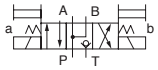
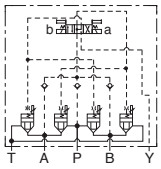
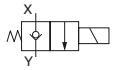
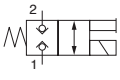
Poppet Type Directional Valves

Valve Type	Graphic Symbols	Max. Operating Pressure MPa (PSI)	Maximum Flow U. S. GPM: .5 1 5 10 50 100 200 / 1 2 5 10 20 50 100 200 500 1000 L/min	Page
Poppet Type Solenoid Operated Directional Valves		31.5 (4570)	DSLG−01	453
Multi Purpose Control Valves		25 (3630)	DSLHG−04 DSLHG−06 DSLHG−10	459
Solenoid Operated Poppet Type Two-Way Valves		21 (3050)	CDSC−01	480
		14 (2030)	CDSC−03 CDST−03※ CDSG−03	
Shut-off Type Solenoid Operated Directional Valves		25 (3630)	DSPC−01 DSPG−01 DSPC−03 DSPG−03	489

Mounting Surface

Mounting surfacedimensions conform to ISO standard discribed in below table.

Name	Model Number	ISO Code of Mounting Surface
Shut-off Type Solenoid Operated Directional Valves	DSPG-01	ISO 4401-AB-03-4-A
	DSPG-03	ISO 4401-AC-05-4-A
	DSPC-01	ISO 7789 20-01-0-93
	DSPC-03	ISO 7789 27-01-0-93
Multi Purpose Control Cavles	DSLHG-04	ISO 4401-AD-07-4-A
	DSLHG-06	ISO 4401-AE-08-4-A
	DSLHG-10	ISO 4401-AF-10-4-A

Interchangeability in Installation between Current and New Design

Model change has been made on the following products.
The difference between current and new design has been described on the paragraph of “Interchangeability in Installation between Current and New Design”. Refer to relevant pages on each series.

Name	Model Numbers		Mtg. Inter-changeability	Page	Main changes
	Current	New			
Multi Purpose Control Valves	DSLHG-04-∗-∗-12∗ DSLHG-06-∗-∗-12∗ DSLHG-10-∗-∗-12∗	DSLHG-04-∗-∗-13∗ DSLHG-06-∗-∗-13∗ DSLHG-10-∗-∗-13∗	Yes	—	Pilot valve (DSG-01) changed to design.
Solenoid Operated Poppet Type Two-Way Valves	CDS∗-03∗-C-∗-20∗	CDS∗-03∗-C-∗-21∗	Yes	488	The change of solenoid ratings.
Shut-offf Type Solenoid Operated Directional Valves	DSP∗-01-C-∗-10∗	DSP∗-01-C-∗-20∗	Yes	—	The change of solenoid.

Solenoid

Solenoid connector (DIN connector)

The solenoid connector is in accordance with the international standard ISO 4400 (Fluidpower System and components-Three-Pin electrical plug connectors-Characteristics and requirements.).

AC Solenoid

50-60 Hz common service solenoids do not require re-wiring when the applied frequency is changed.

DC Solenoid (K-series Solenoid)

K-series DC Solenoid which has a reputation for excellent DC control is employed.

1. The spark between the relay contacts has been eliminated and therefore the valve can be operated by miniature relays.
2. The surge voltage is approximately 10 % of that normally experienced.
3. Time lag on de-exercitation is reduced by approximately 50 %.

R Type Models with Current Rectifier and DC Solenoid

Specially designed DC solenoids and receptacle (or connector) containing AC-DC rectifier and transient peak suppressor are provided. Connection to be made to AC power source as with conventional AC solenoid. Remarkably high reliability and long life and other advantages including quiet valve operation. No over-heating of coil due to the spool sticking and protection against transient voltage peaks are assured.

Insulation Class of Solenoid

Model Numbers	Insulation Class
DSLG-01	Class H
DSLHG-04/06/10	
CDSC-01 CDS∗-03∗ DSP∗-01/03	

Poppet Type Directional Valves

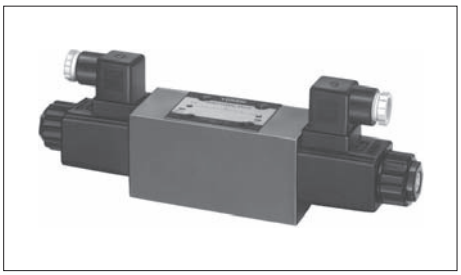
These are Solenoid Operated Directional Valves of No Leak Type developed with the aim of responding the demand of the age including energy saving. Because these valves are of no leak type they allow the low viscosity hydraulic fluids to be used as well as the circuit construction which cannot be used by the conventional spool type directional valves because of too much internal leak of pressure oil. The use of the low viscosity hydraulic fluids reduces the pressure loss which can arise from the passage resistance of the hydraulic fluids, leading to the system energy saving.

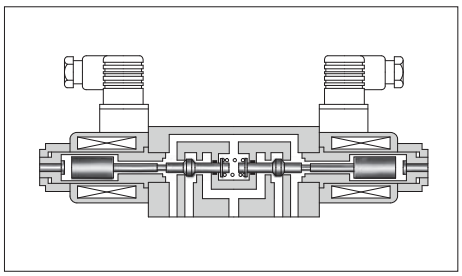
Poppet Type Solenoid Operated Directional Valves

- High Response High Reliability
  Because these valves are of poppet type, there is no overlap, high response can be achieved. At the same time, hydraulic lock is eliminated.

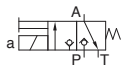
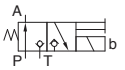
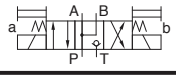
- No Leak
  Sheet type seal has been adopted and internal leak is greatly reduced.

- ISO Comformant Mounting Surface
  Because the mounting surface conforms to ISO 4401-AB-03-4-A, there is an interchangeability with the conventional valves. This makes it possible to use these valves in combination with 01 Series Modular Valves.





Specifications

Model Numbers	Max. Flow L/min (U.S.GPM)	Max. Operating Pressure MPa (PSI)	Max. T-Line Back Pressure MPa (PSI)	Max. Changeover Frequency min^{-1} {Cycles/Min}	Internal leakage cm^3/min (cu. in./min)	Approx. Mass kg (lbs.)	Graphic Symbols
DSLG-01-3-C-∗-N-11	16 (4.2)	31.5 (4570)	16 (2320)	240	Or Less 0.5 ★1 (.03)	1.9 (4.2)	
DSLG-01-3-O-∗-N-11							
DSLG-01-4-O-∗-N-11					Or Less 1 ★2 (.06)	3.7 (8.2)	

★1. This is the leakage towards "T" port in A port block at "P" port pressure 14 MPa (2030 PSI).
★2. This is the leakage towards "T" port in A•B port block at "P" port pressure 14 MPa (2030 PSI).

Solenoid Ratings

Electric Source	Coil Type	Frequency (Hz)	Voltage (V)		Current & Power at Rated Voltage	
			Source Rating	Serviceable Range	Holding (A)	Power (W)
DC (K Series)	D12	—	12	10.8 - 13.2	2.45	29
	D24	—	24	21.6 - 26.4	1.23	
AC→DC Rectified	R100	50/60	100	90 - 110	0.33	29
	R200	50/60	200	180 - 220	0.16	

Model Number Designation

F-	DSLG	-01	-4	-O	-D24	-N	-11	*
Special Seals	Series Number	Valve Size	Number of Port	Function	Coil Type	Type of Electrical Conduit Connection	Design Number	Design Standards
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	**DSLG**: Poppet Type Solenoid Operated Directional Valve (Sub-plate Mtg.)	**01**	**3**: 3 Port	**O**: Normally Open **C**: Normally Closed	DC **D12, D24** AC→DC **R100** **R200**	**N**: Plug-in Connector	**11**	Refer to ★
			4: 4 Port	**O**: Normally Open				

★ Design Standards: None ..... Japanese Standard "JIS" and European Design Standard
90 ..... N. American Design Standard

Sub-plate

Piping Size	Japanese Standard "JIS"		European Design Std.		N. American Design Std.		Approx. Mass kg (lbs.)
	Sub-plate Model No.	Thread Size	Sub-plate Model No.	Thread Size	Sub-plate Model No.	Thread Size	
1/8	DSGM-01-31	Rc 1/8	DSGM-01-3180	1/8 BSP.F	DSGM-01-3190	1/8 NPT	0.8 (1.8)
1/4	DSGM-01X-31	Rc 1/4	DSGM-01X-3180	1/4 BSP.F	DSGM-01X-3190	1/4 NPT	0.8 (1.8)
3/8	DSGM-01Y-31	Rc 3/8	—	—	DSGM-01Y-3190	3/8 NPT	0.8 (1.8)

● 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.

Mounting Bolts

Four socket head cap screws in the table below are included.

Descriptions	Socket Head Cap Screw (4 pcs.)	Tightening Torque
Japanese Standard "JIS" European Design Standard	M5 × 45 Lg.	5-7 Nm (44-62 in. lbs.) [Applicable to working pressure more than 25 MPa (3630 PSI) : 6-7 Nm (53-62 in. lbs.)]
N. American Design Standard	No. 10-24 UNC × 1-3/4 Lg.	

Instructions

● **Mounting**

No mounting restrictions for any models.

● **Solenoid Shifting**

On double solenoid valves do not energise both at the same time.

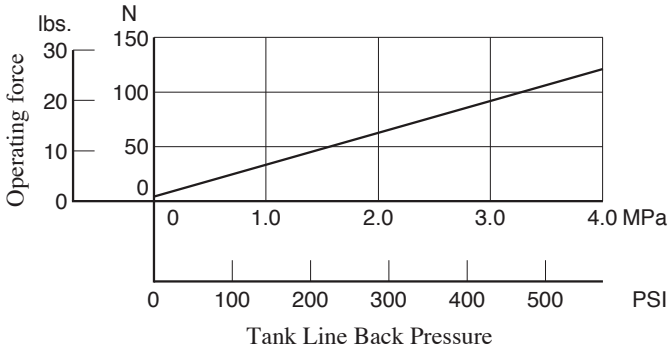
● **Valve Tank Port**

Avoid connecting the valve tank port to a line with possible surge pressure.

● **Operating Force by Manual Actuator**

Take care as the operating force by the manual actuator increases in proportion to the tank line back pressure. (See the graph right.)

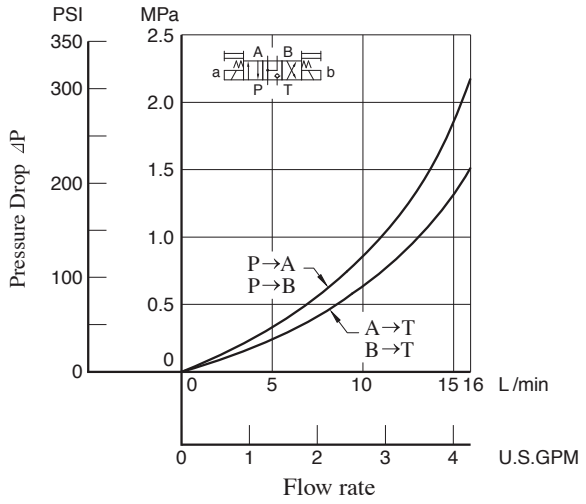
Operating Force by Manual Actuator



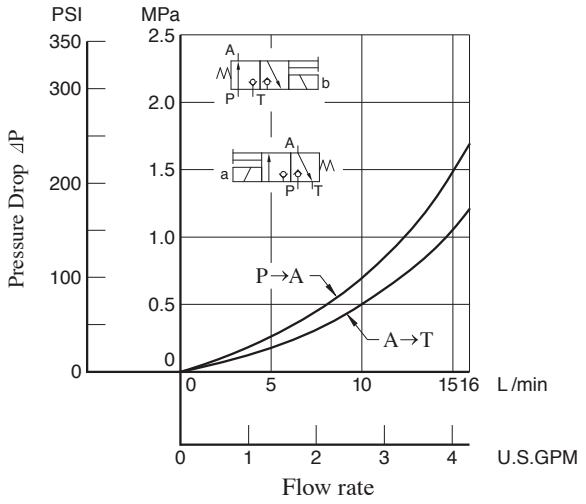
Pressure Drop

Hydraulic Fluid: Viscosity 35 mm^2/s (164 SSU), Specific Gravity 0.850

4 Port Valve



3 Port Valve



- For any other viscosity, multiply the factors in the table below.

Viscosity	mm^2/s	15	20	30	40	50	60	70	80	90	100
	SSU	77	98	141	186	232	278	324	371	417	464
Factor		0.81	0.87	0.96	1.03	1.09	1.14	1.19	1.23	1.27	1.30

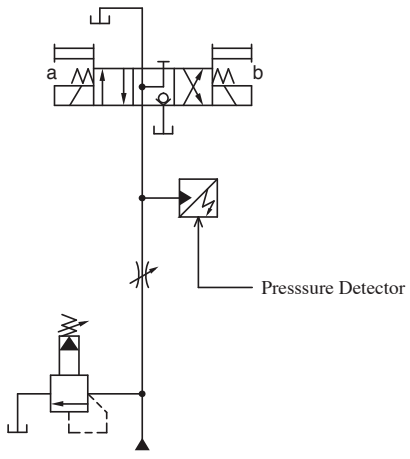
- For any other specific gravity (G'), the pressure drop (⊿P') may be obtained from the formula below.

$$\Delta P' = \Delta P\ (G'/0.850)$$

Changeover Time

Changeover time varies according to hydraulic circuit of the model actually used and conditions. An example of measurement is given in the figure below.

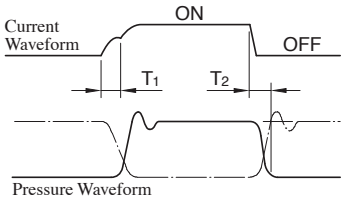
Test Circuit and Conditions



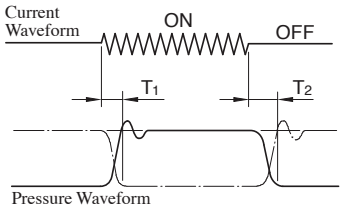
Pressure: 21 MPa (3050 PSI)
Flow Rate: 16 L/min (4.2 U.S.GPM)
Voltage: Rated voltage

Result of Measurement

(DC Solenoid)



(AC→DC Rectified)



Note: Alternate long and short dash lines in the pressure waveform figures indicate the waveforms for Normally Closed Type 3 Port Valves.

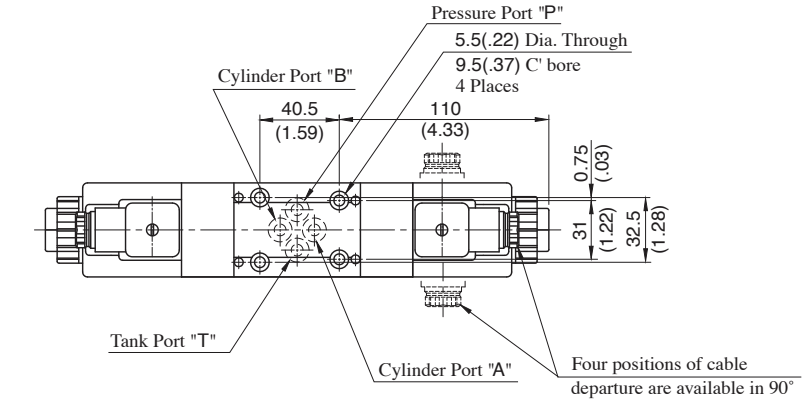
Solenoid Type	Model Numbers	Time (ms) T_1	Time (ms) T_2	Remarks
DC	DSLG-01-4-O-D*	55	30	4 port valve, normally open
	DSLG-01-3-O-D*	55	30	3 port valve, normally open
	DSLG-01-3-C-D*	70	25	3 port valve, normally closed
AC→DC Rectified	DSLG-01-4-O-R*	55	150	4 port valve, normally open
	DSLG-01-3-O-R*	55	150	3 port valve, normally open
	DSLG-01-3-C-R*	70	150	3 port valve, normally closed

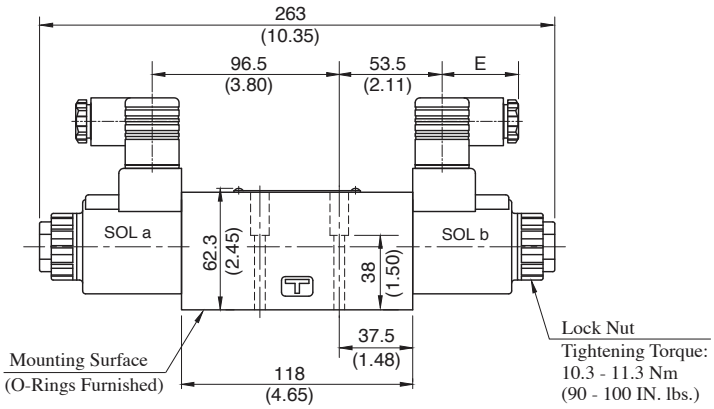
4 Port Valve

Mounting Surface:
ISO4401-AB-03-4-A

Normally Open: DSLG-01-4-O-∗-N-11/1190

DIMENSIONS IN MILLIMETRES (INCHES)

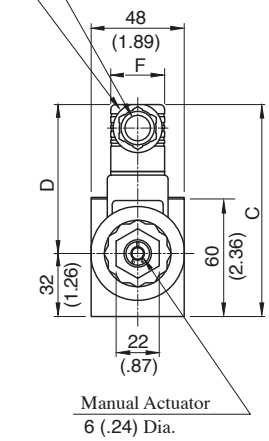




The connector can be moved to various positions by loosening the "Lock Nut". After location tighten "Lock Nut".

Cable Departure

Cable Applicable:
Outside Dia. ····· 8-10 mm (.31 - .39 in.)
Conductor Area ··· Not Exceeding 1.5 mm^2 (.0023 Sq. in.)



Model Numbers	Dimensions mm (Inches)			
	C	D	E	F
DSLG-01-4-O-D∗-N	108 (4.25)	64 (2.52)	39 (1.54)	27.5 (1.08)
DSLG-01-4-O-R∗-N	111 (4.37)	57.2 (2.25)	51 (2.01)	34 (1.34)

● The information on 3 Port Valves is provided in the following page.

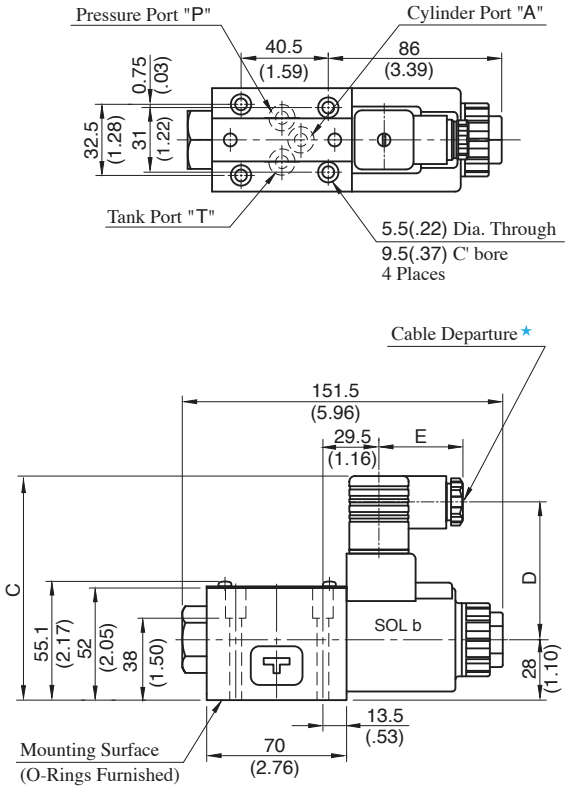
Note: For the valve mounting surface dimensions, see the dimensional drawing of the sharable sub-plate in page 356.

Mounting Surface:
ISO4401-AB-03-4-A

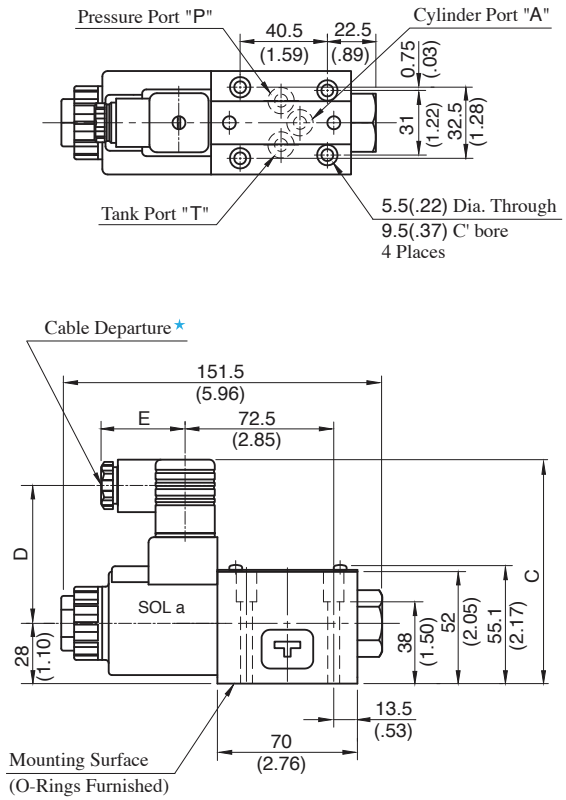
3 Port Valves

DIMENSIONS IN MILLIMETRES (INCHES)

Normally Open Type:
DSLG-01-3-O-∗-N-11/1190



Normally Closed Type:
DSLG-01-3-C-∗-N-11/1190



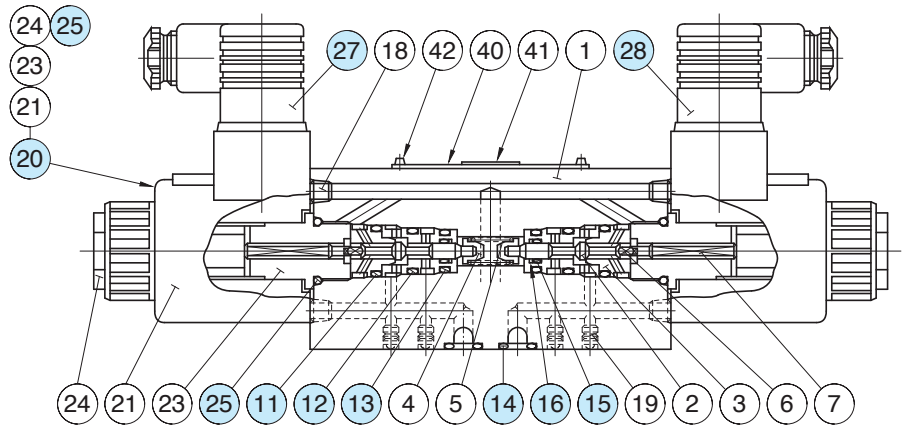
Model Numbers	Dimensions mm (Inches)		
	C	D	E
DSLG-01-3-∗-D∗-N	104 (4.09)	64 (2.52)	39 (1.54)
DSLG-01-3-∗-R∗-N	107 (4.21)	57.2 (2.25)	51 (2.01)

★ Cable departure position can be changed. See "4 Port Valves" in the previous page for the details.

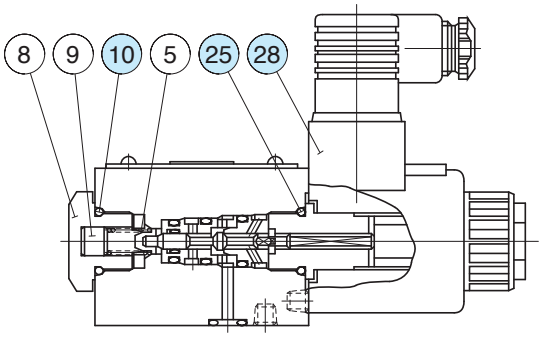
Note: For the valve mounting surface dimensions, see the dimensional drawing of the sharable sub-plate in page 356.

List of Seals, Solenoid Ass'y and Connectors

4 Port Valve



3 Port Valve



List of Seals

Item	Name of Parts	Part Numbers	Quantity	
			4 Port Valve	3 Port Valve
10	O-Ring	SO-NB-P18	—	1
11	O-Ring	SO-NB-P14	2	1
12	O-Ring	SO-NB-P12	2	1
13	O-Ring	SO-NB-P11	2	1
14	O-Ring	SO-NB-P9	4	3
15	O-Ring	SO-NA-P5	2	1
16	Back Up Ring	2705-VK414322-8	2	1
25	O-Ring	SO-NB-P18	2	1

Note 1: O-Ring of item ㉕ are included in solenoid assembly.
2: When ordering the seals, specify the seal kit number from the table right.

Change of supply voltage

The supply voltage can be changed by replacing the coil ㉑ only.

List of Seal Kits

Valve Model Numbers	Seal Kit Numbers
DSLG-01-3-O-∗-N-11∗	KS-DSLG-01-3-N-11
DSLG-01-3-C-∗-N-11∗	
DSLG-01-4-O-∗-N-11∗	KS-DSLG-01-4-N-11

List of Solenoid Ass'y and Connectors

Valve Model No.	⑳ Solenoid Ass'y No.	㉑ Coil No.	㉗ Connector No.	㉘ Connector No.
DSLG-01-∗-∗-D12-N-11∗	SD1L-12-N-20	C-SD1-12-N-60	GDM-211-A-11	GDM-211-B-11
DSLG-01-∗-∗-D24-N-11∗	SD1L-24-N-20	C-SD1-24-N-60		
DSLG-01-∗-∗-R100-N-11∗	SD1L-100-N-20	C-SR1-100-N-60	GDME-211-R-A-10	GDME-211-R-B-10
DSLG-01-∗-∗-R200-N-11∗	SD1L-200-N-20	C-SR1-200-N-60		

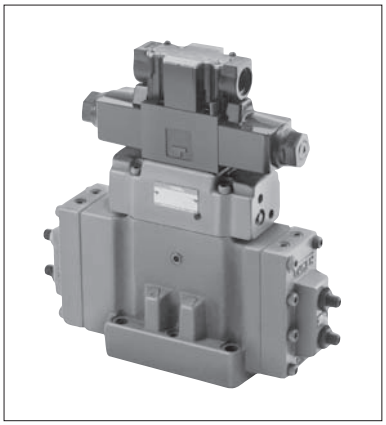
Multi Purpose Control Valves

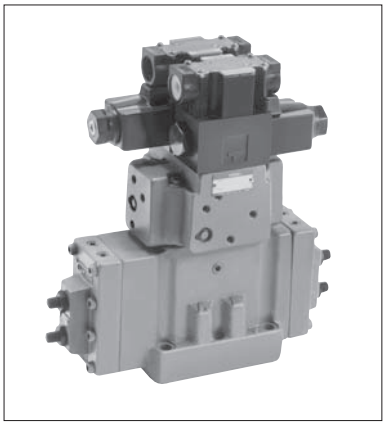
The Yuken Multi-Purpose Control Valves Comply with The Needs of Reducing Cost and Size of Your Machine

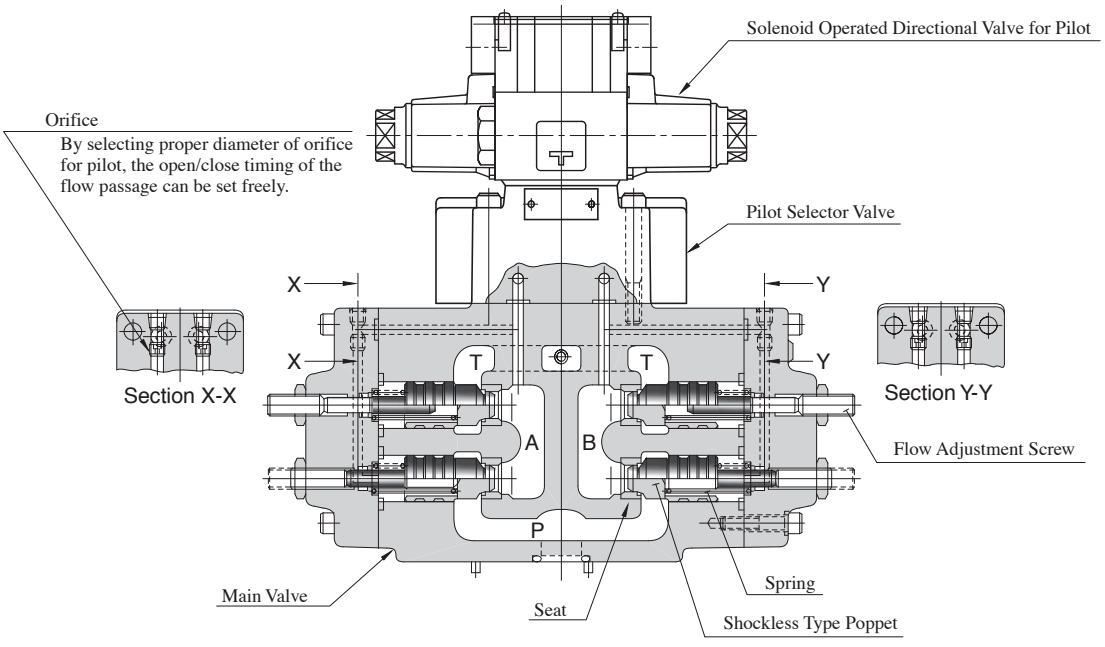
YUKEN's Multi Purpose Control Valves are compound valves composed of the main valve having four poppets, 1/8 Solenoid Operated Directional Valves for pilot and Pilot Selector Valves. This valve is multifunctionalized by having individual poppet had functions such as directional control, flow control or pressure control according to the combination of the main valve and pilot selector valve.

Features

- **Multi-purpose control valves**
  The valves combine three functions of directional control, flow control and of pilot operated check valve (or counterbalance valve). The valves contribute for reducing a number of valves in applications and space for installation and then eventually leads to reduction in size and cost of your machines.
- **Quick response, High reliability**
  Changeover response time is very quick as the valves are poppet type, there is no over-lap.
  No hydraulic lock occurs as there is no leakage of pressurised oil from the seat parts.
- **Easy to reduce shock in your hydraulic system**
  By selecting proper diameter of orifice for pilot, the open/close timing of the flow passage can be set freely. Therefore, smooth starting and stopping of actuator can be done combined with using shockless type poppet. Noise of ON/OFF and vibration of piping in hydraulic system can be also reduced.
- **For regenerative circuit**
  4 position-4 way type, which is to compose regenerative circuit, is available. By adopting regenerative circuit, gaining fast feed speed by using smaller volume pump is possible. Therefore saving electric power of system is possible.
- **The mounting dimensions are conformed with ISO standard**
  The valves are interchangeable with our conventional valves in mounting.







Specifications

Model Numbers	Max. Flow L/min (U.S.GPM)	Max. Operating Pressure MPa (PSI)	Max. Pilot Pressure MPa (PSI)	Max. T-Line Back Pres. MPa (PSI)	Pressure Adj. Range of Counterbalance MPa (PSI)	Ratio of Poppet Area (Seat Area: Annular Area)		Approx. Mass kg (lbs.)
						Direction & Flow Control	Pressure Control	
DSLHG-04-1-∗-13∗	150 (39.6)	25 (3630)	25 (3630)	16 (2320)	—	1:1	—	15 (33)
DSLHG-04-2-∗-13∗								15 (33)
DSLHG-04-3-∗-13∗								19 (42)
DSLHG-04-4∗-∗-∗-13∗	150 {100}★ (39.6 {26.4})				Refer to Model No. Designation	1:1	24:1	20 (44)
DSLHG-04-5∗-∗-∗-13∗								22.5 (50)
DSLHG-06-1-∗-13∗	300 (79.3)	25 (3630)	25 (3630)	16 (2320)	—	1:1	—	26.5 (59)
DSLHG-06-2-∗-13∗								26.5 (59)
DSLHG-06-3-∗-13∗								28 (62)
DSLHG-06-4∗-∗-13∗	300 {200}★ (79.3 {52.8})				Refer to Model No. Designation	1:1	24:1	31 (68)
DSLHG-06-5∗-∗-13∗								34.5 (76)
DSLHG-10-1-∗-13∗	500 (132)	25 (3630)	25 (3630)	16 (2320)	—	1:1	—	59 (130)
DSLHG-10-2-∗-13∗								59 (130)
DSLHG-10-3-∗-13∗								62 (137)
DSLHG-10-4∗-∗-13∗	500 {300}★ (132 {79.3})				Refer to Model No. Designation	1:1	24:1	63.5 (140)
DSLHG-10-5∗-∗-13∗								67 (148)

★In case of counterbalance function line, maximum flow is limited to the values in brackets.

Solenoid Ratings

Refer to Pilot Valve (DSG-01 Series Solenoid Operated Directional Valve) Solenoid Ratings on page 345.

Model Number Designation

F-	DSLH	G	-04	-4	A	-B
Special Seals	Series Number	Type of Mounting	Valve Size	Type of Pilot Control	Counterbalance Function	Pressure Adj. Range of Counterbalance MPa (PSI)
F: For phosphate ester type fluids (Omit if not required)	**DSLH**: Multi-Purpose Control Valve	**G**: Sub-plate Mounting	**04**	**1** **2** **3**	—	—
				4 **5**	**A** : AT Line **W**: AT & BT Lines	**B**: ∗★1- 7 (∗★1- 1020) **H**: 6 - 25 (870 - 3630)
			06	**1** **2** **3**	—	—
				4 **5**	**A** : AT Line **W**: AT & BT Lines	**None**: ∗★1- 25 (∗★1- 3630)
			10	**1** **2** **3**	—	—
				4 **5**	**A** : AT Line **W**: AT & BT Lines	**None**: ∗★1- 25 (∗★1- 3630)
				See page 462 for functions and purpose of use.		

★1. See "Min. Adjustment Pressure", page 464, for information on minimum adjustment pressure.

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.)
DSLHG-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)
DSLHG-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)
DSLHG-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.
- These sub-plates are sharable with those for DSHG Series Solenoid Controlled Pilot Operated Directional Valve. For dimensions, see pages 401 to 403.

Mounting Bolts

Socket head cap screws in the table below are included.

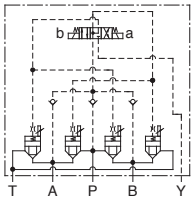
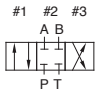
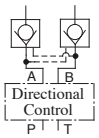
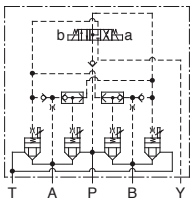
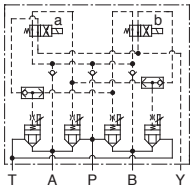
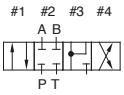
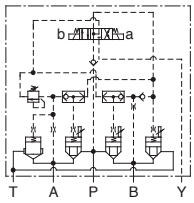
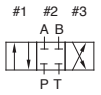
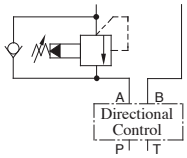
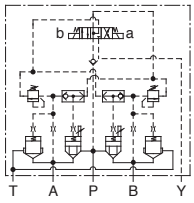
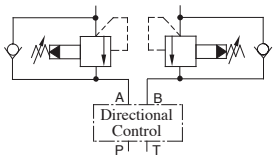
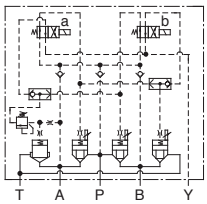
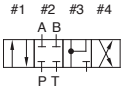
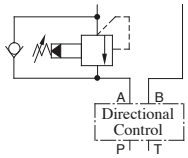
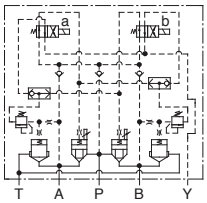
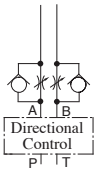
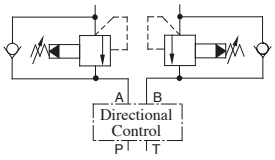
Model Numbers	Socket Head Cap Screw			
	Japanese Standard "JIS" and European Design Standard	N. American Design Standard	Qty.	Tightening Torque Nm (In. lbs.)
DSLHG-04	M6 × 40 Lg. M10 × 45 Lg.	1/4-20 UNC × 1-1/2 Lg. 3/8-16 UNC × 1-3/4 Lg.	2 4	12-15 (106-133) 58-72 (513-637)
DSLHG-06	M12 × 60 Lg.	1/2-13 UNC × 2-1/2 Lg.	6	100-123 (885-1089)
DSLHG-10	M20 × 75 Lg.	3/4-10 UNC × 3 Lg.	6	473-585 (4186-5177)

-E	T	-A100	-C	-N	-13	✻
Pilot Connection	Drain ★2 Connection	Coil Type	Manual Override	Electrical Conduit Connection	Design Number	Design Standards
None: Internal Pilot **E**: External Pilot	**None**: External Drain **T**: Internal Drain	AC: **A100** **A120** **A200** **A240** DC: **D12** **D24** **D48** R: (AC→DC) **R100** **R200**	**None**: Manual Override Pin **C**: Push Button & Lock Nut (Options)	**None**: Terminal Box Type **N**: Plug-in Connector Type	**13** **13** **13**	**None**: Japanese Std. "JIS" **90**: N.American Design Std. **None**: Japanese Std. "JIS" & European Design Std. **90**: N.American Design Std.

★2. In case of lines with counterbalance function (-4$\frac{A}{W}$, -5$\frac{A}{W}$), External Drain must be selected for Drain Connection.

The coil type numbers in the shaded column are handled as optional extras. In case these coils are required to be chosen, please confirm the time of delivery with us before ordering.

Function and Purpose of Use

<table>
<tr><th rowspan="2">Type of Pilot Control</th><th rowspan="2">Model No.</th><th rowspan="2">Graphic Symbols</th><th colspan="3">Function</th><th rowspan="2">Purpose of Use</th></tr>
<tr><th>Directional Control</th><th>Flow Control</th><th>Pilot Operated Check Valve / Pressure Control</th></tr>
<tr><td>Type "1"</td><td>DSLHG-∗-1</td><td>  </td><td rowspan="2"> 
Position | #1 | #2 | #3
SOL a | ON | OFF | OFF
SOL b | OFF | OFF | ON</td><td rowspan="2"> 
Both Metre-in and Metre-out are possible</td><td rowspan="2"> 
To get a function of pilot operated check valve, the following conditions should be fulfilled.
● Internal pilot type
("P" port pressure) ≧
("A""B" ports pressure)
● External pilot type
(Pilot pressure) ≧
("A""B" ports pressure)</td><td>● Functions as Three Position Four-Way Valve (Spring Centred Model).</td></tr>
<tr><td>Type "2"</td><td>DSLHG-∗-2</td><td>  </td><td>● Functions as Three Position Four-Way Valve (Spring Centred Model) as well as Two Position Valve which uses positions #1 and #3.
● Effective especially when the actuator has inertia force.</td></tr>
<tr><td>Type "3"</td><td>DSLHG-∗-3</td><td>  </td><td> 
Position | #1 | #2 | #3 | #4
SOL a | ON | OFF | ON | OFF
SOL b | OFF | OFF | ON | ON</td><td>● Functions as Four Position Four-Way Valve.
● Regenerative circuit can be constructed at the Position #3.</td></tr>
<tr><td rowspan="2">Type "4"</td><td>DSLHG-∗-4A</td><td>  </td><td rowspan="2"> 
Position | #1 | #2 | #3
SOL a | ON | OFF | OFF
SOL b | OFF | OFF | ON</td><td>  </td><td>  </td><td rowspan="2">● Pressure control function (counterbalance valve) has been added to Type "2" to make this type.
● Used to control the back pressure of the actuator.</td></tr>
<tr><td>DSLHG-∗-4W</td><td>  </td><td>  </td><td>  </td></tr>
<tr><td rowspan="2">Type "5"</td><td>DSLHG-∗-5A</td><td>  </td><td rowspan="2"> 
Position | #1 | #2 | #3 | #4
SOL a | ON | OFF | ON | OFF
SOL b | OFF | OFF | ON | ON</td><td>  </td><td>  </td><td rowspan="2">● Pressure control function (counterbalance valve) has been added to Type "3" to make this type.
● Used to control the back pressure of the actuator.</td></tr>
<tr><td>DSLHG-∗-5W</td><td>  </td><td>  </td><td>  </td></tr>
</table>

Instructions

- **Pilot Pressure**
  Pilot pressure of external pilot drain models must always exceed the pressure of the main pressure port "P".

- **Pilot Drain Port**
  Avoid connecting the pilot drain port to a line with possible surge pressure.

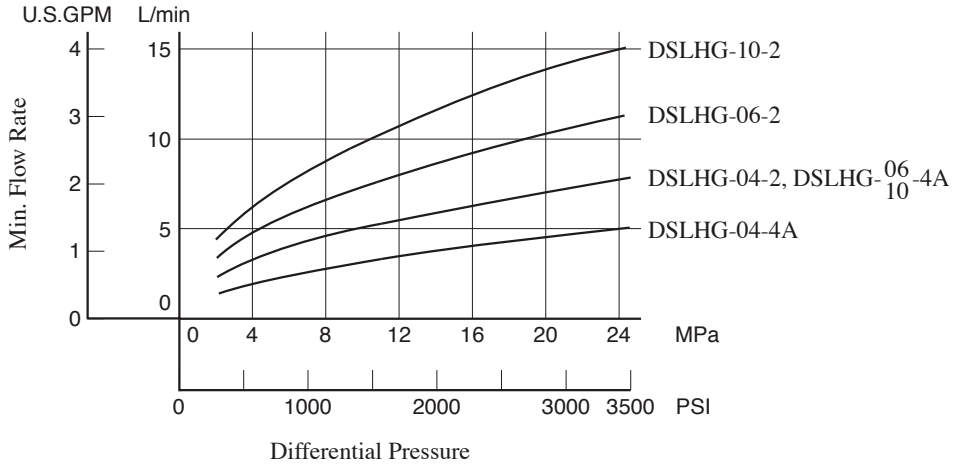
- **Drain Connection when with Counterbalance Function**
  When a valve having counterbalance function is used with internal drain type, the counterbalance pilot valve is subjected to pressure fluctuation and the pressure setting becomes unstable. For this reason, be sure to use external drain type valve.

- **Flow Adjustment**
  To perform the flow adjustment, loosen the lock nut, then turn the flow adjustment screw clockwise to decrease the flow. Be sure to re-tighten the lock nut after the adjustment.

- **Pressure Adjustment**
  To perform the pressure adjustment, loosen the lock nut, then turn the pressure adjustment screw clockwise to increase the pressure. Be sure to re-tighten the lock nut after the adjustment.

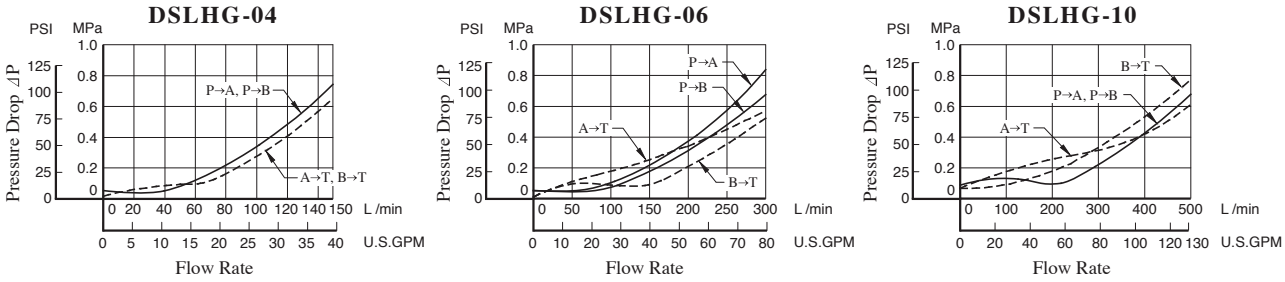
- **Min. Controlled Flow for Types "2" and "4A" at The Time of Metre-out Control**
  Minimum controlled flow at the time of metre-out control is limited (this does not happen during metre-in control) as shown in the figure below only in the case of pilot control types "2" (DSLHG-∗-2) and "4A" (DSLHG-∗-4A).

Min. Controlled Flow for Types "2" and "4A" at The Time of Metre-out Control



Hydraulic Fluid: Viscosity 35 m m²/s (164 SSU), Specific Gravity 0.850

Pressure Drop



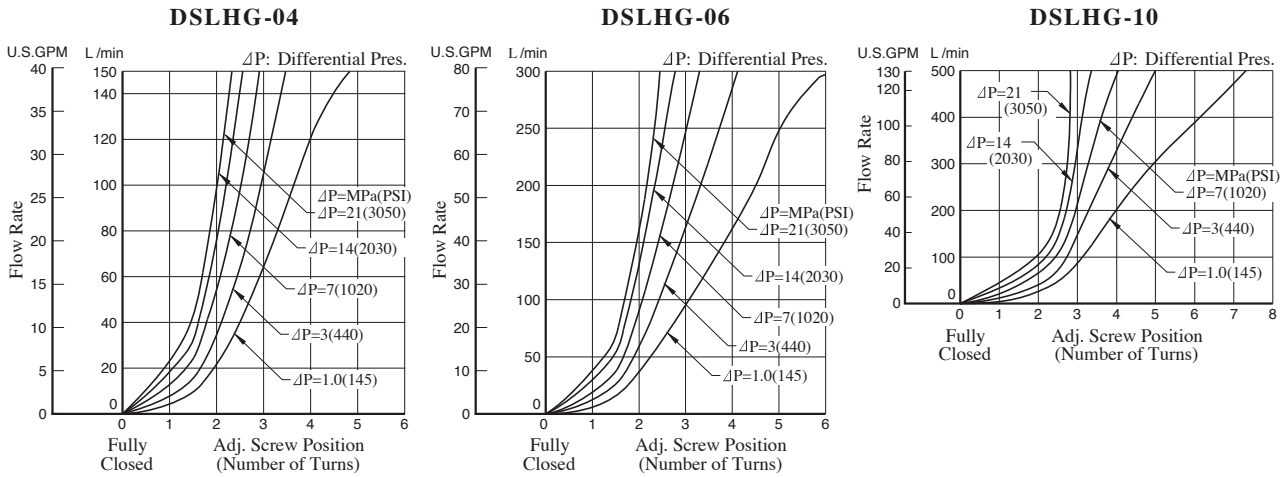
- For any other viscosity, multiply the factors in the table below.

Viscosity	mm²/s	15	20	30	40	50	60	70	80	90	100
	SSU	77	98	141	186	232	278	324	371	417	464
Factor		0.81	0.87	0.96	1.03	1.09	1.14	1.19	1.23	1.27	1.30

- For any other specific gravity (G'), the pressure drop (⊿P') may be obtained from the formula below.

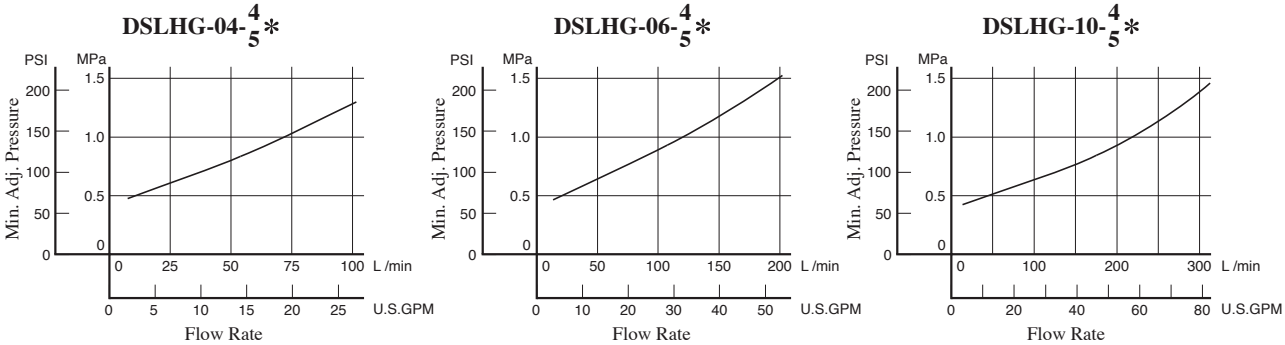
$$\Delta P' = \Delta P \, (G'/0.850)$$

Flow vs. Adjustment Revolutions



Minimum Adjustment Pressure

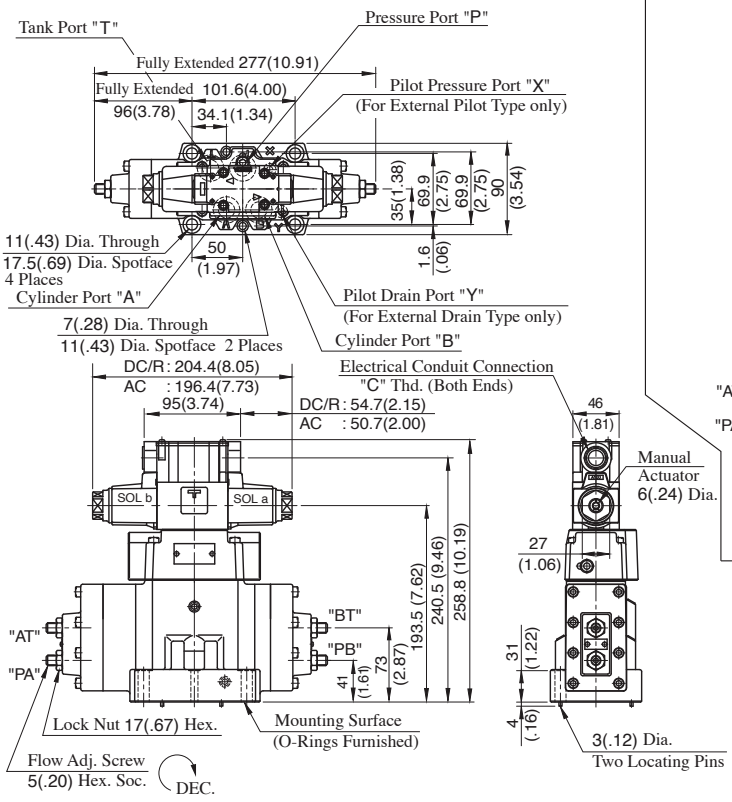
Because the minimum adjustment pressure varies with the tank line back pressure, add the tank line back pressure to the value on the following lines.



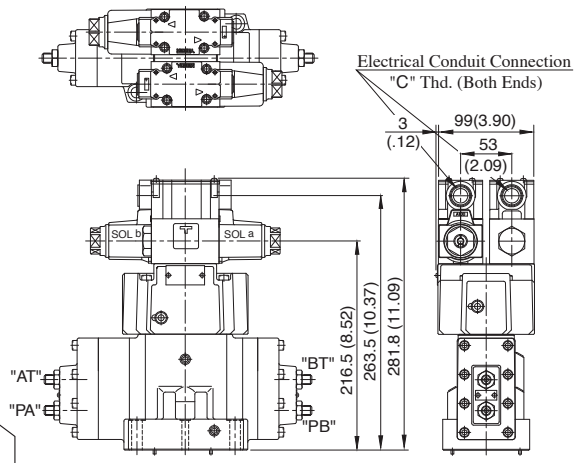
DSLHG-04-$\frac{1}{2}$-∗-13/1390

Terminal Box Type

Mounting Surface: ISO4401-AD-07-4-A



DSLHG-04-3-∗-13/1390

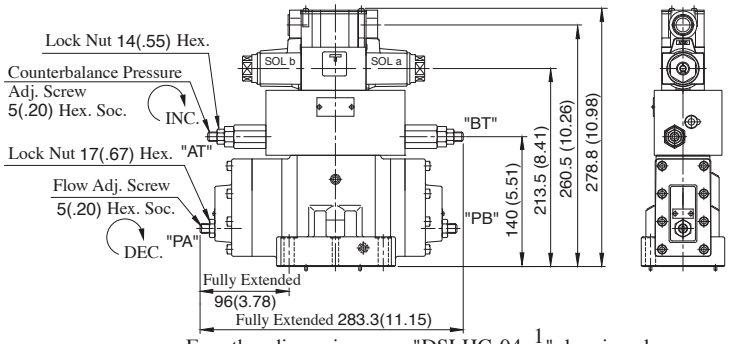


For other dimensions, see "DSLHG-04-$\frac{1}{2}$" drawing left.

Model Numbers	"C" Thd.
DSLHG-04-∗-∗-13	G 1/2
DSLHG-04-∗-∗-1390	1/2 NPT

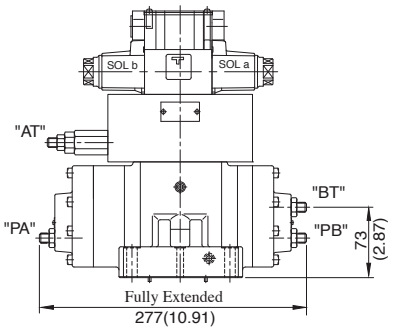
DIMENSIONS IN MILLIMETRES (INCHES)

DSLHG-04-4W-∗-∗-13/1390



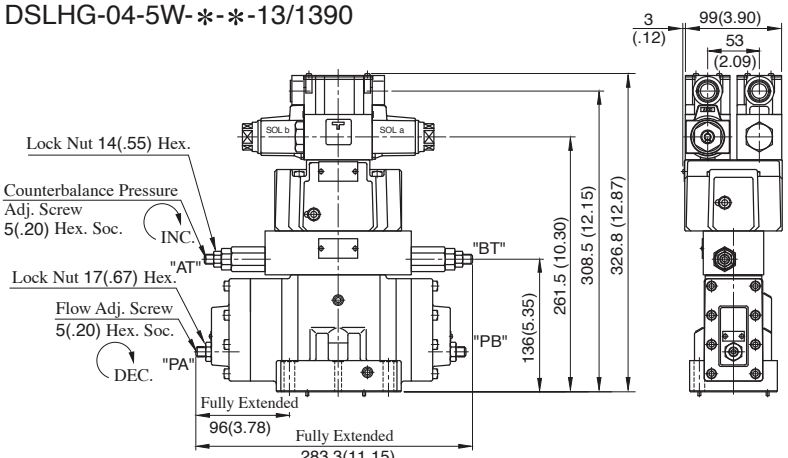
For other dimensions, see "DSLHG-04-$\frac{1}{2}$" drawing above.

DSLHG-04-4A-∗-∗-13/1390



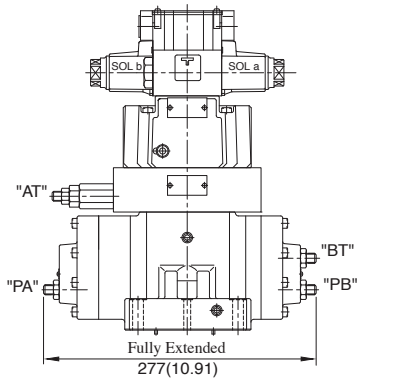
For other dimensions, see "DSLHG-04-4W" drawing left.

DSLHG-04-5W-∗-∗-13/1390



For other dimensions, see "DSLHG-04-$\frac{1}{2}$" drawing above.

DSLHG-04-5A-∗-∗-13/1390

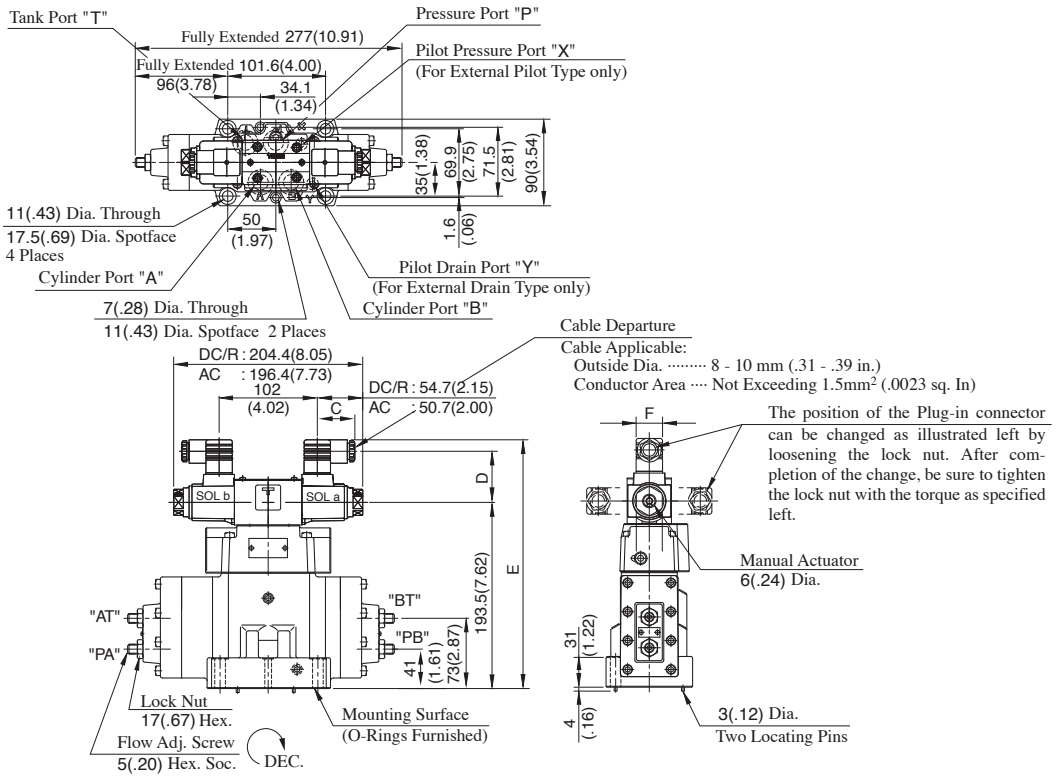


For other dimensions, see "DSLHG-04-5W" drawing left.

DSLHG-04-$\frac{1}{2}$-∗-N-13/1390

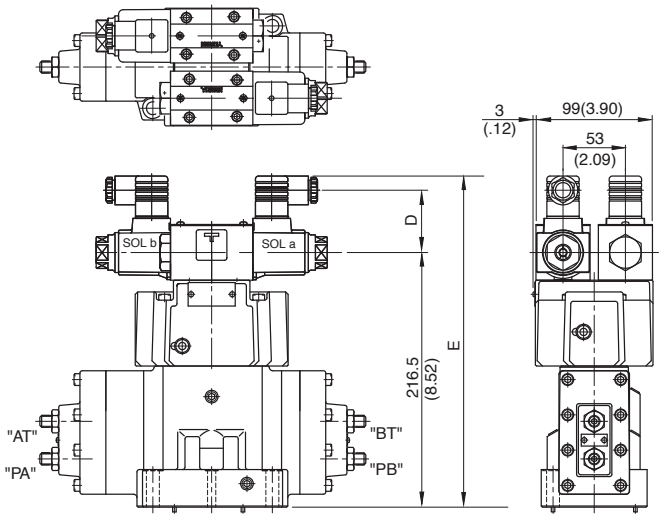
Plug-in Connector Type

Mounting Surface:
ISO4401-AD-07-4-A



Model Numbers	Dimensions mm (Inches)			
	C	D	E	F
DSLHG-04-∗-A∗-N	39 (1.54)	53 (2.09)	258.5(10.18)	27.5 (1.08)
DSLHG-04-∗-D∗-N	39 (1.54)	64 (2.52)	269.5(10.61)	27.5 (1.08)
DSLHG-04-∗-R∗-N	53 (2.09)	57.2 (2.25)	272.5(10.73)	34 (1.34)

DSLHG-04-3-∗-N-13/1390



Model Numbers	Dimensions mm (Inches)	
	D	E
DSLHG-04-3-A∗-N	53 (2.09)	281.5 (11.08)
DSLHG-04-3-D∗-N	64 (2.52)	292.5 (11.52)
DSLHG-04-3-R∗-N	57.2 (2.25)	299.5 (11.63)

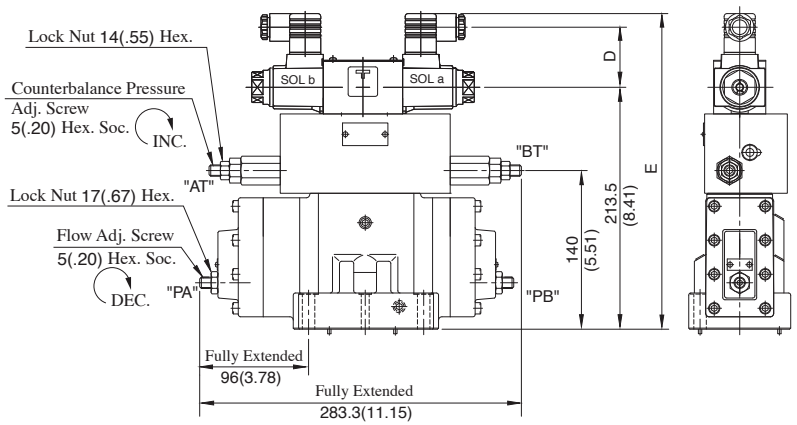
DIMENSIONS IN MILLIMETRES (INCHES)

For other dimensions, see "DSLHG-04-$\frac{1}{2}$-∗-N" drawing above.

Plug-in Connector Type

Mounting Surface:
ISO4401-AD-07-4-A

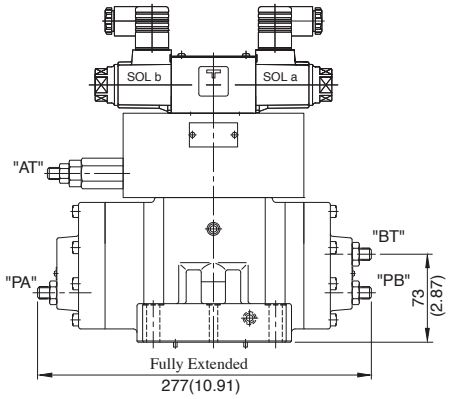
DSLHG-04-4W-∗-∗-N-13/1390



Model Numbers	Dimensions mm (Inches)	
	D	E
DSLHG-04-4W-∗-A∗-N	53 (2.09)	278.5 (10.96)
DSLHG-04-4W-∗-D∗-N	64 (2.52)	289.5 (11.40)
DSLHG-04-4W-∗-R∗-N	57.2 (2.25)	292.5 (11.52)

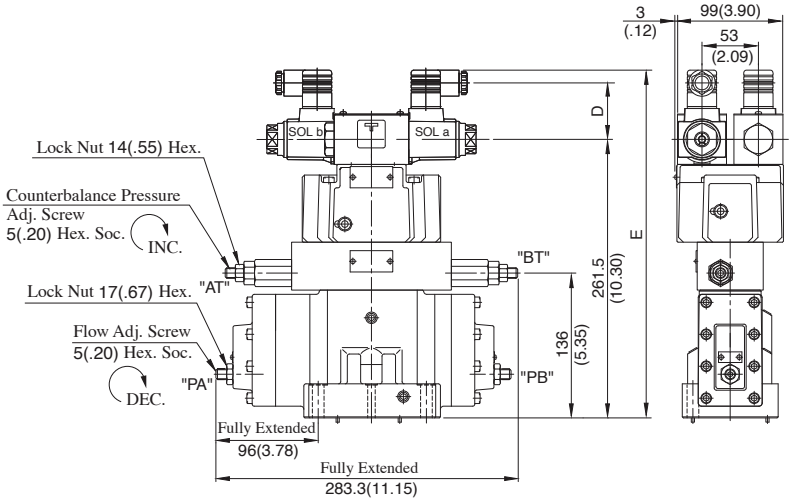
For other dimensions, see DSLHG-04-$\frac{1}{2}$-∗-N on the previous page.

DSLHG-04-4A-∗-∗-N-13/1390



For other dimensions, see "DSLHG-04-4W-∗-∗-N" drawing left.

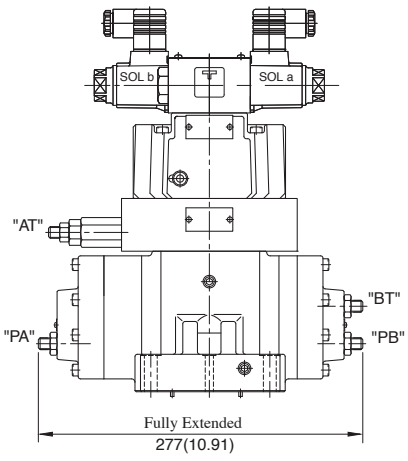
DSLHG-04-5W-∗-∗-N-13/1390



Model Numbers	Dimensions mm (Inches)	
	D	E
DSLHG-04-5W-∗-A∗-N	53 (2.09)	326.5 (12.85)
DSLHG-04-5W-∗-D∗-N	64 (2.52)	337.5 (13.28)
DSLHG-04-5W-∗-R∗-N	57.2 (2.25)	340.5 (13.41)

For other dimensions, see DSLHG-04-$\frac{1}{2}$-∗-N on the previous page.

DSLHG-04-5A-∗-∗-N-13/1390



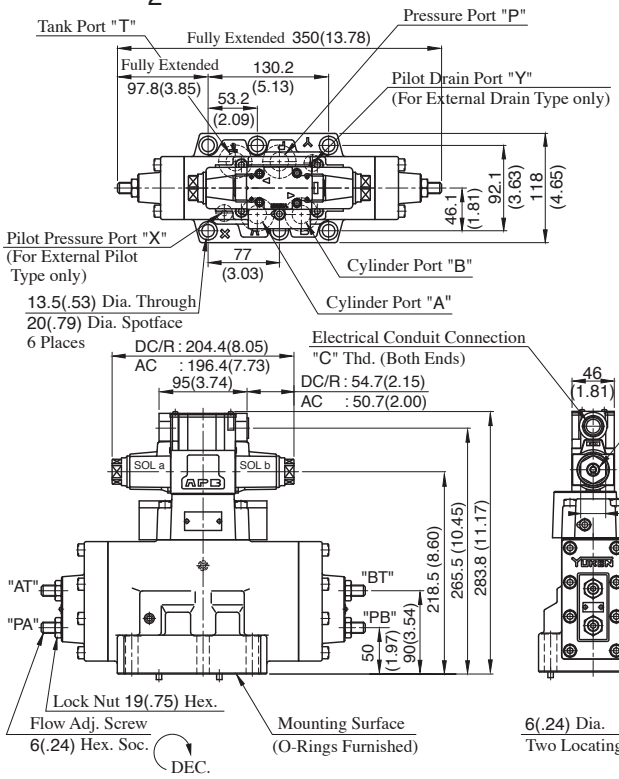
For other dimensions, see "DSLHG-04-5W-∗-∗-N" drawing left.

DIMENSIONS IN MILLIMETRES (INCHES)

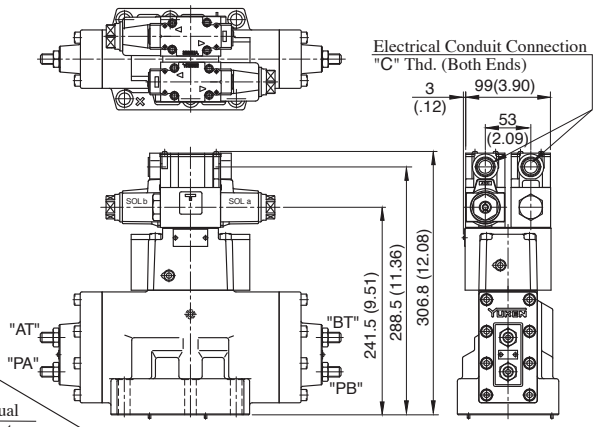
Terminal Box Type

Mounting Surface: ISO4401-AE-08-4-A

DSLHG-06-$\frac{1}{2}$-∗-13/1390



DSLHG-06-3-∗-13/1390

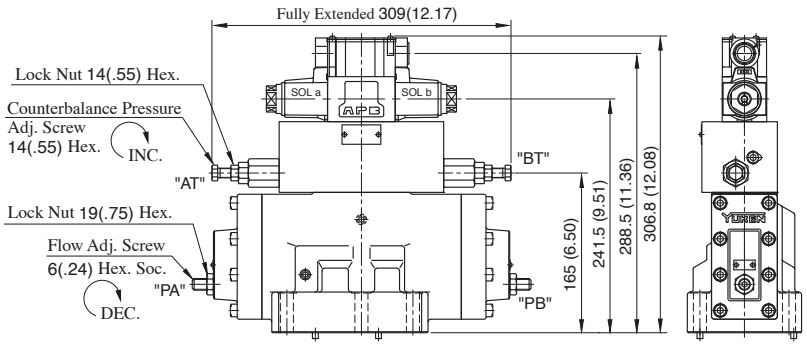


For other dimensions, see "DSLHG-06-$\frac{1}{2}$" drawing left.

Model Numbers	"C" Thd.
DSLHG-06-∗∗-∗-13	G 1/2
DSLHG-06-∗∗-∗-1390	1/2 NPT

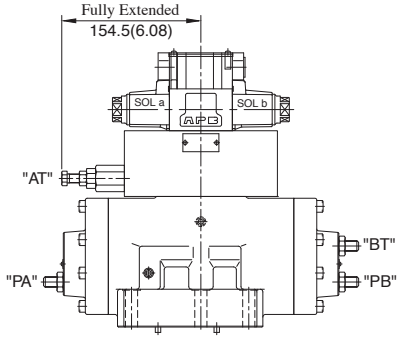
DIMENSIONS IN MILLIMETRES (INCHES)

DSLHG-06-4W-∗-13/1390



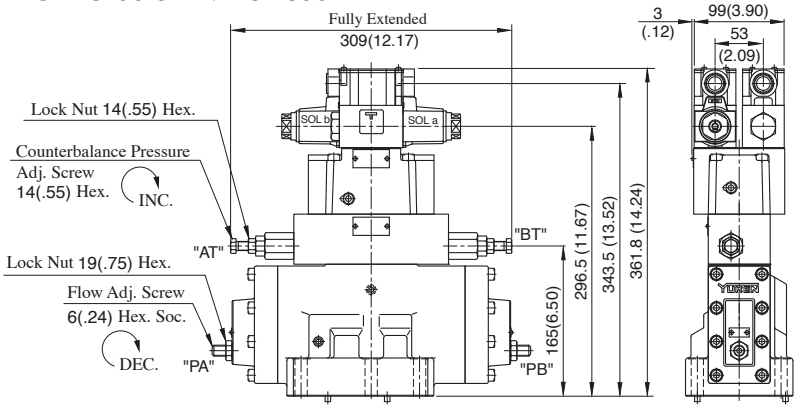
For other dimensions, see "DSLHG-06-$\frac{1}{2}$" drawing above.

DSLHG-06-4A-∗-13/1390



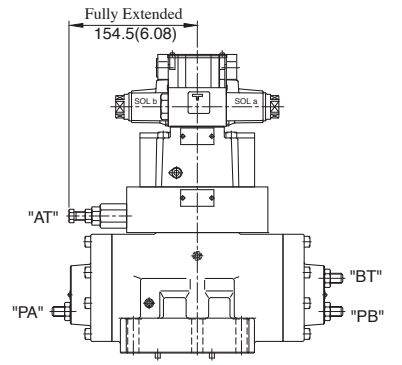
For other dimensions, see "DSLHG-06-4W" drawing left.

DSLHG-06-5W-∗-13/1390



For other dimensions, see "DSLHG-06-$\frac{1}{2}$" drawing above.

DSLHG-06-5A-∗-13/1390

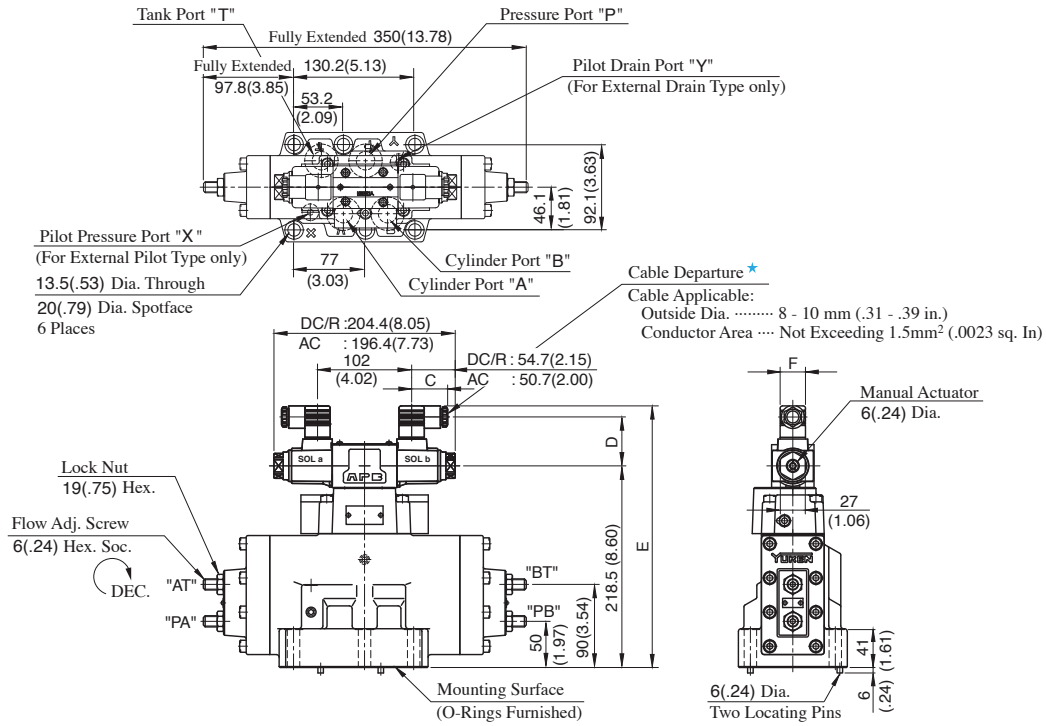


For other dimensions, see "DSLHG-06-5W" drawing left.

DSLHG-06-$\frac{1}{2}$-∗-N-13/1390

Plug-in Connector Type

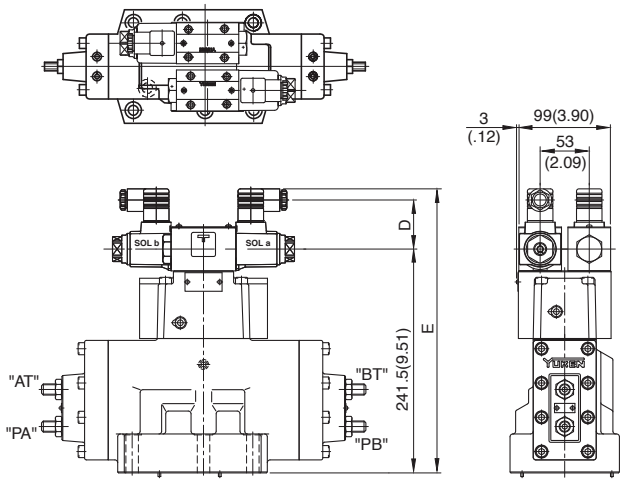
Mounting Surface:
ISO4401-AE-08-4-A



Model Numbers	Dimensions mm (Inches)			
	C	D	E	F
DSLHG-06-∗-A∗-N	39 (1.54)	53 (2.09)	283.5 (11.16)	27.5 (1.08)
DSLHG-06-∗-D∗-N	39 (1.54)	64 (2.52)	294.5 (11.59)	27.5 (1.08)
DSLHG-06-∗-R∗-N	53 (2.09)	57.2 (2.25)	297.5 (11.71)	34 (1.34)

★ Position of cable departure can be changed. For the details, refer to DSLHG-04 valve on page 466.

DSLHG-06-3-∗-N-13/1390



Model Numbers	Dimensions mm (Inches)	
	D	E
DSLHG-06-3-A∗-N	53 (2.09)	306.5 (12.07)
DSLHG-06-3-D∗-N	64 (2.52)	317.5 (12.50)
DSLHG-06-3-R∗-N	57.2 (2.25)	320.5 (12.62)

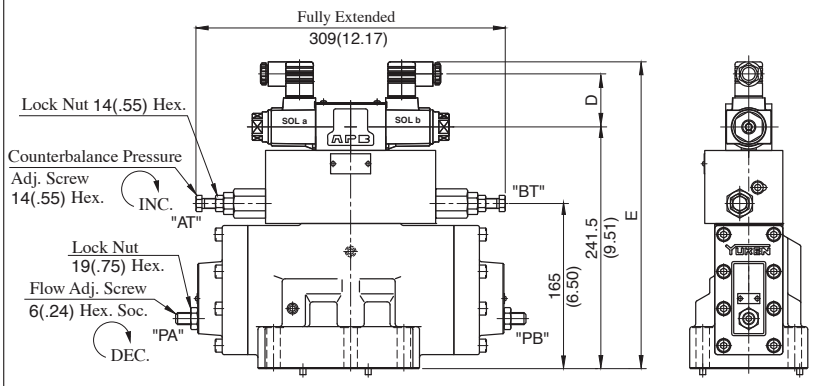
DIMENSIONS IN MILLIMETRES (INCHES)

For other dimensions, see "DSLHG-06-$\frac{1}{2}$-∗-N" drawing above.

Plug-in Connector Type

Mounting Surface:
ISO4401-AE-08-4-A

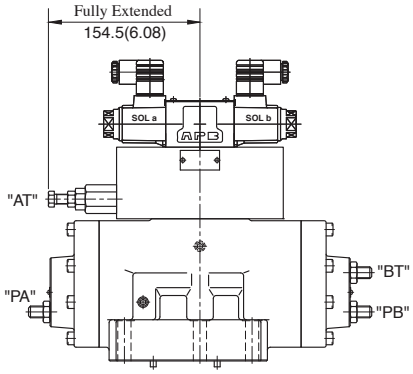
DSLHG-06-4W-∗-N-13/1390



Model Numbers	Dimensions mm (Inches)	
	D	E
DSLHG-06-4W-A∗-N	53 (2.09)	306.5 (12.07)
DSLHG-06-4W-D∗-N	64 (2.52)	317.5 (12.50)
DSLHG-06-4W-R∗-N	57.2 (2.25)	320.5 (12.62)

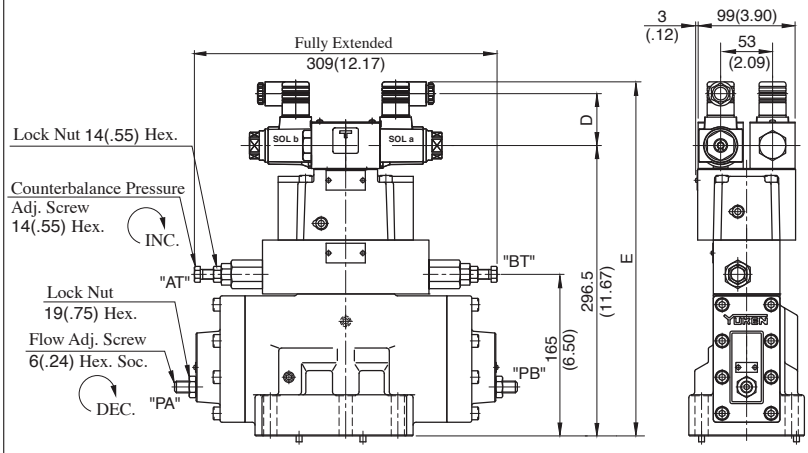
For other dimensions, see DSLHG-06-$\frac{1}{2}$-∗-N on the previous page.

DSLHG-06-4A-∗-N-13/1390



For other dimensions, see "DSLHG-06-4W-∗-N" drawing left.

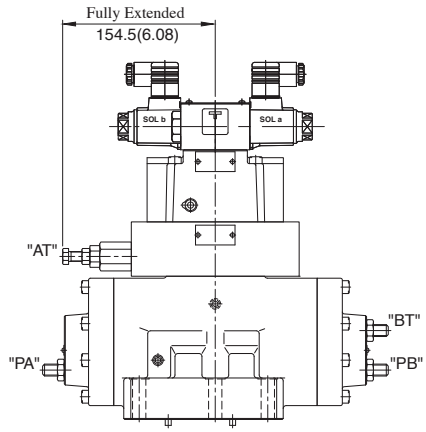
DSLHG-06-5W-∗-N-13/1390



Model Numbers	Dimensions mm (Inches)	
	D	E
DSLHG-06-5W-A∗-N	53 (2.09)	361.5 (14.23)
DSLHG-06-5W-D∗-N	64 (2.52)	372.5 (14.67)
DSLHG-06-5W-R∗-N	57.2 (2.25)	375.5 (14.78)

For other dimensions, see DSLHG-06-$\frac{1}{2}$-∗-N on the previous page.

DSLHG-06-5A-∗-N-13/1390



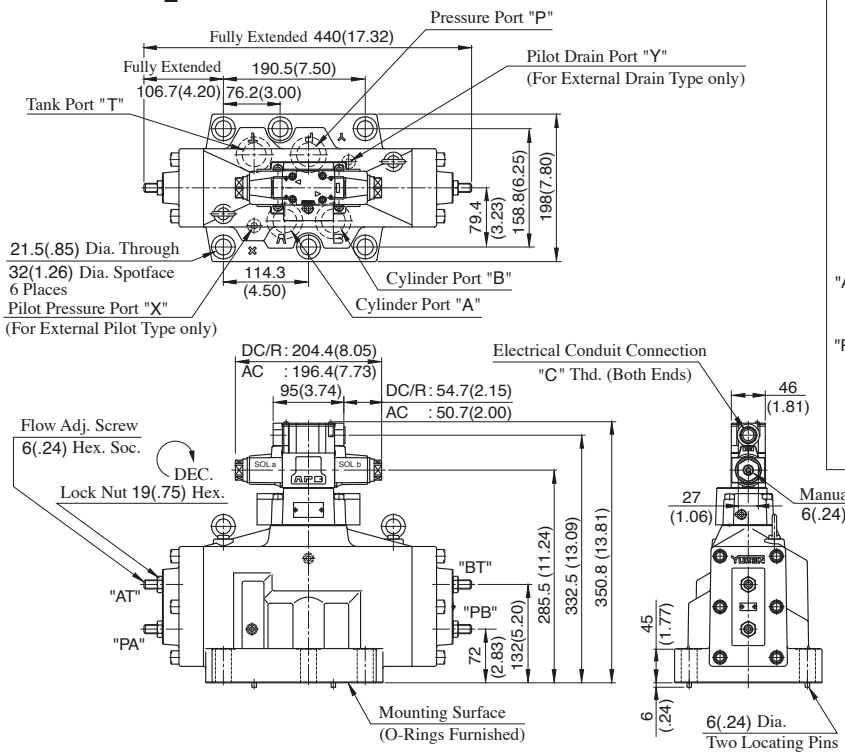
For other dimensions, see "DSLHG-06-5W-∗-N" drawing left.

DIMENSIONS IN MILLIMETRES (INCHES)

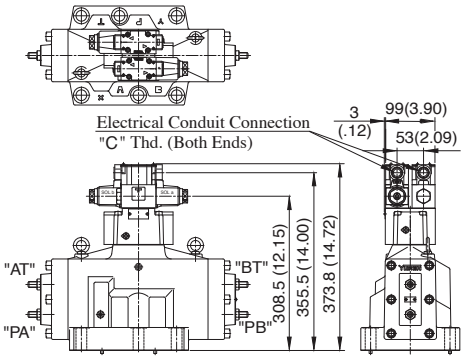
Terminal Box Type

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

DSLHG-10-$\frac{1}{2}$-∗-13/1390



DSLHG-10-3-∗-13/1390

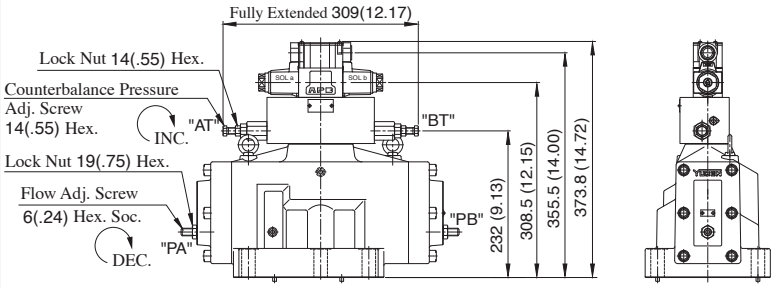


For other dimensions, see "DSLHG-10-$\frac{1}{2}$" drawing left.

Model Numbers	"C" Thd.
DSLHG-10-∗-∗-13	G 1/2
DSLHG-10-∗-∗-1390	1/2 NPT

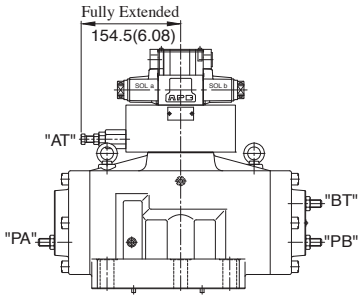
DIMENSIONS IN MILLIMETRES (INCHES)

DSLHG-10-4W-∗-13/1390



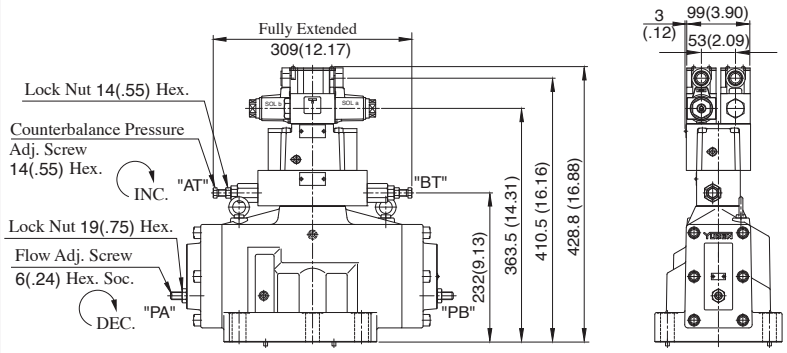
For other dimensions, see "DSLHG-10-$\frac{1}{2}$" drawing above.

DSLHG-10-4A-∗-13/1390



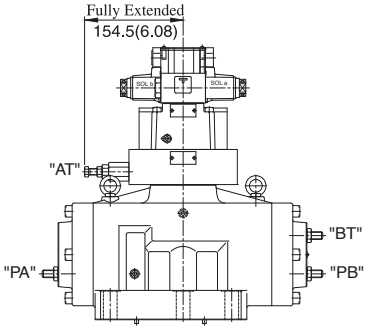
For other dimensions, see "DSLHG-10-4W" drawing left.

DSLHG-10-5W-∗-13/1390



For other dimensions, see "DSLHG-10-$\frac{1}{2}$" drawing above.

DSLHG-10-5A-∗-13/1390

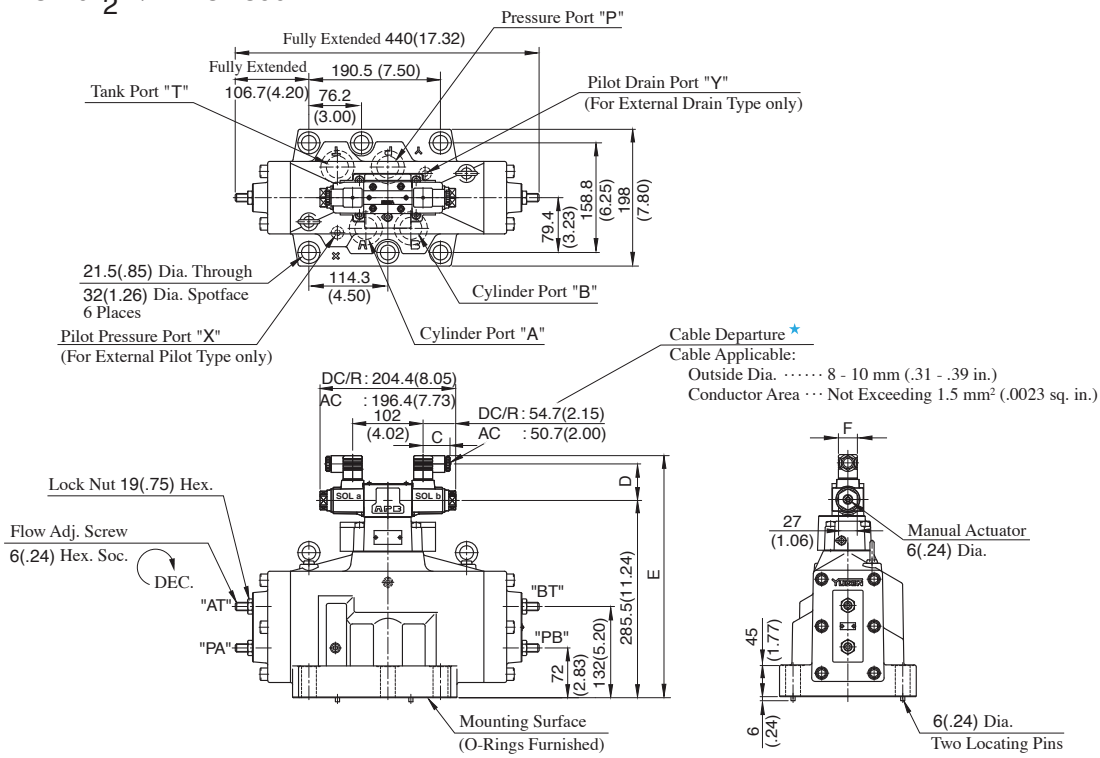


For other dimensions, see "DSLHG-10-5W" drawing left.

Plug-in Connector Type

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

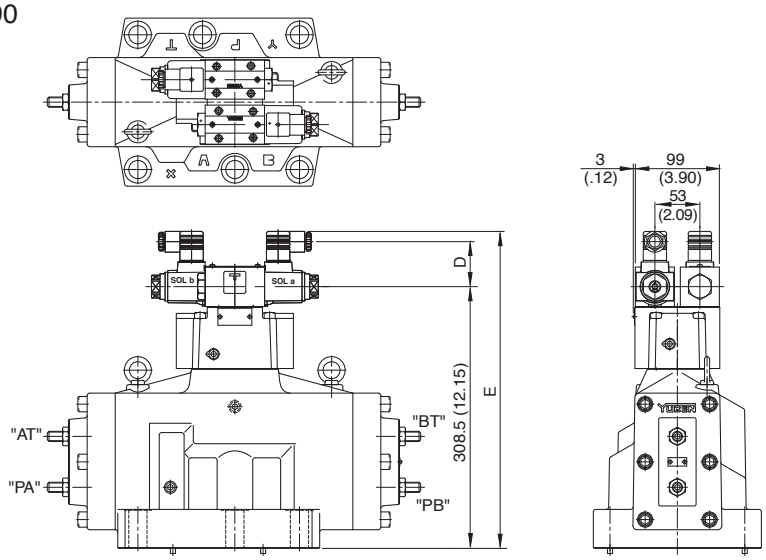
DSLHG-10-$\frac{1}{2}$-∗-N-13/1390



Model Numbers	Dimensions mm (Inches)			
	C	D	E	F
DSLHG-10-∗-A∗-N	39 (1.54)	53 (2.09)	350.5 (13.80)	27.5 (1.08)
DSLHG-10-∗-D∗-N	39 (1.54)	64 (2.52)	361.5 (14.23)	27.5 (1.08)
DSLHG-10-∗-R∗-N	53 (2.09)	57.2 (2.25)	364.5 (14.35)	34 (1.34)

★ Position of cable departure can be changed. For the details, refer to DSLHG-04 valve on page 466.

DSLHG-10-3-∗-N-13/1390



Model Numbers	Dimensions mm (Inches)	
	D	E
DSLHG-10-3-A∗-N	53 (2.09)	373.5 (14.70)
DSLHG-10-3-D∗-N	64 (2.52)	384.5 (15.14)
DSLHG-10-3-R∗-N	57.2 (2.25)	387.5 (15.26)

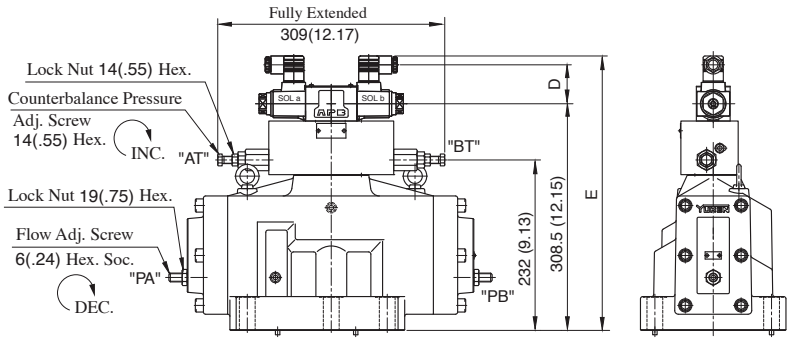
For other dimensions, see "DSLHG-10-$\frac{1}{2}$-∗-N" drawing above.

DIMENSIONS IN MILLIMETRES (INCHES)

Plug-in Connector Type

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

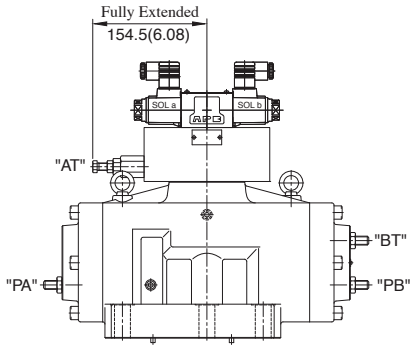
DSLHG-10-4W-∗-N-13/1390



Model Numbers	Dimensions mm (Inches)	
	D	E
DSLHG-10-4W-A∗-N	53 (2.09)	373.5 (14.70)
DSLHG-10-4W-D∗-N	64 (2.52)	384.5 (15.14)
DSLHG-10-4W-R∗-N	57.2 (2.25)	387.5 (15.26)

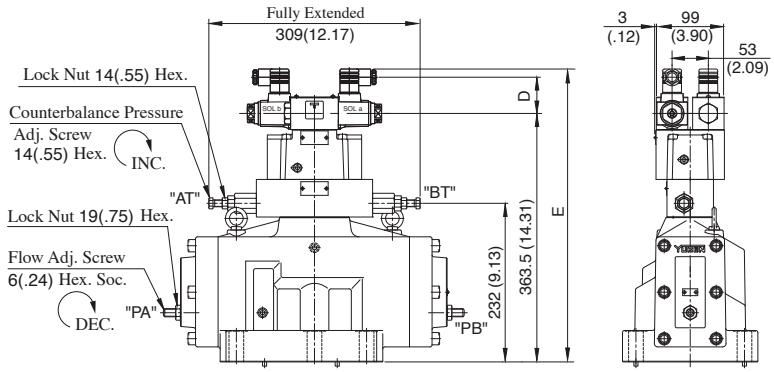
For other dimensions, see DSLHG-10-$\frac{1}{2}$-∗-N on the previous page.

DSLHG-10-4A-∗-N-13/1390



For other dimensions, see "DSLHG-10-4W-∗-N" drawing left.

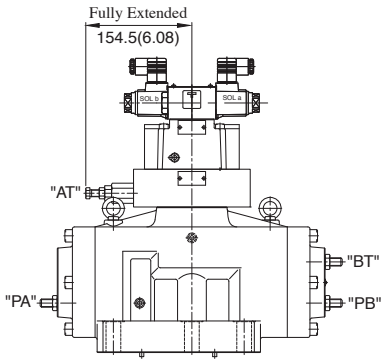
DSLHG-10-5W-∗-N-13/1390



Model Numbers	Dimensions mm (Inches)	
	D	E
DSLHG-10-5W-A∗-N	53 (2.09)	428.5 (16.87)
DSLHG-10-5W-D∗-N	64 (2.52)	439.5 (17.30)
DSLHG-10-5W-R∗-N	57.2 (2.25)	442.5 (17.42)

For other dimensions, see DSLHG-10-$\frac{1}{2}$-∗-N on the previous page.

DSLHG-10-5A-∗-N-13/1390

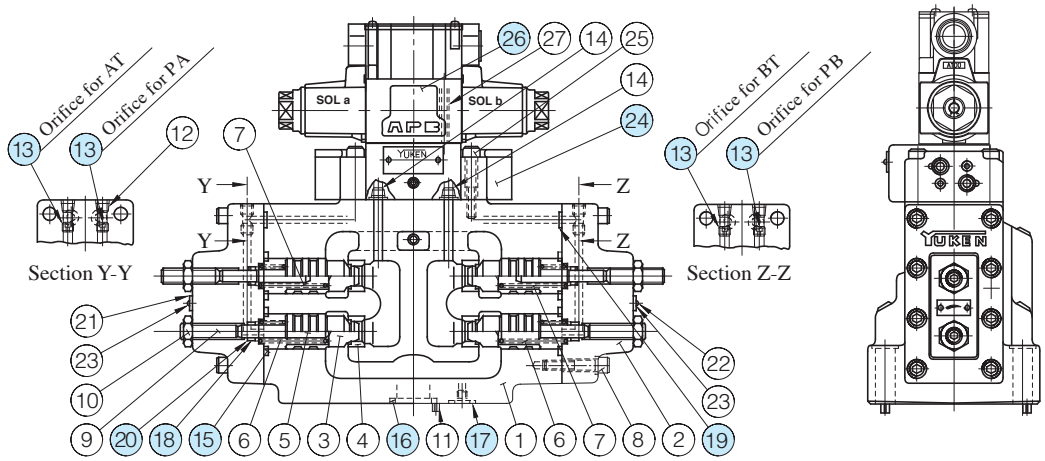


For other dimensions, see "DSLHG-10-5W-∗-N" drawing left.

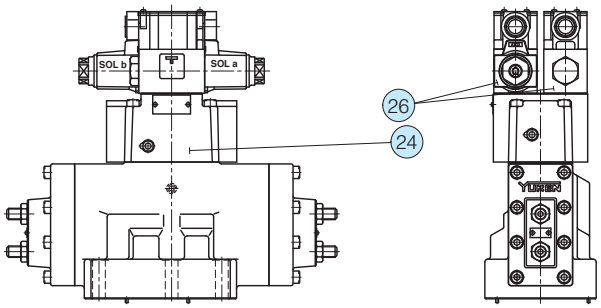
DIMENSIONS IN MILLIMETRES (INCHES)

List of Seals for Main Valve, Pilot Selector Valve and Orifice

DSLHG-04/06/10-$\frac{1}{2}$-∗-13/1390



DSLHG-04/06/10-3-∗-13/1390



Note) Main valve is same as above drawings.

List of Seals for Main Valves

Item	Name of Parts	Part Numbers			Qty.
		DSLHG-04	DSLHG-06	DSLHG-10	
15	O-Ring	SO-NB-P22	SO-NB-G30	SO-NB-G40	4
16	O-Ring	SO-NB-P22	SO-NB-P30	SO-NB-P42	4
17	O-Ring	SO-NB-P9	SO-NB-P14	SO-NB-P14	2
18	O-Ring	SO-NA-P8	SO-NA-P10	SO-NA-P16	4
19	O-Ring	SO-NB-P8	SO-NB-P9	SO-NB-P11	4
20	Back Up Ring	SO-BB-P8	SO-BB-P10	SO-BB-P16	4

Note: When ordering the seals, please specify the seal kit number listed on page 478.

Item (13) Orifice

The timing of flow path opening/closing can be adjusted as required by selecting the appropriate pilot orifice diameter. When the diameter of the orifice is to be changed, another orifice should be ordered. Standard built-in orifice diameters and selectable orifice diameters are listed in the table below.

Orifice Type	TP-OPT-1/16 x d		
Model Numbers	Orifice Diameter "d" mm		
	Standard Built-in	Selectable	Max. Dia. at Pressure over 20 MPa(2900 PSI)
DSLHG-04	1.0	0.5, 0.6, 0.8, 1.0 1.2, 1.4, 1.6, 1.8 2.0, 2.5	1.2
DSLHG-06	1.2		
DSLHG-10	1.4		1.4

Item (24) Pilot Selector Valve List

Multi-Purpose Control Valve Model Numbers	(24) Pilot Selector Valve Model Numbers
DSLHG-04-1	CG-04-1-10
DSLHG-04-2	CG-04-2-10
DSLHG-04-3	CG-04-3-10
DSLHG-06-1	CG-06-1-10
DSLHG-06-2	CG-06-2-10
DSLHG-06-3	CG-06-3-10
DSLHG-10-1	CG-06-1-10
DSLHG-10-2	CG-06-2-10
DSLHG-10-3	CG-06-3-10

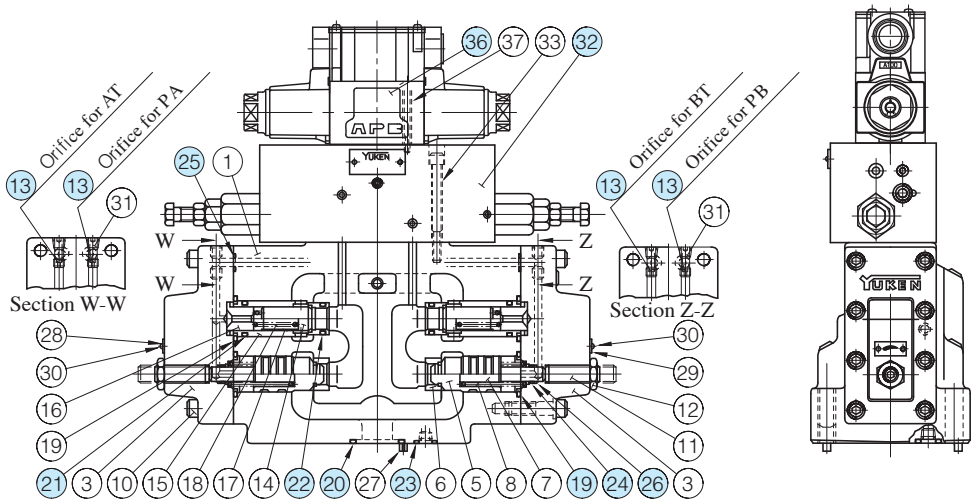
Note: For details of Pilot Selector Valve, see page 476.

Pilot Valve

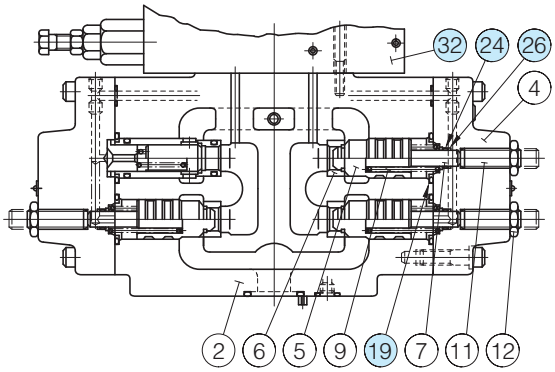
Refer to page 478 for Pilot Valve Model Numbers.

List of Seals for Main Valves and Pilot Selector Valve

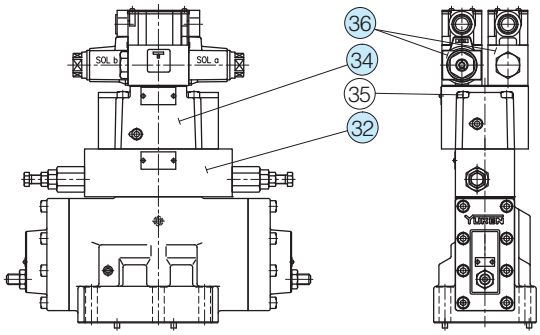
DSLHG-04/06/10-4W-∗-12/1290



DSLHG-04/06/10-$^{4A}_{5A}$-∗-12/1290



DSLHG-04/06/10-5W-∗-12/1290



Note) Main valve is the same as above drawings.

List of Seals for Main Valves

Item	Name of Parts	Part Numbers			Qty.
		DSLHG-04	DSLHG-06	DSLHG-10	
19	O-Ring	SO-NB-P22	SO-NB-G30	SO-NB-G40	4
20	O-Ring	SO-NB-P22	SO-NB-P30	SO-NB-P42	4
21	O-Ring	SO-NB-P16	SO-NB-P22	SO-NB-P30	2(1)
22	O-Ring	SO-NB-P14	SO-NB-P20	SO-NB-A122	2(1)
23	O-Ring	SO-NB-P9	SO-NB-P14	SO-NB-P14	2
24	O-Ring	SO-NA-P8	SO-NA-P10	SO-NA-P16	2(3)
25	O-Ring	SO-NB-P8	SO-NB-P9	SO-NB-P11	4
26	Back Up Ring	SO-BB-P8	SO-BB-P10	SO-BB-P16	2(3)

Note 1: The figures in ( ) indicate the quantity of seals used for 4A and 5A.

Note 2: When ordering the seals, please specify the seal kit number listed on page 478.

Pilot Valve

Refer to page 478 for Pilot Valve Model Numbers.

Pilot Selector Valve List

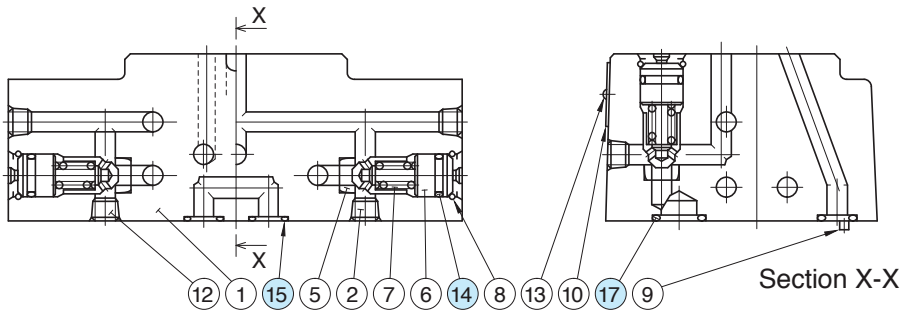
Multi-Purpose Control Valve Model Numbers	Pilot Selector Valve Model Numbers	
	Item (32)	Item (34)
DSLHG-04-4A-■	CG-04-4A-■-10	—
DSLHG-04-4W-■	CG-04-4W-■-10	—
DSLHG-04-5A-■	CG-04-5A-■-10	CG-04-3-10
DSLHG-04-5W-■	CG-04-5W-■-10	
DSLHG-06-4A	CG-06-4A-10	—
DSLHG-06-4W	CG-06-4W-10	—
DSLHG-06-5A	CG-06-5A-10	CG-06-3-10
DSLHG-06-5W	CG-06-5W-10	
DSLHG-10-4A	CG-06-4A-10	—
DSLHG-10-4W	CG-06-4W-10	—
DSLHG-10-5A	CG-06-5A-10	CG-06-3-10
DSLHG-10-5W	CG-06-5W-10	

Note: Fill "B" or "H" representing the pressure adjustment range in section marked with ■.
See page 477 for the details of the pilot selector valves.

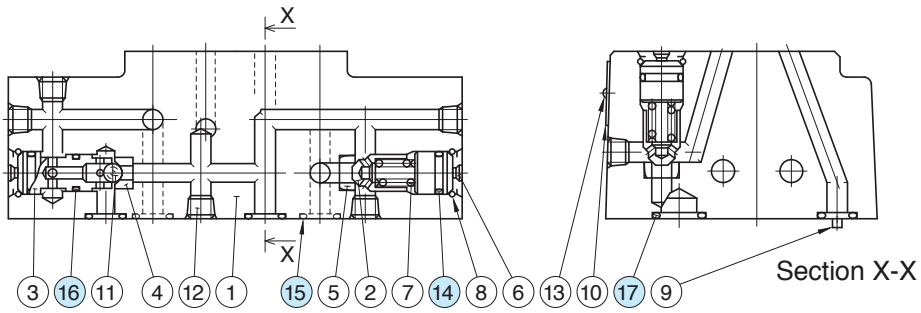
See the previous page for Item (13) Orifice.

List of Seals (Pilot Selector Valves)

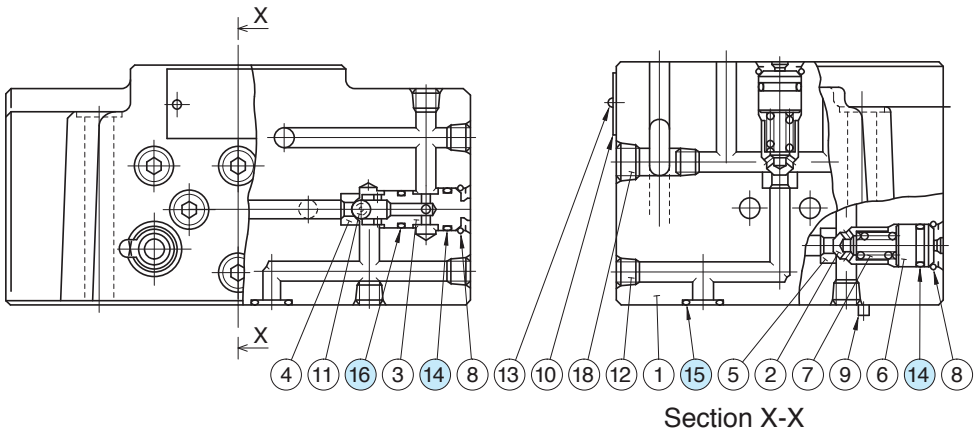
CG-04/06-1-10



CG-04/06-2-10



CG-04/06-3-10



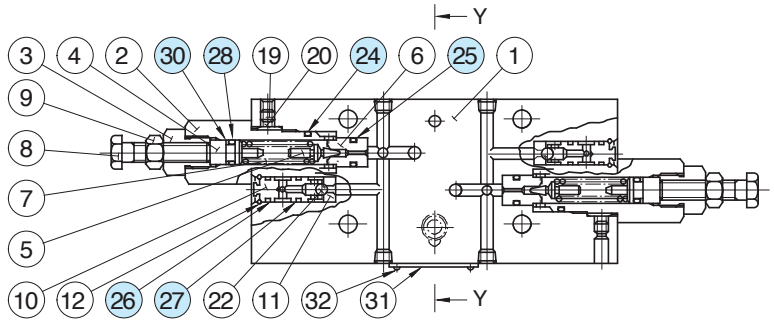
List of Seals

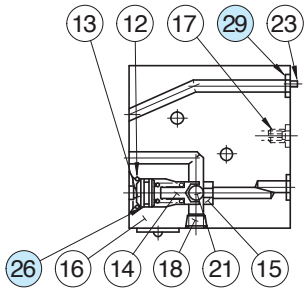
Item	Name of Parts	CG-04				CG-06			
		Part Numbers	Quantity			Part Nmbers	Quantity		
			CG-04-1	CG-04-2	CG-04-3		CG-06-1	CG-06-2	CG-06-3
14	O-Ring	SO-NB-P10	3	5	5	SO-NB-P10	3	5	5
15	O-Ring	SO-NB-P8	7	7	8	SO-NB-P9	7	7	8
16	O-Ring	SO-NB-P8	—	2	2	SO-NB-P8	—	2	2
17	O-Ring	SO-NB-P8	1	1	—	SO-NB-A014	1	1	—

Note: When ordering the o-rings, please specify the seal kit number listed in page 478.

List of Seals (Pilot Selector Valves)

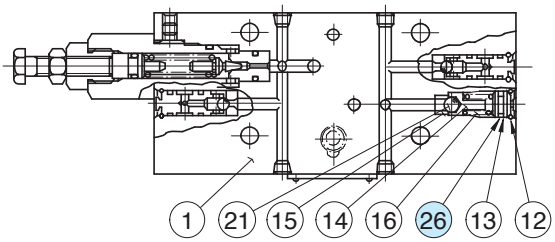
CG-04/06-4W-10



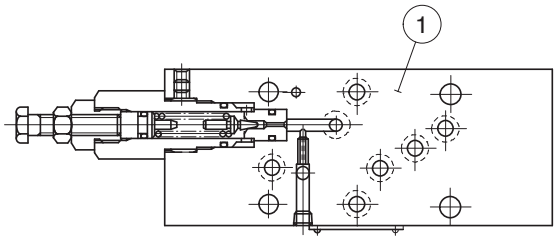


Section Y-Y

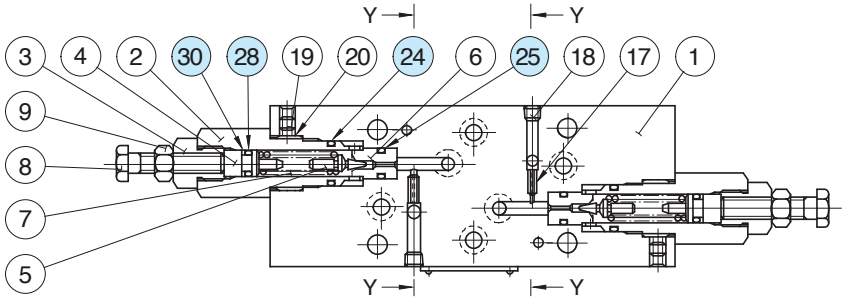
CG-04/06-4A-10

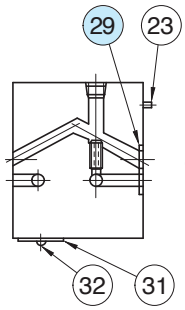


CG-04/06-5A-10



CG-04/06-5W-10





Section Y-Y

List of Seals

Item	Name of Parts	CG-04					CG-06				
		Part Numbers	Quantity				Part Nmbers	Quantity			
			-4W-	-4A-	-5W-	-5A-		-4W-	-4A-	-5W-	-5A-
24	O-Ring	SO-NB-P12	2	1	2	1	SO-NB-P16	2	1	2	1
25	O-Ring	SO-NB-P9	2	1	2	1	SO-NB-P11	2	1	2	1
26	O-Ring	SO-NB-P10	3	4	—	—	SO-NB-P10	3	4	—	—
27	O-Ring	SO-NB-P8	2	2	—	—	SO-NB-P8	2	2	—	—
28	O-Ring	SO-NA-P6	2	1	2	1	SO-NA-P9	2	1	2	1
29	O-Ring	SO-NB-P8	8	8	8	8	SO-NB-P9	8	8	8	8
30	Back Up Ring	SO-BB-P6	2	1	2	1	SO-BB-P9	2	1	2	1

Note: When ordering the seals, please specify the seal kit number listed in page 478.

List of Seal Kits and Pilot Valves

Model Numbers	Pilot Valve Model Numbers	Seal Kit Numbers		
		Complete Kit	For Pilot Selector Valves	For Pilot Valves
DSLHG-04-1-★-▲-13 DSLHG-04-1-★-▲-1390	DSG-01-3C9-★-▲-70 DSG-01-3C9-★-▲-7090	KS-DSLHG-04-1-▲-13	KS-CG-04-1-10	KS-DSG-01-▲-70 (1 Set Req'd)
DSLHG-04-2-★-▲-13 DSLHG-04-2-★-▲-1390	DSG-01-3C9-★-▲-70 DSG-01-3C9-★-▲-7090	KS-DSLHG-04-2-▲-13	KS-CG-04-2-10	
DSLHG-04-3-★-▲-13 DSLHG-04-3-★-▲-1390	DSG-01-2B2-★-▲-70 DSG-01-2B2-★-▲-7090	KS-DSLHG-04-3-▲-13		KS-DSG-01-▲-70 (2 Set Req'd)
DSLHG-04-4A-✻-★-▲-13 DSLHG-04-4A-✻-★-▲-1390	DSG-01-3C9-★-▲-70 DSG-01-3C9-★-▲-7090	KS-DSLHG-04-4A-▲-13	KS-CG-04-4A-10	KS-DSG-01-▲-70 (1 Set Req'd)
DSLHG-04-4W-✻-★-▲-13 DSLHG-04-4W-✻-★-▲-1390	DSG-01-3C9-★-▲-70 DSG-01-3C9-★-▲-7090	KS-DSLHG-04-4W-▲-13	KS-CG-04-4W-10	
DSLHG-04-5A-✻-★-▲-13 DSLHG-04-5A-✻-★-▲-1390	DSG-01-2B2-★-▲-70 DSG-01-2B2-★-▲-7090	KS-DSLHG-04-5A-▲-13	KS-CG-04-5A-10	KS-DSG-01-▲-70 (2 Set Req'd)
DSLHG-04-5W-✻-★-▲-13 DSLHG-04-5W-✻-★-▲-1390	DSG-01-2B2-★-▲-70 DSG-01-2B2-★-▲-7090	KS-DSLHG-04-5W-▲-13	KS-CG-04-5W-10	
DSLHG-06-1-★-▲-13 DSLHG-06-1-★-▲-1390	DSG-01-3C9-★-▲-70 DSG-01-3C9-★-▲-7090	KS-DSLHG-06-1-▲-13	KS-CG-06-1-10	KS-DSG-01-▲-70 (1 Set Req'd)
DSLHG-06-2-★-▲-13 DSLHG-06-2-★-▲-1390	DSG-01-3C9-★-▲-70 DSG-01-3C9-★-▲-7090	KS-DSLHG-06-2-▲-13	KS-CG-06-2-10	
DSLHG-06-3-★-▲-13 DSLHG-06-3-★-▲-1390	DSG-01-2B2-★-▲-70 DSG-01-2B2-★-▲-7090	KS-DSLHG-06-3-▲-13	KS-CG-06-3-10	KS-DSG-01-▲-70 (2 Set Req'd)
DSLHG-06-4A-★-▲-13 DSLHG-06-4A-★-▲-1390	DSG-01-3C9-★-▲-70 DSG-01-3C9-★-▲-7090	KS-DSLHG-06-4A-▲-13	KS-CG-06-4A-10	KS-DSG-01-▲-70 (1 Set Req'd)
DSLHG-06-4W-★-▲-13 DSLHG-06-4W-★-▲-1390	DSG-01-3C9-★-▲-70 DSG-01-3C9-★-▲-7090	KS-DSLHG-06-4W-▲-13	KS-CG-06-4W-10	
DSLHG-06-5A-★-▲-13 DSLHG-06-5A-★-▲-1390	DSG-01-2B2-★-▲-70 DSG-01-2B2-★-▲-7090	KS-DSLHG-06-5A-▲-13	KS-CG-06-5A-10	KS-DSG-01-▲-70 (2 Set Req'd)
DSLHG-06-5W-★-▲-13 DSLHG-06-5W-★-▲-1390	DSG-01-2B2-★-▲-70 DSG-01-2B2-★-▲-7090	KS-DSLHG-06-5W-▲-13	KS-CG-06-5W-10	
DSLHG-10-1-★-▲-13 DSLHG-10-1-★-▲-1390	DSG-01-3C9-★-▲-70 DSG-01-3C9-★-▲-7090	KS-DSLHG-10-1-▲-13	KS-CG-06-1-10	KS-DSG-01-▲-70 (1 Set Req'd)
DSLHG-10-2-★-▲-13 DSLHG-10-2-★-▲-1390	DSG-01-3C9-★-▲-70 DSG-01-3C9-★-▲-7090	KS-DSLHG-10-2-▲-13	KS-CG-06-2-10	
DSLHG-10-3-★-▲-13 DSLHG-10-3-★-▲-1390	DSG-01-2B2-★-▲-70 DSG-01-2B2-★-▲-7090	KS-DSLHG-10-3-▲-13	KS-CG-06-3-10	KS-DSG-01-▲-70 (2 Set Req'd)
DSLHG-10-4A-★-▲-13 DSLHG-10-4A-★-▲-1390	DSG-01-3C9-★-▲-70 DSG-01-3C9-★-▲-7090	KS-DSLHG-10-4A-▲-13	KS-CG-06-4A-10	KS-DSG-01-▲-70 (1 Set Req'd)
DSLHG-10-4W-★-▲-13 DSLHG-10-4W-★-▲-1390	DSG-01-3C9-★-▲-70 DSG-01-3C9-★-▲-7090	KS-DSLHG-10-4W-▲-13	KS-CG-06-4W-10	
DSLHG-10-5A-★-▲-13 DSLHG-10-5A-★-▲-1390	DSG-01-2B2-★-▲-70 DSG-01-2B2-★-▲-7090	KS-DSLHG-10-5A-▲-13	KS-CG-06-5A-10	KS-DSG-01-▲-70 (2 Set Req'd)
DSLHG-10-5W-★-▲-13 DSLHG-10-5W-★-▲-1390	DSG-01-2B2-★-▲-70 DSG-01-2B2-★-▲-7090	KS-DSLHG-10-5W-▲-13	KS-CG-06-5W-10	

Note 1: Fill coil type (a symbol representing current/voltage) in section marked★. Likewise, in section marked▲, fill a symbol representing the type of electrical conduit connection (None: Terminal Box Type, N: Plug-in Connector Type).
2: A complete seal kit is composed of seal kit for pilot selector valve, seal kit for pilot valve and seal for main valve.
See pages 474 and 475 for information on the seals for main valve.
3: See page 344 for the detailed information on the pilot valves.

How to Change Pilot & Drain Connection

Pilot Connection and Drain Connection can be changed easily with a disconnection/connection of pilot plug. The following drawings give illustrations of External Pilot-External Drain Type, When changing to Internal Pilot-Internal Drain Type, the following procedure may be followed.

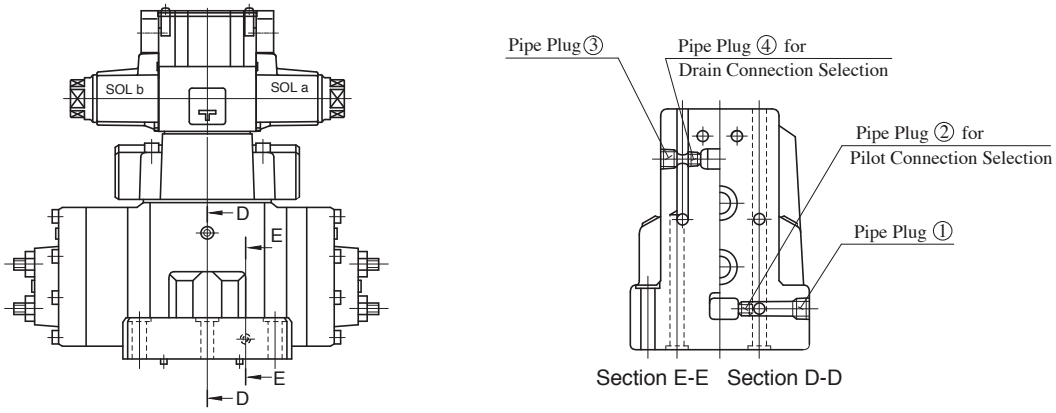
● External Pilot → Internal Pilot
(See Section E-E)

1) Remove pipe plug ①.
2) Remove pipe plug ②.
3) Wind a sealing tape around the pipe plug①, then fit the plug into the port.

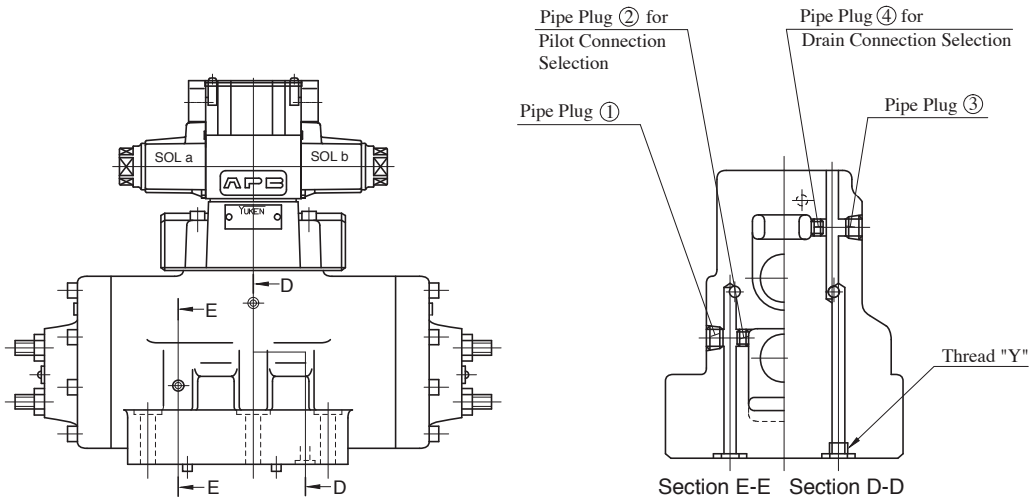
● External Drain → Internal Drain
(See Section D-D)

1) Remove pipe plug ③.
2) Remove pipe plug ④.
3) Wind a sealing tape around the pipe plug③, then fit the plug into the port.
4) In case of DSLHG-04, fit the plug into the port "Y" on the sub-plate. In case of DSLHG-06/10, wind a sealing tape around the plug ④ and then thread it into the port "Y".

DSLHG-04

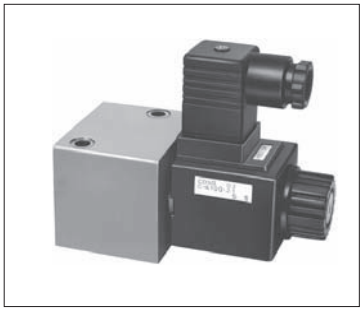


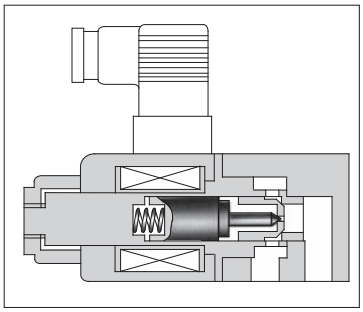
DSLHG-06/10



Solenoid Operated Poppet Type Two-Way Valves

These valves are used for opening/closing the oil path by having the poppet valve operated with an electric signal via solenoid. Because these are of poppet type, the internal leakage is quite small and there is no worry about hydraulic lock.





Specifications

Model Numbers	Max. Flow★1 L/min (U.S.GPM)	Max. Operating Pressure MPa (PSI)	Internal leakage cm^3/min (cu.in./min)	Max. Changeover Frequency min^{-1} (Cycles/Min)	Approx. Mass kg(1bs.)
CDSC-01-C-D24-10∗	15 (4.0)	21 (3050)★2	or less 0.25 (.015)	240	0.35 (.8)
CDSC-03-C-∗-21∗	50 (13.2)	14 (2030)	or less 0.25 (.015)	AC: 300 DC: 240 R: 120	0.5 (1.1)
CDST-$^{03W}_{03}$-C-∗-21∗					0.85 (1.9)
CDSG-03-C-∗-21∗					0.85 (1.9)

★ 1. The maximum flow means the limited flow without inducing any abnormality to the operation (changeover) of the valve.

★ 2. When the valve is operated at 18.5 Mpa (2680 PSI) or higher pressure, continuous energies time is restricted with Max. 30 min., and also the energies ratio less than 90 %.

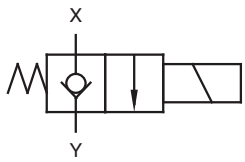
Solenoid Ratings

Electric Source	Coil Type	Frequency (Hz)	Voltage (V)		Current & Power at Rated Voltage		
			Source Rating	Serviceable Range	Inrush (A)	Holding (A)	Power (W)
AC	A100	50	100	80 - 100	1.12	0.55	—
		60	100	90 - 120	0.95	0.40	
			110		0.86	0.36	
	A120	50	120	96 - 132	0.93	0.46	
		60		108 - 144	0.79	0.33	
	A200	50	200	160 - 220	0.56	0.28	
		60	200	180 - 240	0.48	0.20	
			220		0.43	0.18	
	A240	50	240	192 - 264	0.47	0.23	
		60		216 - 288	0.40	0.17	
DC (K Series)	D12	—	12	10.8 - 13.2	—	2.20	26
	D24 ★		24	21.6 - 26.4		1.10	
	D48		48	43.2 - 52.8		0.55	
AC→DC Rectified	R100	50/60	100	90 - 110	—	0.30	26
	R200		200	180 - 220		0.15	

★ CDSC-01 is available with coil type "D24" only.

- Because both AC and DC solenoids employ the plug-in type electrical wiring, the valve can be removed without removing the wiring. (Coil type of CDSC-01 is flying lead wire only.)
- Being 50-60 Hz common service AC solenoids, do not require rewiring when the applied frequency is changed.
- K-Series DC Solenoid which has a reputation for excellent DC control is employed. (Coil type of CDSC-01 is with Surge Suppressor.)

Graphic Symbol



Instructions

Direction of flow when the solenoid is energised

These valves do not allow flow from Y to X when the solenoid is energised.

At the time of test run

At the time of test run, there is a possibility that the oil may not flow even after the solenoid is energised because of the residual air in the valve.

Mounting

There are no mounting restrictions for any models.

Model Number Designation

F-	CDS	T	-03	-C	-D12	-21	∗
Special Seals	Series Number	Type of Connection	Valve Size	Valve Type	Coil Type	Design Number	Design Standard
F: Special seals for phosphate ester type fluids (Omit if not required)	CDS: Solenoid Operated Poppet Type Two-Way Valves	C: Cartridge Type	01	C: Normally Closed	DC D24	10	None: Japanese Std. "JIS" & European Design Std. 90: N. American Design Std.
			03		AC A100, A120 A200, A240 DC D12, D24, D100 AC→DC Rectified R100, R200	21	
		T: Threaded Connection	03W (Piping Size 1/4) 03 (Piping Size 3/8)			21	None: Japanese Std. "JIS" 80: European Design Std. 90: N. American Design Std.
		G: Gasket Mounting	03			21	None: Japanese Std. "JIS" & European Design Std. 90: N. American Design Std.

Mounting Bolts

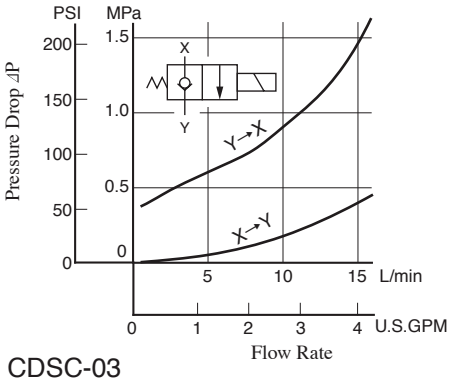
Mounting bolt in the table below is attached only for Gasket mounting type valve (CDSG-03).

Valve Model Numbers	Socket Head Cap Screws (2pcs.)	
	Japanese Standard "JIS European Design Standard	N. American Design Standard
CDSG-03	M6 × 60 Lg.	1/4-20 UNC × 2-1/4Lg.

Pressure Drop

CDSC-01

Hydraulic Fluid: Viscosity 30 mm² (141 SSU), Specific Gravity 0.850



- For any other viscosity, multiply the factors in the table below.

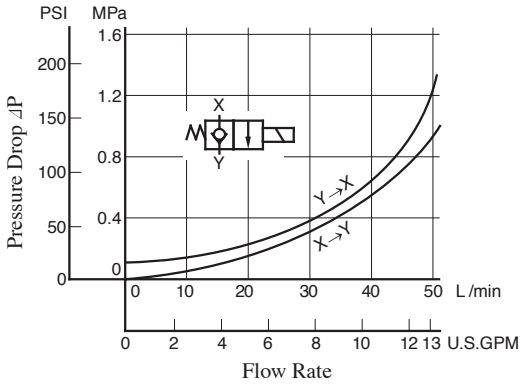
Viscosity	mm²/s	15	20	30	40	50	60	70	80	90	100
	SSU	77	98	141	186	232	278	324	371	417	464
Factor		0.84	0.91	1.00	1.07	1.14	1.19	1.24	1.28	1.32	1.35

- For any other specific gravity (G'), the pressure drop (⊿P') may be obtained from the formula below.

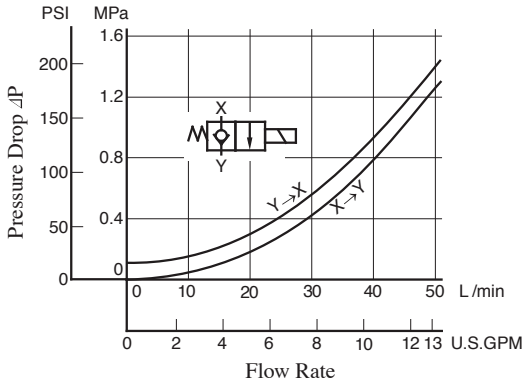
⊿P' = ⊿P (G'/0.850)

CDSC-03
CDST-03
CDSG-03

Hydraulic Fluid: Viscosity 35 mm² (164 SSU), Specific Gravity 0.850



CDST-03W



Note: Measuring has been made for the CDSC-03 (Cartridge type) when it is equipped with the same body as the threaded connections and the gasket mounting type.

- For any other viscosity, multiply the factors in the table below.

Viscosity	mm²/s	15	20	30	40	50	60	70	80	90	100
	SSU	77	98	141	186	232	278	324	371	417	464
Factor		0.81	0.87	0.96	1.03	1.09	1.14	1.19	1.23	1.27	1.30

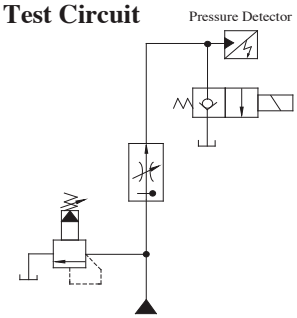
- For any other specific gravity (G'), the pressure drop (⊿P') may be obtained from the formula below.

⊿P' = ⊿P (G'/0.850)

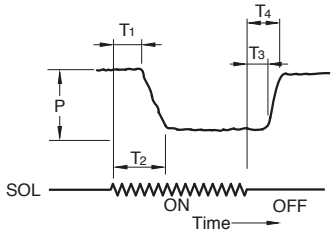
Changeover Time

Changeover time, T_2 and T_4, in particular, varies according to the hydraulic circuit and operating conditions. As an example, the following figures show how the measurement is made.

Test Circuit

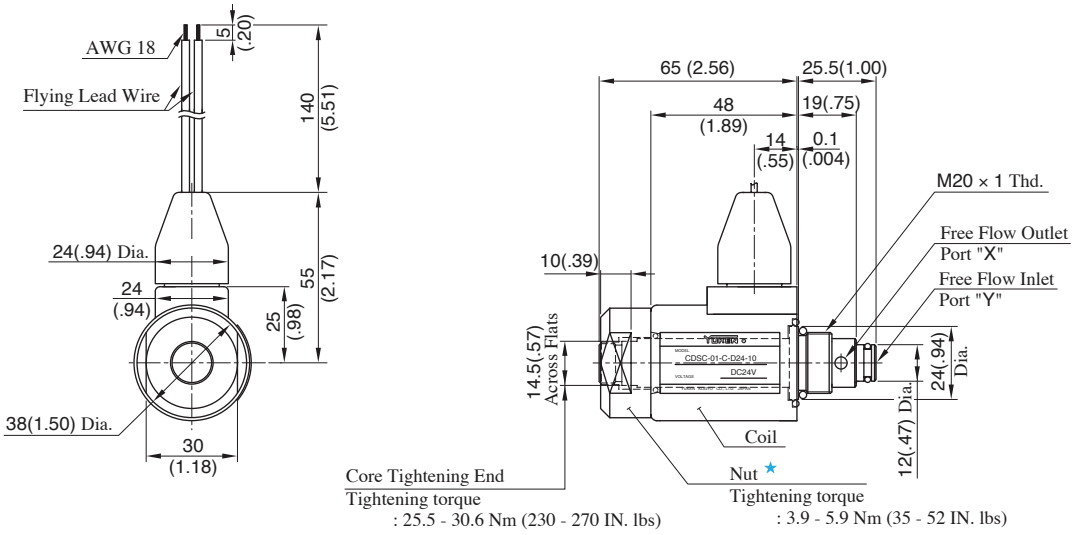


Result of measurement



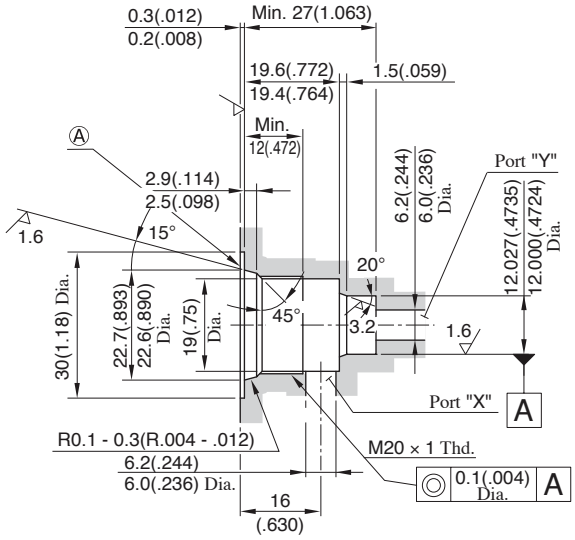
Model Number	Solenoid Types	Condition		Shifting time (ms)			
		Pressure "P" MPa (PSI)	Flow Rate L/min (U.S.GPM)	SOL "ON"(Open→Close)		SOL "OFF"(Open→Close)	
				T_1	T_2 (ex.)	T_3	T_4 (ex.)
CDSC-01	DC	10 (1450)	15 (4.0)	21.4	44.0	29.0	38.4
		21 (3050)	15 (4.0)	30.6	47.0	27.0	44.0
CDS✻-03	AC	7 (1020)	50 (13.2)	10.0	86.0	20.0	44.0
		14 (2030)	50 (13.2)	11.0	43.0	12.0	54.0
	DC	7 (1020)	50 (13.2)	22.0	104.0	44.0	66.0
		14 (2030)	50 (13.2)	24.0	60.0	41.0	73.0
	AC→DC Rectified	7 (1020)	50 (13.2)	27.0	100.0	114.0	146.0
		14 (2030)	50 (13.2)	32.0	66.0	108.0	142.0

CDSC-01-C-D24-10/1090



DIMENSIONS IN MILLIMETRES (INCHES)

Details of Mounting Holes



Note: The fitting portion of o-rings should have a good machined finish.

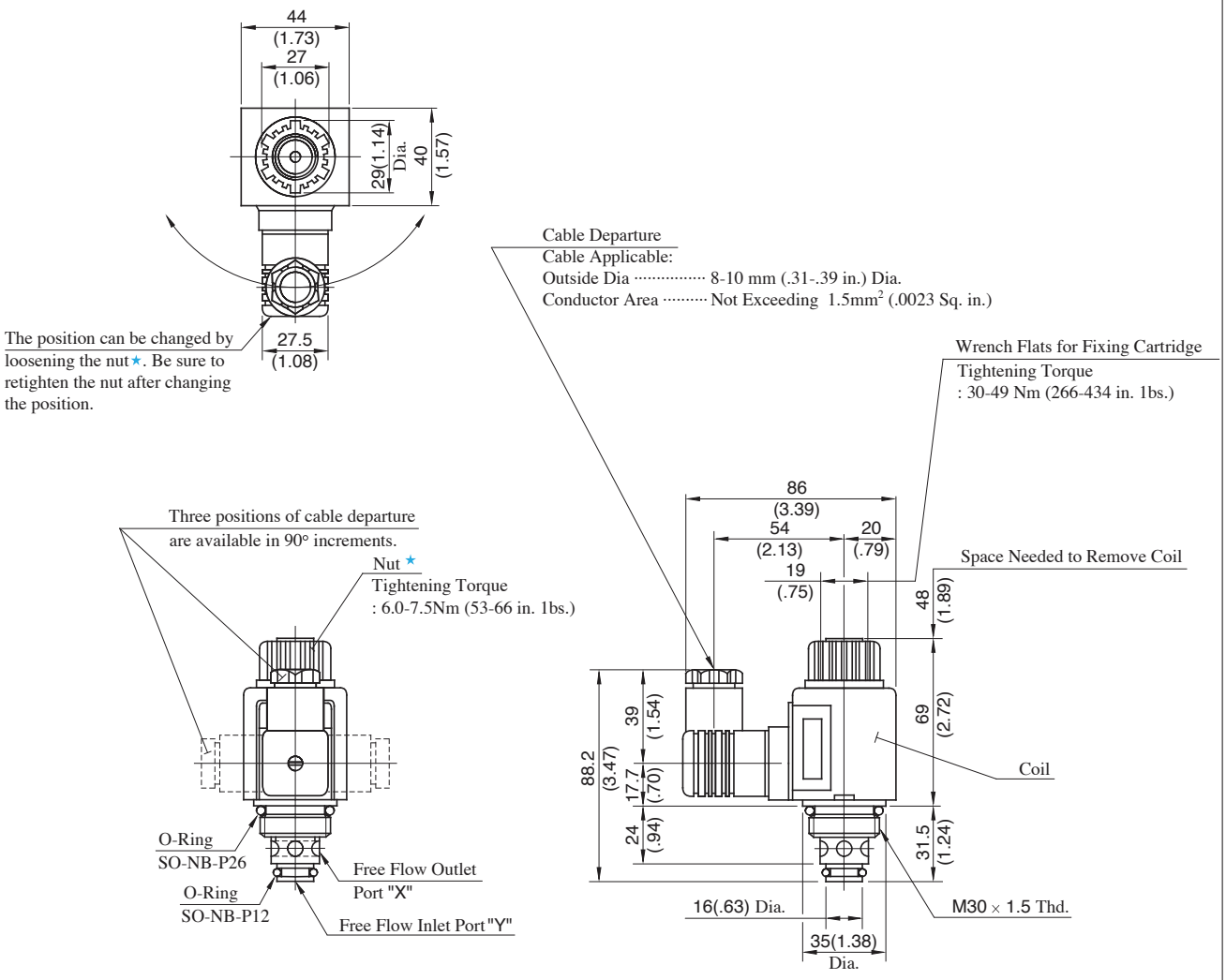
How to Mount

When mounting, the following steps must be followed:

1. Loosen the nut ★, then remove the coil.
2. Thread the cartridge, making sure that the collar 24 (.94) Dia. of the cartridge is well fitted to the component surface (Ⓐ surface in the left drawing).
3. Attach the coil and secure it with a nut.

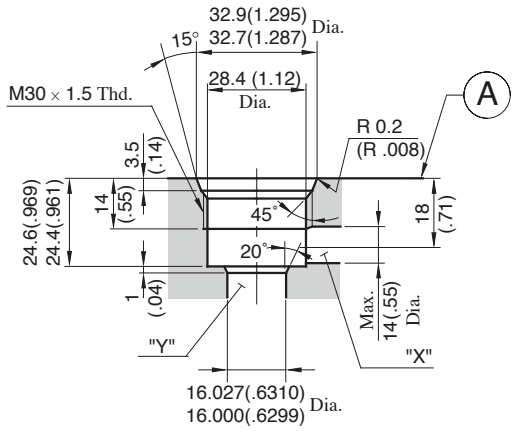
CDSC-03-C-A∗-21/2190

Models with AC Solenoids



DIMENSIONS IN MILLIMETRES (INCHES)

Details of Mounting Holes



How to Mount

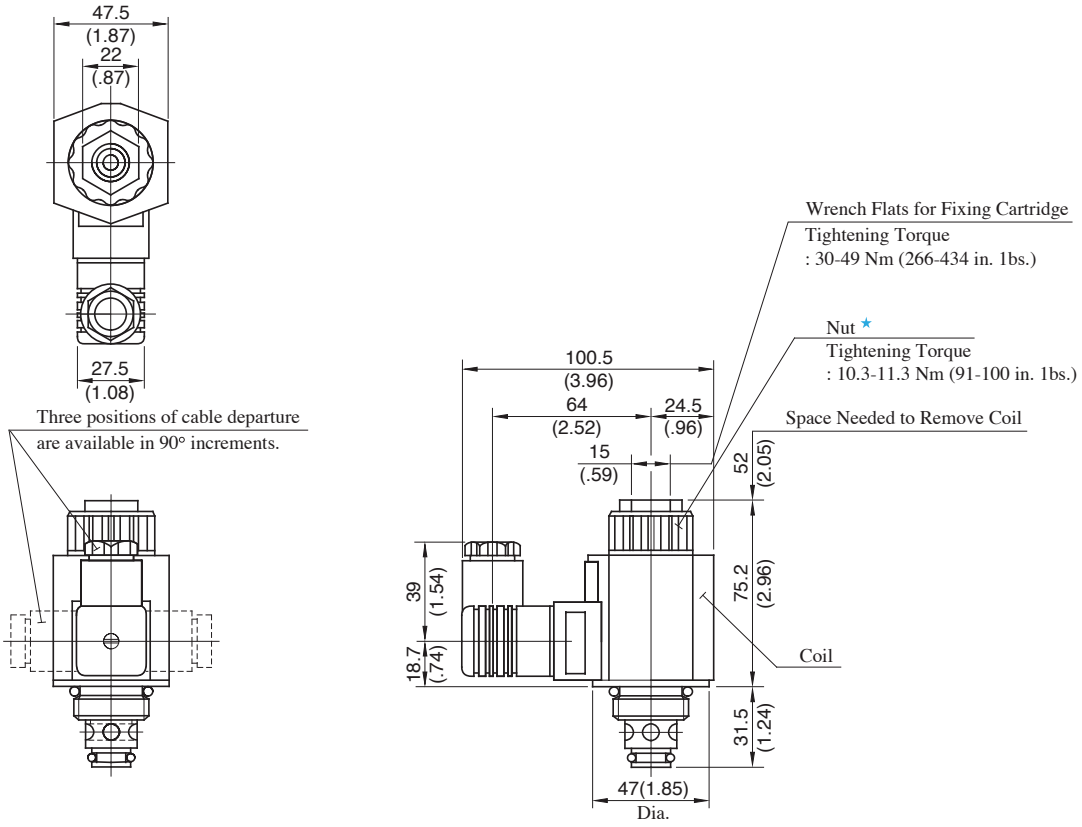
When mounting, the following steps must be followed:

1. Loosen the nut ★, then remove the coil.
2. Thread the cartridge, making sure that the collar 35 (1.38) Dia. of the cartridge is well fitted to the component surface (Ⓐ surface in the left drawing).
3. Attach the coil and secure it with a nut.

Note: The fitting portion of O-rings should have a good machined finish.

CDSC-03-C-D∗-21/2190

Models with DC Solenoids

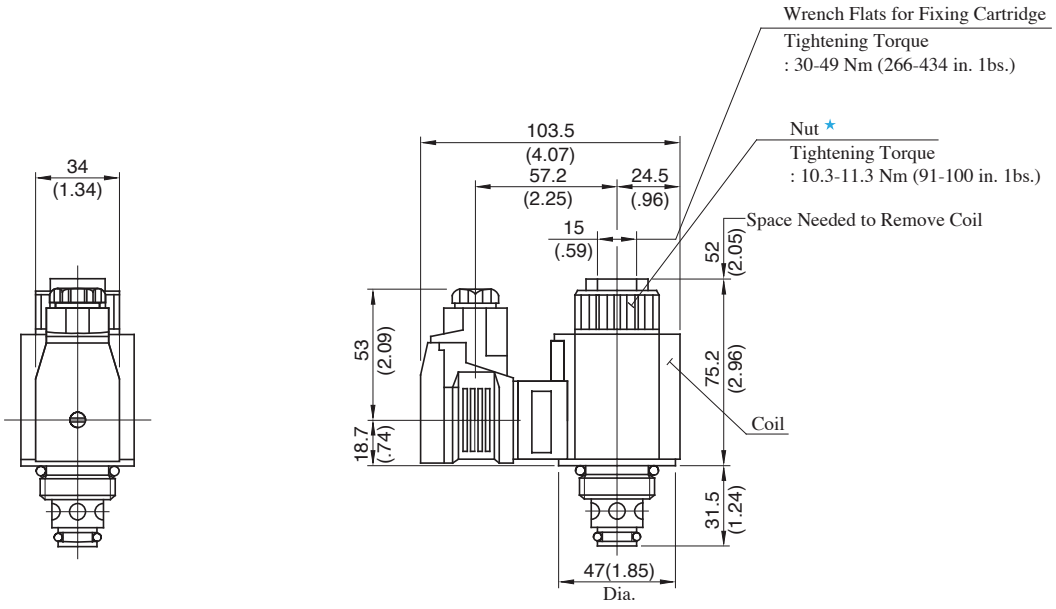


For other dimensions, refer to the "Models with AC Solenoids".

DIMENSIONS IN MILLIMETRES (INCHES)

CDSC-03-C-R∗-21/2190

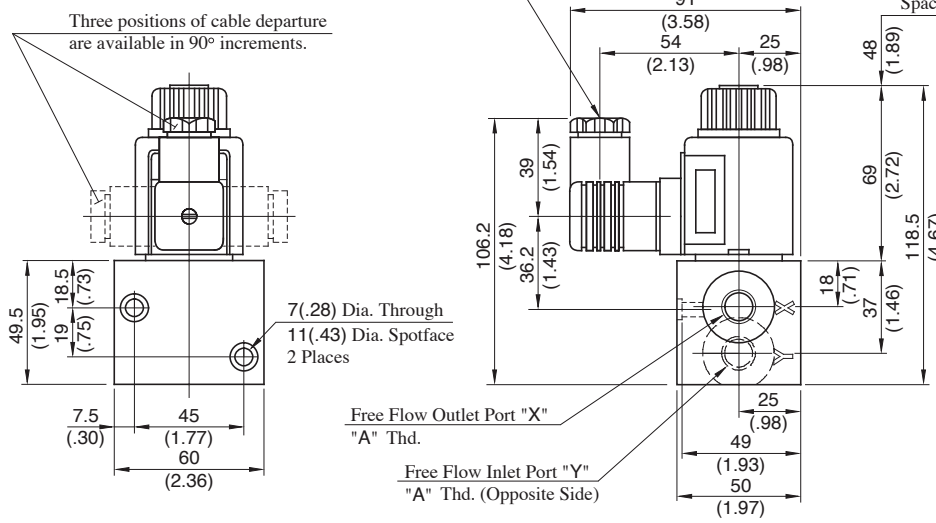
Models with R Type Solenoids



For other dimensions, refer to the "Models with AC Solenoids".

CDST-03, 03W-C-∗-21/2180/2190

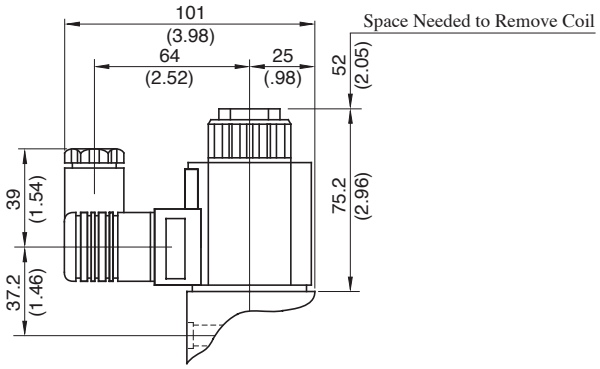
Models with AC Solenoids



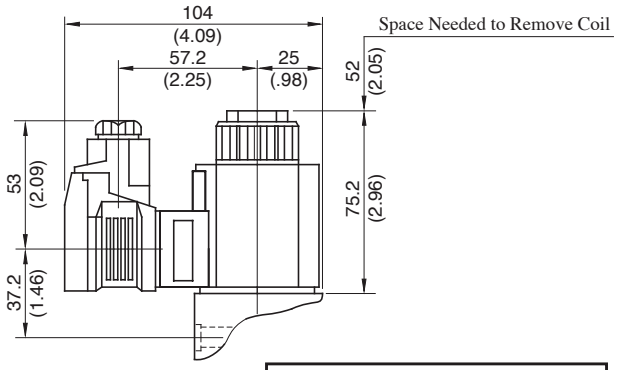
Model Numbers	"A" Thd.
CDST-03W-C-∗-21	Rc 1/4
CDST-03-C-∗-21	Rc 3/8
CDST-03W-C-∗-2180	1/4 BSP.F
CDST-03-C-∗-2180	3/8 BSP.F
CDST-03W-C-∗-2190	1/4 NPT
CDST-03-C-∗-2190	3/8 NPT

Note: The position of cable departure can be changed. For the detail, refer to CDSC-03 on the previous page.

Models with DC Solenoids



Models with R Type Solenoids

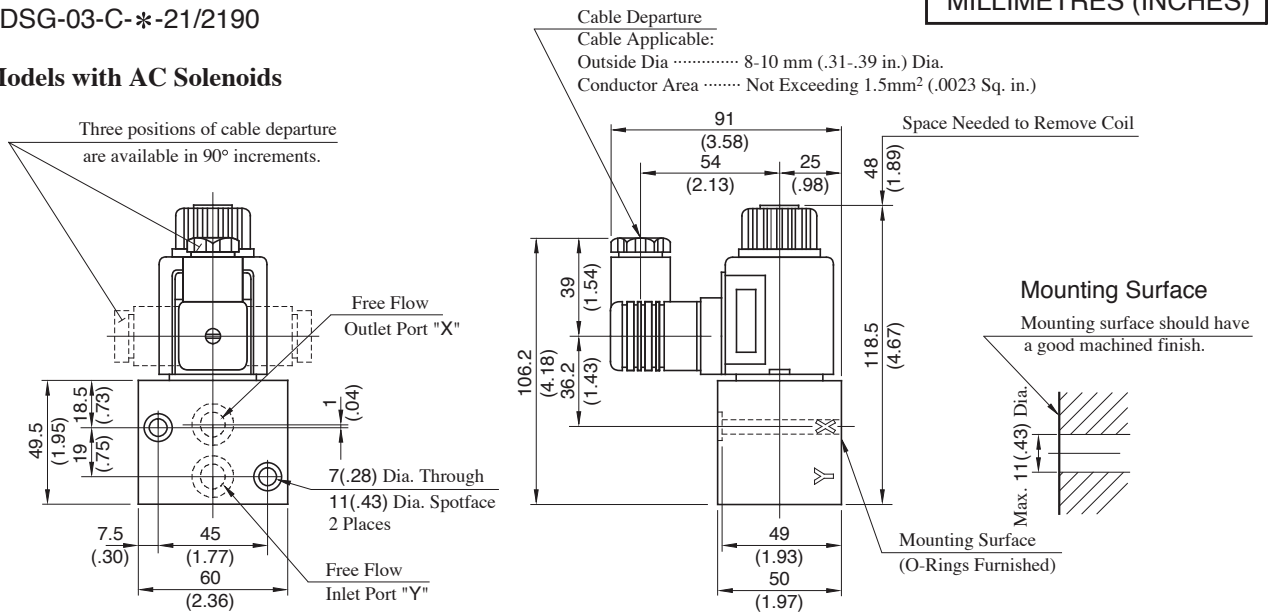


For other dimensions, refer to the "Models with AC Solenoids".

DIMENSIONS IN MILLIMETRES (INCHES)

CDSG-03-C-∗-21/2190

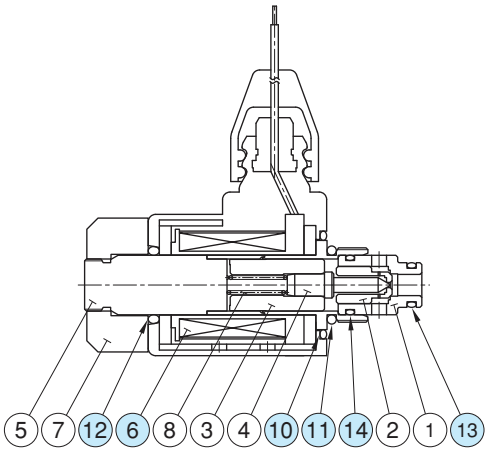
Models with AC Solenoids



Note 1: For models with DC solenoids and models with R type solenoids, refer to CDST-03, 03W.
2: The position of cable departure can be changed. For the detail, refer to CDSC-03 on the previous page.

List of Seals and Coil Ass'y

CDSC-01-C-D24-10/1090

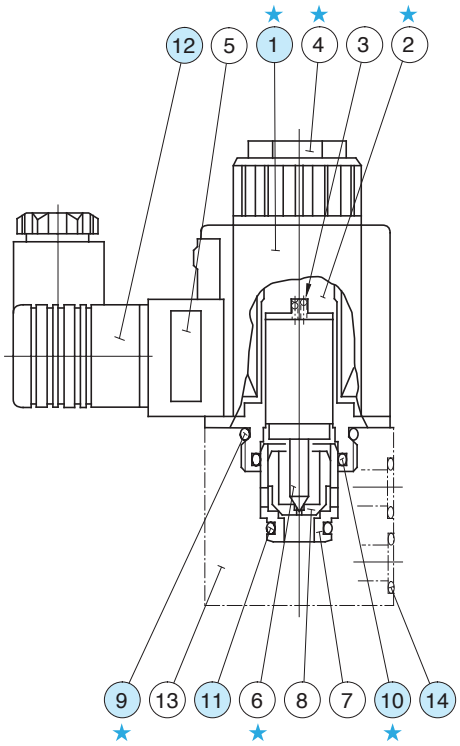


Item	Name of Parts	Part Numbers	Qty.	Seal Kit Numbers
6	Coil Ass'y	2697-VK317470-3	1	————
10	O-Ring	TK280163-7	1	KS-CDSC-01-10
11	O-Ring	SO-NB-P18	1	
12	O-Ring	SO-NB-P16	1	
13	O-Ring	SO-NB-P9	1	
14	O-Ring	SO-NB-A014	1	

Note: When ordering the seals, please specify the seal kit number.

List of Seals, Solenoid Ass'y, Coil Ass'y and Connector Ass'y

CDST-03∗-C-∗-21/2180/2190
CDSC-03-C-∗-21/2190
CDSG-03-C-∗-21/2190



Solenoid assembly is composed of the parts marked with ★.

List of Seals

Item	Name of Parts	Part Numbers	Qty.	Remarks
9	O-Ring	SO-NB-P26	1	————
10	O-Ring	SO-NB-P20	1	————
11	O-Ring	SO-NB-P12	1	————
14	O-Ring	SO-NB-A014	2	only for CDSG

Note: When ordering the seals, please specify the seal kit number from the table right.

List of Seal Kits

Valve Model Numbers	Seal Kit Numbers
CDSC-03-C-∗-21∗	KS-CDSC-03-20
CDST-03∗-C-∗-21∗	
CDSG-03-C-∗-21∗	KS-CDSG-03-20

Solenoid Ass'y, Coil Ass'y and Connector Ass'y No.

Valve Model No.	Solenoid Ass'y No.	① Coil No.	⑫ Connector Ass'y No.
CDS∗-03∗-C-A100	CSA1-100-20	C-CSA1-100-20	GDM-211-B-11
CDS∗-03∗-C-A120	CSA1-120-20	C-CSA1-120-20	
CDS∗-03∗-C-A200	CSA1-200-20	C-CSA1-200-20	
CDS∗-03∗-C-A240	CSA1-240-20	C-CSA1-240-20	
CDS∗-03∗-C-D12	CSD1-12-20	C-SD1-12-50	GDM-211-B-11
CDS∗-03∗-C-D24	CSD1-24-20	C-SD1-24-50	
CDS∗-03∗-C-D48	CSD1-48-20	C-SD1-48-50	
CDS∗-03∗-C-R100	CSR1-100-20	C-SR1-100-50	GDME-211-R-B-10
CDS∗-03∗-C-R200	CSR1-200-20	C-SR1-200-50	

Change of supply voltage

The supply voltage can be changed by replacing the coil.

Interchangeability between Current and New Design

Because of solenoid assembly improvements, CDS∗-03∗ has been model-changed (design 20 to design 21).

Specifications and Characteristics

There are no changes in the specifications and characteristics of the valves themselves.

Solenoid Ratings

There are changes in the inrush current, holding current and power as shown below. No other changes.

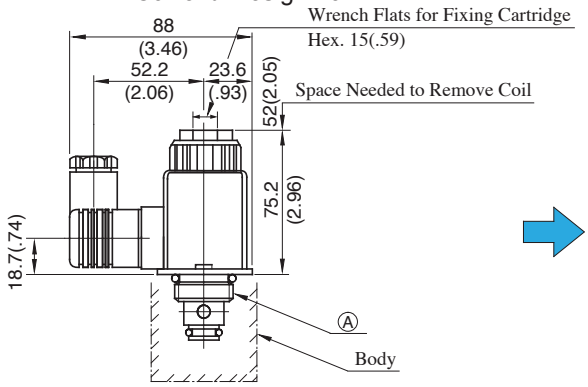
Electric Source	Coil Type	Frequency (Hz)	Voltage (V)		Current & Power at Rated Voltage					
			Source Rating	Serviceable Range	Inrush (A)		Holding (A)		Power (W)	
					New	Current	New	Current	New	Current
AC	A100	50	100	80 - 110	1.12	1.30	0.55	0.52	—	—
		60	100	90 - 120	0.95	1.08	0.40	0.39		
			110		0.86	1.19	0.36	0.47		
	A120	50	120	96 - 132	0.93	1.08	0.46	0.45		
		60		108 - 144	0.79	0.98	0.33	0.33		
	A200	50	200	160 - 220	0.56	0.65	0.28	0.27		
		60	200	180 - 240	0.48	0.54	0.20	0.20		
			220		0.43	0.59	0.18	0.24		
	A240	50	240	192 - 264	0.47	0.55	0.23	0.23		
		60		216 - 288	0.40	0.45	0.17	0.17		
DC (K Series)	D12	—	12	10.8 - 13.2	—	—	2.20	2.40	26	29
	D24		24	21.6 - 26.4			1.10	1.20		
	D48		48	43.2 - 52.8			0.55	0.60		
AC→DC Rectified	R100	50/60	100	90 - 110	—	—	0.30	0.32	26	29
	R200		200	180 - 220			0.15	0.17		

Interchangeability in Installation

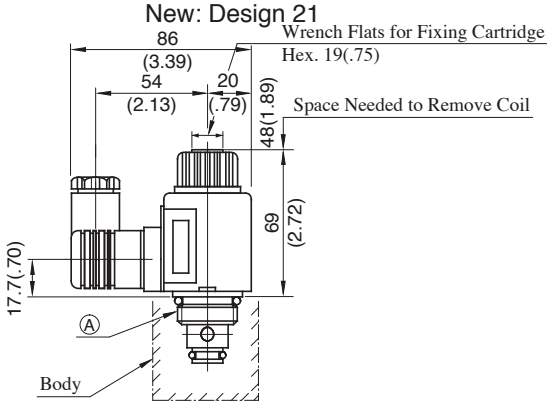
AC Solenoids

Most items of mounting are interchangeable except the dimensions as shown below. In addition, the size of the spanner (core end faces) for locking the CDSC cartridges has been changed to 15-19 mm across flats.

Current: Design 20



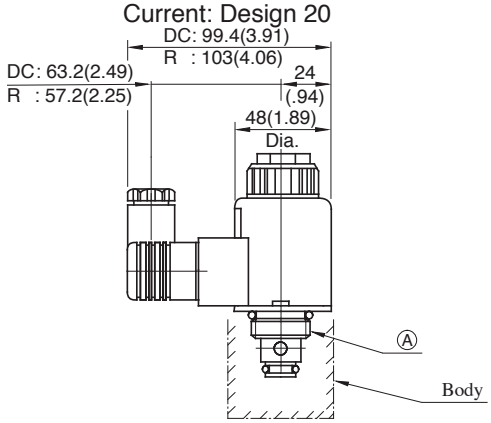
New: Design 21



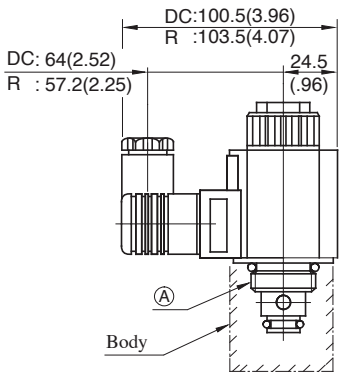
DC/R Type Solenoids

Most items of mounting are interchangeable except the dimensions as shown below. The solenoid shape changed from circular to hexagonal. No change in the size 15 mm of the spanner for locking cartridges.

Current: Design 20



New: Design 21

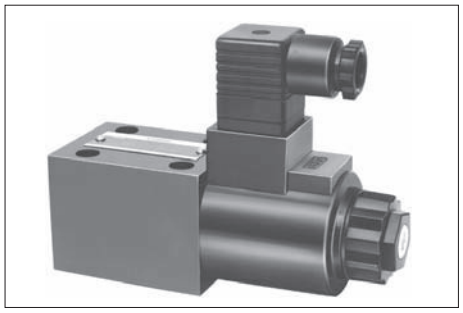


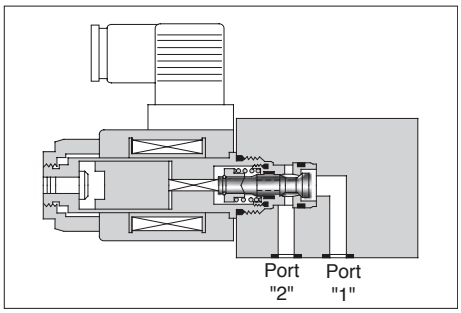
Note: The above drawings give illustrations for the cartridge type. The dimension Ⓐ at the mounting section remains unchanged. In case of the Thread Connection Type and Gasket Mounting Type, a body is mounted to the hatched section. The dimensions of the body remain unchanged.

Shut-off Type Solenoid Operated Directional Valves

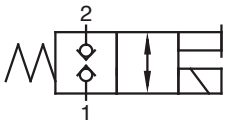
The shut-off type solenoid operated directional valves are poppet type solenoid operated two-way directional valves developed to meet the needs of this age such as energy and resources saving.

- **High-response**
  High response is provided by the poppet design.
- **Smallest internal leakage**
  Internal leakage are very small, less than 5 drips per min., which is achieved by the poppet design.
- **Two mounting types: cartridge and sub-plate**
  Mounting dimensions for both types conform to ISO standard.
- **Water-proof type (conforming to JIS D 0203 Water Spray Test 32) is also available.**





Graphic Symbol



Specifications

Model Numbers	Max. Flow ★1 L/min (U.S.GPM)	Max. Operating Pressure			Max. Changeover Frequency min^{-1} (Cycles/Min)	Internal leakage cm^3/min (cu.in./min)	Approx. Mass kg(1bs.)	
		Port "1" ★2		Port "2"			AC	DC
		"1" to "2" Flow	"2" to "1" Flow					
DSPC-01-C-∗-20∗ ★3 ★4	40 (10.6)	10 (1450)	16 (2320)	25 (3630)	300	or Less 0.25 (.015)	0.45 (1.0)	0.6 (1.3)
DSPG-01-C-∗-20∗ ★3							1.45 (3.2)	1.6 (3.5)
DSPC-03-C-∗-10∗ ★3	80 (21.1)				240	or Less 0.25 (.015)	0.9 (2.0)	1.0 (2.2)
DSPG-03-C-∗-10∗ ★3							3.8 (8.4)	3.9 (8.6)

★1. Maximum flow rates depend on operating conditions. For details, see page 491.
★2. Do not connect port "1" to a line subjected to surge pressures. In addition, if you use port "1" for tank line, be sure to keep the end of the line in the oil.
★3. Protections against dust and water conform to the international electric standard (IEC) PUBL 529 IP64.
★4. In the case of "DSPC-01-C-D∗", use iron material for installation body (cabity).

Model Number Designation

F-	DSP	G	-01	-C	-D24	-20	*
Special Seals	Series Number	Type of Connection	Valve Size	Valve Type	Coil Type	Design Number	Design Standard
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	**DSP**: Shut-Off Type Solenoid Operated Directional Valves	**C**: Cartridge Type **G**: Sub-plate Mounting	**01** **03**	**C**: Normally Closed	AC **A 100** **A 200** DC **D12** **D24**	**20** **10**	**None**: Japanese Std. "JIS" & European Design Std. **90**: N. American Design Std.

Solenoid Ratings

Electric Source	Coil Type	Frequency (Hz)	Voltage (V)		Current & Power at Rated Voltage					
			Source Rating	Serviceable Range	Inrush (A) ★1		Holding (A)		Power (W)	
					01	03	01	03	01	03
AC	A100	50	100	80 - 110	2.42	5.37	0.51	0.90	—	—
		60	100	90 - 120	2.14	4.57	0.37	0.63		
			110		2.35	5.03	0.44	0.77		
	A200	50	200	160 - 220	1.21	2.69	0.25	0.45		
		60	200	180 - 240	1.07	2.29	0.19	0.31		
			220		1.18	2.52	0.22	0.38		
DC ★2 (K Series)	D12	—	12	10.8 - 13.2	—	—	2.45	3.16	29	38
	D24		24	21.6 - 26.4			1.23	1.57		

★1. Inrush current in the above table show rms values at maximum stroke.
★2. K-Series DC Solenoid which has a reputation for excellent DC control is employed.

Sub-plate

Model Numbers	Japanese Standard "JIS"		European Design Standard		N.American Design Standard		Approx. Mass kg (lbs.)
	Sub-plate Model Numbers	Thread Size	Sub-plate Model Numbers	Thread Size	Sub-plate Model Numbers	Thread Size	
DSPG-01	DSGM-01-31	Rc 1/8	DSGM-01-3180	1/8 BSP.F	DSGM-01-3190	1/8 NPT	0.8 (1.8)
	DSGM-01X-31	Rc 1/4	DSGM-01X-3180	1/4 BSP.F	DSGM-01X-3190	1/4 NPT	0.8 (1.8)
	DSGM-01Y-31	Rc 3/8	—	—	DSGM-01Y-3190	3/8 NPT	0.8 (1.8)
DSPG-03	DSGM-03-40	Rc 3/8	DSGM-03-2180	3/8 BSP.F	DSGM-03-2190	3/8 NPT	3.0 (6.6)
	DSGM-03X-40	Rc 1/2	DSGM-03X-2180	1/2 BSP.F	DSGM-03X-2190	1/2 NPT	3.0 (6.6)
	DSGM-03Y-40	Rc 3/4	DSGM-03Y-2180	3/4 BSP.F	DSGM-03Y-2190	3/4 NPT	4.7 (10.4)

● 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.

Mounting Bolts

Four socket head cap screws in the table below are included.

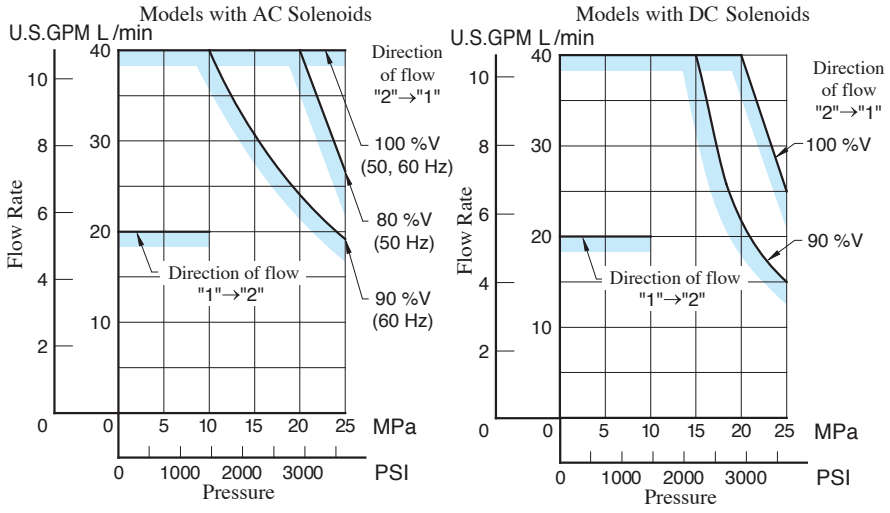
Valve Model Numbers	Descriptions	Soc. Hd. Cap Screw (4 pcs.)	Tightening Torque
DSPG-01	Japanese Standard "JIS" and European Design Standard	M5 × 50 Lg.	5-7 Nm (44 -62 in. 1bs.)
	N. American Design Standard	No. 10-24 UNC × 2 Lg.	
DSPG-03	Japanese Standard "JIS" and European Design Standard	M6 × 80 Lg.	12-15 Nm (106 -133 in. 1bs.)
	N. American Design Standard	1/4-20 UNC × 3-1/4 Lg.	

Typical Performance Characteristics at Viscosity 30 mm²/s (141 SSU) [ISO VG 46 oils, 50°C(122°F)]

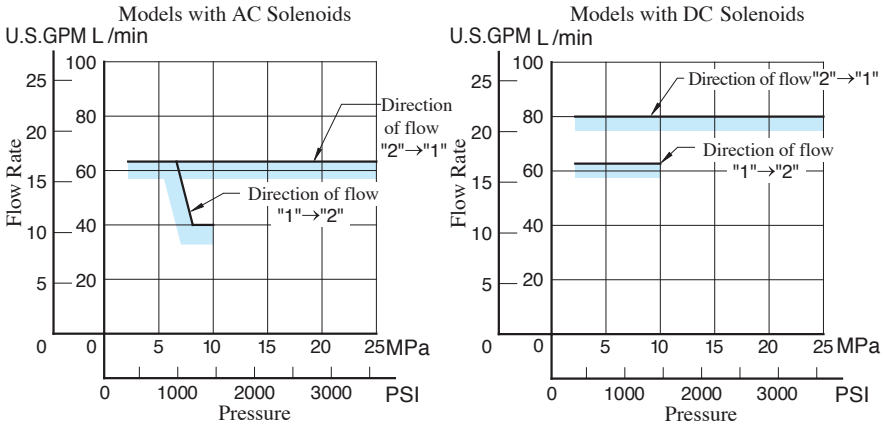
Maximum Flow Rate

The zone under each shaded line denotes the flow rate ranges being free of trouble in changeover.

DSPC/DSPG-01



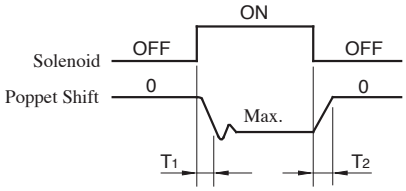
DSPC/DSPG-03



Typical Changeover Time

[Test Conditions]

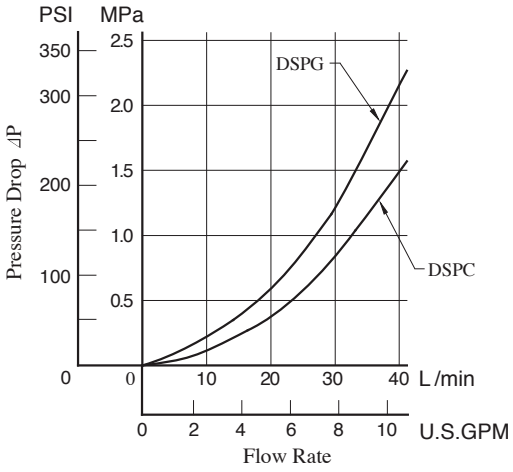
- Pressure: 15 MPa (2180 PSI)
- Flow Rate: (01) 30 L/min (7.9 U.S.GPM)
  (03) 63 L/min (16.6 U.S.GPM)
- Viscosity: 30 mm²/s (141 SSU)
- Voltage: 100 % V
  (After coil temperature rise and saturates)
- Direction of Flow: "2" → "1"



Model Numbers	Shifting Time (ms)	
	T1	T2
DSPC/DSPG-01-C-A∗	22	30
DSPC/DSPG-01-C-D∗	69	14
DSPC/DSPG-03-C-A∗	22	20
DSPC/DSPG-03-C-D∗	60	80

Pressure Drop

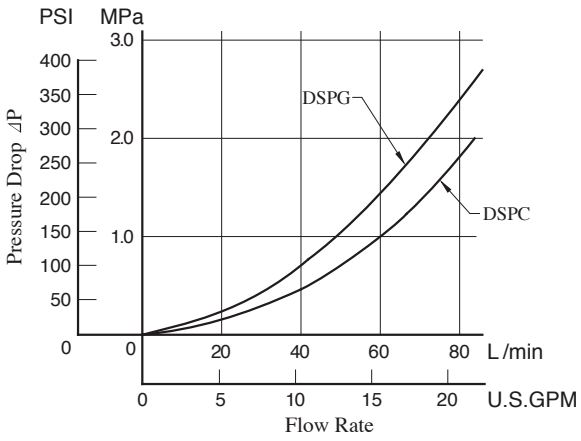
DSPC/DSPG-01



- For any other viscosity, multiply the factors in the table below.

Viscosity	mm²/s	15	20	30	40	50	60	70	80	90	100
	SSU	77	98	141	186	232	278	324	371	417	464
Factor		0.81	0.87	0.96	1.03	1.09	1.14	1.19	1.23	1.27	1.30

DSPC/DSPG-03



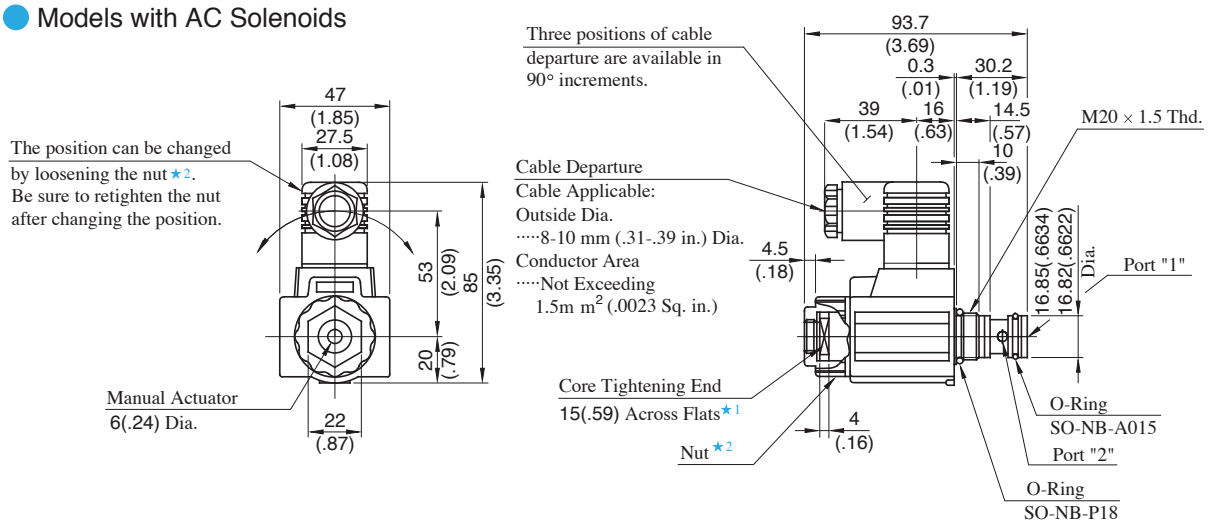
- For any other specific gravity (G'), the pressure drop (ΔP') may be obtained from the formula below.

$$\Delta P' = \Delta P(G'/0.850)$$

DSPC-01-C-∗-20/2090

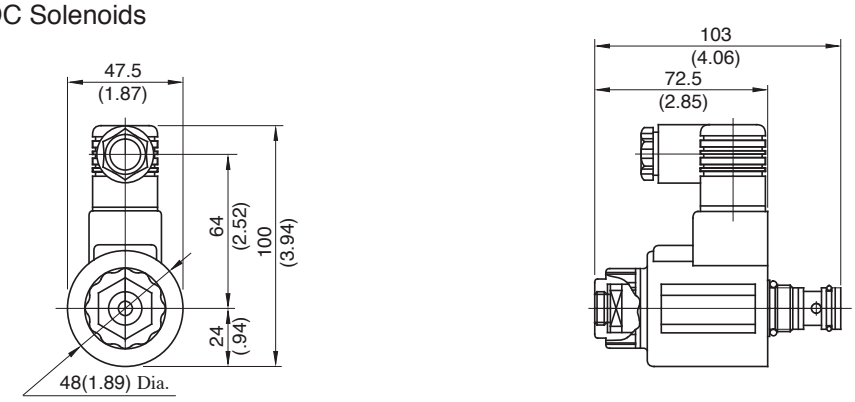
Mounting Surface: ISO 7789 20-01-0-93

Models with AC Solenoids



★1. Tightening torque for iron core assembly: 30 - 50 Nm (266-443 IN. lbs.)
★2. Tightening torque for nuts: 10.3 - 11.3 Nm (91-100 IN. lbs.)

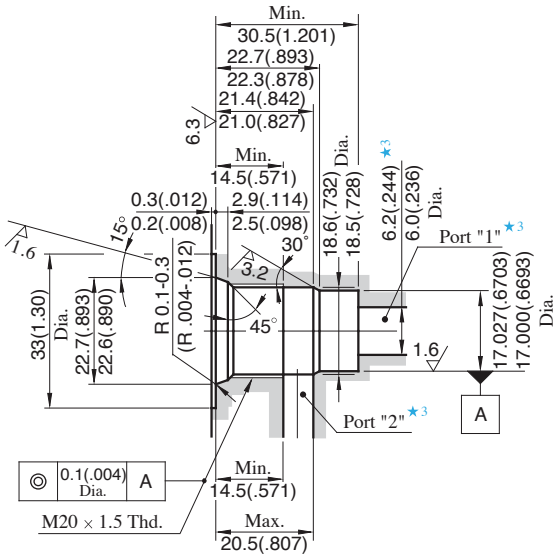
Models with DC Solenoids



● For other dimensions, refer to the "Models with AC Solenoids".

Details of Mounting Holes

DIMENSIONS IN MILLIMETRES (INCHES)



How to Mount

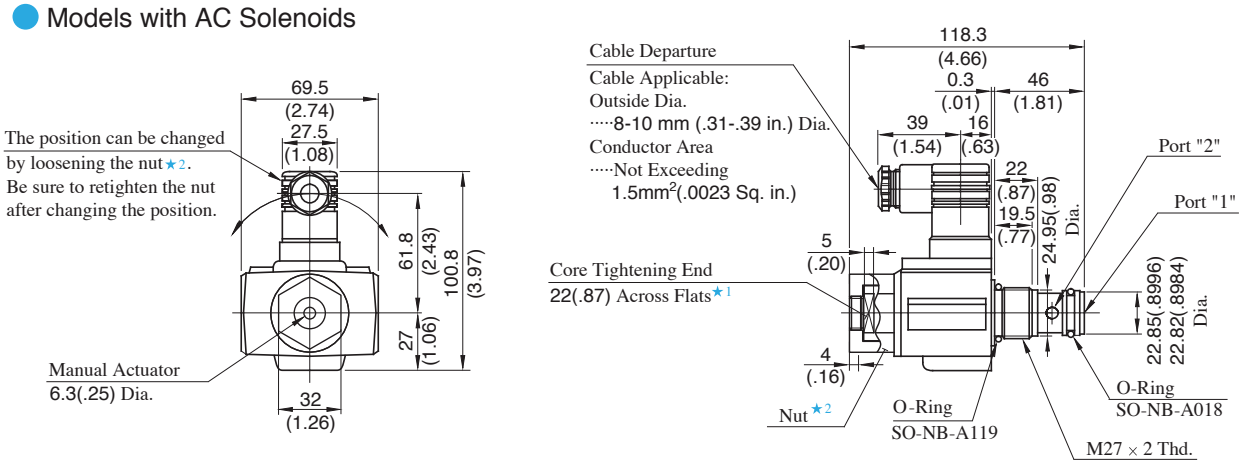
When mounting, the following steps must be followed.
1. Loosen the coil fastening the nut and remove the coil.
2. Making use of the core tightening end, screw the cartridge in.
3. Attach the coil and fix it with the nut.

★3. Port diameter of 6.2 (.244) Dia. recommended.
★4. Use iron materials for the mounting section.

DSPC-03-C-∗-10/1090

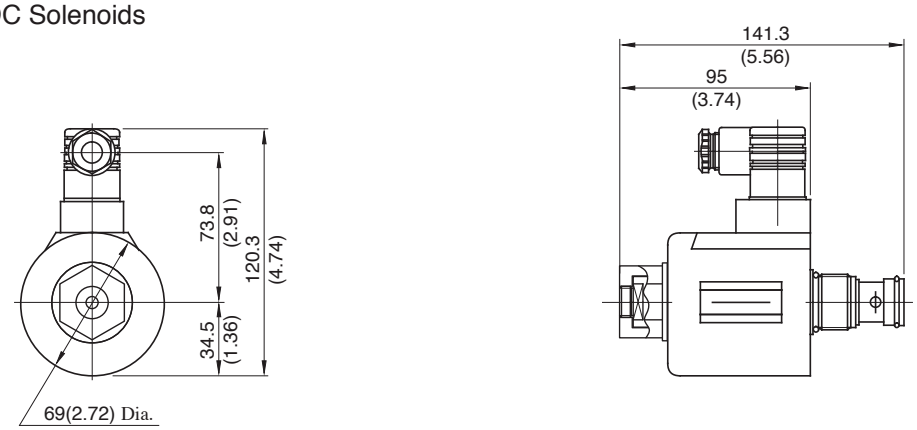
Mounting Surface: ISO 7789 27-01-0-93

Models with AC Solenoids



★1. Tightening torque for iron core assembly: 110-140 Nm (970-1240 IN. lbs.)
★2. Tightening torque for nuts: 8.5-10.5 Nm (75-93 IN. lbs.)

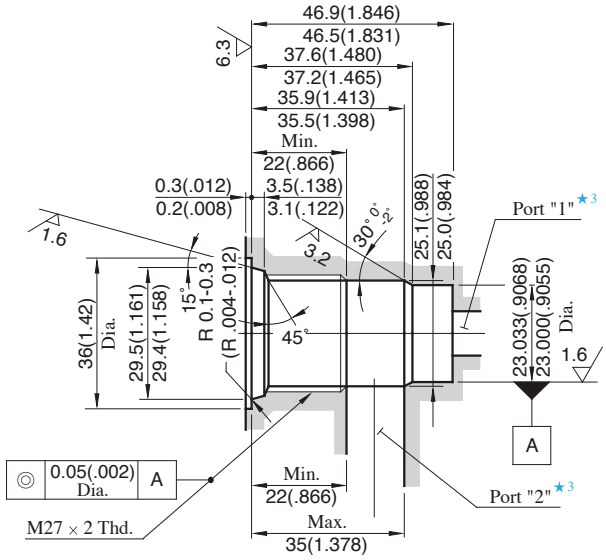
Models with DC Solenoids



● For other dimensions, refer to the "Models with AC Solenoids".

Details of Mounting Holes

DIMENSIONS IN MILLIMETRES (INCHES)



How to Mount

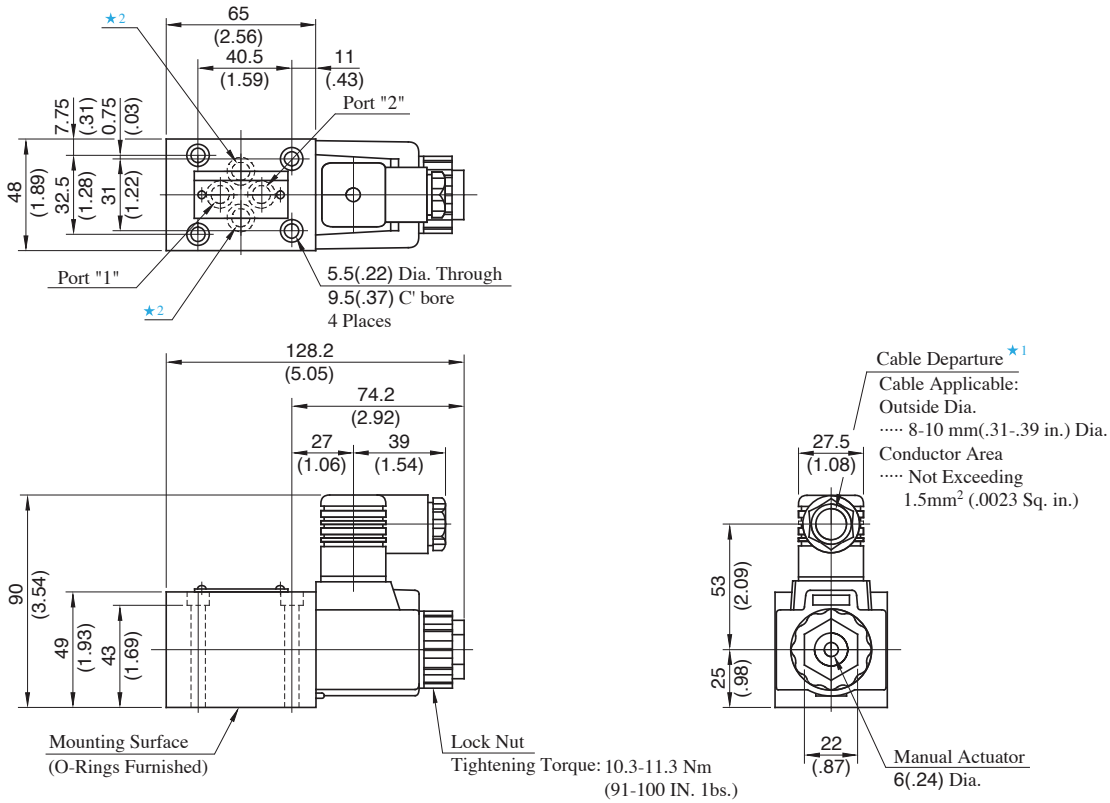
When mounting, the following steps must be followed.
1. Loosen the coil fastening the nut and remove the coil.
2. Making use of the core tightening end, screw the cartridge in.
3. Attach the coil and fix it with the nut.

★3. A recommendable port dia. is 11 (.433) mm.
★4. Use iron materials for the mounting section.

DSPG-01-C-∗-20/2090

Mounting Surface: ISO 4401-AB-03-4-A

Models with AC Solenoids



★1. The location and the position of the cable departure can be changed. For details, see the cartridge type.

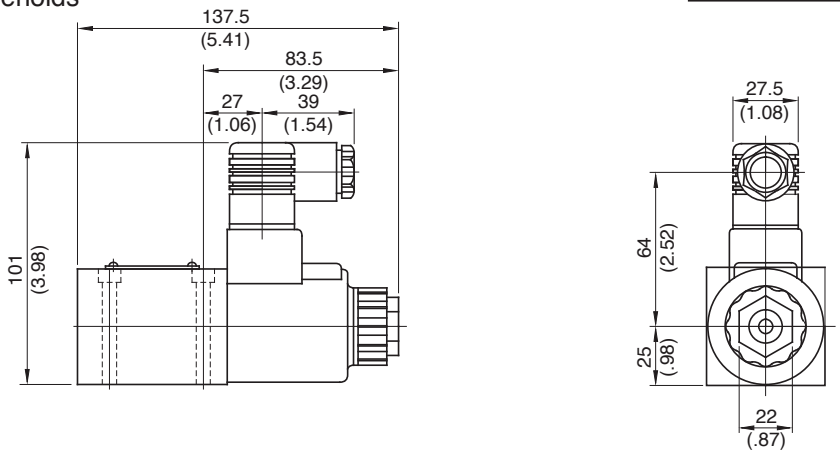
★2. These ports (2) are not used. In addition, the body has the O-ring grooves and O-rings are included in the body.

★3. The mounting dimensions conform to ISO 4401-AB-03-4-A. Ports A and B are used as ports "2" and "1" respectively.

★4. O-rings for ports: SO-NB-P9

DIMENSIONS IN MILLIMETRES (INCHES)

Models with DC Solenoids



● For other dimensions, refer to the "Models with AC Solenoids".