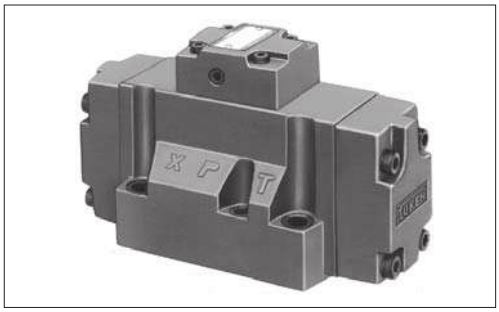
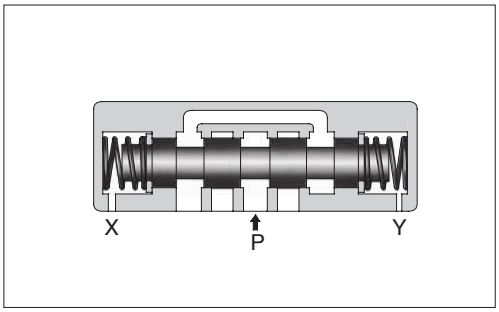
Pilot Operated Directional Valves

These valves perform a change over of spool by hydraulic pilot and shift the direction of oil flow.

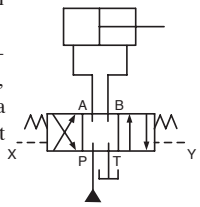




Specifications

Model Numbers	Maximum Flow L/min (U.S.GPM) 10 MPa (1450 PSI)	16 MPa (2320 PSI)	25 MPa (3630 PSI)	31.5 MPa (4570 PSI)	Max.Operating Pressure MPa (PSI)	Max. Pilot Pressure MPa (PSI)	Min. Required Pilot Pressure MPa (PSI)	Max. T-Line Back Pressure MPa (PSI)	Approx. Mass kg (lbs.)
DHG-04-3C∗-50∗	300 (79.3)★1	300 (79.3)★1	300 (79.3)★1	300 (79.3)★1	31.5 (4570)	25 (3630)	0.8 (120)	21 (3050)	7.4 (16.3)
DHG-04-2N∗-50∗	300 (79.3)	300 (79.3)	300 (79.3)	300 (79.3)					7.4 (16.3)
DHG-04-2B∗-50∗	130 (34.3)	70 (18.5)	70 (18.5)	60 (15.9)					7.8 (17.2)
DHG-06-3C∗-50∗	500 (132)★2	500 (132)★2	500 (132)★2	500 (132)★2	31.5 (4570)	25 (3630)	0.8 (120)★4	21 (3050)	11.2 (24.7)
DHG-06-2N∗-50∗	500 (132)	500 (132)	500 (132)	500 (132)					11.2 (24.7)
DHG-06-2B∗-50∗	140 (37)	100 (26.4)	90 (23.8)	80 (21.1)					11.7 (25.8)
DHG-06-3H∗-50∗	500 (132)	500 (132)	500 (132)	500 (132)★2		21 (3050)	1 (150)		12.0 (26.5)
DHG-10-3C∗-40∗	1100 (291)★3	1100 (291)★3	1100 (291)★3	1100 (291)★3	31.5 (4570)	25 (3630)	1 (150)★4	21 (3050)	43.8 (96.6)
DHG-10-2N∗-40∗	1100 (291)	1100 (291)	1100 (291)	1100 (291)					43.8 (96.6)
DHG-10-2B∗-40∗	460 (122)	300 (79.3)	220 (58.1)	200 (52.8)					45.6 (101)
DHG-10-3H∗-40∗	1100 (291)	1100 (291)	1100 (291)★3	1100 (291)★3		21 (3050)	1 (150)		51.6 (114)

Note: Max. flow in the table above represents the value in the flow condition of P→A →B →T (or P→B →A →T) as shown in the circuit diagram right.
In case the valves is used in the condition that eihter A or B port is blocked, the maximum flow differs according to a hydraulic circuit, therefore, please consult us for details.



★1. Varies depending on the spool type. For more information, see page 388 for the List of "Standard Model and Maximum Flow" (DSHG-04) for Solenoid Controlled Pilot Operated Directional Valves.
★2. Varies depending on the spool type and pilot pressure. For more information, see page 389 for the List of "Standard Model and Maximum Flow" (DSHG-06) related to the Solenoid Controlled Pilot Operated Directional Valves.
★3. Varies depending on the spool type and pilot pressure. For more information, see page 390 for the List of "Standard Model and Maximum Flow" (DSHG-10) related to the Solenoid Controlled Pilot Operated Directional Valves.
★4. Minimum Pilot Pressure for the models with pilot piston is 1.8 MPa (260 PSI).

Yuken can offer flanged connection valves described below.
Consult us for the details.

Model Numbers	Rated Flow L/min (U.S.GPM)	Max.Operating Pres. MPa (PSI)
DHF-16-∗∗∗-30∗	500 (132)	21 (3050)
DHF-24-∗∗∗-26∗	1200 (317)	
DHF-32-∗∗∗-21∗	2400 (634)	

Pressure Drop

Same as those for Solenoid Controlled Pilot Operated Directional Valves. See pages 392 and 393 for the related information.

Instruction

- In case of Spring Offset Models, directly connect the pilot pressure port "Y" to the reservoir as a drain port.

Model Number Designation

F-	DH	G	-04	-2	B	2	A	-C2	-RA	-H	-50	*
Special Seals	Series Number	Type of Connection	Valve Size	Number of Valve Positions	Spool-Spring Arrangement	Spool Type	Special Two Position Valve	Model with Pilot Choke Valve (Options) ★2	Spool Control Modification (Options) ★2	Built-in Orifice for Pilot Line	Design Number	Design Standard
F: Special Seals for Phosphate ester type fluids (Omit if not required)	**DH**: Pilot Operated Directional Valve	**G**: Sub-plate Mounting	**04**	**3**	**C**: Spring Centred	**2**, **3**, **4**, **40**, **5**, **6**, **60**, **7**, **9**, **10**, **11**, **12**	**A**★3, **B**★3 (Omit if not required)	**C2**: With C2 Choke	**R2**: With Stroke Adjustment, Both Ends	—	**50**	Refer to ★5
			06	**2**	**H**: Pressure Centred (Option) ★2				**RA**: With Stroke Adjustment, Port A End		**50**	
			10	Refer to ★1	**N**: No-Spring				**RB**: With Stroke Adjustment, Port B End	**H**: Refer to ★4	**40**	
					B: Spring Offset				**P2**: With Pilot Piston, Both Ends			
									PA: With Pilot Piston, Port A End			
									PB: With Pilot Piston, Port B End			

★1. For various combination, see the List of Valve Types below.
★2. For the option combinations of the Type (Valve Size) and Options, see the List of Options below.
★3. Refer to the column "valves using neutral position and side position" (Special 2-position valve) on page 426.
★4. In spool-spring arrangement "H" (pressure centred models), in case the pilot pressure is more than 10 MPa (150PSI), please specify that the valve should have the built-in orifice to the pilot line.
★5. Design Standards: None..... Japanese Standard "JIS" and European Design Standard
90..... N. American Design Standard

List of Valve Type

Spool Type	Valve Types			
	Three Positions		Two Positions	
	Spring Centred	Pressure★ Centred	No-Spring	Spring Offset
	Graphic Symbols			
2	3C2	3H2	2N2	2B2
3	3C3	3H3	2N3	2B3
4	3C4	3H4	2N4	2B4
40	3C40	3H40	2N40	2B40
5	3C5	3H5		
6	3C6	3H6		
60	3C60	3H60		
7	3C7	3H7	2N7	2B7
9	3C9	3H9		
10	3C10	3H10		
11	3C11	3H11		
12	3C12	3H12		

★: Pressure Centered Models are not available for the Valve Size of "04".

List of Options

Model Numbers	Option Code							
	3H*	C2	R2	RA	RB	P2	PA	PB
DHG-04-3C*	×	○	○	○	○	×	×	×
DHG-04-2N*	×	○	○	○	○	×	×	×
DHG-04-2B*	×	○	×	○	×	×	×	×
DHG-06-3C*	×	○	○	○	○	○	○	○
DHG-06-2N*	×	○	○	○	○	○	○	○
DHG-06-2B*	×	○	×	○	×	×	○	×
DHG-06-3H*	○	○	×	×	×	×	×	×
DHG-10-3C*	×	○	○	○	○	○	○	○
DHG-10-2N*	×	○	○	○	○	○	○	○
DHG-10-2B*	×	○	×	○	×	×	○	×
DHG-10-3H*	○	○	×	×	×	×	○	×

Note. ○ Mark: Available
× Mark: Not Available

Sub-plate

Valve Model Numbers	Japanese Standard "JIS"			European Design Standard			N. American Design Standard		
	Sub-plate Model Numbers	Thread Size	Approx. Mass kg (lbs.)	Sub-plate Model Numbers	Thread Size	Approx. Mass kg (lbs.)	Sub-plate Model Numbers	Thread Size	Approx. Mass kg (lbs.)
DHG-04	DHGM-04-20 DHGM-04X-20	Rc 1/2 Rc 3/4	4.4 (9.7) 4.1 (9.0)	DHGM-04-2080 DHGM-04X-2080	1/2 BSP.F 3/4 BSP.F	4.4 (9.7) 4.1 (9.0)	DHGM-04-2090 DHGM-04X-2090	1/2 NPT 3/4 NPT	4.4 (9.7) 4.1 (9.0)
DHG-06	DHGM-06-50 DHGM-06X-50	Rc 3/4 Rc 1	7.4 (16.3) 7.4 (16.3)	DHGM-06-5080 DHGM-06X-5080	3/4 BSP.F 1 BSP.F	8.5 (18.7) 8.5 (18.7)	DHGM-06-5090 DHGM-06X-5090	3/4 NPT 1 NPT	7.4 (16.3) 7.4 (16.3)
DHG-10	DHGM-10-40 DHGM-10X-40	Rc 1-1/4 Rc 1-1/2	21.5 (47.4) 21.5 (47.4)	DHGM-10-4080 DHGM-10X-4080	1-1/4 BSP.F 1-1/2 BSP.F	21.5 (47.4) 21.5 (47.4)	DHGM-10-4090 DHGM-10X-4090	1-1/4 NPT 1-1/2 NPT	21.5 (47.4) 21.5 (47.4)

- Sub-plates are available. Specify the sub-plate model number from the table above.
  When sub-plates are not used, the mounting surface should have a good machined finish.
- Sub-plates are shared with those for Solenoid Controlled Pilot Operated Directional Valves. Refer to pages 401 to 403 for dimensions.

Mounting Bolts

Model Numbers	Socket Head Cap Screw			
	Japanese Standard "JIS" European Design Standard	N. American Desgin Standard	Qty.	Tightening Torque Nm (in. lbs)
DHG-04	M6 × 45 Lg. M10 × 50 Lg.	1/4-20 UNC × 1-3/4 Lg. 3/8-16 UNC × 2 Lg.	2 4	12-15 (106-133) 58-72 (513-637)
DHG-06	M12 × 60 Lg.	1/2-13 UNC × 2-1/2 Lg.	6	100-123 (885-1089)
DHG-10	M20 × 75 Lg.	3/8-16 UNC × 2 Lg.	6	473-585 (4186-5177)

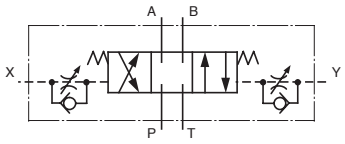
Options

Models with Pilot Choke Adjustment (C2)

When the adjustment screw is turned clockwise, changeover speed of the spool becomes slow. In case of the spring centred valves in particular, making slow of the returning speed of the spool to the neutral position is possible with a C2 choke valve.
These choke valves can be used in combination with valves of spring centred, no spring, spring offset, pressure centred and the valves with stroke adjustment.

Graphic Symbols

Spring Centred Models

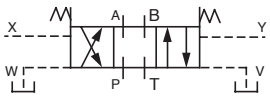


Models with Pilot Piston (P ∗)

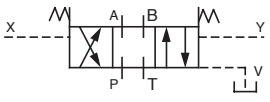
The valves with a pilot piston can be used when the high speed changeover of the spool is required. However, please note that in case of spring centred valves, there is no change in the returning speed of the spool to the neutral position even with the pilot piston.

Graphic Symbols

Spring Centred Models with Pilot Piston on Both Ends (P2)



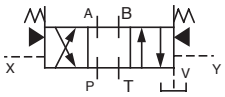
Spring Centred Models with Pilot Piston on Port "A" End (PA)



Pressure Centered Models (3H ∗)

The pressure centred type can be used when the returning of the spool to the neutral position is required to be done firmly.

Graphic Symbol

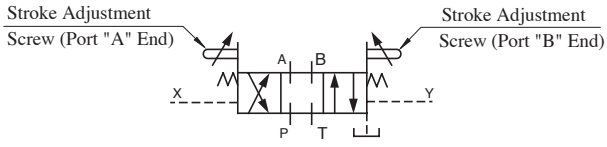


Models with Stroke Adjustment (R ∗)

When the adjustment screw is screwed in, the spool stroke becomes short and flow rate reduces

Graphic Symbol

Spring Centred Models with Stroke Adjustment on Both Ends (R2)



Additional Mass of Options

Add the mass described below to the mass of standard models on page 423 if options are required.

kg (lbs.)

Model Numbers	With Pilot Choke Valve	With Pilot Piston		With Stroke Adjustment	
		P2	PA PB	R2	RA RB
DHG-04	0.65 (1.4)	—	—	1.0 (2.2)	0.5 (1.1)
DHG-06	0.65 (1.4)	1.0 (2.2)	0.5 (1.1)	1.2 (2.6)	0.6 (1.3)
DHG-10	0.65 (1.4)	3.6(7.9)	1.8 (4.0)	3.7 (8.2)	1.85 (4.1)

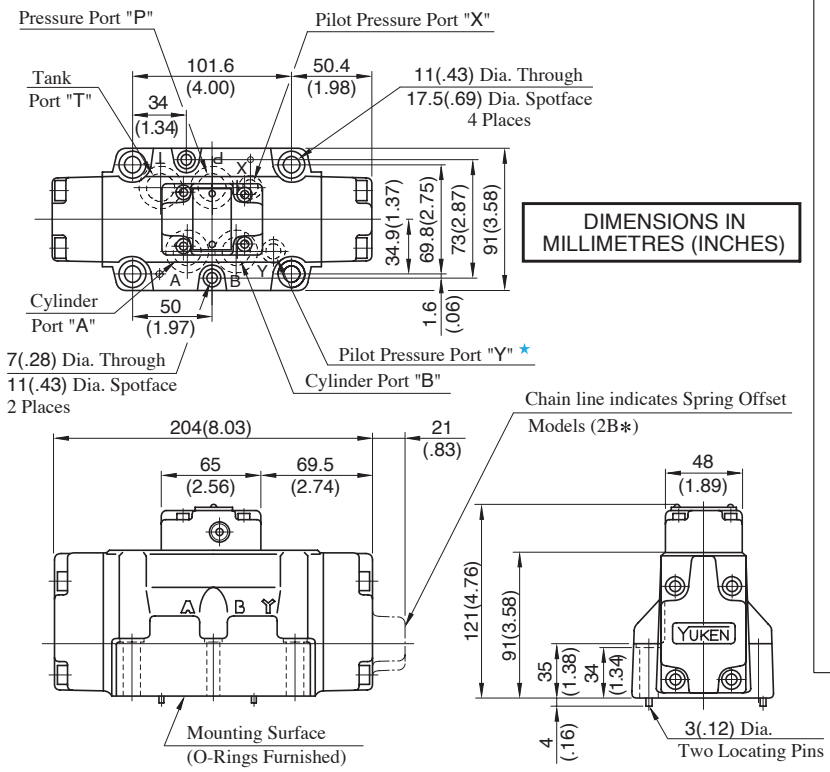
Valves Using Neutral Position and Side Position (Special Two Position Valve)

In addition to the standard two positions valves (2B∗), the following two types of two positions valves are available: valves with neutral position and pilot Y pressure position (2B∗A), valves with neutral position and pilot X pressure position (2B∗B).

Model Numbers 04 DHG-06-2B∗A 10	Graphic Symbols
DHG-∗-2B2A	
DHG-∗-2B3A	
DHG-∗-2B4A	
DHG-∗-2B40A	
DHG-∗-2B5A	
DHG-∗-2B6A	
DHG-∗-2B60A	
DHG-∗-2B7A	
DHG-∗-2B9A	
DHG-∗-2B10A	
DHG-∗-2B11A	
DHG-∗-2B12A	

Model Numbers 04 DHG-06-2B∗B 10	Graphic Symbols
DHG-∗-2B2B	
DHG-∗-2B3B	
DHG-∗-2B4B	
DHG-∗-2B40B	
DHG-∗-2B5B	
DHG-∗-2B6B	
DHG-∗-2B60B	
DHG-∗-2B7B	
DHG-∗-2B9B	
DHG-∗-2B10B	
DHG-∗-2B11B	
DHG-∗-2B12B	

DHG-04-∗∗∗-50/5090

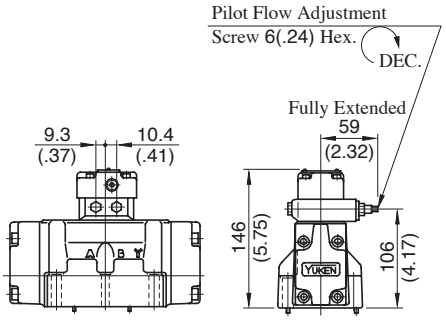


Note: For the valve mounting surface dimensions, see the dimensional drawing of the sharable sub-plate on page 401.

Mounting Surface: ISO 4401-AD-07-4-A

Options

- **Models with Pilot Choke Valve**
  DHG-04-∗∗∗-C2

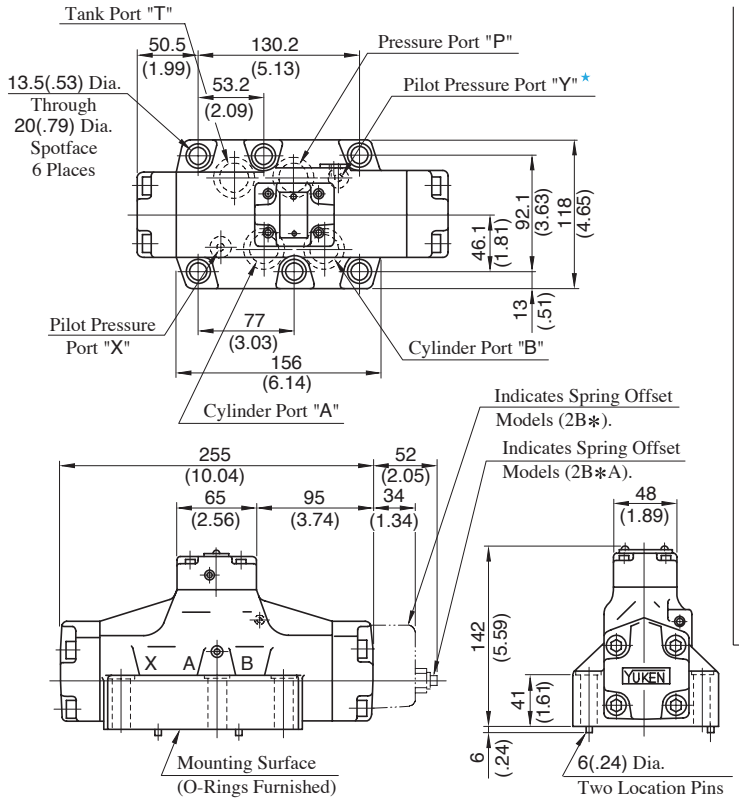


- **Models with Stroke Adj. (R∗)**
  Outside dimensions are the same as those of the main valve of Solenoid Controlled Pilot Operated Directional Valves (DSHG-04). See page 405.

★For Spring Offset Models (2B∗, 2B∗$\frac{A}{B}$), it functions as drain port. When that model is used, directly connect it to the reservoir.

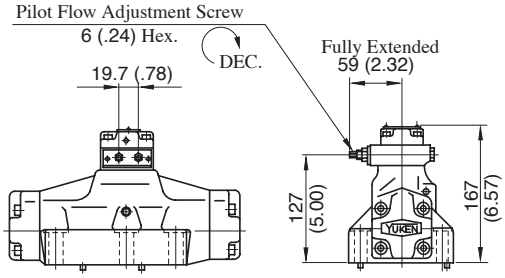
DHG-06-∗∗∗-50/5090

Mounting surface: ISO 4401-AE-08-4-A



Options

- **Models with Pilot Choke Valve**
  DHG-06-∗∗∗-C2



- **Pressure Centred Models (3H∗)**
- **Models with Stroke Adjustment (R∗)**
- **Models with Pilot Piston (P∗)**

The outside dimensions of the above options are the same as those of the main valve of Solenoid Controlled Pilot Operated Directional Valve (DSHG-06). See page 405.

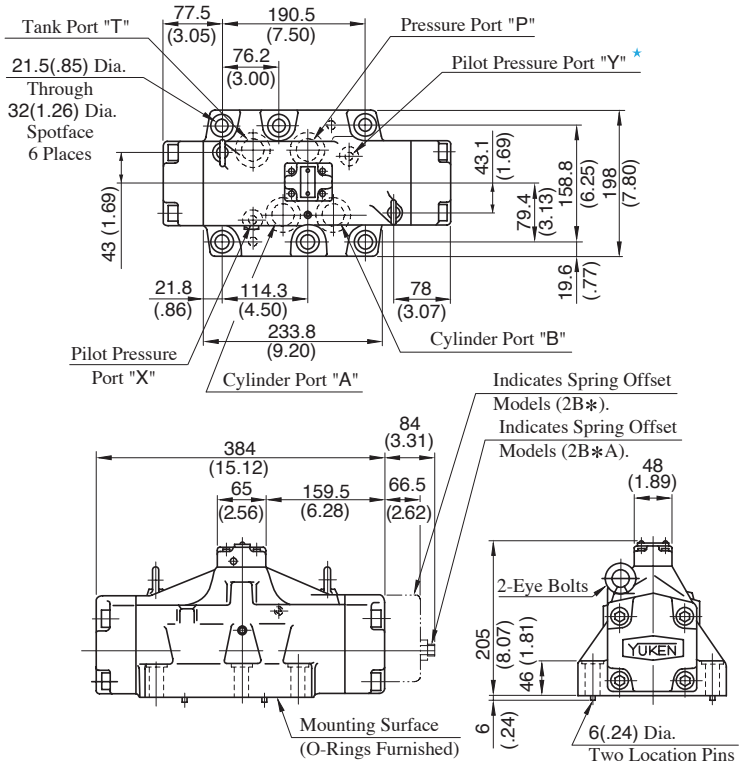
★ In case of Spring Offset Model (2B∗, 2B∗$^{A}_{B}$), it functions as a drain port. When that model is used, directly connect it to the reservoir.

DIMENSIONS IN MILLIMETRES (INCHES)

Note: For the valve mounting surface dimensions, see the dimensional drawing of the sharable sub-plate in page 402.

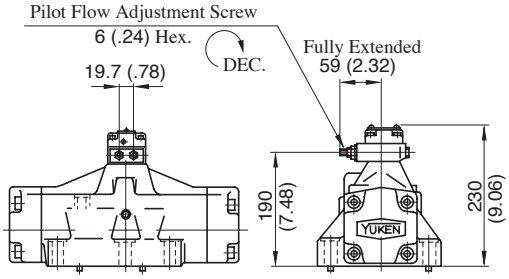
DHG-10-∗∗∗-40/4090

Mounting surface: ISO 4401-AF-10-4-A



Options

- **Models with Pilot Choke Valve**
  DHG-10-∗∗∗-C2



- **Pressure Centred Models (3H∗)**
- **Models with Stroke Adjustment (R∗)**
- **Models with Pilot Piston (P∗)**

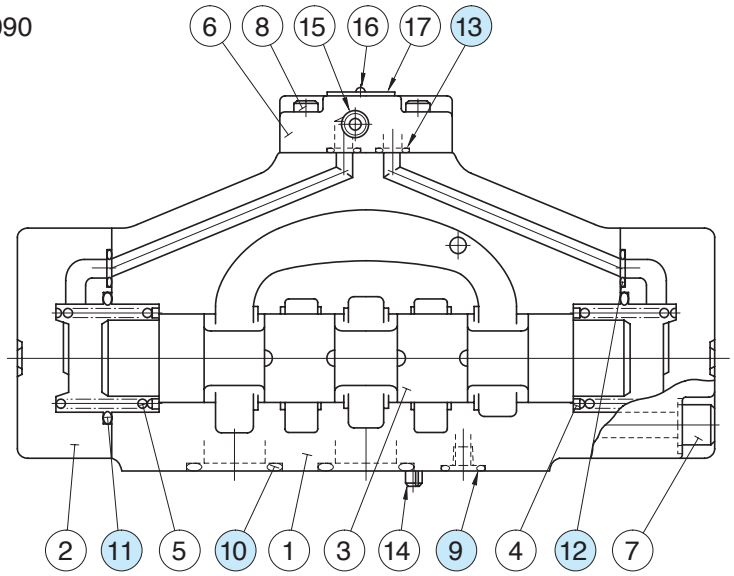
The outside dimensions of the above options are the same as those of the main valve of Solenoid Controlled Pilot Operated Directional Valves (DSHG-10). See page 405.

★ In case of Spring Offset Model (2B∗, 2B∗$^{A}_{B}$), in functions as a drain port. When that model is used, directly connect it to the reservoir.

Note: For the valve mounting surface dimensions, see the dimensional drawing of the sharable sub-plate in page 403.

List of Seals

DHG-04-∗∗∗-50/5090
DHG-06-∗∗∗-50/5090
DHG-10-∗∗∗-40/4090



Item	Name of Parts	Part Numbers			Qty
		DHG-04	DHG-06	DHG-10	
9	O-Ring	SO-NB-P9	SO-NB-P14	SO-NB-P20	2
10	O-Ring	SO-NB-P22	SO-NB-P30	SO-NB-P42	4
11	O-Ring	SO-NB-P34	SO-NB-P40	SO-NB-G65	2
12	O-Ring	SO-NB-P9	SO-NB-P10	SO-NB-P14	2
13	O-Ring	SO-NB-P9	SO-NB-P9	SO-NB-P9	4

Note: When ordering the o-rings, please specify the seal kit number from the table below.

Valve Model Numbers	Seal Kit Numbers
DHG-04-∗∗∗-50/5090	KS-DHG-04-50
DHG-06-∗∗∗-50/5090	KS-DHG-06-50
DHG-10-∗∗∗-40/4090	KS-DHG-10-40