type AL:	DG4VC-3-2AL-M-**-7-56
Spring Offset, type B:	DG4VC-3-6B-M-**-7-56	Spring Offset, type BL:	DG4VC-3-6BL-M-**-7-56
Spring Center, type C:	DG4VC-3-6C-M-**-7-56	No Spring Detented, type N:	DG4VC-3-2N-M-**-7-56
Spring Center, type D:	DG4VC-3-7C-M-**-7-56		

Note: 1/8B uses DG4VC-3-6BL and 1/8BL uses DG4VC-3-6B

Spring Offset, type AL: DG4VC-3-2AL-M-**-7-56
 Spring Offset, type BL: DG4VC-3-6BL-M-**-7-56
 No Spring Detented, type N: DG4VC-3-2N-M-**-7-56

Note: 4/8B uses DG4VC-3-6BL and 4/8BL uses DG4VC-3-6B

Spool Types and Pressure-Flow Characteristics (DG5VC-7)

Spool Neutral Position		Valve Function Schematics			
		3 Position		2 Position	
		Spring Centered - C -	Pressure Centered - D -	Spring Offset, B Type - B -	
0		Open Center	DG5VC-7-0C 	DG5VC-7-0D 	DG5VC-7-0B
1		P-A-T Connection	DG5VC-7-1C 	DG5VC-7-1D 	DG5VC-7-1B
2		Closed Center	DG5VC-7-2C 	DG5VC-7-2D 	DG5VC-7-2B
3		A-T Connection	DG5VC-7-3C 	DG5VC-7-3D 	DG5VC-7-3B
4		Tandem	DG5VC-7-4C 	DG5VC-7-4D 	DG5VC-7-4B
6		A-B-T Connection	DG5VC-7-6C 	DG5VC-7-6D 	DG5VC-7-6B
8		Tandem	DG5VC-7-8C 	DG5VC-7-8D 	DG5VC-7-8B
9		Open Center w/ A, B Restrictors	DG5VC-7-9C 	DG5VC-7-9D 	DG5VC-7-9B
11		P-B-T Connection	DG5VC-7-11C 	DG5VC-7-11D 	DG5VC-7-11B
31		B-T Connection	DG5VC-7-31C 	DG5VC-7-31D 	DG5VC-7-31B
33		A-B-T Connection	DG5VC-7-33C 	DG5VC-7-33D 	DG5VC-7-33B
52		Closed Center	DG5VC-7-52C 	DG5VC-7-52D 	
X2		Closed Center	DG5VC-7-X2C 	DG5VC-7-X2D 	DG5VC-7-X2B
Y2		Closed Center	DG5VC-7-Y2C 	DG5VC-7-Y2D 	DG5VC-7-Y2B
X33		A-B-T Connection w/ Restrictors	DG5VC-7-X33C 	DG5VC-7-X33D 	DG5VC-7-X33B
Y33		A-B-T Connection w/ Restrictors	DG5VC-7-Y33C 	DG5VC-7-Y33D 	DG5VC-7-Y33B

Spool Neutral Position		Valve Function Schematics				
		2 Position				
		Spring Offset, A Type		No Spring Detented		
		- A -	- AL -	- N -		
0		Open Center	DG5VC-7-0A 	DG5VC-7-0AL 	DG5VC-7-0N 	
2		Closed Center	DG5VC-7-2A 	DG5VC-7-2AL 	DG5VC-7-2N 	
6		A-B-T Connection	DG5VC-7-6A 	DG5VC-7-6AL 	DG5VC-7-6N 	
9		Open Center w/ A, B Restrictors	DG5VC-7-9A 	DG5VC-7-9AL 	DG5VC-7-9N 	
52		Closed Center	DG5VC-7-52A 	DG5VC-7-52AL 	DG5VC-7-52N 	
X2		Closed Center	DG5VC-7-X2A 	DG5VC-7-X2AL 	DG5VC-7-X2N 	
Y2		Closed Center	DG5VC-7-Y2A 	DG5VC-7-Y2AL 	DG5VC-7-Y2N 	

Note • Maximum flow without malfunction.

2 Position Spring Offset, B Type - BL -	Max. Flow L/min					Pressure Drop Curve Number				
	7 MPa	14 MPa	21 MPa	28 MPa	31.5 MPa	Switched Condition				Neutral
						P→A	B→T	P→B	A→T	P→T
DG5VC-7-0BL 	300	300	300	300	300	②	①	②	③	③
DG5VC-7-1BL 	260	220	120	100	90	①	②	②	③	④
DG5VC-7-2BL 	300	300	300	300	300	①	②	①	②	—
DG5VC-7-3BL 	300	300	300	300	300	①	②	①	③	—
DG5VC-7-4BL 	260	220	120	100	90	②	②	②	①	⑥
DG5VC-7-6BL 	300	300	300	300	300	①	①	①	③	—
DG5VC-7-8BL 	300	300	250	165	140	②	②	②	①	⑤
DG5VC-7-9BL 	260	220	120	100	90	①	②	①	③	⑦
DG5VC-7-11BL 	260	220	120	100	90	②	③	①	②	④
DG5VC-7-31BL 	300	300	300	300	300	①	③	①	②	—
DG5VC-7-33BL 	300	300	300	300	300	①	②	①	②	—
DG5VC-7-52BL 	300	300	300	300	300	②	—	③	③	—
DG5VC-7-X2BL 	120	120	120	120	120	—	②	—	②	—
DG5VC-7-Y2BL 	120	120	120	120	120	①	—	①	—	—
DG5VC-7-X33BL 	120	120	120	120	120	—	②	—	②	—
DG5VC-7-Y33BL 	120	120	120	120	120	①	—	①	—	—

Max. Flow L/min					Pressure Drop Curve No.			
7 MPa	14 MPa	21 MPa	28 MPa	31.5 MPa	Switched Condition			
					P→A	B→T	P→B	A→T
300	300	300	300	300	②	①	②	③
300	300	300	300	300	①	②	①	②
300	300	300	300	300	①	①	①	③
260	220	120	100	90	①	②	①	③
300	300	300	300	300	②	—	③	③
120	120	120	120	120	—	②	—	②
120	120	120	120	120	①	—	①	—

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DIRECTIONAL CONTROL VALVES

Spool Types and Pressure-Flow Characteristics (DG5VC-H8)

Spool Neutral Position		Valve Function Schematics			
		3 Position		2 Position	
		Spring Centered - C -	Pressure Centered - D -	Spring Offset, B Type - B -	
0		Open Center	DG5VC-H8-0C 	DG5VC-H8-0D 	DG5VC-H8-0B
1		P-A-T Connection	DG5VC-H8-1C 	DG5VC-H8-1D 	DG5VC-H8-1B
2		Closed Center	DG5VC-H8-2C 	DG5VC-H8-2D 	DG5VC-H8-2B
3		A-T Connection	DG5VC-H8-3C 	DG5VC-H8-3D 	DG5VC-H8-3B
4		Tandem	DG5VC-H8-4C 	DG5VC-H8-4D 	DG5VC-H8-4B
6		A-B-T Connection	DG5VC-H8-6C 	DG5VC-H8-6D 	DG5VC-H8-6B
8		Tandem	DG5VC-H8-8C 	DG5VC-H8-8D 	DG5VC-H8-8B
9		Open Center w/ A, B Restrictors	DG5VC-H8-9C 	DG5VC-H8-9D 	DG5VC-H8-9B
11		P-B-T Connection	DG5VC-H8-11C 	DG5VC-H8-11D 	DG5VC-H8-11B
31		B-T Connection	DG5VC-H8-31C 	DG5VC-H8-31D 	DG5VC-H8-31B
33		A-B-T Connection	DG5VC-H8-33C 	DG5VC-H8-33D 	DG5VC-H8-33B
52		Closed Center	DG5VC-H8-52C 	DG5VC-H8-52D 	
X2		Closed Center	DG5VC-H8-X2C 	DG5VC-H8-X2D 	DG5VC-H8-X2B
Y2		Closed Center	DG5VC-H8-Y2C 	DG5VC-H8-Y2D 	DG5VC-H8-Y2B
X33		A-B-T Connection w/ Restrictors	DG5VC-H8-X33C 	DG5VC-H8-X33D 	DG5VC-H8-X33B
Y33		A-B-T Connection w/ Restrictors	DG5VC-H8-Y33C 	DG5VC-H8-Y33D 	DG5VC-H8-Y33B

Spool Neutral Position		Valve Function Schematics			
		2 Position			
		Spring Offset, A Type		No Spring Detented	
0		Open Center	DG5VC-H8-0A 	DG5VC-H8-0AL 	DG5VC-H8-0N
2		Closed Center	DG5VC-H8-2A 	DG5VC-H8-2AL 	DG5VC-H8-2N
6		A-B-T Connection	DG5VC-H8-6A 	DG5VC-H8-6AL 	DG5VC-H8-6N
9		Open Center w/ A, B Restrictors	DG5VC-H8-9A 	DG5VC-H8-9AL 	DG5VC-H8-9N
52		Closed Center	DG5VC-H8-52A 	DG5VC-H8-52AL 	DG5VC-H8-52N
X2		Closed Center	DG5VC-H8-X2A 	DG5VC-H8-X2AL 	DG5VC-H8-X2N
Y2		Closed Center	DG5VC-H8-Y2A 	DG5VC-H8-Y2AL 	DG5VC-H8-Y2N

Notes • Upper values for maximum flow for spring offset, types A, AL: lower values for no spring detent types.
• Max. flow without malfunction.

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DIRECTIONAL CONTROL VALVES

2 Position Spring Offset, B Type — BL —	Max. Flow L/min		Pressure Drop Curve Number				
	21 MPa	31.5 MPa	Switched Condition				Neutral
			P→A	B→T	P→B	A→T	P→T
DG5VC-H8-0BL 	700	650	②	⑤	②	③	④
DG5VC-H8-1BL 	650	500	①	②	②	②	⑤
DG5VC-H8-2BL 	700	700	①	②	①	②	—
DG5VC-H8-3BL 	700	700	①	②	①	④	—
DG5VC-H8-4BL 	350	220	①	④	①	③	⑥
DG5VC-H8-6BL 	650	600	①	④	①	④	—
DG5VC-H8-8BL 	700	450	①	④	①	③	⑥
DG5VC-H8-9BL 	350	220	②	④	②	③	—
DG5VC-H8-11BL 	650	500	②	②	①	②	⑤
DG5VC-H8-31BL 	700	700	①	④	①	②	—
DG5VC-H8-33BL 	700	700	①	②	①	①	—
DG5VC-H8-52BL 	700	700	②	—	⑤	②	—
DG5VC-H8-X2BL 	300	300	—	②	—	②	—
DG5VC-H8-Y2BL 	300	300	①	—	①	—	—
DG5VC-H8-X33BL 	300	300	—	②	—	②	—
DG5VC-H8-Y33BL 	300	300	①	—	①	—	—

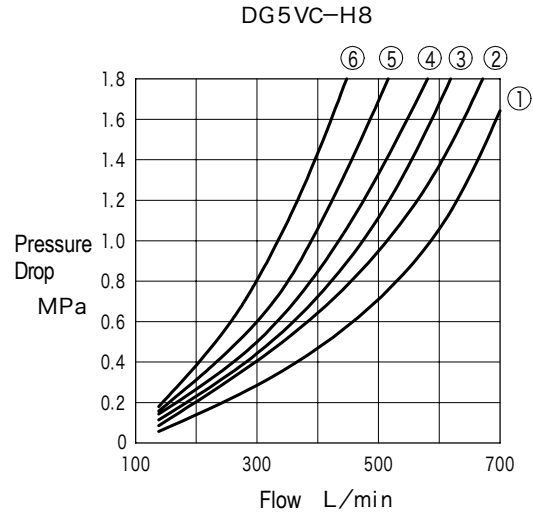
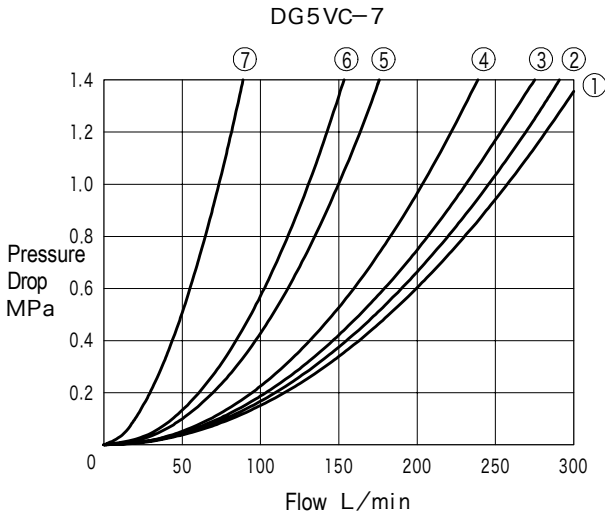
Max. Flow L/min		Pressure Drop Curve Number			
21 MPa	31.5 MPa	Switched Condition			
		P→A	B→T	P→B	A→T
500 — 700	500 — 650	②	⑤	②	③
700	700	①	②	①	②
500 — 650	500 — 600	①	④	①	④
500 — 350	500 — 220	②	④	②	③
700	700	②	—	⑤	②
300	300	—	②	—	②
300	300	①	—	①	—

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DIRECTIONAL CONTROL VALVES

Performance Curve (viscosity 20 mm²/s , specific gravity 0.87)

Pressure Drop Characteristics



- For pressure drops (ΔP_1) of viscosities other than 20mm²/s, calculate using multiplier coefficients in below table.
- The formula to calculate pressure drops (ΔP_1) for specific gravities other than 0.87 is as follows.

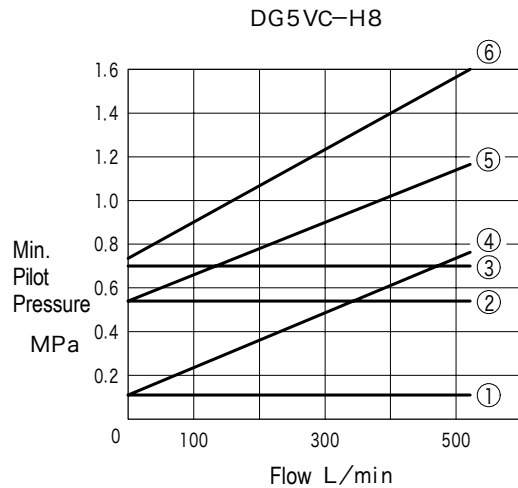
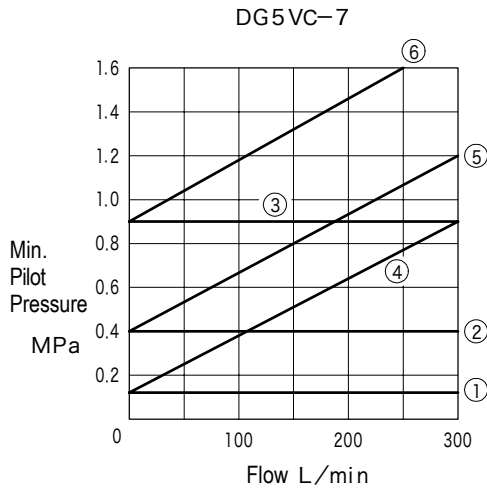
$$\Delta P_1 = \Delta P \times G_1 / G$$

ΔP characteristics curve value
 G0.87
 G_1 desired specific gravity

Viscositymm ² /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

Pilot

Minimum Pilot Pressure



Min. Pilot Pressure Curve No.

Spool/Spring Arrangement	Spool Types	Min. Pilot Press. Curve No.
A, AL	0, 9	①
	2, 6, 52, X2, Y2	④
B, BL, C, N	0, 1, 4, 8, 9, 11	②
	2, 3, 6, 31, 33, 52, X2, Y2, X33, Y33	⑤
D	0, 1, 4, 8, 9, 11	③
	2, 3, 6, 31, 33, 52, X2, Y2, X33, Y33	⑥

● In case of internal pilot, pilot pressure is equal to P port pressure.

Unit : cm ³			
Model	Spool/Spring Arrangement	Neutral to Stroke End	Stroke End to Stroke End
DG5VC-7	A, AL, N	—	8.1
	B, BL	4.1	—
	C, D	4.1	8.1
DG5VC-H8	A, AL, N	—	23
	B, BL	12	—
	C, D	12	23

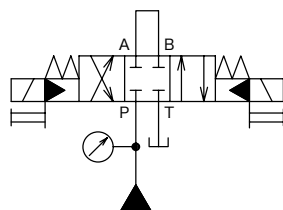
Switching Times

Unit :ms

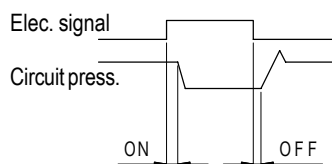
Model	Power	Operation	Pilot Pressure				
			1.5 MPa	5 MPa	15 MPa	21 MPa	25 MPa
DG5VC-7-2C	DC	Solenoid Energize	60	40	35	30	28
		Spring Return	50	50	50	50	50
DG5VC-H8-2C	DC	Solenoid Energize	145	85	70	60	45
		Spring Return	90	90	90	90	90

Note: Values may vary slightly according spool type, circuit conditions, and in case diode or rectifier is incorporated in electrical circuit.

[Circuit Example]



[Switching Time Definition]



Conditions: spool type 2, spring center type, open loop circuit, flow 300 L/min (DG5VC-7), 350 L/min (DG5VC-H8), supply pressure 31.5 MPa, fluid viscosity 20 mm²/s, fluid temperature 50°C

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DIRECTIONAL CONTROL VALVES

Spool Transient Condition

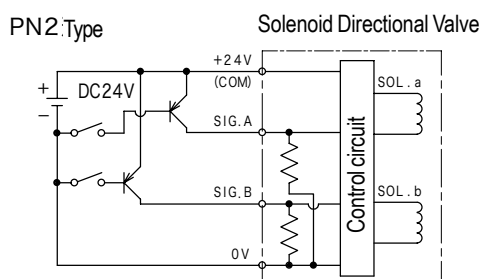
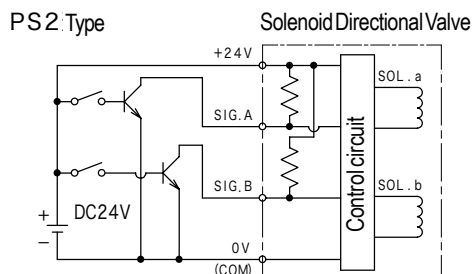
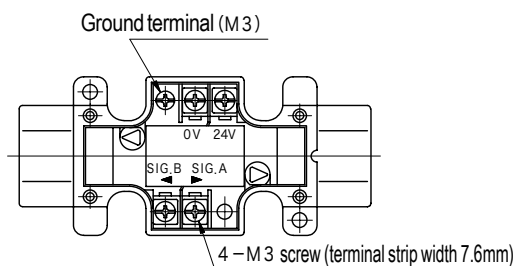
Detailed Symbol	Simple Symbol	Detailed Symbol	Simple Symbol	Detailed Symbol	Simple Symbol
0		11		X33	
1		31		Y33	
2		33		4	
3		52		8	
6		X2			
9		Y2			

Operating Considerations

- **Mounting orientation**
To ensure sure switching of no spring detented type valves, mount valves so spool axis is horizontal. There are no mounting attitude restrictions for other spool/spring arrangements.
- **Solenoid energization**
Always insure that one side solenoid is deenergized before energizing the opposite side solenoid. For spring centered and spring offset valves, solenoid should be continuously energized during circuit switching. Deenergization of solenoid will cause spool to return to prescribed position by spring force. For no spring detented type valves, spool will be maintained in switched position by the detent but to ensure sure circuit switching, solenoid should be energized for more than 0.1 second.
- **Long periods of solenoid energization**
Care should be paid as long periods of solenoid energization at high pressure may cause spool "sticking" and switching malfunction.
- **Drain and pilot**
 1. For internal drain type valves, pilot pressure (P port pressure of internal pilot valves) must be higher than min. pilot pressure + tank line back pressure. Therefore the pressure difference must be maintained even when surge pressures occur in the tank line.
 2. External drain type valve is recommended when surge pressures may occur in tank line. Drain line should also be piped directly to tank.
 3. In case of internal drain valve with spring sets B, C, and D and spool types 0, 1, 4, 8, 9, and 11, internal pilot type valve cannot be used if P to T port pressure drop during solenoid deenergization falls below minimum pilot pressure. Use external pilot type valve in this case.
- **Manual operation**
For manual switching, push the manual override pin. Be aware that actuation force increases with higher back pressure. (See page E16)
- **Solenoid indicator lamp**
For valves with indicator lamps, the lamps will light when current flows to the solenoid.

Operating Considerations (Cont'd)

- Conduit box wiring
Solenoid and conduit box are pre-wired. Refer to below diagrams for wiring from power source to conduit box or DIN connectors.
- Terminal wiring
 - Power source terminals should be connected to smoothed power source and always kept energized.
 - Signal terminals should be connected to relays and open collector transistors (PS2 type: NPN type, PN2 type, PNP type).
 - Programmable controller, etc., used should have leakage current of less than 200 μ A.
 - DO NOT reverse connect COM terminals (0V or 24V) and signal terminals (SIG. A, SIG. B) as it may damage equipment.



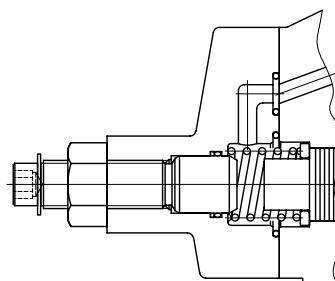
Options

Spool stroke adjustment

Spool stroke adjusters can be installed on one or both sides and provides flow control by adjustment of the spool maximum opening. Flow control can be enhanced by use X2, X33, Y2, Y33 type spools.

Pilot restrictor valve

A restrictor module valve incorporated with the pilot solenoid valve enables meter out control of oil from the pilot chamber during shifting of the main valve spool. This reduces transient shock. Stack valverestrictorvalvemod, TGMFN-3-Y-A2W-B2W-50.



Mounting Bolts (JIS B1176, Strength Class 12.9)

Model	Hex Socket Bolt	Quantity
DG5VC-7	M10 × 60	4
	M 6 × 55	2
DG5VC-H8	M12 × 80	6

- Order mounting bolts separately.
- Mounting bolt tightening torque:
M6: 9~14Nm
M10: 50~60Nm
M12: 75~81Nm

Subplate

Model	Subplate Model	Port Dia.	
		P, T, A, B	X, Y, W
DG5VC-7	DGSMV-04-10	Rc1/2	Rc1/4
	DGSMV-04-D-10		
	DGSMV-04X-10	Rc3/4	
	DGSMV-04X-D-10		
DG5VC-H8	DGSMV-06-10	Rc3/4	Rc1/4
	DGSMV-06-D-10		
	DGSMV-06X-10	Rc1	
	DGSMV-06X-D-10		

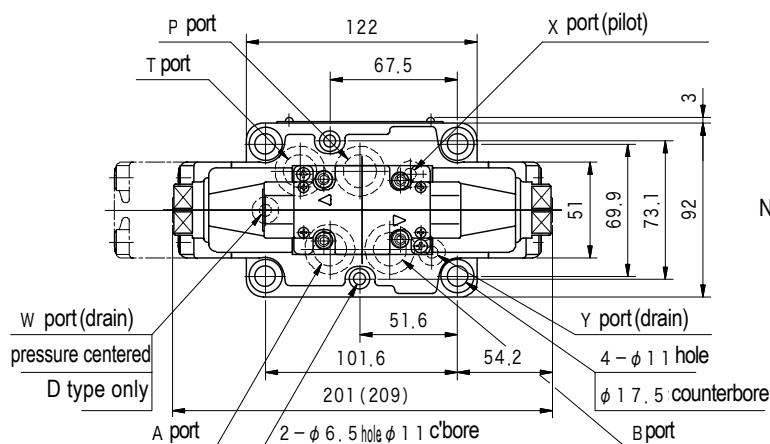
- Subplate must be ordered separately.
- Hex socket bolts for subplate mounting are included.
- See page Q6 for dimensions.
- DGSMV-**-D-10 used is pressure center type.
- Max. working pressure 21 MPa. For higher pressures, valve should be mounted on manifold block.

Dimensions

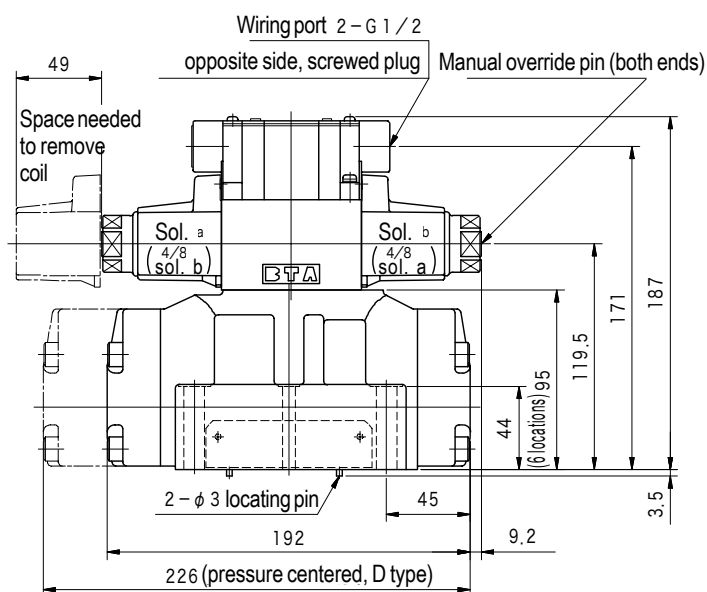
DG5VC-7-*C

DG5VC-7-*D

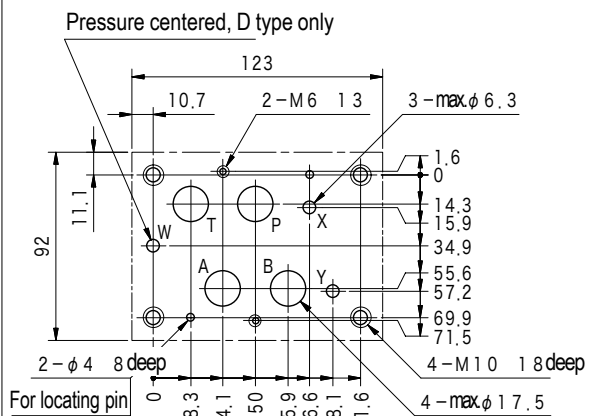
DG5VC-7-*N



Notes: - For DG5VC-7-*A, DG5VC-7-*8, solenoid valve for pilot will be only for one side (side b).
- For DG5VC-7-*AL, DG5VC-7-*BL, solenoid valve for pilot will be only for one side (side a).

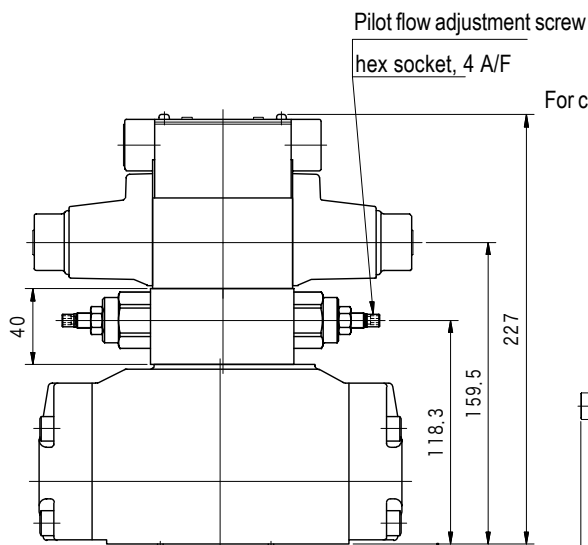


Mounting Dimensions
(ISO 4401-AD-07-4-A)

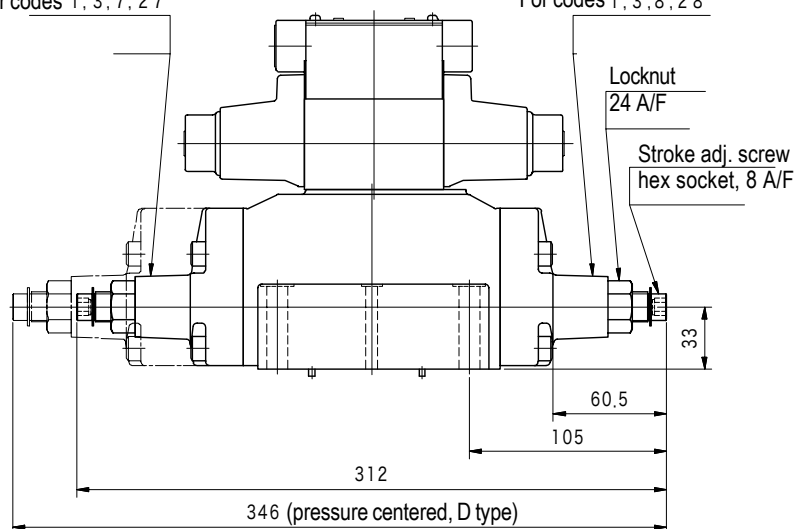


With Pilot Restrictor Valve

With Stroke Adjuster



For codes 1, 3, 7, 2, 7

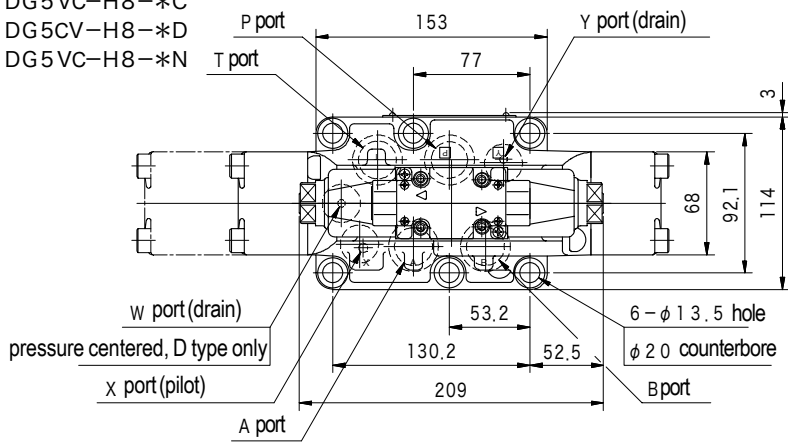


E
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DIRECTIONAL CONTROL VALVES

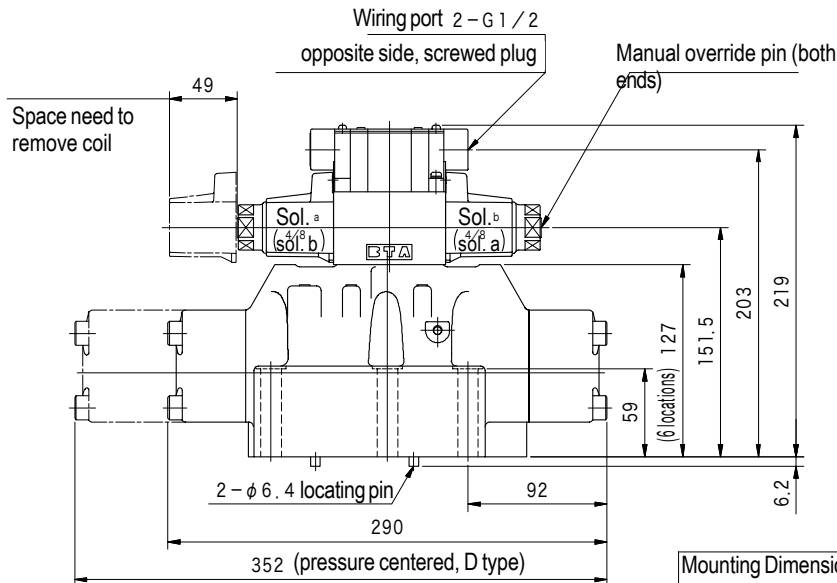
Dimensions

DG5VC-H8-*C
DG5CV-H8-*D
DG5VC-H8-*N

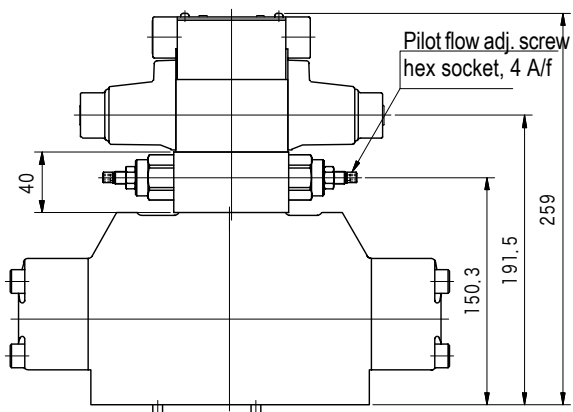


Notes:

- For DG5VC-H8-*A, DG5VC-H8-*8, solenoid valve for pilot will be only for one side (side b).
- For DG5VC-H8-*AL, DG5VC-H8-*BL, solenoid valve for pilot will be only for one side (side a).



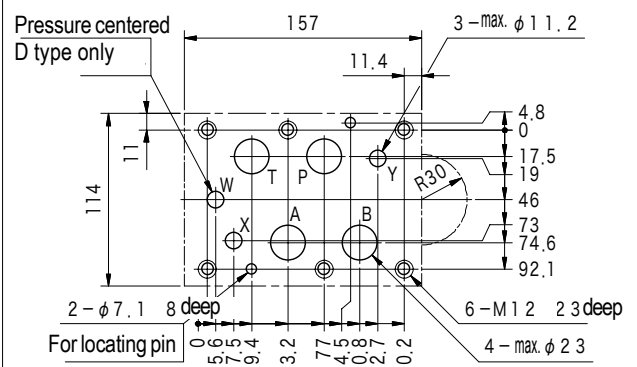
With Pilot Restrictor Valve



For codes 1, 3, 7, 2, 7

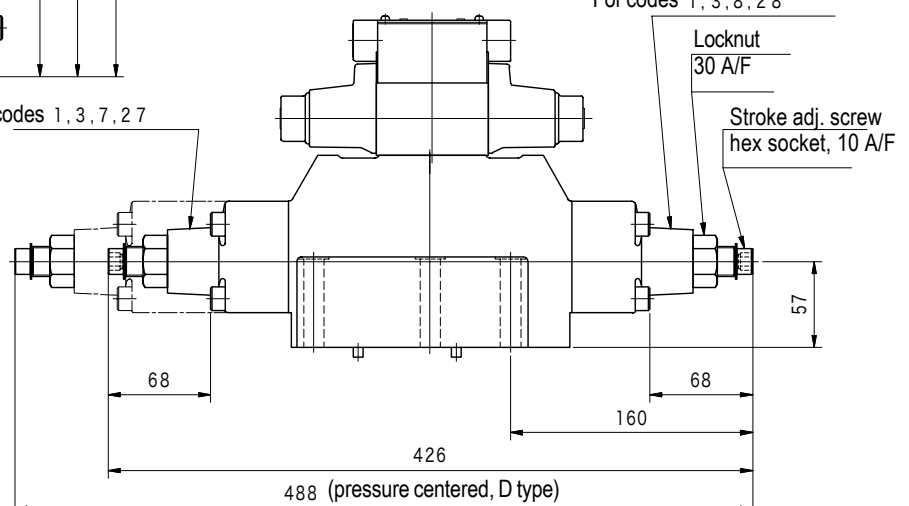
Mounting Dimensions

(ISO 4401-AE-08-4-A)



With Stroke Adjuster

For codes 1, 3, 8, 2, 8



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DIRECTIONAL CONTROL VALVES

DIRECTIONAL CONTROL VALVES

Pressure Centered, T Type Cover Section

- Notes:
- *1 ③⑦⑧ not used in DG5VC-H8
 - *2 ⑤⑥ not used in spring offset A type
 - *3 ⑫ only used with pressure centered D type
 - *4 ⑨ body differs according to pilot, internal/external drain combination.
 - *5 ⑪ solenoid directional valve DG4VC-3 model varies according to spool/spring arrangement.
- See [DG4VC-3](#).

DG5VC-H8

No.	Description	Part No.	Standard	Qty
4	O-ring	007922419	AS568-224 (NBR, Hs90)	2
10	O-ring	007921019	AS568-210 (NBR, Hs90)	2
11	O-ring	007921519	AS568-215 (NBR, Hs90)	4
12	O-ring	007921019	AS568-210 (NBR, Hs90)	1
15	O-ring	007901219	AS568-012 (NBR, Hs90)	4
18	O-ring	007901119	AS568-011 (NBR, Hs90)	1
19	O-ring	007913119	AS568-131 (NBR, Hs90)	1
25	O-ring	007902319	AS568-023 (NBR, Hs90)	1 or 2
26	Backup ring	48197581	MS28774-023	1 or 2

Note: For external pilot, external drain, O-ring 8 quantity is 1 pc.