

# E

## DIRECTIONAL CONTROLS

|                                                               |          |
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## Directional Valves

These valve are used for shifting oil flow direction of hydraulic circuit and for actuator starting/stopping as well as the operating direction shifting of actuator.

### ● Solenoid Operated Directional Valves



### ● Solenoid Controlled Pilot Operated Directional Valves



### ● "G" Series Shockless Type Directional Valves



### ● Pilot/Manually/Mechanically Operated Directional Valves



### ● Poppet Type Directional Valves



### ● Check/Pilot Controlled Check Valves



# Hydraulic Fluids

## 1. Type of Fluids

Any type of hydraulic fluid, listed in the table below can be used.

| Type of Fluids                 | Remarks                                                                                                                                                                      |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Petroleum Base Oils            | Use fluids equivalent to ISO VG32 or VG46.                                                                                                                                   |
| Synthetic Fluids <sup>1)</sup> | Use phosphate ester or polyol ester type. When phosphate ester type fluid is to be used, prefix "F-" to the model number because a special seal (fluororubber) will be used. |
| Water Containing Fluids        | Use water-glycol fluids or W/O emulsion type fluids.                                                                                                                         |

- Notes
- 1: Not applicable with G-DSG and G-DSHG series valves.
  - 2: For two types of manually operated directional valves, DMT-<sup>06</sup><sub>06X</sub> and DMT-<sup>10</sup><sub>10X</sub>, only petroleum base oils and polyol ester type fluids are available.
  - 3: Water-glycol fluids cannot be used for two types of solenoid operated poppet type two-way valves; CDST-03\* and CDSG-03 types.
  - 4: For use with hydraulic fluids other than those listed above, please consult your Yuken representatives in advance.

## 2. Recommended Viscosity and Oil Temperatures

Use hydraulic fluids which satisfy the both recommended viscosity and oil temperatures given in the table below.

| Name                                                                                                                                                                                                                                                                                                                                                                                                          | Viscosity                                      | Oil Temperature            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------|
| DSG-005 series Solenoid Operated Directional Valves                                                                                                                                                                                                                                                                                                                                                           | 20 – 200 mm <sup>2</sup> /s<br>(100 – 900 SSU) | –15 – +60°C<br>(5 – 140°F) |
| Solenoid Operated Directional Valves<br>Solenoid Controlled Pilot Operated Directional Valves<br>Poppet Type Solenoid Operated Directional Valves<br>Multi Purpose Control Valves<br>Solenoid Operated Poppet Type Two-Way Valves<br>Pilot Controlled Directional Valves<br>Manually Operated Directional Valves<br>Mechanically Operated Directional Valves<br>Check Valves<br>Pilot Controlled Check Valves | 15 – 400 mm <sup>2</sup> /s<br>(80 – 1800 SSU) | –15 – +70°C<br>(5 – 160°F) |
| G Series Shockless Type Solenoid Operated Directional Valves<br>(Shifting Time Adjustable)                                                                                                                                                                                                                                                                                                                    | 15 – 200 mm <sup>2</sup> /s<br>(80 – 900 SSU)  | –15 – +60°C<br>(5 – 140°F) |

## 3. Control of Contamination

Due caution must be paid to maintaining control over contamination of the hydraulic fluids which may otherwise lead to breakdowns and shorter the life of the valve. Please maintain the degree of contamination within NAS 1638-Grade 12. Use 25 µm or finer line filter (In case of DSG-005 series Solenoid Operated Directional Valves, NAS1638-Grade 11. Use 20 µm or finer line filter).

## Water-proof, dust-proof and vibration-resistance

There properties are in compliance with the following standards.

(The marking of ○ indicates compliance)

| Item                 | Standard                                                                              | Type                                       | Description                                                                                        | Compliance                        |                                                                                     |                                 |                                                |                      |      |
|----------------------|---------------------------------------------------------------------------------------|--------------------------------------------|----------------------------------------------------------------------------------------------------|-----------------------------------|-------------------------------------------------------------------------------------|---------------------------------|------------------------------------------------|----------------------|------|
|                      |                                                                                       |                                            |                                                                                                    | DSG-005                           | (S-/T-/L-)DSG-01<br>DSHG-01<br>DSHG-03<br>(S-)DSHG-04<br>(S-)DSHG-06<br>(S-)DSHG-10 | E-DSG-01<br>(S-/E-/T-/L-)DSG-03 | G-DSG-01<br>G-DSG-03<br>G-DSHG-04<br>G-DSHG-06 | DSL<br>DSLHG<br>DSP* | CDS* |
| ★2<br>Water-proof    | JIS F8001<br>Water-proof test for marine electric appliance                           | Class 1 water spray                        | Drip-proof construction                                                                            | ○                                 | ○                                                                                   | ○                               | ○                                              | ○                    | ○    |
|                      |                                                                                       | Class 2 water spray                        | Froth-roof construction                                                                            | ×                                 | ○                                                                                   | ○                               | ○                                              | ○                    | ○    |
|                      | JIS D0203<br>Damp-proof and Water-proof test for automobile parts                     | Damp-proof test M1                         | Test to examine damp-resistance of parts                                                           | ×                                 | ○                                                                                   | ○                               | ○                                              | ○                    | ○    |
|                      |                                                                                       | Damp-proof test M2                         | Test to examine functions of part under high temperature and high humidity                         | ×                                 | ○                                                                                   | ○                               | ○                                              | ○                    | ○    |
|                      |                                                                                       | Splash-proof test R1                       | Test to examine functions of parts which are likely to be exposed to water splash.                 | ○                                 | ○                                                                                   | ○                               | ○                                              | ○                    | ○    |
|                      |                                                                                       | Splash-proof test R2                       | Test to examine functions of parts which are indirectly exposed to stormy weather or water splash. | ×                                 | ○                                                                                   | ○                               | ○                                              | ○                    | ○    |
|                      | ★2<br>JIS C0920<br>Water-proof test for electro-mechanical parts and wiring materials | Drip-proof type                            | Not affected by water dropping at vertical angle of 15 degrees or less.                            | ○                                 | ○                                                                                   | ○                               | ○                                              | ○                    | ○    |
|                      |                                                                                       | Rain-proof type                            | Not affected by rain fall at vertical angle of 60 degrees or less.                                 | ×                                 | ○                                                                                   | ○                               | ○                                              | ○                    | ○    |
|                      |                                                                                       | Froth-proof type                           | Not affected by water drip from any direction.                                                     | ×                                 | ○                                                                                   | ○                               | ○                                              | ○                    | ○    |
|                      |                                                                                       | Jet-flow proof type                        | Not affected by jet flow from any direction.                                                       | ×                                 | ○                                                                                   | ×                               | ×                                              | ×                    | ×    |
|                      | (I.E.C)<br>PUBL. 529                                                                  | Protection Class 2: Drip-proof type (2)    | Not affected by water drip falling at vertical angle of 15 degrees or less.                        | ○                                 | ○                                                                                   | ○                               | ○                                              | ○                    | ○    |
|                      |                                                                                       | Protection Class 3: Rain-proof type        | Not affected by rain falling at vertical angle of 60 degrees or less.                              | ×                                 | ○                                                                                   | ○                               | ○                                              | ○                    | ○    |
|                      |                                                                                       | Protection Class 4: Froth-proof type       | Not affected by water drip from any direction.                                                     | ×                                 | ○                                                                                   | ○                               | ○                                              | ○                    | ○    |
|                      |                                                                                       | Protection Class 5: Jet-flow proof type    | Not affected by jet flow from any direction.                                                       | ×                                 | ○                                                                                   | ×                               | ×                                              | ×                    | ×    |
| Dust-proof           | (I.E.C)<br>PUBL. 529                                                                  | Protection Class 6                         | Fully protected from entry of dust.                                                                | ○                                 | ○                                                                                   | ○                               | ○                                              | ○                    | ○    |
| Vibration-resistance | JIS C0911<br>Vibration test for small electric appliances                             | Resonance test (IC)                        | Vibration range: 7-59.5 Hz<br>Duplex amplitude: 0.1 mm                                             | ×                                 | ○                                                                                   | ○                               | ○                                              | ○                    | ○    |
|                      |                                                                                       | Fixed frequency resistance test (IIC)      | Frequency: 20 Hz                                                                                   | Grade 1: duplex amplitude-0.5 mm  | ×                                                                                   | ○                               | ○                                              | ○                    | ○    |
|                      |                                                                                       |                                            |                                                                                                    | Grade 2: duplex amplitude-1.2 mm  | ×                                                                                   | ○(2D*)★1                        | ○(2D*)★1                                       | ○★1                  | ○    |
|                      |                                                                                       |                                            |                                                                                                    | Grade 3: duplex amplitude-1.8 mm  | ×                                                                                   | ○(2D*)★1                        | ○(2D*)★1                                       | ○★1                  | ○    |
|                      |                                                                                       |                                            |                                                                                                    | Grade 4: duplex amplitude-2.4 mm  | ×                                                                                   | ○(2D*)★1                        | ○(2D*)★1                                       | ○★1                  | ○    |
|                      |                                                                                       | Variable frequency resistance test (IIIC)  | Frequency range: 7-59.5 Hz                                                                         | Grade 1: duplex amplitude-0.3 mm  | ×                                                                                   | ○(2D*)★1                        | ○(2D*)★1                                       | ○★1                  | ○    |
|                      |                                                                                       |                                            |                                                                                                    | Grade 2: duplex amplitude-0.5 mm  | ×                                                                                   | ○(2D*)★1                        | ○(2D*)★1                                       | ○★1                  | ○    |
|                      |                                                                                       |                                            |                                                                                                    | Grade 3: duplex amplitude-0.75 mm | ×                                                                                   | ○(2D*)★1                        | ○(2D*)★1                                       | ○★1                  | ×    |
|                      | JIS D1601<br>Vibration test for automobile parts                                      | Class 1: mainly for parts of passenger car | Grade A: Parts mounted on spring of body or chassis having relatively low vibration.               | ×                                 | ○(2D*)★1                                                                            | ○(2D*)★1                        | ○                                              | ○                    | ×    |
|                      |                                                                                       |                                            | Grade B: Parts mounted on spring of body or chassis having relatively low vibration.               | ×                                 | ○(2D*)★1                                                                            | ○(2D*)★1                        | ○                                              | ○                    | ×    |
|                      |                                                                                       |                                            | Grade C: Parts mounted in engine having relatively low vibration                                   | ×                                 | ○(2D*)★1                                                                            | ○(2D*)★1                        | ×                                              | ○                    | ×    |

★1 : No-spring detented type (2D\*) and No-spring type (2N\*) can be used when energised continuous for position holding.

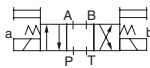
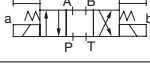
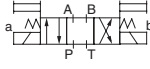
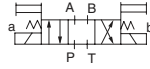
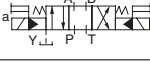
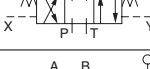
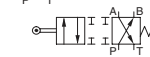
★2 : For outdoor use, protect equipment with a cover, etc., to prevent direct exposure to water.

# Solenoid Operated Directional Valves

## Solenoid Controlled Pilot Operated Directional Valves

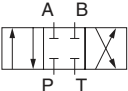
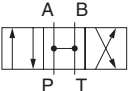
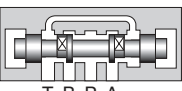
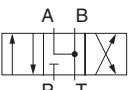
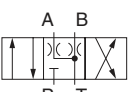
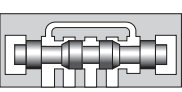
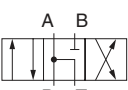
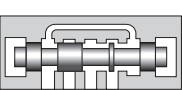
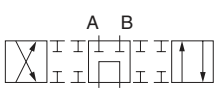
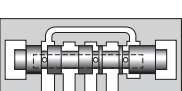
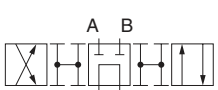
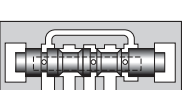
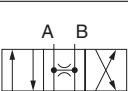
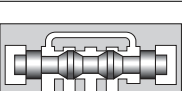
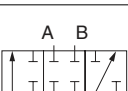
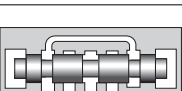
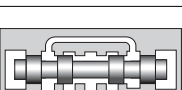
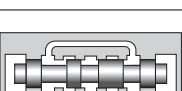
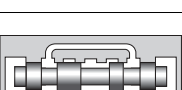
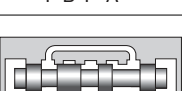
### “G” Series Shockless Type Directional Valves

### Pilot / Manually / Mechanically Operated Directional Valves

| Valve Type                                                                      | Graphic Symbols                                                                     | Max. Operating Pressure<br>MPa (PSI) | Maximum Flow                                       |  |  |  |  |  |  |  |  |  |  | Page |
|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------------------|--|--|--|--|--|--|--|--|--|--|------|
|                                                                                 |                                                                                     |                                      | U.S.GPM<br>L/min                                   |  |  |  |  |  |  |  |  |  |  |      |
| Solenoid Operated Directional Valves                                            |  | 25 (3600)                            | DSG-005                                            |  |  |  |  |  |  |  |  |  |  | 336  |
|                                                                                 |                                                                                     | 16 (2320)                            | L-DSG-01                                           |  |  |  |  |  |  |  |  |  |  | 344  |
|                                                                                 |                                                                                     | 25 (3600)                            | S-DSG-01                                           |  |  |  |  |  |  |  |  |  |  |      |
|                                                                                 |                                                                                     | 35 (5080)                            | DSG-01                                             |  |  |  |  |  |  |  |  |  |  | 361  |
|                                                                                 |                                                                                     | 16 (2320)                            | L-DSG-03                                           |  |  |  |  |  |  |  |  |  |  |      |
|                                                                                 |                                                                                     | 25 (3600)                            | S-DSG-03                                           |  |  |  |  |  |  |  |  |  |  |      |
|                                                                                 |                                                                                     | 31.5 (4580)                          | DSG-03                                             |  |  |  |  |  |  |  |  |  |  |      |
| Low Wattage (5W) Type Solenoid Operated Directional Valves                      |  | 16 (2320)                            | E-DSG-01                                           |  |  |  |  |  |  |  |  |  |  | 378  |
|                                                                                 |                                                                                     |                                      | E-DSG-03                                           |  |  |  |  |  |  |  |  |  |  |      |
| Electronic Relay Incorporated Solenoid Operated Directional Valves              |  | 25 (3600)                            | T-S-DSG-01                                         |  |  |  |  |  |  |  |  |  |  | 379  |
|                                                                                 |                                                                                     | 35 (5080)                            | T-DSG-01                                           |  |  |  |  |  |  |  |  |  |  | 379  |
|                                                                                 |                                                                                     | 25 (3600)                            | T-S-DSG-03                                         |  |  |  |  |  |  |  |  |  |  |      |
|                                                                                 |                                                                                     | 31.5 (4580)                          | T-DSG-03                                           |  |  |  |  |  |  |  |  |  |  |      |
| Solenoid Controlled Pilot Operated Directional Valve                            |  | 21 (3050)                            | DSHG-01                                            |  |  |  |  |  |  |  |  |  |  | 381  |
|                                                                                 |                                                                                     | 25 (3600)                            | DSHG-03                                            |  |  |  |  |  |  |  |  |  |  |      |
|                                                                                 |                                                                                     | 31.5 (4580)                          | DSHG-04/S-DSHG-04                                  |  |  |  |  |  |  |  |  |  |  |      |
|                                                                                 |                                                                                     |                                      | DSHG-06/S-DSHG-06                                  |  |  |  |  |  |  |  |  |  |  |      |
|                                                                                 |                                                                                     |                                      | DSHG-10/S-DSHG-10                                  |  |  |  |  |  |  |  |  |  |  |      |
| “G” Series Shockless Type Solenoid Operated Directional Valves                  |  | 25 (3600)                            | G-DSG-01                                           |  |  |  |  |  |  |  |  |  |  | 412  |
|                                                                                 |                                                                                     |                                      | G-DSG-03                                           |  |  |  |  |  |  |  |  |  |  |      |
| “G” Series Shockless Type Solenoid Controlled Pilot Operated Directional Valves |  | 25 (3600)                            | G-DSHG-04                                          |  |  |  |  |  |  |  |  |  |  | 418  |
|                                                                                 |                                                                                     |                                      | G-DSHG-06                                          |  |  |  |  |  |  |  |  |  |  |      |
| Pilot Operated Directional Valves                                               |  | 31.5 (4580)                          | DHG-04 06 10                                       |  |  |  |  |  |  |  |  |  |  | 423  |
| Manually Operated Directional Valves                                            |  | 21 (3050)                            | Threaded Connection (DMT) 03 06 10                 |  |  |  |  |  |  |  |  |  |  | 429  |
|                                                                                 |                                                                                     | 31.5 (4580)                          | Sub-plate connection (DMG) 01 03 04 06 10          |  |  |  |  |  |  |  |  |  |  |      |
| Mechanically Operated Directional Valves                                        |  | 7 (1020)                             | Rotary (DR <sup>T</sup> <sub>G</sub> ) 02          |  |  |  |  |  |  |  |  |  |  | 441  |
|                                                                                 |                                                                                     | 25 (3600)                            | Cam Operated (DC <sup>T</sup> <sub>G</sub> ) 01 03 |  |  |  |  |  |  |  |  |  |  |      |

## Spool Types

Spool types are classified to the condition of flow at the neutral position.

| Spool Type                                             | Graphic Symbols                                                                     | Schematic Drawing<br>(Centre Position)                                              | Functions and Applications                                                                                                                                                                         |
|--------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>2</b><br>(Closed Centre<br>All Ports)               |    |    | Holds pump pressure and cylinder position at neutral. Care should be paid if used as a 2-position type because shock occurs when each port is blocked in transit.                                  |
| <b>3</b><br>(Open Centre<br>All Ports)                 |    |    | Pump can be unloaded and actuator is floating at neutral. If a 2-position type is used, shock is reduced as each ports is released to tank in transit.                                             |
| <b>4</b><br>(Open Centre A, B&T)                       |    |    | Pump pressure is held and actuator is floated at neutral. 2-position type is used when system pressure is required to be held in transit. Shock during transit is less compared to spool type "2". |
| <b>40</b><br>(Open Centre A, B&T<br>Restricted Flow)   |    |    | In a variation of spool type "4", a restrictor is provided in A-T and B-T ports. Making it faster at stopping the actuator.                                                                        |
| <b>5</b><br>(Open Centre P, A&T)                       |    |    | It can be used when a pump is unloading at neutral and actuator is halted at one way flow.                                                                                                         |
| <b>6</b><br>(Open Centre P&T<br>Closed Crossover)      |   |   | Pump is unloading and actuator position held at neutral. Suitable for series operation.                                                                                                            |
| <b>60</b><br>(Open Centre P&T<br>Open Crossover)       |  |  | It is a variation of spool type "6". Shock is reduced as each port is released to tank on transit.                                                                                                 |
| <b>7</b><br>(Open Centre All Ports<br>Restricted Flow) |  |  | Mainly used as a 2-position type. Shock is reduced on transit.                                                                                                                                     |
| <b>8</b><br>(2-Way)                                    |  |  | Pump pressure and cylinder position is held at neutral in the same way as spool type "2". It is used as 2 way type.                                                                                |
| <b>9</b><br>(Open Centre P, A&B)                       |  |  | Regenerative circuit is provided at neutral.                                                                                                                                                       |
| <b>10</b><br>(Open Centre B&T)                         |  |  | Prevent actuator from one direction drift by leakage of P port at neutral.                                                                                                                         |
| <b>11</b><br>(Open Centre P&A)                         |  |  | Halt actuator movement positively at B, T ports blocked P, A ports connected at neutral.                                                                                                           |
| <b>12</b><br>(Open Centre A&T)                         |  |  | Prevent actuator from one direction drift by leakage of P port at neutral.                                                                                                                         |

## ■ Mounting Surface

Mounting surface dimensions conform to ISO 4401, Hydraulic fluid power-Four-Port directional control valves-Mounting surfaces.

| Model Numbers                                                                                    | ISO Code of Mounting Surface |
|--------------------------------------------------------------------------------------------------|------------------------------|
| $\begin{pmatrix} S- \\ L- \\ E- \\ T- \\ G- \end{pmatrix}$ DSG-01<br>DSHG-01<br>DMG-01<br>DCG-01 | ISO 4401-AB-03-4-A           |
| $\begin{pmatrix} S- \\ L- \\ E- \\ T- \\ G- \end{pmatrix}$ DSG-03<br>DMG-03<br>DCG-03            | ISO 4401-AC-05-4-A           |
| DSHG-03                                                                                          | ISO 4401-AC-05-4-A*          |
| $\begin{pmatrix} S- \\ G- \end{pmatrix}$ DSHG-04<br>DHG-04<br>DMG-04                             | ISO 4401-AD-07-4-A           |
| $\begin{pmatrix} S- \\ G- \end{pmatrix}$ DSHG-06<br>DHG-06<br>DMG-06                             | ISO 4401-AE-08-4-A           |
| (S-) DSHG-10<br>DHG-10<br>DMG-10                                                                 | ISO 4401-AF-10-4-A           |

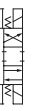
\* The main port conform to the ISO 4401-AC-05-4-A.  
 The pilot and drain ports is accordance with the ISO original draft.

## Interchangeability in Installation between Current and New Design

Model change has been made on the following product.

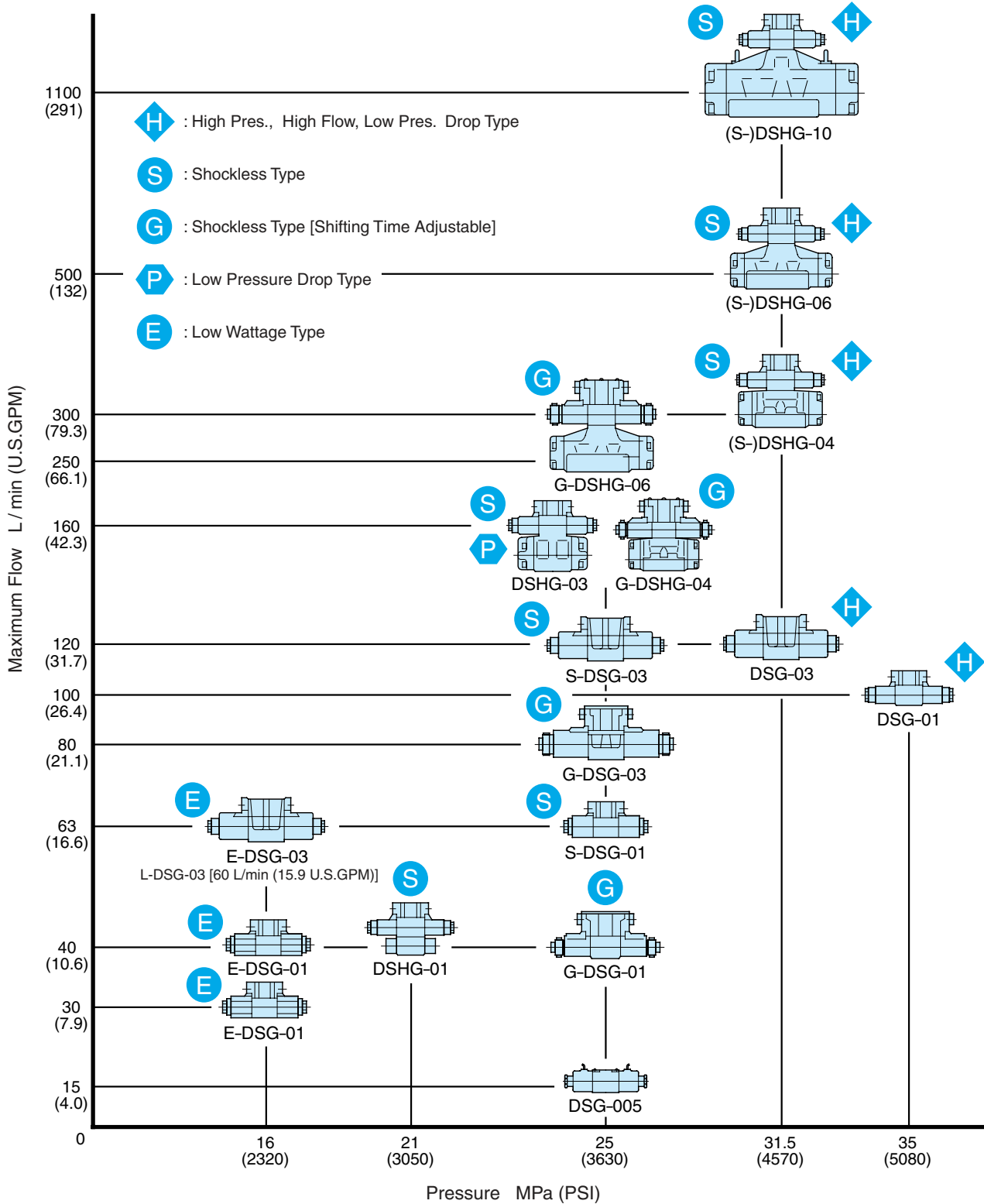
The difference between current and new design has been described on the paragraph of “Interchangeability in Installation between Current and New Design.” Refer to relevant pages on each series.

| Name                                                            | Model Numbers                                                       |                                                                     | Interchangeability in Installation | Related Page | Major Changes                                                                                                                                 |
|-----------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|------------------------------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                 | Current                                                             | New                                                                 |                                    |              |                                                                                                                                               |
| DSG-005 Series Solenoid Operated Directional Valves             | DSG-005-***-*-30/3090                                               | DSG-005-***-*-40/4090<br>DSG-005-***-*- $\frac{N}{NI}$ -40/4090     | Yes                                | —            | <ul style="list-style-type: none"> <li>● High Flow</li> <li>● Low Pressure Drop</li> <li>● Din-connector type solenoid in addition</li> </ul> |
| DSG-01 Series Solenoid Operated Directional Valves              | $\begin{pmatrix} S- \\ L- \\ T- \end{pmatrix}$ DSG-01-***-*-60/6090 | $\begin{pmatrix} S- \\ L- \\ T- \end{pmatrix}$ DSG-01-***-*-70/7090 | Yes                                | 357          | <ul style="list-style-type: none"> <li>● High Pressure and High Flow</li> <li>● Low Pressure Drop</li> </ul>                                  |
| 1/8,3/8 Solenoid Controlled Pilot Operated Directional Valves   | DSHG-01-***-*-13/1390<br>DSHG-03-***-*-13/1390                      | DSHG-01-***-*-14/1490<br>DSHG-03-***-*-14/1490                      | Yes                                | —            | <ul style="list-style-type: none"> <li>● Pilot valve has been changed from DSG-01, 60 design to 70 design.</li> </ul>                         |
| 1/2 Solenoid Controlled Pilot Operated Directional Valves       | (S-) DSHG-04-***-*-51/5190                                          | (S-) DSHG-04-***-*-52/5290                                          | Yes                                | —            | <ul style="list-style-type: none"> <li>● Pilot valve has been changed from DSG-01, 60 design to 70 design.</li> </ul>                         |
| 3/4,1-1/4 Solenoid Controlled Pilot Operated Directional Valves | (S-) DSHG-06-***-*-52/5290<br>(S-) DSHG-10-***-*-42/4290            | (S-) DSHG-06-***-*-53/5390<br>(S-) DSHG-10-***-*-43/4390            | Yes                                | —            | <ul style="list-style-type: none"> <li>● Pilot valve has been changed from DSG-01, 60 design to 70 design.</li> </ul>                         |



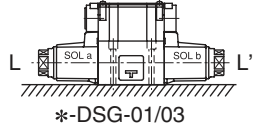
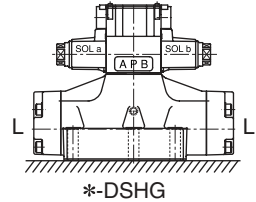
■ Solenoid Operated / Solenoid Controlled Operated Directional Valves

*WIDE RANGE OF MODELS – Choose the optimum valve to meet your needs from a large selection available.*



## Instructions

### Mounting

|                                                                    |                                                                                                                                                                |                                                                                     |
|--------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| DSG-005                                                            | No mounting restrictions for any model.                                                                                                                        |                                                                                     |
| *-DSG-01<br>*-DSG-03                                               | No-spring detented models not energised continuously must be installed so that the spool axis L-L' is horizontal. Otherwise there is no mounting restrictions. |  |
| DSHG-01<br>DSHG-03<br>(S-) DSHG-04<br>(S-) DSHG-06<br>(S-) DSHG-10 | No-spring models not energised continuously must be installed so that the spool axis L-L' is horizontal. Otherwise there is no mounting restrictions.          |  |

### Energisation

#### 1. No-Spring Type

One of two solenoids should be energised continuously to avoid malfunction.

#### 2. On double solenoid valves do not energise both at the same time as it will result in coils burning out.

### Valve Tank Port

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

Piping end of tank line should be submerged in oil.

### Pilot Drain Port for Solenoid Controlled Pilot Operated Valve

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

Piping end of drain should be submerged in oil.

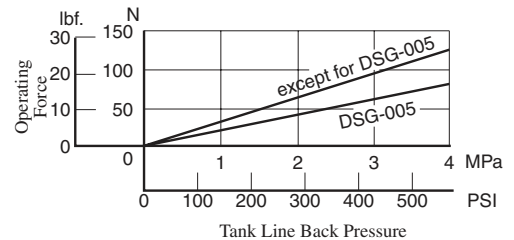
### Shockless Type

In order to benefit from a shockless operation, it is necessary to fill the tank line with operating oil.

Only after the tank line has been filled with operating oil should the valve be used on a regular basis.

### 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.)



## Solenoid

### Solenoid connector (DIN connector)

The solenoid connector is in accordance with the international standard ISO 4400 (Fluid power systems 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 Operated Directional Valve)

These valves differ from conventional DC solenoid operated directional valves and have the following characteristics:

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-energisation is reduced by approximately 50 %.

### R type Models with Current Rectifier and DC Solenoid

Specially designed DC solenoid 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.

### RQ type Models with Current rectifier and Quick Return Solenoid

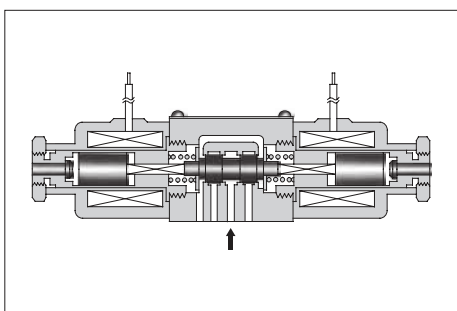
Valve characteristics are identical to R type except for the fast return time of the spool after deenergisation.

### Insulation Class of Solenoid

| Model numbers                                                                                                                                         | Insulation Class |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| DSG-005, DSG-01, S-DSG01<br>L-DSG-01, E-DSG-01, T-DSG-01<br>DSG-03, S-DSG-03, L-DSG-03<br>E-DSG-03, T-DSG-03<br>DSHG-01/03/04/06/10, S-DSHG-04/-06/10 | Class H          |
| G-DSG-01, G-DSG-03                                                                                                                                    | Class F          |

## Solenoid Operated Directional Valves, DSG-005 Series

These DSG-005 series solenoid directional valves are the products newly developed as a “Mini-series”. Compared with DSG-01 series, the valve are much more compactly manufactured but enjoy a maximum operating pressure of 25 MPa (3630 PSI) and a maximum flow rate of 15 L/min (3.96 U.S.GPM), while contributing further to a space saving requirement. Moreover, using wet armature solenoids, the valves ensure the long life.



Flying Lead Wire Type



Plug-in Connector Type

### Specifications

| Model Numbers          | Max. Flow★<br>L/min<br>(U.S.GPM) | Max. Operating<br>Pressure<br>MPa<br>(PSI) | Max. Tank-Line<br>Back Pressure<br>MPa<br>(PSI) | Max. Changeover<br>Frequency<br>min <sup>-1</sup><br>(Cycles/min) | Approx. Mass<br>kg<br>(lbs.) |
|------------------------|----------------------------------|--------------------------------------------|-------------------------------------------------|-------------------------------------------------------------------|------------------------------|
| DSG-005-3C*- *-40/4090 | 15<br>(3.96)                     | 25<br>(3630)                               | 7<br>(1020)                                     | 120                                                               | 0.5 (1.1)                    |
| DSG-005-2B*- *-40/4090 |                                  |                                            |                                                 |                                                                   | 0.4 (.9)                     |

★ The maximum flow means the limited flow without inducing any abnormality to the operation (changeover) of the valve.  
The maximum flow differs according to the type and operating conditions. For details, please refer to the “List of Standard Models and Maximum Flow” on [pages 338 to 339](#).

### Solenoid Rating

| Electric Source  | Coil Type | Frequency<br>(Hz) | Voltage (V)   |             | Current & Power at Rated Voltage |                |              |
|------------------|-----------|-------------------|---------------|-------------|----------------------------------|----------------|--------------|
|                  |           |                   | Source Rating | Serviceable | Inrush★ <sup>1</sup><br>(A)      | Holding<br>(A) | Power<br>(W) |
| AC               | A100      | 50                | 100           | 80 – 110    | 0.36                             | 0.16           | —            |
|                  |           | 60                |               | 90 – 120    | 0.34                             | 0.11           |              |
|                  | A200      | 50                | 200           | 160 – 220   | 0.18                             | 0.08           |              |
|                  |           | 60                |               | 180 – 240   | 0.17                             | 0.05           |              |
| DC★ <sup>2</sup> | D12       | —                 | 12            | 10.8 – 13.2 | —                                | 1.2            | 15           |
|                  | D24       |                   | 24            | 21.6 – 26.4 |                                  | 0.6            |              |

★<sup>1</sup> Inrush current in the above table shows rms values at maximum stroke.

★<sup>2</sup> The Plug-in Connector Type DC solenoid has a built-in surge absorber.  
The Flying Lead Wire Type has no surge absorber equipped. Install a surge absorber separately.

## Model Number Designation

| F-                                                                         | DSG                                         | -005       | -3                       | C                        | 2          | -D24                               | -N                                                                                                     | -40           | *               |
|----------------------------------------------------------------------------|---------------------------------------------|------------|--------------------------|--------------------------|------------|------------------------------------|--------------------------------------------------------------------------------------------------------|---------------|-----------------|
| Special Seals                                                              | Series Number                               | Valve Size | Number of Valve Position | Spool-Spring Arrangement | Spool Type | Coil Type                          | Electrical Conduit Connection                                                                          | Design Number | Design Standard |
| F:<br>Special Seals for Phosphate Ester Type Fluids (Omit if not required) | DSG:<br>Solenoid Operated Directional Valve | 005        | 3                        | C:<br>Spring Centred     | 2, 3<br>40 | AC<br>A100, A200<br>DC<br>D12, D24 | None: Flying Lead Wire Type<br>N: Plug-in Connector Type<br>N1: Plug-in Connector with Indicator Light | 40            | Refer to ★      |
|                                                                            |                                             |            | 2                        | B:<br>Spring Offset      | 2, 3       |                                    |                                                                                                        |               |                 |

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

## Sub-plates

| Piping Size | Japanese Standard "JIS" |             | European Design Standard |             | N. American Design Standard |             | Approx. Mass<br>kg (lbs.) |
|-------------|-------------------------|-------------|--------------------------|-------------|-----------------------------|-------------|---------------------------|
|             | Sub-plate Model Numbers | Thread Size | Sub-plate Model Numbers  | Thread Size | Sub-plate Model Numbers     | Thread Size |                           |
| 1/8         | DSGM-005X-20            | Rc 1/8      | DSGM-005X-2080           | 1/8 BSP.F   | DSGM-005X-2090              | 1/8 NPT     | 0.8 (1.8)                 |
| 1/4         | DSGM-005Y-20            | Rc 1/4      | DSGM-005Y-2080           | 1/4 BSP.F   | DSGM-005Y-2090              | 1/4 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.

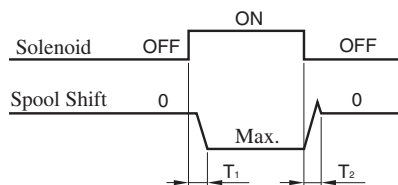
## Mounting Bolts

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

| Descriptions                | Soc. Hd. Cap Screw (4 Pcs.) | Tightening Torque                   |
|-----------------------------|-----------------------------|-------------------------------------|
| Japanese Standard "JIS"     | M4 × 35 Lg.                 | 2.5 - 3.5 Nm (22.1 - 31.0 in. lbs.) |
| European Design Standard    |                             |                                     |
| N. American Design Standard | No. 8-32 UNC × 1-3/8 Lg.    |                                     |

## Typical Changeover Time (Example)

Changeover time varies according to oil viscosity, spool type and hydraulic circuit.



[Test Conditions]

Pressure: 16 MPa (2320 PSI)

Flow Rate: 7.5 L/min (1.98 U.S.GPM)

Viscosity: 30 mm<sup>2</sup>/s (141 SSU)

Voltage: Rated Voltage (After coil temperature rises and saturated)

Direction of Flow: P → A → B → T  
P → B → A → T

[Result of Measurement]

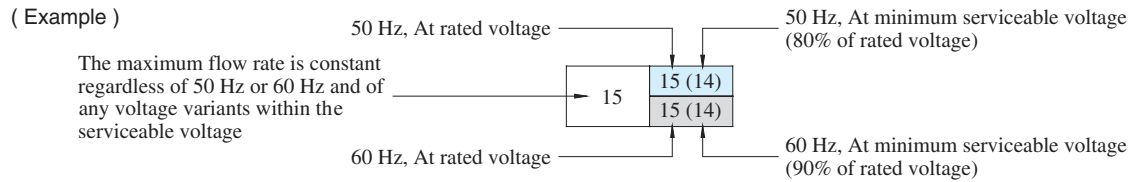
| Model Numbers  | Time ms        |                |
|----------------|----------------|----------------|
|                | T <sub>1</sub> | T <sub>2</sub> |
| DSG-005-3C2-A* | 16             | 60             |
| DSG-005-3C2-D* | 23             | 40             |
| DSG-005-2B2-A* | 14             | 45             |
| DSG-005-2B2-D* | 15             | 33             |

■ List of Standard Models and The Maximum Flow

● Models with AC Solenoids : DSG-005-\*\*\*-A\*-40/4090

| No. of Valve Position | Spool-Spring Arrangement | Model Numbers | Graphic Symbols | Max. Flow L/min      |      |      |      |                          |       |       |        |                          |        |        |        |
|-----------------------|--------------------------|---------------|-----------------|----------------------|------|------|------|--------------------------|-------|-------|--------|--------------------------|--------|--------|--------|
|                       |                          |               |                 | P → A → B → T        |      |      |      | P → A [Port "B" Blocked] |       |       |        | P → B [Port "A" Blocked] |        |        |        |
|                       |                          |               |                 | Working Pressure MPa |      |      |      | Working Pressure MPa     |       |       |        | Working Pressure MPa     |        |        |        |
|                       |                          |               |                 | 5                    | 10   | 16   | 25   | 5                        | 10    | 16    | 25     | 5                        | 10     | 16     | 25     |
| Three Positions       | Spring Centred           | DSG-005-3C2   |                 | 15                   | 15   | 15   | 15   | 15(14)                   | 15(7) | 12(3) | 4(0.5) | 15(14)                   | 15(7)  | 12(3)  | 4(0.5) |
|                       |                          | DSG-005-3C3   |                 | 12                   | 12   | 12   | 12   | 15                       | 15    | 15    | 15     | 15                       | 15     | 15     | 15     |
|                       |                          | DSG-005-3C40  |                 | 15                   | 15   | 15   | 15   | 15(14)                   | 15(6) | 12(2) | 4(0.5) | 15(14)                   | 15(6)  | 12(2)  | 4(0.5) |
| Two Positions         | Spring Offset            | DSG-005-2B2   |                 | 14                   | 14   | 14   | 14   | 2                        | 1     | 1     | 1      | 15(14)                   | 15(10) | 13(5)  | 6(0.5) |
|                       |                          | DSG-005-2B3   |                 | 13.5                 | 13.5 | 13.5 | 13.5 | 3                        | 3     | 3     | 3      | 15                       | 15(14) | 15(11) | 15(9)  |

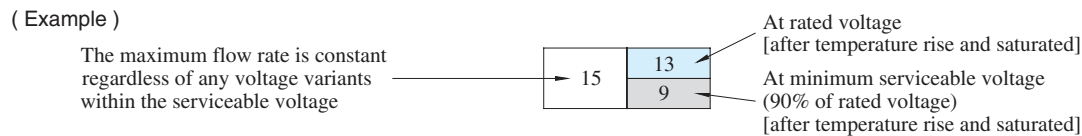
Notes: 1. The relation between the maximum flow in the table above and the frequency/voltage (within the serviceable voltage) is as shown below.



● Models with DC Solenoids : DSG-005-\*\*\*-D\*-40/4090

| No. of Valve Position | Spool-Spring Arrangement | Model Numbers | Graphic Symbols | Max. Flow L/min      |      |      |      |                          |     |     |     |                          |    |    |      |
|-----------------------|--------------------------|---------------|-----------------|----------------------|------|------|------|--------------------------|-----|-----|-----|--------------------------|----|----|------|
|                       |                          |               |                 | P → A → B → T        |      |      |      | P → A [Port "B" Blocked] |     |     |     | P → B [Port "A" Blocked] |    |    |      |
|                       |                          |               |                 | Working Pressure MPa |      |      |      | Working Pressure MPa     |     |     |     | Working Pressure MPa     |    |    |      |
|                       |                          |               |                 | 5                    | 10   | 16   | 25   | 5                        | 10  | 16  | 25  | 5                        | 10 | 16 | 25   |
| Three Positions       | Spring Centred           | DSG-005-3C2   |                 | 15                   | 15   | 15   | 15   | 15                       | 8   | 5   | 3   | 15                       | 8  | 5  | 3    |
|                       |                          | DSG-005-3C3   |                 | 15                   | 15   | 15   | 15   | 15                       | 15  | 15  | 15  | 15                       | 15 | 15 | 15   |
|                       |                          | DSG-005-3C40  |                 | 15                   | 15   | 15   | 15   | 15                       | 13  | 8   | 5   | 15                       | 13 | 8  | 5    |
| Two Positions         | Spring Offset            | DSG-005-2B2   |                 | 14                   | 14   | 14   | 14   | 8.5                      | 4.5 | 6.5 | 6.5 | 15                       | 15 | 11 | 9    |
|                       |                          | DSG-005-2B3   |                 | 13.5                 | 13.5 | 13.5 | 13.5 | 8                        | 7   | 8   | 9   | 15                       | 15 | 15 | 13.5 |

Notes: 1. The relation between the maximum flow in the table above and the voltage (within the serviceable voltage) is as shown below.



## List of Standard Models and The Maximum Flow

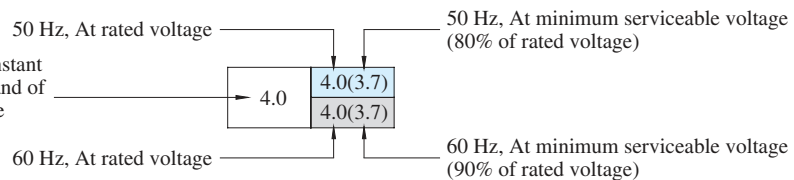
### Models with AC Solenoids : DSG-005-\*\*\*-A\*-40/4090

| No. of Valve Position | Spool-Spring Arrangement | Model Numbers | Graphic Symbols | Max. Flow U.S.GPM    |      |      |      |                          |          |         |         |                          |          |          |          |
|-----------------------|--------------------------|---------------|-----------------|----------------------|------|------|------|--------------------------|----------|---------|---------|--------------------------|----------|----------|----------|
|                       |                          |               |                 | P → A → B → T        |      |      |      | P → A [Port "B" Blocked] |          |         |         | P → B [Port "A" Blocked] |          |          |          |
|                       |                          |               |                 | Working Pressure PSI |      |      |      | Working Pressure PSI     |          |         |         | Working Pressure PSI     |          |          |          |
|                       |                          |               |                 | 730                  | 1450 | 2320 | 3630 | 730                      | 1450     | 2320    | 3630    | 730                      | 1450     | 2320     | 3630     |
| Three Positions       | Spring Centred           | DSG-005-3C2   |                 | 4.0                  | 4.0  | 4.0  | 4.0  | 4.0(3.7)                 | 4.0(1.9) | 3.2(.8) | 1.1(.1) | 4.0(3.7)                 | 4.0(1.9) | 3.2(.8)  | 1.1(.1)  |
|                       |                          | DSG-005-3C3   |                 | 3.2                  | 3.2  | 3.2  | 3.2  | 4.0                      | 4.0      | 4.0     | 4.0     | 4.0                      | 4.0      | 4.0      | 4.0      |
|                       |                          | DSG-005-3C40  |                 | 4.0                  | 4.0  | 4.0  | 4.0  | 4.0(3.7)                 | 4.0(1.6) | 3.2(.5) | 1.1(.1) | 4.0(3.7)                 | 4.0(1.6) | 3.2(.5)  | 1.1(.1)  |
| Two Positions         | Spring Offset            | DSG-005-2B2   |                 | 3.7                  | 3.7  | 3.7  | 3.7  | .5                       | .3       | .3      | .3      | 4.0(3.7)                 | 4.0(2.6) | 3.4(1.3) | 1.6(.1)  |
|                       |                          | DSG-005-2B3   |                 | 3.6                  | 3.6  | 3.6  | 3.6  | .8                       | .8       | .8      | .8      | 4.0                      | 4.0(3.7) | 4.0(2.9) | 4.0(2.4) |

Notes: 1. The relation between the maximum flow in the table above and the frequency/voltage (within the serviceable voltage) is as shown below.

( Example )

The maximum flow rate is constant regardless of 50 Hz or 60 Hz and of any voltage variants within the serviceable voltage



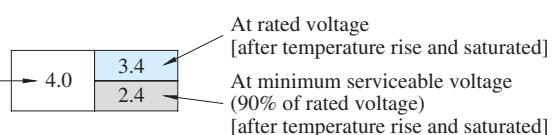
### Models with DC Solenoids : DSG-005-\*\*\*-D\*-40/4090

| No. of Valve Position | Spool-Spring Arrangement | Model Numbers | Graphic Symbols | Max. Flow U.S.GPM    |      |      |      |                          |      |      |      |                          |      |      |      |
|-----------------------|--------------------------|---------------|-----------------|----------------------|------|------|------|--------------------------|------|------|------|--------------------------|------|------|------|
|                       |                          |               |                 | P → A → B → T        |      |      |      | P → A [Port "B" Blocked] |      |      |      | P → B [Port "A" Blocked] |      |      |      |
|                       |                          |               |                 | Working Pressure PSI |      |      |      | Working Pressure PSI     |      |      |      | Working Pressure PSI     |      |      |      |
|                       |                          |               |                 | 730                  | 1450 | 2320 | 3630 | 730                      | 1450 | 2320 | 3630 | 730                      | 1450 | 2320 | 3630 |
| Three Positions       | Spring Centred           | DSG-005-3C2   |                 | 4.0                  | 4.0  | 4.0  | 4.0  | 4.0                      | 2.1  | 1.3  | .8   | 4.0                      | 2.1  | 1.3  | .8   |
|                       |                          | DSG-005-3C3   |                 | 4.0                  | 4.0  | 4.0  | 4.0  | 3.2                      | 1.3  | .8   | .5   | 3.2                      | 1.3  | .8   | .5   |
|                       |                          | DSG-005-3C40  |                 | 4.0                  | 4.0  | 4.0  | 4.0  | 4.0                      | 3.4  | 2.1  | 1.3  | 4.0                      | 3.4  | 2.1  | 1.3  |
| Two Positions         | Spring Offset            | DSG-005-2B2   |                 | 3.7                  | 3.7  | 3.7  | 3.7  | 2.3                      | 1.2  | 1.7  | 1.7  | 4.0                      | 4.0  | 2.9  | 2.4  |
|                       |                          | DSG-005-2B3   |                 | 3.6                  | 3.6  | 3.6  | 3.6  | 2.1                      | 1.9  | 2.1  | 2.4  | 4.0                      | 4.0  | 4.0  | 3.6  |

Notes: 1. The relation between the maximum flow in the table above and the voltage (within the serviceable voltage) is as shown below.

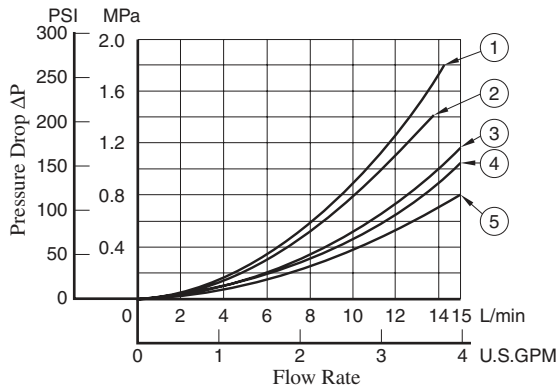
( Example )

The maximum flow rate is constant regardless of any voltage variants within the serviceable voltage



## Pressure Drop

Pressure drop curves based on viscosity of 30 mm<sup>2</sup>/s (141 SSU) and specific gravity of 0.850.



| Model Numbers | Pressure Drop Curve Numbers |       |       |       |       |
|---------------|-----------------------------|-------|-------|-------|-------|
|               | P → A                       | B → T | P → B | A → T | P → T |
| DSG-005-3C2   | ④                           | ④     | ④     | ④     | —     |
| DSG-005-3C3   | ⑤                           | ⑤     | ⑤     | ⑤     | ③     |
| DSG-005-3C40  | ④                           | ④     | ④     | ④     | —     |
| DSG-005-2B2   | ①                           | ①     | ④     | ④     | —     |
| DSG-005-2B3   | ②                           | ②     | ④     | ④     | —     |

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

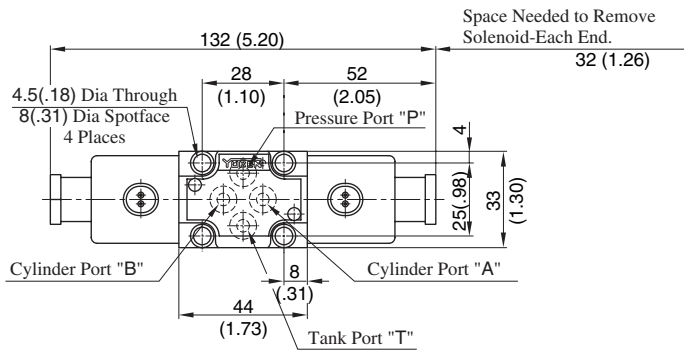
| Viscosity | mm <sup>2</sup> /s | 15   | 20   | 30   | 40   | 50   | 60   | 70   | 80   | 90   | 100  |
|-----------|--------------------|------|------|------|------|------|------|------|------|------|------|
|           | SSU                | 77   | 98   | 141  | 186  | 232  | 278  | 324  | 371  | 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 ( $\Delta P$ ) may be obtained from the formula below.

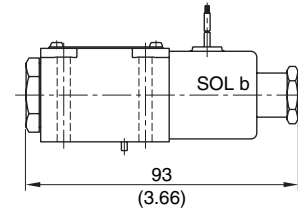
$$\Delta P' = \Delta P (G'/0.850)$$

## Flying Lead Wire Type

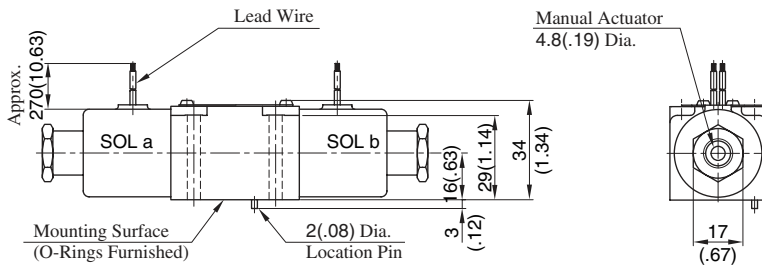
- Spring Centred: DSG-005-3C\* - A\*-D\*-40/4090



- Spring Offset: DSG-005-2B\* - A\*-D\*-40/4090



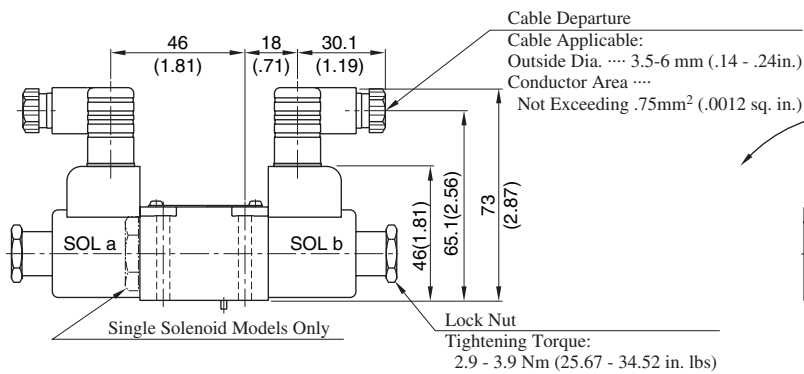
- For other dimensions, refer to "Spring Centred" type.



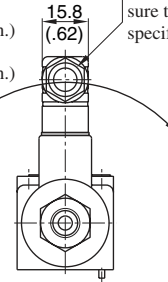
DIMENSIONS IN  
MILLIMETRES (INCHES)

## DIN Connector Type / DIN Connector with Indicator Light

- Spring Centred: DSG-005-3C\* - A\*-D\*-N/N1-40/4090
- Spring Offset: DSG-005-2B\* - A\*-D\*-N/N1-40/4090



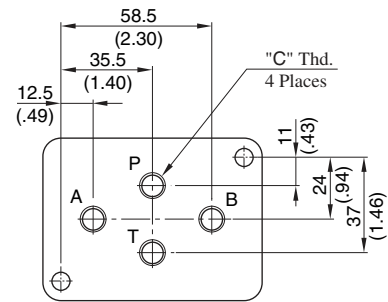
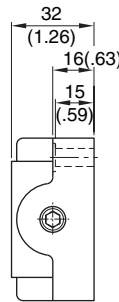
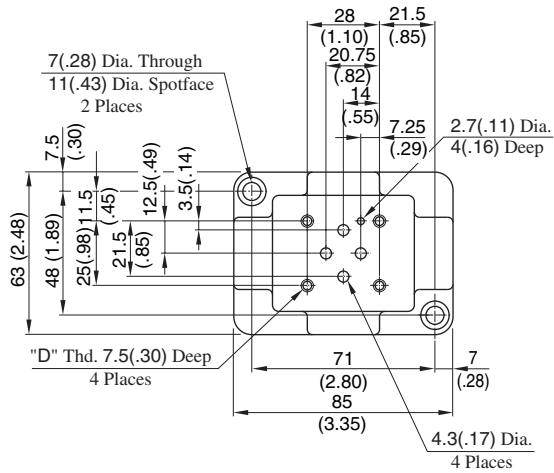
The position of the Plug-in connector can be changed as illustrated below by loosening the lock nut. After completion of the change, be sure to tighten the lock nut with the torque as specified below.



- For other dimensions, refer to "Flying Lead Wire Type".

■ Sub-plates: DSGM-005\* -20/2080/2090

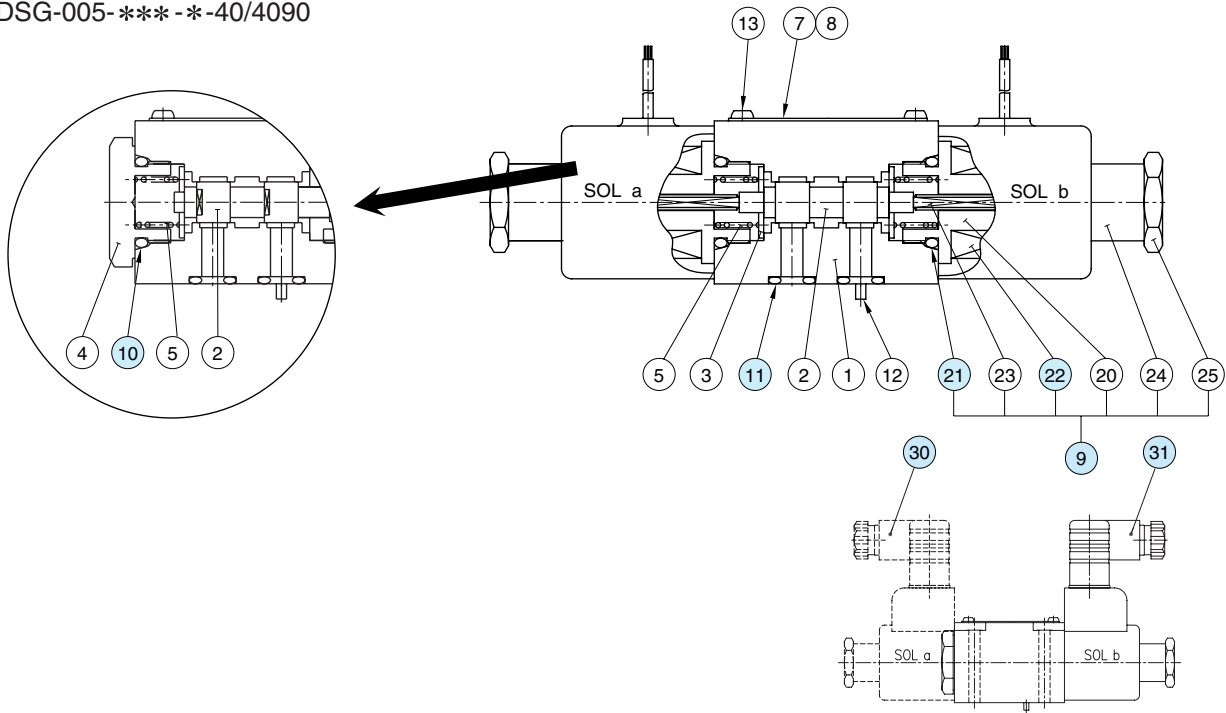
DIMENSIONS IN  
MILLIMETRES (INCHES)



| Sub-plate<br>Model Numbers | Piping Size<br>"C" Thd. | "D" Thd.     |
|----------------------------|-------------------------|--------------|
| DSGM-005X-20               | Rc 1/8                  | M4           |
| DSGM-005X-2080             | 1/8 BSP. F              |              |
| DSGM-005X-2090             | 1/8 NPT                 | No. 8-32 UNC |
| DSGM-005Y-20               | Rc 1/4                  | M4           |
| DSGM-005Y-2080             | 1/4 BSP. F              |              |
| DSGM-005Y-2090             | 1/4 NPT                 | No. 8-32 UNC |

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

DSG-005-\*\*\*-\*-40/4090



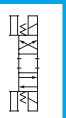
### List of Seals

| Item | Name of Parts | Part Numbers | Qty. |     | Remarks                    |
|------|---------------|--------------|------|-----|----------------------------|
|      |               |              | 3C*  | 2B* |                            |
| 10   | O-Ring        | SO-NB-P14    | —    | 1   |                            |
| 11   | O-Ring        | SO-NB-P6     | 4    | 4   |                            |
| 21   | O-Ring        | SO-NB-P14    | 2    | 1   | Included in Solenoid Ass'y |

Note: When ordering seals, please specify the seal kit number "KS-DSG-005-40".

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

| Valve Model Number  | ⑨ Solenoid Ass'y No. | ②② Coil No.     | ③① Connector Ass'y Part No. | ③① Connector Ass'y Part No. | Remarks                                |
|---------------------|----------------------|-----------------|-----------------------------|-----------------------------|----------------------------------------|
| DSG-005-***-A100    | SA05-100-40          | C-SA05-100-40   | —                           | —                           | Flying Lead Wire Type                  |
| DSG-005-***-A200    | SA05-200-40          | C-SA05-200-40   |                             |                             |                                        |
| DSG-005-***-D12     | SD05-12-40           | C-SD05-12-40    |                             |                             |                                        |
| DSG-005-***-D24     | SD-05-24-40          | C-SD-05-24-40   |                             |                             |                                        |
| DSG-005-***-A100-N  | SA05-100-N-40        | C-SA05-100-N-40 | TK290058-7                  | TK290058-7                  | Plug-in Connector Type                 |
| DSG-005-***-A200-N  | SA05-200-N-40        | C-SA05-200-N-40 |                             |                             |                                        |
| DSG-005-***-D12-N   | SD05-12-N-40         | C-SD05-12-N-40  |                             |                             |                                        |
| DSG-005-***-D24-N   | SD-05-24-N-40        | C-SD-05-24-N-40 |                             |                             |                                        |
| DSG-005-***-A100-N1 | SA05-100-N-40        | C-SA05-100-N-40 | TK290378-9                  | TK290378-9                  | Plug-in Connector with Indicator Light |
| DSG-005-***-A200-N1 | SA05-200-N-40        | C-SA05-200-N-40 | TK290379-7                  | TK290379-7                  |                                        |
| DSG-005-***-D12-N1  | SD05-12-N-40         | C-SD05-12-N-40  | TK290089-2                  | TK290089-2                  |                                        |
| DSG-005-***-D24-N1  | SD-05-24-N-40        | C-SD-05-24-N-40 | TK290090-0                  | TK290090-0                  |                                        |



## ■ 1/8 Solenoid Operated Directional Valves, DSG-01 Series

These are Solenoid Operated Directional Valves of high pressure, high flow and low pressure drop, the features of which can be materialized by employing a powerful wet type solenoid and the rational flow channel design.

### ● High Pressure & High Flow Rate

In comparison to our existing lines, both the pressure and flow of these valves are much increased.

- Max. Operating Pressure: approx. 10 % increased [31.5→35 MPa (4570 →5080 PSI)]
- Max. T-Line Back Pressure: approx. 30 % increased [16→21 MPa (2320 →3050 PSI)]
- Max. Flow Rate: approx. 60 % increased [63→100 L/min (16.64 →26.42 U.S.GPM)]

### ● Low Pressure Drop

The pressure drop of these valves is reduced by 10 % from 1.0 to 0.9 MPa (145 to 131 PSI), in comparison to our existing lines\*; the valves effectively reduce the energy consumption of the unit.

{\* At Flow Rate: 60 L/min (15.9 U.S.GPM), Spool Type: 3C2 (P→A)}

### ● Compact & Small Mass

Despite of high pressure, high flow and low pressure drop, these valve bodies are compact and lightweight with DC double solenoids; the overall length and mass are reduced from 210 to 205 mm (8.26 to 8.07 inch) and from 2.2 to 1.85 kg (4.85 to 4.08 lbs), respectively.

### ● Shockless type available

In addition to the standard valves for high pressure and high flow, a shockless type capable of minimizing noise and vibration in piping during spool changeover is also available.

### ● Stable Operation

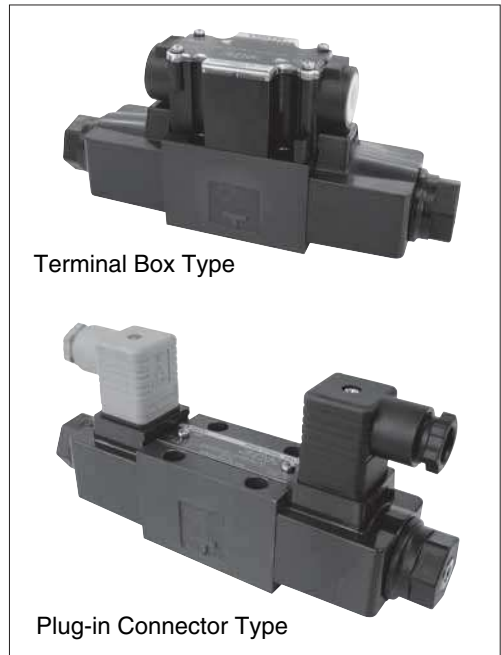
Due to the powerful magnetic and spring force of the solenoids, these valves exhibit a high tolerance to contaminants and especially stable operation.

### ● IP65-equivalent high dust- and water-proof

These valves demonstrate excellent dust- and water-proof characteristics, in compliance with I. E. C. Pub. 529. IP65 and JIS C 0920 IP65 (dust- and jet-proof type).

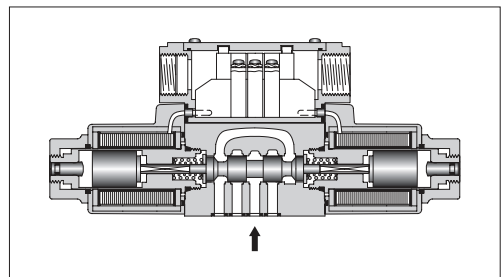
### ● Usable in products of various standards

These standard valves are CE certified for installation in equipment overseas. UL/CSA certified products are also available.



Terminal Box Type

Plug-in Connector Type



## ■ Specifications

| Valve Type                             | Model Numbers         | Max. Flow<br>L/min<br>(U.S.GPM) | Max. Operating<br>Pressure<br>MPa (PSI) | Max. T-Line<br>Back Pressure<br>MPa (PSI) | Max. Changeover<br>Frequency<br>Cycle/min {min <sup>-1</sup> } | Mass<br>kg<br>(lbs.) |
|----------------------------------------|-----------------------|---------------------------------|-----------------------------------------|-------------------------------------------|----------------------------------------------------------------|----------------------|
| Standard Type                          | DSG-01-3C*-70/7090    | 100<br>(26.4)                   | 35<br>(5080)                            | 21<br>(3050)                              | 300<br>(R Type Sol. Only)<br>120                               | 1.85<br>(4.08)       |
|                                        | DSG-01-2D2*-70/7090   |                                 |                                         |                                           |                                                                | 1.4(3.09)            |
|                                        | DSG-01-2B*-70/7090    |                                 |                                         |                                           |                                                                | 1.4(3.09)            |
| Shockless Type                         | S-DSG-01-3C*-70/7090  | 63<br>(16.6)                    | 25<br>(3630)                            | 21<br>(3050)                              | 120                                                            | 1.85(4.08)           |
|                                        | S-DSG-01-2B2*-70/7090 |                                 |                                         |                                           |                                                                | 1.4(3.09)            |
| Low Wattage(14W)<br>Type <sup>★1</sup> | L-DSG-01-3C*-70/7090  | 40<br>(10.6)                    | 16<br>(2320)                            | 16<br>(2320)                              | 300<br>(R Type Sol. Only)<br>120                               | 1.85<br>(4.08)       |
|                                        | L-DSG-01-2D2*-70/7090 |                                 |                                         |                                           |                                                                | 1.4(3.09)            |
|                                        | L-DSG-01-2N*-70/7090  |                                 |                                         |                                           |                                                                | 1.4(3.09)            |
|                                        | L-DSG-01-2B*-70/7090  |                                 |                                         |                                           |                                                                | 1.4(3.09)            |

★ 1. For details of L-DSG-01, please contact us.

★ 2. Maximum flow indicates a ceiling flow depends on the type of spool and operating condition, refer to the List of Spool Functions on pages 347 to 351 for details.

## Sub-plate

| Piping Size | Japanese Standard "JIS " |             | European Design Standard |             | N.American Design Standard |             | Approx. Mass<br>kg (lbs.) |
|-------------|--------------------------|-------------|--------------------------|-------------|----------------------------|-------------|---------------------------|
|             | Sub-plate Model Numbers  | Thread Size | Sub-plate Model Numbers  | Thread Size | Sub-plate Model Numbers    | 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 Bolt

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

| Descriptions                                        | Soc. Hd. Cap Screw (4 pcs.) | Tightening Torque                                                                                                         |
|-----------------------------------------------------|-----------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Japanese Standard "JIS"<br>European Design Standard | M5 × 45 Lg.                 | 5 - 7 Nm (43 - 60 in. lbs.)<br>Applicable to working pressure more than<br>25 MPa (3630 PSI): 6 - 7 Nm (52 - 60 in. lbs.) |
| N. American Design Standard                         | No. 10-24 UNC × 1-3/4 Lg.   |                                                                                                                           |

## Solenoid Ratings

| Valve Type     | Electric source       | Coil Type | Frequency (Hz) | Voltage (V)   |                   | Current & Power at Rated Voltage |             |           |
|----------------|-----------------------|-----------|----------------|---------------|-------------------|----------------------------------|-------------|-----------|
|                |                       |           |                | Source Rating | Serviceable Range | Inrush (A) <sup>★2</sup>         | Holding (A) | Power (W) |
| Standard Type  | AC <sup>★1</sup>      | A100      | 50             | 100           | 80 - 110          | 2.42                             | 0.51        | —         |
|                |                       |           | 60             | 100           | 90 - 120          | 2.14                             | 0.37        |           |
|                |                       |           |                | 110           |                   | 2.35                             | 0.44        |           |
|                |                       | A120      | 50             | 120           | 96 - 132          | 2.02                             | 0.42        |           |
|                |                       |           | 60             |               | 108 - 144         | 1.78                             | 0.31        |           |
|                |                       | A200      | 50             | 200           | 160 - 220         | 1.21                             | 0.25        |           |
|                |                       |           | 60             |               | 180 - 240         | 1.07                             | 0.19        |           |
|                |                       |           |                |               |                   | 1.18                             | 0.22        |           |
|                |                       | A240      | 50             | 240           | 192 - 264         | 1.01                             | 0.21        |           |
|                |                       |           | 60             |               | 216 - 288         | 0.89                             | 0.15        |           |
| Shockless Type | DC (K Series)         | D12       | —              | 12            | 10.8 - 13.2       | —                                | 2.45        | 29        |
|                |                       | D24       |                | 24            | 21.6 - 26.4       |                                  | 1.23        |           |
|                |                       | D48       |                | 48            | 43.2 - 52.8       |                                  | 0.61        |           |
|                | AC → DC Rectified (R) | R100      | 50/60          | 100           | 90 - 110          | —                                | 0.33        | 29        |
|                |                       | R200      |                | 200           | 180 - 220         |                                  | 0.16        |           |
|                |                       |           |                |               |                   |                                  |             |           |

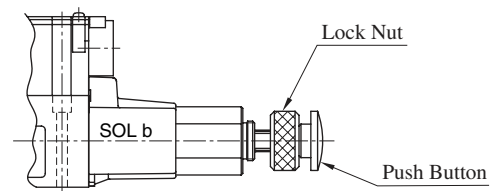
- ★1. AC solenoid is not available in shockless type.  
R type models with built-in current rectifier is recommended for shockless operation with AC power.
- ★2. Inrush current in the above table show rms values at maximum stroke.
- ★3. There are more coil types other than the above. For details, please make inquiries.

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.

## Options

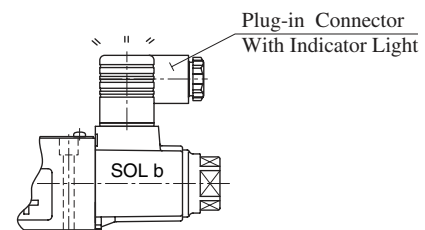
### Push Button with Lock Nut

Can be used for manual changeover of spool. The push button can be locked in the pressed condition.



### Plug-in Connector with Solenoid Indicator Light

These are the indicator light incorporated plug-in connector type solenoids. Energisation or de-energisation of the solenoid can be easily identified with the incorporated indicator light.



**Model Number Designation**

| F-                                                                      | S-                        | DSG                                                  | - 01          | -2                              | B                               | 2                                      | A                                                               | -D24                                | -C                                 | -N                                  | -70              | *                                                                                                                       | -L                                                                       |                                                                    |                          |                                      |
|-------------------------------------------------------------------------|---------------------------|------------------------------------------------------|---------------|---------------------------------|---------------------------------|----------------------------------------|-----------------------------------------------------------------|-------------------------------------|------------------------------------|-------------------------------------|------------------|-------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------|--------------------------------------|
| Special<br>Seals                                                        | Shockless<br>Type         | Series<br>Number                                     | Valve<br>Size | Number<br>of Valve<br>Positions | Spool-<br>Spring<br>Arrangement | Spool<br>Type                          | Special Two<br>Position Valve<br><br>(Omit if not<br>required ) | Coil<br>Type                        | Manual<br>Override                 | Electrical<br>Conduit<br>Connection | Design<br>Number | Design<br>Standard                                                                                                      | Models with<br>Reverse Mtg. of<br>Solenoid<br>(Omit if not<br>required ) |                                                                    |                          |                                      |
| F:<br>For Phosphate<br>Ester Type<br>Fluids<br>(Omit if not<br>required | None:<br>Standard<br>Type | DSG:<br>Solenoid<br>Operated<br>Directional<br>Valve | 01            | 3:<br>Three<br>Positions        | C:<br>Spring<br>Centred         | 2, 3<br>4, 40<br>60, 9<br>10, 11<br>12 | —                                                               | AC:<br>A100<br>A120<br>A200<br>A240 | None:<br>Manual<br>Override<br>Pin | None:<br>Terminal<br>Box Type       | 70               | None:<br>Japanese<br>Std. "JIS"                                                                                         | —                                                                        |                                                                    |                          |                                      |
|                                                                         |                           |                                                      |               | 2:<br>Two<br>Positions          | D:<br>No-Spring<br>Detented     | 2                                      | —                                                               | DC:<br>D12<br>D24<br>D48            |                                    |                                     |                  | N:<br>Plug-in<br>Connector<br>Type<br><br>N1:<br>Plug-in<br>Connector<br>Type<br>with<br>Indicator<br>Light<br>(Option) | 90:<br>N.American<br>Design Std.                                         |                                                                    |                          |                                      |
|                                                                         |                           |                                                      |               |                                 | B:<br>Spring<br>Offset          | 2<br>3<br>8                            | A *1<br>B *1                                                    | R:<br>(AC→<br>DC)<br>R100<br>R200   |                                    |                                     |                  |                                                                                                                         |                                                                          | 90:<br>Japanese<br>Std. "JIS"<br>and<br>European<br>Design<br>Std. | L                        |                                      |
|                                                                         |                           |                                                      |               |                                 | 3:<br>Three<br>Positions        | C:<br>Spring<br>Centred                | 2<br>4                                                          | —                                   |                                    |                                     |                  |                                                                                                                         |                                                                          |                                                                    | DC:<br>D12<br>D24<br>D48 | 90:<br>N. American<br>Design<br>Std. |
|                                                                         |                           |                                                      |               | 2:<br>Two<br>Positions          | B:<br>Spring<br>Offset          | 2                                      | —                                                               | R:<br>(AC→<br>DC)<br>R100<br>R200   |                                    |                                     |                  | L                                                                                                                       |                                                                          |                                                                    |                          |                                      |
|                                                                         |                           |                                                      |               | S:<br>Shockless<br>Type         |                                 |                                        |                                                                 | 3:<br>Three<br>Positions            |                                    |                                     |                  | C:<br>Spring<br>Centred                                                                                                 | 2<br>4                                                                   | —                                                                  | DC:<br>D12<br>D24<br>D48 |                                      |
|                                                                         | 2:<br>Two<br>Positions    | B:<br>Spring<br>Offset                               | 2             |                                 |                                 |                                        |                                                                 | —                                   | R:<br>(AC→<br>DC)<br>R100<br>R200  |                                     |                  |                                                                                                                         |                                                                          |                                                                    |                          |                                      |
|                                                                         |                           |                                                      |               |                                 |                                 |                                        |                                                                 |                                     |                                    |                                     |                  |                                                                                                                         |                                                                          |                                                                    |                          |                                      |
|                                                                         |                           |                                                      |               |                                 |                                 |                                        |                                                                 |                                     |                                    |                                     |                  |                                                                                                                         |                                                                          |                                                                    |                          |                                      |

★1. In case of the special two position valve, please refer to page 352 for details.

★2. N1 is not available for R type solenoids.

In the table above, the symbols or numbers highlighted with shade represent the optional extras. The valves with model number having such optional extras are handles as options, therefore, please confirm the time of delivery with us before ordering.

## List of Standard Models and The Maximum Flow

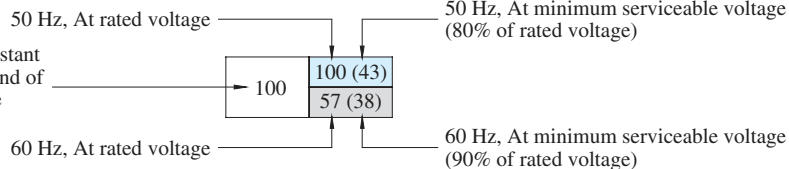
### Models with AC Solenoids: DSG-01-\*\*\*-A\*

| No. of Valve Positions | Spool-Spring Arrangement | Model Numbers | Graphic Symbols | Max. Flow L/min      |         |         |         |         |                             |         |         |        |        |                             |         |         |        |        |
|------------------------|--------------------------|---------------|-----------------|----------------------|---------|---------|---------|---------|-----------------------------|---------|---------|--------|--------|-----------------------------|---------|---------|--------|--------|
|                        |                          |               |                 | P → A → B → T        |         |         |         |         | P → A<br>[Port "B" Blocked] |         |         |        |        | P → B<br>[Port "A" Blocked] |         |         |        |        |
|                        |                          |               |                 |                      |         |         |         |         |                             |         |         |        |        |                             |         |         |        |        |
|                        |                          |               |                 | Working Pressure MPa |         |         |         |         | Working Pressure MPa        |         |         |        |        | Working Pressure MPa        |         |         |        |        |
|                        |                          |               |                 | 10                   | 16      | 25      | 31.5    | 35      | 10                          | 16      | 25      | 31.5   | 35     | 10                          | 16      | 25      | 31.5   | 35     |
| Three Positions        | Spring Centred           | DSG-01-3C2    |                 | 100                  | 100     | 100     | 100     | 100     | 100(43)                     | 100(41) | 80(21)  | 60(17) | 38(15) | 100(43)                     | 100(41) | 80(21)  | 60(17) | 38(15) |
|                        |                          | DSG-01-3C3    |                 | 100(80)              | 100(80) | 100(80) | 100(77) | 100(77) | 57(38)                      | 53(31)  | 29(17)  | 19(10) | 13(9)  | 57(38)                      | 53(31)  | 29(17)  | 19(10) | 13(9)  |
|                        |                          | DSG-01-3C4    |                 | 90                   | 90      | 90      | 90(22)  | 35(18)  | 90(43)                      | 76(28)  | 67(15)  | 57(10) | 35(7)  | 100(38)                     | 76(28)  | 67(15)  | 57(10) | 35(7)  |
|                        |                          | DSG-01-3C40   |                 | 85                   | 85      | 85      | 80(40)  | 80(22)  | 85(40)                      | 85(35)  | 85(24)  | 60(16) | 55(12) | 85(40)                      | 85(35)  | 85(24)  | 60(16) | 55(12) |
|                        |                          | DSG-01-3C60   |                 | 43(23)               | 43(23)  | 42(23)  | 42(23)  | 42(23)  | 54(32)                      | 54(32)  | 52(32)  | 52(32) | 52(32) | 54(32)                      | 54(32)  | 52(32)  | 52(32) | 52(32) |
|                        |                          | DSG-01-3C9    |                 | 100                  | 100     | 100     | 100     | 100     | 20                          | 15      | 10      | 10     | 8      | 20                          | 15      | 10      | 10     | 8      |
|                        |                          | DSG-01-3C10   |                 | 100                  | 100     | 100(63) | 100(33) | 100(27) | 100(50)                     | 100(37) | 100(20) | 78(16) | 62(13) | 100(50)                     | 100(37) | 100(20) | 78(16) | 62(13) |
|                        |                          | DSG-01-3C11   |                 | 100                  | 100     | 100     | 100     | 100     | 23                          | 20      | 13      | 10     | 5      | 100(65)                     | 85(52)  | 72(45)  | 65(34) | 60(27) |
|                        |                          | DSG-01-3C12   |                 | 100                  | 100     | 100(63) | 100(33) | 100(27) | 100(50)                     | 100(37) | 100(20) | 78(16) | 62(13) | 100(50)                     | 100(37) | 100(20) | 78(16) | 62(13) |
| Two Positions          | No-Spring Detented       | DSG-01-2D2    |                 | 80                   | 80      | 80      | 80      | 80      | 45                          | 45      | 45(21)  | 45(16) | 38(13) | 50                          | 50(45)  | 50(42)  | 45(40) | 45(40) |
|                        |                          |               |                 |                      |         |         |         |         |                             |         | 36(18)  | 28(13) | 22(12) |                             | 50(45)  | 50(42)  | 45(40) | 45(40) |
|                        | Spring Offset            | DSG-01-2B2    |                 | 85                   | 85      | 85      | 85      | 85      | 20                          | 16      | 16      | 15     | 13     | 85(63)                      | 80(50)  | 63(40)  | 44(32) | 44(32) |
|                        |                          | DSG-01-2B3    |                 | 70                   | 70      | 70      | 70      | 70      | 50                          | 50      | 50      | 50     | 50     | 80(70)                      | 80(70)  | 80(70)  | 80(70) | 80(70) |
|                        |                          | DSG-01-2B8    |                 | —                    | —       | —       | —       | —       | 26                          | 17      | 13      | 11     | 10     | 80(50)                      | 70(40)  | 60(20)  | 45(10) | 30(10) |

Notes: 1. The relation between the maximum flow in the table above and the frequency/voltage (within the serviceable voltage) is as shown below.

( Example )

The maximum flow rate is constant regardless of 50 Hz or 60 Hz and of any voltage variants within the serviceable voltage



2. For the maximum flow rate in P → T of the valves with a ★ mark, please see page 351.

The valve models with a ◆ mark are handled as Options. If you choose such valves, check the time of delivery beforehand.

■ List of Standard Models and The Maximum Flow

● Models with DC or R Type Solenoids: DSG-01-\*\*\*-D\*/R\*

| No. of Valve Positions | Spool-Spring Arrangement | Model Numbers | Graphic Symbols | Max. Flow L/min      |     |     |      |     |                             |    |    |      |    |                             |    |    |      |    |
|------------------------|--------------------------|---------------|-----------------|----------------------|-----|-----|------|-----|-----------------------------|----|----|------|----|-----------------------------|----|----|------|----|
|                        |                          |               |                 | P → A → B → T        |     |     |      |     | P → A<br>[Port "B" Blocked] |    |    |      |    | P → B<br>[Port "A" Blocked] |    |    |      |    |
|                        |                          |               |                 |                      |     |     |      |     |                             |    |    |      |    |                             |    |    |      |    |
|                        |                          |               |                 | Working Pressure MPa |     |     |      |     | Working Pressure MPa        |    |    |      |    | Working Pressure MPa        |    |    |      |    |
|                        |                          |               |                 | 10                   | 16  | 25  | 31.5 | 35  | 10                          | 16 | 25 | 31.5 | 35 | 10                          | 16 | 25 | 31.5 | 35 |
| Three Positions        | Spring Centred           | DSG-01-3C2    |                 | 100                  | 100 | 100 | 100  | 100 | 100                         | 45 | 28 | 25   | 22 | 100                         | 45 | 28 | 25   | 22 |
|                        |                          | DSG-01-3C3    |                 | 100                  | 100 | 100 | 100  | 100 | 78                          | 78 | 78 | 78   | 75 | 78                          | 78 | 78 | 78   | 75 |
|                        |                          | DSG-01-3C4    |                 | 90                   | 90  | 90  | 50   | 38  | 100                         | 58 | 38 | 31   | 29 | 100                         | 58 | 38 | 31   | 29 |
|                        |                          | DSG-01-3C40   |                 | 85                   | 85  | 42  | 26   | 20  | 62                          | 48 | 30 | 25   | 23 | 62                          | 48 | 30 | 25   | 23 |
|                        |                          | DSG-01-3C60   |                 | 50                   | 50  | 65  | 40   | 33  | 85                          | 52 | 30 | 26   | 24 | 85                          | 52 | 30 | 26   | 24 |
|                        |                          | DSG-01-3C9    |                 | 100                  | 100 | 100 | 100  | 100 | 20                          | 15 | 10 | 10   | 8  | 20                          | 15 | 10 | 10   | 8  |
|                        |                          | DSG-01-3C10   |                 | 85                   | 85  | 85  | 80   | 40  | 100                         | 56 | 36 | 28   | 24 | 100                         | 56 | 36 | 28   | 24 |
|                        |                          | DSG-01-3C11   |                 | 100                  | 100 | 100 | 100  | 100 | 23                          | 20 | 13 | 10   | 5  | 100                         | 60 | 40 | 36   | 32 |
|                        |                          | DSG-01-3C12   |                 | 85                   | 85  | 85  | 80   | 40  | 100                         | 56 | 36 | 28   | 24 | 100                         | 56 | 36 | 28   | 24 |
|                        |                          |               |                 |                      |     | 35  | 23   | 20  | 74                          | 43 | 28 | 20   | 19 | 74                          | 43 | 28 | 20   | 19 |
| Two Positions          | No-Spring Detented       | DSG-01-2D2    |                 | 75                   | 75  | 75  | 75   | 75  | 45                          | 45 | 40 | 30   | 27 | 50                          | 50 | 50 | 45   | 45 |
|                        |                          |               |                 | 70                   | 70  | 70  | 70   | 70  |                             |    | 30 | 25   | 22 |                             | 45 | 42 | 40   | 40 |
|                        | Spring Offset            | DSG-01-2B2    |                 | 80                   | 80  | 80  | 80   | 80  | 20                          | 16 | 16 | 15   | 13 | 46                          | 31 | 24 | 22   | 22 |
|                        |                          | DSG-01-2B3    |                 | 70                   | 70  | 70  | 70   | 70  | 50                          | 50 | 50 | 50   | 50 | 32                          | 23 | 19 | 18   | 18 |
|                        |                          | DSG-01-2B8    |                 | —                    | —   | —   | —    | —   | 26                          | 17 | 13 | 11   | 10 | 75                          | 75 | 75 | 75   | 75 |
|                        |                          |               |                 |                      |     |     |      |     |                             |    |    |      |    | 65                          | 65 | 65 | 65   | 65 |
|                        |                          |               |                 |                      |     |     |      |     |                             |    |    |      |    | 53                          | 35 | 23 | 19   | 17 |
|                        |                          |               |                 |                      |     |     |      |     |                             |    |    |      |    | 35                          | 30 | 17 | 13   | 12 |

Notes: 1. The relation between the maximum flow in the table above and the voltage (within the serviceable voltage) is as shown below.

( Example )

The maximum flow rate is constant regardless of any voltage variants within the serviceable voltage



At rated voltage  
[after temperature rise and saturated]

At minimum serviceable voltage  
(90% of rated voltage)  
[after temperature rise and saturated]

2. For the maximum flow rate in P → T of the valves with a ★ mark, please see page 351.

The valve models with a ◆ mark are handled as Options. If you choose such valves, check the time of delivery beforehand.

## List of Standard Models and The Maximum Flow

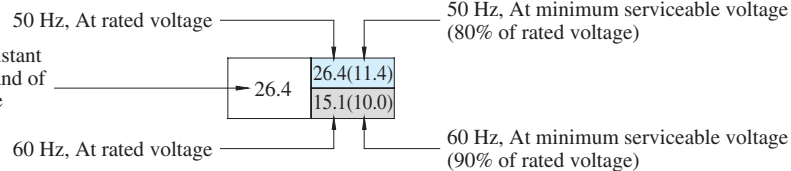
### Models with AC Solenoids: DSG-01-\*\*\*-A\*

| No. of Valve Positions | Spool-Spring Arrangement | Model Numbers | Graphic Symbols | Max. Flow U.S.GPM    |            |            |            |            |                             |            |            |            |            |                             |            |            |            |            |
|------------------------|--------------------------|---------------|-----------------|----------------------|------------|------------|------------|------------|-----------------------------|------------|------------|------------|------------|-----------------------------|------------|------------|------------|------------|
|                        |                          |               |                 | P → A → B → T        |            |            |            |            | P → A<br>[Port "B" Blocked] |            |            |            |            | P → B<br>[Port "A" Blocked] |            |            |            |            |
|                        |                          |               |                 |                      |            |            |            |            |                             |            |            |            |            |                             |            |            |            |            |
|                        |                          |               |                 | Working Pressure PSI |            |            |            |            | Working Pressure PSI        |            |            |            |            | Working Pressure PSI        |            |            |            |            |
|                        |                          |               |                 | 1450                 | 2320       | 3630       | 4570       | 5080       | 1450                        | 2320       | 3630       | 4570       | 5080       | 1450                        | 2320       | 3630       | 4570       | 5080       |
| Three Positions        | Spring Centred           | DSG-01-3C2    |                 | 26.4                 | 26.4       | 26.4       | 26.4       | 26.4       | 26.4(11.4)                  | 26.4(10.8) | 21.1(5.6)  | 15.9(4.5)  | 10.0(4.0)  | 26.4(11.4)                  | 26.4(10.8) | 21.1(5.6)  | 15.9(4.5)  | 10.0(4.0)  |
|                        |                          | DSG-01-3C3    |                 | 26.4(21.1)           | 26.4(21.1) | 26.4(21.1) | 26.4(21.1) | 26.4(21.1) | 18.5(12.2)                  | 18.5(12.2) | 18.5(12.2) | 18.5(12.2) | 18.5(12.2) | 18.5(12.2)                  | 18.5(12.2) | 18.5(12.2) | 18.5(12.2) | 18.5(12.2) |
|                        |                          | DSG-01-3C4    |                 | 23.8                 | 23.8       | 23.8       | 23.8(5.8)  | 9.2(4.8)   | 26.4(10.0)                  | 20.1(17.4) | 17.7(4.0)  | 15.1(2.6)  | 9.2(1.8)   | 26.4(10.0)                  | 20.1(17.4) | 17.7(4.0)  | 15.1(2.6)  | 9.2(1.8)   |
|                        |                          | DSG-01-3C40   |                 | 22.5                 | 22.5       | 22.5       | 21.1(10.6) | 21.1(5.8)  | 22.5(10.6)                  | 22.5(9.3)  | 22.5(6.3)  | 15.9(4.2)  | 14.5(3.2)  | 22.5(10.6)                  | 22.5(9.3)  | 22.5(6.3)  | 15.9(4.2)  | 14.5(3.2)  |
|                        |                          | DSG-01-3C60   |                 | 11.4(6.1)            | 11.4(6.1)  | 11.1(6.1)  | 11.1(6.1)  | 11.1(6.1)  | 14.2(8.4)                   | 14.2(8.4)  | 13.7(8.4)  | 13.7(8.4)  | 13.7(8.4)  | 14.2(8.4)                   | 14.2(8.4)  | 13.7(8.4)  | 13.7(8.4)  | 13.7(8.4)  |
|                        |                          | DSG-01-3C9    |                 | 26.4                 | 26.4       | 26.4       | 26.4       | 26.4       | 5.3                         | 4.0        | 2.6        | 2.6        | 2.1        | 5.3                         | 4.0        | 2.6        | 2.6        | 2.1        |
|                        |                          | DSG-01-3C10   |                 | 26.4                 | 26.4       | 26.4(16.6) | 26.4(8.7)  | 26.4(7.1)  | 26.4(13.2)                  | 26.4(9.8)  | 26.4(5.3)  | 20.6(4.2)  | 16.4(3.4)  | 26.4(13.2)                  | 26.4(9.8)  | 26.4(5.3)  | 20.6(4.2)  | 16.4(3.4)  |
|                        |                          | DSG-01-3C11   |                 | 26.4                 | 26.4       | 26.4       | 26.4       | 26.4       | 6.1                         | 5.3        | 3.4        | 2.6        | 1.3        | 26.4(17.2)                  | 22.5(13.7) | 19.0(13.7) | 17.2(9.0)  | 15.9(7.1)  |
|                        |                          | DSG-01-3C12   |                 | 26.4                 | 26.4       | 26.4(16.6) | 26.4(8.7)  | 26.4(7.1)  | 26.4(13.2)                  | 26.4(9.8)  | 26.4(5.3)  | 20.6(4.2)  | 16.4(3.4)  | 26.4(13.2)                  | 26.4(9.8)  | 26.4(5.3)  | 20.6(4.2)  | 16.4(3.4)  |
|                        |                          |               |                 | 26.4(18.5)           | 21.1(5.3)  | 18.5(5.3)  | 10.6(5.0)  | 26.4(9.8)  | 14.5(6.6)                   | 7.7(3.7)   | 5.3(2.9)   | 4.0(2.6)   | 26.4(9.8)  | 14.5(6.6)                   | 7.7(3.7)   | 5.3(2.9)   | 4.0(2.6)   |            |
| Two Positions          | No-Spring Detented       | DSG-01-2D2    |                 | 21.1                 | 21.1       | 21.1       | 21.1       | 21.1       | 11.9                        | 11.9       | 11.9(5.6)  | 11.9(4.2)  | 10.0(3.4)  | 13.2                        | 13.2(11.9) | 13.2(11.1) | 11.9(10.6) | 11.9(10.6) |
|                        | Spring Offset            | DSG-01-2B2    |                 | 22.5                 | 22.5       | 22.5       | 22.5       | 22.5       | 5.3                         | 4.2        | 4.2        | 4.0        | 3.4        | 22.5(16.6)                  | 21.1(13.2) | 16.6(10.6) | 11.6(8.5)  | 11.6(8.5)  |
|                        |                          | DSG-01-2B3    |                 | 18.5                 | 18.5       | 18.5       | 18.5       | 18.5       | 13.2                        | 13.2       | 13.2       | 13.2       | 13.2       | 21.1(18.5)                  | 21.1(18.5) | 21.1(18.5) | 21.1(18.5) | 21.1(18.5) |
|                        |                          | DSG-01-2B8    |                 | —                    | —          | —          | —          | —          | 6.9                         | 4.5        | 3.4        | 2.9        | 2.6        | 21.1(13.2)                  | 18.5(10.6) | 15.9(5.3)  | 11.9(2.6)  | 7.9(2.6)   |
|                        |                          |               |                 | —                    | —          | —          | —          | —          | —                           | —          | —          | —          | —          | 9.2(5.3)                    | 6.1(4.0)   | 4.0(2.1)   | 2.6(1.3)   | 1.9(1.3)   |

Notes: 1. The relation between the maximum flow in the table above and the frequency/voltage (within the serviceable voltage) is as shown below.

( Example )

The maximum flow rate is constant regardless of 50 Hz or 60 Hz and of any voltage variants within the serviceable voltage



2. For the maximum flow rate in P → T of the valves with a ★ mark, please see [page 351](#).

The valve models with a ◆ mark are handled as Options. If you choose such valves, check the time of delivery beforehand.

■ List of Standard Models and The Maximum Flow

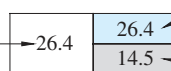
● Models with DC or R Type Solenoids: DSG-01-\*\*\*-D\*/R\*

| No. of Valve Positions | Spool-Spring Arrangement | Model Numbers | Graphic Symbols | Max. Flow U.S.GPM    |      |      |      |      |                             |      |      |      |      |                             |      |      |      |      |
|------------------------|--------------------------|---------------|-----------------|----------------------|------|------|------|------|-----------------------------|------|------|------|------|-----------------------------|------|------|------|------|
|                        |                          |               |                 | P → A → B → T        |      |      |      |      | P → A<br>[Port "B" Blocked] |      |      |      |      | P → B<br>[Port "A" Blocked] |      |      |      |      |
|                        |                          |               |                 |                      |      |      |      |      |                             |      |      |      |      |                             |      |      |      |      |
|                        |                          |               |                 | Working Pressure PSI |      |      |      |      | Working Pressure PSI        |      |      |      |      | Working Pressure PSI        |      |      |      |      |
|                        |                          |               |                 | 1450                 | 2320 | 3630 | 4570 | 5080 | 1450                        | 2320 | 3630 | 4570 | 5080 | 1450                        | 2320 | 3630 | 4570 | 5080 |
| Three Positions        | Spring Centred           | DSG-01-3C2    |                 | 26.4                 | 26.4 | 26.4 | 26.4 | 26.4 | 26.4                        | 11.9 | 7.4  | 6.6  | 5.8  | 26.4                        | 11.9 | 7.4  | 6.6  | 5.8  |
|                        |                          | DSG-01-3C3    |                 | 26.4                 | 26.4 | 26.4 | 26.4 | 26.4 | 20.6                        | 20.6 | 20.6 | 20.6 | 19.8 | 20.6                        | 20.6 | 20.6 | 20.6 | 19.8 |
|                        |                          | DSG-01-3C4    |                 | 23.8                 | 23.8 | 23.8 | 13.2 | 10.0 | 26.4                        | 15.3 | 10.0 | 8.2  | 7.7  | 26.4                        | 15.3 | 10.0 | 8.2  | 7.7  |
|                        |                          | DSG-01-3C40   |                 | 22.5                 | 22.5 | 17.2 | 10.6 | 8.7  | 22.5                        | 13.7 | 7.9  | 6.3  | 6.3  | 22.5                        | 13.7 | 7.9  | 6.9  | 6.3  |
|                        |                          | DSG-01-3C60   |                 | 13.3                 | 13.3 | 13.3 | 13.3 | 13.3 | 17.4                        | 17.4 | 17.4 | 17.4 | 17.4 | 17.4                        | 17.4 | 17.4 | 17.4 | 17.4 |
|                        |                          | DSG-01-3C9    |                 | 26.4                 | 26.4 | 26.4 | 26.4 | 26.4 | 5.3                         | 4.0  | 2.6  | 2.6  | 2.1  | 5.3                         | 4.0  | 2.6  | 2.6  | 2.1  |
|                        |                          | DSG-01-3C10   |                 | 22.5                 | 22.5 | 22.5 | 21.1 | 10.6 | 26.4                        | 14.8 | 9.5  | 7.4  | 6.3  | 26.4                        | 14.8 | 9.5  | 7.4  | 6.3  |
|                        |                          | DSG-01-3C11   |                 | 26.4                 | 26.4 | 26.4 | 26.4 | 26.4 | 6.1                         | 5.3  | 3.4  | 2.6  | 1.3  | 26.4                        | 15.9 | 10.6 | 9.5  | 8.5  |
|                        |                          | DSG-01-3C12   |                 | 22.5                 | 22.5 | 22.5 | 21.1 | 10.6 | 26.4                        | 14.8 | 9.5  | 7.4  | 6.3  | 26.4                        | 14.8 | 9.5  | 7.4  | 6.3  |
|                        |                          |               |                 |                      |      | 9.2  | 6.1  | 5.3  | 19.6                        | 11.4 | 7.4  | 5.3  | 5.0  | 19.6                        | 11.4 | 7.4  | 5.3  | 5.0  |
| Two Positions          | No-Spring Detented       | DSG-01-2D2    |                 | 19.8                 | 19.8 | 19.8 | 19.8 | 19.8 |                             |      | 10.6 | 7.9  | 7.1  |                             | 13.2 | 13.2 | 11.9 | 11.9 |
|                        |                          |               |                 | 18.5                 | 18.5 | 18.5 | 18.5 | 18.5 | 11.9                        | 11.9 | 7.9  | 6.6  | 5.8  | 13.2                        | 13.2 | 11.1 | 10.6 | 10.6 |
|                        | Spring Offset            | DSG-01-2B2    |                 | 21.1                 | 21.1 | 21.1 | 21.1 | 21.1 | 5.3                         | 4.2  | 4.2  | 4.0  | 3.4  | 12.2                        | 8.2  | 6.3  | 5.8  | 5.8  |
|                        |                          | DSG-01-2B3    |                 | 18.5                 | 18.5 | 18.5 | 18.5 | 18.5 | 13.2                        | 13.2 | 13.2 | 13.2 | 13.2 | 19.8                        | 19.8 | 19.8 | 19.8 | 19.8 |
|                        |                          | DSG-01-2B8    |                 | —                    | —    | —    | —    | —    | 6.9                         | 4.5  | 3.4  | 2.9  | 2.6  | 14.0                        | 9.2  | 6.1  | 5.0  | 4.5  |
|                        |                          |               |                 |                      |      |      |      |      |                             |      |      |      |      | 9.3                         | 7.9  | 4.5  | 3.4  | 3.2  |

Notes: 1. The relation between the maximum flow in the table above and the voltage (within the serviceable voltage) is as shown below.

( Example )

The maximum flow rate is constant regardless of any voltage variants within the serviceable voltage



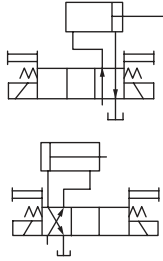
At rated voltage  
[after temperature rise and saturated]  
At minimum serviceable voltage  
(90% of rated voltage)  
[after temperature rise and saturated]

2. For the maximum flow rate in P → T of the valves with a ★ mark, please see [page 351](#).

The valve models with a ◆ mark are handled as Options. If you choose suce valves, check the time of delivery beforehand.

## Maximum Flow of Centre By-Pass

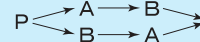
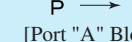
In valve type 3C60, in case where the actuator is put on in between the cylinder ports A and B as illustrated below and where the actuator moves and suspended at its stroke end and where the valve is then shifted to the neutral position in the suspended state of the actuator, the maximum flow rates available are those as shown as the table below regardless of any voltage in the range of serviceable voltage.



| Mode Numbers         | Graphic Symbol | Max. Flow L/min (U.S.GPM) |                      |                      |                        |                      |
|----------------------|----------------|---------------------------|----------------------|----------------------|------------------------|----------------------|
|                      |                | 10 MPa<br>(1450 PSI)      | 16 MPa<br>(2320 PSI) | 25 MPa<br>(3630 PSI) | 31.5 MPa<br>(4570 PSI) | 35 MPa<br>(5080 PSI) |
| DSG-01-3C60-A*/D*/R* |                | 55<br>(14.5)              | 44<br>(11.6)         | 30<br>(7.9)          | 26<br>(6.9)            | 22<br>(5.8)          |

## List of Shockless Models and The Maximum Flow

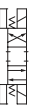
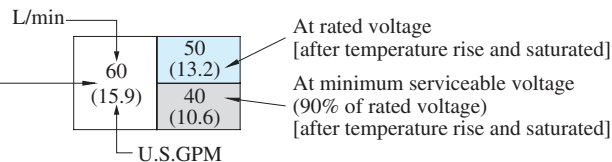
### Models with DC or R Type Solenoids: S-DSG-01-\*\*\*-D\*/R\*

| No. of Valve Positions | Spool-Spring Arrangement | Model Numbers | Graphic Symbol                                                                      | Max. Flow      L/min (U.S.GPM)                                                     |              |              |                                                                                                           |              |              |                                                                                                           |              |              |
|------------------------|--------------------------|---------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------|--------------|-----------------------------------------------------------------------------------------------------------|--------------|--------------|-----------------------------------------------------------------------------------------------------------|--------------|--------------|
|                        |                          |               |                                                                                     |   |              |              | <br>[Port "B" Blocked] |              |              | <br>[Port "A" Blocked] |              |              |
|                        |                          |               |                                                                                     |  |              |              |                       |              |              |                       |              |              |
|                        |                          |               |                                                                                     | Working Pressure<br>MPa (PSI)                                                      |              |              | Working Pressure<br>MPa (PSI)                                                                             |              |              | Working Pressure<br>MPa (PSI)                                                                             |              |              |
|                        |                          |               |                                                                                     | 10<br>(1450)                                                                       | 16<br>(2320) | 25<br>(3630) | 10<br>(1450)                                                                                              | 16<br>(2320) | 25<br>(3630) | 10<br>(1450)                                                                                              | 16<br>(2320) | 25<br>(3630) |
| Three Positions        | Spring Centred           | S-DSG-01-3C2  |  | 63<br>(16.6)                                                                       | 63<br>(16.6) | 40<br>(10.6) | 40<br>(10.6)                                                                                              | 32<br>(8.5)  | 25<br>(6.6)  | 40<br>(10.6)                                                                                              | 32<br>(8.5)  | 25<br>(6.6)  |
|                        |                          |               |                                                                                     |                                                                                    |              |              | 32<br>(8.5)                                                                                               | 20<br>(5.3)  | 16<br>(4.23) | 32<br>(8.5)                                                                                               | 20<br>(5.3)  | 16<br>(4.23) |
|                        |                          | S-DSG-01-3C4  |  | 60<br>(15.9)                                                                       | 50<br>(13.2) | 40<br>(10.6) | 40<br>(10.6)                                                                                              | 32<br>(8.5)  | 16<br>(4.2)  | 40<br>(10.6)                                                                                              | 32<br>(8.5)  | 16<br>(4.2)  |
|                        |                          |               |                                                                                     |                                                                                    | 40<br>(10.6) | 20<br>(5.3)  | 32<br>(8.45)                                                                                              | 16<br>(4.23) | 12<br>(3.17) | 32<br>(8.45)                                                                                              | 16<br>(4.23) | 12<br>(3.17) |
| Two Positions          | Spring Offset            | S-DSG-01-3B2  |  | 50<br>(13.2)                                                                       | 45<br>(11.9) | 45<br>(11.9) | 30<br>(7.9)                                                                                               | 30<br>(7.9)  | 30<br>(7.9)  | 60<br>(15.9)                                                                                              | 40<br>(10.6) | 40<br>(10.6) |
|                        |                          |               |                                                                                     | 45<br>(11.9)                                                                       | 40<br>(10.6) | 40<br>(10.6) |                                                                                                           |              |              |                                                                                                           |              |              |

Notes: 1. The relation between the maximum flow in the table above and the voltage (within the serviceable voltage) is as shown below.

( Example )

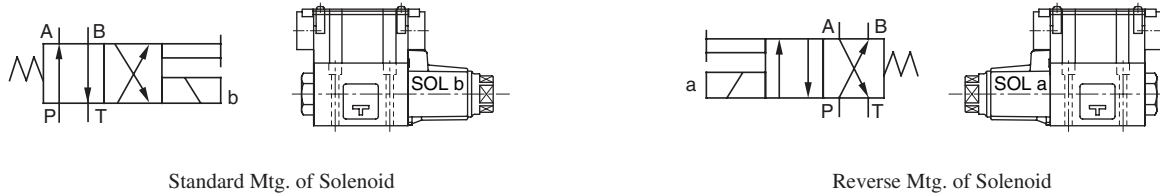
The maximum flow rate is constant regardless of any voltage variants within the serviceable voltage



## Reverse Mounting of Solenoid.

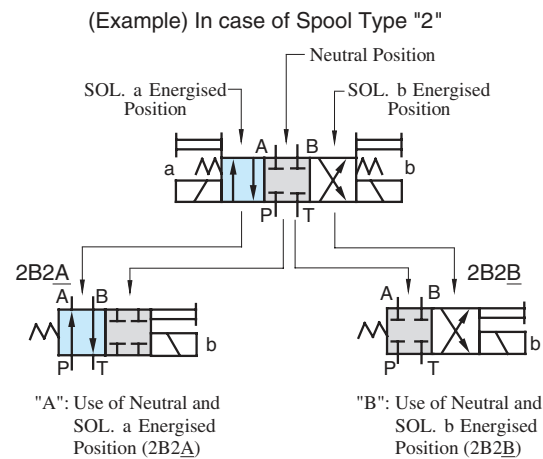
In spring offset type, it is a standard configuration that the solenoid is mounted onto the valve in the SOL b position (side). However, in this particular spool-spring arrangement, the mounting of the solenoid onto the valve in the reverse position -SOL a side- is also available. The graphic symbol for this reverse mounting is as shown below.

As for the valve type 2B\*A and 2B\*B, please refer to the explanation under the heading of "Valves Using Neutral Position and Side Position" given below.



## Valves Using Neutral Position and Side Position. (Special Two position Valve)

Besides the use of the standard 2-position valves aforementioned in the "List of Standard Models and Maximum Flow", the 3-position valves also can be used as the 2-position valves using the two of their three positions. In this case, there are two kinds of the valve available. One is the valve using the neutral position and SOL a position (2B\*A) and another is the valve using the neutral position and SOL b position (2B\*B).



| Model Numbers | Graphic SymbolsG   |                   |
|---------------|--------------------|-------------------|
|               | Standard Mtg. Type | Reverse Mtg. Type |
| DSG-01-2B*A   |                    |                   |
| DSG-01-2B2A   |                    | —                 |

| Model Numbers | Graphic Symbols    |                   |
|---------------|--------------------|-------------------|
|               | Standard Mtg. Type | Reverse Mtg. Type |
| DSG-01-2B*B   |                    |                   |
| DSG-01-2B2B   |                    | —                 |
| DSG-01-2B3B   |                    | —                 |
| DSG-01-2B4B   |                    |                   |
| DSG-01-2B60B  |                    | —                 |
| DSG-01-2B10B  |                    | —                 |

In the above table, the graphic symbols in mounting type highlighted with shade are optional extra, therefore, please confirm the time of delivery with us before ordering.

## Typical Changeover Time

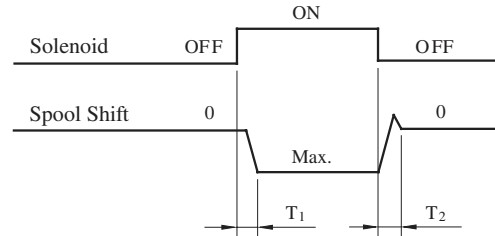
Changeover time varies according to oil viscosity, spool type and hydraulic circuit.

### Standard Type (Without Shockless Function)

#### [Test Conditions]

Pressure: 16 MPa (2320 PSI)  
 Flow Rate: 31.5 L/min (8.3 U.S.GPM)  
 Viscosity: 35 mm<sup>2</sup>/s (164 SSU)  
 Voltage: 100 %V  
 (After coil temperature rises and saturated)

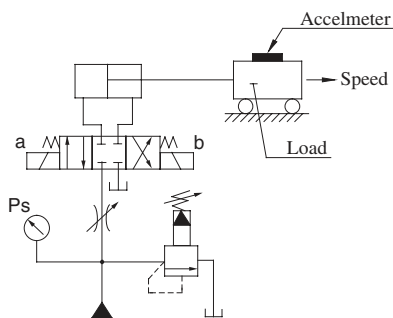
#### [Result of Measurement]



| Type          | Model Numbers  | Time ms        |                |
|---------------|----------------|----------------|----------------|
|               |                | T <sub>1</sub> | T <sub>2</sub> |
| Standard Type | DSG-01-3C2- A* | 15             | 23             |
|               | DSG-01-3C2- D* | 48             | 19             |
|               | DSG-01-3C2- R* | 50             | 100            |

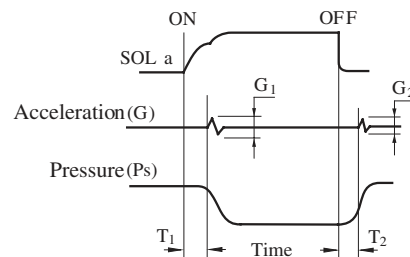
### Shockless Type

#### [Test Circuit and Conditions]



Setting Pressure (Ps): 7 MPa (1020 PSI)  
 Load (W): 1000 kg (2205 lbs.)  
 Speed: 8 m/min (26.2 ft./min)  
 Viscosity: 35 mm<sup>2</sup>/s (164 SSU)

#### [Results of Measurement]

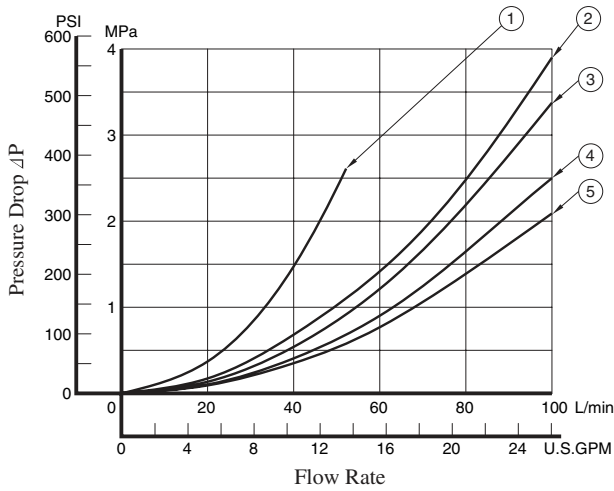


| Type           | Model Numbers    | Time ms        |                | Acceleration m/s <sup>2</sup> (G) |                |
|----------------|------------------|----------------|----------------|-----------------------------------|----------------|
|                |                  | T <sub>1</sub> | T <sub>2</sub> | G <sub>1</sub>                    | G <sub>2</sub> |
| Shockless Type | S-DSG-01-3C2- D* | 70             | 30             | 12 (1.2)                          | 7 (0.7)        |
| Standard Type  | DSG-01-3C2- D*   | 35             | 25             | 18 (1.8)                          | 15 (1.5)       |

## Pressure Drop

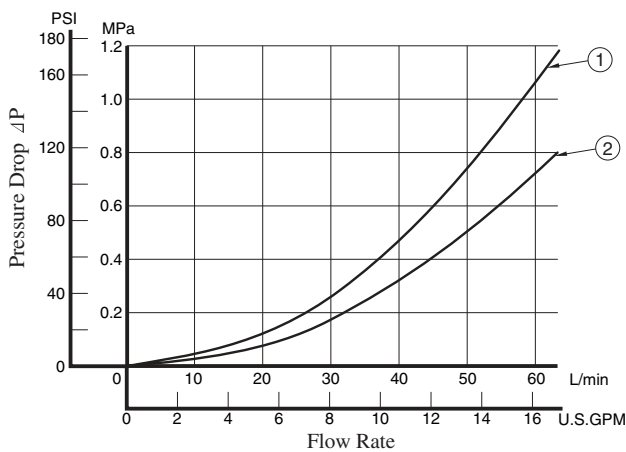
Pressure drop curves based on viscosity of 35 mm<sup>2</sup>/s (164 SSU) and specific gravity of 0.850.

### Standard Type: DSG-01



| Model Numbers | Pressure Drop Curve Number |     |     |     |     |
|---------------|----------------------------|-----|-----|-----|-----|
|               | P→A                        | B→T | P→B | A→T | P→T |
| DSG-01-3C2    | ④                          | ④   | ④   | ④   | —   |
| DSG-01-3C3    | ⑤                          | ⑤   | ⑤   | ⑤   | ②   |
| DSG-01-3C4    | ④                          | ④   | ④   | ④   | —   |
| DSG-01-3C40   | ④                          | ④   | ④   | ④   | —   |
| DSG-01-3C60   | ①                          | ①   | ①   | ①   | ②   |
| DSG-01-3C9    | ⑤                          | ③   | ⑤   | ③   | —   |
| DSG-01-3C10   | ④                          | ⑤   | ④   | ④   | —   |
| DSG-01-3C11   | ④                          | ④   | ④   | ④   | —   |
| DSG-01-3C12   | ④                          | ④   | ④   | ⑤   | —   |
| DSG-01-2D2    | ⑤                          | ④   | ⑤   | ④   | —   |
| DSG-01-2B2    | ⑤                          | ④   | ⑤   | ④   | —   |
| DSG-01-2B3    | ⑤                          | ⑤   | ⑤   | ⑤   | —   |
| DSG-01-2B8    | ⑤                          | —   | ④   | —   | —   |

### Shockless Type: S-DSG-01



| Model Numbers | Pressure Drop Curve Number |     |     |     |
|---------------|----------------------------|-----|-----|-----|
|               | P→A                        | B→T | P→B | A→T |
| S-DSG-01-3C2  | ①                          | ①   | ①   | ①   |
| S-DSG-01-3C4  | ①                          | ②   | ①   | ②   |
| S-DSG-01-2B2  | ①                          | ①   | ①   | ①   |

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

| Viscosity | mm <sup>2</sup> /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 (ΔP') may be obtained from the formula below.

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

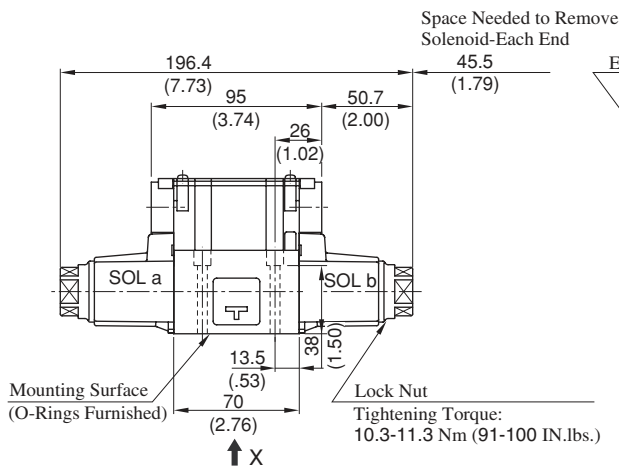
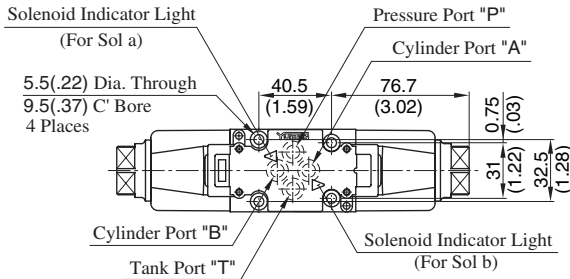
Mounting surface: ISO 4401-AB-03-4-A

## TERMINAL BOX TYPE

### Models with AC Solenoids

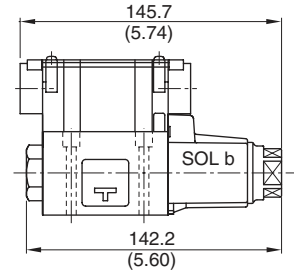
- Double Solenoid: Spring Centred & No-Spring Detented

DSG-01- 3C\*  
2D2 -A\*-70/7090

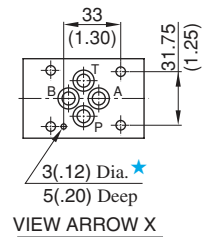
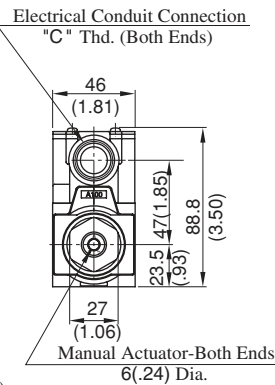


| Model Numbers       | "C" Thd. |
|---------------------|----------|
| DSG-01- ***-A*-70   | G 1/2    |
| DSG-01- ***-A*-7090 | 1/2 NPT  |

- Single Solenoid: Spring Offset  
DSG-01-2B\*-A\*-70/7090



- For other dimensions, refer to "spring Centred and No-Spring Detented" models.
- Solenoid being mounted in the reverse position SOL a side is also available.



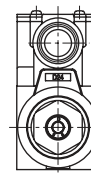
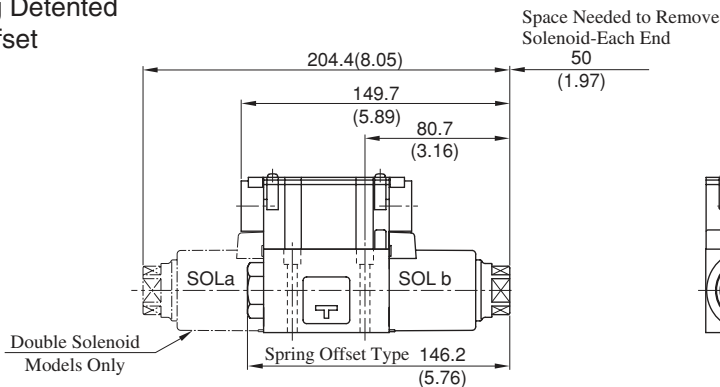
- ★ Locating pin can be fitted to this hole to conform with ISO4401-03-02-94. However, locating pin is not provided to standard design valve. When ordering valve with a locating pin, please consult Yuken.

DIMENSIONS IN  
MILLIMETRES (INCHES)

### Models with DC Solenoids: (S-)DSG-01- \*\*\*-D\*-70/7090

### Models with R Type Solenoids: (S-)DSG-01- \*\*\*-R\*-70/7090

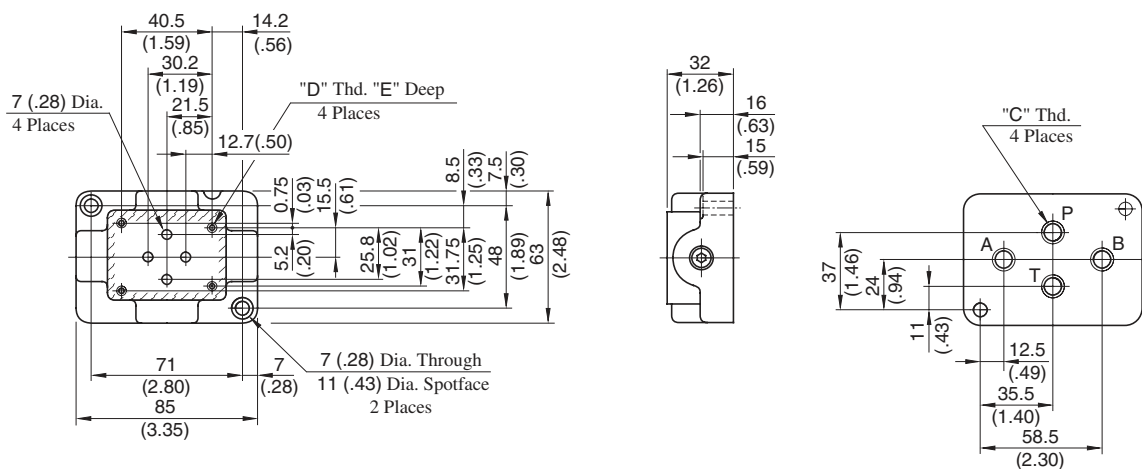
- Spring Centred
- No-Spring Detented
- Spring Offset



- For other dimensions, refer to models with AC solenoids.

■ Sub-plate : DSGM-01/01X/01Y-31/3180/3190

DIMENSIONS IN  
MILLIMETRES (INCHES)

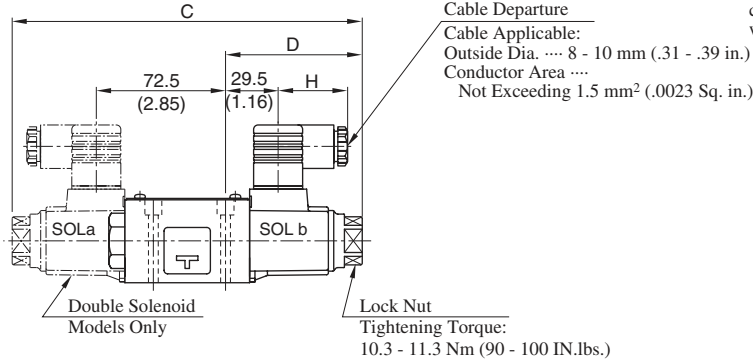


| Sub-plate<br>Model Numbers | Piping Size<br>"C" Thd. | "D" Thd.      | "E"<br>mm(IN.) |
|----------------------------|-------------------------|---------------|----------------|
| DSGM-01-31                 | Rc 1/8                  | M5            | 10 (.39)       |
| DSGM-01-3180               | 1/8 BSP.F               |               |                |
| DSGM-01-3190               | 1/8 NPT                 | No.10-24 UNC  | 12 (.47)       |
| DSGM-01X-31                | Rc 1/4                  | M5            | 10 (.39)       |
| DSGM-01X-3180              | 1/4 BSP.F               |               |                |
| DSGM-01X-3190              | 1/4 NPT                 | No.10-24 UNC  | 12 (.47)       |
| DSGM-01Y-31                | Rc 3/8                  | M5            | 10 (.39)       |
| DSGM-01Y-3190              | 3/8 NPT                 | No. 10-24 UNC | 12 (.47)       |

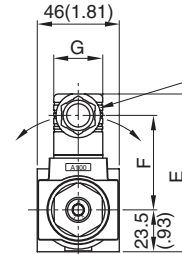
## PLUG-IN CONNECTOR TYPE (N) PLUG-IN CONNECTOR WITH INDICATOR LIGHT (N1)

- Models with AC Solenoids: DSG-01-\*\*\*-A\*-N<sub>1</sub>-70/7090
- Models with DC Solenoids: (S-)DSG-01-\*\*\*-D\*-N<sub>1</sub>-70/7090
- Models with R Solenoids: (S-)DSG-01-\*\*\*-R\*-N-70/7090

### DIMENSIONS IN MILLIMETRES (INCHES)



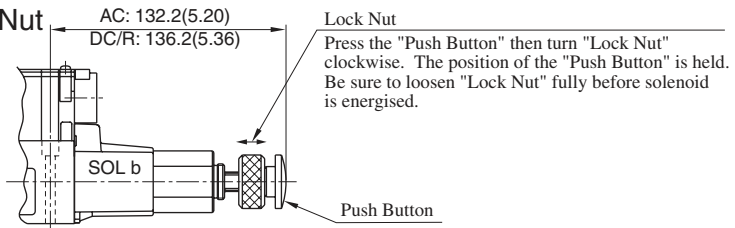
The position of the Plug-in connector can be changed as illustrated below by loosening the lock nut. After completion of the change, be sure to tighten the lock nut with the torque as specified below.



| Model Numbers        | C               | D              | E               | F              | G              | H            |
|----------------------|-----------------|----------------|-----------------|----------------|----------------|--------------|
| DSG-01-***-A*-N*     | 196.4<br>(7.73) | 76.7<br>(3.02) | 88.5<br>(3.48)  | 53<br>(2.09)   | 27.5<br>(1.08) | 39<br>(1.54) |
| (S-)DSG-01-***-D*-N* | 204.4<br>(8.05) | 80.7<br>(3.18) | 99.5<br>(3.92)  | 64<br>(2.52)   | 27.5<br>(1.08) | 39<br>(1.54) |
| (S-)DSG-01-***-R*-N  | 204.4<br>(8.05) | 80.7<br>(3.18) | 102.5<br>(4.04) | 57.2<br>(2.25) | 34<br>(1.34)   | 53<br>(2.09) |

● For other dimensions, refer to "Terminal Box type" (Page 356).

## Models with Push Button & Lock Nut (S-)DSG-01-\*\*\*-\*-C



## Interchangeability in Installation Current and New Design

In order to achieve higher pressure, higher flow, lower pressure drop DSG-01 valves has been upgraded from the 60 design series to the 70 design series.

The figures in the table below are the comparison between the current and the new design valves.

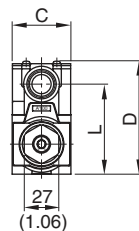
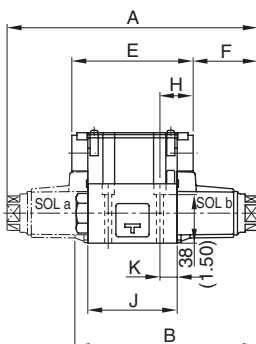
### Specifications

| Design Number      | Max. Flow<br>L/min<br>(U.S.GPM) | Max. Operating<br>Pressure<br>MPa (PSI) | Max. T-Line<br>Back Pres.<br>MPa (PSI) | Max. Changeover<br>Frequency<br>Cycle/min (min <sup>-1</sup> ) | Pressure Drop <sup>*</sup><br>MPa (PSI)<br>{P→A} | Mass kg (lbs.) |           |
|--------------------|---------------------------------|-----------------------------------------|----------------------------------------|----------------------------------------------------------------|--------------------------------------------------|----------------|-----------|
|                    |                                 |                                         |                                        |                                                                |                                                  | 3C*/2D*        | 2B*       |
| New Design: 70     | 100(26.4)                       | 35(5080)                                | 21(3050)                               | 300<br>(R Type sol. Only 120)                                  | 0.9(130)                                         | 1.85(4.08)     | 1.4(3.09) |
| Current Design: 60 | 63(16.6)                        | 31.5(4570)                              | 16(2320)                               |                                                                | 1.0(145)                                         | 2.2(4.85)      | 1.6(3.53) |

<sup>\*</sup> Flow Rate: 60 L/min (15.9 U.S.GPM), Viscosity: 30 mm<sup>2</sup>/s (141 SSU), Spool type "2" (Closed centre)

### Interchangeability in Installation

Interchangeability in installation is maintained though there are minor differences in dimension as in the following table.



| Coil Type | Design Number       | A               | B               | C            | D              | E            | F              | H             | J            | K             | L              |
|-----------|---------------------|-----------------|-----------------|--------------|----------------|--------------|----------------|---------------|--------------|---------------|----------------|
| AC        | New Design : 70     | 196.4<br>(7.73) | 142.2<br>(5.60) | 46<br>(1.81) | 88.8<br>(3.50) | 95<br>(3.74) | 50.7<br>(2.00) | 26<br>(1.02)  | 70<br>(2.76) | 13.5<br>(.53) | 70.5<br>(2.78) |
|           | Current Design : 60 | 191.4<br>(7.54) | 142.7<br>(5.62) | 48<br>(1.89) | 90.3<br>(3.56) | 90<br>(3.54) | 50.7<br>(2.00) | 23.5<br>(.93) | 65<br>(2.56) | 11<br>(.43)   | 72<br>(2.83)   |
| DC<br>R   | New Design : 70     | 204.4<br>(8.05) | 146.2<br>(5.76) | 46<br>(1.81) | 88.8<br>(3.50) | 95<br>(3.74) | 54.7<br>(2.15) | 26<br>(1.02)  | 70<br>(2.76) | 13.5<br>(.53) | 70.5<br>(2.78) |
|           | Current Design : 60 | 210<br>(8.27)   | 152<br>(5.98)   | 48<br>(1.89) | 90.3<br>(3.56) | 90<br>(3.54) | 60<br>(2.36)   | 23.5<br>(.93) | 65<br>(2.56) | 11<br>(.43)   | 72<br>(2.83)   |

## Details of Receptacle

| Type of Electrical Conduit Connection | Double Solenoid Type | Single Solenoid Type |
|---------------------------------------|----------------------|----------------------|
| Terminal Box Type                     |                      |                      |
| Plug-in Connector Type                |                      |                      |

- ★ 1. There are two grounding terminals. You can use either one.  
 ★ 2. If you do not need the common plate, remove it.  
 ★ 3. With DC solenoids, polarity is no question.



### DANGER

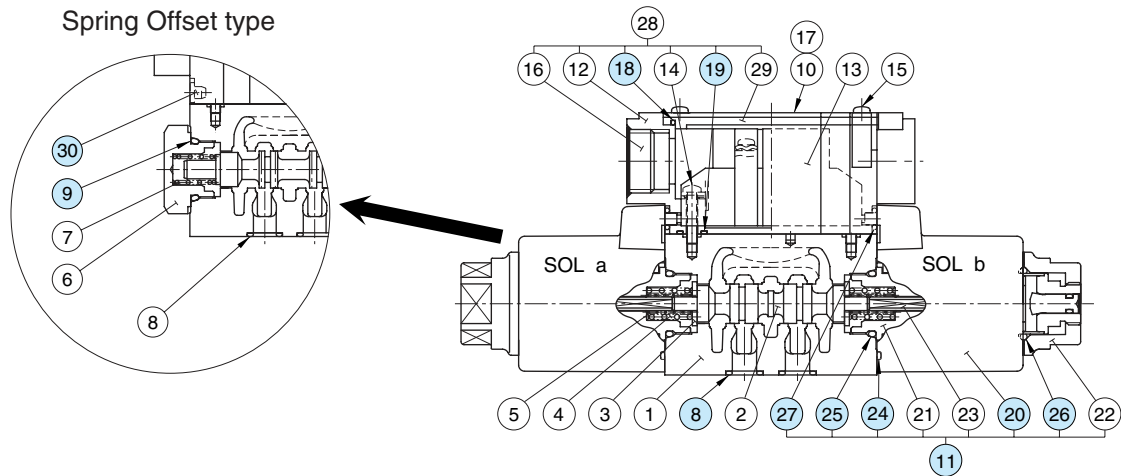
- Do not perform wiring while the power is on. Doing so may result in electric shock, burns or death.
- Make the wiring properly. Improper wiring will cause an irregular movement of the machine, resulting in a grave accident.

## Electrical Circuit

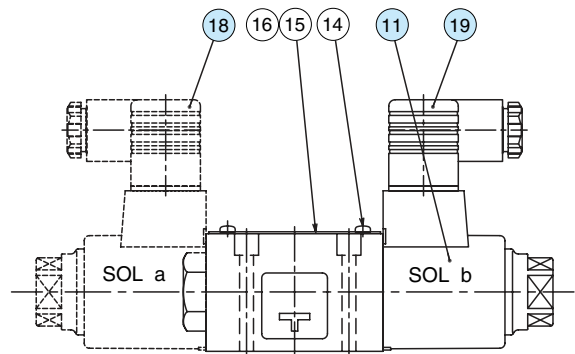
| Type of Electrical Conduit Connection | Electric Source |    |                 |
|---------------------------------------|-----------------|----|-----------------|
|                                       | AC              | DC | AC→DC Rectified |
| Terminal Box Type                     |                 |    |                 |
| Plug-in Connector Type                |                 |    |                 |

## List of Seals

\*-DSG-01-\*\*\*-\*-70/7090



\*-DSG-01-\*\*\*-\*-N/N1-70/7090



## List of Seals

| Item | Name of Parts | Part Numbers            | Qty. |     |     | Remarks                              |
|------|---------------|-------------------------|------|-----|-----|--------------------------------------|
|      |               |                         | 3C*  | 2D* | 2B* |                                      |
| 8    | O-Ring        | SO-NB-A-012 (NBR, Hs90) | 4    | 4   | 4   |                                      |
| 9    | O-Ring        | SO-NB-P18               | —    | —   | 1   |                                      |
| 18   | Packing       | 1790S-VK421290-8        | 1    | 1   | 1   |                                      |
| 19   | O-Ring        | S6                      | 2    | 2   | 2   |                                      |
| 24   | O-Ring        | AS 568-026 (NBR, Hs70)  | 2    | 2   | 1   | Included in Solenoid Ass'y (Item 11) |
| 25   | O-Ring        | SO-NB-P18               | 2    | 2   | 1   |                                      |
| 26   | O-Ring        | SO-NA-P20               | 2    | 2   | 1   |                                      |
| 27   | O-Ring        | SO-NA-P4                | 4    | 4   | 2   |                                      |
| 30   | Plug          | 1790S-VK418329-9        | —    | —   | 2   |                                      |

★ When ordering the O-Rings, please specify the seal kit number from the table below.

| Valve Model Numbers      | Seal Kit No.   | O-Ring Details for Seal Kit                                |
|--------------------------|----------------|------------------------------------------------------------|
| *-DSG-01-***-*-70/7090   | KS-DSG-01-70   | (8)(4 Pcs.), (9) & (25) (2 Pcs., see above), (27) (4 Pcs.) |
| *-DSG-01-***-*-N-70/7090 | KS-DSG-01-N-70 | (8)(4 Pcs.), (9) & (25) (2 Pcs., see above)                |

● Solenoid Ass'y, Coil, Receptacle and Connector Refer to [page 360](#) for the details of these parts.

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

| Valve Model Numbers     | ⑪<br>Solenoid Ass'y No. | ⑫<br>Coil No.  | ⑬<br>Receptacle<br>Part No. | ⑮<br>Connector Ass'y<br>Part No. | ⑰<br>Connector Ass'y<br>Part No. | Remarks                      |                                                    |
|-------------------------|-------------------------|----------------|-----------------------------|----------------------------------|----------------------------------|------------------------------|----------------------------------------------------|
| DSG-01-***-A100-70*     | SA1-100-70              | C-SA1-100-70   | R1-70                       | —                                | —                                | Terminal<br>Box<br>Type      |                                                    |
| DSG-01-***-A120-70*     | SA1-120-70              | C-SA1-120-70   |                             |                                  |                                  |                              |                                                    |
| DSG-01-***-A200-70*     | SA1-200-70              | C-SA1-200-70   |                             |                                  |                                  |                              |                                                    |
| DSG-01-***-A240-70*     | SA1-240-70              | C-SA1-240-70   |                             |                                  |                                  |                              |                                                    |
| DSG-01-***-D12-70*      | SD1-12-70               | C-SD1-12-70    | KR1-A-70                    |                                  |                                  |                              |                                                    |
| DSG-01-***-D24-70*      | SD1-24-70               | C-SD1-24-70    |                             |                                  |                                  |                              |                                                    |
| DSG-01-***-D48-70*      | SD1-48-70               | C-SD1-48-70    | KR1-B-70                    |                                  |                                  |                              |                                                    |
| DSG-01-***-R100-70*     | SR1-100-70              | C-SR1-100-70   | RR1-70                      |                                  |                                  |                              |                                                    |
| DSG-01-***-R200-70*     | SR1-200-70              | C-SR1-200-70   |                             |                                  |                                  |                              |                                                    |
| S-DSG-01-***-D12-70*    | SD1-12-S-70             | C-SD1-12-70    | KR1-A-70                    |                                  |                                  |                              |                                                    |
| S-DSG-01-***-D24-70*    | SD1-24-S-70             | C-SD1-24-70    |                             |                                  |                                  |                              |                                                    |
| S-DSG-01-***-D48-70*    | SD1-48-S-70             | C-SD1-48-70    | KR1-B-70                    |                                  |                                  |                              |                                                    |
| S-DSG-01-***-R100-70*   | SR1-100-S-70            | C-SR1-100-70   | RR1-70                      |                                  |                                  |                              |                                                    |
| S-DSG-01-***-R200-70*   | SR1-200-S-70            | C-SR1-200-70   |                             |                                  |                                  |                              |                                                    |
| DSG-01-***-A100-N-70*   | SA1-100-N-70            | C-SA1-100-N-70 | —                           | GDM-211-A-11                     | GDM-211-B-11                     | Plug-in<br>Connector<br>Type |                                                    |
| DSG-01-***-A120-N-70*   | SA1-120-N-70            | C-SA1-120-N-70 |                             |                                  |                                  |                              |                                                    |
| DSG-01-***-A200-N-70*   | SA1-200-N-70            | C-SA1-200-N-70 |                             |                                  |                                  |                              |                                                    |
| DSG-01-***-A240-N-70*   | SA1-240-N-70            | C-SA1-240-N-70 |                             |                                  |                                  |                              |                                                    |
| DSG-01-***-D12-N-70*    | SD1-12-N-70             | C-SD1-12-N-70  |                             | GDME-211-R-A-10                  | GDME-211-R-B-10                  |                              |                                                    |
| DSG-01-***-D24-N-70*    | SD1-24-N-70             | C-SD1-24-N-70  |                             |                                  |                                  |                              |                                                    |
| DSG-01-***-D48-N-70*    | SD1-48-N-70             | C-SD1-48-N-70  |                             |                                  |                                  |                              |                                                    |
| DSG-01-***-R100-N-70*   | SR1-100-N-70            | C-SR1-100-N-70 |                             |                                  |                                  |                              |                                                    |
| DSG-01-***-R200-N-70*   | SR1-200-N-70            | C-SR1-200-N-70 |                             | GDM-211-A-11                     | GDM-211-B-11                     |                              |                                                    |
| S-DSG-01-***-D12-N-70*  | SD1-12-S-N-70           | C-SD1-12-N-70  |                             |                                  |                                  |                              |                                                    |
| S-DSG-01-***-D24-N-70*  | SD1-24-S-N-70           | C-SD1-24-N-70  |                             |                                  |                                  |                              |                                                    |
| S-DSG-01-***-D48-N-70*  | SD1-48-S-N-70           | C-SD1-48-N-70  |                             |                                  |                                  |                              |                                                    |
| S-DSG-01-***-R100-N-70* | SR1-100-S-N-70          | C-SR1-100-N-70 | GDME-211-R-A-10             | GDME-211-R-B-10                  |                                  |                              |                                                    |
| S-DSG-01-***-R200-N-70* | SR1-200-S-N-70          | C-SR1-200-N-70 |                             |                                  |                                  |                              |                                                    |
| DSG-01-***-A100-N1-70*  | SA1-100-N-70            | C-SA1-100-N-70 |                             |                                  | GDML-211-1-11                    | GDML-211-1-11                | Plug-in<br>Connector<br>with<br>Indicator<br>Light |
| DSG-01-***-A120-N1-70*  | SA1-120-N-70            | C-SA1-120-N-70 |                             |                                  |                                  |                              |                                                    |
| DSG-01-***-A200-N1-70*  | SA1-200-N-70            | C-SA1-200-N-70 |                             |                                  |                                  |                              |                                                    |
| DSG-01-***-A240-N1-70*  | SA1-240-N-70            | C-SA1-240-N-70 |                             |                                  |                                  |                              |                                                    |
| DSG-01-***-D12-N1-70*   | SD1-12-N-70             | C-SD1-12-N-70  | GDML-211-2-11               | GDML-211-2-11                    |                                  |                              |                                                    |
| DSG-01-***-D24-N1-70*   | SD1-24-N-70             | C-SD1-24-N-70  | GDML-211-3-11               | GDML-211-3-11                    |                                  |                              |                                                    |
| DSG-01-***-D48-N1-70*   | SD1-48-N-70             | C-SD1-48-N-70  | GDML-211-1-11               | GDML-211-1-11                    |                                  |                              |                                                    |
| S-DSG-01-***-D12-N1-70* | SD1-12-S-N-70           | C-SD1-12-N-70  | GDML-211-2-11               | GDML-211-2-11                    |                                  |                              |                                                    |
| S-DSG-01-***-D24-N1-70* | SD1-24-S-N-70           | C-SD1-24-N-70  | GDML-211-3-11               | GDML-211-3-11                    |                                  |                              |                                                    |
| S-DSG-01-***-D48-N1-70* | SD1-48-S-N-70           | C-SD1-48-N-70  | GDML-211-1-11               | GDML-211-1-11                    |                                  |                              |                                                    |

Note: The connector assembly is not included in the solenoid assembly.

## 3/8 Solenoid Operated Directional Valves, DSG-03 Series

These are epoch-making solenoid operated valves of high pressure, high flow which have been developed incorporating a unique design concept into every part of the valve including the solenoid. With wet type solenoids, these valves ensure the low noise and the long life, moreover, ensure no leakage of oil outside of the valves.

### Wide Range of Models

Choose the optimum valve to meet your need from a large selection available. The DSG-03 50 design series solenoid operated directional valves are classified into the two basic models.

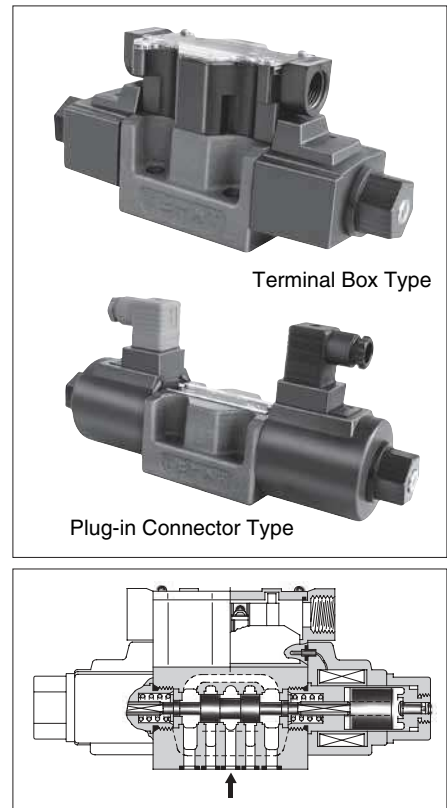
- Standard type .... Useable at high pressure: 31.5 MPa (4570 PSI) and high flow: 120 L/min (31.7 U.S.GPM)
- Shockless type .... A noise at spool changeover and a vibration in piping can be reduced to a minimum.

### Stable Operation

With a strong magnet and spring force, the valves are tough against contamination and thus ensure a stable operation.

### Usable in products of various standards

CE/UL/CSA certified products are available.



### Specifications

| Valve Type               | Model Numbers         | Max. Flow<br>L/min (U.S.GPM) | Max. Operating Pressure<br>MPa (PSI)              | Max. T-Line Back Pres.<br>MPa (PSI) | Max. Changeover Frequency<br>min <sup>-1</sup> (Cycles/Min) | Approx. Mass kg(lbs.) |           |
|--------------------------|-----------------------|------------------------------|---------------------------------------------------|-------------------------------------|-------------------------------------------------------------|-----------------------|-----------|
|                          |                       |                              |                                                   |                                     |                                                             | Type of Solenoid      |           |
| Standard Type            | DSG-03-3C*-50/5090    | 120 (31.7)                   | 31.5 (4570)<br>[Spool Type 60 Only]<br>25 (3630)] | 16 (2320)                           | 240<br>(R Type Sol. Only)<br>120                            | 3.6 (7.9)             | 5 (11)    |
|                          | DSG-03-2D2*-50/5090   |                              |                                                   |                                     |                                                             | 2.9 (6.4)             | 3.6 (7.9) |
|                          | DSG-03-2B*-50/5090    |                              |                                                   |                                     |                                                             | 2.9 (6.4)             | 3.6 (7.9) |
| Shockless Type           | S-DSG-03-3C*-50/5090  | 120 (31.7)                   | 25 (3630)                                         | 16 (2320)                           | 120                                                         | —                     | 5 (11)    |
|                          | S-DSG-03-2B2*-50/5090 |                              |                                                   |                                     |                                                             | —                     | 3.6 (7.9) |
| Low Wattage<br>(14W)Type | L-DSG-03-3C*-50/5090  | 60 (15.9)                    | 16 (2320)                                         | 16 (2320)                           | 240<br>(R Type Sol. Only)<br>120                            | 3.6 (7.9)             | 5 (11)    |
|                          | L-DSG-03-2D2*-50/5090 |                              |                                                   |                                     |                                                             | 2.9 (6.4)             | 3.6 (7.9) |
|                          | L-DSG-03-2B*-50/5090  |                              |                                                   |                                     |                                                             | 2.9 (6.4)             | 3.6 (7.9) |

★1 For details of L-DSG-03, please contact us.

★2 The maximum flow means the limited flow without inducing any abnormality to the operation (changeover) of the valve. The maximum flow differs according to the spool type and operating conditions. For details, please refer to the "List of Standard Models and Maximum Flow" on pages 364 to 368.

### Sub-plate

| Piping Size | 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 |                        |
| 3/8         | DSGM-03-40              | Rc 3/8      | DSGM-03-2180             | 3/8 BSP.F   | DSGM-03-2190               | 3/8 NPT     | 3.0 (6.6)              |
| 1/2         | DSGM-03X-40             | Rc 1/2      | DSGM-03X-2180            | 1/2 BSP.F   | DSGM-03X-2190              | 1/2 NPT     | 3.0 (6.6)              |
| 3/4         | 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

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

| Descriptions                                        | Soc. Hd. Cap Screw (4 pcs.) | Tightening Torque                  |
|-----------------------------------------------------|-----------------------------|------------------------------------|
| Japanese Standard "JIS"<br>European Design Standard | M6 × 35 Lg.                 | 12 - 15 Nm<br>(106 - 133 in. lbs.) |
| N. American Design Standard                         | 1/4-20 UNC × 1-1/2 Lg.      |                                    |

## Solenoid Ratings

| Valve Type     | Electric source                        | Coil Type | Frequency (Hz) | Voltage (V)   |                   | Current & Power at Rated Voltage |             |           |
|----------------|----------------------------------------|-----------|----------------|---------------|-------------------|----------------------------------|-------------|-----------|
|                |                                        |           |                | Source Rating | Serviceable Range | Inrush (A) <sup>★2</sup>         | Holding (A) | Power (W) |
| Standard Type  | AC <sup>★1</sup>                       | A100      | 50             | 100           | 80 - 110          | 5.37                             | 0.90        | —         |
|                |                                        |           | 60             | 100           | 90 - 120          | 4.57                             | 0.63        |           |
|                |                                        |           |                | 110           |                   | 5.03                             | 0.77        |           |
|                |                                        | A120      | 50             | 120           | 96 - 132          | 4.48                             | 0.75        |           |
|                |                                        |           | 60             |               | 108 - 144         | 3.81                             | 0.52        |           |
|                |                                        | A200      | 50             | 200           | 160 - 220         | 2.69                             | 0.45        |           |
|                |                                        |           | 60             |               | 180 - 240         | 2.29                             | 0.31        |           |
|                |                                        |           |                |               |                   | 2.52                             | 0.38        |           |
|                |                                        | A240      | 50             | 240           | 192 - 264         | 2.24                             | 0.37        |           |
|                |                                        |           | 60             |               | 216 - 288         | 1.91                             | 0.26        |           |
| Shockless Type | DC (K Series)                          | D12       | —              | 12            | 10.8 - 13.2       | —                                | 3.16        | 38        |
|                |                                        | D24       |                | 24            | 21.6 - 26.4       |                                  | 1.57        |           |
|                |                                        | D100      |                | 100           | 90 - 110          |                                  | 0.38        |           |
|                | AC→DC Rectified (R)                    | R100      | 50/60          | 100           | 90 - 110          | —                                | 0.43        | 38        |
|                |                                        | R200      |                | 200           | 180 - 220         |                                  | 0.21        |           |
|                | AC→DC Rectified (RQ)<br>(Quick Return) | RQ100     | 50/60          | 100           | 90 - 110          | —                                | 0.43        | 38        |
|                |                                        |           |                |               |                   |                                  |             |           |

★1. AC solenoid is not available in shockless type.

R or RQ type models with built-in current rectifier is recommended for shockless operation with AC power.

★2. Inrush current in the above table show rms values at maximum stroke.

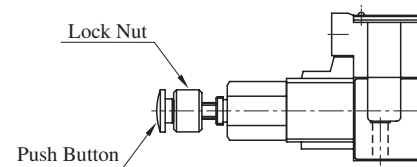
★3. There are more coil types other than the above. For details, please make inquiries .

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 .

## Options

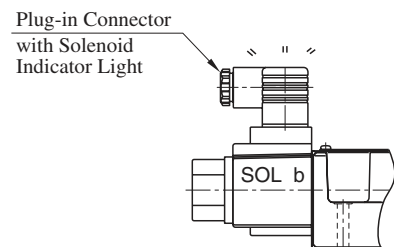
### ● Push Button with Lock Nut

Can be used for manual changeover of spool. The push button can be locked in the pressed condition.



### ● Plug-in Connector with Solenoid Indicator Light

These are the indicator light incorporated plug-in connector type solenoids. Energisation or de-energisation of the solenoid can be easily identified with the incorporated indicator light.



### ● M8 Mounting Bolts.

As the mounting bolts, M6 socket head cap screws are used for the standard valves, however, M8 socket head cap screws are also available for supply as optional extras. In case the M8 screws are required, suffix "02" to the design number of both valve and sub-plate model number like below.

(Example)

Valve: DSG-03-3C2-A100-5002

Sub-plate: DSGM-03-4002

The valve is supplied with 4 pcs. hexagon socket head cap screws M8 × 38 Lg.

## Model Number Designation

| F-                                                                       | S-                        | DSG                                                  | -03           | -2                              | B                               | 2                                         | A                                                              | -D24                                                                                                                         | -C                                 | -N                                  | -50              | *                                                                       | -L                                                                                                                                  |   |                                                     |   |
|--------------------------------------------------------------------------|---------------------------|------------------------------------------------------|---------------|---------------------------------|---------------------------------|-------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------------------------------------|------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|---|-----------------------------------------------------|---|
| Special<br>Seals                                                         | Shockles<br>Type          | Series<br>Number                                     | Valve<br>Size | Number<br>of Valve<br>Positions | Spool-<br>Spring<br>Arrangement | Spool<br>Type                             | Special Two<br>Position Valve<br><br>(Omit if not<br>required) | Coil<br>Type                                                                                                                 | Manual<br>Override                 | Electrical<br>Conduit<br>Connection | Design<br>Number | Design<br>Standard                                                      | Models with<br>Reverse Mtg. of<br>Solenoid<br><br>(Omit if not<br>required)                                                         |   |                                                     |   |
| F:<br>For Phosphate<br>Ester Type<br>Fluids<br>(Omit if not<br>required) | None:<br>Standard<br>Type | DSG:<br>Solenoid<br>Operated<br>Directional<br>Valve | 03            | 3:<br>Three<br>Positions        | C:<br>Spring<br>Centred         | 2, 3<br>4, 40<br>5, 60<br>9, 10<br>11, 12 | —                                                              | AC:<br>A100<br>A120<br>A200<br>A240<br>DC:<br>D12<br>D24<br>D100<br>R:<br>(AC→DC)<br>R100<br>R200<br>RQ:<br>(AC→DC)<br>RQ100 | None:<br>Manual<br>Override<br>Pin | None:<br>Terminal<br>Box Type       | 50               | None:<br>Japanese<br>Std. "JIS"<br><br>90:<br>N.American<br>Design Std. | —                                                                                                                                   |   |                                                     |   |
|                                                                          |                           |                                                      |               | 2:<br>Two<br>Positions          | D:<br>No-Spring<br>Detented     | 2                                         | —                                                              | R100<br>R200                                                                                                                 |                                    |                                     |                  |                                                                         | N:<br>*2<br>Plug-in<br>Connector<br>Type<br><br>N1:<br>*3<br>Plug-in<br>Connector<br>Type<br>with<br>Indicator<br>Light<br>(Option) | L |                                                     |   |
|                                                                          |                           |                                                      |               |                                 | B:<br>Spring<br>Offset          | 2<br>3<br>8                               | A*1<br>B*1                                                     | RQ100                                                                                                                        |                                    |                                     |                  |                                                                         |                                                                                                                                     |   |                                                     |   |
|                                                                          |                           |                                                      |               | 3:<br>Three<br>Positions        | C:<br>Spring<br>Centred         | 2<br>4                                    | —                                                              | DC:<br>D12<br>D24<br>D100<br><br>R:<br>(AC DC)<br>R100<br>R200                                                               |                                    |                                     |                  |                                                                         |                                                                                                                                     |   | C:<br>Push<br>Button<br>and<br>Lock Nut<br>(Option) | — |
|                                                                          |                           |                                                      |               |                                 | 2:<br>Two<br>Positions          | B:<br>Spring<br>Offset                    | 2                                                              | A*1<br>B*1                                                                                                                   |                                    |                                     |                  |                                                                         |                                                                                                                                     |   |                                                     |   |
|                                                                          |                           |                                                      |               | S:<br>Shockles<br>Type          |                                 |                                           |                                                                |                                                                                                                              |                                    |                                     |                  |                                                                         |                                                                                                                                     |   |                                                     |   |

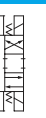
★ 1. In case of the special two position valve, please refer to page 369 for details.

★ 2. N is not available for RQ-type solenoids .

★ 3. N1 is not available for R and RQ-type solenoids .

In the table above, the symbols or numbers highlighted with shade represent the optional extras. The valves with model number having such optional extras are handles as options, therefore, please confirm the time of delivery with us before ordering.

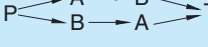
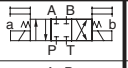
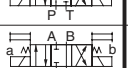
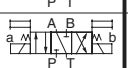
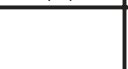
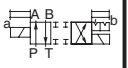
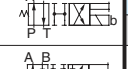
E



DSG-03 Series Solenoid  
Operated Directional Valves

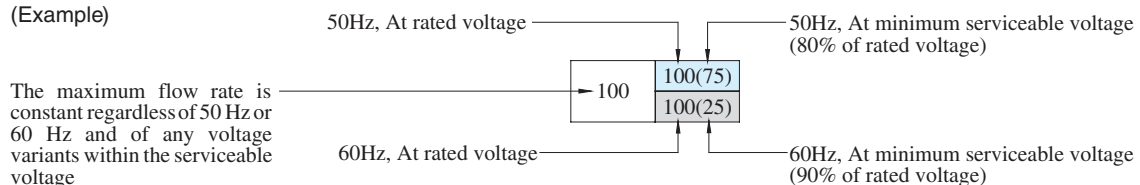
■ List of Standard Models and The Maximum Flow

● Models with AC Solenoids: DSG-03-\*\*\*-A\*

| No. of Valve Positions | Spool-Spring Arrangement | Model Numbers | Graphic Symbols                                                                     | Max. Flow L/min                                                                   |     |        |        |                                                                                                          |         |         |         |                                                                                                           |         |         |         |
|------------------------|--------------------------|---------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----|--------|--------|----------------------------------------------------------------------------------------------------------|---------|---------|---------|-----------------------------------------------------------------------------------------------------------|---------|---------|---------|
|                        |                          |               |                                                                                     |  |     |        |        | <br>[Port "B" Blocked] |         |         |         | <br>[Port "A" Blocked] |         |         |         |
|                        |                          |               |                                                                                     |  |     |        |        |                        |         |         |         |                        |         |         |         |
|                        |                          |               |                                                                                     | Working Pressure MPa                                                              |     |        |        | Working Pressure MPa                                                                                     |         |         |         | Working Pressure MPa                                                                                      |         |         |         |
|                        |                          |               |                                                                                     | 10                                                                                | 16  | 25     | 31.5   | 10                                                                                                       | 16      | 25      | 31.5    | 10                                                                                                        | 16      | 25      | 31.5    |
| Three Positions        | Spring Centred           | DSG-03-3C2    |    | 100                                                                               | 100 | 100    | 100    | 100(70)                                                                                                  | 100(48) | 96(28)  | 65(24)  | 100(70)                                                                                                   | 100(48) | 96(28)  | 65(24)  |
|                        |                          | DSG-03-3C3    |    | 90                                                                                | 90  | 90     | 90     | 100(81)                                                                                                  | 100(81) | 100(81) | 100(81) | 100(81)                                                                                                   | 100(81) | 100(81) | 100(81) |
|                        |                          | DSG-03-3C4    |    | 80                                                                                | 80  | 80(65) | 80(25) | 100(58)                                                                                                  | 100(33) | 76(22)  | 46(19)  | 100(58)                                                                                                   | 100(33) | 76(22)  | 46(19)  |
|                        |                          | DSG-03-3C40   |    | 100                                                                               | 100 | 100    | 100    | 100(75)                                                                                                  | 100(62) | 100(39) | 84(21)  | 100(62)                                                                                                   | 100(39) | 84(21)  | 48(18)  |
|                        |                          | DSG-03-3C5    |    | 30                                                                                | 30  | 30     | 30     | 26                                                                                                       | 21      | 18      | 16      | 30                                                                                                        | 28      | 28      | 28      |
|                        |                          | DSG-03-3C60   |   | 70                                                                                | 70  | 70     | —      | 100                                                                                                      | 100     | 100     | —       | 100                                                                                                       | 100     | 100     | —       |
|                        |                          | DSG-03-3C9    |  | 100                                                                               | 100 | 100    | 100    | 60                                                                                                       | 60      | 60      | 60      | 60                                                                                                        | 60      | 60      | 60      |
|                        |                          | DSG-03-3C10   |  | 80                                                                                | 80  | 80(30) | 80(20) | 100(55)                                                                                                  | 100(36) | 60(21)  | 34(16)  | 100(55)                                                                                                   | 100(36) | 60(21)  | 34(16)  |
|                        |                          | DSG-03-3C11   |  | 100                                                                               | 100 | 100    | 100    | 100(80)                                                                                                  | 100(65) | 85(35)  | 62(28)  | 100(80)                                                                                                   | 100(65) | 85(35)  | 62(28)  |
|                        |                          | DSG-03-3C12   |  | 90                                                                                | 90  | 90(30) | 90(20) | 100(55)                                                                                                  | 100(36) | 60(21)  | 34(16)  | 100(55)                                                                                                   | 100(36) | 60(21)  | 34(16)  |
| Two Positions          | No-Spring Detented       | DSG-03-2D2    |  | 100                                                                               | 100 | 100    | 100    | 40                                                                                                       | 40      | 30      | 28      | 60                                                                                                        | 60      | 40      | 35      |
|                        | Spring Offset            | DSG-03-2B2    |  | 100                                                                               | 100 | 100    | 100    | 34                                                                                                       | 24      | 20      | 19      | 100(62)                                                                                                   | 100(62) | 100(44) | 94(37)  |
|                        |                          | DSG-03-2B3    |  | 100                                                                               | 100 | 100    | 100    | 57                                                                                                       | 57      | 57      | 57      | 100(79)                                                                                                   | 100(72) | 100(64) | 100(59) |
|                        |                          | DSG-03-2B8    |  | —                                                                                 | —   | —      | —      | 26                                                                                                       | 19      | 18      | 16      | 100(35)                                                                                                   | 87(15)  | 61(9)   | 49(7)   |

Notes : 1. The relation between the maximum flow in the table above and the frequency/voltage (within the serviceable voltage) is as shown below.

(Example)



2. For the maximum flow rate in P → T of the valves with a ★ mark, please see [page 368](#).

The valve models with a ◆ mark are handled as Options. If you choose such valves, check the time of delivery beforehand.

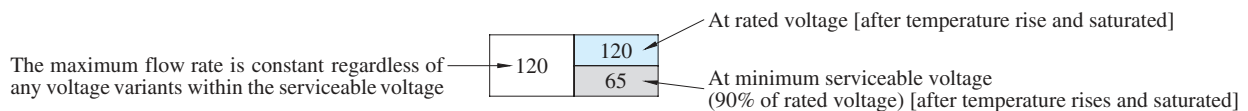
## List of Standard Models and The Maximum Flow

- Models with DC Solenoids: DSG-03-\*\*\*-D\*
- Models with R Type Solenoids: DSG-03-\*\*\*-R\*
- Models with RQ Type Solenoids: DSG-03-\*\*\*-RQ100\*

| No. of Valve Positions | Spool-Spring Arrangement | Model Numbers | Graphic Symbols | Max. Flow L/min                |     |     |      |                             |     |     |      |                             |     |     |      |
|------------------------|--------------------------|---------------|-----------------|--------------------------------|-----|-----|------|-----------------------------|-----|-----|------|-----------------------------|-----|-----|------|
|                        |                          |               |                 | P → A → B → T<br>P → B → A → T |     |     |      | P → A<br>[Port "B" Blocked] |     |     |      | P → B<br>[Port "A" Blocked] |     |     |      |
|                        |                          |               |                 |                                |     |     |      |                             |     |     |      |                             |     |     |      |
|                        |                          |               |                 | Working Pressure MPa           |     |     |      | Working Pressure MPa        |     |     |      | Working Pressure MPa        |     |     |      |
|                        |                          |               |                 | 10                             | 16  | 25  | 31.5 | 10                          | 16  | 25  | 31.5 | 10                          | 16  | 25  | 31.5 |
| Three Positions        | Spring Centred           | DSG-03-3C2    |                 | 120                            | 120 | 120 | 120  | 120                         | 120 | 80  | 55   | 120                         | 120 | 80  | 55   |
|                        |                          | DSG-03-3C3    |                 | 120                            | 120 | 120 | 120  | 120                         | 120 | 120 | 120  | 120                         | 120 | 120 | 120  |
|                        |                          | DSG-03-3C4    |                 | 120                            | 120 | 120 | 120  | 120                         | 120 | 84  | 64   | 120                         | 120 | 84  | 64   |
|                        |                          | DSG-03-3C40   |                 | 120                            | 120 | 120 | 120  | 120                         | 120 | 65  | 53   | 120                         | 120 | 65  | 53   |
|                        |                          | DSG-03-3C5    |                 | 50                             | 50  | 50  | 50   | 35                          | 24  | 21  | 20   | 45                          | 45  | 45  | 45   |
|                        |                          | DSG-03-3C60   |                 | 120                            | 120 | 120 | —    | 120                         | 120 | 120 | —    | 120                         | 120 | 120 | —    |
|                        |                          | DSG-03-3C9    |                 | 120                            | 120 | 120 | 120  | 100                         | 100 | 100 | 100  | 100                         | 100 | 100 | 100  |
|                        |                          | DSG-03-3C10   |                 | 120                            | 120 | 120 | 65   | 120                         | 112 | 60  | 51   | 120                         | 112 | 60  | 51   |
|                        |                          | DSG-03-3C11   |                 | 120                            | 120 | 120 | 120  | 100                         | 100 | 80  | 65   | 100                         | 100 | 80  | 65   |
|                        |                          | DSG-03-3C12   |                 | 120                            | 120 | 120 | 65   | 120                         | 120 | 62  | 51   | 120                         | 120 | 62  | 51   |
| Two Positions          | Spring Offset            | DSG-03-2B2    |                 | 110                            | 110 | 110 | 110  | 68                          | 47  | 38  | 38   | 120                         | 114 | 75  | 63   |
|                        |                          | DSG-03-2B3    |                 | 120                            | 120 | 120 | 120  | 77                          | 77  | 77  | 77   | 120                         | 120 | 120 | 120  |
|                        |                          | DSG-03-2B8    |                 | —                              | —   | —   | —    | 53                          | 33  | 24  | 23   | 120                         | 120 | 62  | 47   |
|                        |                          |               |                 |                                |     |     |      |                             |     |     |      |                             |     |     |      |

Notes ) 1. The relation between the maximum flow in the table above and the voltage (within the serviceable voltage) is as shown below.

(Example)

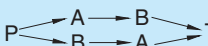
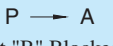
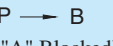
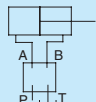
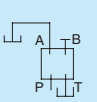
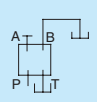
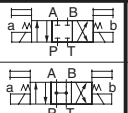
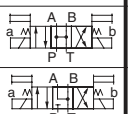
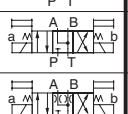
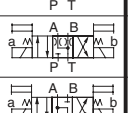
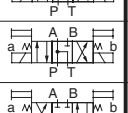
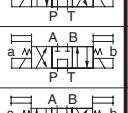
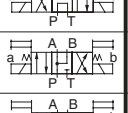
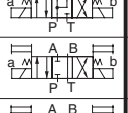
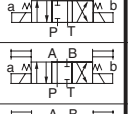
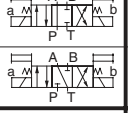
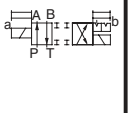
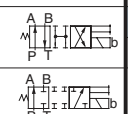
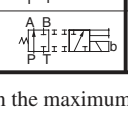


2. For the maximum flow rate in P → T of the valves with a ★ mark, please see page 368.

The valve models with a ★ mark are handled as Options. If you choose such valves, check the time of delivery beforehand.

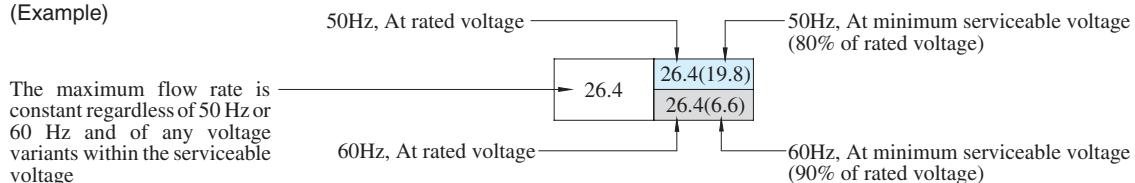
■ List of Standard Models and The Maximum Flow

● Models with AC Solenoids: DSG-03-\*\*\*-A\*

| No. of Valve Positions | Spool-Spring Arrangement | Model Numbers | Graphic Symbol                                                                      | Max. Flow U.S.GPM                                                                 |      |             |            |                                                                                                          |             |             |            |                                                                                                           |             |             |             |
|------------------------|--------------------------|---------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------|-------------|------------|----------------------------------------------------------------------------------------------------------|-------------|-------------|------------|-----------------------------------------------------------------------------------------------------------|-------------|-------------|-------------|
|                        |                          |               |                                                                                     |  |      |             |            | <br>[Port "B" Blocked] |             |             |            | <br>[Port "A" Blocked] |             |             |             |
|                        |                          |               |                                                                                     |  |      |             |            |                        |             |             |            |                        |             |             |             |
|                        |                          |               |                                                                                     | Working Pressure PSI                                                              |      |             |            | Working Pressure PSI                                                                                     |             |             |            | Working Pressure PSI                                                                                      |             |             |             |
|                        |                          |               |                                                                                     | 1450                                                                              | 2320 | 3630        | 4570       | 1450                                                                                                     | 2320        | 3630        | 4570       | 1450                                                                                                      | 2320        | 3630        | 4570        |
| Three Positions        | Spring Centred           | DSG-03-3C2    |    | 26.4                                                                              | 26.4 | 26.4        | 26.4       | 26.4 (18.5)                                                                                              | 26.4 (12.7) | 25.4 (7.4)  | 17.2 (6.3) | 26.4 (18.5)                                                                                               | 26.4 (12.7) | 25.4 (7.4)  | 17.2 (6.3)  |
|                        |                          | DSG-03-3C3    |    | 23.8                                                                              | 23.8 | 23.8        | 23.8       | 23.8 (12.9)                                                                                              | 14.0 (7.9)  | 9.0 (5.0)   | 6.7 (4.0)  | 23.8 (12.9)                                                                                               | 14.0 (7.9)  | 9.0 (5.0)   | 6.7 (4.0)   |
|                        |                          | DSG-03-3C4    |    | 21.1                                                                              | 21.1 | 21.1 (17.2) | 21.1 (6.6) | 26.4 (15.3)                                                                                              | 26.4 (8.7)  | 20.1 (5.8)  | 12.2 (5.0) | 26.4 (15.3)                                                                                               | 26.4 (8.7)  | 20.1 (5.8)  | 12.2 (5.0)  |
|                        |                          | DSG-03-3C40   |    | 26.4                                                                              | 26.4 | 26.4        | 26.4       | 26.4 (19.8)                                                                                              | 26.4 (16.4) | 26.4 (10.3) | 22.2 (5.5) | 12.7 (4.8)                                                                                                | 26.4 (16.4) | 26.4 (10.3) | 22.2 (5.5)  |
|                        |                          | DSG-03-3C5    |    | 7.9                                                                               | 7.9  | 7.9         | 7.9        | 6.9                                                                                                      | 5.5         | 4.8         | 4.2        | 7.9                                                                                                       | 7.4         | 7.4         | 7.4         |
|                        |                          | DSG-03-3C60   |   | 18.5                                                                              | 18.5 | 18.5        | —          | 26.4                                                                                                     | 26.4        | 26.4        | —          | 26.4                                                                                                      | 26.4        | 26.4        | —           |
|                        |                          | DSG-03-3C9    |   | 26.4                                                                              | 26.4 | 26.4        | 26.4       | 15.9                                                                                                     | 15.9        | 15.9        | 15.9       | 15.9                                                                                                      | 15.9        | 15.9        | 15.9        |
|                        |                          | DSG-03-3C10   |  | 21.1                                                                              | 21.1 | 21.1 (7.9)  | 21.1 (5.3) | 26.4 (14.5)                                                                                              | 26.4 (9.5)  | 15.9 (5.5)  | 9.0 (4.2)  | 26.4 (14.5)                                                                                               | 26.4 (9.5)  | 15.9 (5.5)  | 9.0 (4.2)   |
|                        |                          | DSG-03-3C11   |  | 26.4                                                                              | 26.4 | 26.4        | 26.4       | 26.4 (21.1)                                                                                              | 26.4 (17.2) | 22.5 (9.2)  | 16.4 (7.4) | 26.4 (21.1)                                                                                               | 26.4 (17.2) | 22.5 (9.2)  | 16.4 (7.4)  |
|                        |                          | DSG-03-3C12   |  | 23.8                                                                              | 23.8 | 23.8 (7.9)  | 23.8 (5.3) | 26.4 (14.5)                                                                                              | 26.4 (9.5)  | 15.9 (5.5)  | 9.0 (4.2)  | 26.4 (14.5)                                                                                               | 26.4 (9.5)  | 15.9 (5.5)  | 9.0 (4.2)   |
| Two Positions          | No-Spring Detented       | DSG-03-2D2    |  | 26.4                                                                              | 26.4 | 26.4        | 26.4       | 10.6                                                                                                     | 10.6        | 7.9         | 7.4        | 15.9                                                                                                      | 15.9        | 10.6        | 9.2         |
|                        | Spring Offset            | DSG-03-2B2    |  | 26.4                                                                              | 26.4 | 26.4        | 26.4       | 9.0                                                                                                      | 6.3         | 5.3         | 5.0        | 26.4 (16.4)                                                                                               | 26.4 (16.4) | 26.4 (11.6) | 24.8 (9.8)  |
|                        |                          | DSG-03-2B3    |  | 26.4                                                                              | 26.4 | 26.4        | 26.4       | 15.1                                                                                                     | 15.1        | 15.1        | 15.1       | 26.4 (20.9)                                                                                               | 26.4 (19)   | 26.4 (16.9) | 26.4 (15.6) |
|                        |                          | DSG-03-2B8    |  | —                                                                                 | —    | —           | —          | 6.9                                                                                                      | 5.0         | 4.8         | 4.2        | 26.4 (9.2)                                                                                                | 23 (4.0)    | 16.1 (2.4)  | 12.9 (1.8)  |

Notes: 1. The relation between the maximum flow in the table above and the voltage (within the serviceable voltage) is as shown below.

(Example)



2. For the maximum flow rate in P → T of the valves with a ★ mark, please see [page 368](#).

The valve models with a ◆ mark are handled as Options. If you choose such valves, check the time of delivery beforehand.

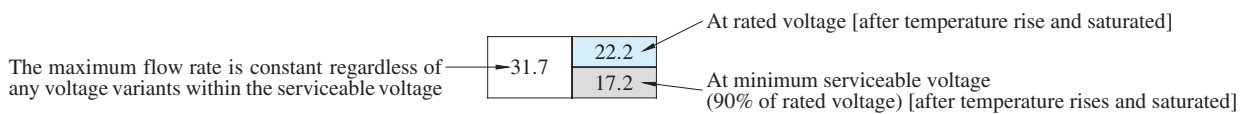
## List of Standard Models and The Maximum Flow

- Models with DC Solenoids: DSG-03-\*\*\*-D\*
- Models with R Type Solenoids: DSG-03-\*\*\*-R\*
- Models with RQ Type Solenoids: DSG-03-\*\*\*-RQ100\*

| No. of Valve Positions | Spool-Spring Arrangement | Model Numbers | Graphic Symbols | Max. Flow U.S. GPM   |      |      |      |                             |      |      |      |                             |      |      |      |
|------------------------|--------------------------|---------------|-----------------|----------------------|------|------|------|-----------------------------|------|------|------|-----------------------------|------|------|------|
|                        |                          |               |                 | P → A → B → T        |      |      |      | P → A<br>[Port "B" Blocked] |      |      |      | P → B<br>[Port "A" Blocked] |      |      |      |
|                        |                          |               |                 |                      |      |      |      |                             |      |      |      |                             |      |      |      |
|                        |                          |               |                 | Working Pressure PSI |      |      |      | Working Pressure PSI        |      |      |      | Working Pressure PSI        |      |      |      |
|                        |                          |               |                 | 1450                 | 2320 | 3630 | 4570 | 1450                        | 2320 | 3630 | 4570 | 1450                        | 2320 | 3630 | 4570 |
| Three Positions        | Spring Centred           | DSG-03-3C2    |                 | 31.7                 | 31.7 | 31.7 | 31.7 | 31.7                        | 31.7 | 21.1 | 14.5 | 31.7                        | 31.7 | 21.1 | 14.5 |
|                        |                          | DSG-03-3C3    |                 | 31.7                 | 31.7 | 31.7 | 31.7 | 31.7                        | 31.7 | 31.7 | 31.7 | 31.7                        | 31.7 | 31.7 | 31.7 |
|                        |                          | DSG-03-3C4    |                 | 31.7                 | 31.7 | 31.7 | 31.7 | 31.7                        | 31.7 | 22.2 | 16.9 | 31.7                        | 31.7 | 22.2 | 16.9 |
|                        |                          | DSG-03-3C40   |                 | 31.7                 | 31.7 | 31.7 | 31.7 | 31.7                        | 31.7 | 16.4 | 12.9 | 31.7                        | 31.7 | 16.4 | 12.9 |
|                        |                          | DSG-03-3C5    |                 | 13.2                 | 13.2 | 13.2 | 13.2 | 9.2                         | 6.3  | 5.5  | 5.3  | 11.9                        | 11.9 | 11.9 | 11.9 |
|                        |                          | DSG-03-3C60   |                 | 31.7                 | 31.7 | 31.7 | —    | 31.7                        | 31.7 | 31.7 | —    | 31.7                        | 31.7 | 31.7 | —    |
|                        |                          | DSG-03-3C9    |                 | 31.7                 | 31.7 | 31.7 | 31.7 | 26.4                        | 26.4 | 26.4 | 26.4 | 26.4                        | 26.4 | 26.4 | 26.4 |
|                        |                          | DSG-03-3C10   |                 | 31.7                 | 31.7 | 31.7 | 17.2 | 31.7                        | 29.6 | 15.9 | 13.5 | 31.7                        | 29.6 | 15.9 | 13.5 |
|                        |                          | DSG-03-3C11   |                 | 31.7                 | 31.7 | 31.7 | 31.7 | 26.4                        | 26.4 | 21.1 | 17.2 | 26.4                        | 26.4 | 21.1 | 17.2 |
|                        |                          | DSG-03-3C12   |                 | 31.7                 | 31.7 | 31.7 | 17.2 | 31.7                        | 31.7 | 16.4 | 13.5 | 31.7                        | 31.7 | 16.4 | 13.5 |
| Two Positions          | No-Spring Detented       | DSG-03-2D2    |                 | 31.7                 | 31.7 | 31.7 | 31.7 | 11.9                        | 9.8  | 7.9  | 7.4  | 15.9                        | 15.9 | 10.6 | 9.2  |
|                        | Spring Offset            | DSG-03-2B2    |                 | 29.1                 | 29.1 | 29.1 | 29.1 | 18                          | 12.4 | 10   | 10   | 31.7                        | 30.1 | 19.8 | 16.6 |
|                        |                          |               |                 | 26.4                 | 26.4 | 26.4 | 26.4 |                             |      |      |      |                             | 21.9 | 15.3 | 12.7 |
|                        |                          | DSG-03-2B3    |                 | 31.7                 | 31.7 | 31.7 | 31.7 | 20.3                        | 20.3 | 20.3 | 20.3 | 31.7                        | 31.7 | 31.7 | 31.7 |
|                        |                          | DSG-03-2B8    |                 | —                    | —    | —    | —    | 14                          | 8.7  | 6.3  | 6.1  | 31.7                        | 31.7 | 16.4 | 12.4 |
|                        |                          |               |                 |                      |      |      |      |                             |      |      |      |                             | 16.4 | 10.6 | 9.8  |

Notes ) 1. The relation between the maximum flow in the table above and the voltage (within the serviceable voltage) is as shown below.

(Example)

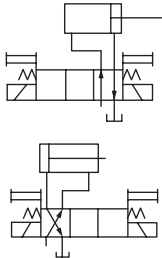


2. For the maximum flow rate in P → T of the valves with a ★ mark, please see [page 368](#).

The valve models with a ★ mark are handled as Options. If you choose such valves, check the time of delivery beforehand.

### Maximum Flow of Centre By-Pass

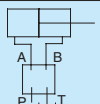
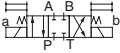
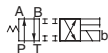
In valve type 3C3, 3C5 and 3C60, in case where the actuator is put on in between the cylinder ports A and B as illustrated below and where the actuator moves and suspended at its stroke end and where the valve is then shifted to the neutral position in the suspended state of the actuator, the maximum flow rates available are those as shown as the table below regardless of any voltage in the range of serviceable voltage.



| Model Numbers           | Graphic Symbols | Max. Flow L/min (U.S.GPM) |                      |                      |                        |
|-------------------------|-----------------|---------------------------|----------------------|----------------------|------------------------|
|                         |                 | 10 MPa<br>(1450 PSI)      | 16 MPa<br>(2320 PSI) | 25 MPa<br>(3630 PSI) | 31.5 MPa<br>(4570 PSI) |
| DSG-03-3C3-A*           |                 | 100 (26.4)                | 100 (26.4)           | 100 (26.4)           | 100 (26.4)             |
| DSG-03-3C3-D*/R*/RQ100  |                 | 120 (31.7)                | 120 (31.7)           | 120 (31.7)           | 120 (31.7)             |
| DSG-03-3C5-A*           |                 | 26 (6.9)                  | 21 (5.5)             | 18 (4.8)             | 16 (4.2)               |
| DSG-03-3C5-D*/R*/RQ100  |                 | 35 (9.2)                  | 24 (6.3)             | 21 (5.5)             | 20 (5.3)               |
| DSG-03-3C60-A*          |                 | 84 (22.2)                 | 52 (13.7)            | 52 (13.7)            | —                      |
| DSG-03-3C60-D*/R*/RQ100 |                 | 68 (18.0)                 | 65 (17.2)            | 61 (16.1)            | —                      |

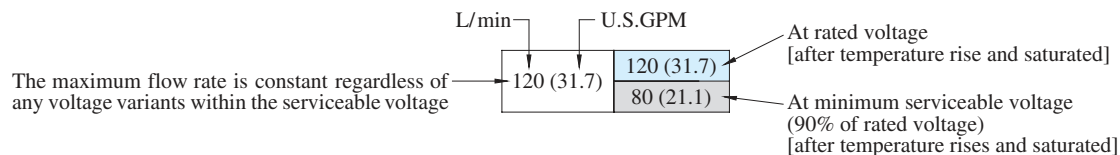
### List of Shockless Models and The Maximum Flow

- Models with DC Solenoids: S-DSG-03-\*\*\*-D\*
- Models with R Type Solenoids: S-DSG-03-\*\*\*-R\*
- Models with RQ Type Solenoids: S-DSG-03-\*\*\*-RQ100

| No. of Valve Positions | Spool-Spring Arrangement | Model Numbers | Graphic Symbols                                                                     | Max. Flow <b>L/min (U.S.GPM)</b>                                                    |              |              |              |                                                                                                            |              |              |              |                                                                                                             |              |              |              |            |
|------------------------|--------------------------|---------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------|--------------|--------------|------------------------------------------------------------------------------------------------------------|--------------|--------------|--------------|-------------------------------------------------------------------------------------------------------------|--------------|--------------|--------------|------------|
|                        |                          |               |                                                                                     |  |              |              |              | <br>[Port "B" Blocked] |              |              |              | <br>[Port "A" Blocked] |              |              |              |            |
|                        |                          |               |                                                                                     |  |              |              |              |                        |              |              |              |                        |              |              |              |            |
|                        |                          |               |                                                                                     | Working Pressure MPa (PSI)                                                          |              |              |              | Working Pressure MPa (PSI)                                                                                 |              |              |              | Working Pressure MPa (PSI)                                                                                  |              |              |              |            |
|                        |                          |               |                                                                                     | 5<br>(730)                                                                          | 10<br>(1450) | 16<br>(2320) | 25<br>(3630) | 5<br>(730)                                                                                                 | 10<br>(1450) | 16<br>(2320) | 25<br>(3630) | 5<br>(730)                                                                                                  | 10<br>(1450) | 16<br>(2320) | 25<br>(3630) |            |
| Three Positions        | Spring Centred           | S-DSG-03-3C2  |  | 120 (31.7)                                                                          | 120 (31.7)   | 120 (31.7)   | 120 (31.7)   | 120 (31.7)                                                                                                 | 120 (31.7)   | 120 (31.7)   | 75 (19.8)    | 50 (13.2)                                                                                                   | 120 (31.7)   | 120 (31.7)   | 75 (19.8)    | 50 (13.2)  |
|                        |                          |               |                                                                                     |                                                                                     |              |              |              |                                                                                                            |              |              | 105 (27.7)   | 65 (17.2)                                                                                                   | 40 (10.6)    |              |              | 105 (27.7) |
|                        |                          | S-DSG-03-3C4  |  | 120 (31.7)                                                                          | 120 (31.7)   | 85 (22.5)    | 65 (17.2)    | 120 (31.7)                                                                                                 | 120 (31.7)   | 75 (19.8)    | 40 (10.6)    | 120 (31.7)                                                                                                  | 120 (31.7)   | 75 (19.8)    | 40 (10.6)    |            |
|                        |                          |               |                                                                                     |                                                                                     |              |              | 70 (18.5)    | 45 (11.9)                                                                                                  |              |              | 100 (26.4)   | 65 (17.2)                                                                                                   | 35 (9.2)     |              |              | 100 (26.4) |
| Two Positions          | Spring Offset            | S-DSG-03-2B2  |  | 120 (31.7)                                                                          | 100 (26.4)   | 75 (19.8)    | 40 (10.6)    | 39 (10.3)                                                                                                  | 39 (10.3)    | 39 (10.3)    | 39 (10.3)    | 120 (31.7)                                                                                                  | 120 (31.7)   | 105 (27.7)   | 60 (15.9)    |            |
|                        |                          |               |                                                                                     |                                                                                     |              |              |              |                                                                                                            |              |              |              |                                                                                                             |              | 80 (21.1)    | 50 (13.2)    |            |

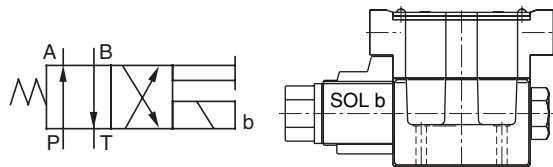
Note: The relation between the maximum flow in the table above and the voltage (within the serviceable voltage) is as shown below.

(Example)

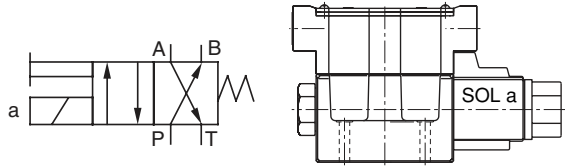


## Reverse Mounting of Solenoid

In spring offset type, it is a standard configuration that the solenoid is mounted onto the valve in the SOL b position (side). However, in this particular spool-spring arrangement, the mounting of the solenoid onto the valve in the reverse position -SOL a side- is also available. The graphic symbol for this reverse mounting is as shown below. As for the valve type 2B\*A and 2B\*B, please refer to the explanation under the heading of "Valves Using Neutral Position and Side Position" given below.



Standard Mtg. of Solenoid

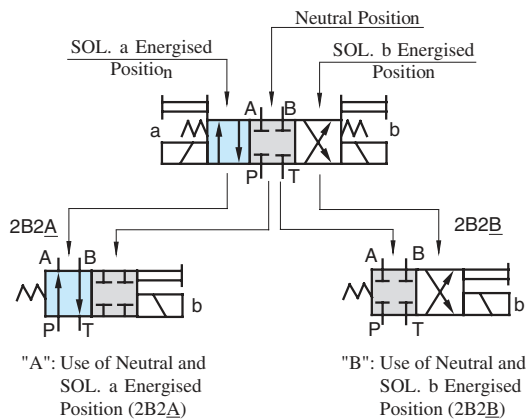


Reverse Mtg. of Solenoid

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

Besides the use of the standard 2-position valves aforementioned in the "List of Standard Models and Maximum Flow", the 3-position valves also can be used as the 2-position valves using the two of their three positions. In this case, there are two kinds of the valve available. One is the valve using the neutral position and SOL a position (2B\*A) and another is the valve using the neutral position and SOL b position (2B\*B).

(Example) In case of Spool Type "2"



| Model Numbers    | Graphic SymbolsG   |                   |
|------------------|--------------------|-------------------|
|                  | Standard Mtg. Type | Reverse Mtg. Type |
| (S-) DSG-03-2B*A |                    |                   |
| (S-) DSG-03-2B2A |                    | —                 |

| Model Numbers    | raphic Symbols     |                   |
|------------------|--------------------|-------------------|
|                  | Standard Mtg. Type | Reverse Mtg. Type |
| DSG-03-2B*B      |                    |                   |
| (S-) DSG-03-2B2B |                    |                   |
| DSG-03-2B3B      |                    | —                 |
| (S-) DSG-03-2B4B |                    | —                 |
| DSG-03-2B60B     |                    | —                 |
| DSG-03-2B10B     |                    | —                 |

In the above table, the graphic symbols in mounting type highlighted with shade are optional extra, therefore, please confirm the time of delivery with us before ordering.

## Typical Changeover Time

Changeover time varies according to oil viscosity, spool type and hydraulic circuit.

### Standard Type (Without Shockless Function)

#### [Test Conditions]

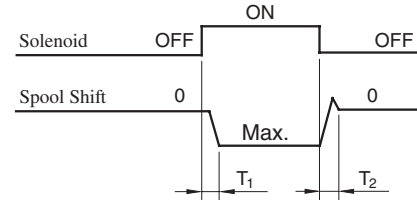
Pressure: 16 MPa (2320 PSI)

Flow Rate: 70 L/min (18.5 U.S.GPM)

Viscosity: 30 mm<sup>2</sup>/s (140 SSU)

Voltage: 100 %V (After coil temperature rises and saturated)

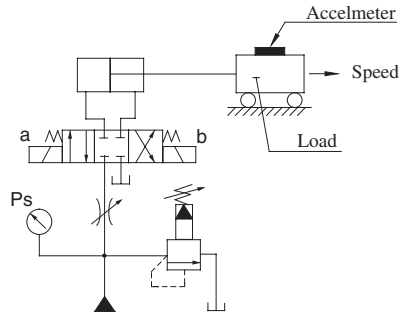
#### [Result of Measurement]



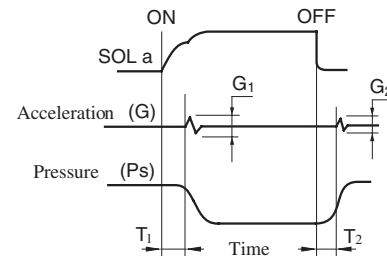
| Type          | Model Numbers    | Changeover Time ms |                |
|---------------|------------------|--------------------|----------------|
|               |                  | T <sub>1</sub>     | T <sub>2</sub> |
| Standard Type | DSG-03-3C2-A*    | 27                 | 22             |
|               | DSG-03-3C2-D*    | 97                 | 30             |
|               | DSG-03-3C2-R*    | 97                 | 204            |
|               | DSG-03-3C2-RQ100 | 97                 | 41             |

### Shockless Type

#### [Test Circuit and Conditions]



#### [Result of Measurement]



Setting Pressure (Ps): 7 MPa (1020 PSI)

Load (W): 1000 kg (2205 lbs.)

Speed: 8.8 m/min (28.9 ft./min)

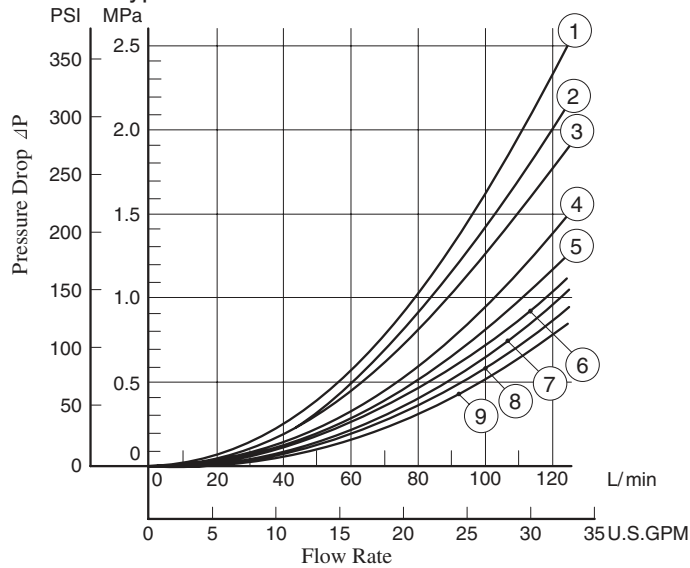
Viscosity: 30 mm<sup>2</sup>/s (140 SSU)

| Type           | Model Numbers      | Time ms        |                | Acceleration m/s <sup>2</sup> (G) |                |
|----------------|--------------------|----------------|----------------|-----------------------------------|----------------|
|                |                    | T <sub>1</sub> | T <sub>2</sub> | G <sub>1</sub>                    | G <sub>2</sub> |
| Shockless Type | S-DSG-03-3C2-D*    | 110            | 120            | 6.4                               | 6.4            |
|                | S-DSG-03-3C2-R*    | 110            | 220            | (.65)                             | (.65)          |
|                | S-DSG-03-3C2-RQ100 | 110            | 120            |                                   |                |

## Pressure Drop

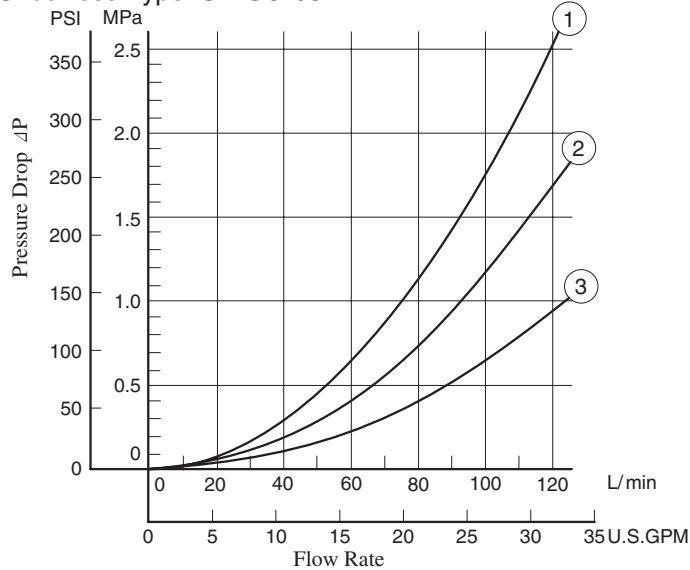
Pressure drop curves based on viscosity of 35 mm<sup>2</sup>/s (164 SSU) and specific gravity of 0.850.

### Standard Type: DSG-03



| Model Numbers | Pressure Drop Curve Number |     |     |     |     |
|---------------|----------------------------|-----|-----|-----|-----|
|               | P→A                        | B→T | P→B | A→T | P→T |
| DSG-03-3C2    | ⑦                          | ⑦   | ⑦   | ⑦   | —   |
| DSG-03-3C3    | ⑨                          | ⑨   | ⑨   | ⑨   | ⑤   |
| DSG-03-3C4    | ⑦                          | ⑧   | ⑦   | ⑧   | —   |
| DSG-03-3C40   | ⑦                          | ⑦   | ⑦   | ⑦   | —   |
| DSG-03-3C5    | ⑨                          | ⑦   | ⑦   | ⑨   | ①   |
| DSG-03-3C60   | ⑥                          | ⑤   | ⑥   | ⑤   | ①   |
| DSG-03-3C9    | ⑨                          | ⑦   | ⑨   | ⑦   | —   |
| DSG-03-3C10   | ⑦                          | ⑧   | ⑦   | ⑦   | —   |
| DSG-03-3C11   | ⑨                          | ⑦   | ⑦   | ⑦   | —   |
| DSG-03-3C12   | ⑦                          | ⑦   | ⑦   | ⑧   | —   |
| DSG-03-2D2    | ④                          | ③   | ⑥   | ⑥   | —   |
| DSG-03-2B2    | ②                          | ①   | ⑦   | ⑦   | —   |
| DSG-03-2B3    | ③                          | ②   | ⑨   | ⑨   | —   |
| DSG-03-2B8    | ⑥                          | —   | ⑤   | —   | —   |

### Shockless Type: S-DSG-03



| Model Numbers | Pressure Drop Curve Number |     |     |     |
|---------------|----------------------------|-----|-----|-----|
|               | P→A                        | B→T | P→B | A→T |
| S-DSG-03-3C2  | ②                          | ②   | ②   | ②   |
| S-DSG-03-3C4  | ②                          | ②   | ③   | ③   |
| S-DSG-03-2B2  | ①                          | ②   | ②   | ②   |

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

| Viscosity | mm <sup>2</sup> /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 (ΔP') may be obtained from the formula below.

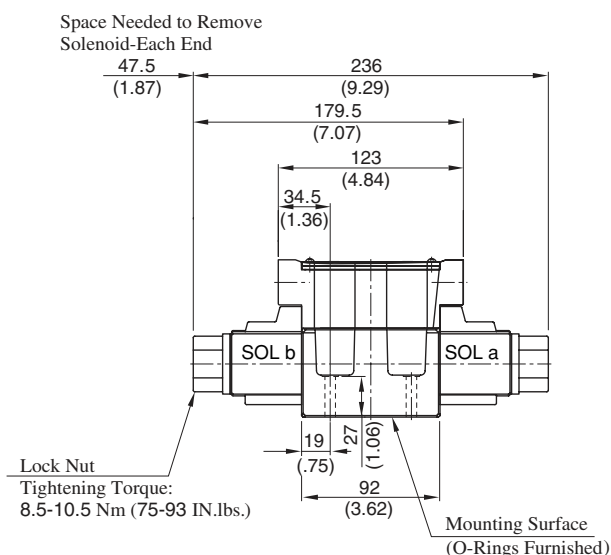
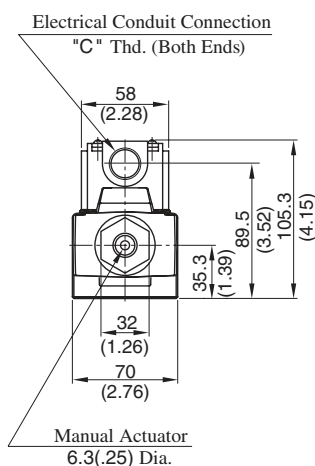
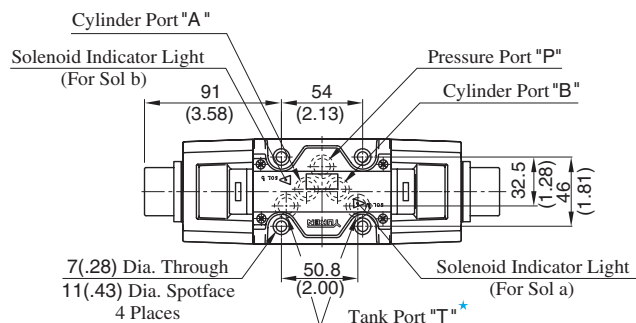
$$\Delta P' = \Delta P (G'/0.850)$$

# TERMINAL BOX TYPE

## Models with AC Solenoids: DSG-03- \*\*\*-A\* -50/5090

### Double Solenoid: Spring Centred & No-Spring Detented

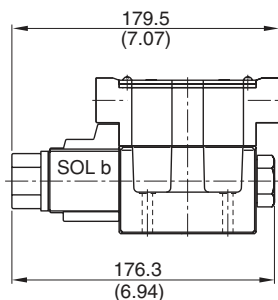
| Model Numbers        | "C" Thd. |
|----------------------|----------|
| DSG-03- ***-A* -50   | G 1/2    |
| DSG-03- ***-A* -5090 | 1/2 NPT  |



★. Of the two of tank port "T", the tank port in the left side is normally used in our standard sub-plate, though, either side of the tank port "T" can be used without problem.

DIMENSIONS IN  
MILLIMETRES (INCHES)

### Single Solenoid: Spring Offset

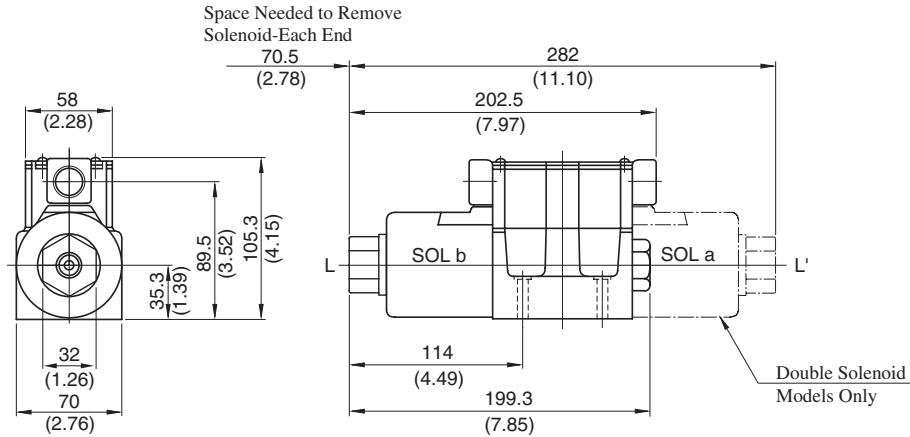


- For other dimensions, refer to "Spring Centred and No-Spring Detented" models.
- Solenoid being mounted in the reverse position -SOL a side- is also available.

Mounting surface: ISO 4401-AC-05-4-A

## TERMINAL BOX TYPE

- Models with DC Solenoids : (S-)DSG-03- \*\*\* -D\* -50/5090
- Models with R Type Solenoids : (S-)DSG-03- \*\*\* -R\* -50/5090
- Models with RQ Type Solenoids : (S-)DSG-03- \*\*\* -RQ100-50/5090
- Double Solenoid: Spring Centred & No-Spring Detented
- Single Solenoid: Spring Offset

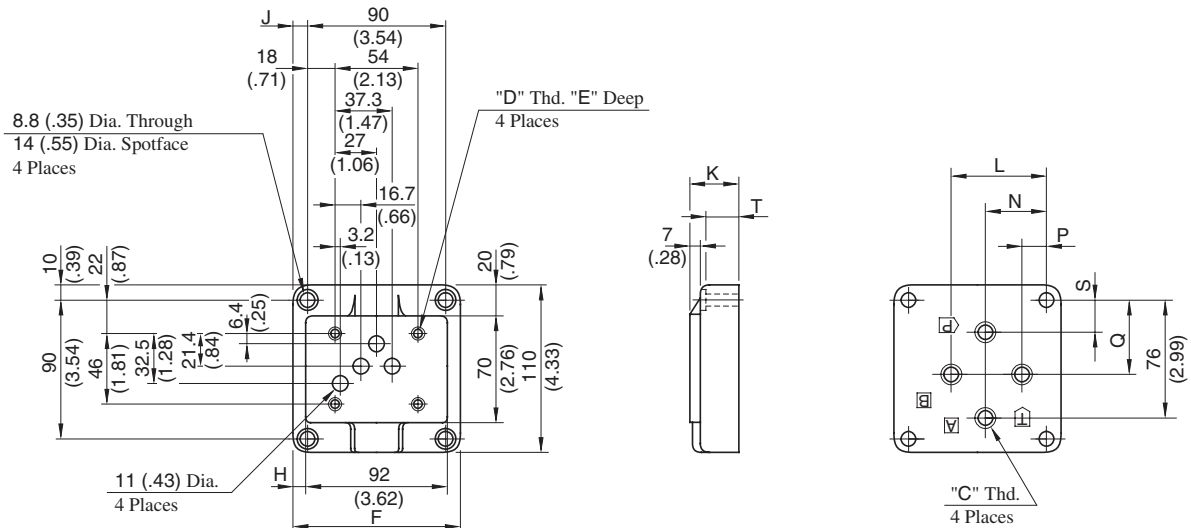


- For other dimensions, refer to Models with AC solenoids (Page 372).

DIMENSIONS IN  
MILLIMETRES (INCHES)

### Sub- plates

DSGM-03\*-40/2180/2190

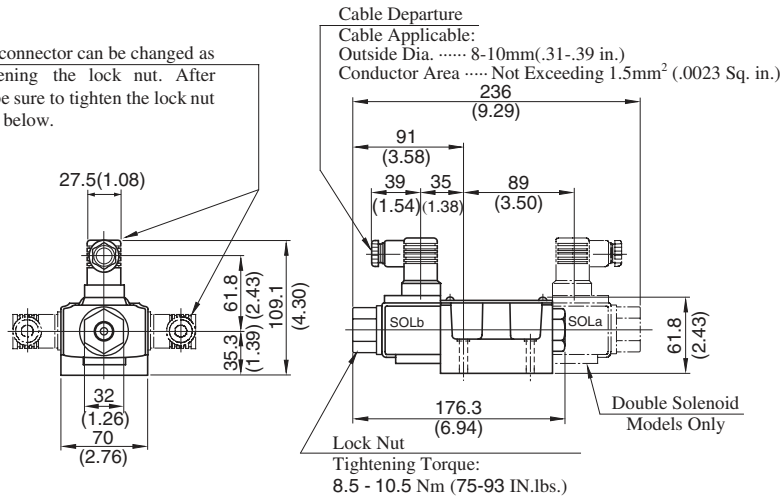


| Sub-plate<br>Model Numbers | Piping Size<br>"C" Thd. | "D" Thd. | Dimensions mm (Inches) |            |          |          |           |           |           |          |           |          |           |
|----------------------------|-------------------------|----------|------------------------|------------|----------|----------|-----------|-----------|-----------|----------|-----------|----------|-----------|
|                            |                         |          | E                      | F          | H        | J        | K         | L         | N         | P        | Q         | S        | T         |
| DSGM-03-40                 | Rc 3/8                  | M6       | 13 (.51)               | 110 (4.33) | 9 (.35)  | 10 (.39) | 32 (1.26) | 62 (2.44) | 40 (1.57) | 16 (.63) | 48 (1.89) | 21 (.83) | 24 (.94)  |
| DSGM-03-2180               | 3/8 BSP.F               |          | 15 (.59)               | 110 (4.33) | 9 (.35)  | 10 (.39) | 32 (1.26) | 62 (2.44) | 40 (1.57) | 16 (.63) | 48 (1.89) | 21 (.83) | 24 (.94)  |
| DSGM-03-2190               | 3/8 NPT                 |          | 15 (.59)               | 110 (4.33) | 9 (.35)  | 10 (.39) | 32 (1.26) | 62 (2.44) | 40 (1.57) | 16 (.63) | 48 (1.89) | 21 (.83) | 24 (.94)  |
| DSGM-03X-40                | Rc 1/2                  | M6       | 13 (.51)               | 110 (4.33) | 9 (.35)  | 10 (.39) | 32 (1.26) | 62 (2.44) | 40 (1.57) | 16 (.63) | 48 (1.89) | 21 (.83) | 24 (.94)  |
| DSGM-03X-2180              | 1/2 BSP.F               |          | 15 (.59)               | 110 (4.33) | 9 (.35)  | 10 (.39) | 32 (1.26) | 62 (2.44) | 40 (1.57) | 16 (.63) | 48 (1.89) | 21 (.83) | 24 (.94)  |
| DSGM-03X-2190              | 1/2 NPT                 |          | 15 (.59)               | 110 (4.33) | 9 (.35)  | 10 (.39) | 32 (1.26) | 62 (2.44) | 40 (1.57) | 16 (.63) | 48 (1.89) | 21 (.83) | 24 (.94)  |
| DSGM-03Y-40                | Rc 3/4                  | M6       | 13 (.51)               | 120 (4.72) | 14 (.55) | 15 (.59) | 50 (1.97) | 80 (3.15) | 45 (1.77) | 10 (.39) | 47 (1.85) | 16 (.63) | 42 (1.65) |
| DSGM-03Y-2180              | 3/4 BSP.F               |          | 15 (.59)               | 120 (4.72) | 14 (.55) | 15 (.59) | 50 (1.97) | 80 (3.15) | 45 (1.77) | 10 (.39) | 47 (1.85) | 16 (.63) | 42 (1.65) |
| DSGM-03Y-2190              | 3/4 NPT                 |          | 15 (.59)               | 120 (4.72) | 14 (.55) | 15 (.59) | 50 (1.97) | 80 (3.15) | 45 (1.77) | 10 (.39) | 47 (1.85) | 16 (.63) | 42 (1.65) |

■ **PLUG-IN CONNECTOR TYPE (N)**  
**PLUG-IN CONNECTOR WITH INDICATOR LIGHT (N1)**

● **Models with AC Solenoids: DSG-03- \*\*\* -A\* -  $\frac{N}{N1}$ -50/5090**

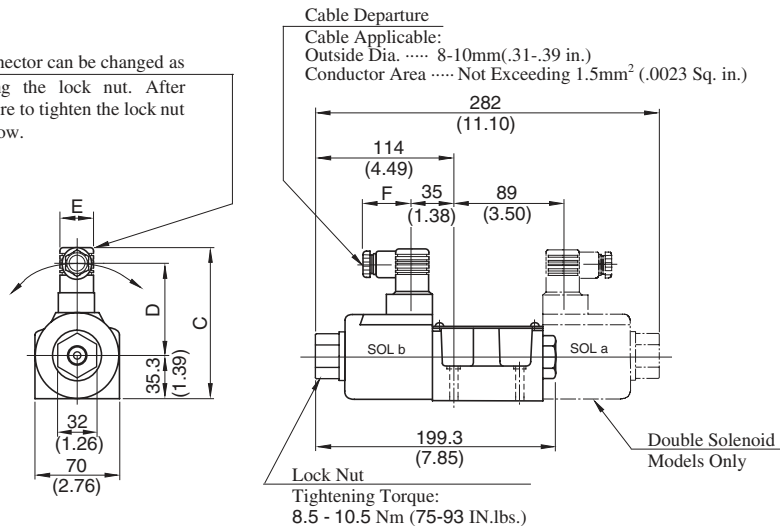
The position of the Plug-in connector can be changed as illustrated below by loosening the lock nut. After completion of the change, be sure to tighten the lock nut with the torque as specified below.



● **Models with DC Solenoids: (S-)DSG-03- \*\*\* -D\* -  $\frac{N}{N1}$ -50/5090**

● **Models with R Type Solenoids: (S-)DSG-03- \*\*\* -R\* -N-50/5090**

The position of the Plug-in connector can be changed as illustrated below by loosening the lock nut. After completion of the change, be sure to tighten the lock nut with the torque as specified below.



| Model Numbers                             | Dimensions mm (Inches) |             |             |           |
|-------------------------------------------|------------------------|-------------|-------------|-----------|
|                                           | C                      | D           | E           | F         |
| DSG-03- *** -D* - $\frac{N}{N1}$ -50/5090 | 121.1 (4.77)           | 73.8 (2.91) | 27.5 (1.08) | 39 (1.54) |
| DSG-03- *** -R* -N-50/5090                | 124.9 (4.92)           | 62.6 (2.46) | 34 (1.34)   | 53 (2.09) |

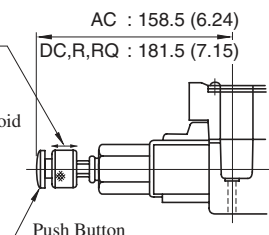
● For other dimensions, refer to "Terminal Box Type" (Page 372 - 373).

**DIMENSIONS IN  
 MILLIMETRES (INCHES)**

■ **Options**

**Models with Push Button & Lock Nut: (S-)DSG-03- \*\*\* -\*C(-  $\frac{N}{N1}$ )-50/5090**

**Lock Nut**  
 Press the "Push Button" then turn "Lock Nut" clockwise. The position of the "Push Button" is held.  
 Be sure to loosen "LockNut" fully before solenoid is energised



## Details of Receptacle

| Type of Electrical Conduit Connection | Double Solenoid Type | Single Solenoid Type |
|---------------------------------------|----------------------|----------------------|
| Terminal Box Type                     |                      |                      |
| Plug-in Connector Type                |                      |                      |

★ 1. There are two grounding terminals. You can use either one.

★ 2. If you do not need the common plate, remove it.

★ 3. With DC solenoids, polarity is no question.



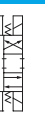
**DANGER**

- Do not perform wiring while the power is on. Doing so may result in electric shock, burns or death.
- Make the wiring properly. Improper wiring will cause an irregular movement of the machine, resulting in a grave accident.

## Electrical Circuit

| Type of Electrical Conduit Connection | Electric Source |    |                 |
|---------------------------------------|-----------------|----|-----------------|
|                                       | AC              | DC | AC→DC Rectified |
| Terminal Box Type                     |                 |    |                 |
| Plug-in Connector Type                |                 |    |                 |

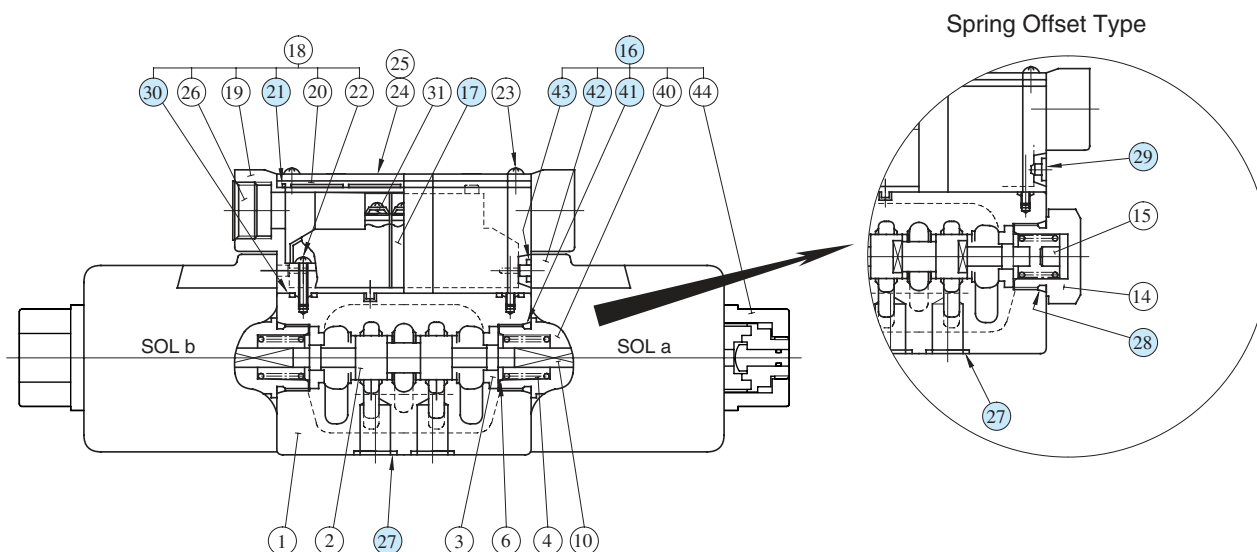
**E**



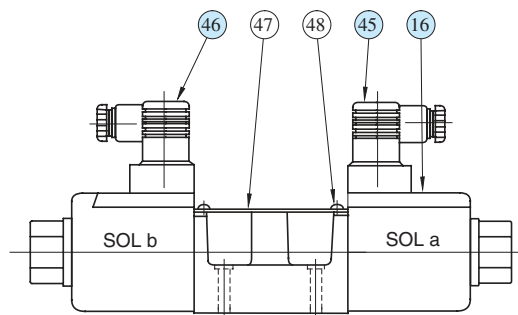
DSG-03 Series Solenoid Operated Directional Valves

# List of Seals

\*-DSG-03-\*\*\*-\*-50/5090



\*-DSG-03-\*\*\*-N/N1-50/5090



# List of Seals

| Item | Name of Parts | Part Numbers          | Qty. |     |    | Remarks                                |
|------|---------------|-----------------------|------|-----|----|----------------------------------------|
|      |               |                       | 3C   | 2D2 | 2B |                                        |
| 21   | Gasket        | 1751S-VK418689-6      | 1    | 1   | 1  |                                        |
| 27   | O-Ring        | SO-NB-A014(NBR, Hs90) | 5    | 5   | 5  |                                        |
| 28   | O-Ring        | SO-NB-P21             | —    | —   | 1  |                                        |
| 29   | Plug          | 1790S-VK418329-9      | —    | —   | 2  |                                        |
| 30   | O-Ring        | S6                    | 2    | 2   | 2  |                                        |
| 41   | O-Ring        | SO-NB-P21             | 2    | 2   | 1  | } Included in Solenoid Ass'y (Item 16) |
| 43   | O-Ring        | SO-NA-P4              | 4    | 4   | 2  |                                        |

★ When ordering the O-Rings, please specify the seal kit number from the table below.

| Valve Model Numbers    | Seal Kit No.   | O-Ring Details for Seal Kit                        |
|------------------------|----------------|----------------------------------------------------|
| DSG-03-***-*-50/5090   | KS-DSG-03-50   | 27(5 Pcs.), 28 & 41(2 Pcs., see above), 43(4 Pcs.) |
| DSG-03-***-*-N-50/5090 | KS-DSG-03-N-50 | 27(5 Pcs.), 28 & 41(2 Pcs., see above)             |

# Solenoid Ass'y, Coil, Receptacle and Connector

Refer to [Page 377](#) for the details of these parts.

## ■ Solenoid Ass'y, Coil, Receptacle and Connector Ass'y No.

| Valve Model Numbers      | ⑬<br>Solenoid Ass'y No. | ④②<br>Coil No. | ⑰<br>Receptacle Part No. | ④⑤<br>Connector Ass'y Part No. | ④⑥<br>Connector Ass'y Part No. | Remarks                |                                        |
|--------------------------|-------------------------|----------------|--------------------------|--------------------------------|--------------------------------|------------------------|----------------------------------------|
| DSG-03-***-A100-50*      | SA3-100-51              | C-SA3-100-51   | R3-60                    | —                              | —                              | Terminal Box Type      |                                        |
| DSG-03-***-A120-50*      | SA3-120-51              | C-SA3-120-51   |                          |                                |                                |                        |                                        |
| DSG-03-***-A200-50*      | SA3-200-51              | C-SA3-200-51   |                          |                                |                                |                        |                                        |
| DSG-03-***-A240-50*      | SA3-240-51              | C-SA3-240-51   |                          |                                |                                |                        |                                        |
| DSG-03-***-D12-50*       | SD3-12-51               | C-SD3-12-51    | KR3-A-60                 |                                |                                |                        |                                        |
| DSG-03-***-D24-50*       | SD3-24-51               | C-SD3-24-51    |                          |                                |                                |                        |                                        |
| DSG-03-***-D100-50*      | SD3-100-51              | C-SD3-100-51   | KR3-C-60                 |                                |                                |                        |                                        |
| DSG-03-***-R100-50*      | SR3-100-51              | C-SR3-100-51   | RR3-60                   |                                |                                |                        |                                        |
| DSG-03-***-R200-50*      | SR3-200-51              | C-SR3-200-51   |                          |                                |                                |                        |                                        |
| DSG-03-***-RQ100-50*     | SR3-100-51              | C-SR3-100-51   | QR3-C-60                 |                                |                                |                        |                                        |
| S-DSG-03-***-D12-50*     | SD3-12-S-51             | C-SD3-12-51    | KR3-A-60                 |                                |                                |                        |                                        |
| S-DSG-03-***-D24-50*     | SD3-24-S-51             | C-SD3-24-51    |                          |                                |                                |                        |                                        |
| S-DSG-03-***-D100-50*    | SD3-100-S-51            | C-SD3-100-51   | KR3-C-60                 |                                |                                |                        |                                        |
| S-DSG-03-***-R100-50*    | SR3-100-S-51            | C-SR3-100-51   | RR3-60                   |                                |                                |                        |                                        |
| S-DSG-03-***-R200-50*    | SR3-200-S-51            | C-SR3-200-51   |                          |                                |                                |                        |                                        |
| S-DSG-03-***-RQ100-50*   | SR3-100-51              | C-SR3-100-51   | QR3-C-60                 |                                |                                |                        |                                        |
| DSG-03-***-A100-N-50*    | SA3-100-N-51            | C-SA3-100-N-51 | —                        | GDM-211-A-11                   | GDM-211-B-11                   | Plug-in Connector Type |                                        |
| DSG-03-***-A120-N-50*    | SA3-120-N-51            | C-SA3-120-N-51 |                          |                                |                                |                        |                                        |
| DSG-03-***-A200-N-50*    | SA3-200-N-51            | C-SA3-200-N-51 |                          |                                |                                |                        |                                        |
| DSG-03-***-A240-N-50*    | SA3-240-N-51            | C-SA3-240-N-51 |                          |                                |                                |                        |                                        |
| DSG-03-***-D12-N-50*     | SD3-12-N-51             | C-SD3-12-N-51  |                          |                                |                                |                        |                                        |
| DSG-03-***-D24-N-50*     | SD3-24-N-51             | C-SD3-24-N-51  |                          |                                |                                |                        |                                        |
| DSG-03-***-D100-N-50*    | SD3-100-N-51            | C-SD3-100-N-51 |                          |                                |                                |                        |                                        |
| DSG-03-***-R100-N-50*    | SR3-100-N-51            | C-SR3-100-N-51 |                          |                                |                                |                        |                                        |
| DSG-03-***-R200-N-50*    | SR3-200-N-51            | C-SR3-200-N-51 |                          |                                |                                |                        |                                        |
| S-DSG-03-***-D12-N-50*   | SD3-12-S-N-51           | C-SD3-12-N-51  |                          |                                |                                |                        |                                        |
| S-DSG-03-***-D24-N-50*   | SD3-24-S-N-51           | C-SD3-24-N-51  |                          |                                |                                |                        |                                        |
| S-DSG-03-***-D100-N-50*  | SD3-100-S-N-51          | C-SD3-100-N-51 |                          |                                |                                |                        |                                        |
| S-DSG-03-***-R100-N-50*  | SR3-100-S-N-51          | C-SR3-100-N-51 |                          |                                |                                |                        |                                        |
| S-DSG-03-***-R200-N-50*  | SR3-200-S-N-51          | C-SR3-200-N-51 |                          |                                |                                |                        |                                        |
| DSG-03-***-A100-N1-50*   | SA3-100-N-51            | C-SA3-100-N-51 |                          | —                              | GDML-211-1-11                  | GDML-211-1-11          | Plug-in Connector with Indicator Light |
| DSG-03-***-A120-N1-50*   | SA3-120-N-51            | C-SA3-120-N-51 |                          |                                |                                |                        |                                        |
| DSG-03-***-A200-N1-50*   | SA3-200-N-51            | C-SA3-200-N-51 |                          |                                |                                |                        |                                        |
| DSG-03-***-A240-N1-50*   | SA3-240-N-51            | C-SA3-240-N-51 |                          |                                |                                |                        |                                        |
| DSG-03-***-D12-N1-50*    | SD3-12-N-51             | C-SD3-12-N-51  | GDML-211-2-11            |                                | GDML-211-2-11                  |                        |                                        |
| DSG-03-***-D24-N1-50*    | SD3-24-N-51             | C-SD3-24-N-51  | GDML-211-3-11            |                                | GDML-211-3-11                  |                        |                                        |
| DSG-03-***-D100-N1-50*   | SD3-100-N-51            | C-SD3-100-N-51 | GDML-211-1-11            |                                | GDML-211-1-11                  |                        |                                        |
| S-DSG-03-***-D12-N1-50*  | SD3-12-S-N-51           | C-SD3-12-N-51  | GDML-211-2-11            |                                | GDML-211-2-11                  |                        |                                        |
| S-DSG-03-***-D24-N1-50*  | SD3-24-S-N-51           | C-SD3-24-N-51  | GDML-211-3-11            |                                | GDML-211-3-11                  |                        |                                        |
| S-DSG-03-***-D100-N1-50* | SD3-48-S-N-51           | C-SD3-100-N-51 | GDML-211-1-11            |                                | GDML-211-1-11                  |                        |                                        |

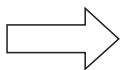
Note: The connector assembly is not included in the solenoid assembly.

## ■ Low Wattage (5W) Type Solenoid Operated Directional Valves

2 type of Direct Acting type Solenoid Operated Directional Valves, E-DSG-01/03, with suppressed consumption power 5W were launched in series.

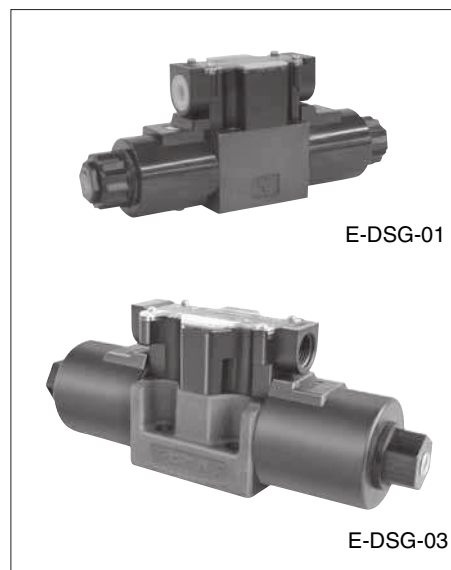
- Because these valves only 5W of power which enables remarkable reduction of operating cost.

Standard DSG Series  
DSG-01: 29W  
DSG-03: 38W



Low Wattage Type E-DSG Series  
E-DSG-01: 5W  
E-DSG-03: 5W

- Since these valves operate on only 5W, they can be driven through the output circuit of a programmed or sequence controller. This feature simplifies the electric circuitry and enables savings in initial cost.
- These low wattage valves minimize coil surface temperature.
- CE certified products are available.



### ■ Specifications

| Model Numbers      | Max. Flow<br>L/min<br>(U.S.GPM) | Max. Operating Pressure<br>MPa (PSI) | Max. T-Line<br>Back Pressure<br>MPa (PSI) | Max. Changeover<br>Frequency<br>Cycle/min {min <sup>-1</sup> } | Mass<br>kg (lbs.) |
|--------------------|---------------------------------|--------------------------------------|-------------------------------------------|----------------------------------------------------------------|-------------------|
| E-DSG-01-3C*-D*-60 | 30<br>(7.9)                     | 16 (2320)                            | 16 (2320)                                 | 240                                                            | 2.2 (4.85)        |
| E-DSG-01-2N2-D*-60 |                                 |                                      |                                           |                                                                | 2.2 (4.85)        |
| E-DSG-01-2D2-D*-60 |                                 |                                      |                                           |                                                                | 2.2 (4.85)        |
| E-DSG-01-2B*-D*-60 |                                 |                                      |                                           |                                                                | 1.6 (3.53)        |
| E-DSG-03-3C*-D*-50 | 63<br>(16.6)                    | 16 (2320)                            | 16 (2320)                                 | 240                                                            | 5 (11.03)         |
| E-DSG-01-2D2-D*-50 |                                 |                                      |                                           |                                                                | 5 (11.03)         |
| E-DSG-01-2B2-D*-50 |                                 |                                      |                                           |                                                                | 3.6 (7.94)        |

★ Maximum flow indicates a ceiling flow depends on the type of spool and operating condition.

### ■ Solenoid Ratings

| Model Numbers | Electric source | Coil Type | Voltage (V)   |                   | Current & Power at Rated Voltage |           |
|---------------|-----------------|-----------|---------------|-------------------|----------------------------------|-----------|
|               |                 |           | Source Rating | Serviceable Range | Inrush (A)                       | Power (W) |
| E-DSG-01      | DC (K Series)   | D12       | 12            | 10.8 – 13.2       | 0.43                             | 5         |
|               |                 | D24       | 24            | 21.6 – 26.4       | 0.23                             |           |
| E-DSG-03      |                 | D12       | 12            | 10.8 – 13.2       | 0.44                             | 5         |
|               |                 | D24       | 24            | 21.6 – 26.4       | 0.22                             |           |

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 .

For details, please contact us.

## Electronic Relay Incorporated Solenoid Operated Directional Valves

*Drive power source and signal are separate.*

The valve is actuated by operating a built-in switch using a very small current signal (about 10 mA) when the solenoid is energised.

- **A Direct Drive by a programmable controller is now possible.**

As the valve can be actuated by a very small current, as we have mentioned, a Direct Drive is possible on the output circuit of the programmable controller or sequence controller.

- **Simple construction and stable operation.**

Since the valve is a direct type, the construction is quite simple. Also the solenoid is the well proven wet armature type, which can withstand contamination. Therefore a stable operation can be obtained.



T-DSG-01

T-DSG-03

### Specifications

| Valve Type     | Model Numbers               | Max. Flow ★<br>L/min<br>(U.S.GPM) | Max. Operating Pressure<br>MPa<br>(PSI)            | Max. T-Line Back Pressure<br>MPa<br>(PSI) | Max. Changeover Frequency<br>Cycle/min {min <sup>-1</sup> } | Mass<br>kg<br>(lbs.) |
|----------------|-----------------------------|-----------------------------------|----------------------------------------------------|-------------------------------------------|-------------------------------------------------------------|----------------------|
| Standard Type  | T-DSG-01-3C*-D24*-70/7090   | 100<br>(26.4)                     | 35<br>(5080)                                       | 21<br>(3050)                              | 300                                                         | 1.85 (4.08)          |
|                | T-DSG-01-2D2-D24*-70/7090   |                                   |                                                    |                                           |                                                             | 1.4 (3.09)           |
|                | T-DSG-01-2B*-D24*-70/7090   |                                   |                                                    |                                           |                                                             | 1.4 (3.09)           |
| Shockless Type | T-S-DSG-01-3C*-D24*-70/7090 | 63<br>(16.6)                      | 25<br>(3630)                                       | 21<br>(3050)                              | 120                                                         | 1.85 (4.08)          |
|                | T-S-DSG-01-2B2-D24*-70/7090 |                                   |                                                    |                                           |                                                             | 1.4 (3.09)           |
| Standard Type  | T-DSG-03-3C*-D24*-50/5090   | 120<br>(31.7)                     | 31.5 (4570)<br>{ Spool Type 60 Only }<br>25 (3630) | 16<br>(2320)                              | 240                                                         | 5 (11.03)            |
|                | T-DSG-03-2D2-D24*-50/5090   |                                   |                                                    |                                           |                                                             | 3.6 (7.94)           |
|                | T-DSG-03-2B*-D24*-50/5090   |                                   |                                                    |                                           |                                                             | 3.6 (7.94)           |
| Shockless Type | T-S-DSG-03-3C*-D24*-50/5090 | 120<br>(31.7)                     | 25<br>(3630)                                       | 16<br>(2320)                              | 120                                                         | 5 (11.03)            |
|                | T-S-DSG-03-2B2-D24*-50/5090 |                                   |                                                    |                                           |                                                             | 3.6 (7.94)           |

★ Maximum flow indicates a ceiling flow. As the ceiling flow depends on the type of spool and operating condition the same as those for standard DSG-01/03, refer to the List of Spool Functions on [pages 347 - 351](#) (DSG-01) and [364 - 368](#) (DSG-03) for details.

### Model Number Designation

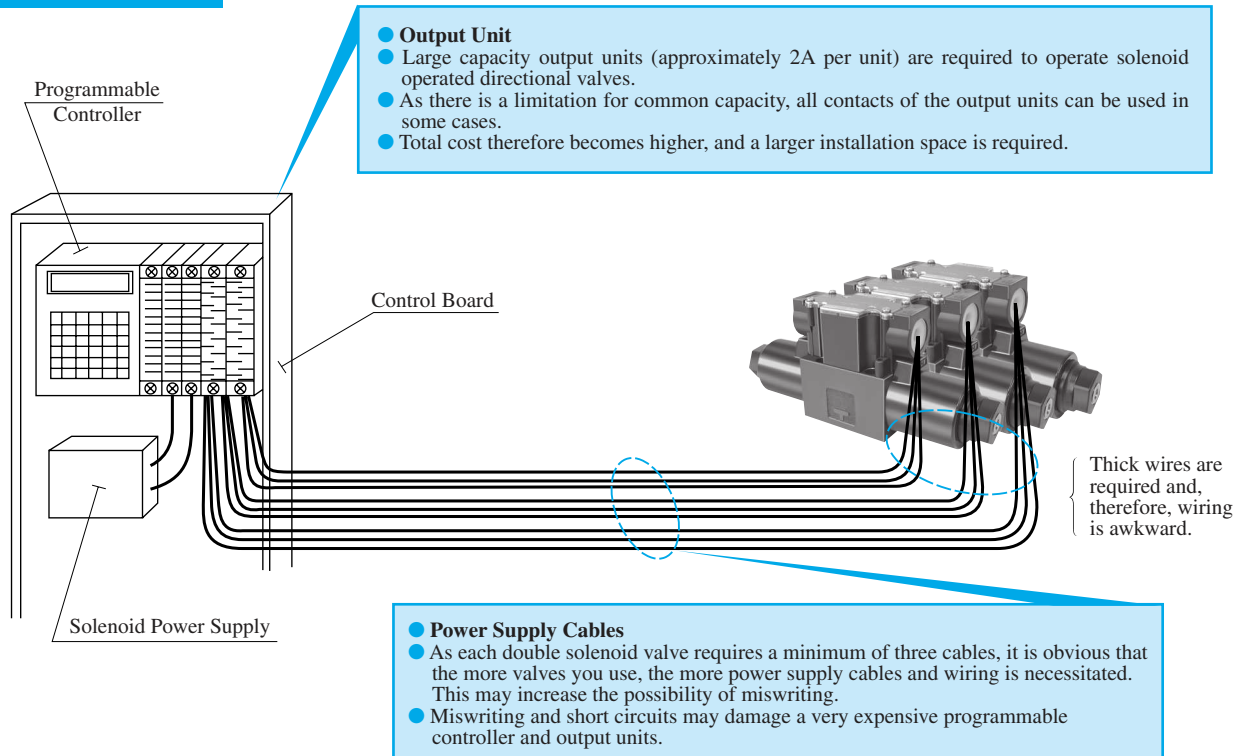
| F-            | T-                                       | S-   | DSG           | -03        | -2                       | B                        | 2          | A                          | -D24      | M                              | -70           | *               | -L                                    |
|---------------|------------------------------------------|------|---------------|------------|--------------------------|--------------------------|------------|----------------------------|-----------|--------------------------------|---------------|-----------------|---------------------------------------|
| Special Seals | Control Type                             | Type | Series Number | Valve Size | Number of Valve Position | Spool-Spring Arrangement | Spool Type | Special Two Position Valve | Coil Type | Supply Type of Signal Power    | Design Number | Design Standard | Models with Alternate Offset Solenoid |
|               | T:<br>Electronic Relay Incorporated Type |      |               | 01         |                          |                          |            |                            | DC<br>D24 | None:<br>Internal Signal Power | 70            |                 |                                       |
|               |                                          |      |               | 03         |                          |                          |            |                            |           | M:<br>External Signal Power    | 50            |                 |                                       |

★ Please refer to the valve type DSG-01 and DSG-03 shown on [page 346](#) and [363](#) for the area shaded.

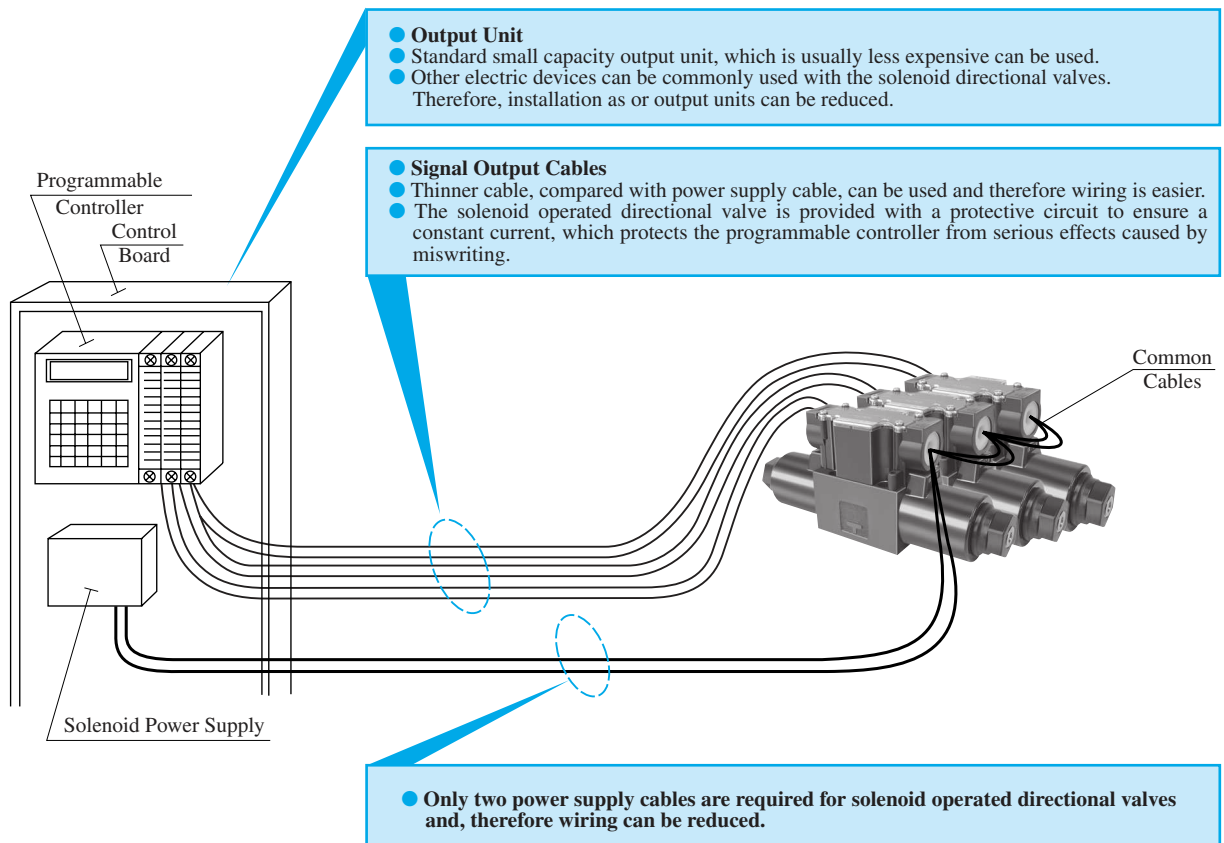
For details, please contact us.

## Comparison of The Conventional Type and The Electronic Relay Incorporated Type

### Conventional Type



### Electronic Relay Incorporated Type



## Solenoid Controlled Pilot Operated Directional Valves

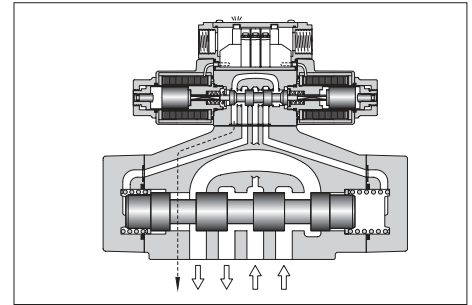
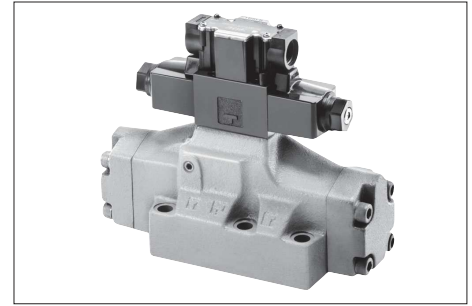
These valves are composed of a solenoid operated pilot valve and a pilot operated slave valve. When a solenoid is energised the pilot valve directs the flow to move the spool of the slave valve, thus changing the direction of flow in the hydraulic circuit.

### High Pressure High Flow

High pressure [31.5 MPa (4570 PSI)] along which high flow means compact system design.

### Lower Pressure Drop

System energy saving increased as pressure drop of each valve has been greatly reduced.



## Specifications

| Valve Type     | Model Numbers              | Max. Flow L/min (U.S.GPM)★1 | Max. Operating Pressure MPa (PSI) | Max. Pilot Pressure MPa (PSI) | Min.★2 Required Pilot Pres. MPa (PSI) | Max. T-Line Back Pressure MPa (PSI) |            | Max. Change-over Frequency Cycles/Min {min <sup>-1</sup> } |     |             | Mass kg (lbs.) |
|----------------|----------------------------|-----------------------------|-----------------------------------|-------------------------------|---------------------------------------|-------------------------------------|------------|------------------------------------------------------------|-----|-------------|----------------|
|                |                            |                             |                                   |                               |                                       | Ext. Drain                          | Int. Drain | AC                                                         | DC  | R           |                |
| Standard Type  | DSHG-01-3C*-*-14/1480/1490 | 40 (10.6)                   | 21 (3050)                         | 21 (3050)                     | 1.0 (145)                             | 16 (2320)                           | 16 (2320)  | 120                                                        | 120 | 120         | 3.2 (7.1)      |
|                | DSHG-01-2B*-*-14/1480/1490 |                             |                                   |                               |                                       |                                     |            |                                                            |     |             | 2.7 (6.0)      |
|                | DSHG-03-3C*-*-14/1490      | 160 (42.3)                  | 25 (3630)                         | 25 (3630)                     | 0.7 (100)                             | 16 (2320)                           | 16 (2320)  | 120                                                        | 120 | 120         | 6.9 (15.2)     |
|                | DSHG-03-2N*-*-14/1490      |                             |                                   |                               |                                       |                                     |            |                                                            |     |             | 6.9 (15.2)     |
|                | DSHG-03-2B*-*-14/1490      |                             |                                   |                               |                                       |                                     |            |                                                            |     |             | 6.4 (14.1)     |
|                | (S-)DSHG-04-3C*-*-52/5290  | 300 (79.3)                  | 31.5 (4570)                       | 25 (3630)                     | 0.8 (120)                             | 21 (3050)                           | 16 (2320)  | 120                                                        | 120 | 120         | 8.5 (18.7)     |
|                | (S-)DSHG-04-2N*-*-52/5290  |                             |                                   |                               |                                       |                                     |            |                                                            |     |             | 8.5 (18.7)     |
|                | (S-)DSHG-04-2B*-*-52/5290  |                             |                                   |                               |                                       |                                     |            |                                                            |     |             | 8.0 (17.6)     |
| Shockless Type | (S-)DSHG-06-3C*-*-53/5390  | 500 (132)                   | 31.5 (4570)                       | 25 (3630)                     | 0.8 (120)★3                           | 21 (3050)                           | 16 (2320)  | 120                                                        | 120 | 120         | 12.4 (27.3)    |
|                | (S-)DSHG-06-2N*-*-53/5390  |                             |                                   |                               |                                       |                                     |            |                                                            |     |             | 12.4 (27.3)    |
|                | (S-)DSHG-06-2B*-*-53/5390  |                             |                                   | 21 (3050)                     | 1.0 (145)                             |                                     |            | 110                                                        | 110 | 110         | 11.9 (26.2)    |
|                | (S-)DSHG-06-3H*-*-53/5390  |                             |                                   |                               |                                       |                                     |            |                                                            |     |             | 13.2 (29.1)    |
|                | (S-)DSHG-10-3C*-*-43/4390  | 1100 (291)                  | 31.5 (4570)                       | 25 (3630)                     | 1.0 (145)★3                           | 21 (3050)                           | 16 (2320)  | 120                                                        | 120 | 100         | 45.0 (99.2)    |
|                | (S-)DSHG-10-2N*-*-43/4390  |                             |                                   | 100                           |                                       |                                     |            | 100                                                        | 100 | 45.0 (99.2) |                |
|                | (S-)DSHG-10-2B*-*-43/4390  |                             |                                   | 21 (3050)                     |                                       |                                     |            | 60                                                         | 60  | 50          | 44.5 (98.1)    |
|                | (S-)DSHG-10-3H*-*-43/4390  |                             |                                   |                               |                                       |                                     |            |                                                            |     |             | 52.9 (116.6)   |

- ★1. Maximum flow indicates a ceiling flow. As the ceiling flow depends on the type of spool and operating condition, refer to the List of Spool Functions on pages 386 to 390 for details.
- ★2. Pilot pressure of internal pilot drain models must always exceed tank line back pressure by a minimum required pilot pressure.
- ★3. Min. pilot pressure of with pilot piston in 1.8 MPa (260 PSI).

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

| Model Numbers   | Rated Flow<br>l/min (U.S.GPM) | Max. Pressure<br>MPa (PSI) |
|-----------------|-------------------------------|----------------------------|
| DSHF-10-***-27* | 315 (83)                      | 21 (3050)                  |
| DSHF-16-***-37* | 500 (132)                     | 21 (3050)                  |
| DSHF-24-***-28* | 1200 (317)                    | 21 (3050)                  |
| DSHF-32-***-27* | 2400 (634)                    | 21 (3050)                  |

## Solenoid Ratings

Solenoid ratings of pilot valve are identical with those of standard solenoid valve. Refer to relevant solenoid ratings described on the page below.

| Model Numbers | Pilot Valve Model Numbers | Solenoid Ratings described on the page below |
|---------------|---------------------------|----------------------------------------------|
| DSHG-01       | DSG-01-***-70*            | 345                                          |
| DSHG-03       |                           |                                              |
| (S-)DSHG-04   |                           |                                              |
| (S-)DSHG-06   |                           |                                              |
| (S-)DSHG-10   |                           |                                              |

### CSA Approved Solenoid Valve

Available to supply DSHG-06 series valve approved by the CSA (Canadian Standards Association). Consult us for details.



■ Model Number Designation

| F-                                                              | S-                                                 | DSHG                                                                              | -06        | -2                    | B                                | 2                                                               | A                                         | -C2                                                                                                               | -E                      | T                       |  |                      |                      |
|-----------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------------------|------------|-----------------------|----------------------------------|-----------------------------------------------------------------|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------|--|----------------------|----------------------|
| Special Seals                                                   | Type                                               | Series Number                                                                     | Valve Size | No. of Valve Position | Spool-Spring Arrangement         | Spool Type                                                      | Special Two Position Valve                | Models with Pilot Choke Valve                                                                                     | Pilot Connection        | Drain Connection        |  |                      |                      |
| F:<br>For Phosphate Ester Type Fluids<br>(Omit if not required) | None:<br>Standard Type                             | DSHG:<br>Solenoid Controlled Pilot Operated Directional Valve, Sub-plate Mounting | 01         | 3                     | C:<br>Spring Centred             | 2, 3, 4<br>40, 5, 60<br>7, 9, 10<br>11, 12                      | —                                         | —                                                                                                                 | None:<br>Internal Pilot | None:<br>External Drain |  |                      |                      |
|                                                                 |                                                    |                                                                                   |            | 2                     | B:<br>Spring Offset              | 2, 3, 4<br>40, 7                                                |                                           |                                                                                                                   |                         |                         |  |                      |                      |
|                                                                 |                                                    |                                                                                   | 03         | 3                     | C:<br>Spring Centred             | 2, 3, 4<br>40, 5, 60<br>7, 9, 10<br>11, 12                      | —                                         | C1:<br>With C1 Choke<br><br>C2:<br>With C2 Choke<br><br>C1C2:<br>With C1 & C2 Choke<br><br>(Omit if not required) |                         |                         |  | E:<br>External Pilot | E:<br>Internal Drain |
|                                                                 |                                                    |                                                                                   |            | 2                     | N:<br>No-Spring                  | 2<br>3<br>4<br>40<br>7                                          |                                           |                                                                                                                   |                         |                         |  |                      |                      |
|                                                                 |                                                    |                                                                                   | 04         | 3                     | C:<br>Spring Centred             | 2, 4, 40<br>60, 10, 12<br>(3, 5, 6) <sup>*1</sup><br>(7, 9, 11) | —                                         | A <sup>*2</sup><br>(Omit if not required)<br><br>A <sup>*2</sup> B <sup>*2</sup><br>(Omit if not required)        |                         |                         |  |                      |                      |
|                                                                 |                                                    |                                                                                   |            | 2                     | N:<br>No-Spring                  | 2, 4, 40<br>(3, 7) <sup>*1</sup>                                |                                           |                                                                                                                   |                         |                         |  |                      |                      |
|                                                                 | None:<br>Standard Type<br><br>S:<br>Shockless Type |                                                                                   | 06         | 3                     | H:<br>Pressure Centred           | 2, 4, 40<br>60, 10, 12<br>(3, 5, 6) <sup>*1</sup><br>(7, 9, 11) | —                                         | (Omit if not required)                                                                                            |                         |                         |  |                      |                      |
|                                                                 |                                                    |                                                                                   |            | C:<br>Spring Centred  |                                  |                                                                 |                                           |                                                                                                                   |                         |                         |  |                      |                      |
|                                                                 |                                                    |                                                                                   | 10         | 2                     | N:<br>No-Spring                  | 2, 4, 40<br>(3, 7) <sup>*1</sup>                                | A <sup>*2</sup><br>(Omit if not required) | A <sup>*2</sup> B <sup>*2</sup><br>(Omit if not required)                                                         |                         |                         |  |                      |                      |
|                                                                 |                                                    |                                                                                   |            | B:<br>Spring Offset   | 2, 4, 40<br>(3, 7) <sup>*1</sup> |                                                                 |                                           |                                                                                                                   |                         |                         |  |                      |                      |

Note: In spool type “3”, “5”, “6”, “60”, and “7”, the combination applicable between pilot system and drain system is as described in the table below.

| Pilot Connection   | Drain Connection                     | Care in Application                                                                                                                                       |
|--------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Internal Pilot     | External Drain                       | Hold back pressure in the tank line so that the difference between pilot pressure and drain pressure is always more than minimum required pilot pressure. |
|                    | Internal Drain (T)                   | Combination is not applicable                                                                                                                             |
| External Pilot (E) | External Drain<br>Internal Drain (T) | No restrictions in the combination on us                                                                                                                  |

| -R2                                                                                                                                                                                                                                                                           | -A100                                                                                                                                                         | -C                                   | -H                              | -N                                                       | -53           | -*                                                                   | -L                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|---------------------------------|----------------------------------------------------------|---------------|----------------------------------------------------------------------|---------------------------------------------|
| Spool Control Modification<br>(Omit if not required)                                                                                                                                                                                                                          | Coil Type                                                                                                                                                     | Manual Override of Pilot Valve       | Built-in Orifice for Pilot Line | Type of Electrical Conduit Connection                    | Design Number | Design Standard                                                      | Models with Reverse Mtg. of Solenoid        |
| —                                                                                                                                                                                                                                                                             | AC:<br><b>A100</b> , <b>A200</b><br><b>A120</b> , <b>A240</b><br><br>DC:<br><b>D12</b> , <b>D24</b><br><b>D48</b><br><br>AC → DC<br><b>R100</b> , <b>R200</b> | —                                    | —                               | —                                                        | <b>14</b>     | <b>None:</b><br>Japanese Standard "JIS"                              | —<br><br><b>L</b><br>(Omit if not required) |
| <b>R2</b> :<br>With Stroke Adjustment, Both Ends<br><br><b>RA</b> :<br>With Stroke Adjustment, Port "A" End<br><br><b>RB</b> :<br>With Stroke Adjustment, Port "B" End                                                                                                        | —                                                                                                                                                             | <b>None</b> :<br>Manual Override Pin | —                               | <b>None:</b><br>Terminal Box Type                        | <b>14</b>     | <b>90:</b><br>N. American Design Standard                            | —<br><br><b>L</b><br>(Omit if not required) |
| —                                                                                                                                                                                                                                                                             | AC:<br><b>A100</b> , <b>A200</b><br><b>A120</b> , <b>A240</b><br><br>DC:<br><b>D12</b> , <b>D24</b><br><b>D48</b><br><br>AC → DC<br><b>R100</b> , <b>R200</b> | <b>C</b> :<br>Push Button & Lock Nut | —                               | —                                                        | <b>52</b>     | <b>None:</b><br>Japanese Standard "JIS" & European Design Standard   | —<br><br><b>L</b><br>(Omit if not required) |
| <b>R2</b> : With Stroke Adj., Both Ends<br><b>RA</b> : With Stroke Adj., Port "A" End<br><b>RB</b> : With Stroke Adj., Port "B" End<br><b>P2</b> : With Pilot Piston, Both Ends<br><b>PA</b> : With Pilot Piston, Port "A" End<br><b>PB</b> : With Pilot Piston, Port "B" End | —                                                                                                                                                             | —                                    | —                               | —                                                        | <b>53</b>     | <b>80:</b><br>European Design Standard (Applicable only for DSHG-01) | —                                           |
| —                                                                                                                                                                                                                                                                             | AC:<br><b>A100</b> , <b>A200</b><br><b>A120</b> , <b>A240</b><br><br>DC:<br><b>D12</b> , <b>D24</b><br><b>D48</b><br><br>AC → DC<br><b>R100</b> , <b>R200</b> | —                                    | <b>H</b> :<br>Refer to ★5       | <b>N1</b> :<br>Push-in Connector with Indicator Light ★4 | <b>43</b>     | <b>90:</b><br>N. American Design Standard                            | —<br><br><b>L</b><br>(Omit if not required) |

★1. Shekless type (S-DSHG) are not available for spool type marked ( ).

★2. As for the details of the valve using the neutral position and the side position (either SOL a or SOL b side), please refer to page 391. Furthermore, the spool types other than "2", "4", "40" (3, 7) are also available.

★3. In spool-spring arrangement "H" (Pressure centred models), the valves with stroke adjustment (R\*) and pilot-piston (P\*) are not available.

★4. NI stands for Plug-in connector with solenoid indicator light. NI is not available for R-type solenoids.

★5. In spool-spring arrangement "H" (pressure centred models), in case the pilot pressure is more than 10 MPa (1450 PSI), please specify that the valve should have the built-in orifice to the pilot line.

In the table above, the symbols and numbers highlighted with shade represent the optional extras. The valves with model number having such optional extras are handles as options, therefore please confirm the time of delivery with us before ordering.



## Sub-plates

| 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.) |
| DSHG-01             | DSGM-01-31              | Rc 1/8      | 0.8 (1.8)              | DSGM-01-3080             | 1/8 BSP.F   | 0.8 (1.8)              | DSGM-01-3090                | 1/8 NPT     | 0.8 (1.8)              |
|                     | DSGM-01X-31             | Rc 1/4      | 0.8 (1.8)              | DSGM-01X-3080            | 1/4 BSP.F   | 0.8 (1.8)              | DSGM-01X-3090               | 1/4 NPT     | 0.8 (1.8)              |
|                     | DSGM-01Y-31             | Rc 3/8      | 0.8 (1.8)              | —                        | —           | —                      | DSGM-01Y-3090               | 3/8 NPT     | 0.8 (1.8)              |
| DSHG-03             | DSGM-03-40★             | Rc 3/8      | 3.0 (6.6)              | DSGM-03-2180★            | 3/8 BSP.F   | 3.0 (6.6)              | DSGM-03-2190★               | 3/8 NPT     | 3.0 (6.6)              |
|                     | DSGM-03X-40★            | Rc 1/2      | 3.0 (6.6)              | DSGM-03X-2180★           | 1/2 BSP.F   | 3.0 (6.6)              | DSGM-03X-2190★              | 1/2 NPT     | 3.0 (6.6)              |
|                     | DSGM-03Y-40★            | Rc 3/4      | 4.7 (10.4)             | DSGM-03Y-2180★           | 3/4 BSP.F   | 4.7 (10.4)             | DSGM-03Y-2190★              | 3/4 NPT     | 4.7 (10.4)             |
|                     | DHGM-03Y-10             | Rc 3/4      | 4.7 (10.4)             | DHGM-03Y-1080            | 3/4 BSP.F   | 4.7 (10.4)             | DHGM-03Y-1090               | 3/4 NPT     | 4.7 (10.4)             |
| DSHG-04             | DHGM-04-20              | Rc 1/2      | 4.4 (9.7)              | DHGM-04-2080             | 1/2 BSP.F   | 4.4 (9.7)              | DHGM-04-2090                | 1/2 NPT     | 4.4 (9.7)              |
|                     | DHGM-04X-20             | Rc 3/4      | 4.1 (9.0)              | DHGM-04X-2080            | 3/4 BSP.F   | 4.1 (9.0)              | DHGM-04X-2090               | 3/4 NPT     | 4.1 (9.0)              |
| DSHG-06             | DHGM-06-50              | Rc 3/4      | 7.4 (16.3)             | DHGM-06-5080             | 3/4 BSP.F   | 8.5 (18.7)             | DHGM-06-5090                | 3/4 NPT     | 7.4 (16.3)             |
|                     | DHGM-06X-50             | Rc 1        | 7.4 (16.3)             | DHGM-06X-5080            | 1 BSP.F     | 8.5 (18.7)             | DHGM-06X-5090               | 1 NPT       | 7.4 (16.3)             |
| DSHG-10             | DHGM-10-40              | Rc 1-1/4    | 21.5 (47.4)            | DHGM-10-4080             | 1-1/4 BSP.F | 21.5 (47.4)            | DHGM-10-4090                | 1-1/4 NPT   | 21.5 (47.4)            |
|                     | DHGM-10X-40             | Rc 1-1/2    | 21.5 (47.4)            | DHGM-10X-4080            | 1-1/2 BSP.F | 21.5 (47.4)            | DHGM-10X-4090               | 1-1/2 NPT   | 21.5 (47.4)            |

★ DSGM-03★ is available only for Internal pilot-Internal drain type (Use DHGM-03Y for other valves).

● 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 Bolt

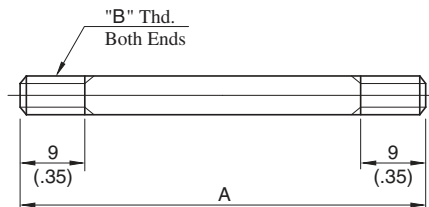
| Model Numbers | Mounting Bolt                |                                                            |                                                                |        |                                            |
|---------------|------------------------------|------------------------------------------------------------|----------------------------------------------------------------|--------|--------------------------------------------|
|               | Name                         | Japanese Standard "JIS"<br>European Design Standard        | N. American Design Standard                                    | Qty.   | Tightening Torque<br>Nm (in. lbs.)         |
| DSHG-01       | Mtg. Bolt Kit ★ <sup>3</sup> | MBK-01-01-30 ★ <sup>1</sup><br>MBK-01-02-30 ★ <sup>2</sup> | MBK-01-01-3090 ★ <sup>1</sup><br>MBK-01-02-3090 ★ <sup>2</sup> | 1 set  | 5 - 6 (43 - 52)                            |
| DSHG-03       | Soc. Hd. Cap Screw           | M6 × 35 Lg.                                                | 1/4-20 UNC × 1-3/4 Lg.                                         | 4      | 12 - 15 (104 - 130)                        |
| (S-)DSHG-04   | Soc. Hd. Cap Screw           | M6 × 45 Lg.<br>M10 × 50 Lg.                                | 1/4-20 UNC × 1-3/4 Lg.<br>3/8-16 UNC × 2 Lg.                   | 2<br>4 | 12 - 15 (104 - 130)<br>58 - 72 (504 - 625) |
| (S-)DSHG-06   | Soc. Hd. Cap Screw           | M12 × 60 Lg.                                               | 1/2-13 UNC × 2-1/2 Lg.                                         | 6      | 100 - 123 (868 - 1068)                     |
| (S-)DSHG-10   | Soc. Hd. Cap Screw           | M20 × 75 Lg.                                               | 3/4-10 UNC × 3 Lg.                                             | 6      | 473 - 585 (4106 - 5078)                    |

★ 1. For Internal Pilot-Internal Drain.

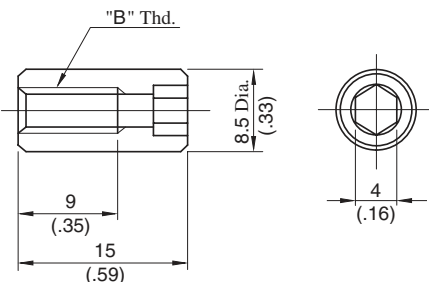
★ 2. For External Pilot or External Drain.

★ 3. Mounting bolt kit is common to that of 01 series modular valves.  
Refer to figure below for the dimensions of bolt kit.

### Stud Bolt



### Nut



### DIMENSIONS IN MILLIMETRES (INCHES)

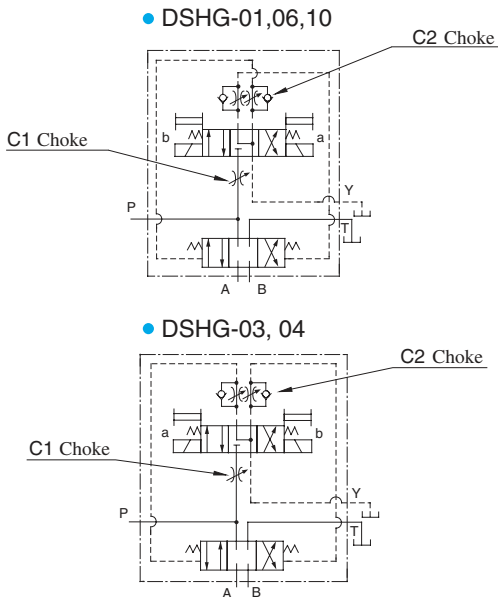
| Model Numbers  | A mm (In.) | "B" Thd.     |
|----------------|------------|--------------|
| MBK-01-01-30   | 94 (3.70)  | M5           |
| MBK-01-02-30   | 134 (5.28) |              |
| MBK-01-01-3090 | 94 (3.70)  | No.10-24 UNC |
| MBK-01-02-3090 | 134 (5.28) |              |

## Options

### Models with Pilot Choke Adjustment

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

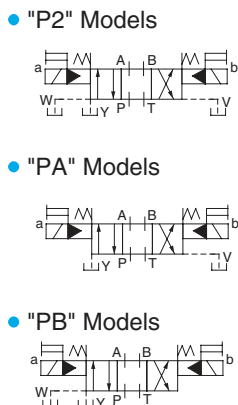
Graphic Symbols (Ex.: Spring Centred)



### Models with Pilot Piston(P2, PA, PB)

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

Graphic Symbols (Ex.: Spring Centred)

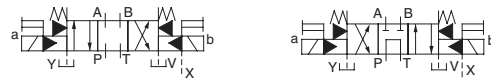


### Pressure Centred Models (3H\*)

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

Graphic Symbols (Ex.: External Pilot-External Drain)

(Only for 3H6, 3H60)

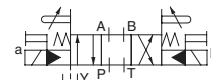


### Models with Stroke Adjustment (R2, RA, RB)

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

Graphic Symbols (Ex.: Spring Centred)

#### "R2" Models



#### "RA" Models



#### "RB" Models



### Additional Mass of Options

Add the mass described below to the mass of standard models on [page 381](#), if options are required.

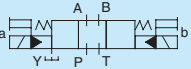
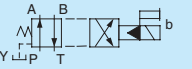
kg (lbs.)

| Model Numbers | Model with Pilot Choke Adj. |          | Models with Pilot Piston |          | Models with Stroke Adj. |           |
|---------------|-----------------------------|----------|--------------------------|----------|-------------------------|-----------|
|               | C1, C2                      | C1C2     | P2                       | PA PB    | P2                      | PA PB     |
| DSHG-03       | 0.65(1.4)                   | 1.3(2.9) | —                        | —        | 0.6(1.3)                | 0.3 (.7)  |
| (S-)DSHG-04   | 0.65(1.4)                   | 1.3(2.9) | —                        | —        | 1.0(2.2)                | 0.5(1.1)  |
| (S-)DSHG-06   | 0.65(1.4)                   | 1.3(2.9) | 1.0(2.2)                 | 0.5(1.1) | 1.2(2.6)                | 0.6(1.3)  |
| (S-)DSHG-10   | 0.65(1.4)                   | 1.3(2.9) | 3.6(7.9)                 | 1.8(4.0) | 3.7(8.2)                | 1.85(4.1) |

### Options on Pilot Valve

The same options to DSG-01 series valves are available. Please refer to [page 345](#) for the details.

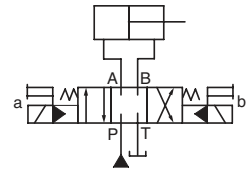
■ List of Spool Functions and Maximum Flow (DSHG-01)

| Spool Type                                                                               | Three Positions                                                                                     |                                 |                      |                      | Two Positions                                                                                        |                                 |                      |                      |
|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|---------------------------------|----------------------|----------------------|------------------------------------------------------------------------------------------------------|---------------------------------|----------------------|----------------------|
|                                                                                          | Spring Centred                                                                                      |                                 |                      |                      | Spring Centred                                                                                       |                                 |                      |                      |
|                                                                                          | Graphic Symbol<br> | Maximum Flow<br>L/min (U.S.GPM) |                      |                      | Graphic Symbol<br> | Maximum Flow<br>L/min (U.S.GPM) |                      |                      |
|                                                                                          | Model Numbers                                                                                       | 7 MPa<br>(1020 PSI)             | 14 MPa<br>(2030 PSI) | 21 MPa<br>(3050 PSI) | Model Numbers                                                                                        | 7 MPa<br>(1020 PSI)             | 14 MPa<br>(2030 PSI) | 21 MPa<br>(3050 PSI) |
| "2"     | DSHG-01-3C2                                                                                         | 40 (10.6)                       | 40 (10.6)            | 40 (10.6)            | DSHG-01-2B2                                                                                          | 40 (10.6)                       | 40 (10.6)            | 40 (10.6)            |
| "3"     | DSHG-01-3C3                                                                                         | 40 (10.6)                       | 40 (10.6)            | 40 (10.6)            | DSHG-01-2B3                                                                                          | 40 (10.6)                       | 40 (10.6)            | 40 (10.6)            |
| "4"     | DSHG-01-3C4                                                                                         | 40 (10.6)                       | 40 (10.6)            | 40 (10.6)            | DSHG-01-2B4                                                                                          | 40 (10.6)                       | 40 (10.6)            | 40 (10.6)            |
| "40"    | DSHG-01-3C40                                                                                        | 40 (10.6)                       | 40 (10.6)            | 40 (10.6)            | DSHG-01-2B40                                                                                         | 40 (10.6)                       | 40 (10.6)            | 40 (10.6)            |
| "5"     | DSHG-01-3C5                                                                                         | 40 (10.6)                       | 40 (10.6)            | 40 (10.6)            |                                                                                                      |                                 |                      |                      |
| "60"    | DSHG-01-3C60                                                                                        | 40 (10.6)                       | 40 (10.6)            | 40 (10.6)            |                                                                                                      |                                 |                      |                      |
| "7"     | DSHG-01-3C7                                                                                         | 40 (10.6)                       | 40 (10.6)            | 40 (10.6)            | DSHG-01-2B7                                                                                          | 40 (10.6)                       | 40 (10.6)            | 40 (10.6)            |
| "9"     | DSHG-01-3C9                                                                                         | 40 (10.6)                       | 40 (10.6)            | 40 (10.6)            |                                                                                                      |                                 |                      |                      |
| "10"    | DSHG-01-3C10                                                                                        | 40 (10.6)                       | 40 (10.6)            | 40 (10.6)            |                                                                                                      |                                 |                      |                      |
| "11"   | DSHG-01-3C11                                                                                        | 40 (10.6)                       | 40 (10.6)            | 40 (10.6)            |                                                                                                      |                                 |                      |                      |
| "12"  | DSHG-01-3C12                                                                                        | 40 (10.6)                       | 40 (10.6)            | 40 (10.6)            |                                                                                                      |                                 |                      |                      |

Notes ) 1. Max. flow shows value at pilot pressure more than 1 MPa (150 PSI)

2. 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 valve is used in the condition that either A or B port is blocked, the maximum flow differs according to a hydraulic circuit, therefore, please consult us for details.



## List of Spool Functions and Maximum Flow (DSHG-03)

### Three Positions

| Spool Type | Spring Centred |                     |                         |                          |
|------------|----------------|---------------------|-------------------------|--------------------------|
|            | Graphic Symbol | Maximum Flow        |                         |                          |
|            | Model Numbers  | 7 MPa<br>(1020 PSI) | 14 MPa<br>(2030 PSI)    | 25 MPa<br>(3630 PSI)     |
| "2"        | DSHG-03-3C2    | 160 (42.3)          | 85 (22.5)<br>160 (42.3) | 60 (15.9)<br>95 (25.1)   |
| "3"        | DSHG-03-3C3    | 160 (42.3)          | 160 (42.3)              | 160 (42.3)               |
| "4"        | DSHG-03-3C4    | 160 (42.3)          | 85 (22.5)<br>160 (42.3) | 60 (15.9)<br>95 (25.1)   |
| "40"       | DSHG-03-3C40   | 160 (42.3)          | 85 (22.5)<br>160 (42.3) | 60 (15.9)<br>95 (25.1)   |
| "5"        | DSHG-03-3C5    | 160 (42.3)          | 85 (22.5)<br>160 (42.3) | 60 (15.9)<br>95 (25.1)   |
| "60"       | DSHG-03-3C60   | 160 (42.3)          | 160 (42.3)              | 125 (33.0)<br>160 (42.3) |
| "7"        | DSHG-03-3C7    | 160 (42.3)          | 85 (22.5)<br>160 (42.3) | 60 (15.9)<br>95 (25.1)   |
| "9"        | DSHG-03-3C9    | 160 (42.3)          | 85 (22.5)<br>160 (42.3) | 60 (15.9)<br>95 (25.1)   |
| "10"       | DSHG-03-3C10   | 160 (42.3)          | 85 (22.5)<br>160 (42.3) | 60 (15.9)<br>95 (25.1)   |
| "11"       | DSHG-03-3C11   | 160 (42.3)          | 85 (22.5)<br>160 (42.3) | 60 (15.9)<br>95 (25.1)   |
| "12"       | DSHG-03-3C12   | 160 (42.3)          | 85 (22.5)<br>160 (42.3) | 60 (15.9)<br>95 (25.1)   |

### Two Positions

| Spool Type | No-Spring      |                     |                      |                         | Spring Offset  |                     |                      |                         |
|------------|----------------|---------------------|----------------------|-------------------------|----------------|---------------------|----------------------|-------------------------|
|            | Graphic Symbol | Maximum Flow        |                      |                         | Graphic Symbol | Maximum Flow        |                      |                         |
|            | Model Numbers  | 7 MPa<br>(1020 PSI) | 14 MPa<br>(2030 PSI) | 25 MPa<br>(3630 PSI)    | Model Numbers  | 7 MPa<br>(1020 PSI) | 14 MPa<br>(2030 PSI) | 25 MPa<br>(3630 PSI)    |
| "2"        | DSHG-03-2N2    | 160 (42.3)          | 160 (42.3)           | 85 (22.5)<br>160 (42.3) | DSHG-03-2B2    | 160 (42.3)          | 160 (42.3)           | 85 (22.5)<br>160 (42.3) |
| "3"        | DSHG-03-2N3    | 160 (42.3)          | 160 (42.3)           | 85 (22.5)<br>160 (42.3) | DSHG-03-2B3    | 160 (42.3)          | 160 (42.3)           | 85 (22.5)<br>160 (42.3) |
| "4"        | DSHG-03-2N4    | 160 (42.3)          | 160 (42.3)           | 85 (22.5)<br>160 (42.3) | DSHG-03-2B4    | 160 (42.3)          | 160 (42.3)           | 85 (22.5)<br>160 (42.3) |
| "40"       | DSHG-03-2N40   | 160 (42.3)          | 160 (42.3)           | 85 (22.5)<br>160 (42.3) | DSHG-03-2B40   | 160 (42.3)          | 160 (42.3)           | 85 (22.5)<br>160 (42.3) |
| "7"        | DSHG-03-2N7    | 160 (42.3)          | 160 (42.3)           | 85 (22.5)<br>160 (42.3) | DSHG-03-2B7    | 160 (42.3)          | 160 (42.3)           | 85 (22.5)<br>160 (42.3) |

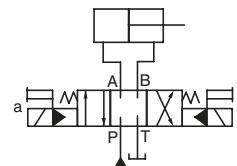
Notes: 1. The relation between max. flow and pilot pressure in the table above is as shown below.

(Example)

Maximum flow rate is constant regardless of pilot pressure.  
Pilot Pressure more than 0.7 MPa (100 PSI).

|            |                         |                                      |
|------------|-------------------------|--------------------------------------|
| 160 (42.3) | 85 (22.5)<br>160 (42.3) | Pilot Pressure at 0.7 MPa (100 PSI). |
|            |                         | Pilot Pressure at 1 MPa (150 PSI).   |

2. 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 valve is used in the condition that either A or B port is blocked, the maximum flow differs according to a hydraulic circuit, therefore, please consult us for details.



■ List of Spool Functions and Maximum Flow (DSHG-04/S-DSHG-04)

● Three Positions

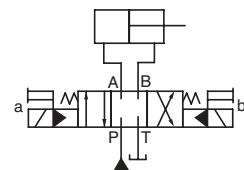
| Spool Type                                                                               | Spring Centred   |                                 |                      |                      |                        |
|------------------------------------------------------------------------------------------|------------------|---------------------------------|----------------------|----------------------|------------------------|
|                                                                                          | Graphic Symbol   | Maximum Flow<br>L/min (U.S.GPM) |                      |                      |                        |
|                                                                                          | Model Numbers    | 10 MPa<br>(1450 PSI)            | 16 MPa<br>(2320 PSI) | 25 MPa<br>(3630 PSI) | 31.5 MPa<br>(4570 PSI) |
| "2"     | DSHG-04-3C2      | 300 (79.3)                      | 300 (79.3)           | 200 (52.8)           | 145 (38.3)             |
|                                                                                          | (S-)DSHG-04-3C2  | 300 (79.3)                      | 250 (66.1)           | 120 (31.7)           | 110 (29.1)             |
| "3"     | DSHG-04-3C3      | 300 (79.3)                      | 300 (79.3)           | 300 (79.3)           | 300 (79.3)             |
| "4"     | DSHG-04-3C4      | 300 (79.3)                      | 300 (79.3)           | 250 (66.1)           | 165 (43.6)             |
|                                                                                          | (S-)DSHG-04-3C4  | 300 (79.3)                      | 300 (79.3)           | 140 (37.0)           | 110 (29.1)             |
| "40"    | DSHG-04-3C40     | 300 (79.3)                      | 300 (79.3)           | 200 (52.8)           | 145 (38.3)             |
|                                                                                          | (S-)DSHG-04-3C40 | 300 (79.3)                      | 250 (66.1)           | 120 (31.7)           | 110 (29.1)             |
| "5"     | DSHG-04-3C5      | 250 (66.1)                      | 250 (66.1)           | 245 (64.7)           | 245 (64.7)             |
| "6"     | DSHG-04-3C6      | 300 (79.3)                      | 260 (68.7)           | 245 (64.7)           | 235 (62.1)             |
| "60"    | DSHG-04-3C60     | 300 (79.3)                      | 300 (79.3)           | 300 (79.3)           | 300 (79.3)             |
|                                                                                          | (S-)DSHG-04-3C60 | 300 (79.3)                      | 300 (79.3)           | 300 (79.3)           | 300 (79.3)             |
| "7"   | DSHG-04-3C7      | 300 (79.3)                      | 300 (79.3)           | 200 (52.8)           | 145 (38.3)             |
| "9"   | DSHG-04-3C9      | 300 (79.3)                      | 300 (79.3)           | 280 (74.0)           | 250 (66.1)             |
| "10"  | DSHG-04-3C10     | 300 (79.3)                      | 300 (79.3)           | 200 (52.8)           | 150 (39.6)             |
|                                                                                          | (S-)DSHG-04-3C10 | 300 (79.3)                      | 250 (66.1)           | 120 (31.7)           | 110 (29.1)             |
| "11"  | DSHG-04-3C11     | 300 (79.3)                      | 260 (68.7)           | 160 (42.3)           | 140 (37.0)             |
| "12"  | DSHG-04-3C12     | 300 (79.3)                      | 280 (74.0)           | 170 (44.9)           | 135 (35.7)             |
|                                                                                          | (S-)DSHG-04-3C12 | 300 (79.3)                      | 250 (66.1)           | 120 (31.7)           | 110 (29.1)             |

● Two Positions

| Spool Type | No-Spring      |                      |                      |                      |                        | Spring Offset  |                      |                      |                      |                        |            |
|------------|----------------|----------------------|----------------------|----------------------|------------------------|----------------|----------------------|----------------------|----------------------|------------------------|------------|
|            | Graphic Symbol | Maximum Flow         |                      |                      |                        | Graphic Symbol | Maximum Flow         |                      |                      |                        |            |
|            | Model Numbers  | 10 MPa<br>(1450 PSI) | 16 MPa<br>(2320 PSI) | 25 MPa<br>(3630 PSI) | 31.5 MPa<br>(4570 PSI) | Model Numbers  | 10 MPa<br>(1450 PSI) | 16 MPa<br>(2320 PSI) | 25 MPa<br>(3630 PSI) | 31.5 MPa<br>(4570 PSI) |            |
| "2"        |                | (S-)DSHG-04-2N2      | 300 (79.3)           | 300 (79.3)           | 300 (79.3)             | 300 (79.3)     | (S-)DSHG-04-2B2      | 300 (79.3)           | 300 (79.3)           | 300 (79.3)             | 300 (79.3) |
| "3"        |                | DSHG-04-2N3          | 300 (79.3)           | 300 (79.3)           | 300 (79.3)             | 300 (79.3)     | DSHG-04-2B3          | 300 (79.3)           | 300 (79.3)           | 300 (79.3)             | 300 (79.3) |
| "4"        |                | (S-)DSHG-04-2N4      | 300 (79.3)           | 300 (79.3)           | 300 (79.3)             | 300 (79.3)     | (S-)DSHG-04-2B4      | 300 (79.3)           | 300 (79.3)           | 300 (79.3)             | 300 (79.3) |
| "40"       |                | (S-)DSHG-04-2N40     | 300 (79.3)           | 300 (79.3)           | 300 (79.3)             | 300 (79.3)     | (S-)DSHG-04-2B40     | 300 (79.3)           | 300 (79.3)           | 300 (79.3)             | 300 (79.3) |
| "7"        |                | DSHG-04-2N7          | 300 (79.3)           | 300 (79.3)           | 300 (79.3)             | 300 (79.3)     | DSHG-04-2B7          | 300 (79.3)           | 300 (79.3)           | 300 (79.3)             | 300 (79.3) |

Notes: 1. Max flow described above shown value at pilot pressure more than 0.8 MPa (120 PSI).

2. 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 valve is used in the condition that either A or B port is blocked, the maximum flow differs according to a hydraulic circuit, therefore, please consult us for details.



## List of Spool Functions and Maximum Flow (DSHG-06/S-DSHG-06)

### Three Positions

| Spool Type | Spring Centred   |                      |                      |                        |                         | Pressure Centred |                      |                      |                      |                        |
|------------|------------------|----------------------|----------------------|------------------------|-------------------------|------------------|----------------------|----------------------|----------------------|------------------------|
|            | Graphic Symbol   | Maximum Flow         |                      |                        |                         | Graphic Symbol   | Maximum Flow         |                      |                      |                        |
|            | Model Numbers    | 10 MPa<br>(1450 PSI) | 16 MPa<br>(2320 PSI) | 25 MPa<br>(3630 PSI)   | 31.5 MPa<br>(4570 PSI)  | Model Numbers    | 10 MPa<br>(1450 PSI) | 16 MPa<br>(2320 PSI) | 25 MPa<br>(3630 PSI) | 31.5 MPa<br>(4570 PSI) |
| "2"        | (S-)DSHG-06-3C2  | 500 (132)            | 500 (132)            | 410 (108)<br>500 (132) | 310 (81.9)<br>500 (132) | (S-)DSHG-06-3H2  | 500 (132)            | 500 (132)            | 500 (132)            | 420 (111)<br>500 (132) |
| "3"        | DSHG-06-3C3      | 500 (132)            | 500 (132)            | 460 (122)              | 370 (97.8)              | DSHG-06-3H3      | 500 (132)            | 500 (132)            | 500 (132)            | 500 (132)              |
| "4"        | (S-)DSHG-06-3C4  | 500 (132)            | 500 (132)            | 410 (108)<br>500 (132) | 310 (81.9)<br>500 (132) | (S-)DSHG-06-3H4  | 500 (132)            | 500 (132)            | 500 (132)            | 420 (111)<br>500 (132) |
| "40"       | (S-)DSHG-06-3C40 | 500 (132)            | 500 (132)            | 410 (108)<br>500 (132) | 310 (81.9)<br>500 (132) | (S-)DSHG-06-3H40 | 500 (132)            | 500 (132)            | 500 (132)            | 420 (111)<br>500 (132) |
| "5"        | DSHG-06-3C5      | 500 (132)            | 500 (132)            | 425 (112)              | 350 (92.5)              | DSHG-06-3H5      | 500 (132)            | 500 (132)            | 500 (132)            | 470 (124)<br>500 (132) |
| "6"        | DSHG-06-3C6      | 475 (125)            | 390 (103)            | 300 (79.3)             | 230 (60.8)              | DSHG-06-3H6      | 500 (132)            | 500 (132)            | 500 (132)            | 420 (111)<br>500 (132) |
| "60"       | (S-)DSHG-06-3C60 | 475 (125)            | 420 (111)            | 340 (89.8)             | 280 (74.0)              | (S-)DSHG-06-3H60 | 500 (132)            | 500 (132)            | 500 (132)            | 420 (111)<br>500 (132) |
| "7"        | DSHG-06-3C7      | 500 (132)            | 500 (132)            | 450 (119)              | 360 (95.1)              | DSHG-06-3H7      | 500 (132)            | 500 (132)            | 500 (132)            | 500 (132)              |
| "9"        | DSHG-06-3C9      | 500 (132)            | 500 (132)            | 450 (119)<br>500 (132) | 360 (95.1)<br>500 (132) | DSHG-06-3H9      | 500 (132)            | 500 (132)            | 500 (132)            | 500 (132)              |
| "10"       | (S-)DSHG-06-3C10 | 500 (132)            | 500 (132)            | 410 (108)<br>500 (132) | 310 (81.9)<br>500 (132) | (S-)DSHG-06-3H10 | 500 (132)            | 500 (132)            | 500 (132)            | 460 (122)<br>500 (132) |
| "11"       | DSHG-06-3C11     | 500 (132)            | 500 (132)            | 410 (108)<br>500 (132) | 310 (81.9)<br>500 (132) | DSHG-06-3H11     | 500 (132)            | 500 (132)            | 500 (132)            | 460 (122)<br>500 (132) |
| "12"       | (S-)DSHG-06-3C12 | 500 (132)            | 500 (132)            | 410 (108)<br>500 (132) | 310 (81.9)<br>500 (132) | (S-)DSHG-06-3H12 | 500 (132)            | 500 (132)            | 500 (132)            | 460 (122)<br>500 (132) |

### Two Positions

| Spool Type | No-Spring        |                      |                      |                      |                        | Spring Offset    |                      |                      |                      |                        |
|------------|------------------|----------------------|----------------------|----------------------|------------------------|------------------|----------------------|----------------------|----------------------|------------------------|
|            | Graphic Symbol   | Maximum Flow         |                      |                      |                        | Graphic Symbol   | Maximum Flow         |                      |                      |                        |
|            | Model Numbers    | 10 MPa<br>(1450 PSI) | 16 MPa<br>(2320 PSI) | 25 MPa<br>(3630 PSI) | 31.5 MPa<br>(4570 PSI) | Model Numbers    | 10 MPa<br>(1450 PSI) | 16 MPa<br>(2320 PSI) | 25 MPa<br>(3630 PSI) | 31.5 MPa<br>(4570 PSI) |
| "2"        | (S-)DSHG-06-2N2  | 500 (132)            | 500 (132)            | 500 (132)            | 500 (132)              | (S-)DSHG-06-2B2  | 500 (132)            | 500 (132)            | 500 (132)            | 500 (132)              |
| "3"        | DSHG-06-2N3      | 500 (132)            | 500 (132)            | 500 (132)            | 500 (132)              | DSHG-06-2B3      | 500 (132)            | 500 (132)            | 500 (132)            | 500 (132)              |
| "4"        | (S-)DSHG-06-2N4  | 500 (132)            | 500 (132)            | 500 (132)            | 500 (132)              | (S-)DSHG-06-2B4  | 500 (132)            | 500 (132)            | 500 (132)            | 500 (132)              |
| "40"       | (S-)DSHG-06-2N40 | 500 (132)            | 500 (132)            | 500 (132)            | 500 (132)              | (S-)DSHG-06-2B40 | 500 (132)            | 500 (132)            | 500 (132)            | 500 (132)              |
| "7"        | DSHG-06-2N7      | 500 (132)            | 500 (132)            | 500 (132)            | 500 (132)              | DSHG-06-2B7      | 500 (132)            | 500 (132)            | 500 (132)            | 500 (132)              |

Notes: 1. The relation between max. flow and pilot pressure in the table above is as shown below.

(Example)

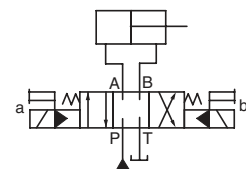
Maximum flow rate is constant regardless of pilot pressure.  
Pilot Pressure more than 0.8 MPa (120 PSI).  
In case pressure centred models, pilot pressure is more than 1 MPa (150 PSI).

|           |           |
|-----------|-----------|
| 500 (132) | 410 (108) |
|           | 500 (132) |

Pilot Pressure at 0.8 MPa (120 PSI).  
In case pressure centred models, pilot pressure is more than 1 MPa (150 PSI)

Pilot Pressure at 1.5 MPa (220 PSI).

2. 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 valve is used in the condition that either A or B port is blocked, the maximum flow differs according to a hydraulic circuit, therefore, please consult us for details.



■ List of Spool Functions and Maximum Flow (DSHG-010/S-DSHG-10)

● Three Positions

| Spool Type | Spring Centred   |                      |                      |                          |                         | Pressure Centred |                      |                      |                      |                          |
|------------|------------------|----------------------|----------------------|--------------------------|-------------------------|------------------|----------------------|----------------------|----------------------|--------------------------|
|            | Graphic Symbol   | Maximum Flow         |                      |                          |                         | Graphic Symbol   | Maximum Flow         |                      |                      |                          |
|            | Model Numbers    | 10 MPa<br>(1450 PSI) | 16 MPa<br>(2320 PSI) | 25 MPa<br>(3630 PSI)     | 31.5 MPa<br>(4570 PSI)  | Model Numbers    | 10 MPa<br>(1450 PSI) | 16 MPa<br>(2320 PSI) | 25 MPa<br>(3630 PSI) | 31.5 MPa<br>(4570 PSI)   |
| "2"        | (S-)DSHG-10-3C2  | 1100 (291)           | 1100 (291)           | 950 (251)<br>1100 (291)  | 750 (198)<br>1100 (291) | (S-)DSHG-10-3H2  | 1100 (291)           | 1100 (291)           | 1100 (291)           | 970 (256)<br>1100 (291)  |
| "3"        | DSHG-10-3C3      | 1100 (291)           | 1100 (291)           | 1060 (280)               | 895 (236)               | DSHG-10-3H3      | 1100 (291)           | 1100 (291)           | 1100 (291)           | 1050 (277)<br>1100 (291) |
| "4"        | (S-)DSHG-10-3C4  | 1100 (291)           | 1100 (291)           | 950 (251)<br>1100 (291)  | 750 (198)<br>1100 (291) | (S-)DSHG-10-3H4  | 1100 (291)           | 1100 (291)           | 1100 (291)           | 970 (256)<br>1100 (291)  |
| "40"       | (S-)DSHG-10-3C40 | 1100 (291)           | 1100 (291)           | 950 (251)<br>1100 (291)  | 750 (198)<br>1100 (291) | (S-)DSHG-10-3H40 | 1100 (291)           | 1100 (291)           | 1100 (291)           | 970 (256)<br>1100 (291)  |
| "5"        | DSHG-10-3C5      | 1100 (291)           | 1100 (291)           | 980 (259)                | 850 (225)               | DSHG-10-3H5      | 1100 (291)           | 1100 (291)           | 1100 (291)           | 1000 (264)<br>1100 (291) |
| "6"        | DSHG-10-3C6      | 1050 (277)           | 880 (232)            | 700 (185)                | 570 (151)               | DSHG-10-3H6      | 1100 (291)           | 1100 (291)           | 1100 (291)           | 970 (256)<br>1100 (291)  |
| "60"       | (S-)DSHG-10-3C60 | 1050 (277)           | 940 (248)            | 785 (207)                | 680 (180)               | (S-)DSHG-10-3H60 | 1100 (291)           | 1100 (291)           | 1100 (291)           | 970 (256)<br>1100 (291)  |
| "7"        | DSHG-10-3C7      | 1100 (291)           | 1100 (291)           | 1040 (275)<br>1100 (291) | 870 (230)<br>1100 (291) | DSHG-10-3H7      | 1100 (291)           | 1100 (291)           | 1100 (291)           | 1100 (291)               |
| "9"        | DSHG-10-3C9      | 1100 (291)           | 1100 (291)           | 1040 (275)               | 870 (230)               | DSHG-10-3H9      | 1100 (291)           | 1100 (291)           | 1100 (291)           | 1100 (291)               |
| "10"       | (S-)DSHG-10-3C10 | 1100 (291)           | 1100 (291)           | 950 (251)<br>1100 (291)  | 750 (198)<br>1100 (291) | (S-)DSHG-10-3H10 | 1100 (291)           | 1100 (291)           | 1100 (291)           | 1060 (280)<br>1100 (291) |
| "11"       | DSHG-10-3C11     | 1100 (291)           | 1100 (291)           | 950 (251)<br>1100 (291)  | 750 (198)<br>1100 (291) | DSHG-10-3H11     | 1100 (291)           | 1100 (291)           | 1100 (291)           | 1060 (280)<br>1100 (291) |
| "12"       | (S-)DSHG-10-3C12 | 1100 (291)           | 1100 (291)           | 950 (251)<br>1100 (291)  | 750 (198)<br>1100 (291) | (S-)DSHG-10-3H12 | 1100 (291)           | 1100 (291)           | 1100 (291)           | 1060 (280)<br>1100 (291) |

● Two Positions

| Spool Type | No-Spring        |                      |                      |                      |                        | Spring Offset    |                      |                      |                      |                        |
|------------|------------------|----------------------|----------------------|----------------------|------------------------|------------------|----------------------|----------------------|----------------------|------------------------|
|            | Graphic Symbol   | Maximum Flow         |                      |                      |                        | Graphic Symbol   | Maximum Flow         |                      |                      |                        |
|            | Model Numbers    | 10 MPa<br>(1450 PSI) | 16 MPa<br>(2320 PSI) | 25 MPa<br>(3630 PSI) | 31.5 MPa<br>(4570 PSI) | Model Numbers    | 10 MPa<br>(1450 PSI) | 16 MPa<br>(2320 PSI) | 25 MPa<br>(3630 PSI) | 31.5 MPa<br>(4570 PSI) |
| "2"        | (S-)DSHG-10-2N2  | 1100 (291)           | 1100 (291)           | 1100 (291)           | 1100 (291)             | (S-)DSHG-10-2B2  | 1100 (291)           | 1100 (291)           | 1100 (291)           | 1100 (291)             |
| "3"        | DSHG-10-2N3      | 1100 (291)           | 1100 (291)           | 1100 (291)           | 1100 (291)             | DSHG-10-2B3      | 1100 (291)           | 1100 (291)           | 1100 (291)           | 1100 (291)             |
| "4"        | (S-)DSHG-10-2N4  | 1100 (291)           | 1100 (291)           | 1100 (291)           | 1100 (291)             | (S-)DSHG-10-2B4  | 1100 (291)           | 1100 (291)           | 1100 (291)           | 1100 (291)             |
| "40"       | (S-)DSHG-10-2N40 | 1100 (291)           | 1100 (291)           | 1100 (291)           | 1100 (291)             | (S-)DSHG-10-2B40 | 1100 (291)           | 1100 (291)           | 1100 (291)           | 1100 (291)             |
| "7"        | DSHG-10-2N7      | 1100 (291)           | 1100 (291)           | 1100 (291)           | 1100 (291)             | DSHG-10-2B7      | 1100 (291)           | 1100 (291)           | 1100 (291)           | 1100 (291)             |

Notes ) 1. The relation between max. flow and pilot pressure in the table above is as shown below.

(Example)

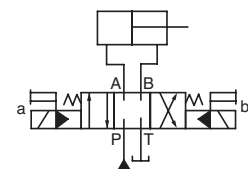
Maximum flow rate is constant regardless of pilot pressure.  
Pilot Pressure more than 1 MPa (150 PSI).

|            |            |
|------------|------------|
| 1100 (291) | 1040 (275) |
|            | 1100 (291) |

Pilot Pressure at 1 MPa (150 PSI).

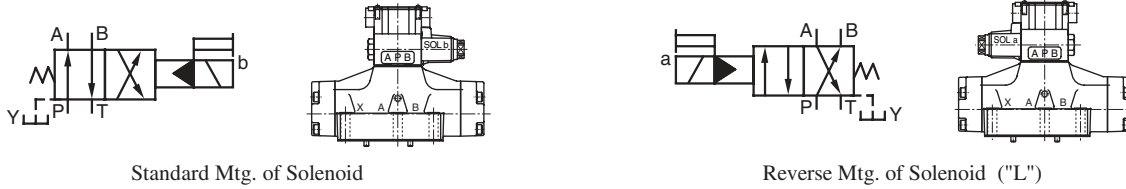
Pilot Pressure at 1.5 MPa (220 PSI).

2. 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 valve is used in the condition that either A or B port is blocked, the maximum flow differs according to a hydraulic circuit, therefore, please consult us for details.



## Reverse Mounting of Solenoid.

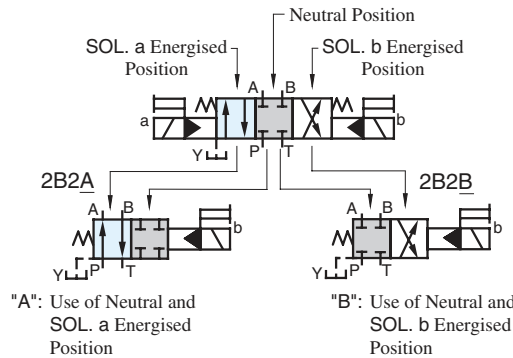
In spring offset type, it is a standard configuration that the solenoid is mounted onto the valve in the SOL b position (side). However, in this particular spool-spring arrangement, the mounting of the solenoid onto the valve in the reverse position - SOL a side - is also available. The graphic symbol for this reverse mounting is as shown below. As for the valve type 2B\*A and 2B\*B, please refer to the explanation under the heading of "Valves Using Neutral Position and Side Position" given below.



## Valves Using Neutral Position and Side Position. (Special Two position Valve)

Besides the use of the standard 2-position valves aforementioned in the "List of Standard Models and Maximum Flow", the 3-position valves also can be used as the 2-position valves using the two of their three positions. In this case, there are two kinds of the valve available. One is the valve using the neutral position and SOL a position (2B\*A) and another is the valve using the neutral position and SOL b position (2B\*B).

(Example) In case of Spool Type "2"



| Model Numbers            | Graphic Symbols |                   |
|--------------------------|-----------------|-------------------|
|                          | Standard Mtg.   | Reverse Mtg. Type |
| 04<br>DSHG-06-2B*A<br>10 |                 |                   |
| (S-)DSHG-*-2B2A          |                 |                   |
| DSHG-*-2B3A              |                 |                   |
| (S-)DSHG-*-2B4A          |                 |                   |
| (S-)DSHG-*-2B40A         |                 |                   |
| DSHG-*-2B5A              |                 |                   |
| DSHG-*-2B6A              |                 |                   |
| (S-)DSHG-*-2B60A         |                 |                   |
| DSHG-*-2B7A              |                 |                   |
| DSHG-*-2B9A              |                 |                   |
| (S-)DSHG-*-2B10A         |                 |                   |
| DSHG-*-2B11A             |                 |                   |
| (S-)DSHG-*-2B12A         |                 |                   |

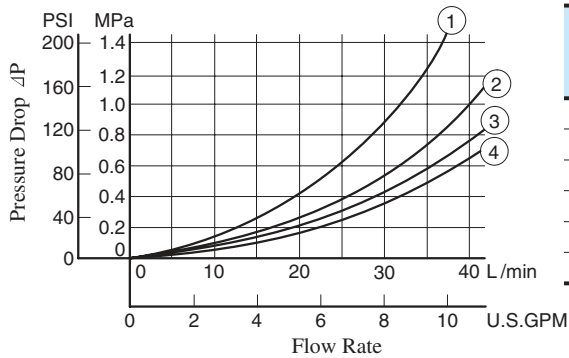
| Model Numbers            | Graphic Symbols |                   |
|--------------------------|-----------------|-------------------|
|                          | Standard Mtg.   | Reverse Mtg. Type |
| 04<br>DSHG-06-2B*B<br>10 |                 |                   |
| (S-)DSHG-*-2B2B          |                 |                   |
| DSHG-*-2B3B              |                 |                   |
| (S-)DSHG-*-2B4B          |                 |                   |
| (S-)DSHG-*-2B40B         |                 |                   |
| DSHG-*-2B5B              |                 |                   |
| DSHG-*-2B6B              |                 |                   |
| (S-)DSHG-*-2B60B         |                 |                   |
| DSHG-*-2B7B              |                 |                   |
| DSHG-*-2B9B              |                 |                   |
| (S-)DSHG-*-2B10B         |                 |                   |
| DSHG-*-2B11B             |                 |                   |
| (S-)DSHG-*-2B12B         |                 |                   |

| Model Numbers            | Graphic Symbols |                   |
|--------------------------|-----------------|-------------------|
|                          | Standard Mtg.   | Reverse Mtg. Type |
| 04<br>DSHG-06-2N*A<br>10 |                 |                   |
| (S-)DSHG-*-2N2A          |                 |                   |
| DSHG-*-2N3A              |                 |                   |
| (S-)DSHG-*-2N4A          |                 |                   |
| (S-)DSHG-*-2N40A         |                 |                   |
| DSHG-*-2N5A              |                 |                   |
| DSHG-*-2N6A              |                 |                   |
| (S-)DSHG-*-2N60A         |                 |                   |
| DSHG-*-2N7A              |                 |                   |
| DSHG-*-2N9A              |                 |                   |
| (S-)DSHG-*-2N10A         |                 |                   |
| DSHG-*-2N11A             |                 |                   |
| (S-)DSHG-*-2N12A         |                 |                   |

## Pressure Drop

Pressure drop curves based on viscosity of 35 mm<sup>2</sup>/s (164 SSU) and specific gravity of 0.850.

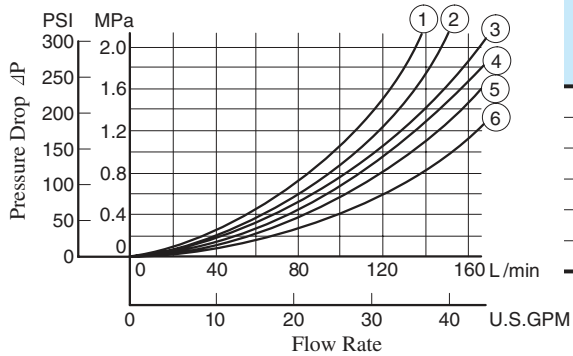
### DSHG-01



### DSHG-01

| Spool Type | Pressure Drop Curve Numbers |     |     |     |     | Spool Type | Pressure Drop Curve Numbers |     |     |     |     |
|------------|-----------------------------|-----|-----|-----|-----|------------|-----------------------------|-----|-----|-----|-----|
|            | P→A                         | B→T | P→B | A→T | P→T |            | P→A                         | B→T | P→B | A→T | P→T |
| 2          | (3)                         | (2) | (3) | (2) | —   | 7          | (3)                         | (2) | (3) | (2) | —   |
| 3          | (4)                         | (2) | (4) | (2) | (2) | 9          | (4)                         | (2) | (4) | (2) | —   |
| 4          | (3)                         | (2) | (3) | (2) | —   | 10         | (3)                         | (2) | (3) | (2) | —   |
| 40         | (3)                         | (2) | (3) | (2) | —   | 11         | (3)                         | (2) | (3) | (2) | —   |
| 5          | (3)                         | (2) | (3) | (2) | (1) | 12         | (3)                         | (2) | (3) | (2) | —   |
| 60         | (3)                         | (2) | (3) | (2) | (1) |            |                             |     |     |     |     |

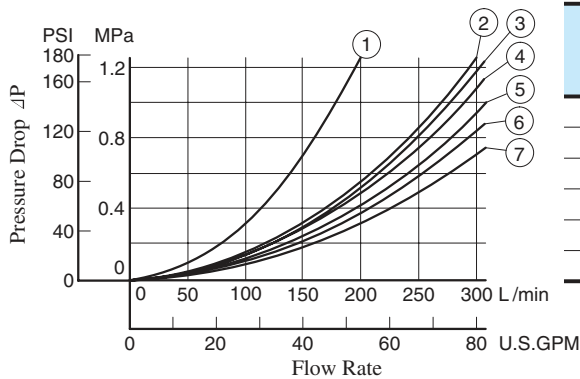
### DSHG-03



### DSHG-03

| Spool Type | Pressure Drop Curve Numbers |     |     |     |     | Spool Type | Pressure Drop Curve Numbers |     |     |     |     |
|------------|-----------------------------|-----|-----|-----|-----|------------|-----------------------------|-----|-----|-----|-----|
|            | P→A                         | B→T | P→B | A→T | P→T |            | P→A                         | B→T | P→B | A→T | P→T |
| 2          | (3)                         | (3) | (4) | (4) | —   | 7          | (3)                         | (3) | (4) | (4) | —   |
| 3          | (5)                         | (5) | (5) | (6) | (4) | 9          | (6)                         | (3) | (6) | (4) | —   |
| 4          | (3)                         | (5) | (4) | (6) | —   | 10         | (3)                         | (5) | (4) | (4) | —   |
| 40         | (3)                         | (3) | (4) | (4) | —   | 11         | (6)                         | (3) | (4) | (4) | —   |
| 5          | (6)                         | (3) | (4) | (6) | (2) | 12         | (3)                         | (3) | (4) | (6) | —   |
| 60         | (3)                         | (3) | (4) | (4) | (1) |            |                             |     |     |     |     |

### DSHG-04, S-DSHG-04



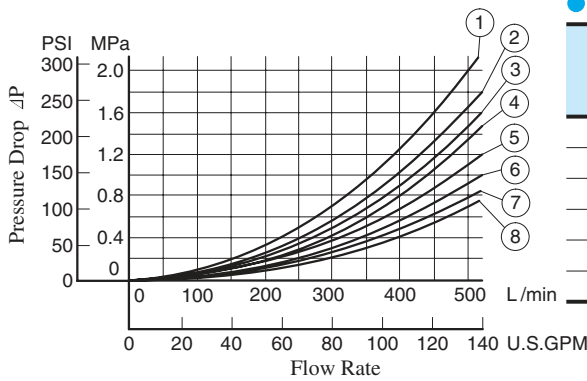
### DSHG-04

| Spool Type | Pressure Drop Curve Numbers |     |     |     |     | Spool Type | Pressure Drop Curve Numbers |     |     |     |     |
|------------|-----------------------------|-----|-----|-----|-----|------------|-----------------------------|-----|-----|-----|-----|
|            | P→A                         | B→T | P→B | A→T | P→T |            | P→A                         | B→T | P→B | A→T | P→T |
| 2          | (5)                         | (4) | (5) | (6) | —   | 60         | (7)                         | (5) | (7) | (7) | (2) |
| 3          | (5)                         | (3) | (5) | (5) | (7) | 7          | (5)                         | (4) | (5) | (6) | —   |
| 4          | (5)                         | (3) | (5) | (5) | —   | 9          | (5)                         | (4) | (5) | (6) | —   |
| 40         | (5)                         | (4) | (5) | (6) | —   | 10         | (5)                         | (2) | (5) | (6) | —   |
| 5          | (7)                         | (4) | (5) | (5) | (5) | 11         | (6)                         | (4) | (5) | (6) | —   |
| 6          | (5)                         | (3) | (5) | (6) | (1) | 12         | (5)                         | (4) | (5) | (5) | —   |

### S-DSHG-04

| Spool Type | Pressure Drop Curve Numbers |     |     |     |     | Spool Type | Pressure Drop Curve Numbers |     |     |     |     |
|------------|-----------------------------|-----|-----|-----|-----|------------|-----------------------------|-----|-----|-----|-----|
|            | P→A                         | B→T | P→B | A→T | P→T |            | P→A                         | B→T | P→B | A→T | P→T |
| 2          | (2)                         | (2) | (2) | (4) | —   | 60         | (6)                         | (4) | (6) | (7) | (2) |
| 4          | (2)                         | (3) | (2) | (5) | —   | 10         | (2)                         | (2) | (2) | (4) | —   |
| 40         | (2)                         | (4) | (2) | (6) | —   | 12         | (2)                         | (2) | (2) | (5) | —   |

## DSHG-06, S-DSHG-06



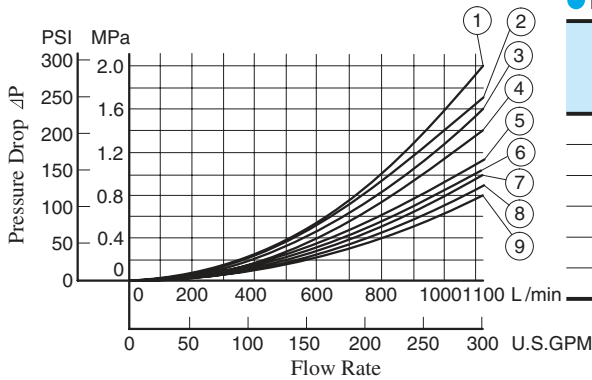
### DSHG-06

| Spool Type | Pressure Drop Curve Numbers |     |     |     |     | Spool Type | Pressure Drop Curve Numbers |     |     |     |     |
|------------|-----------------------------|-----|-----|-----|-----|------------|-----------------------------|-----|-----|-----|-----|
|            | P→A                         | B→T | P→B | A→T | P→T |            | P→A                         | B→T | P→B | A→T | P→T |
| 2          | (8)                         | (5) | (8) | (7) | —   | 60         | (6)                         | (5) | (6) | (7) | (1) |
| 3          | (6)                         | (4) | (6) | (7) | (4) | 7          | (6)                         | (4) | (6) | (7) | —   |
| 4          | (8)                         | (5) | (8) | (7) | —   | 9          | (6)                         | (5) | (6) | (7) | —   |
| 40         | (8)                         | (5) | (8) | (7) | —   | 10         | (8)                         | (5) | (8) | (7) | —   |
| 5          | (8)                         | (4) | (5) | (7) | (1) | 11         | (8)                         | (4) | (5) | (7) | —   |
| 6          | (5)                         | (3) | (5) | (4) | (1) | 12         | (8)                         | (5) | (8) | (7) | —   |

### S-DSHG-06

| Spool Type | Pressure Drop Curve Numbers |     |     |     |     | Spool Type | Pressure Drop Curve Numbers |     |     |     |     |
|------------|-----------------------------|-----|-----|-----|-----|------------|-----------------------------|-----|-----|-----|-----|
|            | P→A                         | B→T | P→B | A→T | P→T |            | P→A                         | B→T | P→B | A→T | P→T |
| 2          | (6)                         | (1) | (6) | (2) | —   | 60         | (6)                         | (2) | (6) | (3) | (1) |
| 4          | (6)                         | (2) | (6) | (2) | —   | 10         | (8)                         | (5) | (8) | (7) | —   |
| 40         | (8)                         | (5) | (8) | (7) | —   | 12         | (8)                         | (5) | (8) | (7) | —   |

## DSHG-10, S-DSHG-10



### DSHG-10

| Spool Type | Pressure Drop Curve Numbers |     |     |     |     | Spool Type | Pressure Drop Curve Numbers |     |     |     |     |
|------------|-----------------------------|-----|-----|-----|-----|------------|-----------------------------|-----|-----|-----|-----|
|            | P→A                         | B→T | P→B | A→T | P→T |            | P→A                         | B→T | P→B | A→T | P→T |
| 2          | (9)                         | (6) | (9) | (8) | —   | 60         | (8)                         | (5) | (8) | (5) | (3) |
| 3          | (7)                         | (6) | (7) | (7) | (5) | 7          | (7)                         | (6) | (7) | (7) | —   |
| 4          | (9)                         | (6) | (9) | (6) | —   | 9          | (7)                         | (6) | (7) | (8) | —   |
| 40         | (9)                         | (6) | (9) | (8) | —   | 10         | (9)                         | (5) | (9) | (8) | —   |
| 5          | (9)                         | (6) | (8) | (6) | (1) | 11         | (9)                         | (6) | (8) | (7) | —   |
| 6          | (5)                         | (3) | (5) | (2) | (2) | 12         | (9)                         | (7) | (9) | (6) | —   |

### S-DSHG-10

| Spool Type | Pressure Drop Curve Numbers |     |     |     |     | Spool Type | Pressure Drop Curve Numbers |     |     |     |     |
|------------|-----------------------------|-----|-----|-----|-----|------------|-----------------------------|-----|-----|-----|-----|
|            | P→A                         | B→T | P→B | A→T | P→T |            | P→A                         | B→T | P→B | A→T | P→T |
| 2          | (8)                         | (3) | (8) | (4) | —   | 60         | (8)                         | (4) | (8) | (4) | (2) |
| 4          | (8)                         | (5) | (8) | (6) | —   | 10         | (9)                         | (5) | (9) | (8) | —   |
| 40         | (9)                         | (6) | (9) | (8) | —   | 12         | (9)                         | (7) | (9) | (6) | —   |

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

| Viscosity | mm <sup>2</sup> /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 (ΔP') may be obtained from the formula right.

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

## Typical Changeover Time

Changeover time varies according to oil viscosity, spool type and hydraulic circuit.

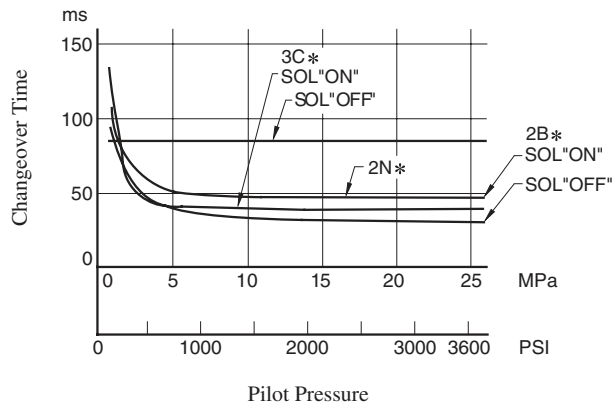
### Test Conditions

Coil Type : D\*(Models with DC solenoids)

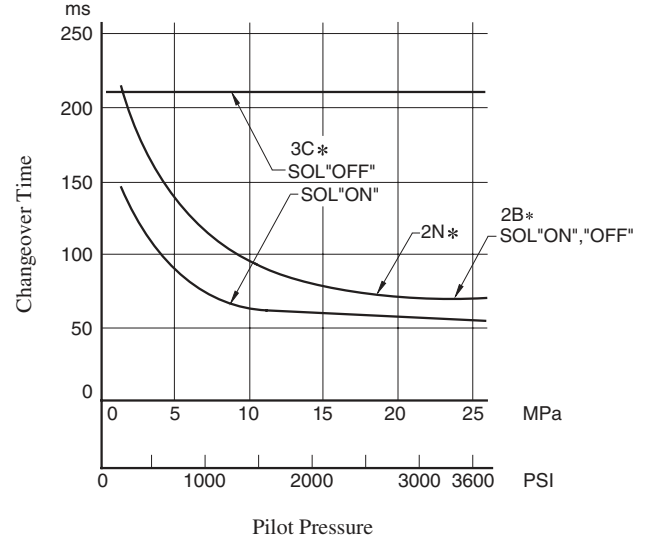
Voltage : Rated Voltage

Oil Viscosity : 35 mm<sup>2</sup>/s (164 SSU)

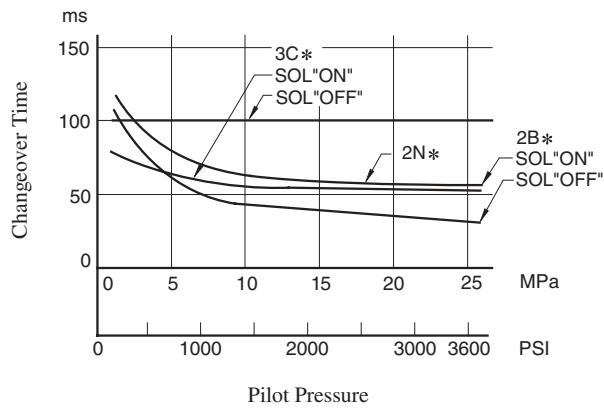
### DSHG-04



### DSHG-10



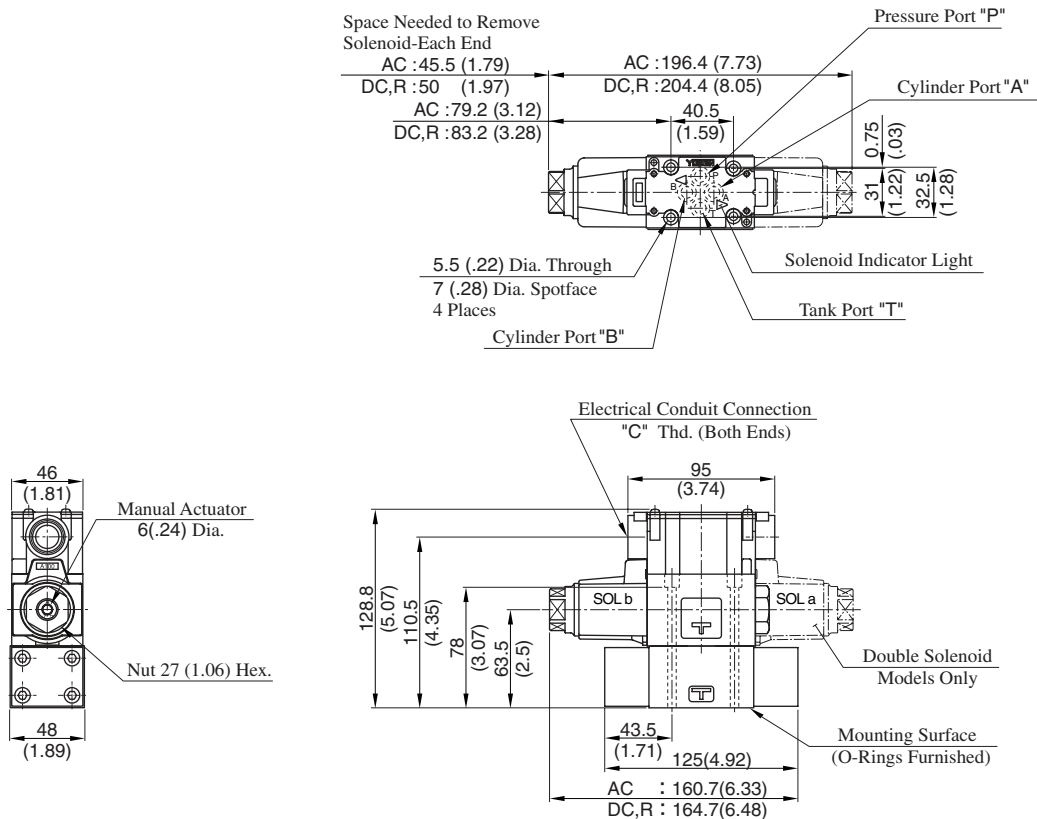
### DSHG-06



■ Terminal Box type: DSHG-01-\*\*\*-\*-14/1490

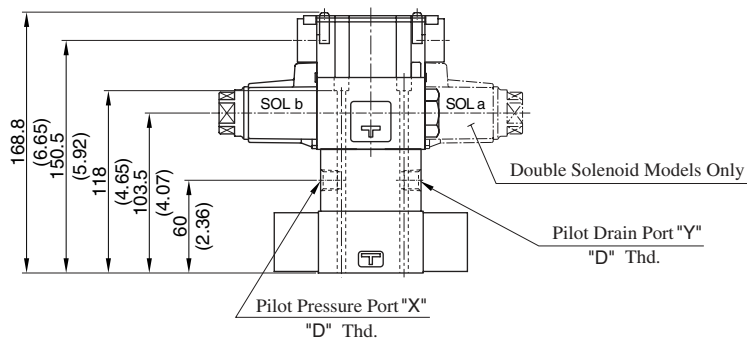
Mounting surface: ISO 4401-AB-03-4-A

● Internal Pilot - Internal Drain



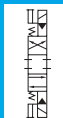
DIMENSIONS IN  
MILLIMETRES (INCHES)

- External Pilot - External Drain
- External Pilot - Internal Drain
- Internal Pilot - External Drain



● For other dimensions, refer to "Internal Pilot Internal Drain".

F

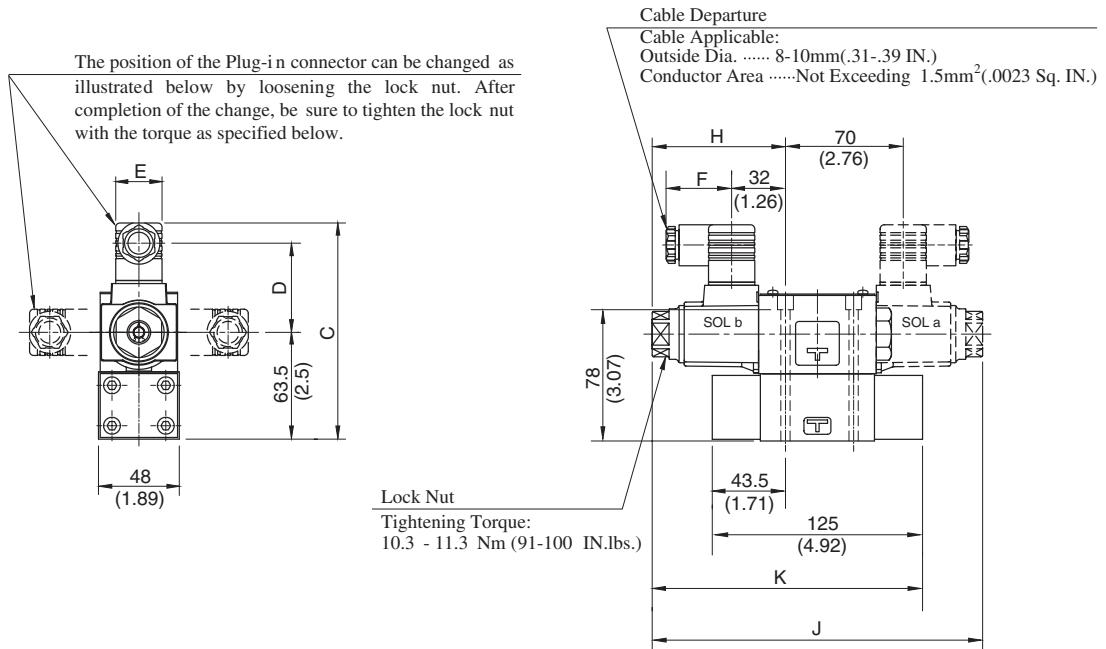


Solenoid Controlled  
Pilot Operated Directional Valves

■ Plug-in Connector Type: DSHG-01-\*\*\*-N<sub>1</sub>-14/1480/1490

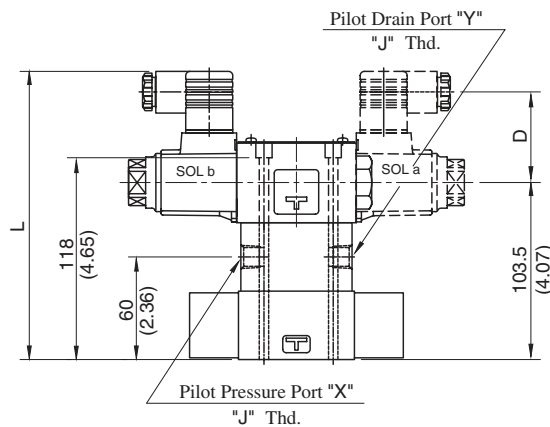
Mounting surface: ISO 4401-AB-03-4-A

● Internal Pilot-Internal Drain



DIMENSIONS IN  
MILLIMETRES (INCHES)

- External Pilot-External Drain
- External Pilot-Internal Drain
- Internal Pilot-External Drain



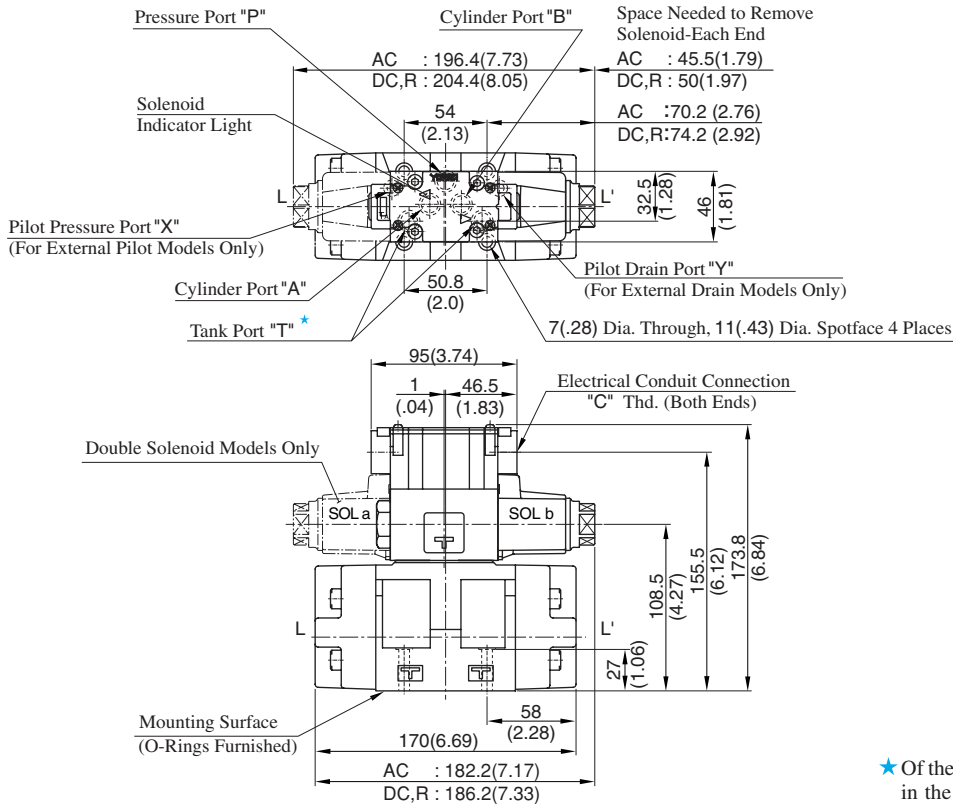
| Model Numbers       | "J" Thd.  |
|---------------------|-----------|
| DSHG-01-***-N*-14   | Rc 1/4    |
| DSHG-01-***-N*-1480 | 1/4 BSP.F |
| DSHG-01-***-N*-1490 | 1/4 NPT   |

| Model Numbers       | Dimensions mm (Inches) |             |             |           |             |              |              |              |
|---------------------|------------------------|-------------|-------------|-----------|-------------|--------------|--------------|--------------|
|                     | C                      | D           | E           | F         | H           | J            | K            | L            |
| DSHG-01-***-A*-N/N1 | 128.5 (5.06)           | 53 (2.09)   | 27.5 (1.08) | 39 (1.54) | 79.2 (3.12) | 196.4 (7.73) | 160.7 (6.33) | 168.5 (6.63) |
| DSHG-01-***-D*-N/N1 | 139.5 (5.49)           | 64 (2.52)   | 27.5 (1.08) | 39 (1.54) | 83.2 (3.28) | 204.4 (8.05) | 164.7 (6.48) | 179.5 (7.07) |
| DSHG-01-***-R*-N    | 142.5 (5.61)           | 57.2 (2.25) | 34 (1.34)   | 53 (2.09) |             |              |              | 182.5 (7.19) |

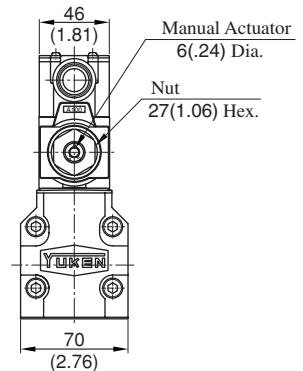
● For other dimensions, refer to "Terminal Box Type".

## Terminal Box Type: DSHG-03-\*\*\*-\*-14/1490

Mounting surface: ISO 4401-AC-05-4-A  
(The pilot and drain ports in accordance with the ISO original draft)



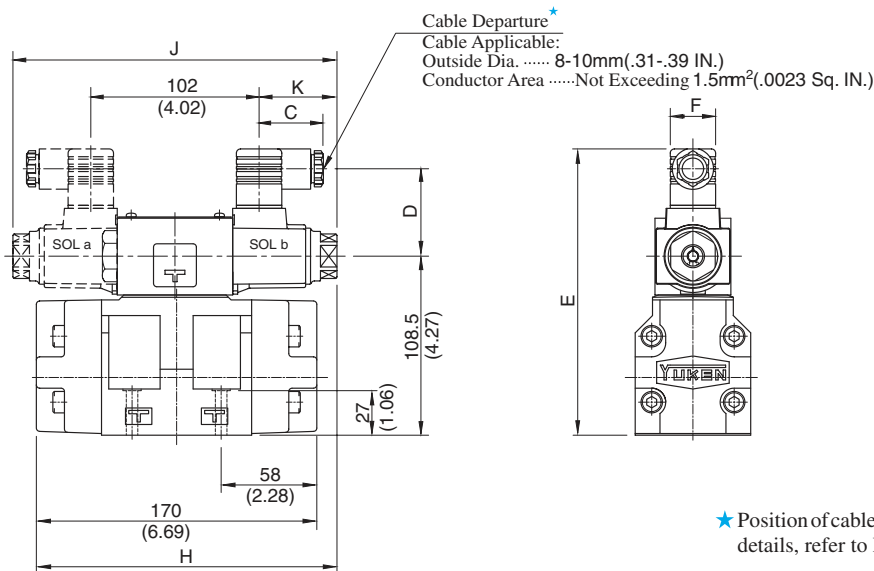
| Model Numbers      | "C" Thd. |
|--------------------|----------|
| DSHG-03-***-*-14   | G 1/2    |
| DSHG-03-***-*-1490 | 1/2 NPT  |



★ Of the two of tank port "T", the tank port in the left side is normally used in our standard sub-plate, though, either side of the tank port "T" can be used without problem.

**DIMENSIONS IN  
MILLIMETRES (INCHES)**

## Plug-in Connector Type: DSHG-03-\*\*\*-\*-N<sub>1</sub>-14/1490



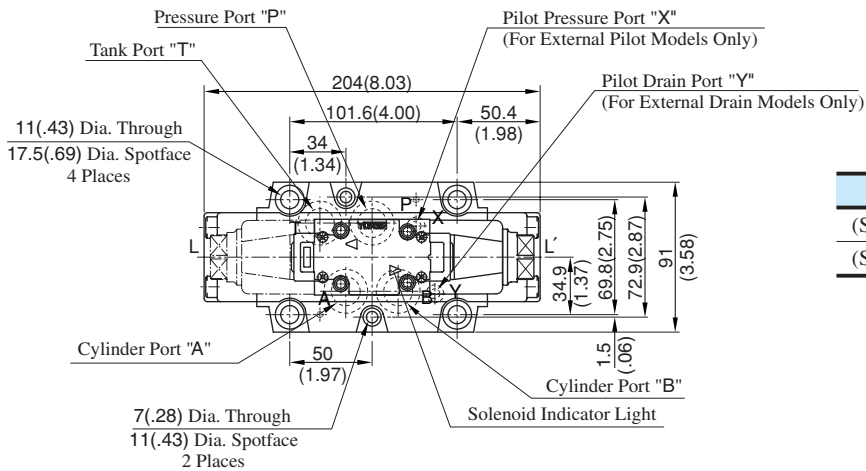
★ Position of cable departure can be changed. For details, refer to DSHG-01 valve on [page 396](#).

| Model Numbers         | Dimensions mm (Inches) |             |              |             |              |              |             |
|-----------------------|------------------------|-------------|--------------|-------------|--------------|--------------|-------------|
|                       | C                      | D           | E            | F           | H            | J            | K           |
| DSHG-03-***-*-A*-N/N1 | 39 (1.54)              | 53 (2.09)   | 173.5 (6.83) | 27.5 (1.08) | 182.2 (7.17) | 196.4 (7.73) | 47.2 (1.86) |
| DSHG-03-***-*-D*-N/N1 | 39 (1.54)              | 64 (2.52)   | 184.5 (7.26) | 27.5 (1.08) | 186.2 (7.33) | 204.4 (8.05) | 51.2 (2.02) |
| DSHG-03-***-*-R*-N    | 53 (2.09)              | 57.2 (2.25) | 187.5 (7.38) | 34 (1.34)   |              |              |             |

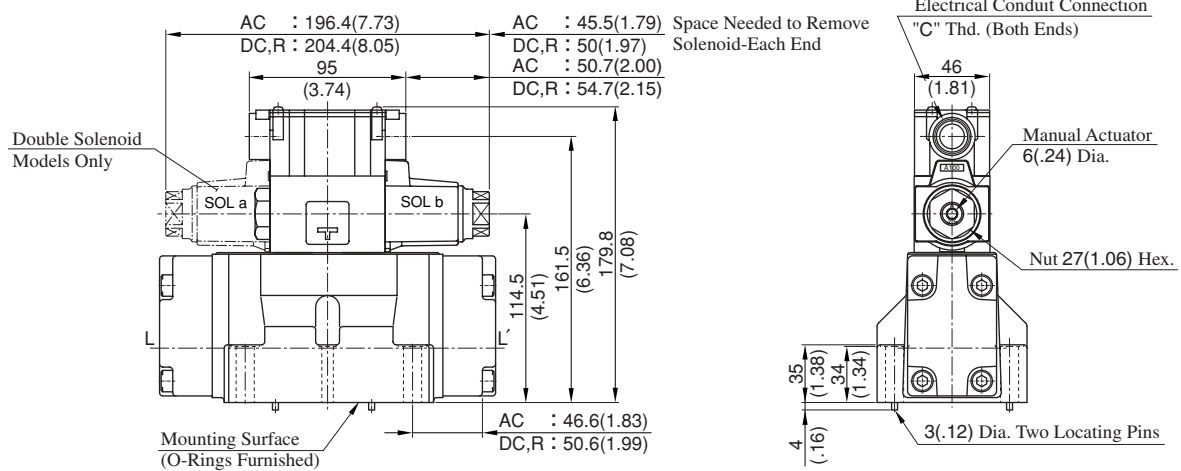
• For other dimensions, refer to "Terminal Box Type".

■ Terminal Box Type: (S-)DSHG-04-\*\*\*-\*-52/5290

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

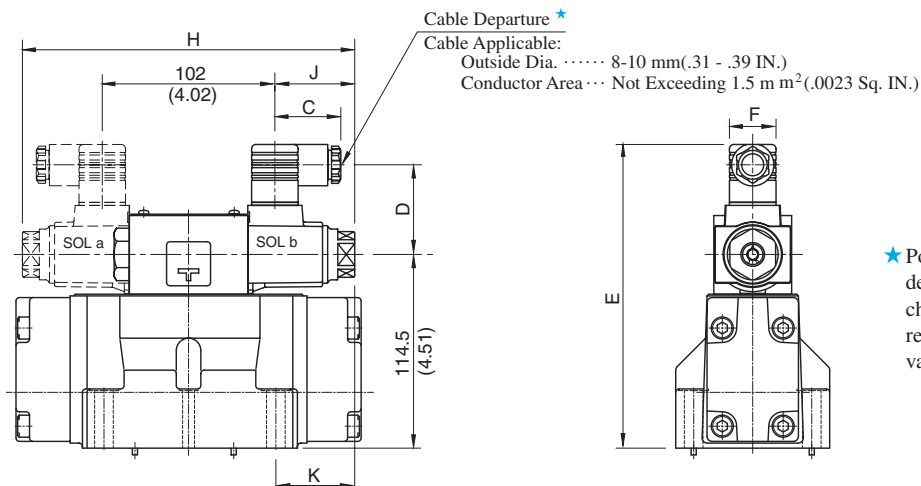


| Model Numbers          | "C" Thd. |
|------------------------|----------|
| (S-)DSHG-04-***-*-52   | G 1/2    |
| (S-)DSHG-04-***-*-5290 | 1/2 NPT  |



DIMENSIONS IN  
MILLIMETRES (INCHES)

■ Plug-in Connector Type: (S-)DSHG-04-\*\*\*-\*-N<sub>1</sub>-52/5290



★ Position of cable departure can be changed. For details, refer to DSHG-01 valve on [page 396](#).

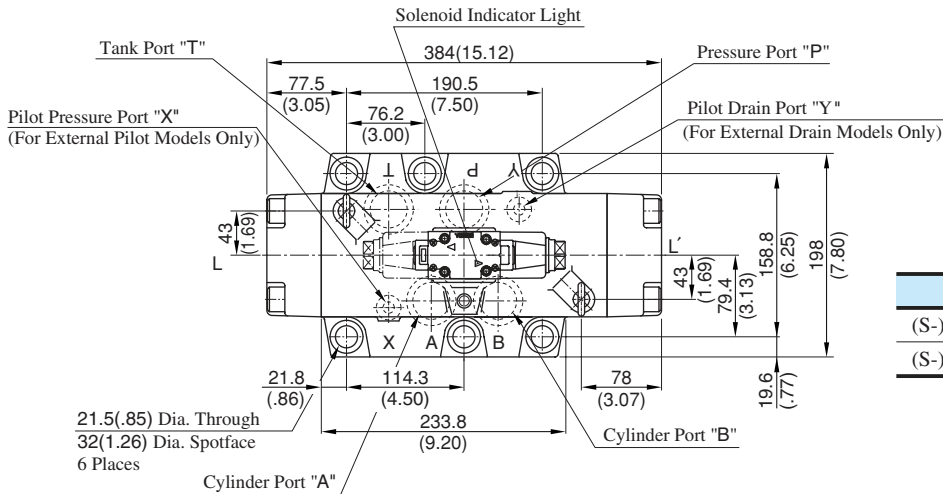
| Model Numbers           | Dimensions mm (Inches) |             |              |             |              |             |             |
|-------------------------|------------------------|-------------|--------------|-------------|--------------|-------------|-------------|
|                         | C                      | D           | E            | F           | H            | J           | K           |
| (S-)DSHG-04-***-A*-N/N1 | 39 (1.54)              | 53 (2.09)   | 173.5 (6.83) | 27.5 (1.08) | 196.4 (7.73) | 47.2 (1.86) | 45.6 (1.80) |
| (S-)DSHG-04-***-D*-N/N1 | 39 (1.54)              | 64 (2.52)   | 184.5 (7.26) | 27.5 (1.08) | 204.4 (8.05) | 51.2 (2.02) | 49.6 (1.95) |
| (S-)DSHG-04-***-R*-N    | 53 (2.09)              | 57.2 (2.25) | 187.6 (7.39) | 34 (1.34)   |              |             |             |

● For other dimensions, refer to "Terminal Box Type".

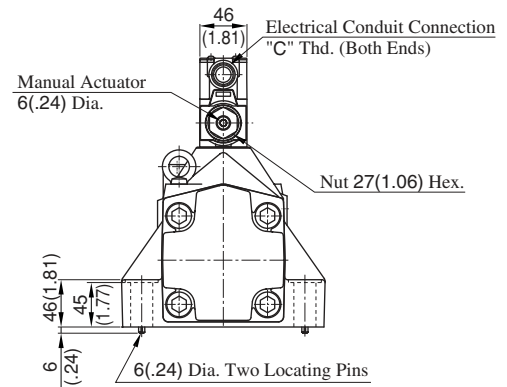
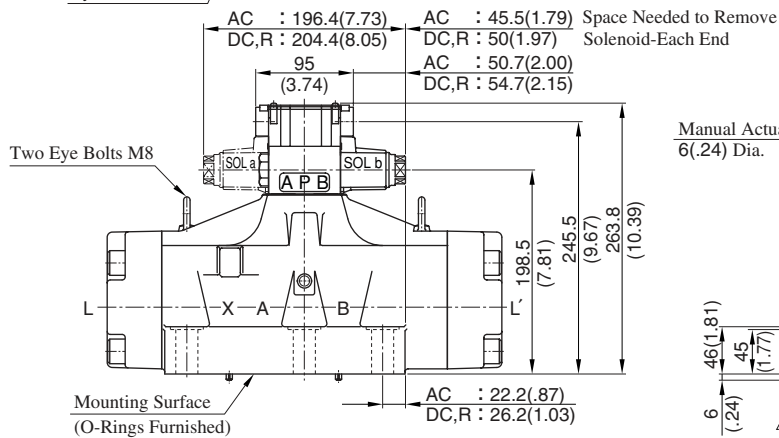


■ Terminal Box Type: (S-)DSHG-10-\*\*\*-\*-43/4390

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

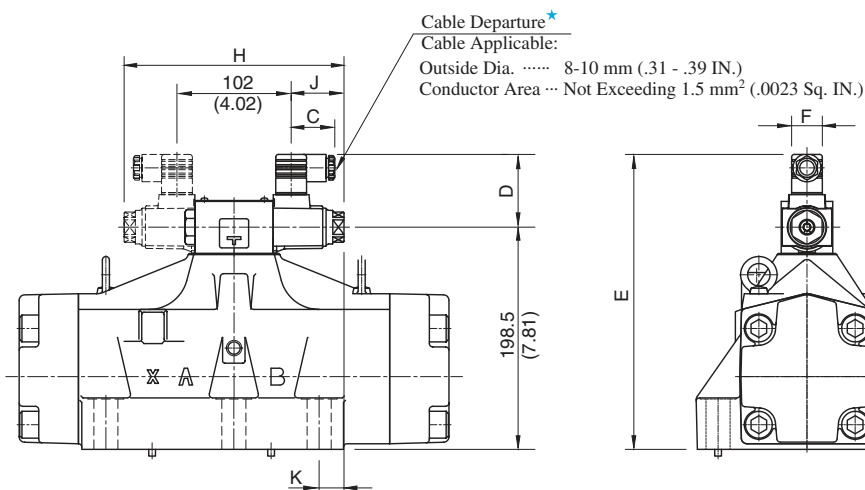


| Model Numbers          | "C" Thd. |
|------------------------|----------|
| (S-)DSHG-10-***-*-43   | G 1/2    |
| (S-)DSHG-10-***-*-4390 | 1/2 NPT  |



DIMENSIONS IN  
MILLIMETRES (INCHES)

■ Plug-in Connector Type: (S-)DSHG-10-\*\*\*-\*-N<sub>1</sub>-43/4390



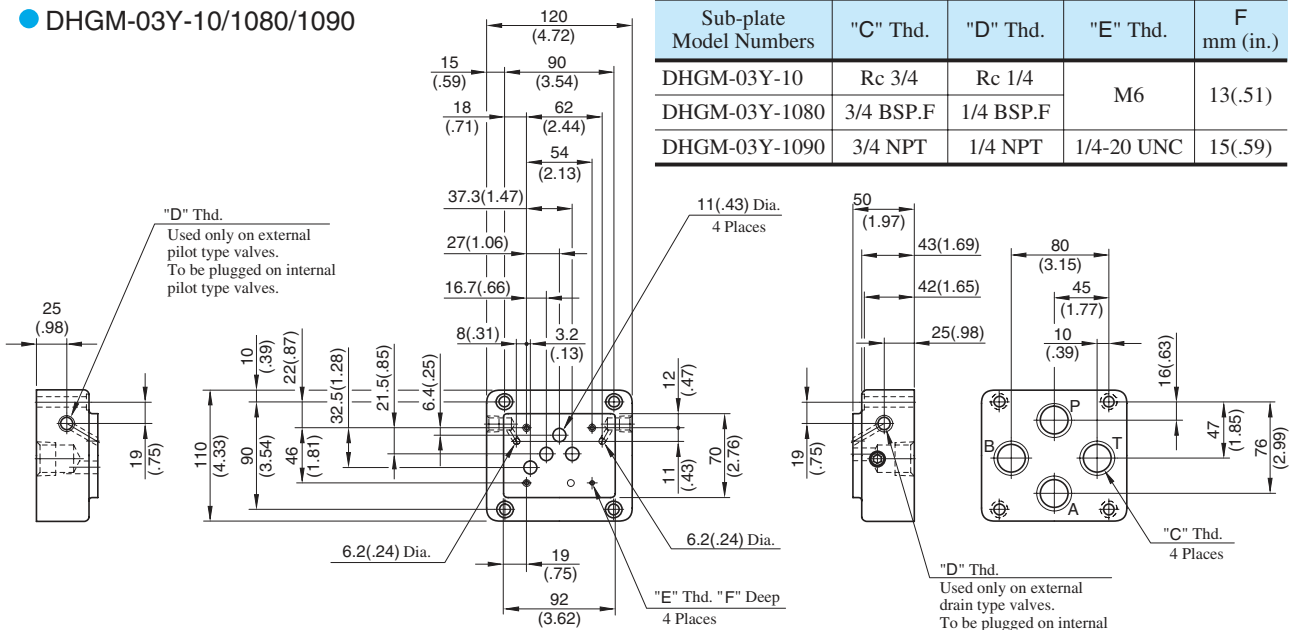
★ Position of cable departure can be changed. For details, refer to DSHG-01 valve on [page 396](#).

| Model Numbers                       | Dimensions mm (Inches) |             |               |             |              |             |             |
|-------------------------------------|------------------------|-------------|---------------|-------------|--------------|-------------|-------------|
|                                     | C                      | D           | E             | F           | H            | J           | K           |
| (S-)DSHG-10-***-A*-N/N <sub>1</sub> | 39 (1.54)              | 53 (2.09)   | 263.5 (10.37) | 27.5 (1.08) | 196.4 (7.73) | 47.2 (1.86) | 22.2 (.87)  |
| (S-)DSHG-10-***-D*-N/N <sub>1</sub> | 39 (1.54)              | 64 (2.52)   | 274.5 (10.81) | 27.5 (1.08) | 204.4 (8.05) | 51.2 (2.02) | 26.2 (1.03) |
| (S-)DSHG-10-***-R*-N                | 53 (2.09)              | 57.2 (2.25) | 277.5 (10.93) | 34 (1.34)   |              |             |             |

● For other dimensions, refer to "Terminal Box Type".

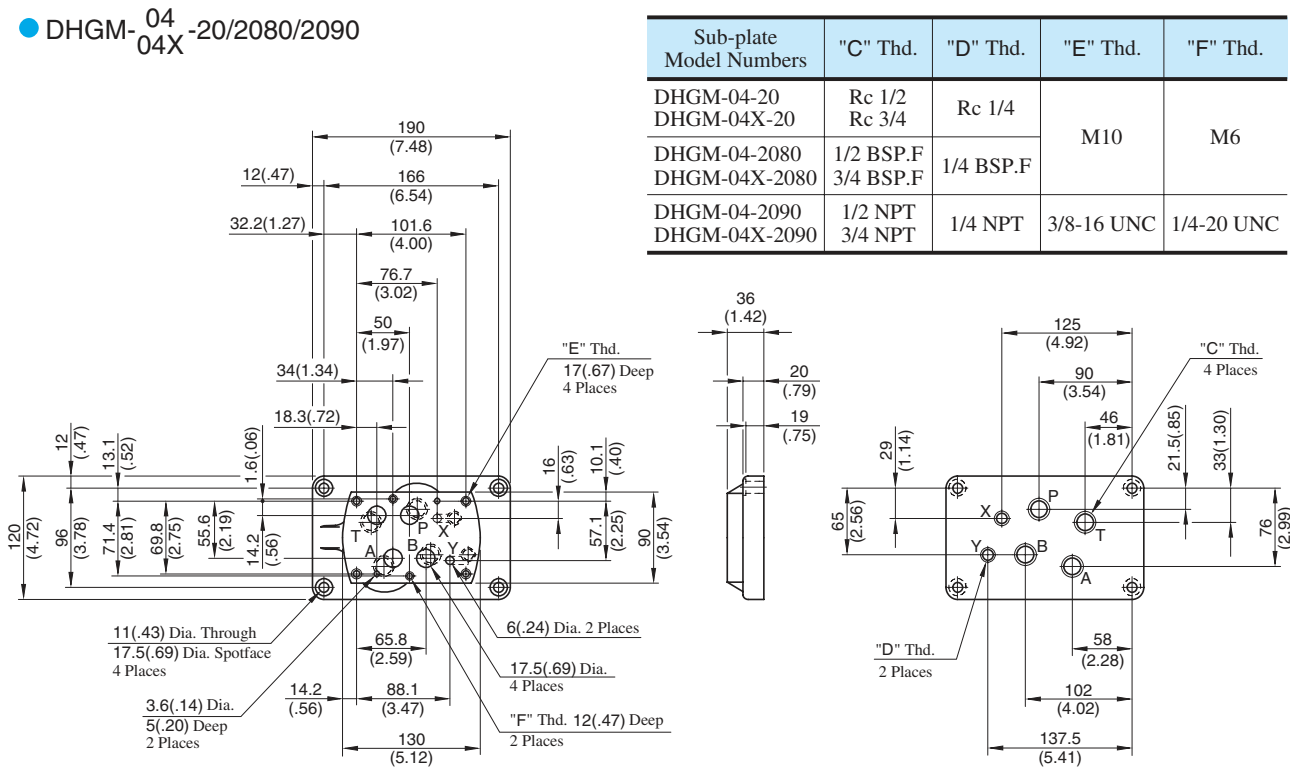
## Sub-plate

### ● DHGM-03Y-10/1080/1090



DIMENSIONS IN  
MILLIMETRES (INCHES)

### ● DHGM-04-20/2080/2090

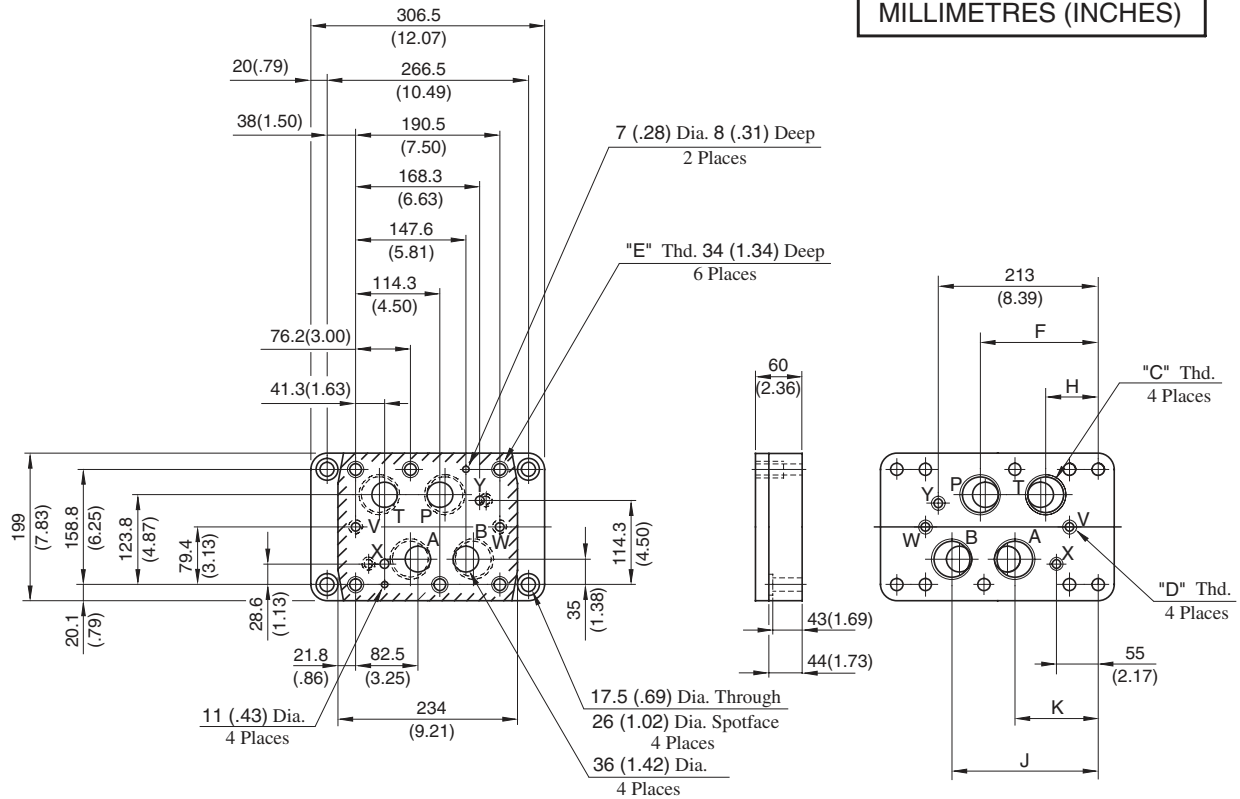


| Valve Types                                           |                          | Pilot Pressure Port "X"                                                                  | Port "Y"                                                                                               |
|-------------------------------------------------------|--------------------------|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Solenoid Controlled Pilot Operated Directional Valves |                          | Used only on external pilot type valves.<br>To be plugged on internal pilot type valves. | Used as drain port only on external drain type valves.<br>To be plugged on internal drain type valves. |
| Pilot Operated Directional Valves                     | Spring Centred No-spring | Used                                                                                     | Used as pilot pressure port                                                                            |
|                                                       | Spring Offset            |                                                                                          | Used as pilot drain port                                                                               |
| Manually Operated Directional Valves                  |                          | Not used (plug is not required)                                                          | Used as drain port                                                                                     |



## Sub-plate

● DHGM-10  
10X -40/4080/4090



| Sub-plate<br>Model Numbers | "C" Thd.    | "D" Thd.  | "E" Thd.   | Dimensions mm (Inches) |           |              |              |
|----------------------------|-------------|-----------|------------|------------------------|-----------|--------------|--------------|
|                            |             |           |            | F                      | H         | J            | K            |
| DHGM-10-40                 | Rc 1-1/4    | Rc 3/8    | M20        | 152 (5.98)             | 79 (3.11) | 185.5 (7.30) | 120.5 (4.74) |
| DHGM-10-4080               | 1-1/4 BSP.F | 3/8 BSP.F | M20        |                        |           |              |              |
| DHGM-10-4090               | 1-1/4 NPT   | 3/8 NPT   | 3/4-10 UNC |                        |           |              |              |
| DHGM-10X-40                | Rc 1-1/2    | Rc 3/8    | M20        | 156 (6.14)             | 74 (2.91) | 194.5 (7.66) | 112.5 (4.43) |
| DHGM-10X-4080              | 1-1/2 BSP.F | 3/8 BSP.F | M20        |                        |           |              |              |
| DHGM-10X-4090              | 1-1/2 NPT   | 3/8 NPT   | 3/4-10 UNC |                        |           |              |              |

Note: Uses of port "X", "Y", "V", and "W"

| Valve Types                                           |                                          | Pilot Pres. Port "X"                         | Port "Y"                                                                         | Drain Port "V"                  | Drain Port "W"                  |
|-------------------------------------------------------|------------------------------------------|----------------------------------------------|----------------------------------------------------------------------------------|---------------------------------|---------------------------------|
| Solenoid Controlled Pilot Operated Directional Valves | Spring Centred, No-spring, Spring Offset | Used only on external pilot type valves.     | Used as drain port only on external drain type valves.                           | Not used (plug is not required) |                                 |
|                                                       | Pressure Centred                         |                                              |                                                                                  | Used                            | Not used                        |
|                                                       | With Pilot Piston, Both Ends             | To be plugged on internal pilot type valves. | To be plugged on <span style="color: blue;">★</span> internal drain type valves. | Used                            | Used                            |
|                                                       | With Pilot Piston, Port "A" End          |                                              |                                                                                  | Used                            | Not used (plug is required)     |
|                                                       | With Pilot Piston, Port "B" End          |                                              |                                                                                  | Not used (plug is required)     | Used                            |
| Pilot Operated Directional Valves                     | Spring Centred, No-spring                | Used                                         | Used as pilot pres. port                                                         | Not used (plug is not required) |                                 |
|                                                       | Spring Offset                            |                                              | Used as pilot drain port                                                         |                                 |                                 |
|                                                       | Pressure Centred                         |                                              | Used as pilot pres. port                                                         | Used                            | Not used                        |
|                                                       | With Pilot Piston, Both Ends             |                                              |                                                                                  | Used                            | Used                            |
|                                                       | With Pilot Piston, Port "B" End          |                                              | Used as pilot pres. port                                                         | Not used (plug is required)     | Used                            |
|                                                       | With Pilot Piston, Port "A" End          |                                              |                                                                                  | Used                            | Not used (plug is required)     |
| Manually Operated Directional Valves                  |                                          | Not used (plug is not required)              | Not used (plug is not required)                                                  | Used                            | Not used (plug is not required) |

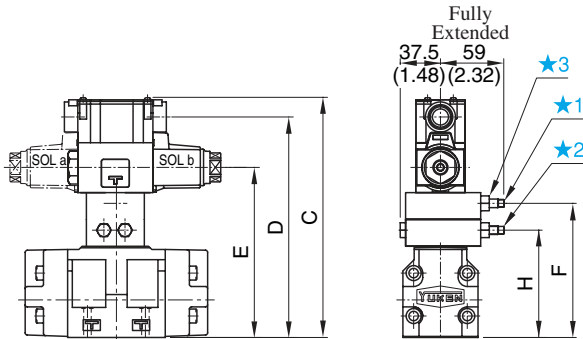
★ As the thread is provided on the body, plug either port on the sub-plate or port on the body.

## Options

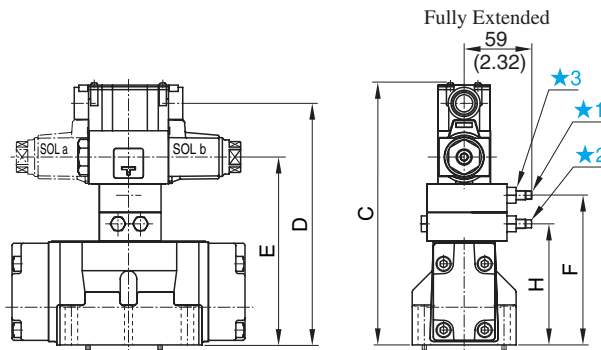
### Models with Pilot Choke Valve

#### Terminal Box Type

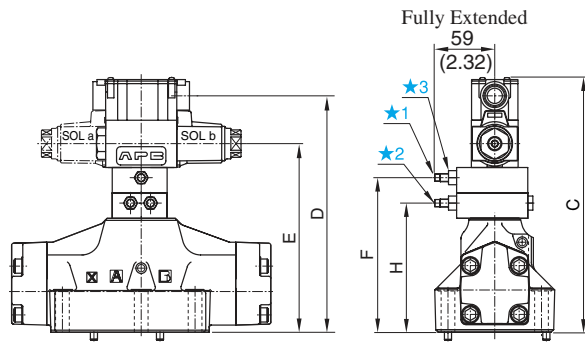
- DSHG-03- \*\*\* -C1/C2/C1C2



- (S-)DSHG-04- \*\*\* -C1/C2/C1C2

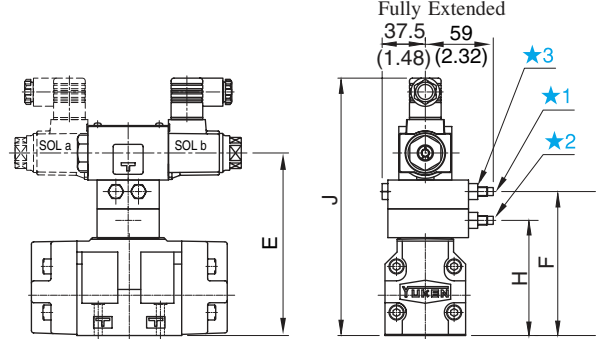


- (S-)DSHG-<sup>06</sup><sub>10</sub> - \*\*\* -C1/C2/C1C2

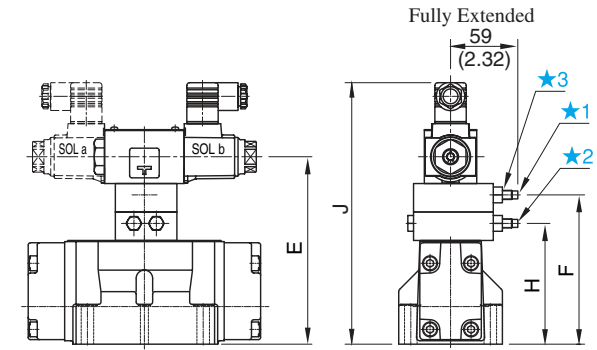


#### Plug-in Connector Type

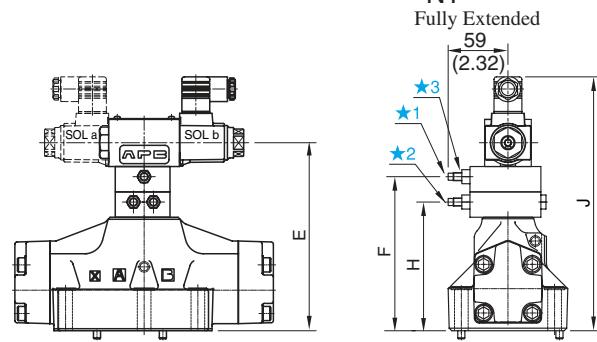
- DSHG-03- \*\*\* -C1/C2/C1C2-<sup>N</sup><sub>N1</sub>



- (S-)DSHG-04- \*\*\* -C1/C2/C1C2-<sup>N</sup><sub>N1</sub>



- (S-)DSHG-<sup>06</sup><sub>10</sub> - \*\*\* -C1/C2/C1C2-<sup>N</sup><sub>N1</sub>



- ★1. "C1" Choke Adj. Screw 6 (.24) Hex.
- ★2. "C2" Choke Adj. Screw 6 (.24) Hex.
- ★3. Lock Nut 12 (.47) Hex.

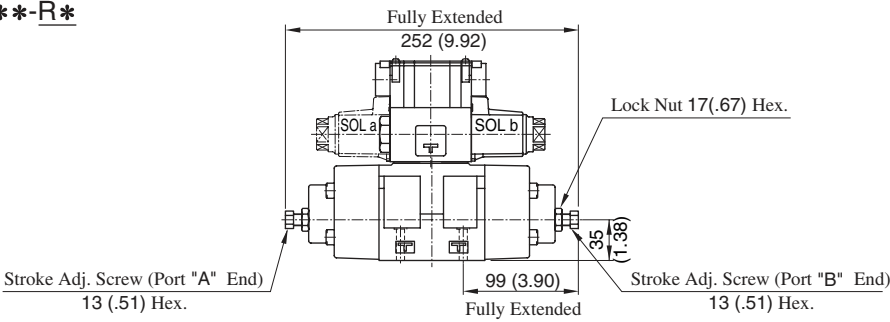
DIMENSIONS IN  
MILLIMETRES (INCHES)

| Model Numbers           | Dimensions mm (Inches) |               |              |            |            |               |               |               |
|-------------------------|------------------------|---------------|--------------|------------|------------|---------------|---------------|---------------|
|                         | C                      | D             | E            | F          | H          | J             |               |               |
|                         |                        |               |              |            |            | AC SO L       | DC SO L       | R SOL         |
| DSHG-03- *** -C1        | 198.8 (7.83)           | 180.5 (7.11)  | 133.5 (5.26) | 100 (3.94) | —          | 198.5 (7.81)  | 209.5 (8.25)  | 212.5 (8.37)  |
| DSHG-03- *** -C2        |                        |               |              | —          | 100 (3.94) |               |               |               |
| DSHG-03- *** -C1C2      | 223.8 (8.81)           | 205.5 (8.09)  | 158.5 (6.24) | 125 (4.92) | 100 (3.94) | 223.5 (8.80)  | 234.5 (9.23)  | 237.5 (9.35)  |
| (S-) DSHG-04- *** -C1   | 204.8 (8.06)           | 186.5 (7.34)  | 139.5 (5.49) | 106 (4.17) | —          | 204.5 (8.05)  | 215.5 (8.48)  | 218.5 (8.60)  |
| (S-) DSHG-04- *** -C2   |                        |               |              | —          | 106 (4.17) |               |               |               |
| (S-) DSHG-04- *** -C1C2 | 229.8 (9.05)           | 211.5 (8.33)  | 164.5 (6.48) | 131 (5.16) | 106 (4.17) | 229.5 (9.04)  | 240.5 (9.47)  | 243.5 (9.59)  |
| (S-) DSHG-06- *** -C1   | 225.8 (8.89)           | 207.5 (8.17)  | 160.5 (6.32) | 127 (5.00) | —          | 225.5 (8.88)  | 236.5 (9.31)  | 239.5 (9.43)  |
| (S-) DSHG-06- *** -C2   |                        |               |              | —          | 127 (5.00) |               |               |               |
| (S-) DSHG-06- *** -C1C2 | 250.8 (9.87)           | 232.5 (9.15)  | 185.5 (7.30) | 152 (5.98) | 127 (5.00) | 250.5 (9.86)  | 261.5 (10.30) | 264.5 (10.41) |
| (S-) DSHG-10- *** -C1   | 288.8 (11.37)          | 270.5 (10.65) | 223.5 (8.80) | 190 (7.48) | —          | 288.5 (11.36) | 299.5 (11.79) | 302.5 (11.91) |
| (S-) DSHG-10- *** -C2   |                        |               |              | —          | 190 (7.48) |               |               |               |
| (S-) DSHG-10- *** -C1C2 | 313.8 (12.35)          | 295.5 (11.63) | 248.5 (9.78) | 215 (8.46) | 190 (7.48) | 313.5 (12.34) | 324.5 (12.78) | 327.5 (12.89) |

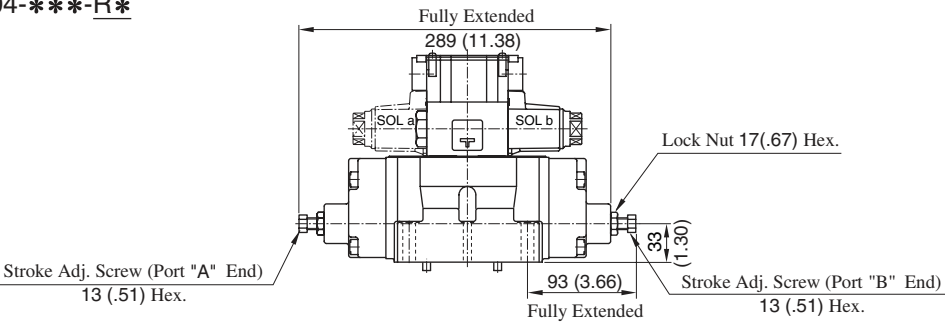
Options

Models with Stroke Adjustment

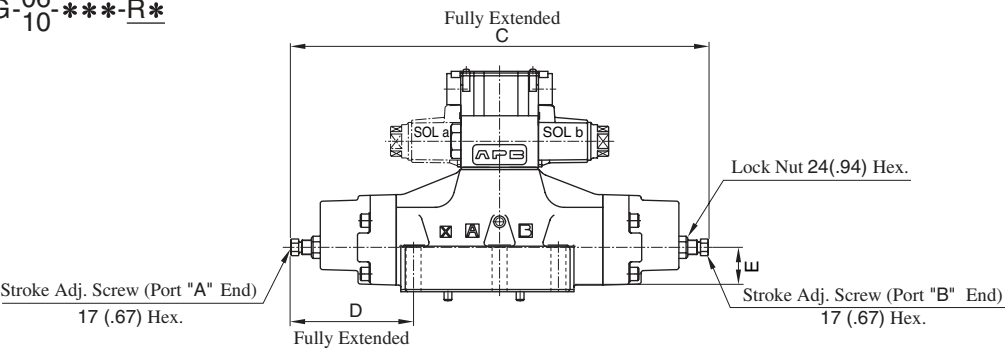
● DSHG-03-\*\*\*-R\*



● (S-)DSHG-04-\*\*\*-R\*



● (S-)DSHG-<sup>06</sup>/<sub>10</sub>-\*\*\*-R\*

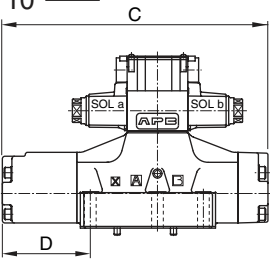


| Model Numbers      | C           | D            | E         |
|--------------------|-------------|--------------|-----------|
| (S-)DSHG-06-***-R2 | 376 (14.80) | 111 (4.37)   | 40 (1.57) |
| (S-)DSHG-10-***-R2 | 558 (21.97) | 164.5 (6.48) | 65 (2.56) |

DIMENSIONS IN  
MILLIMETRES (INCHES)

Pressure Centred Models

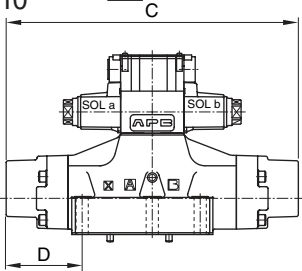
● (S-)DSHG-<sup>06</sup>/<sub>10</sub>-3H\*



| Model Numbers   | C             | D            |
|-----------------|---------------|--------------|
| (S-)DSHG-06-3H* | 306.5 (12.07) | 102 (4.02)   |
| (S-)DSHG-10-3H* | 456 (17.95)   | 149.5 (5.89) |

Models with Pilot Piston

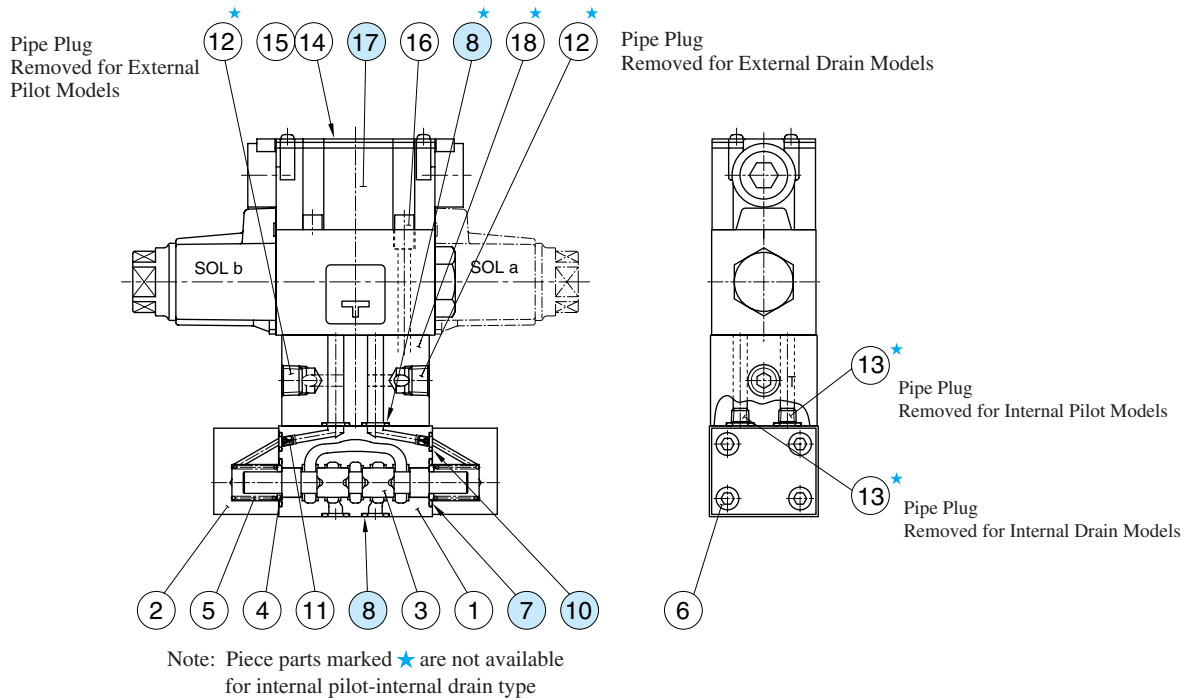
● (S-)DSHG-<sup>06</sup>/<sub>10</sub>-\*\*\*-P\*



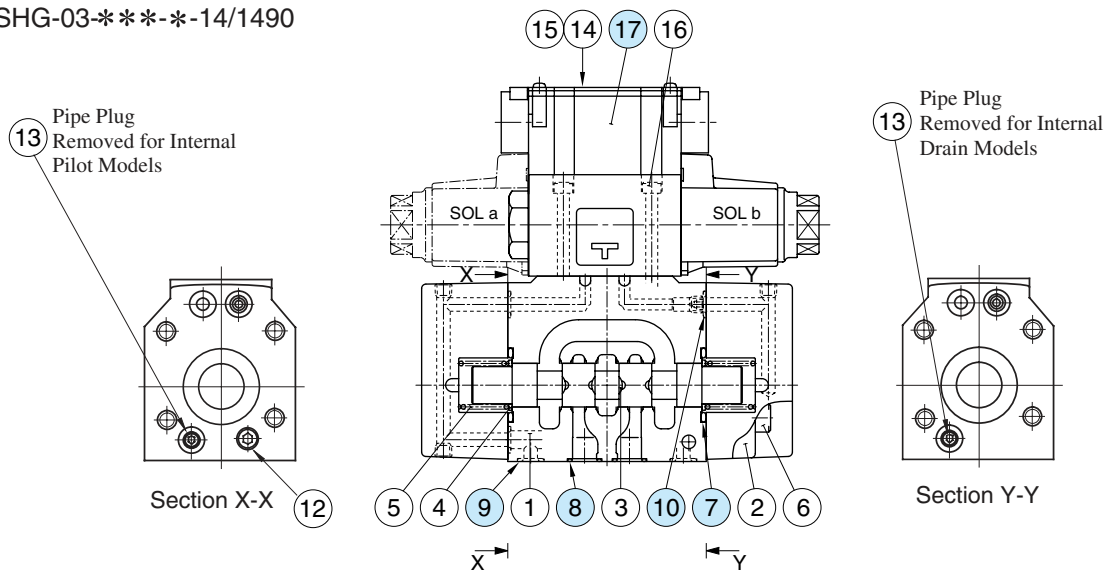
| Model Numbers      | C           | D          |
|--------------------|-------------|------------|
| (S-)DSHG-06-***-P2 | 323 (12.72) | 84 (3.31)  |
| (S-)DSHG-10-***-P2 | 479 (18.86) | 125 (4.92) |

■ List of Seals and Pilot Valves

DSHG-01-\*\*\*-14/1480/1490



DSHG-03-\*\*\*-14/1490



● List of Seals

| Item | Name   | DSHG-01      |       | DSHG-03      |      |
|------|--------|--------------|-------|--------------|------|
|      |        | Part Numbers | Qty.  | Part Numbers | Qty. |
| 7    | O-Ring | JASO-1018-1A | 2     | SO-NB-P28    | 2    |
| 8    | O-Ring | SO-NB-P9     | 8(4)★ | SO-NB-A104   | 5    |
| 9    | O-Ring | —            | —     | SO-NB-P9     | 2    |
| 10   | O-Ring | SO-NB-P5     | 2     | SO-NB-P9     | 6    |

★ Quantities in the ( ) are applicable to internal pilot-internal drain.

Note: When ordering the o-rings, please specify the seal kit number listed in [page 408](#). In addition to the above o-rings, o-rings for pilot valve is included in the seal kit.

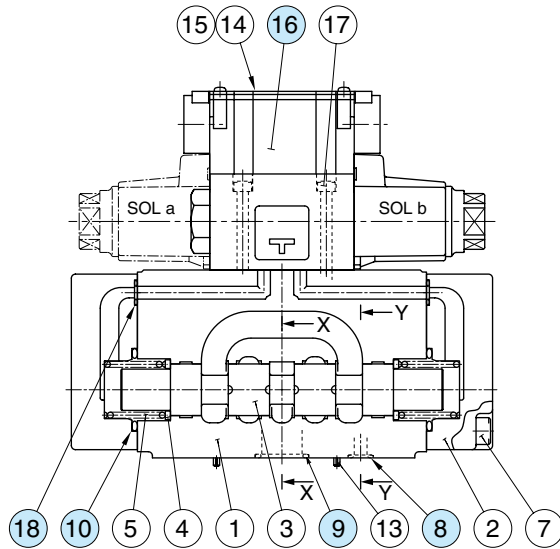
For the detail of the pilot valve o-rings, see [page 359](#).

● Pilot Valves

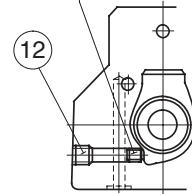
See [page 408](#) for the pilot valve model numbers to be used.

## List of Seals and Pilot Valves

(S-)DSHG-04-\*\*\*-52/5290

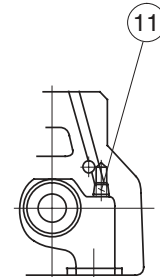


11 Pipe Plug  
Removed for Internal  
Drain Models



Section Y-Y

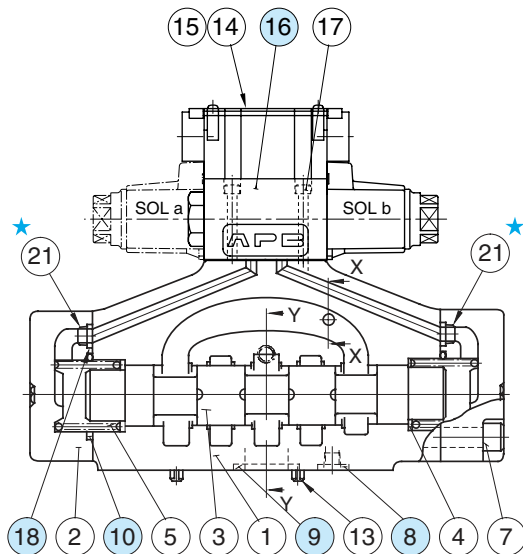
Pipe Plug  
Removed for Internal  
Pilot Models



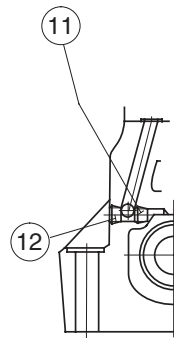
Section X-X

(S-)DSHG-06-\*\*\*-53/5390

(S-)DSHG-10-\*\*\*-43/4390

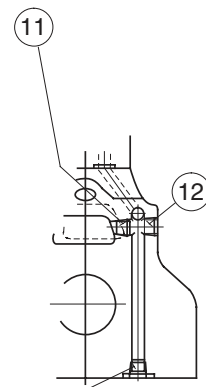


Pipe Plug  
Removed for Internal  
Pilot Models



Section Y-Y

Pipe Plug  
Removed for Internal  
Drain Models



Section X-X

11 Pipe Plug  
Removed for External  
Drain Models

Note: Item ② orifice marked ★ is applicable to pressure centred models (3H\*) with pilot pressure more than 10 MPa (1450 PSI).

### List of Seals

| Item | Name   | Part Numbers |             |             | Qty. |
|------|--------|--------------|-------------|-------------|------|
|      |        | (S-)DSHG-04  | (S-)DSHG-06 | (S-)DSHG-10 |      |
| 8    | O-Ring | SO-NB-P9     | SO-NB-P14   | SO-NB-P20   | 2    |
| 9    |        | SO-NB-P22    | SO-NB-P30   | SO-NB-P42   | 4    |
| 10   |        | SO-NB-P34    | SO-NB-P40   | SO-NB-P65   | 2    |
| 18   |        | SO-NB-P9     | SO-NB-P10   | SO-NB-P14   | 2    |

Note: When ordering the o-rings, please specify the seal kit number listed in [page 408](#). In addition to the above o-rings, o-rings for pilot valve is included in the seal kit.

For the detail of the pilot valve o-rings, see [page 359](#).

### Pilot Valves

See [page 408](#) for the pilot valve model numbers to be used.

## List of Seal Kits and Pilot Valves

| Valve Model Numbers                                                | Pilot Valve Model Numbers                                           | Seal Kit Numbers                                                 |
|--------------------------------------------------------------------|---------------------------------------------------------------------|------------------------------------------------------------------|
| DSHG-01-3C*-★-▲-14<br>DSHG-01-3C*-★-N-1480<br>DSHG-01-3C*-★-▲-1490 | DSG-01-3C4-★-▲-70<br>DSG-01-3C4-★-N-70<br>DSG-01-3C4-★-▲-7090       | KS-DSHG-01-▲-14<br>(For Internal Pilot-Internal Drain)           |
| DSHG-01-2B*-★-▲-14<br>DSHG-01-2B*-★-N-1480<br>DSHG-01-2B*-★-▲-1490 | DSG-01-2B2-★-▲-70-L<br>DSG-01-2B2-★-N-70-L<br>DSG-01-2B2-★-▲-7090-L | KS-DSHG-01-ET-▲-14<br>(Except for Internal Pilot-Internal Drain) |
| DSHG-03-3C*-★-▲-14<br>DSHG-03-3C*-★-▲-1490                         | DSG-01-3C4-★-▲-70<br>DSG-01-3C4-★-▲-7090                            | KS-DSHG-03-▲-14                                                  |
| DSHG-03-2B*-★-▲-14<br>DSHG-03-2B*-★-▲-1490                         | DSG-01-2B2-★-▲-70<br>DSG-01-2B2-★-▲-7090                            |                                                                  |
| DSHG-03-2N*-★-▲-14<br>DSHG-03-2N*-★-▲-1490                         | DSG-01-2D2-★-▲-70<br>DSG-01-2D2-★-▲-7090                            |                                                                  |
| (S-)DSHG-04-3C*-★-▲-52<br>(S-)DSHG-04-3C*-★-▲-5290                 | DSG-01-3C4-★-▲-70<br>DSG-01-3C4-★-▲-7090                            | KS-DSHG-04-▲-52                                                  |
| (S-)DSHG-04-2B*-★-▲-52<br>(S-)DSHG-04-2B*-★-▲-5290                 | DSG-01-2B2-★-▲-70<br>DSG-01-2B2-★-▲-7090                            |                                                                  |
| (S-)DSHG-04-2N*-★-▲-52<br>(S-)DSHG-04-2N*-★-▲-5290                 | DSG-01-2D2-★-▲-70<br>DSG-01-2D2-★-▲-7090                            |                                                                  |
| (S-)DSHG-06-3C*-★-▲-53<br>(S-)DSHG-06-3C*-★-▲-5390                 | DSG-01-3C4-★-▲-70<br>DSG-01-3C4-★-▲-7090                            | KS-DSHG-06-▲-53                                                  |
| (S-)DSHG-06-2B*-★-▲-53<br>(S-)DSHG-06-2B*-★-▲-5390                 | DSG-01-2B2-★-▲-70-L<br>DSG-01-2B2-★-▲-7090-L                        |                                                                  |
| (S-)DSHG-06-2N*-★-▲-53<br>(S-)DSHG-06-2N*-★-▲-5390                 | DSG-01-2D2-★-▲-70<br>DSG-01-2D2-★-▲-7090                            |                                                                  |
| (S-)DSHG-10-3C*-★-▲-43<br>(S-)DSHG-10-3C*-★-▲-4390                 | DSG-01-3C4-★-▲-70<br>DSG-01-3C4-★-▲-7090                            | KS-DSHG-10-▲-43                                                  |
| (S-)DSHG-10-2B*-★-▲-43<br>(S-)DSHG-10-2B*-★-▲-4390                 | DSG-01-2B2-★-▲-70-L<br>DSG-01-2B2-★-▲-7090-L                        |                                                                  |
| (S-)DSHG-10-2N*-★-▲-43<br>(S-)DSHG-10-2N*-★-▲-4390                 | DSG-01-2D2-★-▲-70<br>DSG-01-2D2-★-▲-7090                            |                                                                  |

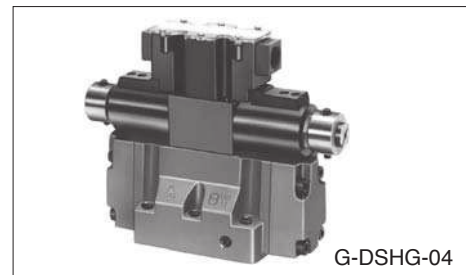
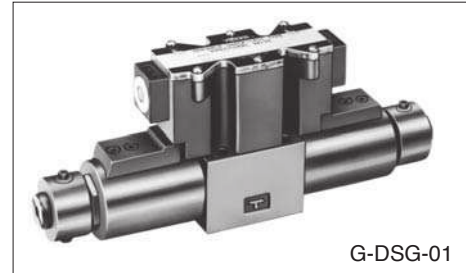
Notes) 1: Fill coil type (a symbol representing current/voltage) in section marked ★. Likewise, in section marked ▲, fill a symbol representing the type of electrical conduit connection (None: Terminal Box Type, N: Plug-in Connector Type).  
2: For the details of the pilot valves, see [page 359 to 360](#).

## “G” Series Shockless Type Solenoid Operated / Solenoid Controlled Pilot Operated Directional Valves

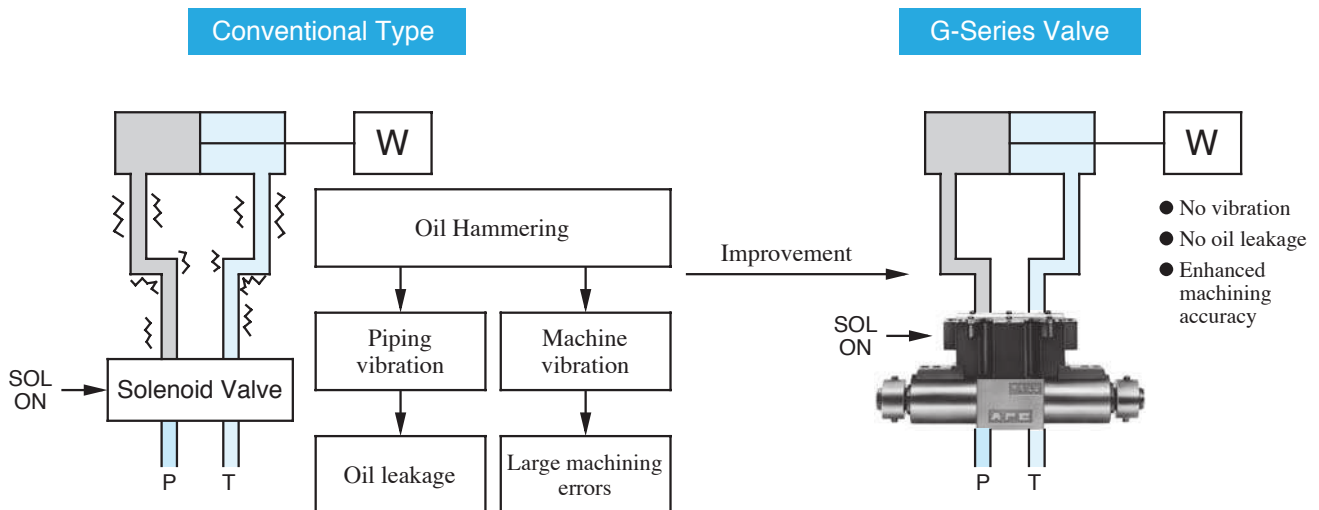
The G-Series Solenoid Operated Directional Valves incorporate electronic circuits to enable adjustment of the spool shifting time.

A special spool shape that minimises shock is used, shocks caused by the actuator starting and stopping, as well as vibration due to oil hammering. The shifting time of conventional Solenoid Operated, Shockless, and Directional Valves is constant and cannot be adjusted.

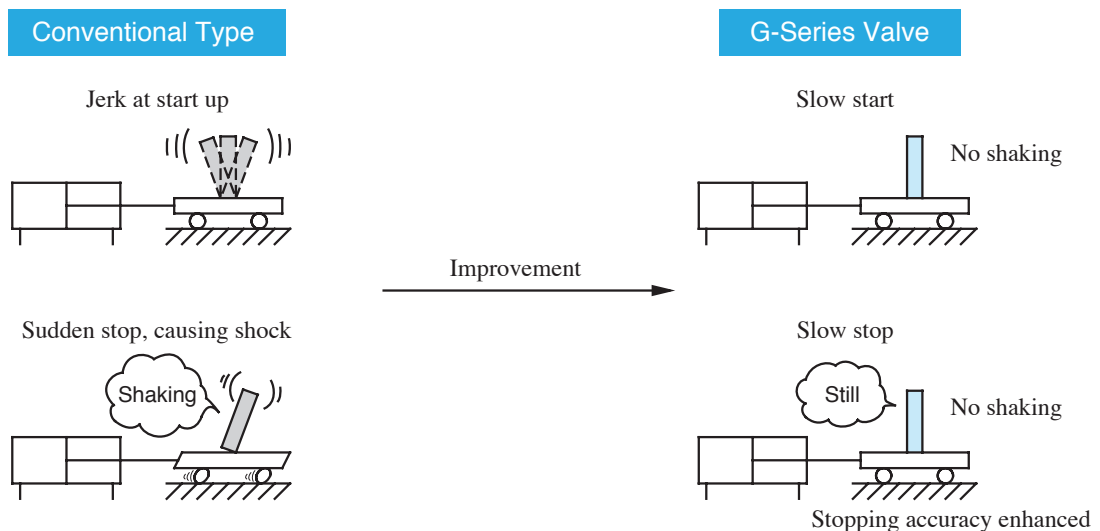
As the shifting time of the G-Series valves can be adjusted, it can be set at an optimal level to minimise shocks to the machine.



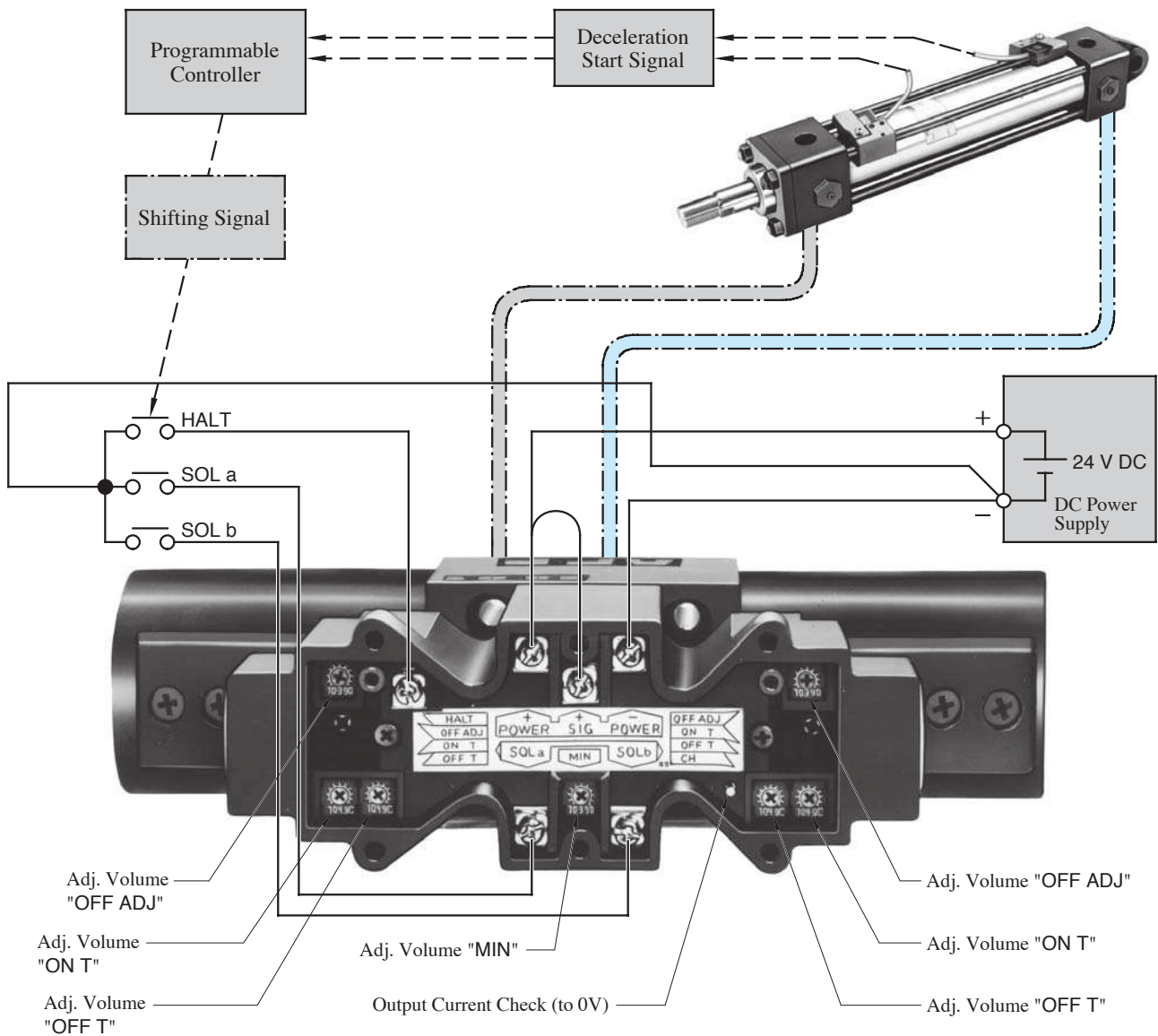
### 1 Reduces oil hammering during spool changeover.



### 2 Reduces shock caused by acceleration and deceleration

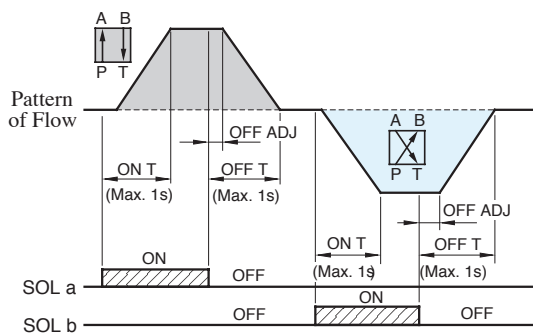


■ System Diagram (Example of sink type wiring)

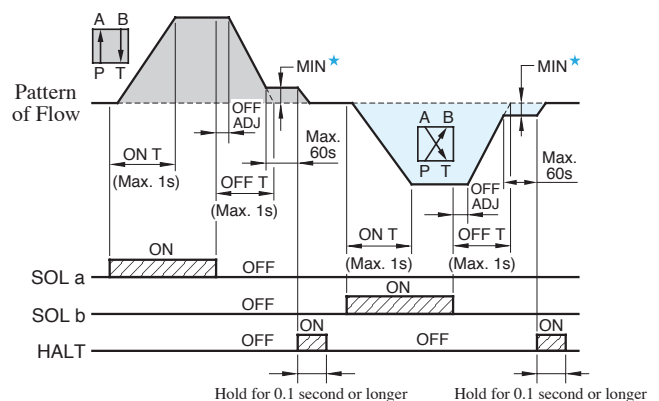


■ Relationships between SOL signals and flow patterns

● Without HALT functions



● With HALT functions



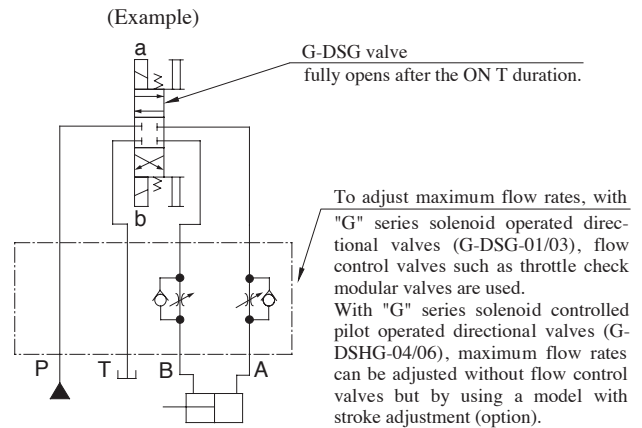
★ The minimum adjustment volume is common for SOL a and b, and it is not possible to set a different volume for each SOL a and b individually. If the HALT functions are not used, set the minimum adjustment volume to zero.

## Instructions

### Adjustment of maximum flow rate

The G-Series Solenoid Operated Directional Valves cannot be adjusted for maximum flow rates.

To adjust maximum flow rates, use flow control valves. In G-series solenoid controlled pilot operated directional valves (G-DSHG-04/06), the maximum flow rate can be adjusted by use of the valve with stroke adjustment screw of optional extra.

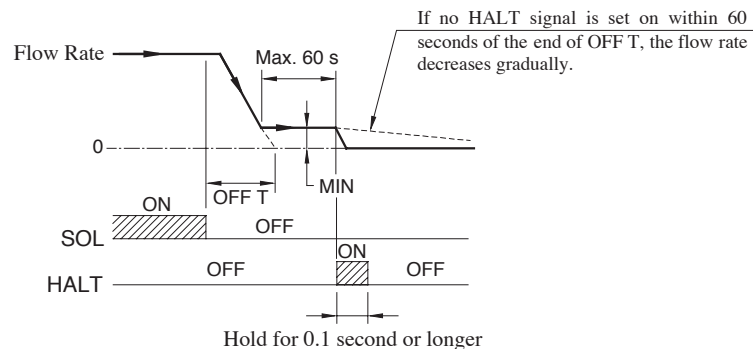


### How to use HALT functions

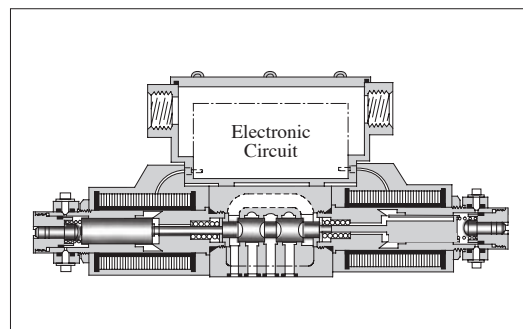
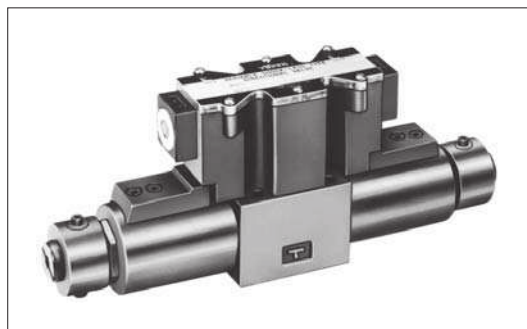
The HALT functions are used to drive the actuator at a low speed to the stop position while keeping a slight flow after OFF T.

A flow rate (min. flow rate) during a low-speed operation can be set with the minimum adjusting volume (The minimum adjusting volume is common for SOL a and b. Individual setting is not possible for SOL a and b.) When HALT signal is on, the min. flow rate becomes zero and the actuator stops. Here, take care to keep the HALT signal on for longer than 0.1 second. The min. flow rate gets to "0" after about 60 seconds following the OFF T. If the HALT functions are not used, set the minimum adjusting volume to zero.

The HALT functions are not applicable to the spool function "2B7".



## **“G” Series Shockless Type Solenoid Operated Directional Valves**



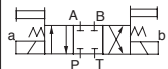
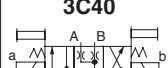
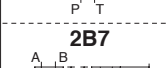
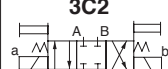
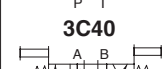
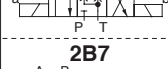
### **Specifications**

| Descriptions                                                                                         |                    | Model Numbers                                                     | G-DSG-01-***-50/5090                    | G-DSG-03-***-50/5090            |
|------------------------------------------------------------------------------------------------------|--------------------|-------------------------------------------------------------------|-----------------------------------------|---------------------------------|
| Max. Flow★ <sup>1</sup>                                                                              | L/min (U.S.GPM)    |                                                                   | 10 (2.6), 20 (5.3), 30 (7.9), 40 (10.6) | 40 (10.6), 60 (15.9), 80 (21.1) |
| Max. Operating Pres.★ <sup>2</sup>                                                                   | MPa (PSI)          |                                                                   | 25 (3630)                               | 25 (3630)                       |
| Max. T-Line Back Pres.                                                                               | MPa (PSI)          |                                                                   | 16 (2320)                               | 16 (2320)                       |
| Electric Power Supply                                                                                | Voltage            | 24 V DC (21 - 28 V DC Included Ripple): Use a stable power supply |                                         |                                 |
|                                                                                                      | Input Power at 24V |                                                                   | 36 W                                    | 36 W                            |
| Shifting signal, low speed operation halt signal (can be used in common with electric power supply). | Voltage            | 5 - 48 V DC (Use a stable power supply)                           |                                         |                                 |
|                                                                                                      | Current            | Constant at 10 mA (A constant-current circuit is used)            |                                         |                                 |
|                                                                                                      | Input interface    | Sink Type, Source Type                                            |                                         |                                 |
| Shifting time range (for ON and OFF)                                                                 |                    |                                                                   | 0.1 - 1 s                               | 0.3 - 1 s                       |
| Low speed operation flow rate (min. flow rate) range (for SOL a and b)<br>L/min (U.S.GPM)            |                    |                                                                   | 0.5 - 5 (.13 - 1.3)                     | 1 - 10 (.26 - 2.6)              |
| Low speed operation flow rate (min. flow rate) hold time                                             |                    | Max. 60 s (After 60 seconds, the flow rate decreases gradually.)  |                                         |                                 |
| Ambient Temperature                                                                                  |                    | 0 - 50 °C (32 - 122 °F) with circulated air                       |                                         |                                 |
| Approx. Mass                                                                                         | Single Solenoid    |                                                                   | 2.1 kg (4.6 lbs.)                       | 5.3 kg (11.7 lbs.)              |
|                                                                                                      | Double Solenoid    |                                                                   | 3.0 kg (6.6 lbs.)                       | 7.5 kg (16.5 lbs.)              |

★ 1. The maximum flow rates may vary according to the operating pressure. Refer to Maximum Flow Rates Characteristics on [pages 414 and 415](#) for details.

★ 2. At pressures more than 21 MPa (3050 PSI), the "shockless effect" is slightly less if compared it with that at 16 MPa (2320 PSI).

## Model Number Designation

| G-DSG                                                                                      | -01        | -10                                               | -2B7                                                                                                                                                                                               | -S                            | -50           | *                | -L                                                                                                                                         |
|--------------------------------------------------------------------------------------------|------------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Series Number                                                                              | Valve Size | Metred Flow Capacity                              | Spool Type                                                                                                                                                                                         | Input Interface               | Design Number | Design Standards | Models with Alternate Offset Solenoid                                                                                                      |
| G-DSG :<br>G Series Shockless Type Solenoid Operated Directional Valve, Sub-plate Mounting | 01         | None : 40 L/min<br>10 : 10 L/min<br>20 : 20 L/min | <div>3C2</div>  <div>3C40</div>  | None:<br>Sink Type (Standard) | 50            | Refer to ★       | L<br>Applicable only for 2B7 (Omit if not required)<br> |
|                                                                                            |            | None : 30 L/min<br>10 : 10 L/min<br>20 : 20 L/min | <div>2B7</div>                                                                                                    |                               |               |                  |                                                                                                                                            |
|                                                                                            | 03         | None : 80 L/min<br>40 : 40 L/min<br>60 : 60 L/min | <div>3C2</div>  <div>3C40</div>  | S:<br>Source Type             | 50            |                  |                                                                                                                                            |
|                                                                                            |            | None : 60 L/min<br>40 : 40 L/min                  | <div>2B7</div>                                                                                                    |                               |               |                  |                                                                                                                                            |
|                                                                                            |            |                                                   |                                                                                                                                                                                                    |                               |               |                  |                                                                                                                                            |

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

## Sub-plate

| Valve Model Numbers | Japanese Standard "JIS" |             | European Design Standard |             | N. American Design Standard |             | Approx. Mass<br>kg (lbs.) |
|---------------------|-------------------------|-------------|--------------------------|-------------|-----------------------------|-------------|---------------------------|
|                     | Sub-plate Model Numbers | Thread Size | Sub-plate Model Numbers  | Thread Size | Sub-plate Model Numbers     | Thread Size |                           |
| G-DSG-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)                 |
| G-DSG-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.

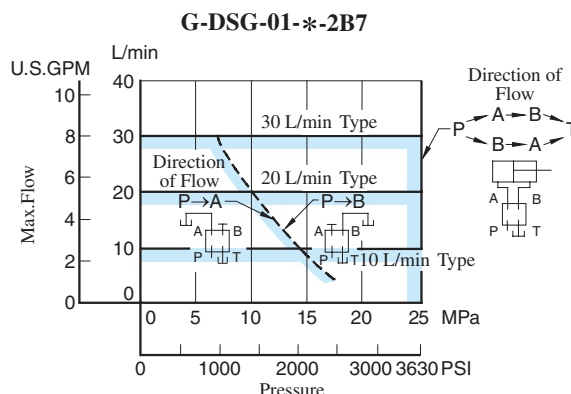
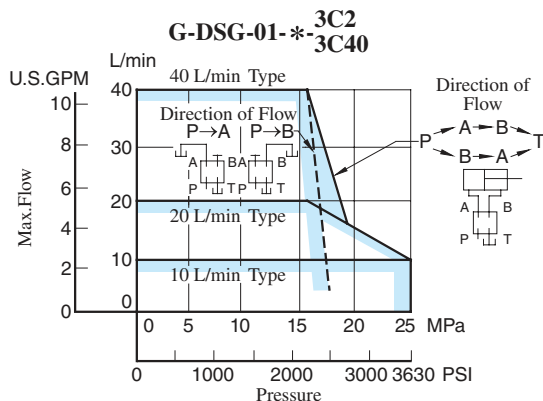
## Attachment (Mtg. Bolt)

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

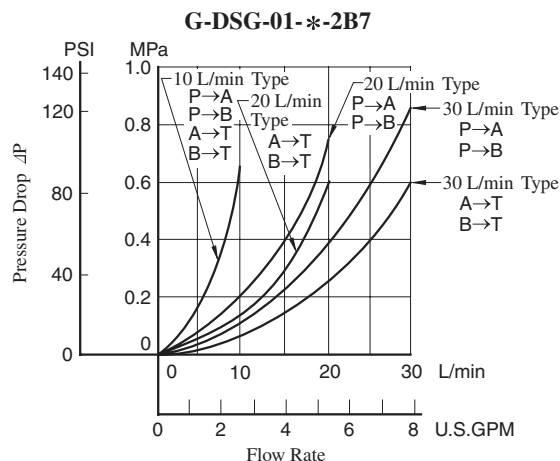
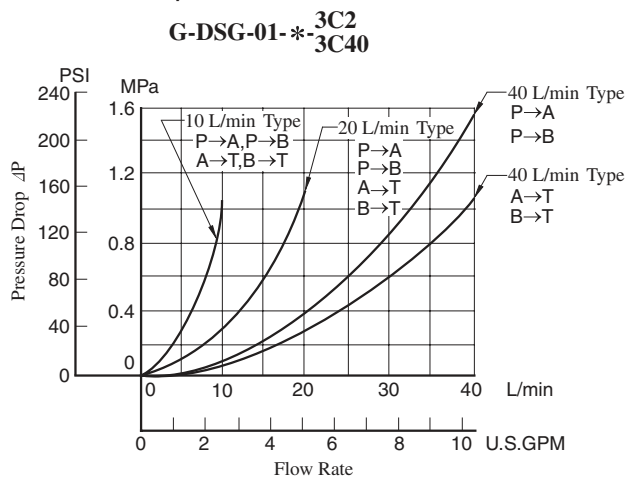
| Model Numbers | Socket Head Cap Screw (4 pcs.)                     |                             |                             |
|---------------|----------------------------------------------------|-----------------------------|-----------------------------|
|               | Japanese Standard "JIS" & European Design Standard | N. American Design Standard | Tightening Torque           |
| G-DSG-01      | M5 × 45 Lg.                                        | No.10-24 UNC × 1-3/4 Lg.    | 5-7 Nm (44-62 in. lbs.)     |
| G-DSG-03      | M6 × 35 Lg.                                        | 1/4-20 UNC × 1-1/2 Lg.      | 12-15 Nm (106-133 in. lbs.) |

Typical Performance Characteristics of "G-DSG-01" at Viscosity 30 mm<sup>2</sup>/s (141 SSU), Specific Gravity 0.850

■ Maximum Flow Rate



■ Pressure Drop



- For any other viscosity, multiply the factors in the table right.
- For any other specific gravity (G'), the pressure drop ( $\Delta P'$ ) may be obtained from the formula below.

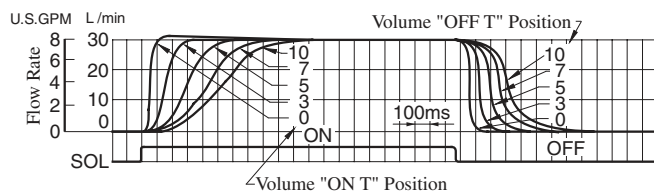
$$\Delta P' = \Delta P (G'/0.850)$$

| Viscosity | mm <sup>2</sup> /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 |

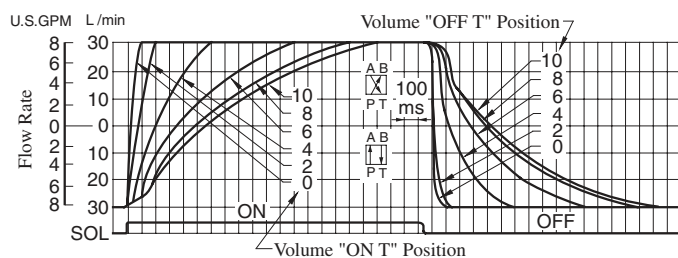
■ Shifting Characteristics

Supply Pressure : 16 MPa (2320 PSI)  
Flow Rate : 30 L/min (7.9 U.S.GPM)

● 3C2, 3C40

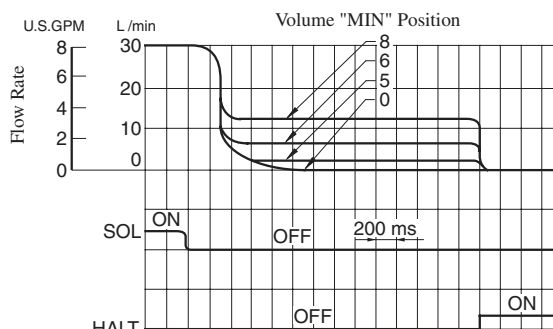


● 2B7



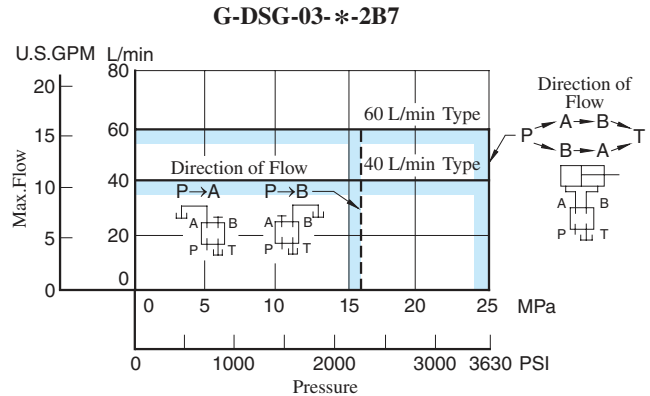
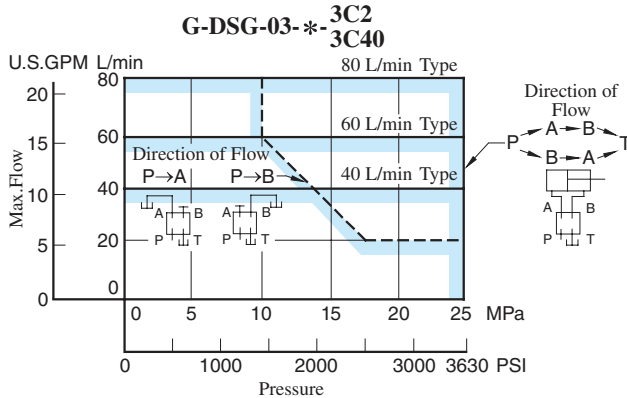
■ Low Speed Operating Flow Characteristics

Supply Pressure : 16 MPa (2320 PSI)  
Flow Rate : 30 L/min (7.9 U.S.GPM)

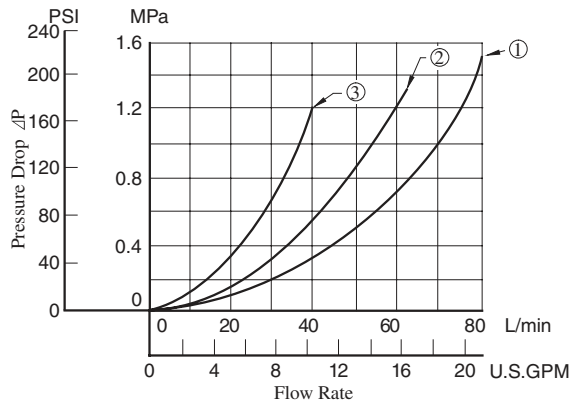


Typical Performance Characteristics of "G-DSG-03" at Viscosity 30 mm<sup>2</sup>/s (141 SSU), Specific Gravity 0.850

## Maximum Flow Rate



## Pressure Drop



| Model Numbers         | Pressure Drop Curve Numbers* |
|-----------------------|------------------------------|
| G-DSG-03-3C2, 3C40    | ①                            |
| G-DSG-03-40-3C2, 3C40 | ③                            |
| G-DSG-03-60-3C2, 3C40 | ②                            |
| G-DSG-03-2B7          | ①                            |
| G-DSG-03-40-2B7       | ③                            |

\* The numbers of the pressure drop curves are the same for P→A, P→B, A→T and B→T.

- For any other viscosity, multiply the factors in the table right.
- For any other specific gravity (G'), the pressure drop ( $\Delta P$ ) may be obtained from the formula below.

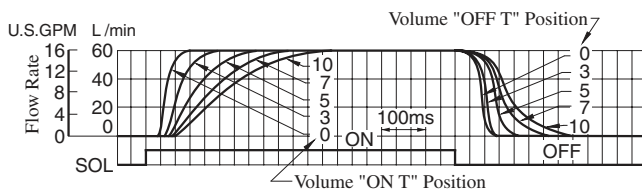
$$\Delta P' = \Delta P (G'/0.850)$$

| Viscosity | mm <sup>2</sup> /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 |

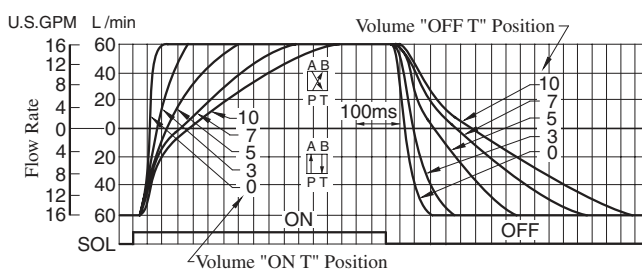
## Shifting Characteristics

Supply Pressure : 16 MPa (2320 PSI)  
Flow Rate : 60 L/min (15.9 U.S.GPM)

### 3C2, 3C40

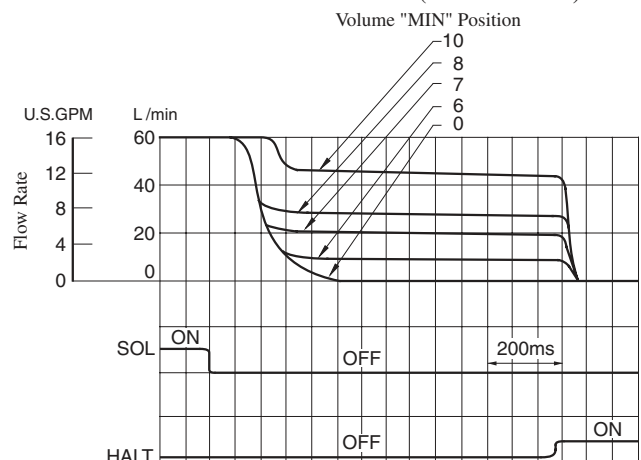


### 2B7



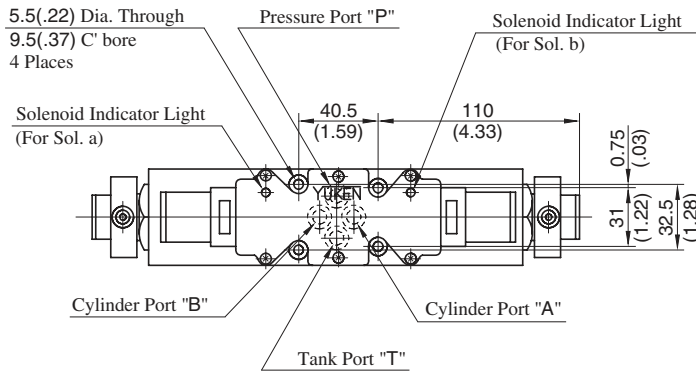
## Low Speed Operating Flow Characteristics

Supply Pressure : 16 MPa (2320 PSI)  
Flow Rate : 60 L/min (15.9 U.S.GPM)

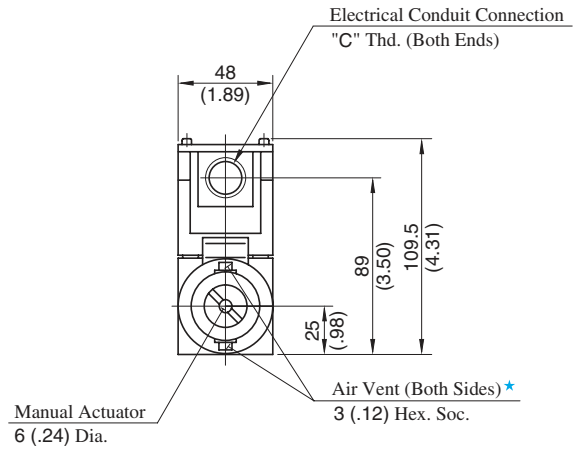
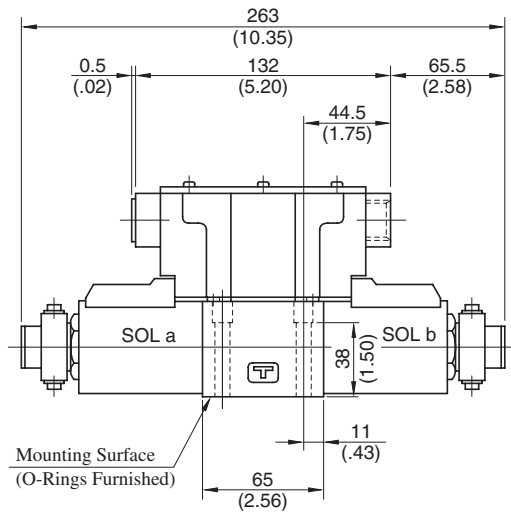


G-DSG-01-\* -3C2/3C40-\* -50/5090

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



| Model Numbers     | "C" Thd. |
|-------------------|----------|
| G-DSG-01-***-50   | G 1/2    |
| G-DSG-01-***-5090 | 1/2 NPT  |

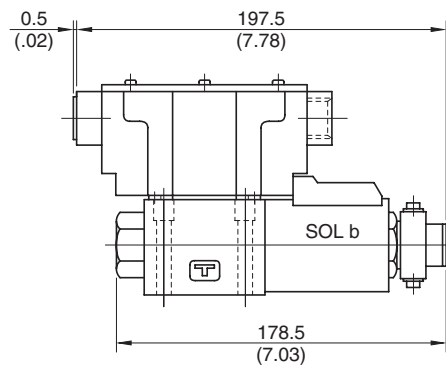


★ Air vent position around valve longitudinal axis can be optionally selected.

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

**DIMENSIONS IN  
MILLIMETRES (INCHES)**

G-DSG-01-\* -2B7-\* -50/5090

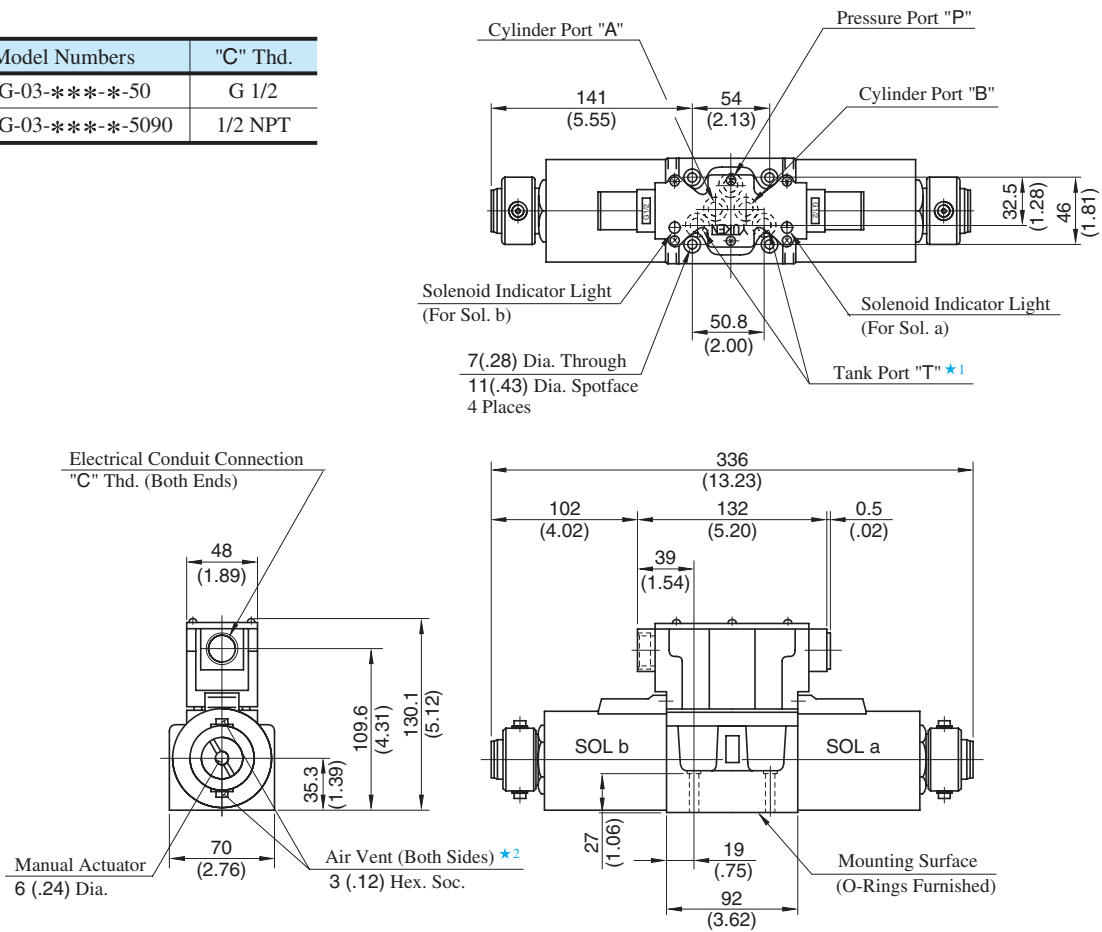


• For other dimensions, refer to the drawing above.

G-DSG-03-\*\*-3C2/3C40-\*\*-50/5090

Mounting Surface:  
ISO 4401-AC-05-4-A

| Model Numbers    | "C" Thd. |
|------------------|----------|
| G-DSG-03-**-50   | G 1/2    |
| G-DSG-03-**-5090 | 1/2 NPT  |



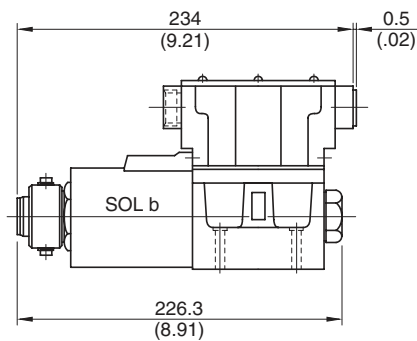
★ 1. Although the tank port is shown on the left in our sub-plate, either may be used.

★ 2. Air vent position around valve longitudinal axis can be optionally selected.

Note: For the valve mounting surface dimensions, see the dimensional drawing of the sharable sub-plate in [page 373](#).

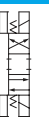
DIMENSIONS IN  
MILLIMETRES (INCHES)

G-DSG-03-\*\*-2B7-\*\*-50/5090



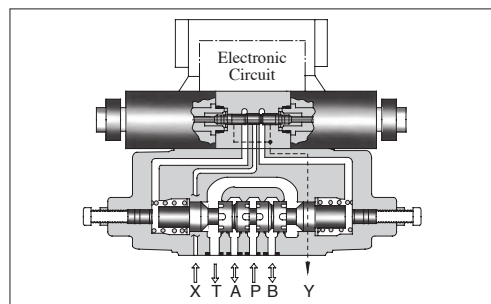
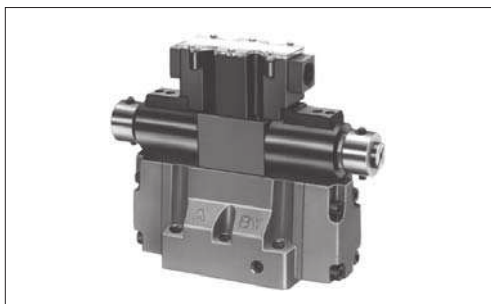
• For other dimensions, refer to the drawing above.

E



"G" Series Shockless Type  
Solenoid Operated Directional Valves

## **“G” Series Shockless Type Solenoid Controlled Pilot Operated Directional Valves**



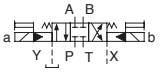
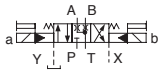
### **Specifications**

| Model Numbers                                                                                       |                    | G-DSHG-04-3C*-**-50/5090                                          | G-DSHG-06-3C*-**-50/5090      |
|-----------------------------------------------------------------------------------------------------|--------------------|-------------------------------------------------------------------|-------------------------------|
| Descriptions                                                                                        |                    |                                                                   |                               |
| Max. Flow                                                                                           | L/min (U.S.GPM)    | 160 (42.3) ★ <sup>1</sup>                                         | 250 (66.1) ★ <sup>1</sup>     |
| Max. Operating Pres.                                                                                | MPa (PSI)          | 25 (3630)                                                         | 25 (3630)                     |
| Max. T-Line Back Pres.                                                                              | MPa (PSI)          | 16 (2320)                                                         | 16 (2320)                     |
| Max. Drain Line Back Pressure                                                                       | MPa (PSI)          | 3 (440)                                                           | 3 (440)                       |
| Max. Pilot Pressure                                                                                 | MPa (PSI)          | 16 (2320)                                                         | 16 (2320)                     |
| Min. Required Pilot Pres.                                                                           | MPa (PSI)          | 1.5 (220) ★ <sup>2</sup>                                          |                               |
| Pilot Flow<br>L/min (U.S.GPM)                                                                       | at Normal          | 1 (0.3)                                                           | 1 (0.3)                       |
|                                                                                                     | at Transition      | 4 (1.1)                                                           | 6 (1.6)                       |
| Electric Power Supply                                                                               | Voltage            | 24 V DC (21 - 28 V DC Included Ripple): Use a stable power supply |                               |
|                                                                                                     | Input Power at 24V | 36 W                                                              | 36 W                          |
| Shifting signal, low speed operation halt signal (can be used in common with electric power supply) | Voltage            | 5 - 48 V DC (Use a stable power supply)                           |                               |
|                                                                                                     | Current            | Constant at 10 mA (A constant-current circuit is used)            |                               |
|                                                                                                     | Input interface    | Sink Type, Source Type                                            |                               |
| Shifting time range (for ON and OFF)                                                                |                    | ON: 0.06 - 1.5 s, OFF: 0.1 - 2 s                                  | ON: 0.1 - 1 s, OFF: 0.2 - 2 s |
| Low speed operation flow rate (min. flow rate) range (for SOL a and b)<br>L/min (U.S.GPM)           |                    | 5 - 20 (1.3 - 5.3)                                                | 10 - 30 (2.6 - 7.9)           |
| Low speed operation flow rate (min. flow rate) hold time                                            |                    | Max. 60 s (After 60 seconds, the flow rate decreases gradually.)  |                               |
| Ambient Temperature                                                                                 |                    | 0 - 50 °C (32 - 122 °F) with circulated air                       |                               |
| Approx. Mass                                                                                        |                    | 12 kg (26.5 lbs.)                                                 | 15 kg (33.1 lbs.)             |

★ 1. The maximum flow rate is constant irrespective of the working pressure.

★ 2. Be sure that the difference between pilot pressure and drain port back pressure is larger than the minimum pilot pressure.

## Model Number Designation

| G-DSHG                                                                                                              | -04        | -3C2                                                                                             | -E                      | -R2                                                                                                       | -S                            | -50           | *                |
|---------------------------------------------------------------------------------------------------------------------|------------|--------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------|-------------------------------|---------------|------------------|
| Series Number                                                                                                       | Valve Size | Spool Type                                                                                       | Pilot Connection        | Spool Control Modification (Omit if not required)                                                         | Input Interface               | Design Number | Design Standards |
| <b>G-DSHG :</b><br>G Series Shockless Type Solenoid Controlled Pilot Operated Directional Valve, Sub-plate Mounting | 04         | <b>3C2</b><br>  | None:<br>Internal Pilot | <b>R2:</b><br>With Stroke Adjustment, Both Ends<br><br><b>RA:</b><br>With Stroke Adjustment, Port "A" End | None:<br>Sink Type (Standard) | 50            | Refer to ★       |
|                                                                                                                     | 06         | <b>3C40</b><br> | E:<br>External Pilot    | <b>RB:</b><br>With Stroke Adjustment, Port "B" End                                                        | S:<br>Source Type             | 50            |                  |

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

## 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.) |
| G-DSHG-04           | DHGM-04-20              | Rc 1/2      | 4.4 (9.7)              | DHGM-04-2080             | 1/2 BSP.F   | 4.4 (9.7)              | DHGM-04-2090                | 1/2 NPT     | 4.4 (9.7)              |
|                     | DHGM-04X-20             | Rc 3/4      | 4.1 (9.0)              | DHGM-04X-2080            | 3/4 BSP.F   | 4.1 (9.0)              | DHGM-04X-2090               | 3/4 NPT     | 4.1 (9.0)              |
| G-DSHG-06           | DHGM-06-50              | Rc 3/4      | 7.4 (16.3)             | DHGM-06-5080             | 3/4 BSP.F   | 8.5 (18.7)             | DHGM-06-5090                | 3/4 NPT     | 7.4 (16.3)             |
|                     | DHGM-06X-50             | Rc 1        | 7.4 (16.3)             | DHGM-06X-5080            | 1 BSP.F     | 8.5 (18.7)             | DHGM-06X-5090               | 1 NPT       | 7.4 (16.3)             |

● 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.

## Attachment (Mtg. Bolts)

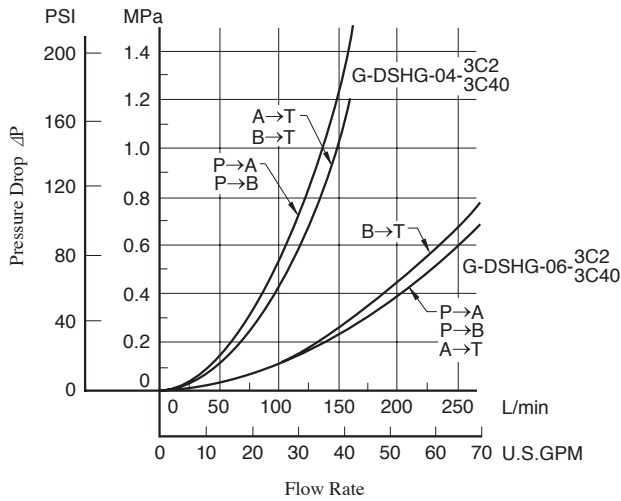
Socket head cap screws in the table below are included.

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

Hydraulic Fluid: Viscosity 30 mm<sup>2</sup>/s (141 SSU), Specific Gravity 0.850

## Pressure Drop

### G-DSHG-04-06-3C2/3C40



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

| Viscosity | mm <sup>2</sup> /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 |

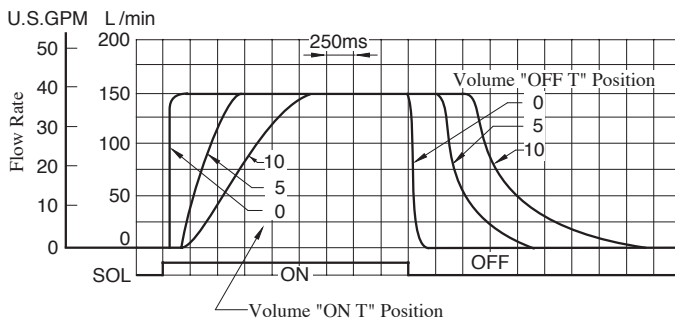
- For any other specific gravity (G'), the pressure drop (ΔP') may be obtained from the formula below.  

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

## Shifting Characteristics

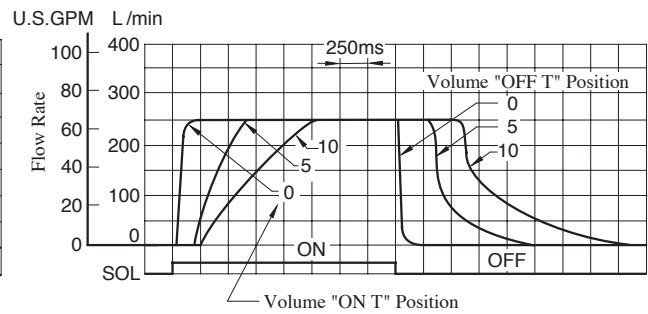
### G-DSHG-04-3C2/3C40

Supply Pressure : 16 MPa (2320 PSI)  
 Flow Rate : 150 L/min (39.6 U.S.GPM)  
 Pilot Pressure : 16 MPa (2320 PSI)



### G-DSHG-06-3C2/3C40

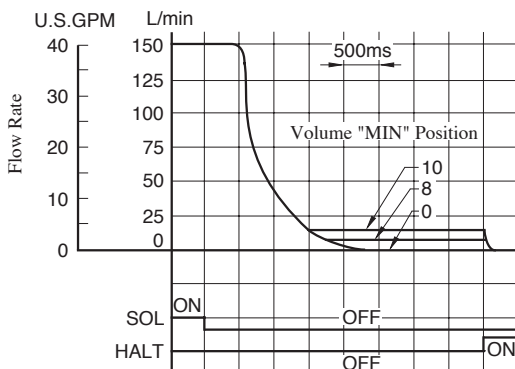
Supply Pressure : 16 MPa (2320 PSI)  
 Flow Rate : 250 L/min (66.1 U.S.GPM)  
 Pilot Pressure : 16 MPa (2320 PSI)



## Low Speed Operating Flow Characteristics

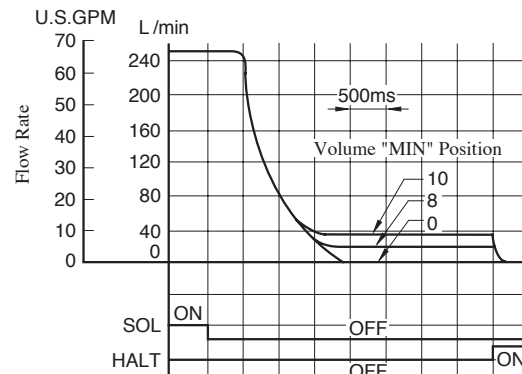
### G-DSHG-04-3C2/3C40

Supply Pressure : 16 MPa (2320 PSI)  
 Flow Rate : 150 L/min (39.6 U.S.GPM)  
 Pilot Pressure : 16 MPa (2320 PSI)



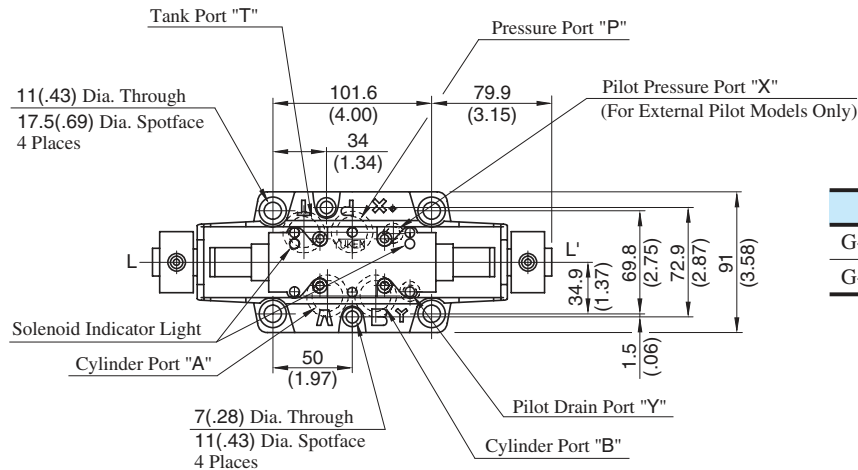
### G-DSHG-06-3C2/3C40

Supply Pressure : 16 MPa (2320 PSI)  
 Flow Rate : 250 L/min (66.1 U.S.GPM)  
 Pilot Pressure : 16 MPa (2320 PSI)

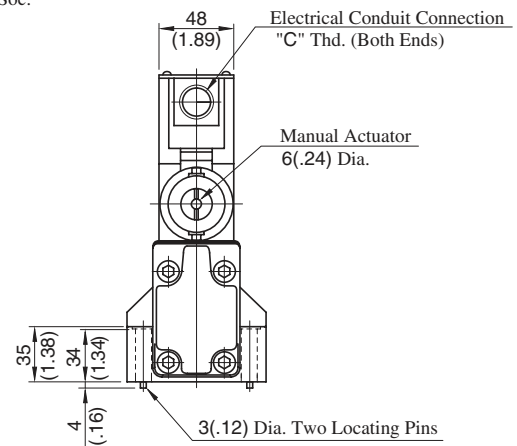
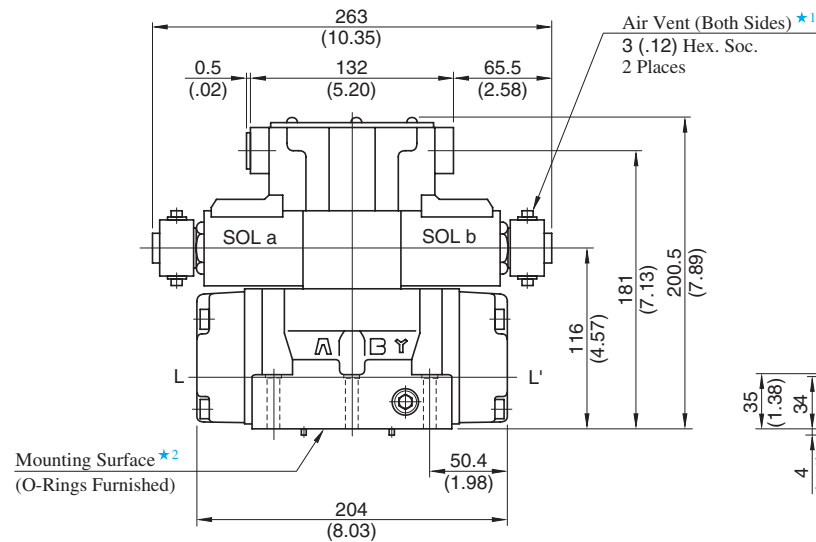


G-DSHG-04-3C\*-50/5090

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



| Model Numbers      | "C" Thd. |
|--------------------|----------|
| G-DSHG-04-3C*-50   | G 1/2    |
| G-DSHG-04-3C*-5090 | 1/2 NPT  |



★1. Air vent position around valve longitudinal axis can be optionally selected.

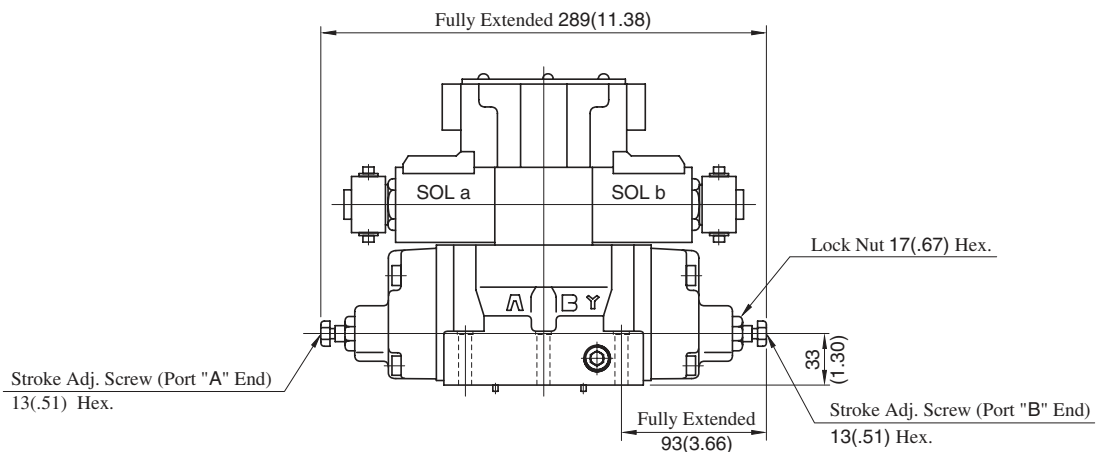
★2. O-rings for ports: SO-NB-P22 for P/A/B/T ports  
SO-NB-P9 for X/Y ports

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

DIMENSIONS IN  
MILLIMETRES (INCHES)

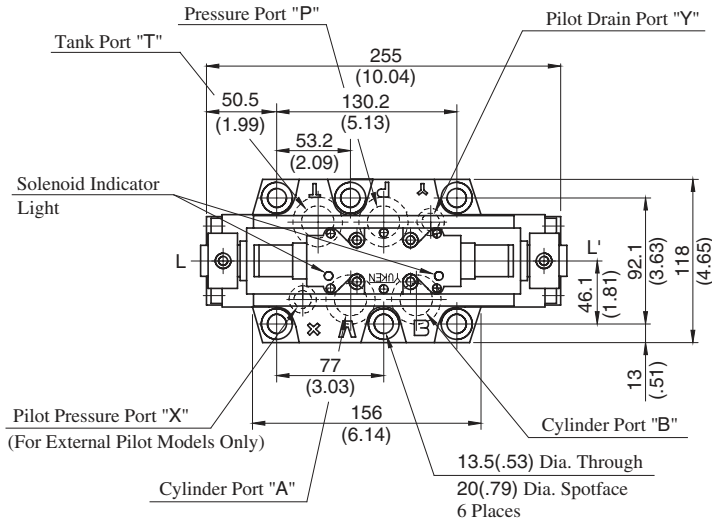
## ● Models with Stroke Adjustment (Option)

G-DSHG-04-3C\*-R\*-50/5090

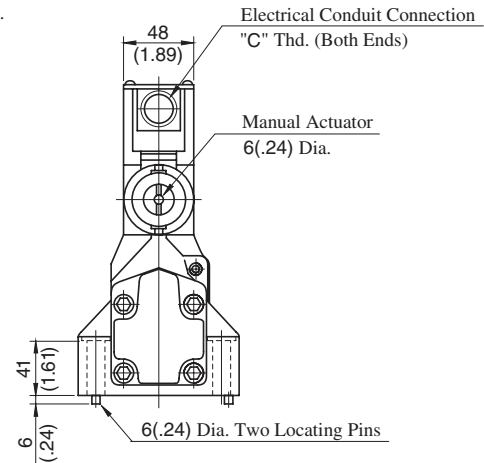
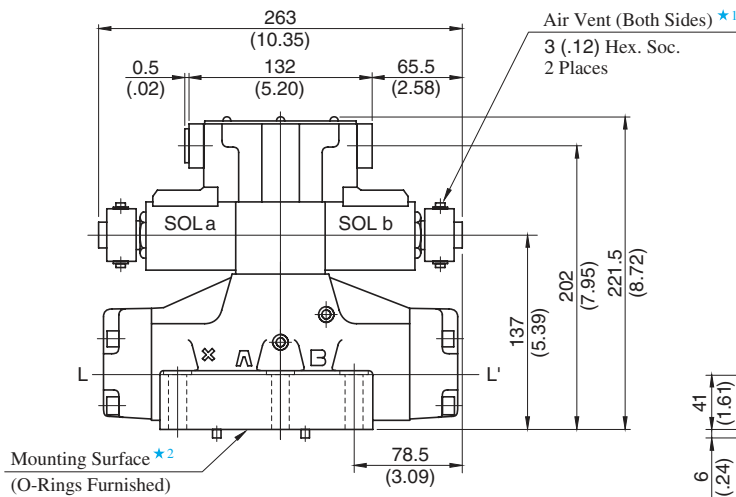


G-DSHG-06-3C\*-\*\*-50/5090

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



| Model Numbers         | "C" Thd. |
|-----------------------|----------|
| G-DSHG-06-3C*-**-50   | G 1/2    |
| G-DSHG-06-3C*-**-5090 | 1/2 NPT  |



★1. Air vent position around valve longitudinal axis can be optionally selected.

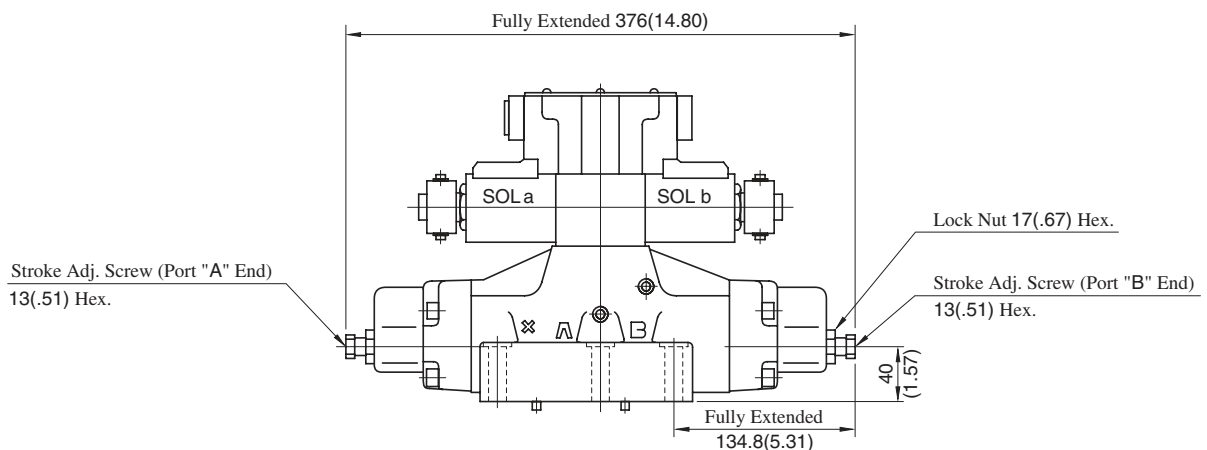
★2. O-rings for ports: SO-NB-P30 for P/A/B/T ports  
SO-NB-P14 for X/Y ports

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

**DIMENSIONS IN  
MILLIMETRES (INCHES)**

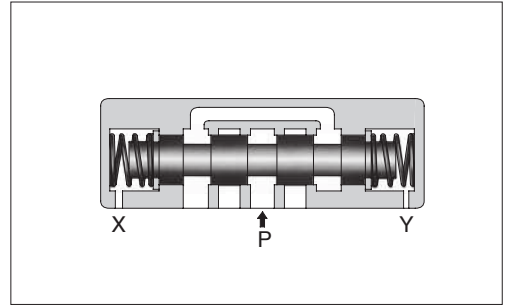
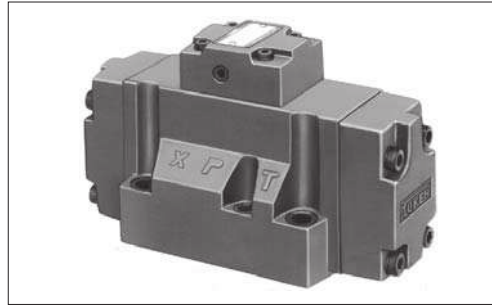
● **Models with Stroke Adjustment (Option)**

G-DSHG-06-3C\*-\*\*-R\*-\*\*-50/5090



## Pilot Operated Directional Valves

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

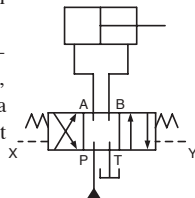


### Specifications

| Model Numbers  | Maximum Flow L/min (U.S.GPM) |                          |                          |                          | 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.) |
|----------------|------------------------------|--------------------------|--------------------------|--------------------------|-----------------------------------|-------------------------------|----------------------------------------|-------------------------------------|------------------------|
|                | 10 MPa (1450 PSI)            | 16 MPa (2320 PSI)        | 25 MPa (3630 PSI)        | 31.5 MPa (4570 PSI)      |                                   |                               |                                        |                                     |                        |
| DHG-04-3C*-50* | 300 (79.3) <sup>*1</sup>     | 300 (79.3) <sup>*1</sup> | 300 (79.3) <sup>*1</sup> | 300 (79.3) <sup>*1</sup> | 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) <sup>*2</sup>      | 500 (132) <sup>*2</sup>  | 500 (132) <sup>*2</sup>  | 500 (132) <sup>*2</sup>  | 31.5 (4570)                       | 25 (3630)                     | 0.8 (120) <sup>*4</sup>                | 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) <sup>*3</sup>  |                                   | 21 (3050)                     | 1 (150)                                |                                     | 12.0 (26.5)            |
| DHG-10-3C*-40* | 1100 (291) <sup>*3</sup>     | 1100 (291) <sup>*3</sup> | 1100 (291) <sup>*3</sup> | 1100 (291) <sup>*3</sup> | 31.5 (4570)                       | 25 (3630)                     | 1 (150) <sup>*4</sup>                  | 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) <sup>*3</sup> | 1100 (291) <sup>*3</sup> |                                   | 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 either 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:<br>Special Seals for Phosphate ester type fluids (Omit if not required) | DH:<br>Pilot Operated Directional Valve | G:<br>Sub-plate Mounting | 04          | 3                         | C:<br>Spring Centred     | 2 , 3<br>4 , 40<br>5 , 6<br>60 , 7<br>9 , 10<br>11 , 12 | A★3 , B★3<br>(Omit if not required) | C2:<br>With C2 Choke                      | R2: With Stroke Adjustment, Both Ends<br>RA: With Stroke Adjustment, Port A End<br>RB: With Stroke Adjustment, Port B End<br>P2: With Pilot Piston, Both Ends<br>PA: With Pilot Piston, Port A End<br>PB: With Pilot Piston, Port B End | —<br><br><br>H:<br>Refer to ★4  | 50            | Refer to ★5     |
|                                                                            |                                         |                          | 06          |                           | N:<br>No-Spring          |                                                         |                                     |                                           | 50                                                                                                                                                                                                                                      |                                 |               |                 |
|                                                                            |                                         |                          | 10          |                           | B:<br>Spring Offset      |                                                         |                                     |                                           | 40                                                                                                                                                                                                                                      |                                 |               |                 |
|                                                                            |                                         |                          | Refer to ★1 |                           |                          |                                                         |                                     |                                           |                                                                                                                                                                                                                                         |                                 |               |                 |

★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 <sup>★</sup> | No-Spring     | Spring Offset |
|            | Graphic Symbols |                               |               |               |
|            |                 |                               |               |               |
| 2          |                 | 3C2                           | 3H2           | 2N2           |
| 3          |                 | 3C3                           | 3H3           | 2N3           |
| 4          |                 | 3C4                           | 3H4           | 2N4           |
| 40         |                 | 3C40                          | 3H40          | 2N40          |
| 5          |                 | 3C5                           | 3H5           |               |
| 6          |                 | 3C6                           | 3H6           |               |
| 60         |                 | 3C60                          | 3H60          |               |
| 7          |                 | 3C7                           | 3H7           | 2N7           |
| 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              | Rc 1/2      | 4.4 (9.7)              | DHGM-04-2080             | 1/2 BSP.F   | 4.4 (9.7)              | DHGM-04-2090                | 1/2 NPT     | 4.4 (9.7)              |
|                     | DHGM-04X-20             | Rc 3/4      | 4.1 (9.0)              | DHGM-04X-2080            | 3/4 BSP.F   | 4.1 (9.0)              | DHGM-04X-2090               | 3/4 NPT     | 4.1 (9.0)              |
| DHG-06              | DHGM-06-50              | Rc 3/4      | 7.4 (16.3)             | DHGM-06-5080             | 3/4 BSP.F   | 8.5 (18.7)             | DHGM-06-5090                | 3/4 NPT     | 7.4 (16.3)             |
|                     | DHGM-06X-50             | Rc 1        | 7.4 (16.3)             | DHGM-06X-5080            | 1 BSP.F     | 8.5 (18.7)             | DHGM-06X-5090               | 1 NPT       | 7.4 (16.3)             |
| DHG-10              | DHGM-10-40              | Rc 1-1/4    | 21.5 (47.4)            | DHGM-10-4080             | 1-1/4 BSP.F | 21.5 (47.4)            | DHGM-10-4090                | 1-1/4 NPT   | 21.5 (47.4)            |
|                     | DHGM-10X-40             | Rc 1-1/2    | 21.5 (47.4)            | DHGM-10X-4080            | 1-1/2 BSP.F | 21.5 (47.4)            | DHGM-10X-4090               | 1-1/2 NPT   | 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"<br>European Design Standard | N. American Design Standard | Qty. | Tightening Torque<br>Nm (in. lbs) |
| DHG-04        | M6 × 45 Lg.                                         | 1/4-20 UNC × 1-3/4 Lg.      | 2    | 12-15 (106-133)                   |
|               | M10 × 50 Lg.                                        | 3/8-16 UNC × 2 Lg.          | 4    | 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)               |

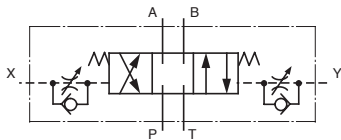
## Options

### 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

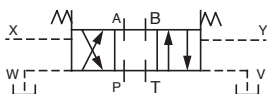


### Models with Pilot Piston (P\*)

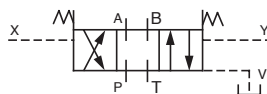
The valves with a pilot piston can be used when the high speed changeover of the spool is required. However, please note that in case of spring centred valves, there is no change in the returning speed of the spool to the neutral position even with the pilot piston.

Graphic Symbols

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



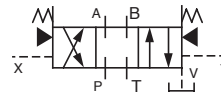
Spring Centred Models with Pilot Piston on Port "A" End (PA)



### 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

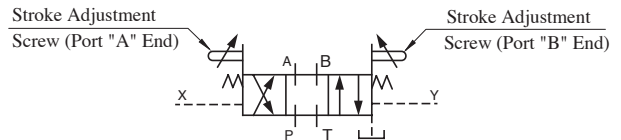


### Models with Stroke Adjustment (R\*)

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) |

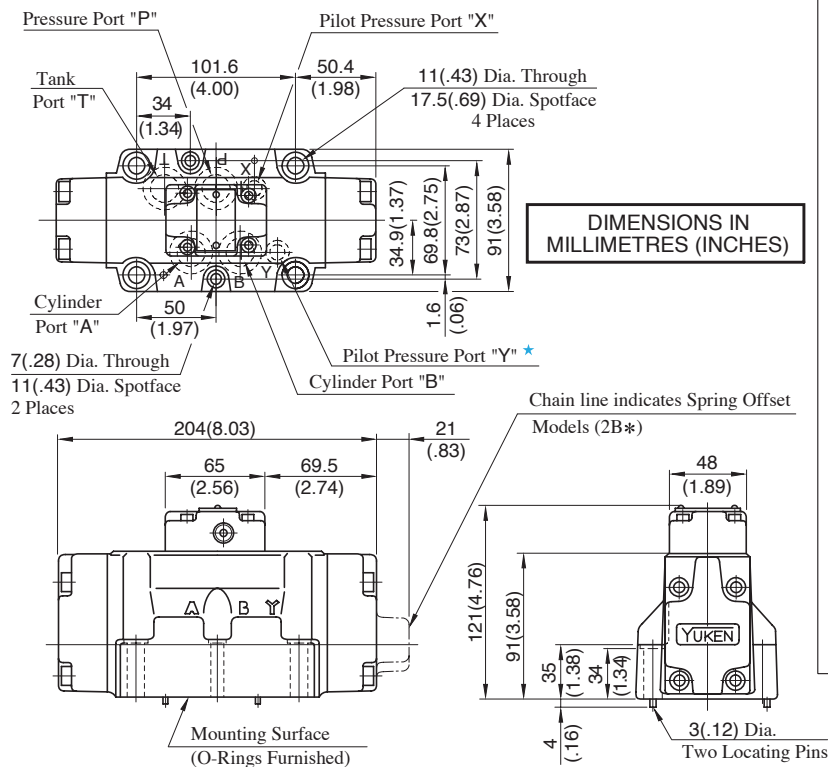
## Valves Using Neutral Position and Side Position (Special Two Position Valve)

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                   | Graphic Symbols |
|---------------------------------|-----------------|
| 04<br>DHG-06-2B* <u>A</u><br>10 |                 |
| 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                   | Graphic Symbols |
|---------------------------------|-----------------|
| 04<br>DHG-06-2B* <u>B</u><br>10 |                 |
| 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

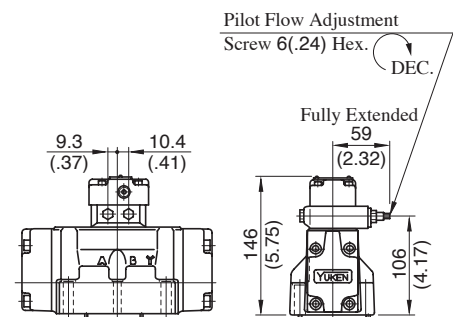


Note: For the valve mounting surface dimensions, see the dimensional drawing of the sharable sub-plate on [page 401](#).

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

#### Options

##### ● Models with Pilot Choke Valve DHG-04-\*\*\*-C2



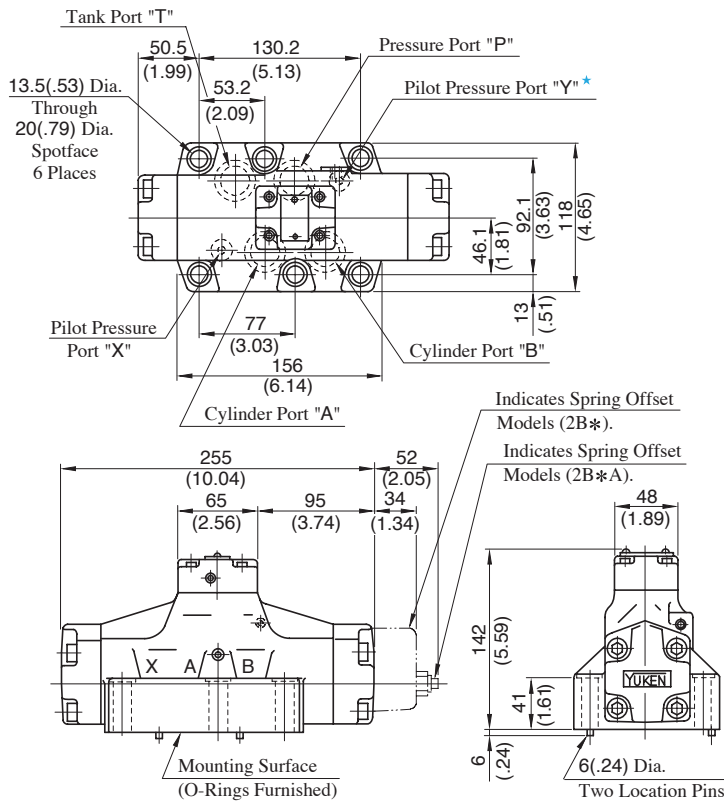
##### ● Models with Stroke Adj. (R\*)

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\*A), 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



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

### Options

#### ● Models with Pilot Choke Valve DHG-06-\*\*\*-C2

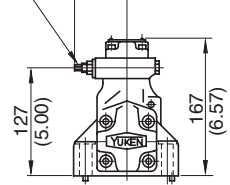
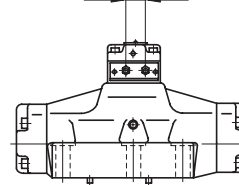
Pilot Flow Adjustment Screw

6 (.24) Hex.

DEC.

Fully Extended

59 (2.32)



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

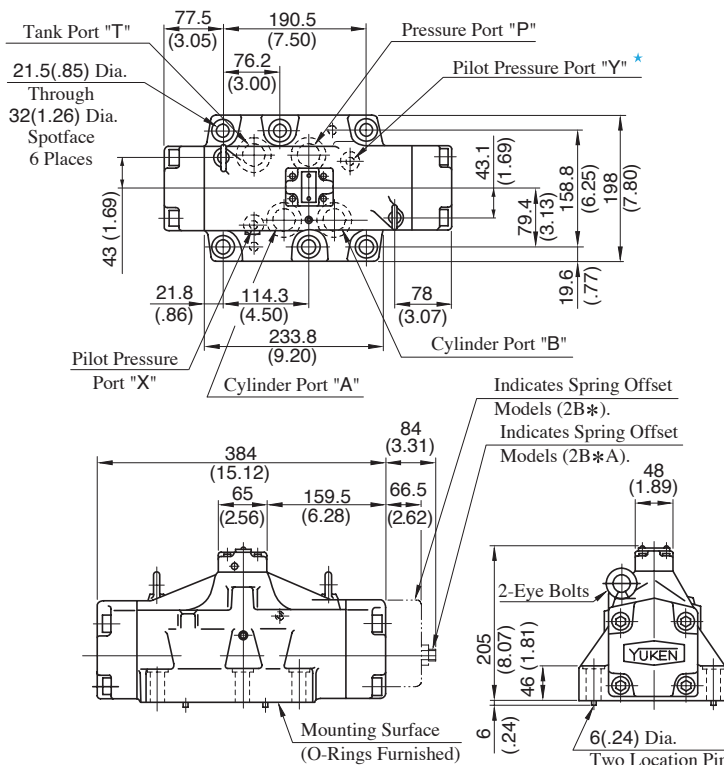
The outside dimensions of the above options are the same as those of the main valve of Solenoid Controlled Pilot Operated Directional Valve (DSHG-06). See [page 405](#).

★ In case of Spring Offset Model (2B\*, 2B\*<sup>A</sup><sub>B</sub>), it functions as a drain port. When that model is used, directly connect it to the reservoir.

DIMENSIONS IN  
MILLIMETRES (INCHES)

## DHG-10-\*\*\*-40/4090

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



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

### Options

#### ● Models with Pilot Choke Valve DHG-10-\*\*\*-C2

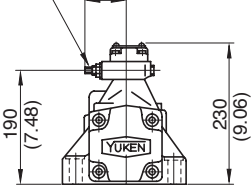
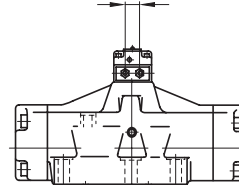
Pilot Flow Adjustment Screw

6 (.24) Hex.

DEC.

Fully Extended

59 (2.32)



- 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\*<sup>A</sup><sub>B</sub>), in functions as a drain port. When that model is used, directly connect it to the reservoir.

E



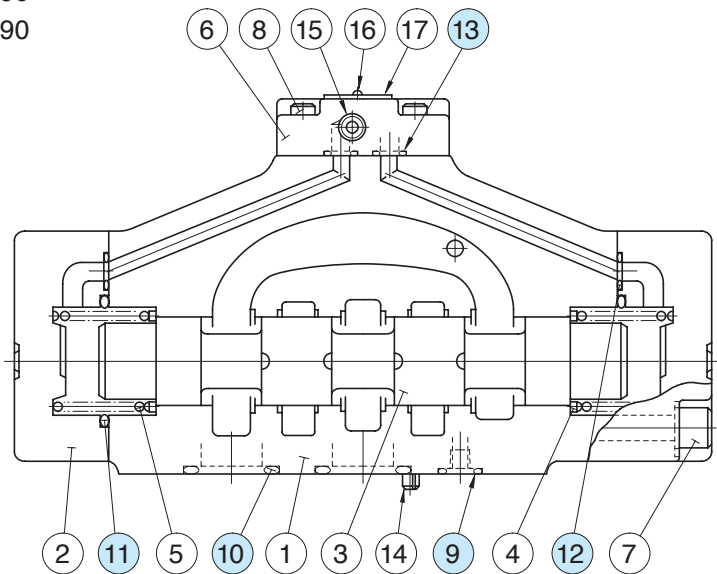
Pilot Operated Directional Valves

■ List of Seals

DHG-04-\*\*\*-50/5090

DHG-06-\*\*\*-50/5090

DHG-10-\*\*\*-40/4090



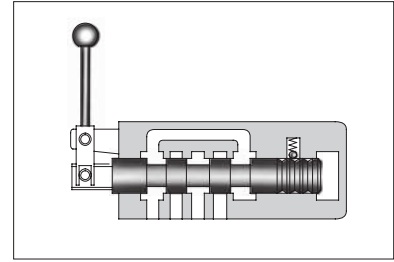
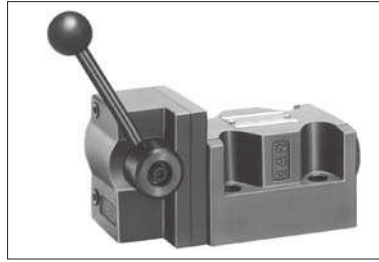
| Item | Name of Parts | Part Numbers |           |           | Qty |
|------|---------------|--------------|-----------|-----------|-----|
|      |               | DHG-04       | DHG-06    | DHG-10    |     |
| 9    | O-Ring        | SO-NB-P9     | SO-NB-P14 | SO-NB-P20 | 2   |
| 10   | O-Ring        | 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     |

## Manually Operated Directional Valves

These valves may be used to manually shift the spool position and change the direction of oil flow.



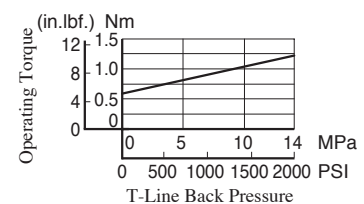
### Specifications

| Model Numbers        | Maximum Flow L/min (U.S.GPM) |                                          |                                          |                                          | Max. Operating Pressure MPa (PSI) | Max. T-Line Back Pressure MPa (PSI)                                                               | Approx. Mass kg (lbs.) |
|----------------------|------------------------------|------------------------------------------|------------------------------------------|------------------------------------------|-----------------------------------|---------------------------------------------------------------------------------------------------|------------------------|
|                      | 7 MPa (1020 PSI)             | 14 MPa (2030 PSI)                        | 21 MPa (3050 PSI)                        | 31.5 MPa (4570 PSI)                      |                                   |                                                                                                   |                        |
| Threaded Connections | DMT-03-3C*-50*               | 100 (26.4) <sup>*1</sup>                 | 100 (26.4) <sup>*1</sup>                 | 100 (26.4) <sup>*1</sup>                 | 25 (3630)                         | 16 (2320)                                                                                         | 5.0 (11.0)             |
|                      | DMT-03-3D*-50*               | 100 (26.4)                               | 100 (26.4)                               | 100 (26.4)                               |                                   |                                                                                                   |                        |
|                      | DMT-03-2D*-50*               | 100 (26.4)                               | 100 (26.4)                               | 100 (26.4)                               |                                   |                                                                                                   |                        |
|                      | DMT-03-2B*-50*               | 100 (26.4) <sup>*1</sup>                 | 100 (26.4) <sup>*1</sup>                 | 100 (26.4) <sup>*1</sup>                 |                                   |                                                                                                   |                        |
|                      | DMT-06*-3C*-30*              | 300 {200} <sup>*2</sup><br>(79.3 {52.8}) | 300 {120} <sup>*2</sup><br>(79.3 {31.7}) | 300 {100} <sup>*2</sup><br>(79.3 {26.4}) | 21 (3050)                         | At time spool shift is required:<br>7 (1020)<br>At time spool shift is not required:<br>21 (3050) | 12.9 (28.5)            |
|                      | DMT-06*-3D*-30*              | 300 (79.3)                               | 300 (79.3)                               | 300 (79.3)                               |                                   |                                                                                                   |                        |
|                      | DMT-06*-2D*-30*              | 300 (79.3)                               | 300 (79.3)                               | 300 (79.3)                               |                                   |                                                                                                   |                        |
|                      | DMT-06*-2B*-30*              | 200 (52.8)                               | 120 (31.7)                               | 100 (26.4)                               |                                   |                                                                                                   |                        |
|                      | DMT-10*-3C*-30*              | 500 {315} <sup>*2</sup><br>(132 {83.2})  | 500 {315} <sup>*2</sup><br>(132 {83.2})  | 500 {315} <sup>*2</sup><br>(132 {83.2})  | 21 (3050)                         | At time spool shift is required:<br>7 (1020)<br>At time spool shift is not required:<br>21 (3050) | 22 (48.5)              |
|                      | DMT-10*-3D*-30*              | 500 (132)                                | 500 (132)                                | 500 (132)                                |                                   |                                                                                                   |                        |
|                      | DMT-10*-2D*-30*              | 500 (132)                                | 500 (132)                                | 500 (132)                                |                                   |                                                                                                   |                        |
|                      | DMT-10*-2B*-30*              | 315 (83.2)                               | 315 (83.2)                               | 315 (83.2)                               |                                   |                                                                                                   |                        |
| Sub-Plate Mounting   | DMG-01-3C*-10*               | 35 (9.2)                                 | 35 (9.2)                                 | 35 (9.2)                                 | 25 (3630)                         | 14 (2030) <sup>*5</sup>                                                                           | 1.8 (4.0)              |
|                      | DMG-01-3D*-10*               |                                          |                                          |                                          |                                   |                                                                                                   |                        |
|                      | DMG-01-2D*-10*               |                                          |                                          |                                          |                                   |                                                                                                   |                        |
|                      | DMG-01-2B*-10*               |                                          |                                          |                                          |                                   |                                                                                                   |                        |
|                      | DMG-03-3C*-50*               | 100 (26.4) <sup>*1</sup>                 | 100 (26.4) <sup>*1</sup>                 | 100 (26.4) <sup>*1</sup>                 | 25 (3630)                         | 16 (2320)                                                                                         | 4.0 (8.8)              |
|                      | DMG-03-3D*-50*               | 100 (26.4)                               | 100 (26.4)                               | 100 (26.4)                               |                                   |                                                                                                   |                        |
|                      | DMG-03-2D*-50*               | 100 (26.4)                               | 100 (26.4)                               | 100 (26.4)                               |                                   |                                                                                                   |                        |
|                      | DMG-03-2B*-50*               | 100 (26.4) <sup>*1</sup>                 | 100 (26.4) <sup>*1</sup>                 | 100 (26.4) <sup>*1</sup>                 |                                   |                                                                                                   |                        |
|                      | DMG-04-3C*-21*               | 200 (52.8) <sup>*3</sup>                 | 200 (52.8) <sup>*3</sup>                 | 105 (27.7) <sup>*3</sup>                 | 21 (3050)                         | 21 (3050) <sup>*6</sup>                                                                           | 7.4 (16.3)             |
|                      | DMG-04-3D*-21*               | 200 (52.8)                               | 200 (52.8)                               | 200 (52.8)                               |                                   |                                                                                                   |                        |
|                      | DMG-04-2D*-21*               | 200 (52.8)                               | 200 (52.8)                               | 200 (52.8)                               |                                   |                                                                                                   | 7.9 (17.4)             |
|                      | DMG-04-2B*-21*               | 90 (23.8)                                | 60 (15.9)                                | 50 (13.2)                                |                                   |                                                                                                   |                        |
|                      | DMG-06-3C*-50*               | 500 (132)                                | 500 (132)                                | 500 (132)                                | 31.5 (4570)                       | 21 (3050) <sup>*6</sup>                                                                           | 11.5 (25.4)            |
|                      | DMG-06-3D*-50*               | 500 (132)                                | 500 (132)                                | 500 (132)                                |                                   |                                                                                                   |                        |
|                      | DMG-06-2D*-50*               | 500 (132)                                | 500 (132)                                | 500 (132)                                |                                   |                                                                                                   | 12 (26.5)              |
|                      | DMG-06-2B*-50*               | 420 (111)                                | 300 (79.3)                               | 250 (66.1)                               |                                   |                                                                                                   |                        |
|                      | DMG-10-3C*-40*               | 1100 (291) <sup>*4</sup>                 | 1100 (291) <sup>*4</sup>                 | 1100 (291) <sup>*4</sup>                 | 31.5 (4570)                       | 21 (3050) <sup>*6</sup>                                                                           | 48.2 (106)             |
|                      | DMG-10-3D*-40*               | 1100 (291)                               | 1100 (291)                               | 1100 (291)                               |                                   |                                                                                                   |                        |
|                      | DMG-10-2D*-40*               | 1100 (291)                               | 1100 (291)                               | 1100 (291)                               |                                   |                                                                                                   | 50 (110)               |
|                      | DMG-10-2B*-40*               | 670 (177)                                | 350 (92.5)                               | 260 (68.7)                               |                                   |                                                                                                   |                        |

Note: The maximum flow means the limited flow without inducing any abnormality to the operation (changeover) of the valve. For details, please refer to the "List of Standard Models and Maximum Flow" on pages 386 to 390.

- ★ 1. Varies depending on the spool type. For details, see the "List of Standard Model and Maximum Flows" for DSG-03 Series Solenoid Operated Directional Valves (page 364 and 366 at 50 Hz rated voltage).
- ★ 2. The figures in parentheses indicate Max. flow for 3C3, 3C5, 3C6 and 3C60.
- ★ 3. Varies depending on the spool type. For the details, see the table in the following page.
- ★ 4. Varies depending on the spool type. Same as DSHG-10 (at pilot pressure of 1.5 MPa (220 PSI). See page 390.
- ★ 5. Lever operating torque varies depends on the T-line back pressure. See the right-hand figure.
- ★ 6. If the T-Line back pressure exceeds 7 MPa (1020 PSI), directly connect the drain port to the reservoir.

### DMG-01 Lever Operating Torque



## Model Number Designation

| F-                                                                         | DM                                          | T                         | -03                                               | -2                    | B                        | 2                                                            | A                               | -50           | *                                                                                    |
|----------------------------------------------------------------------------|---------------------------------------------|---------------------------|---------------------------------------------------|-----------------------|--------------------------|--------------------------------------------------------------|---------------------------------|---------------|--------------------------------------------------------------------------------------|
| Special Seals                                                              | Series Number                               | Type of Connection        | Valve Size                                        | No. of Valve Position | Spool-Spring Arrangement | Spool Type                                                   | Special Two Position Valve      | Design Number | Design Standard                                                                      |
| F:<br>Special Seals for Phosphate ester type fluids (Omit if not required) | DM:<br>Manually Operated Directional Valves | T:<br>Threaded Connection | 03                                                | 3                     | C:<br>Spring Centred     | 2 , 3<br>4 , 40<br>5 , 6<br>60 , 7<br>8 , 9<br>10 , 11<br>12 | A*,B*<br>(Omit if not required) | 50            | None: Japanese Std. "JIS"<br>80: European Design Std.<br>90: N. American Design Std. |
|                                                                            |                                             |                           | 06 (Piping size 3/4)<br>06X (Piping size 1)       |                       |                          |                                                              |                                 | 30            |                                                                                      |
|                                                                            |                                             |                           | 10 (Piping size 1-1/4)<br>10X (Piping size 1-1/2) |                       |                          |                                                              |                                 | 30            |                                                                                      |
|                                                                            |                                             |                           |                                                   |                       |                          |                                                              |                                 |               |                                                                                      |
|                                                                            |                                             | G:<br>Sub-plate Mounting  | 01                                                | 2                     | D:<br>No-Spring Detented | B:<br>Spring Offset                                          |                                 | 10            | None: Japanese Std. "JIS" and European Design Std.<br>90: N. American Design Std.    |
|                                                                            |                                             |                           | 03                                                |                       |                          |                                                              |                                 | 50            |                                                                                      |
|                                                                            |                                             |                           | 04                                                |                       |                          |                                                              |                                 | 21            |                                                                                      |
|                                                                            |                                             |                           | 06                                                |                       |                          |                                                              |                                 | 50            |                                                                                      |
|                                                                            |                                             |                           | 10                                                |                       |                          |                                                              |                                 | 40            |                                                                                      |
|                                                                            |                                             |                           |                                                   |                       |                          |                                                              |                                 |               |                                                                                      |
|                                                                            |                                             |                           |                                                   |                       |                          |                                                              |                                 |               |                                                                                      |
|                                                                            |                                             |                           |                                                   |                       |                          |                                                              |                                 |               |                                                                                      |
| See the table below for combinations.                                      |                                             |                           |                                                   |                       |                          |                                                              |                                 |               |                                                                                      |

★ Refer to column "valves using neutral position and side position" (special 2-position valve) on page 431.

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

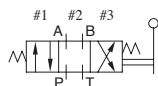
| Model Numbers  | Rated Flow L/min (U.S.GPM) | Max. Operating Pressure MPa (PSI) |
|----------------|----------------------------|-----------------------------------|
| DMF-10-***-30* | 315 (83.2)                 | 21 (3050)                         |
| DMF-16-***-31* | 400 (106)                  |                                   |

## Maximum Flow of DMG-04-3C\*

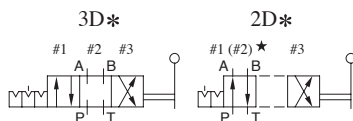
| Model Numbers | Max. Flow L/min (U.S.GPM) |                  |                  |
|---------------|---------------------------|------------------|------------------|
|               | 7 MPa(1020 PSI)           | 14 MPa(2030 PSI) | 21 MPa(3050 PSI) |
| DMG-04-3C2    | 200 (52.8)                | 130 (34.3)       | 85 (22.5)        |
| DMG-04-3C3    | 180 (47.6)                | 90 (23.8)        | 70 (18.5)        |
| DMG-04-3C4    | 200 (52.8)                | 200 (52.8)       | 90 (23.8)        |
| DMG-04-3C40   | 200 (52.8)                | 200 (52.8)       | 105 (27.7)       |
| DMG-04-3C5    | 80 (21.1)                 | 50 (13.2)        | 40 (10.6)        |
| DMG-04-3C6    | 90 (23.8)                 | 60 (15.9)        | 55 (14.5)        |
| DMG-04-3C60   | 140 (37.0)                | 70 (18.5)        | 55 (14.5)        |
| DMG-04-3C7    | 200 (52.8)                | 75 (19.8)        | 55 (14.5)        |
| DMG-04-3C9    | 200 (52.8)                | 125 (33.0)       | 100 (26.4)       |
| DMG-04-3C10   | 200 (52.8)                | 130 (34.3)       | 85 (22.5)        |
| DMG-04-3C11   | 200 (52.8)                | 150 (39.6)       | 85 (22.5)        |
| DMG-04-3C12   | 200 (52.8)                | 200 (52.8)       | 95 (25.1)        |

## Graphic Symbols

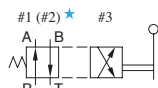
### Spring Centred Models (3C\*)



### No-Spring Detented Models



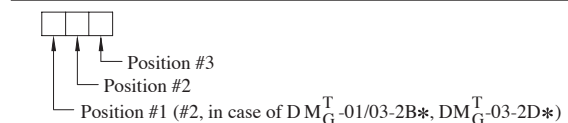
### Spring Offset Models (2B\*)



★. Position #2 is applied for models DMG-01-2B\* and DM<sub>G</sub><sup>T</sup>-03-2B\*/2D\*.

## List of Spool Type

| Spool Type | DMG-01 |    |    | DMT-03 DMG-03 |    |    | DMT-06* DMT-10* |       | DMG-04 DMG-06 DMG-10 |       |
|------------|--------|----|----|---------------|----|----|-----------------|-------|----------------------|-------|
|            | 3C 3D  | 2D | 2B | 3C 3D         | 2D | 2B | 3C 3D           | 2D 2B | 3C 3D                | 2D 2B |
| 2          |        | ○  | ○  | ○             | ○  | ○  | ○               | ○     | ○                    | ○     |
| 3          |        | ○  | ○  | ○             | —  | ○  | ○               | ○     | ○                    | ○     |
| 4          |        | ○  | —  | ○             | —  | —  | ○               | ○     | ○                    | ○     |
| 40         |        | ○  | —  | ○             | —  | —  | ○               | ○     | ○                    | ○     |
| 5          |        | ○  | —  | —             | —  | —  | —               | —     | —                    | —     |
| 6          |        | —  | —  | —             | —  | —  | —               | —     | ○                    | —     |
| 60         |        | ○  | —  | ○             | —  | —  | —               | —     | ○                    | —     |
| 7          |        | ○  | ○  | —             | —  | —  | ○               | ○     | ○                    | ○     |
| 8          |        | ○  | ○  | ○             | —  | ○  | ○               | ○     | —                    | —     |
| 9          |        | ○  | —  | —             | ○  | —  | ○               | —     | ○                    | —     |
| 10         |        | ○  | —  | —             | ○  | —  | ○               | —     | ○                    | —     |
| 11         |        | ○  | —  | —             | —  | —  | ○               | —     | ○                    | —     |
| 12         |        | ○  | —  | —             | ○  | —  | ○               | —     | ○                    | —     |



Note: The ○ mark indicate the spool type available for each type.

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

In addition to the standard two positions valves (2D\*, 2B\*), the following two types of two positions valves are available: Valves with neutral position (#2) and position #1 (2B\*A, 2D\*A), valves with neutral position (#2) and position #3 (2B\*B, 2D\*B).

The ○ mark in the table below indicates the spool type available for each models.

## Spring Offset Models

| Valve Type | Graphic Symbols | Model            |                    |                            | Valve Type | Graphic Symbols | Model  |                  |                    |                            |
|------------|-----------------|------------------|--------------------|----------------------------|------------|-----------------|--------|------------------|--------------------|----------------------------|
|            |                 | DMT-03<br>DMG-03 | DMT-06*<br>DMT-10* | DMG-04<br>DMG-06<br>DMG-10 |            |                 | DMG-01 | DMT-03<br>DMG-03 | DMT-06*<br>DMT-10* | DMG-04<br>DMG-06<br>DMG-10 |
| 2B2A       |                 | ○                | ○                  | ○                          | 2B2B       |                 | ○      | ○                | ○                  | ○                          |
| 2B3A       |                 | ○                | ○                  | ○                          | 2B3B       |                 | ○      | ○                | ○                  | ○                          |
| 2B4A       |                 | —                | ○                  | ○                          | 2B4B       |                 | ○      | ○                | ○                  | ○                          |
| 2B40A      |                 | —                | ○                  | ○                          | 2B40B      |                 | ○      | —                | ○                  | ○                          |
| —          | —               | —                | —                  | —                          | 2B5B       |                 | ○      | —                | —                  | —                          |
| 2B5A       |                 | —                | ○                  | ○                          | 2B5B       |                 | —      | —                | ○                  | ○                          |
| 2B6A       |                 | —                | ○                  | —                          | 2B6B       |                 | —      | —                | ○                  | —                          |
| 2B6A       |                 | —                | ○                  | —                          | 2B6B       |                 | ○      | ○                | —                  | ○                          |
| 2B60A      |                 | —                | ○                  | —                          | 2B60B      |                 | —      | —                | ○                  | —                          |
| 2B60A      |                 | —                | ○                  | —                          | 2B60B      |                 | ○      | ○                | —                  | ○                          |
| 2B7A       |                 | —                | ○                  | ○                          | 2B7B       |                 | ○      | —                | ○                  | ○                          |
| 2B8A       |                 | —                | ○                  | —                          | 2B8B       |                 | ○      | —                | ○                  | —                          |
| 2B9A       |                 | —                | ○                  | ○                          | 2B9B       |                 | ○      | —                | ○                  | ○                          |
| 2B10A      |                 | —                | ○                  | ○                          | 2B10B      |                 | ○      | ○                | ○                  | ○                          |
| 2B11A      |                 | —                | ○                  | ○                          | 2B11B      |                 | ○      | —                | ○                  | ○                          |
| 2B12A      |                 | —                | ○                  | ○                          | 2B12B      |                 | ○      | ○                | ○                  | ○                          |

★ Position #1  
★ Position #2

★ Position #2  
★ Position #3

## No-spring Detented Models

| Valve Type | Graphic Symbols | Model              |                            | Valve Type | Graphic Symbols | Model  |                    |                            |
|------------|-----------------|--------------------|----------------------------|------------|-----------------|--------|--------------------|----------------------------|
|            |                 | DMT-06*<br>DMT-10* | DMG-04<br>DMG-06<br>DMG-10 |            |                 | DMG-01 | DMT-06*<br>DMT-10* | DMG-04<br>DMG-06<br>DMG-10 |
| 2D2A       |                 | ○                  | ○                          | 2D2B       |                 | ○      | ○                  | ○                          |
| 2D3A       |                 | ○                  | ○                          | 2D3B       |                 | ○      | ○                  | ○                          |
| 2D4A       |                 | ○                  | ○                          | 2D4B       |                 | ○      | ○                  | ○                          |
| 2D40A      |                 | ○                  | ○                          | 2D40B      |                 | ○      | ○                  | ○                          |
| —          | —               | —                  | —                          | 2D5B       |                 | ○      | —                  | —                          |
| 2D5A       |                 | ○                  | ○                          | 2D5B       |                 | —      | ○                  | ○                          |
| 2D6A       |                 | —                  | ○                          | 2D6B       |                 | —      | —                  | ○                          |
| 2D6A       |                 | ○                  | —                          | 2D6B       |                 | —      | ○                  | —                          |
| 2D60A      |                 | —                  | ○                          | 2D60B      |                 | ○      | —                  | ○                          |
| 2D60A      |                 | ○                  | —                          | 2D60B      |                 | —      | ○                  | —                          |
| 2D7A       |                 | ○                  | ○                          | 2D7B       |                 | ○      | ○                  | ○                          |
| 2D8A       |                 | ○                  | —                          | 2D8B       |                 | ○      | ○                  | —                          |
| 2D9A       |                 | ○                  | ○                          | 2D9B       |                 | ○      | ○                  | ○                          |
| 2D10A      |                 | ○                  | ○                          | 2D10B      |                 | ○      | ○                  | ○                          |
| 2D11A      |                 | ○                  | ○                          | 2D11B      |                 | ○      | ○                  | ○                          |
| 2D12A      |                 | ○                  | ○                          | 2D12B      |                 | ○      | ○                  | ○                          |

★ Position #1  
★ Position #2

★ Position #2  
★ Position #3

★. Position number is determined with three position type (3C\* and 3D\*) as the standard.

## Sub-plates

| 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.) |
| DMG-01              | DSGM-01-31              | Rc 1/8      | 0.8 (1.8)              | DSGM-01-3080             | 1/8 BSP.F   | 0.8 (1.8)              | DSGM-01-3190                | 1/8 NPT     | 0.8 (1.8)              |
|                     | DSGM-01X-31             | Rc 1/4      | 0.8 (1.8)              | DSGM-01X-3080            | 1/4 BSP.F   | 0.8 (1.8)              | DSGM-01X-3190               | 1/4 NPT     | 0.8 (1.8)              |
|                     | DSGM-01Y-31             | Rc 3/8      | 0.8 (1.8)              | —                        | —           | —                      | DSGM-01Y-3190               | 3/8 NPT     | 0.8 (1.8)              |
| DMG-03              | DSGM-03-40              | Rc 3/8      | 3.0 (6.6)              | DSGM-03-2180             | 3/8 BSP.F   | 3.0 (6.6)              | DSGM-03-2190                | 3/8 NPT     | 3.0 (6.6)              |
|                     | DSGM-03X-40             | Rc 1/2      | 3.0 (6.6)              | DSGM-03X-2180            | 1/2 BSP.F   | 3.0 (6.6)              | DSGM-03X-2190               | 1/2 NPT     | 3.0 (6.6)              |
|                     | DSGM-03Y-40             | Rc 3/4      | 4.7 (10.4)             | DSGM-03Y-2180            | 3/4 BSP.F   | 4.7 (10.4)             | DSGM-03Y-2190               | 3/4 NPT     | 4.7 (10.4)             |
| DMG-04              | DHGM-04-20              | Rc 1/2      | 4.4 (9.7)              | DHGM-04-2080             | 1/2 BSP.F   | 4.4 (9.7)              | DHGM-04-2090                | 1/2 NPT     | 4.4 (9.7)              |
|                     | DHGM-04X-20             | Rc 3/4      | 4.1 (9.0)              | DHGM-04X-2080            | 3/4 BSP.F   | 4.1 (9.0)              | DHGM-04X-2090               | 3/4 NPT     | 4.1 (9.0)              |
| DMG-06              | DHGM-06-50              | Rc 3/4      | 7.4 (16.3)             | DHGM-06-5080             | 3/4 BSP.F   | 8.5 (18.7)             | DHGM-06-5090                | 3/4 NPT     | 7.4 (16.3)             |
|                     | DHGM-06X-50             | Rc 1        | 7.4 (16.3)             | DHGM-06X-5080            | 1 BSP.F     | 8.5 (18.7)             | DHGM-06X-5090               | 1 NPT       | 7.4 (16.3)             |
| DMG-10              | DHGM-10-40              | Rc 1-1/4    | 21.5 (47.4)            | DHGM-10-4080             | 1-1/4 BSP.F | 21.5 (47.4)            | DHGM-10-4090                | 1-1/4 NPT   | 21.5 (47.4)            |
|                     | DHGM-10X-40             | Rc 1-1/2    | 21.5 (47.4)            | DHGM-10X-4080            | 1-1/2 BSP.F | 21.5 (47.4)            | DHGM-10X-4090               | 1-1/2 NPT   | 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.
- Sharable with Solenoid Operated Directional Valves and Solenoid Controlled Pilot Operated Directional Valves. For dimensions, refer to the right table then see the corresponding pages.

- Sub-plate dimensions appearing page

| Subplate Model Numbers | Page |
|------------------------|------|
| DSGM-01*               | 356  |
| DSGM-03*               | 373  |
| DHGM-04*               | 401  |
| DHGM-06*               | 402  |
| DHGM-10*               | 403  |

## Mounting Bolts

| Valve Model Numbers | Socket Head Cap Screw   |                             |      |                                 |
|---------------------|-------------------------|-----------------------------|------|---------------------------------|
|                     | Japanese Standard "JIS" | N. American Design Standard | Qty. | Tightening Torque Nm (in. lbs.) |
| DMG-01              | M5 × 45 Lg.             | No. 10-24 UNC × 1-3/4 Lg.   | 4    | 5-7 (44-62)                     |
| DMG-03              | M6 × 35 Lg.             | 1/4-20 UNC × 1-3/4 Lg.      | 4    | 12-15 (106-133)                 |
| DMG-04              | M6 × 40 Lg.             | 1/4-20 UNC × 1-1/2 Lg.      | 2    | 12-15 (106-133)                 |
|                     | M10 × 45 Lg.            | 3/8-16 UNC × 1-3/4 Lg.      | 4    | 58-72 (513-637)                 |
| DMG-06              | M12 × 60 Lg.            | 1/2-13 UNC × 2-1/2 Lg.      | 6    | 100-123 (885-1089)              |
| DMG-10              | M20 × 75 Lg.            | 3/4-10 UNC × 3 Lg.          | 8    | 473-585 (4195-5177)             |

## Instructions

- Avoid connecting the Tank Port "T" to a line with possible surge pressure.

## Pressure Drop

The following characteristics are based on the following conditions: viscosity of the fluid: 35 mm<sup>2</sup>/s (164 SSU) and Specific Gravity: 0.850

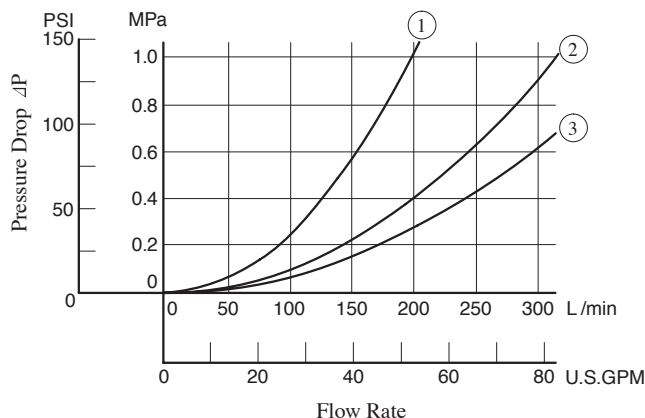
- For any other viscosity, multiply the factors in the table below.

| Viscosity | mm <sup>2</sup> /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 ( $\Delta P$ ) may be obtained from the formula below.

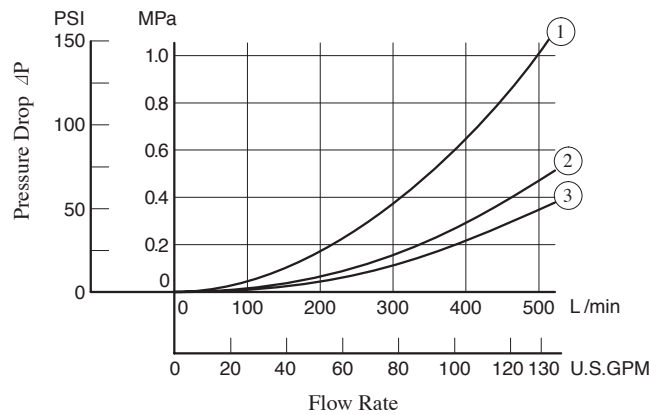
$$\Delta P' = \Delta P (G'/G) \text{ where, } \Delta P \text{ is a value on the following chart and } G \text{ is } 0.850.$$

- DMT-06, 06X



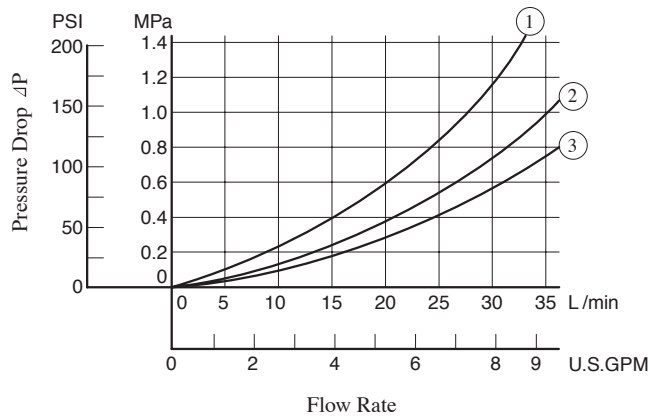
| Spool Type | Pressure Drop Curve Number |     |     |     |     |
|------------|----------------------------|-----|-----|-----|-----|
|            | P→A                        | B→T | P→B | A→T | P→T |
| 2          | (2)                        | (2) | (2) | (2) |     |
| 3          | (3)                        | (2) | (3) | (2) | (2) |
| 4          | (2)                        | (3) | (2) | (2) | —   |
| 40         | (2)                        | (2) | (2) | (2) | —   |
| 5          | (3)                        | (2) | (2) | (2) | —   |
| 6          | (3)                        | (2) | (3) | (2) | (1) |
| 60         | (3)                        | (2) | (3) | (2) | (1) |
| 7          | (2)                        | (2) | (2) | (2) | —   |
| 8          | (2)                        | —   | (2) | —   | —   |
| 9          | (3)                        | (2) | (3) | (2) | —   |
| 10         | (2)                        | (2) | (2) | (2) | —   |
| 11         | (3)                        | (2) | (2) | (2) | —   |
| 12         | (2)                        | (2) | (2) | (2) | —   |

## DMT-10, 10X



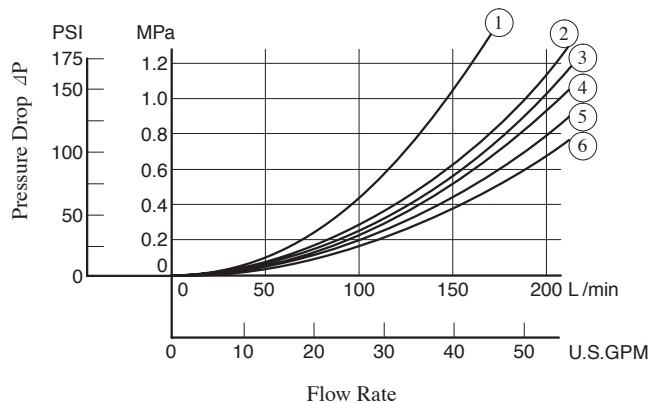
| Spool Type | Pressure Drop Curve Number |     |     |     |     |
|------------|----------------------------|-----|-----|-----|-----|
|            | P→A                        | B→T | P→B | A→T | P→T |
| 2          | (3)                        | (2) | (3) | (2) | —   |
| 3          | (3)                        | (2) | (3) | (2) | (2) |
| 4          | (3)                        | (2) | (3) | (2) | —   |
| 40         | (3)                        | (2) | (3) | (2) | —   |
| 5          | (3)                        | (2) | (3) | (2) | —   |
| 6          | (3)                        | (3) | (3) | (3) | (1) |
| 60         | (3)                        | (3) | (3) | (3) | (1) |
| 7          | (3)                        | (2) | (3) | (2) | —   |
| 8          | (3)                        | —   | (3) | —   | —   |
| 9          | (3)                        | (2) | (3) | (2) | —   |
| 10         | (3)                        | (2) | (3) | (2) | —   |
| 11         | (3)                        | (2) | (3) | (2) | —   |
| 12         | (3)                        | (2) | (3) | (2) | —   |

## DMG-01



| Valve type |      |     |     | Pressure Drop Curve Number |     |     |     |     |
|------------|------|-----|-----|----------------------------|-----|-----|-----|-----|
| 3C*        | 3D*  | 2D* | 2B* | P→A                        | B→T | P→B | A→T | P→T |
| 3C2        | 3D2  | 2D2 |     | (3)                        | (3) | (3) | (3) | —   |
| 3C3        | 3D3  | 2D3 |     | (3)                        | (3) | (3) | (3) | (2) |
| 3C4        | 3D4  |     |     | (3)                        | (3) | (3) | (3) | —   |
| 3C40       | 3D40 |     |     | (3)                        | (3) | (3) | (3) | —   |
| 3C5        | 3D5  |     |     | (2)                        | (1) | (1) | (1) | (3) |
| 3C60       | 3D60 |     |     | (1)                        | (1) | (1) | (1) | (3) |
| 3C7        | 3D7  | 2D7 |     | (3)                        | (3) | (3) | (3) | —   |
| 3C8        | 3D8  | 2D8 |     | (3)                        | —   | (3) | —   | —   |
| 3C9        | 3D9  |     |     | (3)                        | (3) | (3) | (3) | —   |
| 3C10       | 3D10 |     |     | (3)                        | (3) | (3) | (3) | —   |
| 3C11       | 3D11 |     |     | (3)                        | (3) | (3) | (3) | —   |
| 3C12       | 3D12 |     |     | (3)                        | (3) | (3) | (3) | —   |
|            |      |     | 2B2 | (2)                        | (2) | (3) | (3) | —   |
|            |      |     | 2B3 | (2)                        | (2) | (3) | (3) | —   |
|            |      |     | 2B8 | (3)                        | —   | (3) | —   | —   |

## DMG-04



| Spool Type | Pressure Drop Curve Number |     |     |     |     |
|------------|----------------------------|-----|-----|-----|-----|
|            | P→A                        | B→T | P→B | A→T | P→T |
| 2          | (5)                        | (2) | (5) | (4) | —   |
| 3          | (6)                        | (3) | (6) | (5) | (3) |
| 4          | (5)                        | (4) | (5) | (5) | —   |
| 40         | (5)                        | (4) | (5) | (5) | —   |
| 5          | (5)                        | (2) | (4) | (5) | (1) |
| 6          | (2)                        | (3) | (4) | (2) | (1) |
| 60         | (2)                        | (3) | (4) | (2) | (1) |
| 7          | (5)                        | (2) | (5) | (5) | —   |
| 9          | (6)                        | (2) | (6) | (5) | —   |
| 10         | (5)                        | (4) | (5) | (5) | —   |
| 11         | (5)                        | (4) | (5) | (5) | —   |
| 12         | (5)                        | (3) | (5) | (5) | —   |

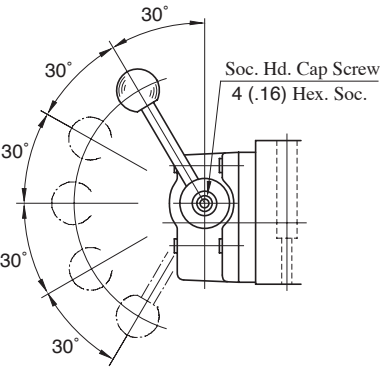
For DMT-03, DMG-03, DMG-06, and DMG-10, refer to the table below then see the related page.

| Model Number     | Pressure Drop Characteristics                                              | Page | Remarks            |
|------------------|----------------------------------------------------------------------------|------|--------------------|
| DMT-03<br>DMG-03 | Same as DSG-03 Series Solenoid Operated Directional Valves (Standard Type) | 371  | 3D* is same as 3C* |
| DMG-06           | Same as Solenoid Controlled Pilot Operated Directional Valves (DSHG-06)    | 393  |                    |
| DMG-10           | Same as Solenoid Controlled Pilot Operated Directional Valves (DSHG-10)    | 393  |                    |

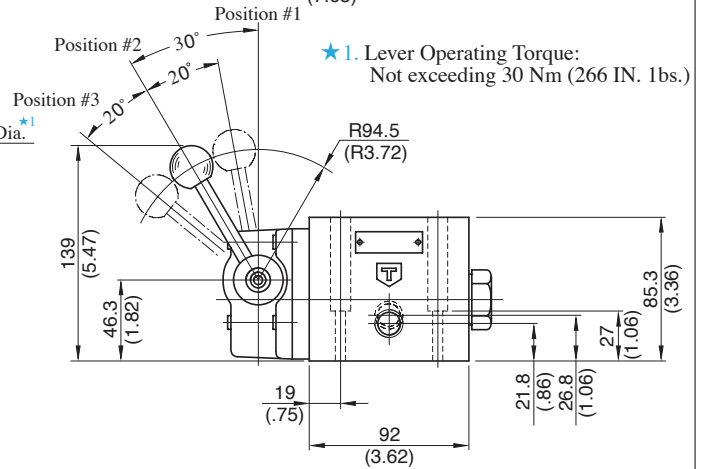
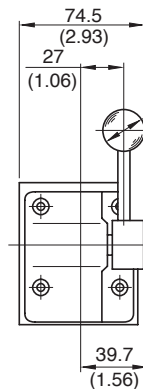
# DMT-03-\*\*\*-50/5080/5090

## How to Change Lever Position:

The lever position can be changed to any position in five different positions shown on the sketch in the right. For the lever position change, remove the Soc. Hd. Cap Screw and lever once, set the lever at the required position and tighten it with the Soc. Hd. Cap Screw firmly.



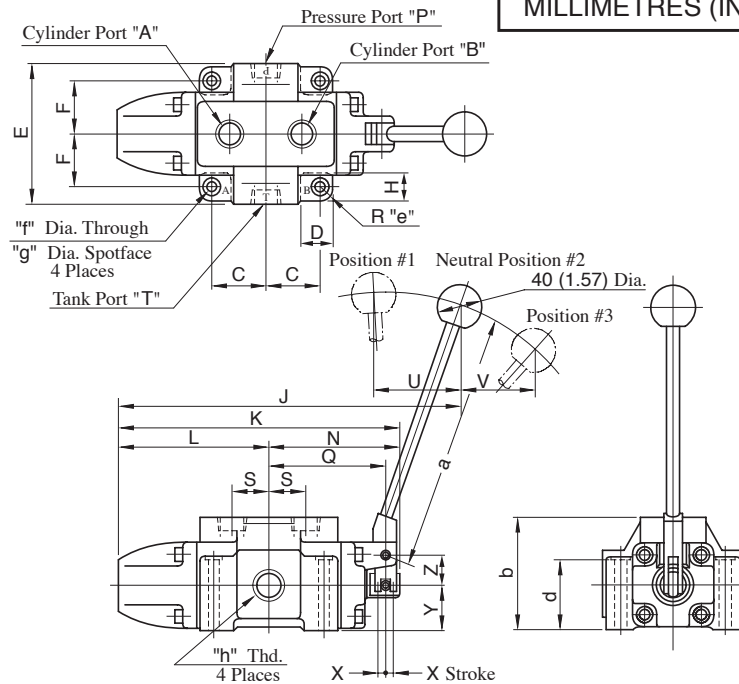
| Model Numbers   | "C" Thd.  |
|-----------------|-----------|
| DMT-03-***-50   | Rc 3/8    |
| DMT-03-***-5080 | 3/8 BSP.F |
| DMT-03-***-5090 | 3/8 NPT   |



DIMENSIONS IN  
MILLIMETRES (INCHES)

# DMT-06, 06X-\*\*\*-30/3080/3090 DMT-10, 10X-\*\*\*-30/3080/3090

| Model Numbers    | "h" Thd.    |
|------------------|-------------|
| DMT-06-***-30    | Rc 3/4      |
| DMT-06X-***-30   | Rc 1        |
| DMT-06-***-3080  | 3/4 BSP.F   |
| DMT-06X-***-3080 | 1 BSP.F     |
| DMT-06-***-3090  | 3/4 NPT     |
| DMT-06X-***-3090 | 1 NPT       |
| DMT-10-***-30    | Rc 1-1/4    |
| DMT-10X-***-30   | Rc 1-1/2    |
| DMT-10-***-3080  | 1-1/4 BSP.F |
| DMT-10X-***-3080 | 1-1/2 BSP.F |
| DMT-10-***-3090  | 1-1/4 NPT   |
| DMT-10X-***-3090 | 1-1/2 NPT   |

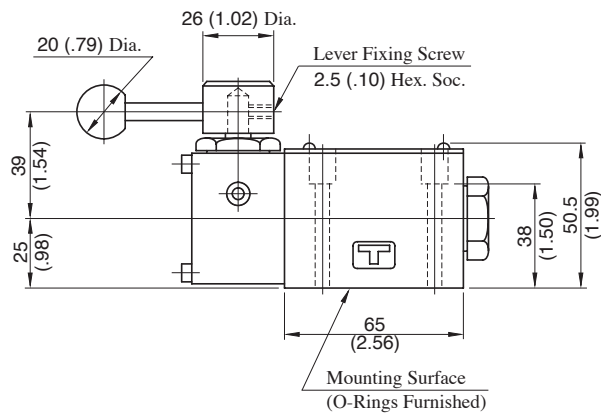
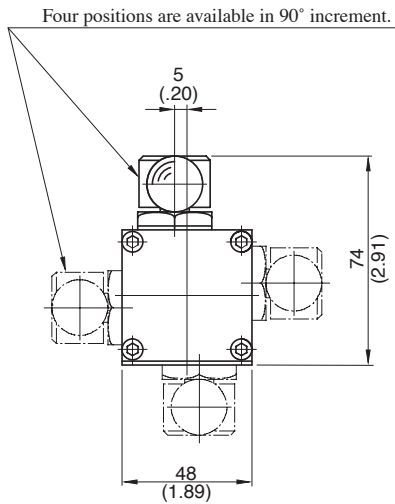
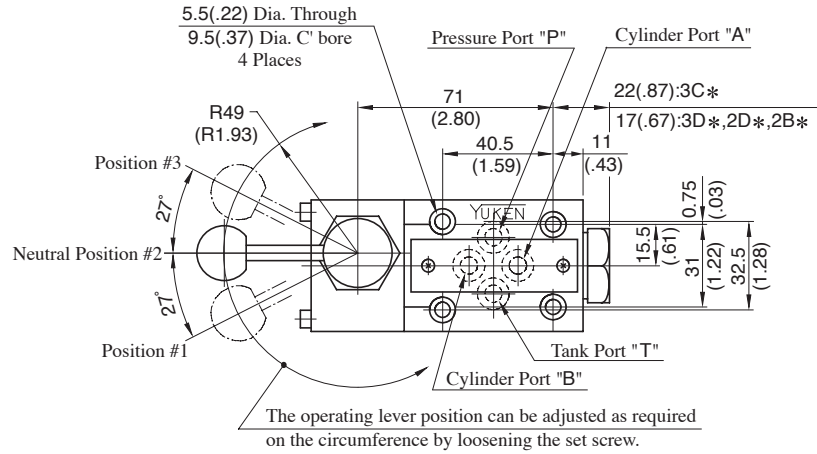


| Model No. | Dimension mm (Inches) |        |        |        |        |         |         |        |        |        |        |        |        |       |        |        |         |        |        |       |
|-----------|-----------------------|--------|--------|--------|--------|---------|---------|--------|--------|--------|--------|--------|--------|-------|--------|--------|---------|--------|--------|-------|
|           | C                     | D      | E      | F      | H      | J       | K       | L      | N      | Q      | S      | U      | V      | X     | Y      | Z      | a       | b      | d      | e     |
| DMT-06    | 50                    | 30     | 126    | 47.5   | 24     | 320     | 255     | 137    | 118    | 107    | 33.5   | 86     | 76     | 9     | 40     | 25     | 250     | 100    | 63.5   | 12    |
| DMT-06X   | (1.97)                | (1.18) | (4.96) | (1.87) | (.94)  | (12.60) | (10.04) | (5.39) | (4.65) | (4.21) | (1.32) | (3.39) | (2.99) | (.35) | (1.57) | (.98)  | (9.84)  | (3.94) | (2.50) | (.47) |
| DMT-10    | 66                    | 40     | 160    | 62.5   | 33     | 402     | 320     | 173    | 147    | 135    | 40     | 102    | 90     | 12.5  | 50     | 35     | 300     | 120    | 78.5   | 15    |
| DMT-10X   | (2.60)                | (1.57) | (6.30) | (2.46) | (1.30) | (15.83) | (12.60) | (6.81) | (5.79) | (5.31) | (1.57) | (4.02) | (3.54) | (.49) | (1.97) | (1.38) | (11.81) | (4.72) | (3.09) | (.59) |

DMG-01-\*\*\*-10/1090

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

DIMENSIONS IN  
MILLIMETRES (INCHES)



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

E

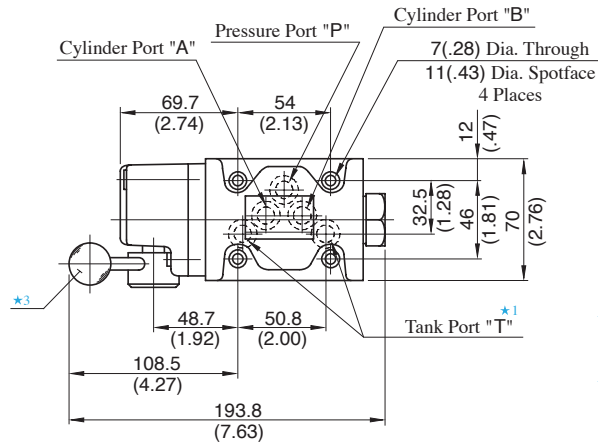


Manually Operated Directional Valves

DMG-03-\*\*\*-50/5090

Mounting surface: ISO 4401-AC-05-4-A

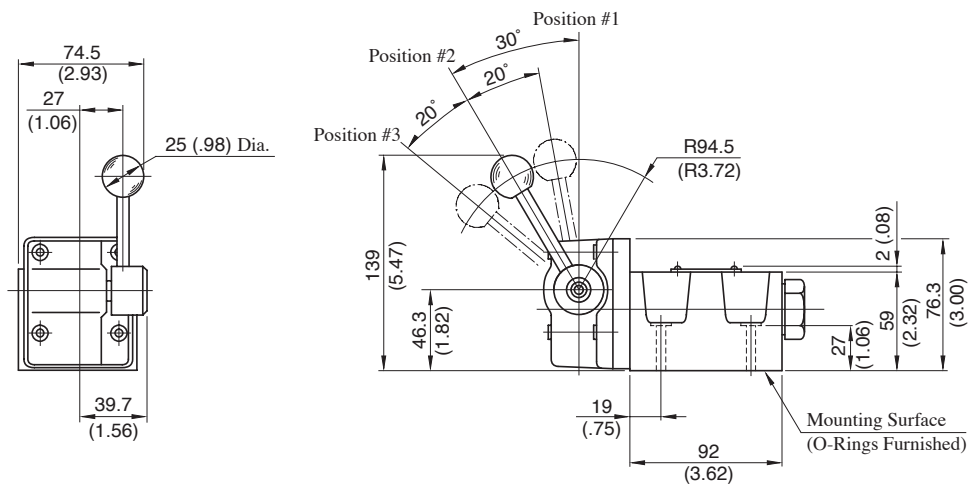
**DIMENSIONS IN  
MILLIMETRES (INCHES)**



★ 1. Although the tank port is shown on the left in our sub-plate either may be used.

★ 2. The position of operating lever can be changed as required. For the detail, see the DMT-03 in the [previous page](#).

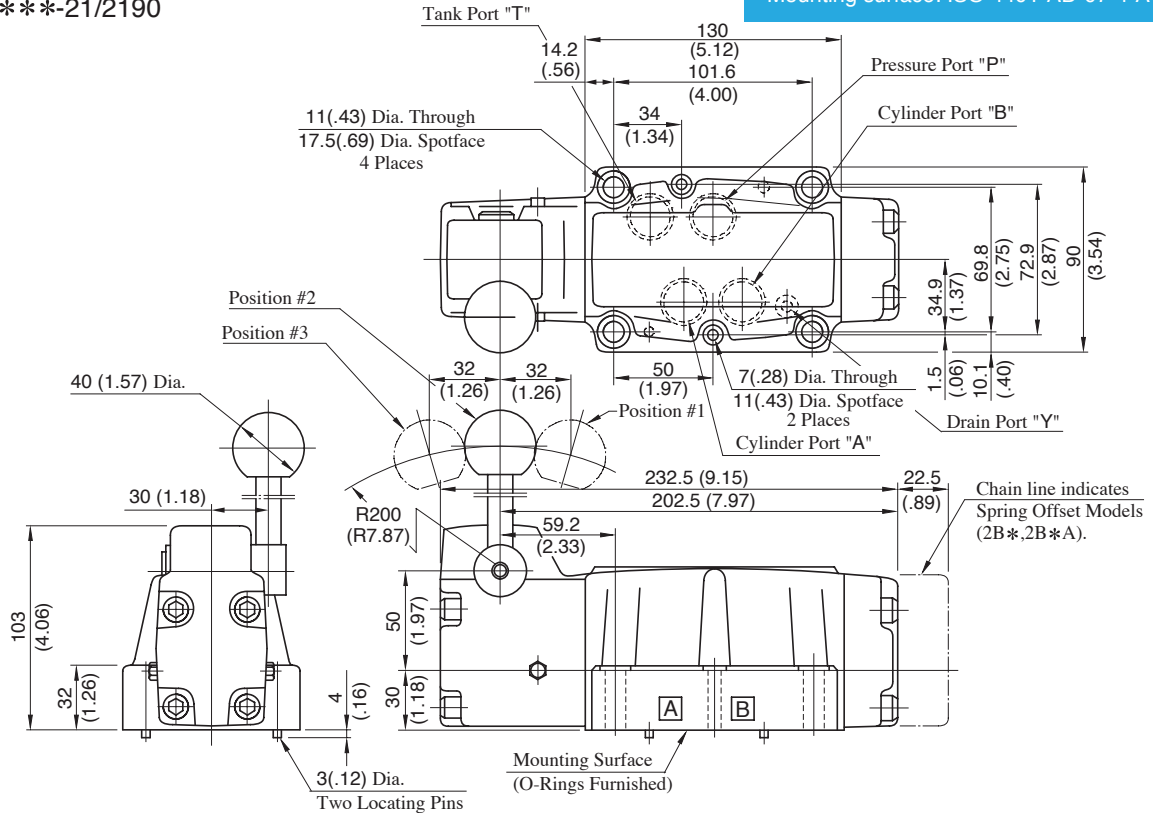
★ 3. Lever Operating Torque:  
Not exceeding 30 Nm (266 IN. lbs.)



Note: For the valve mounting surface dimensions, see the dimensional drawing of the sharable sub-plate in [page 373](#).

DMG-04-\*\*\*-21/2190

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

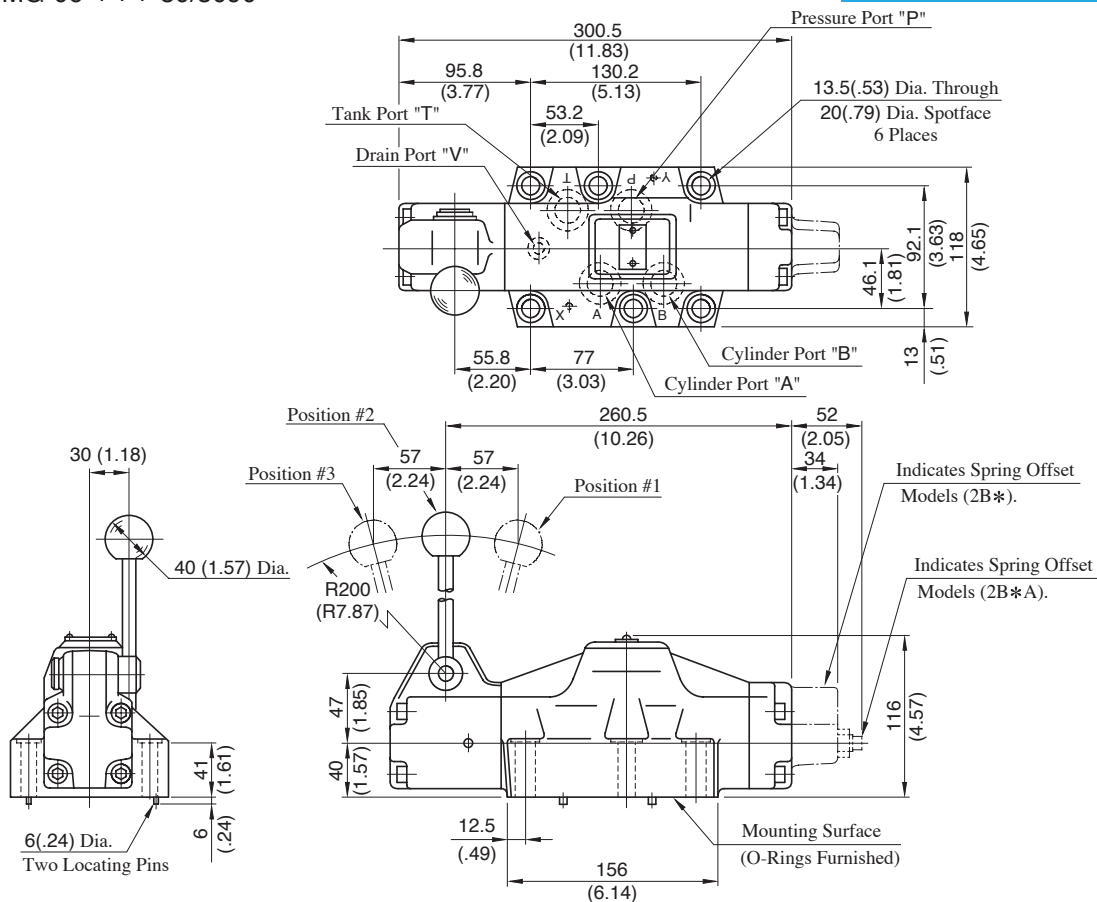


Note: For the valve mounting surface dimensions, see the dimensional drawing of the sharable sub-plate in [page 401](#).

## DIMENSIONS IN MILLIMETRES (INCHES)

DMG-06-\*\*\*-50/5090

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



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

E

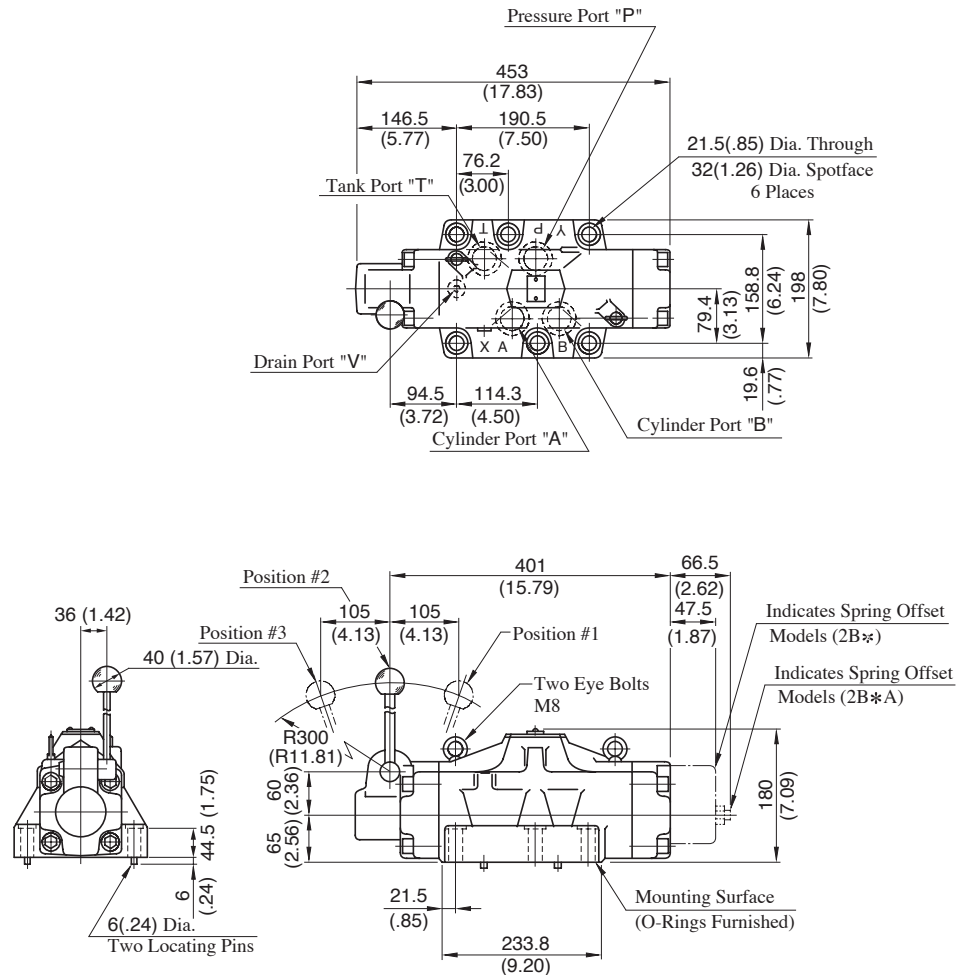


Manually Operated Directional Valves

DMG-10-\*\*\*-50/5090

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

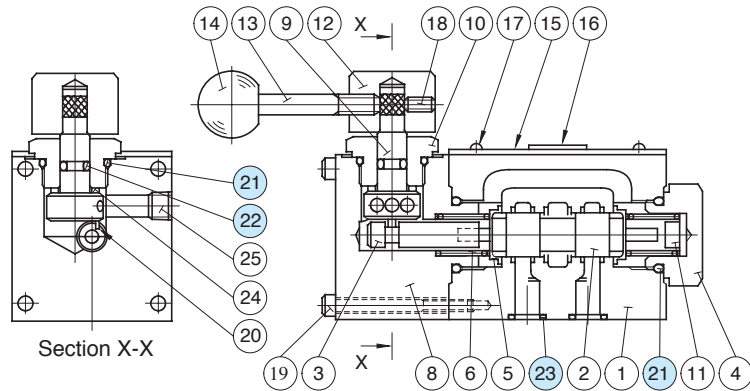
DIMENSIONS IN  
MILLIMETRES (INCHES)



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

## List of Seals

DMG-01-\*\*\*-10/1090

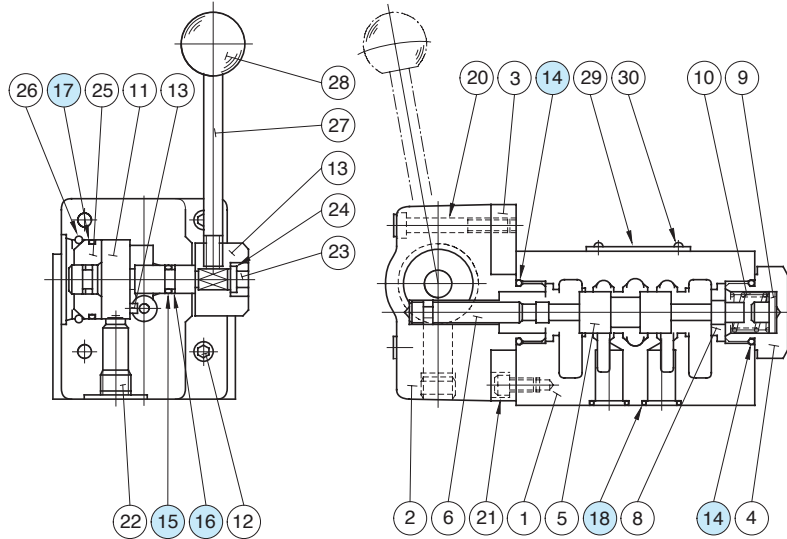


| Item | Name of Parts | Part Numbers | Qty. |
|------|---------------|--------------|------|
| 21   | O-Ring        | SO-NB-P18    | 3    |
| 22   | O-Ring        | SO-NA-P6     | 1    |
| 23   | O-Ring        | SO-NB-P9     | 4    |

Note: When ordering the o-ring, please specify the seal kit number (KS-DMG-01-10).

DMT-03-\*\*\*-50/5080/5090

DMG-03-\*\*\*-50/5090



| Item | Name of Parts | Part Numbers | Qty. |
|------|---------------|--------------|------|
| 14   | O-Ring        | SO-NB-P21    | 2    |
| 15   | O-Ring        | SO-NA-P8     | 2    |
| 16   | Back Up Ring  | SO-BB-P8     | 2    |
| 17   | O-Ring        | SO-NB-A023   | 1    |
| 18   | O-Ring        | SO-NB-A014   | 5    |

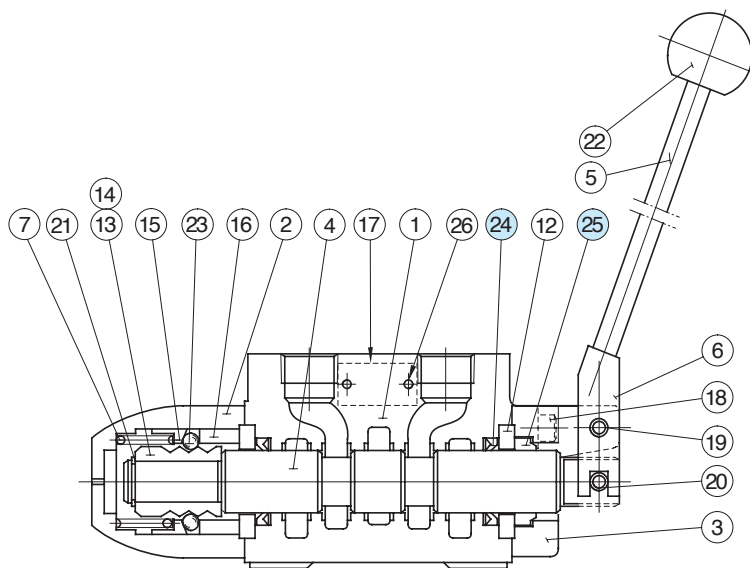
| Valve Model Numbers     | Seal Kit Numbers |
|-------------------------|------------------|
| DMT-03-***-50/5080/5090 | KS-DMT-03-50     |
| DMG-03-***-50/5090      | KS-DMG-03-50     |

Note: 1. O-rings of Item (18) are not used for DMT-03.

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

■ List of Seals

DMT-06, 06X-\*\*\*-30/3080/3090  
DMT-10, 10X-\*\*\*-30/3080/3090



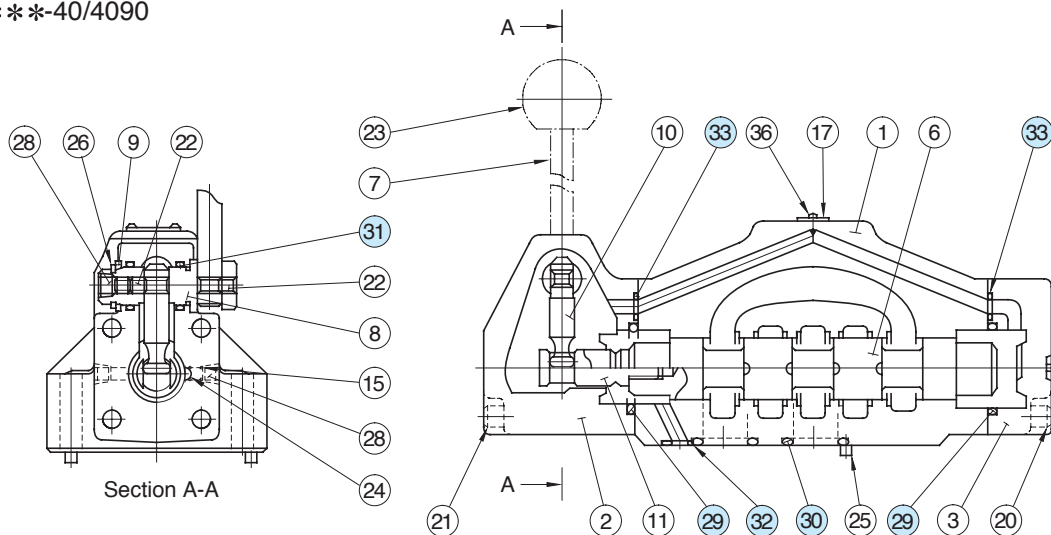
● List of Seal Kits

| Item | Name of Parts | Part Numbers         |                      | Qty. |
|------|---------------|----------------------|----------------------|------|
|      |               | DMT-06*              | DMT-10*              |      |
| 24   | Packing       | UPI 32 • 40 • 6Y     | UPI 40 • 55 • 10Y    | 2    |
| 25   | Dust Seal     | DKI 32 • 44 • 7 • 10 | DKI 40 • 52 • 7 • 10 | 1    |

| Valve Model Numbers      | Seal Kit Numbers |
|--------------------------|------------------|
| DMT-06*-***-30/3080/3090 | KS-DMT-06-30     |
| DMT-10*-***-30/3080/3090 | KS-DMT-10-30     |

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

DMG-04-\*\*\*-21/2190  
DMG-06-\*\*\*-50/5090  
DMG-10-\*\*\*-40/4090



● List of Seal Kits

| Item | Name of Parts | Part Numbers |           |           | Qty. |
|------|---------------|--------------|-----------|-----------|------|
|      |               | DMG-04       | DMG-06    | DMG-10    |      |
| 29   | O-Ring        | SO-NB-P34    | SO-NB-P40 | SO-NB-G65 | 2    |
| 30   | O-Ring        | SO-NB-P22A   | SO-NB-P30 | SO-NB-P42 | 4    |
| 31   | O-Ring        | SO-NA-P20    | SO-NA-P20 | SO-NA-P25 | 2    |
| 32   | O-Ring        | SO-NB-P9     | SO-NB-P14 | SO-NB-P20 | 1    |
| 33   | O-Ring        | SO-NB-P9     | SO-NB-P10 | SO-NB-P14 | 2    |

| Valve Model Numbers | Seal Kit Numbers |
|---------------------|------------------|
| DMG-04*-***-21/2190 | KS-DMG-04-21     |
| DMG-06*-***-50/5090 | KS-DMG-06-50     |
| DMG-10-***-40/4090  | KS-DMG-10-40     |

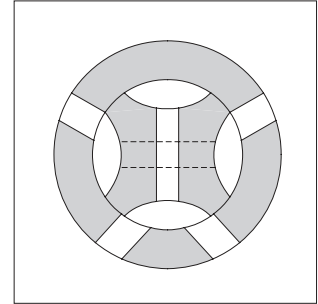
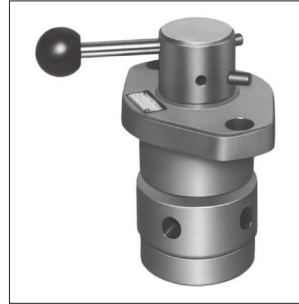
Note: When ordering the seals, please specify the seal kit number from the table right.

## Mechanically Operated Directional Valves

These valves are chiefly used to shift the pilot circuit. Rotary Type Directional Valves and Cam Operated Type Directional Valves are available.

### Rotary Type Directional Valves

These valves are used to rotate the spool either manually or by way of cam and shift the direction of oil flow. The detented mechanism incorporated in these valves prevents the valve from being changed over by itself due to vibrations or any other shocks.



### Specifications

| Model Numbers       |                    | Rated Flow<br>L/min (U.S.GPM) | Max. Operating<br>Pressure<br>MPa (PSI) | Max. T-Line<br>Pressure<br>MPa (PSI) | Approx. Mass kg (lbs.) |           |
|---------------------|--------------------|-------------------------------|-----------------------------------------|--------------------------------------|------------------------|-----------|
| Threaded Connection | Sub-plate Mounting |                               |                                         |                                      | DRT Type               | DRG Type  |
| DRT-02-*D*-20*      | DRG-02-*D*-20*     | 16 (4.2)                      | 7 (1020)                                | 7 (1020) *                           | 4.7 (10.4)             | 3.4 (7.5) |

★ When a back pressure of more than 3 MPa (435 PSI) is generated in the tank port, be sure to use External Drain Type.

### Model Number Designation

| F-                                                                                                        | DR                                                  | G                                   | -02           | -2                       | D                                  | 2             | -A                                                                                                        | -R                                                                      | -20              | *                                                                                                                  |
|-----------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-------------------------------------|---------------|--------------------------|------------------------------------|---------------|-----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|------------------|--------------------------------------------------------------------------------------------------------------------|
| Special<br>Seals                                                                                          | Series<br>Connection                                | Type of<br>Mounting                 | Valve<br>Size | No. of Valve<br>Position | Spool-Spring<br>Arrangement        | Spool<br>Type | Operation<br>Type                                                                                         | Drain<br>Connection                                                     | Design<br>Number | Design<br>Standards                                                                                                |
| <b>F:</b><br>Special<br>seals for<br>phosphate<br>ester<br>type<br>fluids<br>(Omit if<br>not<br>required) | <b>DR:</b><br>Rotary<br>Type<br>Directinal<br>Valve | <b>T:</b><br>Threaded<br>Connection | <b>02</b>     | <b>2</b>                 | <b>D:</b><br>No-spring<br>Detented | <b>2</b>      | <b>A:</b><br>Reversing<br>Dog<br><br><b>B:</b><br>Reversing<br>Dog &<br>Manual<br><br><b>C:</b><br>Manual | <b>None:</b><br>Intrenal<br>Drain<br><br><b>R:</b><br>External<br>Drain | <b>20</b>        | <b>None:</b> Japanese<br>Std. "JIS"<br><b>80:</b> European<br>Design Std.<br><b>90:</b> N. American<br>Design Std. |
|                                                                                                           |                                                     | <b>G:</b><br>Sub-plate<br>Mounting  | <b>02</b>     | <b>3</b>                 |                                    | <b>4</b>      |                                                                                                           |                                                                         | <b>20</b>        |                                                                                                                    |

Note: When selecting the Model type, be sure to give the model number from the following Graphic Symbols.  
No combinations other than those in the table below are allowed.

### Graphic Symbols

| No. of Position    | 2-Position Type            |                                     |                     | 3-Position Type     |
|--------------------|----------------------------|-------------------------------------|---------------------|---------------------|
| Operation<br>Type  | Reversing Dog<br>Operation | Reversing Dog &<br>Manual Operation | Manual<br>Operation | Manual<br>Operation |
| Graphic<br>Symbols |                            |                                     |                     |                     |
| Model No.          | DR*-02-2D2-A               | DR*-02-2D2-B                        | DR*-02-2D2-C        | DR*-02-3D4-C        |

### Instructions

#### Changeover Torque

When the pressure of pressure port "P" and cylinder port "A" (or "B") is set to 7 MPa (1020 PSI), the valve changeover torque will be as right side table:

#### 2-Way directional valves

Be sure to use the External Drain Type Valve of spool type "2" and plug the tank port.

#### Changeover Torque

| Tank Port Back Pres.<br>MPa (PSI) | Torque<br>Nm (in. lbs.) |
|-----------------------------------|-------------------------|
| 0                                 | 1.0 (8.9)               |
| 3 (435)                           | 4.8 (42.5)              |

## Sub-plates

| Drain Connection   | Japanese Standard "JIS"       |                  | European Design Standard          |                        | N.American Design Standard        |                    | Approx. Mass<br>kg (lbs.) |
|--------------------|-------------------------------|------------------|-----------------------------------|------------------------|-----------------------------------|--------------------|---------------------------|
|                    | Sub-plate Model Numbers       | Thread Size      | Sub-plate Model Numbers           | Thread Size            | Sub-plate Model Numbers           | Thread Size        |                           |
| For Internal Drain | DRGM-02-20<br>DRGM-02X-20     | Rc 1/4<br>Rc 3/8 | DRGM-02-2080<br>DRGM-02X-2080     | 1/4 BSP.F<br>3/8 BSP.F | DRGM-02-2090<br>DRGM-02X-2090     | 1/4 NPT<br>3/8 NPT | 1.9 (4.2)                 |
| For External Drain | DRGM-02-R-20<br>DRGM-02X-R-20 | Rc 1/4<br>Rc 3/8 | DRGM-02-R-2080<br>DRGM-02X-R-2080 | 1/4 BSP.F<br>3/8 BSP.F | DRGM-02-R-2090<br>DRGM-02X-R-2090 | 1/4 NPT<br>3/8 NPT |                           |

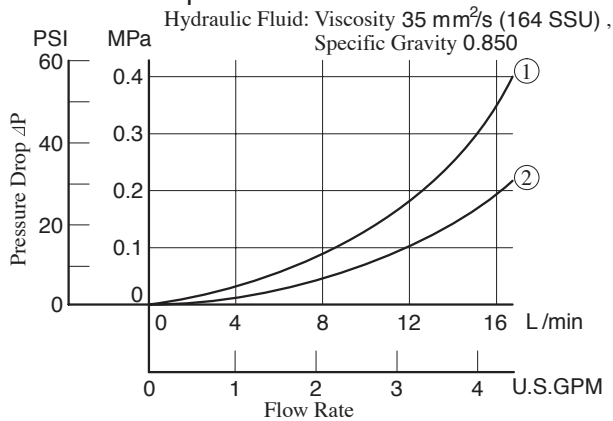
- Sub-plates are available. Specify the sub-plate model number from the table above.
- When sub-plates are not used, the mounting surface should have a good machined finish.

## Mounting Bolts

The Sub-plate Mounting Type Valves (DRG-02) only are furnished with the following mounting bolts.

| Model Numbers | Socket Head Cap Screw (5 Pcs.)                      |                             |
|---------------|-----------------------------------------------------|-----------------------------|
|               | Japanese Standard "JIS"<br>European Design Standard | N. American Design Standard |
| DRG-02        | M8 × 45 Lg.                                         | 5/16-18 UNC × 1-3/4 Lg.     |

## Pressure Drop



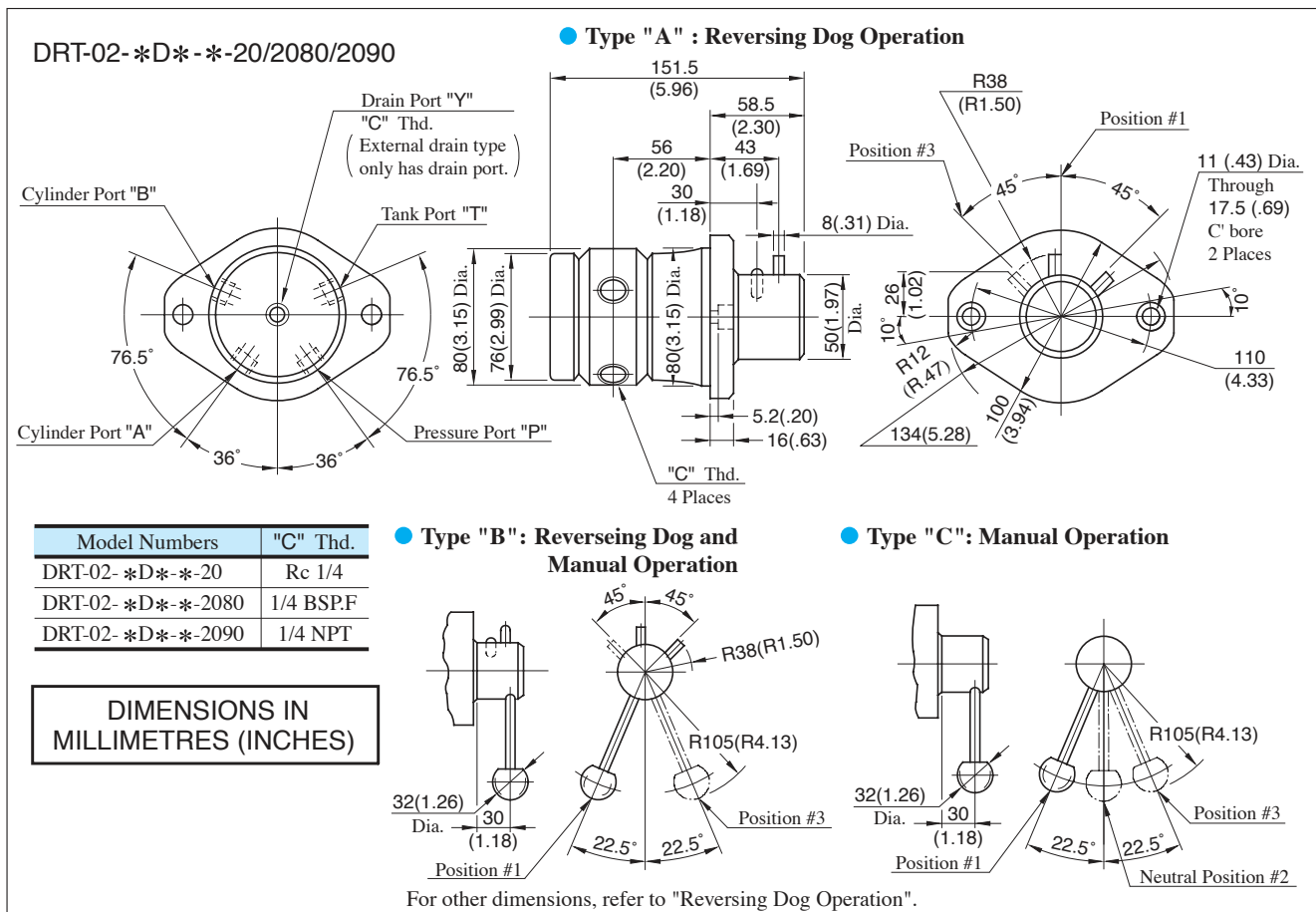
| Valve Type | Pressure Drop Curve No. |     |     |     |
|------------|-------------------------|-----|-----|-----|
|            | P→A                     | B→T | P→B | A→T |
| 2D2        | ②                       | ②   | ②   | ②   |
| 3D4        | ②                       | ②   | ①   | ②   |

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

| Viscosity | mm <sup>2</sup> /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 |

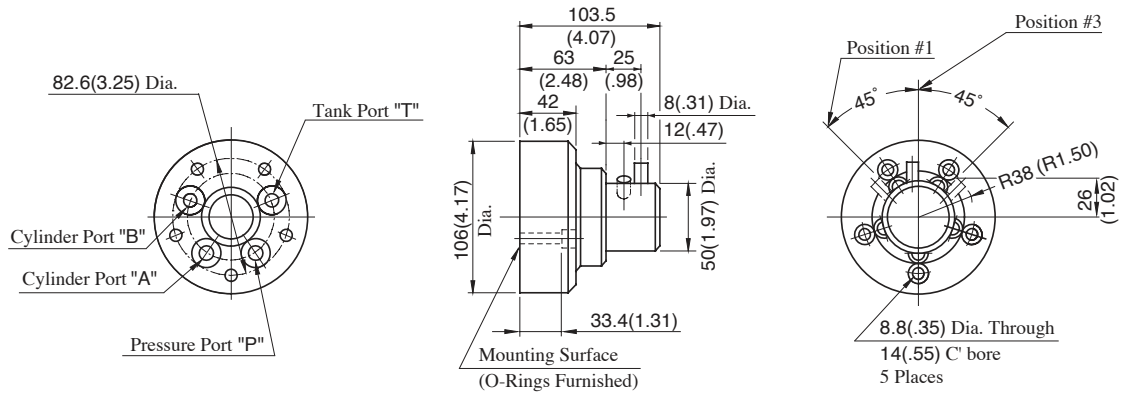
2. For any other specific gravity (G'), the pressure drop ( $\Delta P'$ ) may be obtained from the formula below.

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



DRG-02-\*D\*-\*20/2090

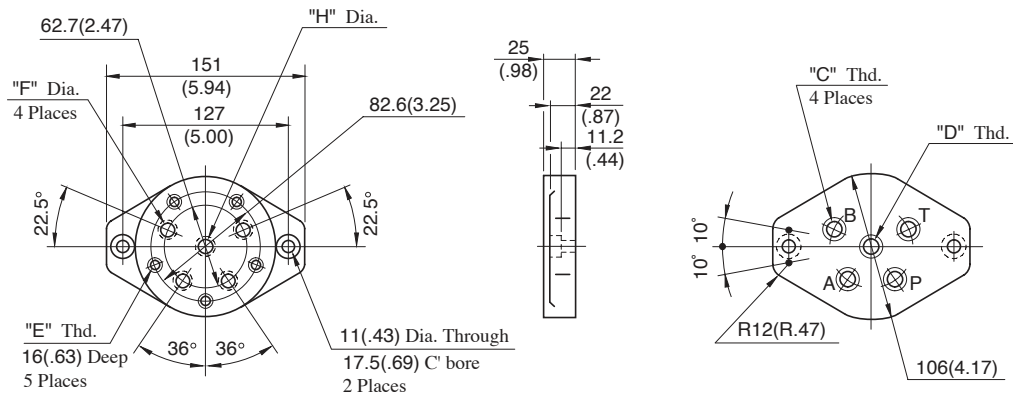
## ● Type "A": Reversing Dog Operation



For information on Type "B": reversing Dog and Manual Operation and Type "C": Manual Operation, see DRT-02 on the [previous page](#).

**DIMENSIONS IN  
MILLIMETRES (INCHES)**

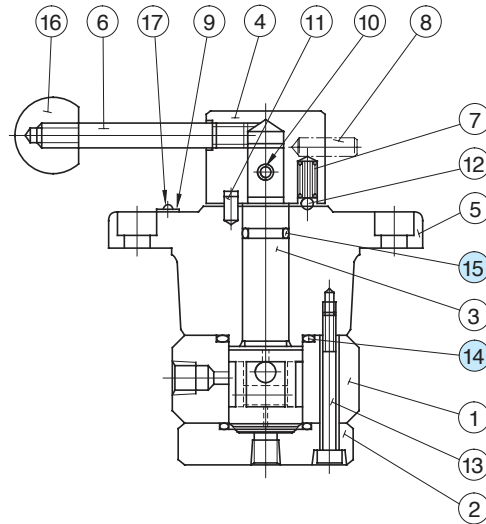
Sub-plates : DRGM-<sup>02</sup><sub>02X</sub>-\*20/2080/2090



| Sub-plate<br>Model Numbers        | "C" Thd.               | "D" Thd.  | "E" Thd.    | mm (Inches) |            | Remarks            |
|-----------------------------------|------------------------|-----------|-------------|-------------|------------|--------------------|
|                                   |                        |           |             | F           | H          |                    |
| DRGM-02-20<br>DRGM-02X-20         | Rc 1/4<br>Rc 3/8       | —         | M8          | 11 (.43)    | —          | For Internal Drain |
| DRGM-02-2080<br>DRGM-02X-2080     | 1/4 BSP.F<br>3/8 BSP.F | —         | M8          | 11.7 (.46)  | —          |                    |
| DRGM-02-2090<br>DRGM-02X-2090     | 1/4 NPT<br>3/8 NPT     | —         | 5/16-18 UNC | 11 (.43)    | —          |                    |
| DRGM-02-R-20<br>DRGM-02X-R-20     | Rc 1/4<br>Rc 3/8       | Rc 1/4    | M8          | 11 (.43)    | 11 (.43)   | For External Drain |
| DRGM-02-R-2080<br>DRGM-02X-R-2080 | 1/4 BSP.F<br>3/8 BSP.F | 1/4 BSP.F | M8          | 11.7 (.46)  | 11.7 (.46) |                    |
| DRGM-02-R-2090<br>DRGM-02X-R-2090 | 1/4 NPT<br>3/8 NPT     | 1/4 NPT   | 5/16-18 UNC | 11 (.43)    | 11 (.43)   |                    |

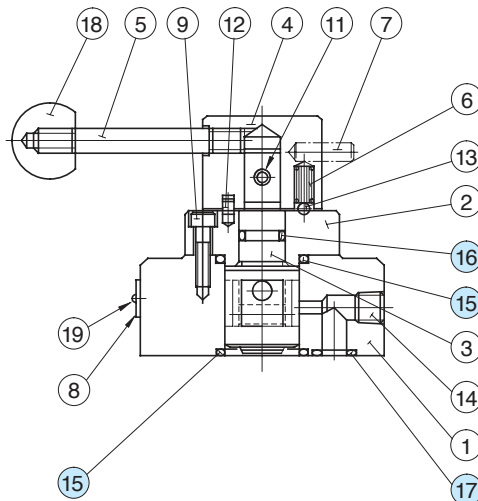
■ List of Seals

DRT-02- \*D\* - \*-20/2080/2090



| Item | Name of Parts | Part Numbers | Qty. | Remarks                                         |
|------|---------------|--------------|------|-------------------------------------------------|
| 14   | O-Ring        | SO-NB-G35    | 2    | Included in Seal Kit<br>(Kit No.: KS-DRT-02-20) |
| 15   | O-Ring        | SO-NA-P16    | 1    |                                                 |

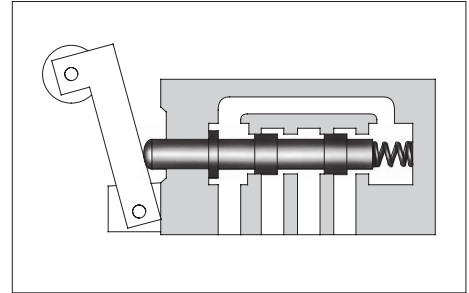
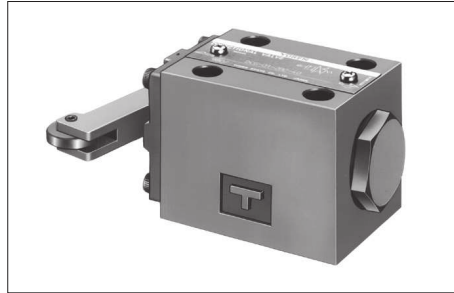
DRG-02- \*D\* - \*-20/2090



| Item | Name of Parts | Part Numbers | Qty. | Remarks                                         |
|------|---------------|--------------|------|-------------------------------------------------|
| 15   | O-Ring        | SO-NB-G35    | 2    | Included in Seal Kit<br>(Kit No.: KS-DRG-02-20) |
| 16   | O-Ring        | SO-NA-P16    | 1    |                                                 |
| 17   | O-Ring        | SO-NB-P16    | 4    |                                                 |

## Cam Operated Directional Valves

These valves may be used to shift the direction of oil flow by depressing the spool by way of a cam.



### Specifications

| Model Numbers       |                    | Max. Flow ★<br>L/min (U.S.GPM) | Max. Operating Pressure<br>MPa (PSI) | Max. T-Line Pressure<br>MPa (PSI) | Approx. Mass kg (lbs.) |           |
|---------------------|--------------------|--------------------------------|--------------------------------------|-----------------------------------|------------------------|-----------|
| Threaded Connection | Sub-plate Mounting |                                |                                      |                                   | DCT Type               | DCG Type  |
| DCT-01-2B*-40*      | DCG-01-2B*-40*     | 30 (7.9)                       | 21 (3050)                            | 7 (1020)                          | 1.1 (2.4)              | 1.1 (2.4) |
| DCT-03-2B*-50*      | DCG-03-2B*-50*     | 100 (26.4)                     | 25 (3630)                            | 10 (1450)                         | 4.5 (9.9)              | 3.8 (8.4) |

★ Max. flow indicates the ceiling flow which does not affect the normal function (changeover) of valves.

### Model Number Designation

| F-                                                                      | DC                                 | T                      | -01        | -2                    | B                        | 2           | -R                                                                        | -40           | *                                                                                                                     |
|-------------------------------------------------------------------------|------------------------------------|------------------------|------------|-----------------------|--------------------------|-------------|---------------------------------------------------------------------------|---------------|-----------------------------------------------------------------------------------------------------------------------|
| Special Seals                                                           | Series Number                      | Type of Connection     | Valve Size | No. of Valve Position | Spool-Spring Arrangement | Spool Type  | Roller Position                                                           | Design Number | Design Standards                                                                                                      |
| F: Special seals for phosphate ester type fluids (Omit if not required) | DC: Cam Operated Directional Valve | T: Threaded Connection | 01         | 2                     | B: Spring Offset         | 2<br>3<br>8 | <div>None (Normal Position)</div> <div>R</div> <div>Y (DC*-01 only)</div> | 40            | <b>None:</b> Japanese Standard "JIS"<br><b>80:</b> European Design Standard<br><b>90:</b> N. American Design Standard |
|                                                                         |                                    |                        | 03         |                       |                          |             |                                                                           | 50            |                                                                                                                       |
|                                                                         |                                    |                        | 01         |                       |                          |             |                                                                           | 40            |                                                                                                                       |
|                                                                         |                                    |                        | 03         |                       |                          |             |                                                                           | 50            |                                                                                                                       |
|                                                                         |                                    | G: Sub-plate Mounting  | 01         |                       |                          |             |                                                                           | 40            | <b>None:</b> Japanese Standard "JIS" & European Design Standard<br><b>90:</b> N. American Design Standard             |
|                                                                         |                                    |                        | 03         |                       |                          |             |                                                                           | 50            |                                                                                                                       |
|                                                                         |                                    |                        | 01         |                       |                          |             |                                                                           | 40            |                                                                                                                       |
|                                                                         |                                    |                        | 03         |                       |                          |             |                                                                           | 50            |                                                                                                                       |

### Sub-plates

| Valve 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 |                        |
| DCG-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)              |
| DCG-03              | DSGM-03-41              | Rc 3/8      | DSGM-03-2180             | 3/8 BSP.F   | DSGM-03-2190                | 3/8 NPT     | 3.0 (6.6)              |
|                     | DSGM-03X-41             | Rc 1/2      | DSGM-03X-2180            | 1/2 BSP.F   | DSGM-03X-2190               | 1/2 NPT     | 3.0 (6.6)              |
|                     | DSGM-03Y-41             | 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

Socket head cap screws in the table below are included.

| Model Numbers | Socket Head Cap Screw                               |                             |      |                                   |
|---------------|-----------------------------------------------------|-----------------------------|------|-----------------------------------|
|               | Japanese Standard "JIS"<br>European Design Standard | N. American Design Standard | Qty. | Tightening Torque<br>Nm (in. lbs) |
| DCT-01        | M5 × 45 Lg.                                         | No. 10-24 UNC × 1-3/4 Lg.   | 2    | 5-7 (43-60)                       |
| DCG-01        | M5 × 45 Lg.                                         | No. 10-24 UNC × 1-3/4 Lg.   | 4    | 5-7 (43-60)                       |
| DCG-03        | M6 × 35 Lg.                                         | 1/4-20 UNC × 1-1/2 Lg.      | 4    | 12-15 (105-130)                   |

## ■ Direction of Oil Flow for Roller Position

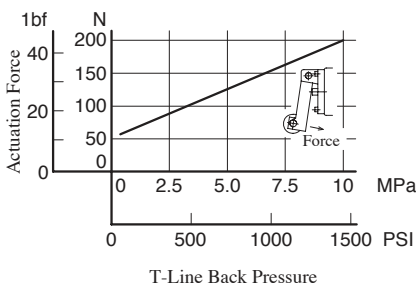
| Model Numbers            | Graphic Symbols | Roller Position and Direction of Oil Flow                                                               |                        |
|--------------------------|-----------------|---------------------------------------------------------------------------------------------------------|------------------------|
|                          |                 | Roller Stroke from Offset Position mm(Inches)                                                           |                        |
|                          |                 | Extended(Offset)                                                                                        | Depressed              |
| DCT-01-2B2<br>DCG-01-2B2 |                 | <p>P → B<br/>A → T</p> <p>0 3.8 (.150) 4.6 (.181) 9.5 (.374)</p> <p>All ports blocked</p>               | <p>P → A<br/>B → T</p> |
| DCT-01-2B3<br>DCG-01-2B3 |                 | <p>P → B<br/>A → T</p> <p>0 3.8 (.150) 4.6 (.181) 9.5 (.374)</p> <p>All ports open</p>                  | <p>P → A<br/>B → T</p> |
| DCT-01-2B8<br>DCG-01-2B8 |                 | <p>P → B<br/>A&amp;T ports blocked</p> <p>0 3.8 (.150) 9.5 (.374)</p> <p>B&amp;T ports blocked</p>      | <p>P → A</p>           |
| DCT-03-2B2<br>DCG-03-2B2 |                 | <p>P → A<br/>B → T</p> <p>0 3.4 (.134) 3.8 (.150) 7 (.276)</p> <p>All ports blocked</p>                 | <p>P → B<br/>A → T</p> |
| DCT-03-2B3<br>DCG-03-2B3 |                 | <p>P → A<br/>B → T</p> <p>0 3.0 (.118) 4.0 (.157) 7 (.276)</p> <p>All ports open</p>                    | <p>P → B<br/>A → T</p> |
| DCT-03-2B8<br>DCG-03-2B8 |                 | <p>P → A<br/>B&amp;T ports blocked</p> <p>0 3.6 (.142) 4.7 (.185) 7 (.276)</p> <p>All ports blocked</p> | <p>P → B</p>           |

## ■ Instructions

### ● Valve Type "2B8"

Tank port "T" functions as a drain port. Directly connect it to the reservoir.  
[Max. allowable back pressure 0.35 MPa (50 PSI)].

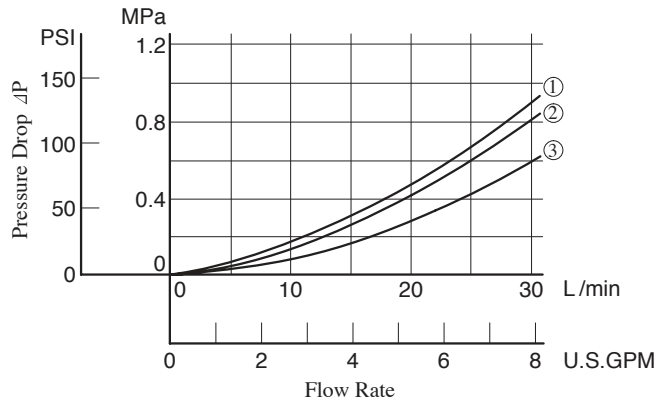
### ● Actuation Force



## Pressure Drop

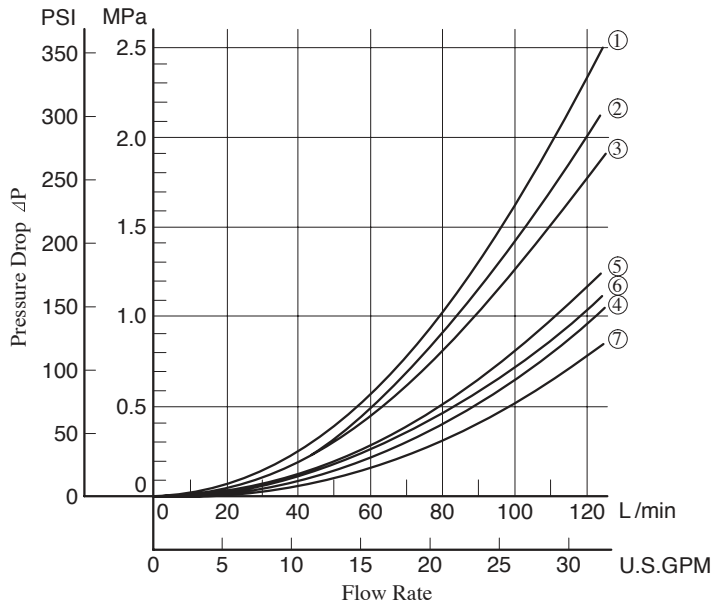
Pressure drop curves based on viscosity of 35 mm<sup>2</sup>/s (164 SSU) and specific gravity of 0.850.

### DCT DCG -01



| Model Numbers | Pressure Drop Curve No. |     |     |     |
|---------------|-------------------------|-----|-----|-----|
|               | P→A                     | B→T | P→B | A→T |
| DCT-01-2B2    | ①                       | ①   | ②   | ①   |
| DCT-01-2B3    | ②                       | —   | ②   | —   |
| DCT-01-2B8    | ③                       | —   | ③   | —   |

### DCT DCG -03



| Model Numbers | Pressure Drop Curve No. |     |     |     |
|---------------|-------------------------|-----|-----|-----|
|               | P→A                     | B→T | P→B | A→T |
| DCG-03-2B2    | ②                       | ①   | ④   | ④   |
| DCG-03-2B3    | ③                       | ②   | ⑦   | ⑦   |
| DCG-03-2B8    | ⑥                       | —   | ⑤   | —   |

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

| Viscosity | mm <sup>2</sup> /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 (ΔP') may be obtained from the formula below.

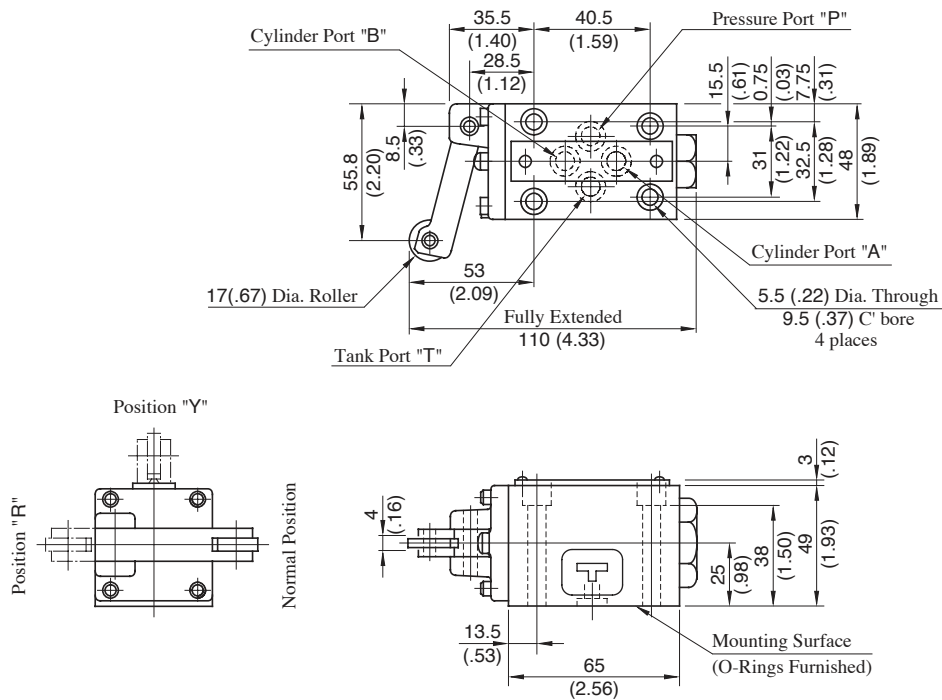
$$\Delta P' = \Delta P (G'/G) \text{ where, } \Delta P \text{ is a value on the above chart and } G \text{ is } 0.850.$$





DCG-01-2B\*-\*\*-40/4090

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



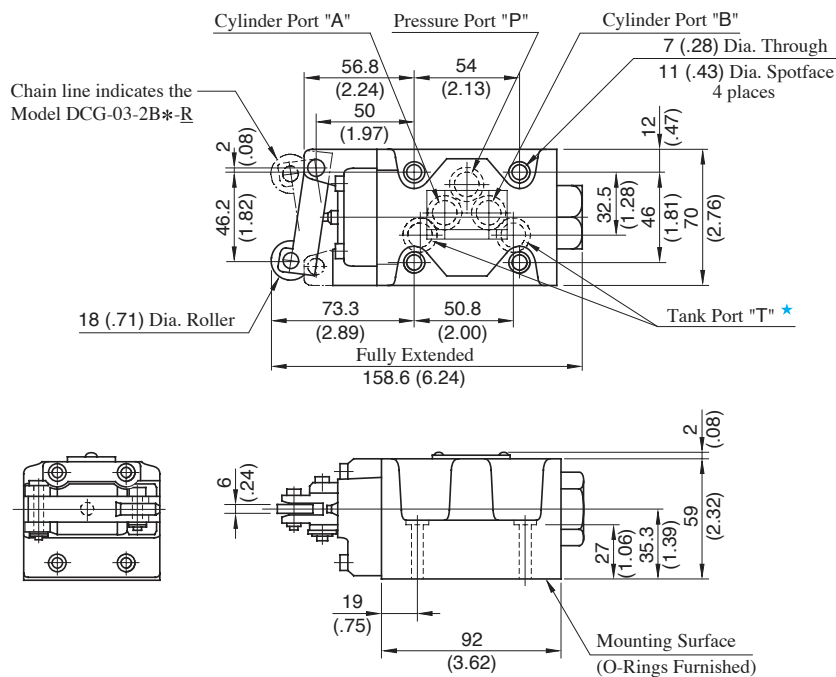
Note1: For the cam and roller travel, see DCT-01 in the [previous page](#).

Note2: For the valve mounting surface dimensions, see the dimensional drawing of the sharable sub-plate in [page 356](#).

**DIMENSIONS IN  
MILLIMETRES (INCHES)**

Mounting Surface: ISO 4401-AC-05-4-A

DCG-03-2B\*-\*\*-50/5090



★. Although the tank port is shown on the left in our sub-plate, either may be used.

Note1: For the cam and roller travel, see DCT-03 in the [previous page](#).

Note2: For the valve mounting surface dimensions, see the dimensional drawing of the sharable sub-plate in [page 373](#).

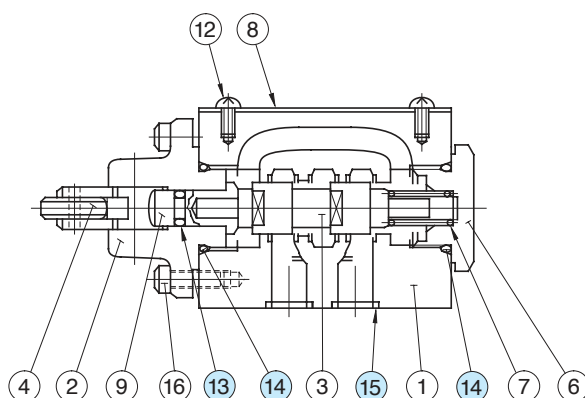
**E**



**Mechanically Operated Directional Valves**

■ List of Seals

DCT-01-2B\*-\*-40/4080/4090  
DCG-01-2B\*-\*-40/4090



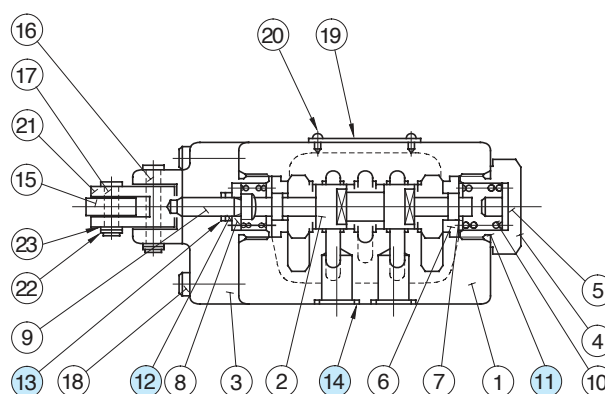
● List of Seal Kit No.

| Item | Name of Parts | Part Numbers | Quantity |        |
|------|---------------|--------------|----------|--------|
|      |               |              | DCT-01   | DCG-01 |
| 13   | O-Ring        | SO-NA-P5     | 1        | 1      |
| 14   | O-Ring        | SO-NB-P18    | 2        | 2      |
| 15   | O-Ring        | SO-NB-P9     | 0        | 4      |

| Valve Model Numbers       | Seal Kit Numbers |
|---------------------------|------------------|
| DCT-01-2B*-*-40/4080/4090 | KS-DCT-01-40     |
| DCG-01-2B*-*-40/4090      | KS-DCG-01-40     |

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

DCT-03-2B\*-\*-50/5080/5090  
DCG-03-2B\*-\*-50/5090



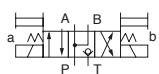
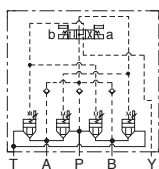
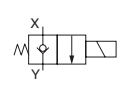
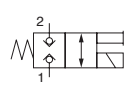
● List of Seal Kit No.

| Item | Name of Parts | Part Numbers | Quantity |        |
|------|---------------|--------------|----------|--------|
|      |               |              | DCT-03   | DCG-03 |
| 11   | O-Ring        | SO-NB-P21    | 2        | 2      |
| 12   | O-Ring        | SO-NA-P6     | 1        | 1      |
| 13   | Back Up Ring  | SO-BE-P6     | 1        | 1      |
| 14   | O-Ring        | SO-NB-A014   | 0        | 5      |

| Valve Model Numbers       | Seal Kit Numbers |
|---------------------------|------------------|
| DCT-03-2B*-*-50/5080/5090 | KS-DCT-03-50     |
| DCG-03-2B*-*-50/5090      | KS-DCG-03-50     |

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

# Poppet Type Directional Valves

| Valve Type                                               | Graphic Symbols                                                                     | Max.<br>Operating<br>Pressure<br>MPa (PSI) | Maximum Flow       |  |  |  |  |  |  |  |  |  | Page |
|----------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------|--------------------|--|--|--|--|--|--|--|--|--|------|
|                                                          |                                                                                     |                                            | U. S. GPM<br>L/min |  |  |  |  |  |  |  |  |  |      |
| Poppet Type Solenoid<br>Operated Directional<br>Valves   |  | 31.5<br>(4570)                             | DSLHG-01           |  |  |  |  |  |  |  |  |  | 453  |
| Multi Purpose<br>Control Valves                          |  | 25<br>(3630)                               | DSLHG-04           |  |  |  |  |  |  |  |  |  | 459  |
|                                                          |                                                                                     |                                            | DSLHG-06           |  |  |  |  |  |  |  |  |  |      |
|                                                          |                                                                                     |                                            | DSLHG-10           |  |  |  |  |  |  |  |  |  |      |
| Solenoid Operated<br>Poppet Type<br>Two-Way Valves       |  | 21<br>(3050)                               | CDSC-01            |  |  |  |  |  |  |  |  |  | 480  |
|                                                          |                                                                                     | 14<br>(2030)                               | CDSC-03            |  |  |  |  |  |  |  |  |  |      |
|                                                          |                                                                                     |                                            | CDST-03※           |  |  |  |  |  |  |  |  |  |      |
|                                                          |                                                                                     |                                            | CDSG-03            |  |  |  |  |  |  |  |  |  |      |
| Shut-off Type Solenoid<br>Operated Directional<br>Valves |  | 25<br>(3630)                               | DSPC-01            |  |  |  |  |  |  |  |  |  | 489  |
|                                                          |                                                                                     |                                            | DSPG-01            |  |  |  |  |  |  |  |  |  |      |
|                                                          |                                                                                     |                                            | DSPC-03            |  |  |  |  |  |  |  |  |  |      |
|                                                          |                                                                                     |                                            | DSPG-03            |  |  |  |  |  |  |  |  |  |      |

## ■ 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 Cables                       | 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*<br>DSLHG-06-*-12*<br>DSLHG-10-*-12* | DSLHG-04-*-13*<br>DSLHG-06-*-13*<br>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-off 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 overheating of coil due to the spool sticking and protection against transient voltage peaks are assured.

### ■ Insulation Class of Solenoid

| Model Numbers          | Insulation Class |
|------------------------|------------------|
| DSLHG-01               | Class H          |
| DSLHG-04/06/10         |                  |
| CDSC-01                |                  |
| CDS*-03*<br>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

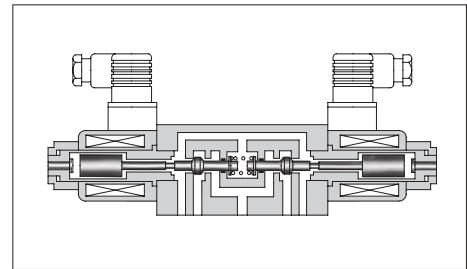
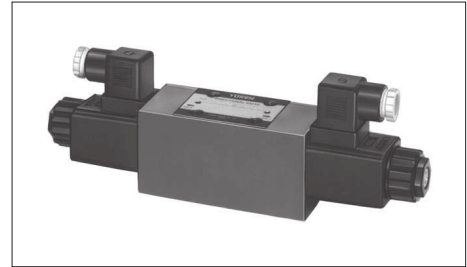
Because these valves are of poppet type, there is no overlap, high response can be achieved. At the same time, hydraulic lock is eliminated.

### 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

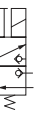
| Model Numbers       | Max. Flow<br>L/min<br>(U.S.GPM) | Max. Operating Pressure<br>MPa<br>(PSI) | Max. T-Line Back Pressure<br>MPa<br>(PSI) | Max. Changeover Frequency<br>min <sup>-1</sup><br>{Cycles/Min} | Internal leakage<br>cm <sup>3</sup> /min<br>(cu. in./min) | Approx. Mass<br>kg<br>(lbs.) | Graphic Symbols |
|---------------------|---------------------------------|-----------------------------------------|-------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------|------------------------------|-----------------|
| DSL-G-01-3-C-∗-N-11 | 16<br>(4.2)                     | 31.5<br>(4570)                          | 16<br>(2320)                              | 240                                                            | Or Less<br>0.5 ★1<br>(.03)                                | 1.9<br>(4.2)                 |                 |
| DSL-G-01-3-O-∗-N-11 |                                 |                                         |                                           |                                                                |                                                           |                              |                 |
| DSL-G-01-4-O-∗-N-11 |                                 |                                         |                                           |                                                                | Or Less<br>1 ★2<br>(.06)                                  | 3.7<br>(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<br>(K Series)   | D12       | —              | 12            | 10.8 - 13.2       | 2.45                             | 29        |
|                    | D24       | —              | 24            | 21.6 - 26.4       | 1.23                             |           |
| AC→DC<br>Rectified | R100      | 50/60          | 100           | 90 - 110          | 0.33                             | 29        |
|                    | R200      | 50/60          | 200           | 180 - 220         | 0.16                             |           |



## Model Number Designation

| F-                                                                                | DSL                                                                              | -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 |
| <b>F:</b><br>Special Seals for Phosphate Ester Type Fluids (Omit if not required) | <b>DSL</b> :<br>Poppet Type Solenoid Operated Directional Valve (Sub-plate Mtg.) | <b>01</b>  | <b>3</b> : 3 Port<br><b>4</b> : 4 Port | <b>O</b> : Normally Open<br><b>C</b> : Normally Closed<br><b>O</b> : Normally Open | DC<br><b>D12, D24</b><br>AC→DC<br><b>R100</b><br><b>R200</b> | <b>N</b> : Plug-in Connector          | <b>11</b>     | Refer to ★       |

★ 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<br>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"<br>European Design Standard | M5 × 45 Lg.                    | 5-7 Nm (44-62 in. lbs.)<br>[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.

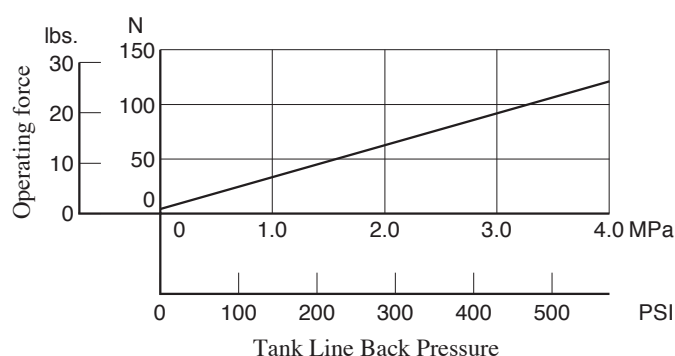
### ● Valve Tank Port

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.)

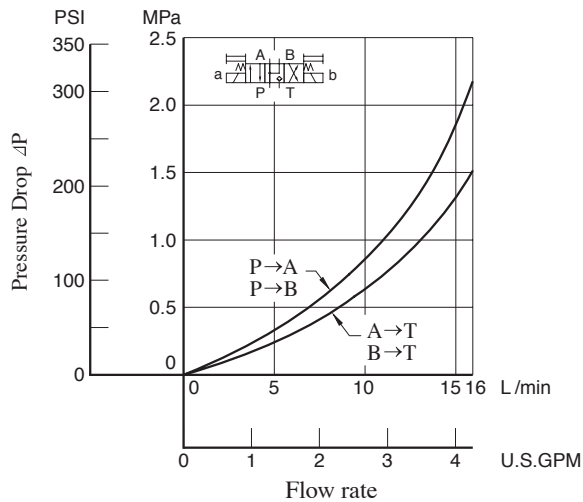
Operating Force by Manual Actuator



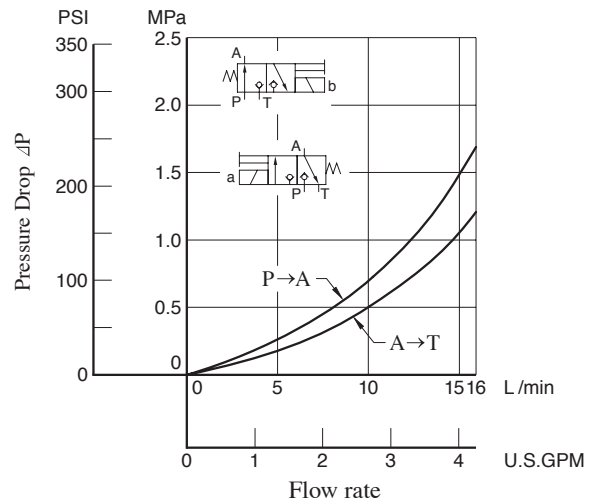
## Pressure Drop

Hydraulic Fluid: Viscosity 35 mm<sup>2</sup>/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 <sup>2</sup> /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 |

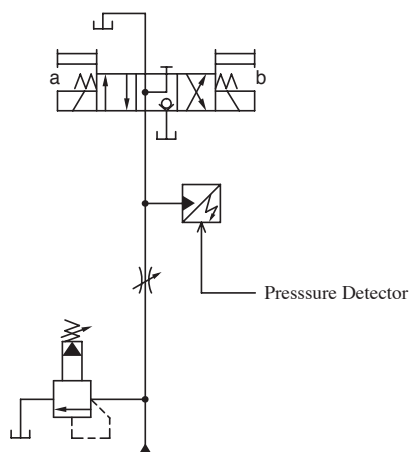
- For any other specific gravity (G'), the pressure drop (ΔP') may be obtained from the formula below.

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

## 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.

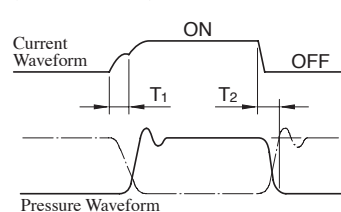
### Test Circuit and Conditions



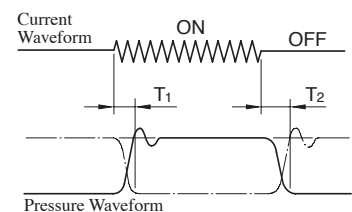
Pressure: 21 MPa (3050 PSI)  
Flow Rate: 16 L/min (4.2 U.S.GPM)  
Voltage: Rated voltage

### 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.

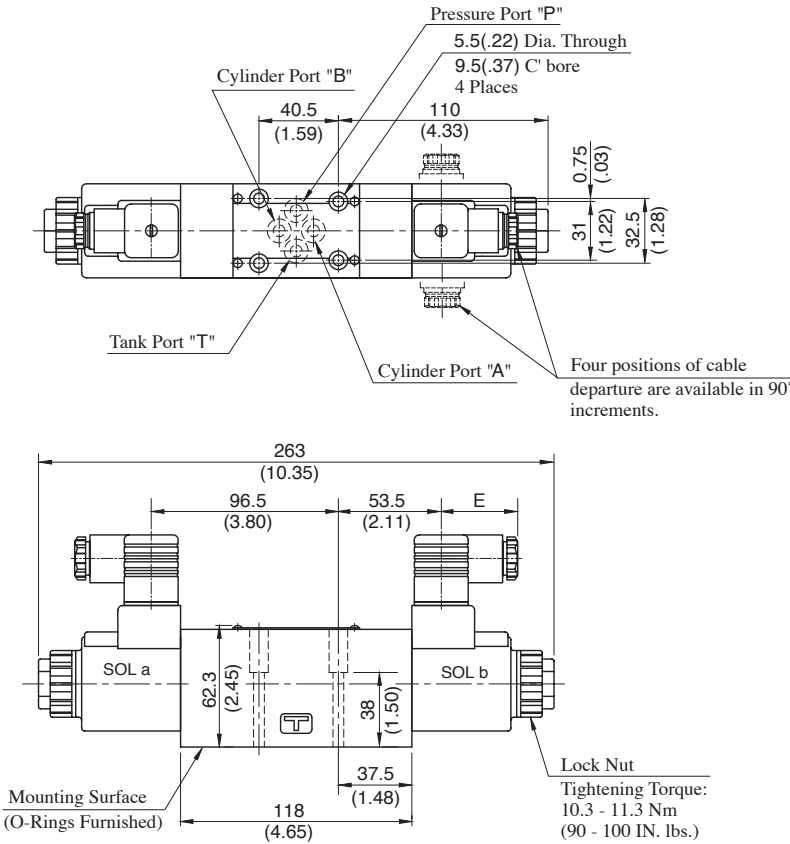
| Solenoid Type   | Model Numbers   | Time (ms)      |                | Remarks                       |
|-----------------|-----------------|----------------|----------------|-------------------------------|
|                 |                 | T <sub>1</sub> | T <sub>2</sub> |                               |
| DC              | DSL-G-01-4-O-D* | 55             | 30             | 4 port valve, normally open   |
|                 | DSL-G-01-3-O-D* | 55             | 30             | 3 port valve, normally open   |
|                 | DSL-G-01-3-C-D* | 70             | 25             | 3 port valve, normally closed |
| AC→DC Rectified | DSL-G-01-4-O-R* | 55             | 150            | 4 port valve, normally open   |
|                 | DSL-G-01-3-O-R* | 55             | 150            | 3 port valve, normally open   |
|                 | DSL-G-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)**

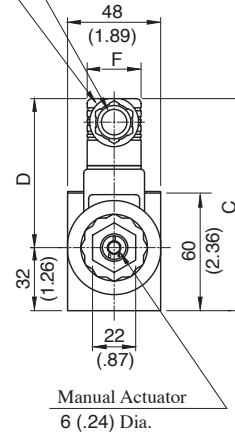


The connector can be moved to various positions by loosening the "Lock Nut". After location tighten "Lock Nut".

Cable Departure

Cable Applicable:

Outside Dia. .... 8-10 mm (.31 - .39 in.)  
Conductor Area ... Not Exceeding 1.5 mm<sup>2</sup> (.0023 Sq. in.)



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

● The information on 3 Port Valves is provided in the [following page](#).

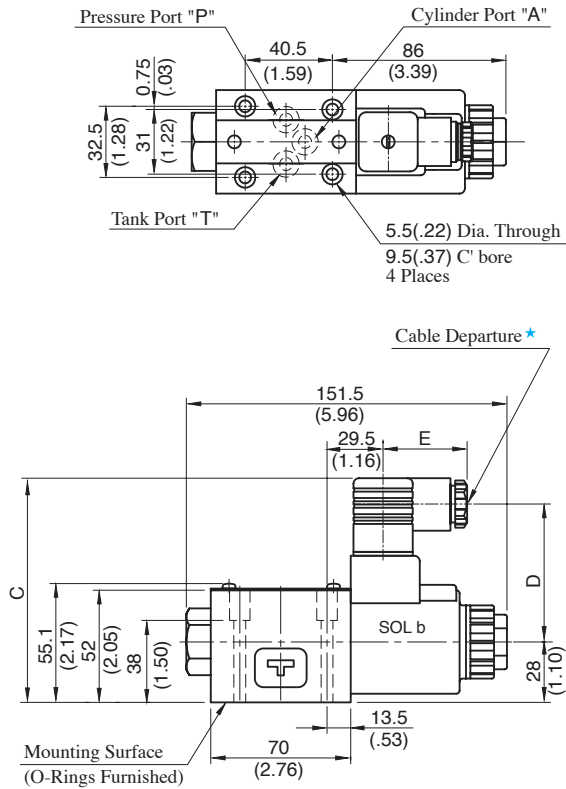
Note: For the valve mounting surface dimensions, see the dimensional drawing of the sharable sub-plate in [page 356](#).

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

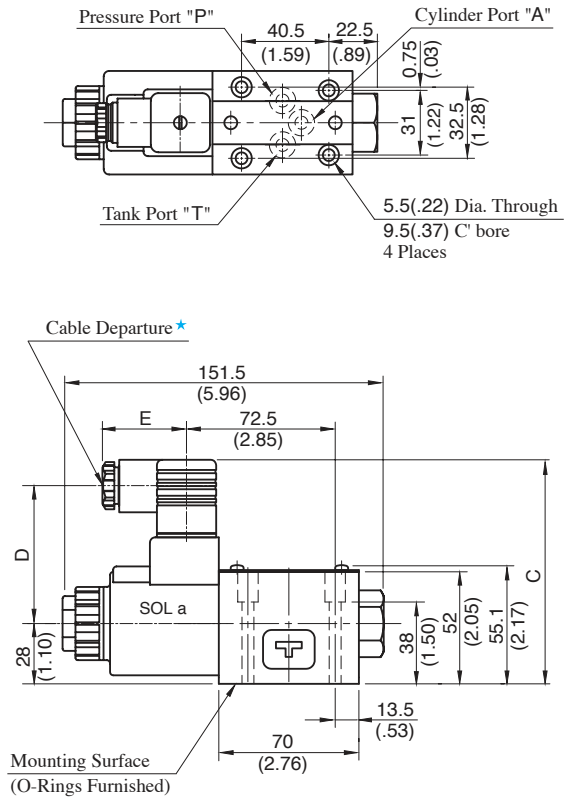
## 3 Port Valves

DIMENSIONS IN  
MILLIMETRES (INCHES)

### ● Normally Open Type: DSL-G-01-3-O-\*N-11/1190



### ● Normally Closed Type: DSL-G-01-3-C-\*N-11/1190

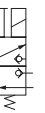


| Model Numbers    | Dimensions mm (Inches) |                |              |
|------------------|------------------------|----------------|--------------|
|                  | C                      | D              | E            |
| DSL-G-01-3-*D*-N | 104<br>(4.09)          | 64<br>(2.52)   | 39<br>(1.54) |
| DSL-G-01-3-*R*-N | 107<br>(4.21)          | 57.2<br>(2.25) | 51<br>(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](#).

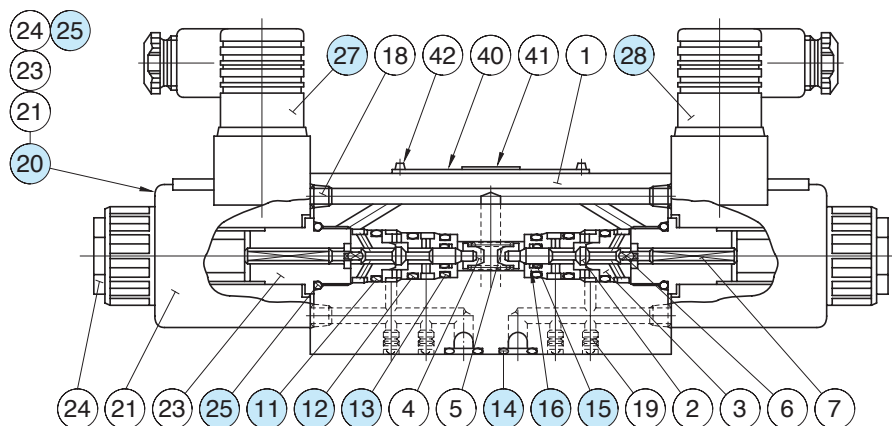
E



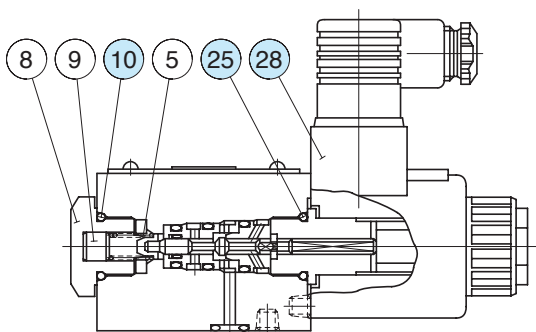
Poppet Type Solenoid Operated Directional Valves

■ 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 Number s | Seal Kit Numbers   |
|----------------------|--------------------|
| DSL G-01-3-O-*-N-11* | KS-DSL G-01-3-N-11 |
| DSL G-01-3-C-*-N-11* |                    |
| DSL G-01-4-O-*-N-11* | KS-DSL G-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. |
|-----------------------|-------------------------|----------------|--------------------|--------------------|
| DSL G-01-*-D12-N-11*  | SD1L-12-N-20            | C-SD1-12-N-60  | GDM-211-A-11       | GDM-211-B-11       |
| DSL G-01-*-D24-N-11*  | SD1L-24-N-20            | C-SD1-24-N-60  |                    |                    |
| DSL G-01-*-R100-N-11* | SD1L-100-N-20           | C-SR1-100-N-60 | GDME-211-R-A-10    | GDME-211-R-B-10    |
| DSL G-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

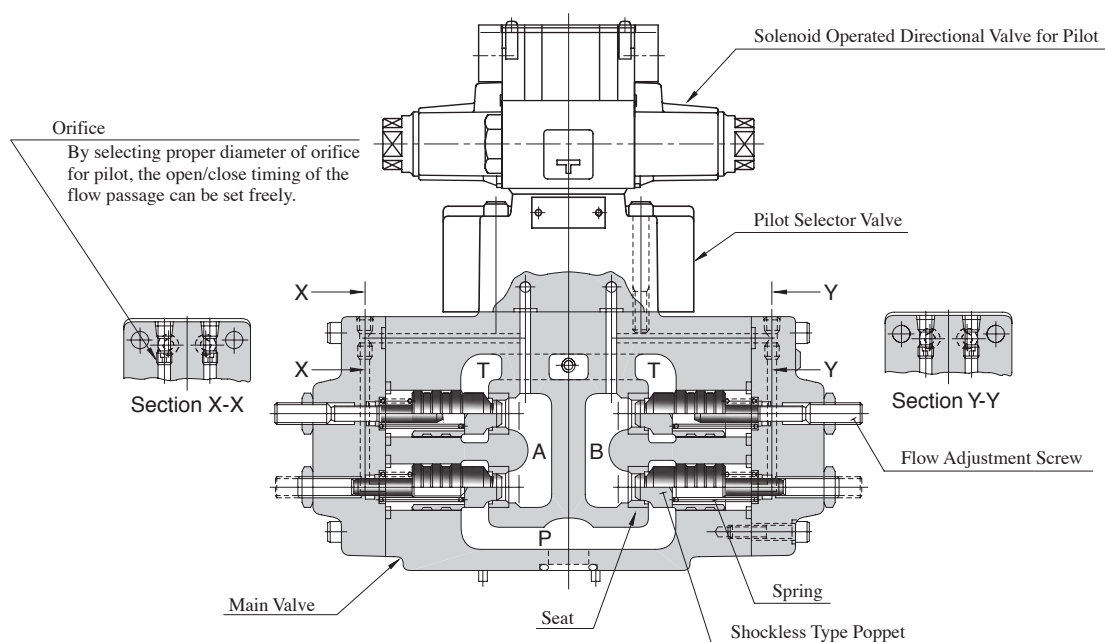
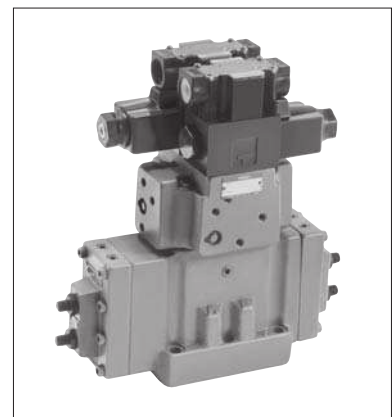
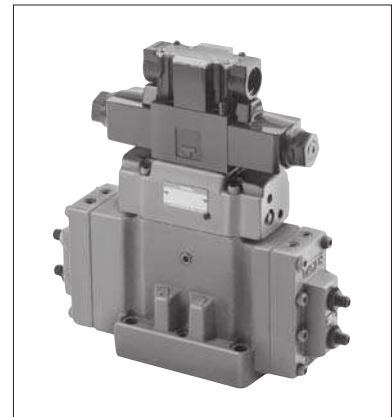
By selecting proper diameter of orifice for pilot, the open/close timing of the flow passage can be set freely. Therefore, smooth starting and stopping of actuator can be done combined with using shockless type poppet. Noise of ON/OFF and vibration of piping in hydraulic system can be also reduced.

#### 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<br>L/min<br>(U.S.GPM) | Max.<br>Operating<br>Pressure<br>MPa (PSI) | Max. Pilot<br>Pressure<br>MPa (PSI) | Max. T-Line<br>Back Pres.<br>MPa (PSI) | Pressure Adj.<br>Range of<br>Counterbalance<br>MPa (PSI) | Ratio of Poppet Area<br>(Seat Area: Annular Area) |                     | Approx.<br>Mass<br>kg (lbs.) |
|-----------------|---------------------------------|--------------------------------------------|-------------------------------------|----------------------------------------|----------------------------------------------------------|---------------------------------------------------|---------------------|------------------------------|
|                 |                                 |                                            |                                     |                                        |                                                          | Direction &<br>Flow Control                       | Pressure<br>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}*<br>(39.6 {26.4})     | 25 (3630)                                  | 25 (3630)                           | 16 (2320)                              | Refer to Model<br>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}*<br>(79.3 {52.8})     | 25 (3630)                                  | 25 (3630)                           | 16 (2320)                              | Refer to Model<br>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}*<br>(132 {79.3})      | 25 (3630)                                  | 25 (3630)                           | 16 (2320)                              | Refer to Model<br>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<br>Seals                                                             | Series<br>Number                               | Type of<br>Mounting                | Valve<br>Size | Type of<br>Pilot<br>Control                                                 | Counterbalance<br>Function                     | Pressure Adj. Range<br>of Counterbalance<br>MPa (PSI)                                     |
| <b>F:</b><br>For phosphate<br>ester type fluids<br>(Omit if not<br>required) | <b>DSLH:</b><br>Multi-Purpose<br>Control Valve | <b>G:</b><br>Sub-plate<br>Mounting | <b>04</b>     | 1<br>2<br>3                                                                 | —                                              | —                                                                                         |
|                                                                              |                                                |                                    |               | 4<br>5                                                                      | <b>A</b> : AT Line<br><b>W</b> : AT & BT Lines | <b>B</b> : * <sup>★1</sup> - 7 (* <sup>★1</sup> - 1020)<br><b>H</b> : 6 - 25 (870 - 3630) |
|                                                                              |                                                |                                    | <b>06</b>     | 1<br>2<br>3                                                                 | —                                              | —                                                                                         |
|                                                                              |                                                |                                    |               | 4<br>5                                                                      | <b>A</b> : AT Line<br><b>W</b> : AT & BT Lines | <b>None</b> : * <sup>★1</sup> - 25 (* <sup>★1</sup> - 3630)                               |
|                                                                              |                                                |                                    | <b>10</b>     | 1<br>2<br>3                                                                 | —                                              | —                                                                                         |
|                                                                              |                                                |                                    |               | 4<br>5<br>See <a href="#">page 462</a> for functions<br>and purpose of use. | <b>A</b> : AT Line<br><b>W</b> : AT & BT Lines | <b>None</b> : * <sup>★1</sup> - 25 (* <sup>★1</sup> - 3630)                               |

★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              | Rc 1/2      | 4.4 (9.7)              | DHGM-04-2080             | 1/2 BSP.F   | 4.4 (9.7)              | DHGM-04-2090                | 1/2 NPT     | 4.4 (9.7)              |
|                     | DHGM-04X-20             | Rc 3/4      | 4.1 (9.0)              | DHGM-04X-2080            | 3/4 BSP.F   | 4.1 (9.0)              | DHGM-04X-2090               | 3/4 NPT     | 4.1 (9.0)              |
| DSLHG-06            | DHGM-06-50              | Rc 3/4      | 7.4 (16.3)             | DHGM-06-5080             | 3/4 BSP.F   | 8.5 (18.7)             | DHGM-06-5090                | 3/4 NPT     | 7.4 (16.3)             |
|                     | DHGM-06X-50             | Rc 1        | 7.4 (16.3)             | DHGM-06X-5080            | 1 BSP.F     | 8.5 (18.7)             | DHGM-06X-5090               | 1 NPT       | 7.4 (16.3)             |
| DSLHG-10            | DHGM-10-40              | Rc 1-1/4    | 21.5 (47.4)            | DHGM-10-4080             | 1-1/4 BSP.F | 21.5 (47.4)            | DHGM-10-4090                | 1-1/4 NPT   | 21.5 (47.4)            |
|                     | DHGM-10X-40             | Rc 1-1/2    | 21.5 (47.4)            | DHGM-10X-4080            | 1-1/2 BSP.F | 21.5 (47.4)            | DHGM-10X-4090               | 1-1/2 NPT   | 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.                                          | 1/4-20 UNC × 1-1/2 Lg.      | 2    | 12-15 (106-133)                 |
|               | M10 × 45 Lg.                                         | 3/8-16 UNC × 1-3/4 Lg.      | 4    | 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 Connection <sup>★2</sup> | Coil Type                                                       | Manual Override              | Electrical Conduit Connection | Design Number | Design Standards                                                                            |
| None:<br>Internal Pilot | None:<br>External Drain        | AC:<br><b>A100</b><br><b>A120</b><br><b>A200</b><br><b>A240</b> | None:<br>Manual Override Pin | None:<br>Terminal Box Type    | 13            | None:<br>Japanese Std. "JIS"<br><br>90:<br>N.American Design Std.                           |
|                         |                                | DC:<br><b>D12</b><br><b>D24</b><br><b>D48</b>                   |                              |                               | 13            |                                                                                             |
|                         |                                | R:<br>(AC→DC)<br><b>R100</b><br><b>R200</b>                     |                              | N:<br>Plug-in Connector Type  | 13            | None:<br>Japanese Std. "JIS" &<br>European Design Std.<br><br>90:<br>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

| Type of Pilot Control | Model No. | Graphic Symbols | Function                                                                                                                                                                                                                        |              |                                               | Purpose of Use                                                                                                                                                 |    |       |       |     |     |       |     |       |     |                                                 |    |                                                                                                                                                                                                                                                   |  |  |
|-----------------------|-----------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-------|-------|-----|-----|-------|-----|-------|-----|-------------------------------------------------|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
|                       |           |                 | Directional Control                                                                                                                                                                                                             | Flow Control | Pilot Operated Check Valve / Pressure Control |                                                                                                                                                                |    |       |       |     |     |       |     |       |     |                                                 |    |                                                                                                                                                                                                                                                   |  |  |
| Type "1"              | DSLHG-*1  |                 |                                                                                                                                                                                                                                 |              |                                               | <ul style="list-style-type: none"><li>Functions as Three Position Four-Way Valve (Spring Centred Model).</li></ul>                                             |    |       |       |     |     |       |     |       |     |                                                 |    |                                                                                                                                                                                                                                                   |  |  |
|                       | DSLHG-*2  |                 | <table><tr><th>Position</th><th>#1</th><th>#2</th><th>#3</th></tr><tr><td>SOL a</td><td>ON</td><td>OFF</td><td>OFF</td></tr><tr><td>SOL b</td><td>OFF</td><td>OFF</td><td>ON</td></tr></table>                                  | Position     | #1                                            | #2                                                                                                                                                             | #3 | SOL a | ON    | OFF | OFF | SOL b | OFF | OFF   | ON  | <p>Both Metre-in and Metre-out are possible</p> |    | <ul style="list-style-type: none"><li>Functions as Three Position Four-Way Valve (Spring Centred Model) as well as Two Position Valve which uses positions #1 and #3.</li><li>Effective especially when the actuator has inertia force.</li></ul> |  |  |
| Position              | #1        | #2              | #3                                                                                                                                                                                                                              |              |                                               |                                                                                                                                                                |    |       |       |     |     |       |     |       |     |                                                 |    |                                                                                                                                                                                                                                                   |  |  |
| SOL a                 | ON        | OFF             | OFF                                                                                                                                                                                                                             |              |                                               |                                                                                                                                                                |    |       |       |     |     |       |     |       |     |                                                 |    |                                                                                                                                                                                                                                                   |  |  |
| SOL b                 | OFF       | OFF             | ON                                                                                                                                                                                                                              |              |                                               |                                                                                                                                                                |    |       |       |     |     |       |     |       |     |                                                 |    |                                                                                                                                                                                                                                                   |  |  |
| Type "3"              | DSLHG-*3  |                 |                                                                                                                                                                                                                                 |              |                                               | <ul style="list-style-type: none"><li>Functions as Four Position Four-Way Valve.</li><li>Regenerative circuit can be constructed at the Position #3.</li></ul> |    |       |       |     |     |       |     |       |     |                                                 |    |                                                                                                                                                                                                                                                   |  |  |
| Type "4"              | DSLHG-*4A |                 |                                                                                                                                                                                                                                 |              |                                               | <ul style="list-style-type: none"><li>Pressure control function (counterbalance valve) has been added to Type "2" to make this type.</li></ul>                 |    |       |       |     |     |       |     |       |     |                                                 |    |                                                                                                                                                                                                                                                   |  |  |
|                       | DSLHG-*4W |                 | <table><tr><th>Position</th><th>#1</th><th>#2</th><th>#3</th></tr><tr><td>SOL a</td><td>ON</td><td>OFF</td><td>OFF</td></tr><tr><td>SOL b</td><td>OFF</td><td>OFF</td><td>ON</td></tr></table>                                  | Position     | #1                                            | #2                                                                                                                                                             | #3 | SOL a | ON    | OFF | OFF | SOL b | OFF | OFF   | ON  |                                                 |    | <ul style="list-style-type: none"><li>Used to control the back pressure of the actuator.</li></ul>                                                                                                                                                |  |  |
| Position              | #1        | #2              | #3                                                                                                                                                                                                                              |              |                                               |                                                                                                                                                                |    |       |       |     |     |       |     |       |     |                                                 |    |                                                                                                                                                                                                                                                   |  |  |
| SOL a                 | ON        | OFF             | OFF                                                                                                                                                                                                                             |              |                                               |                                                                                                                                                                |    |       |       |     |     |       |     |       |     |                                                 |    |                                                                                                                                                                                                                                                   |  |  |
| SOL b                 | OFF       | OFF             | ON                                                                                                                                                                                                                              |              |                                               |                                                                                                                                                                |    |       |       |     |     |       |     |       |     |                                                 |    |                                                                                                                                                                                                                                                   |  |  |
| Type "5"              | DSLHG-*5A |                 |                                                                                                                                                                                                                                 |              |                                               | <ul style="list-style-type: none"><li>Pressure control function (counterbalance valve) has been added to Type "3" to make this type.</li></ul>                 |    |       |       |     |     |       |     |       |     |                                                 |    |                                                                                                                                                                                                                                                   |  |  |
|                       | DSLHG-*5W |                 | <table><tr><th>Position</th><th>#1</th><th>#2</th><th>#3</th><th>#4</th></tr><tr><td>SOL a</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td></tr><tr><td>SOL b</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td></tr></table> | Position     | #1                                            | #2                                                                                                                                                             | #3 | #4    | SOL a | ON  | OFF | ON    | OFF | SOL b | OFF | OFF                                             | ON | ON                                                                                                                                                                                                                                                |  |  |
| Position              | #1        | #2              | #3                                                                                                                                                                                                                              | #4           |                                               |                                                                                                                                                                |    |       |       |     |     |       |     |       |     |                                                 |    |                                                                                                                                                                                                                                                   |  |  |
| SOL a                 | ON        | OFF             | ON                                                                                                                                                                                                                              | OFF          |                                               |                                                                                                                                                                |    |       |       |     |     |       |     |       |     |                                                 |    |                                                                                                                                                                                                                                                   |  |  |
| SOL b                 | OFF       | OFF             | ON                                                                                                                                                                                                                              | ON           |                                               |                                                                                                                                                                |    |       |       |     |     |       |     |       |     |                                                 |    |                                                                                                                                                                                                                                                   |  |  |

## 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.

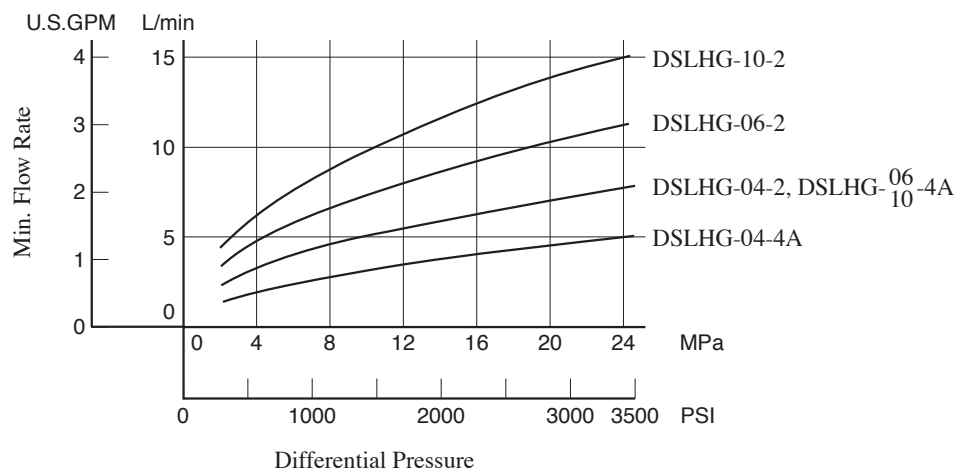
### Pressure Adjustment

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

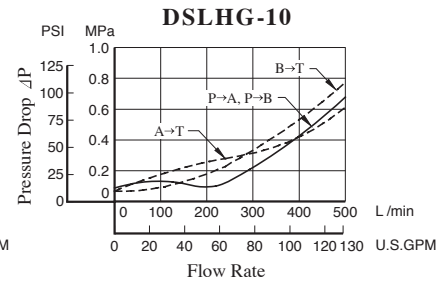
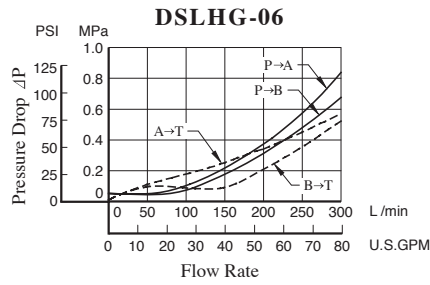
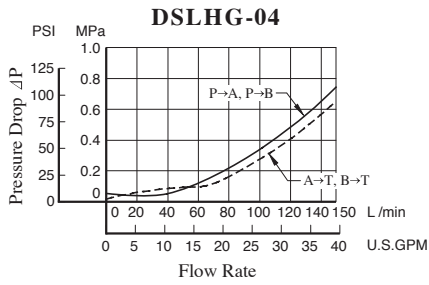
Minimum controlled flow at the time of metre-out control is limited (this does not happen during metre-in control) as shown in the figure below only in the case of pilot control types "2" (DSLHG- \*-2) and "4A" (DSLHG- \*-4A).

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



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

## ■ Pressure Drop



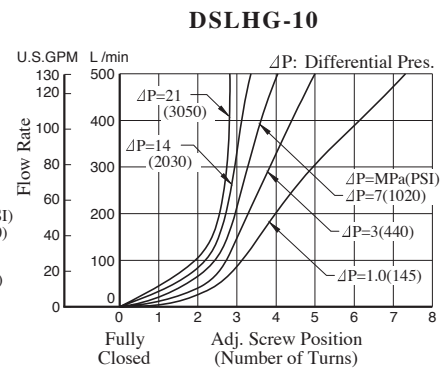
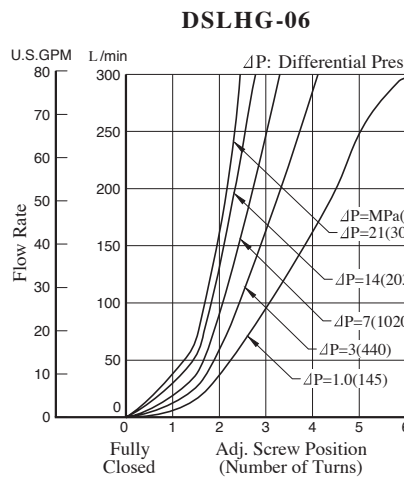
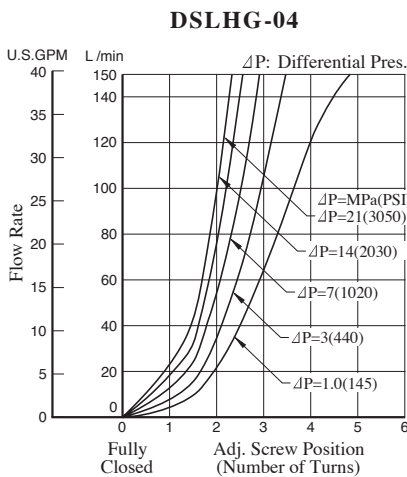
- For any other viscosity, multiply the factors in the table below.

| Viscosity | mm <sup>2</sup> /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 ( $\Delta P'$ ) may be obtained from the formula below.

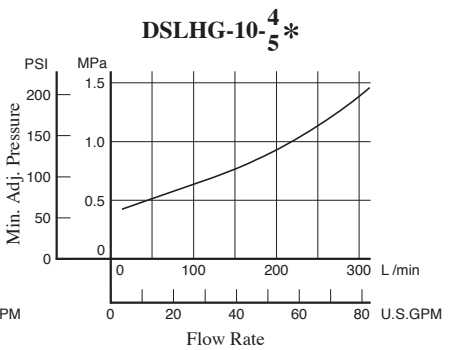
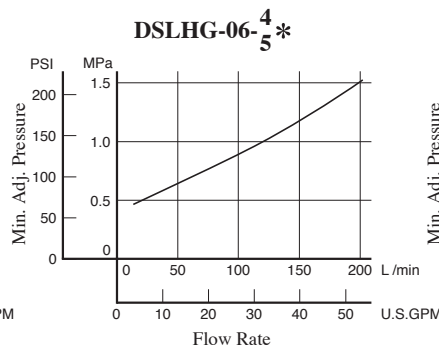
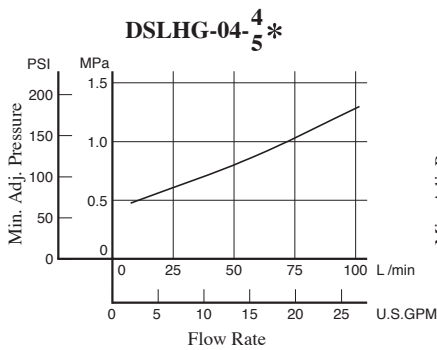
$$\Delta P' = \Delta P (G'/0.850)$$

## ■ Flow vs. Adjustment Revolutions



## ■ Minimum Adjustment Pressure

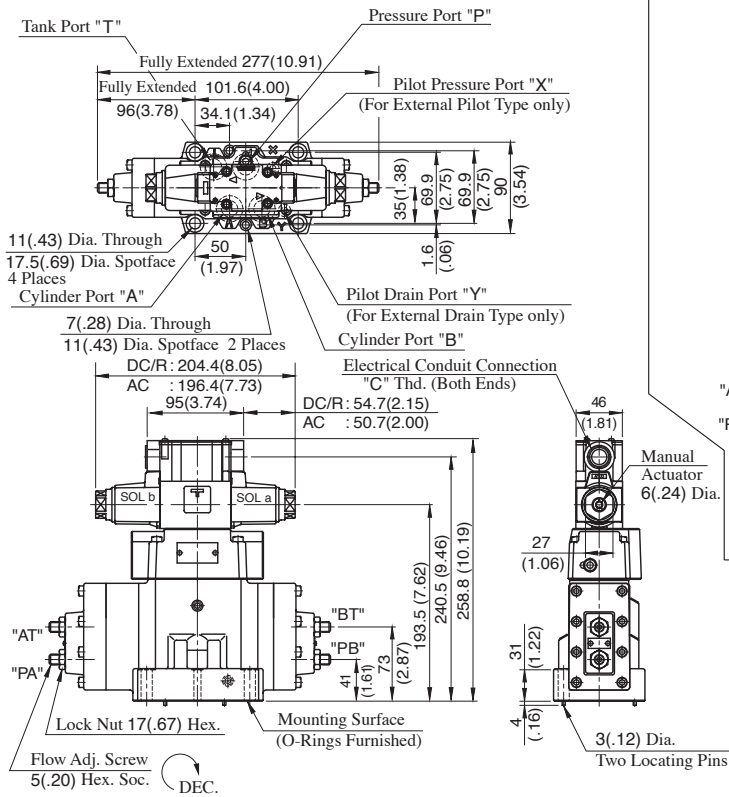
Because the minimum adjustment pressure varies with the tank line back pressure, add the tank line back pressure to the value on the following lines.



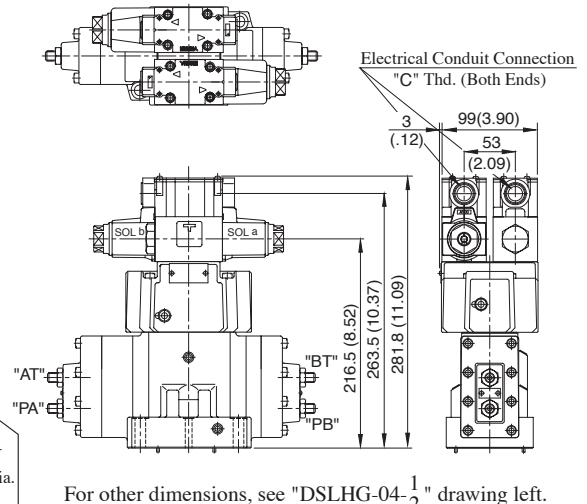
DSLHG-04- $\frac{1}{2}$ -\*-13/1390

## Terminal Box Type

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



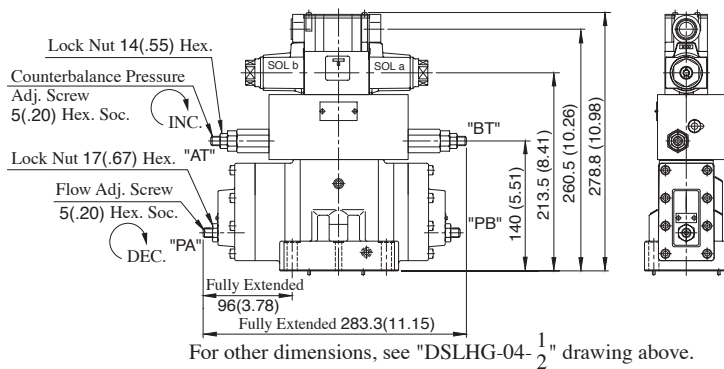
DSLHG-04-3-\*-13/1390



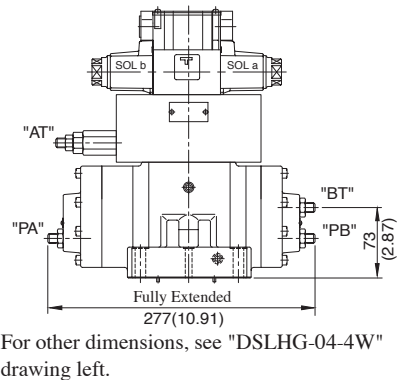
| Model Numbers   | "C" Thd. |
|-----------------|----------|
| DSLHG-04-*-13   | G 1/2    |
| DSLHG-04-*-1390 | 1/2 NPT  |

DIMENSIONS IN  
MILLIMETRES (INCHES)

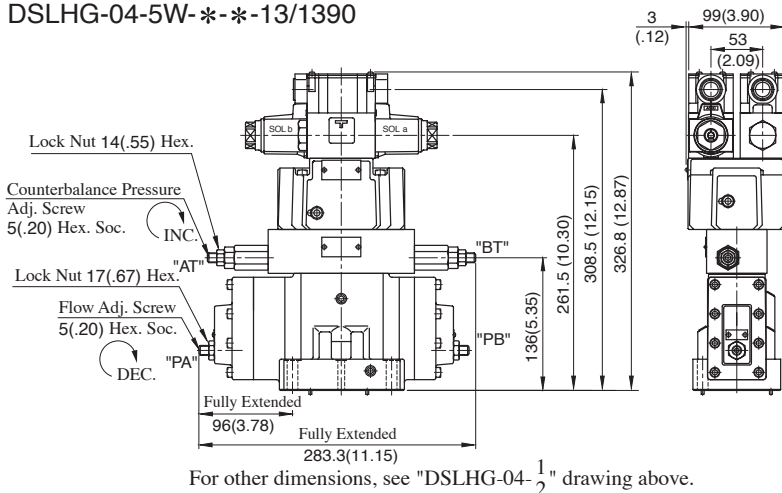
DSLHG-04-4W-\*-13/1390



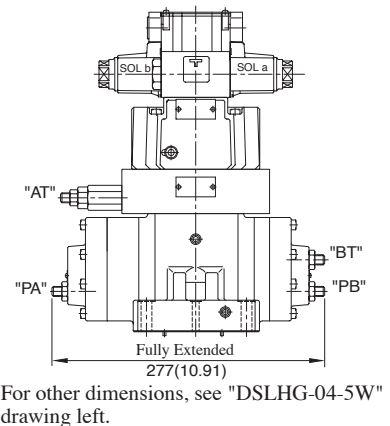
DSLHG-04-4A-\*-13/1390



DSLHG-04-5W-\*-13/1390



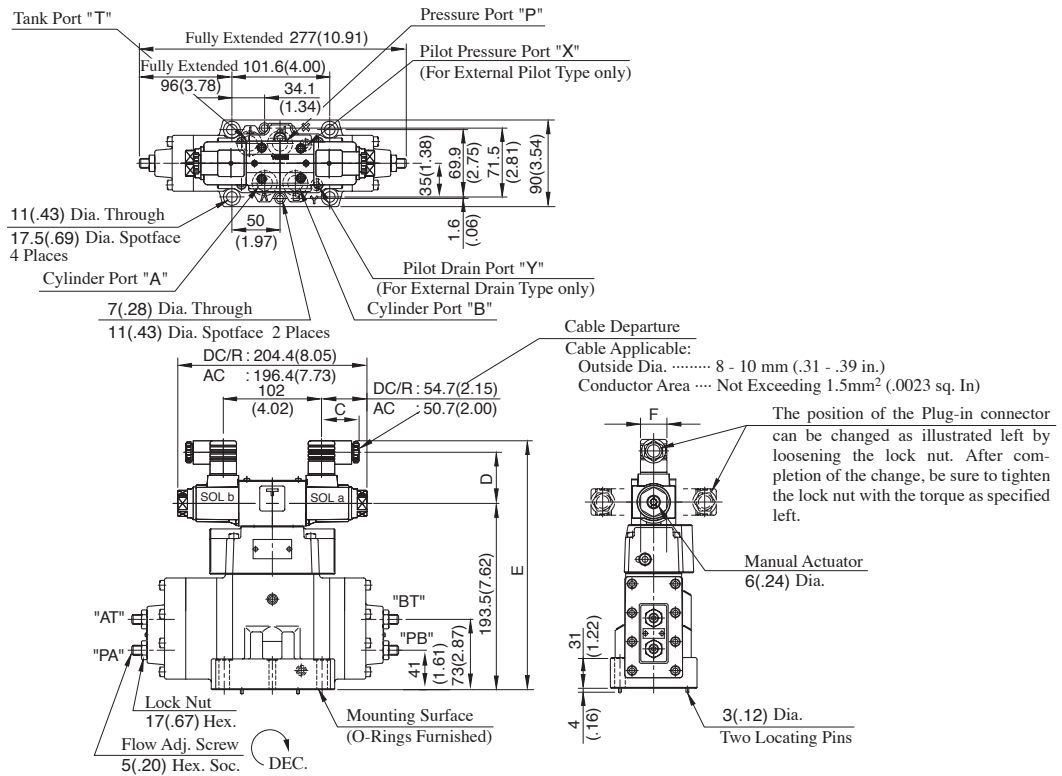
DSLHG-04-5A-\*-13/1390



DSLHG-04- $\frac{1}{2}$ -\*-N-13/1390

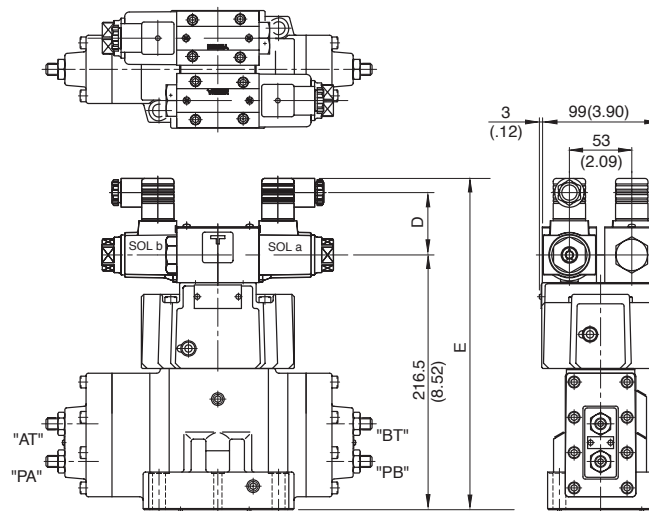
Plug-in Connector Type

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) |

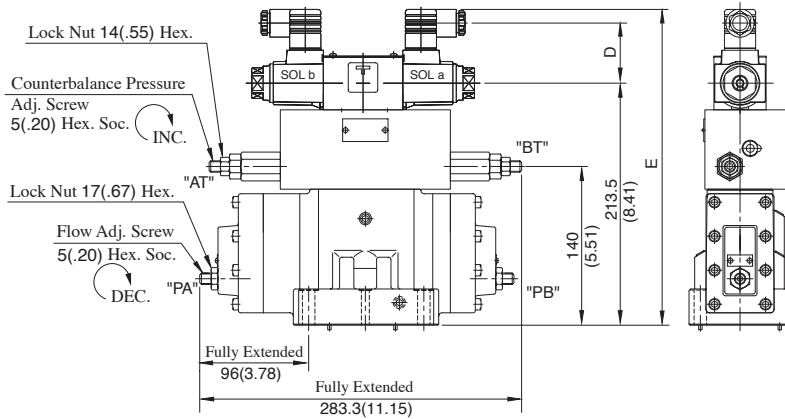
DIMENSIONS IN  
MILLIMETRES (INCHES)

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

## Plug-in Connector Type

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

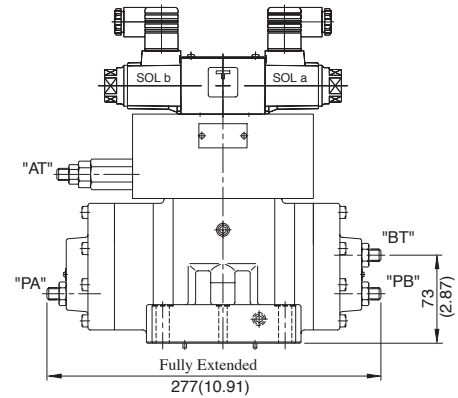
### DSLHG-04-4W-\*-N-13/1390



| 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) |

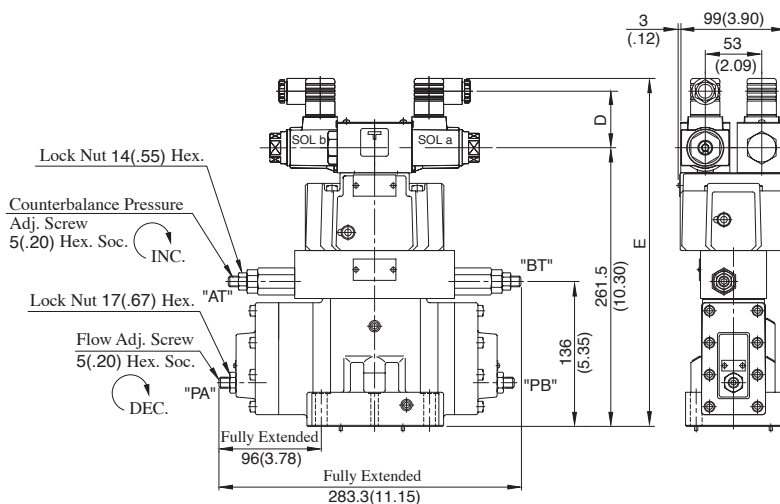
For other dimensions, see DSLHG-04- $\frac{1}{2}$ -\*-N on the [previous page](#).

### DSLHG-04-4A-\*-N-13/1390



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

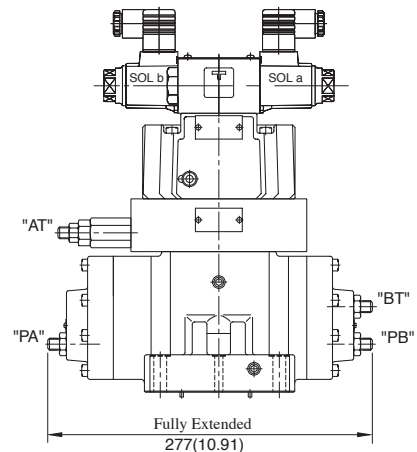
### DSLHG-04-5W-\*-N-13/1390



| 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



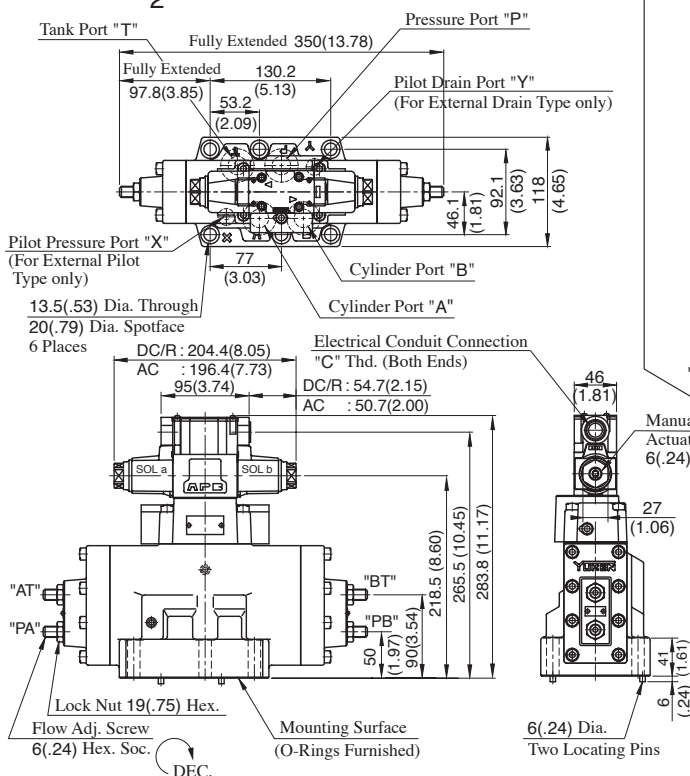
For other dimensions, see  
"DSLHG-04-5W-\*-N" drawing left.

**DIMENSIONS IN  
MILLIMETRES (INCHES)**

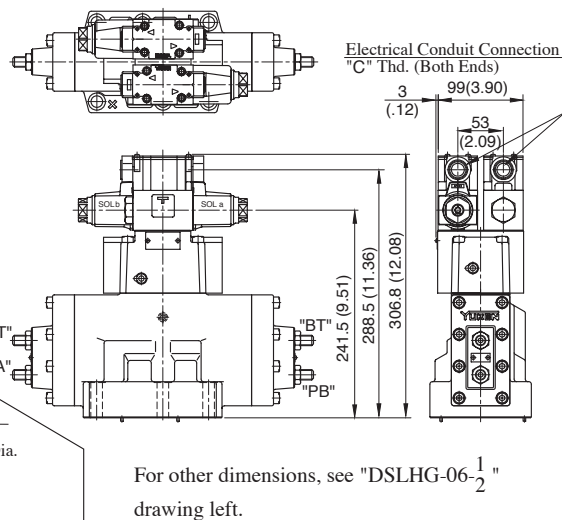
# Terminal Box Type

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

## DSLHG-06- $\frac{1}{2}$ -\*-13/1390



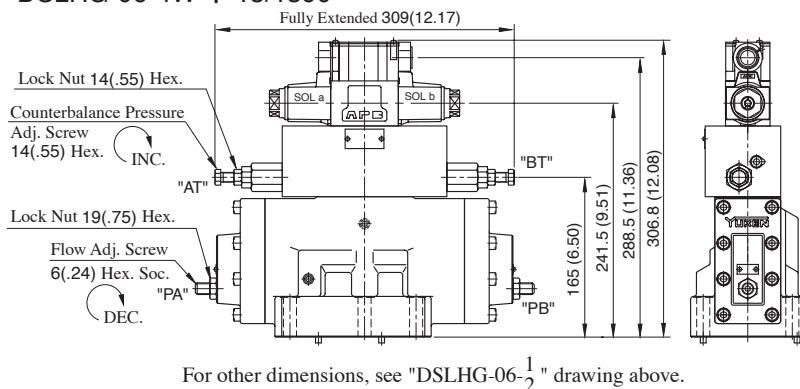
## DSLHG-06-3-\*-13/1390



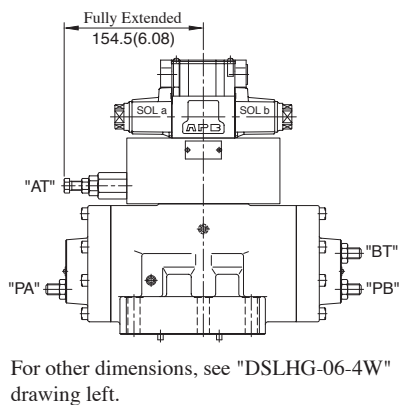
| Model Numbers   | "C" Thd. |
|-----------------|----------|
| DSLHG-06-*-13   | G 1/2    |
| DSLHG-06-*-1390 | 1/2 NPT  |

**DIMENSIONS IN  
MILLIMETRES (INCHES)**

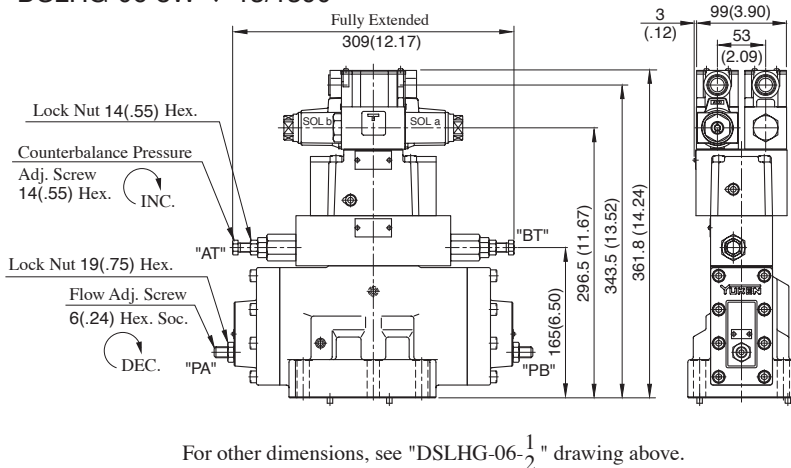
## DSLHG-06-4W-\*-13/1390



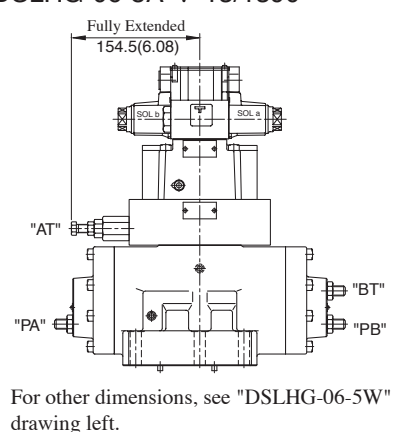
## DSLHG-06-4A-\*-13/1390



## DSLHG-06-5W-\*-13/1390



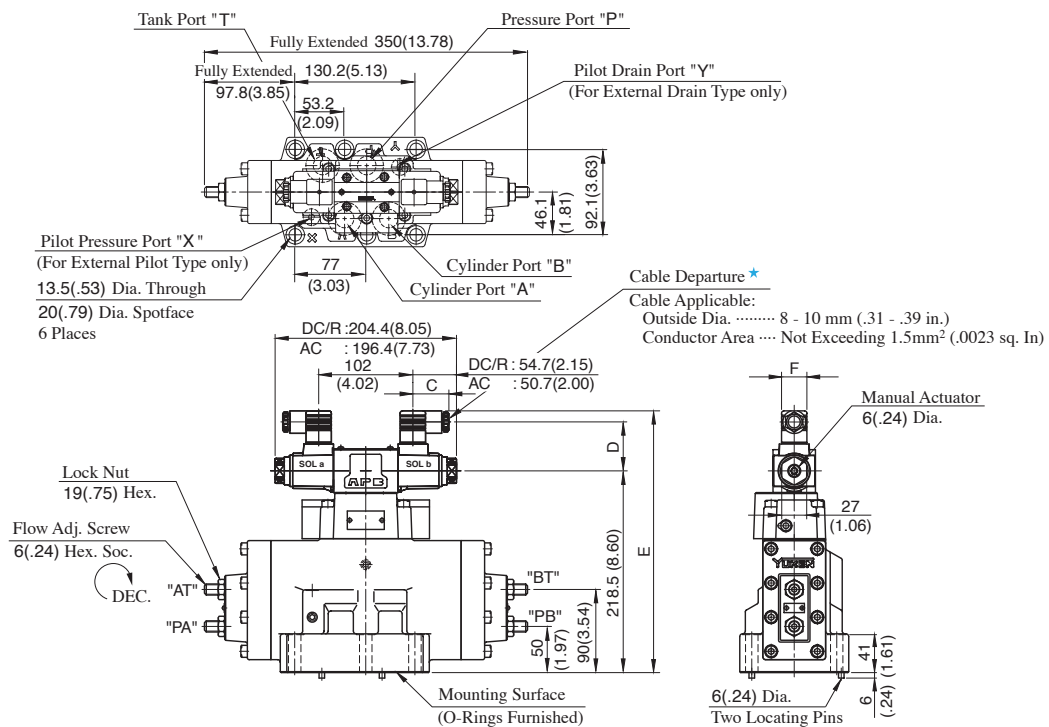
## DSLHG-06-5A-\*-13/1390



DSLHG-06- $\frac{1}{2}$ -\*-N-13/1390

Plug-in Connector Type

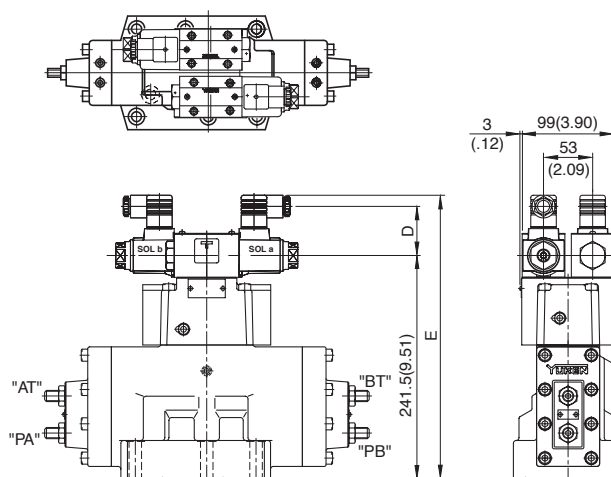
Mounting Surface:  
ISO4401-AE-08-4-A



| 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)   |

$\star$  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) |

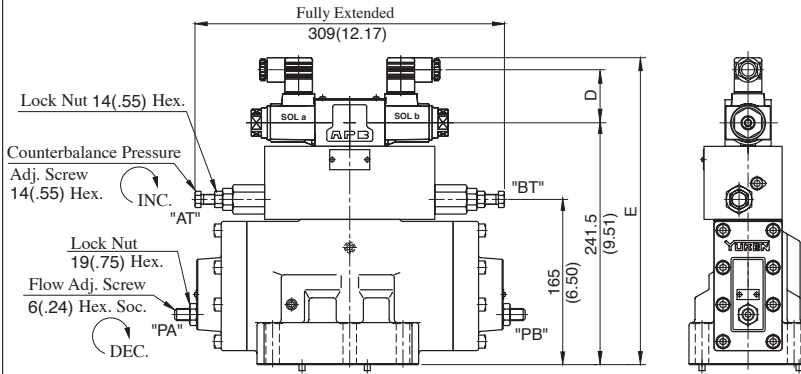
DIMENSIONS IN  
MILLIMETRES (INCHES)

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

**Plug-in Connector Type**

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

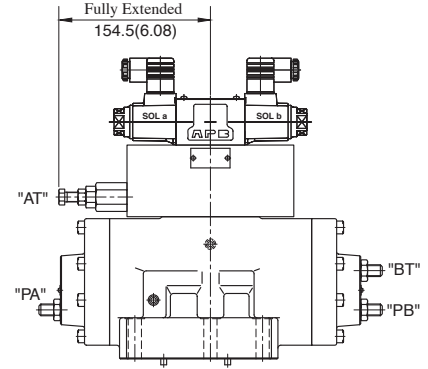
**DSLHG-06-4W-\*N-13/1390**



| 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) |

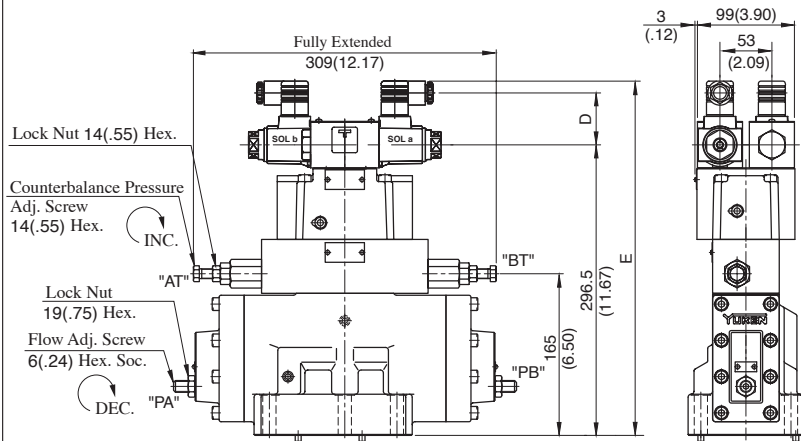
For other dimensions, see DSLHG-06- $\frac{1}{2}$ -\*-N on the [previous page](#).

**DSLHG-06-4A-\*N-13/1390**



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

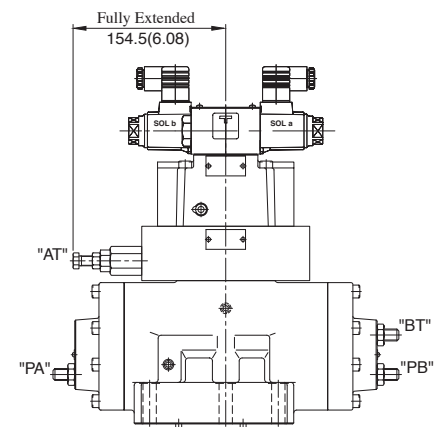
**DSLHG-06-5W-\*N-13/1390**



| 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**

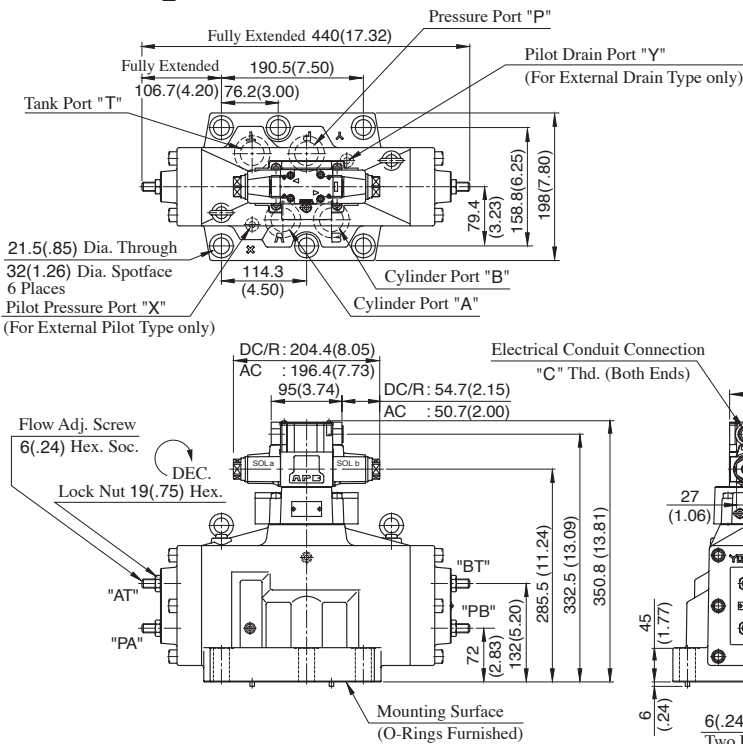


For other dimensions, see "DSLHG-06-5W-\*N" drawing left.

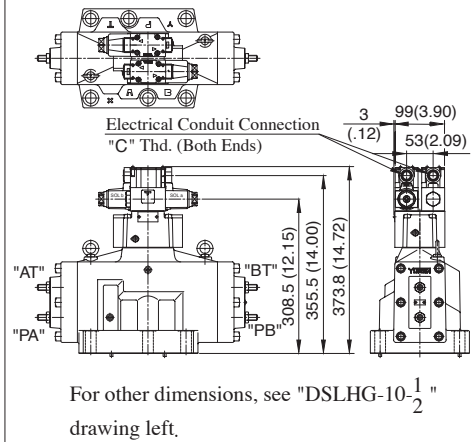
**DIMENSIONS IN  
MILLIMETRES (INCHES)**

## Terminal Box Type

### DSLHG-10- $\frac{1}{2}$ -\*-13/1390



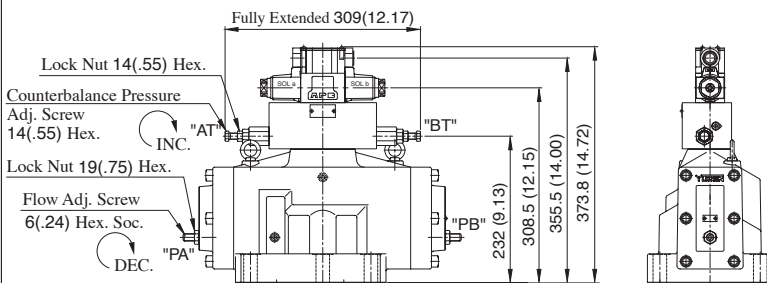
### DSLHG-10-3-\*-13/1390



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

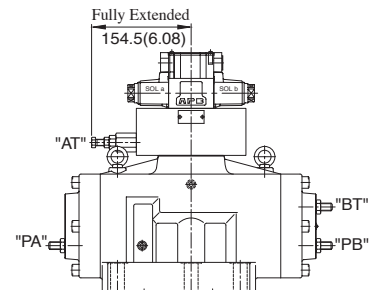
**DIMENSIONS IN MILLIMETRES (INCHES)**

### DSLHG-10-4W-\*-13/1390



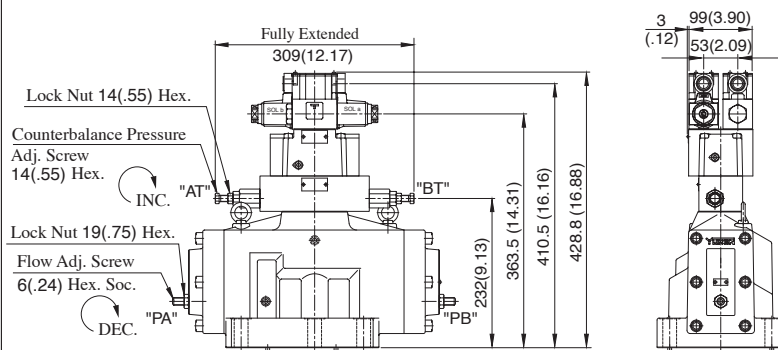
For other dimensions, see "DSLHG-10- $\frac{1}{2}$ " drawing above.

### DSLHG-10-4A-\*-13/1390



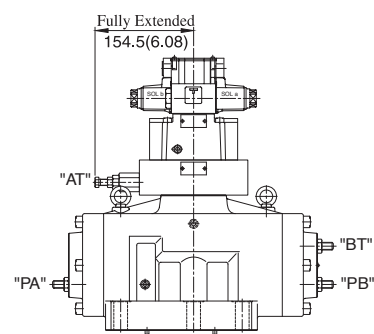
For other dimensions, see "DSLHG-10-4W" drawing left.

### DSLHG-10-5W-\*-13/1390



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

### DSLHG-10-5A-\*-13/1390

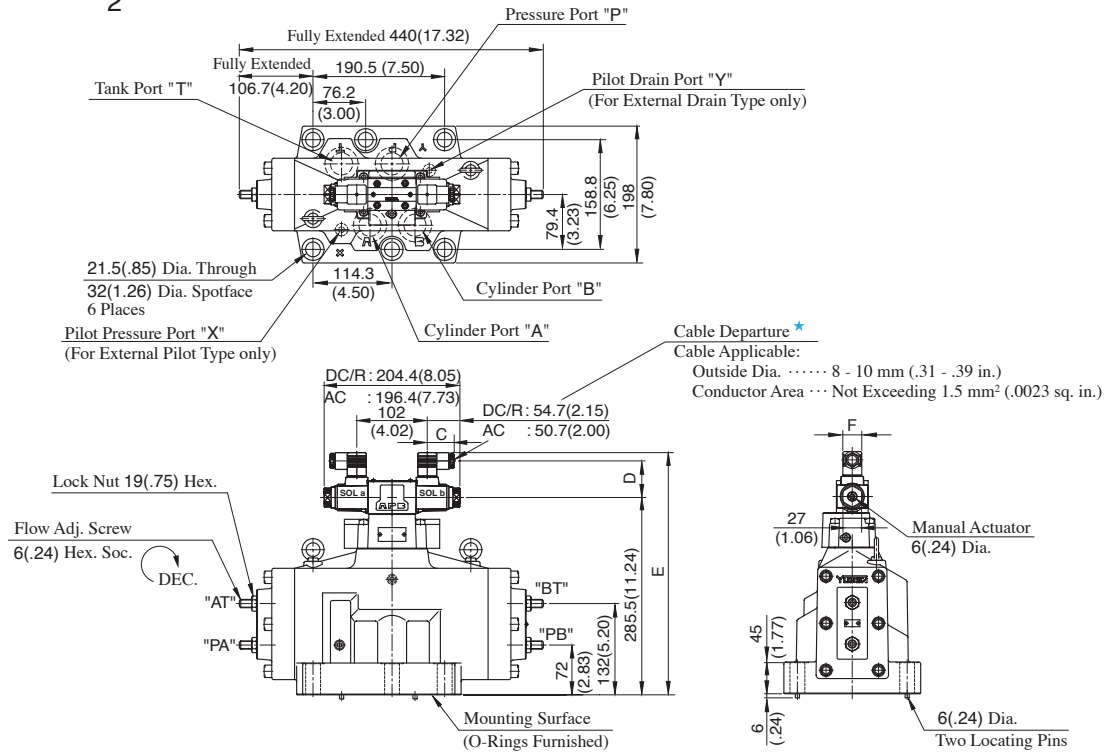


For other dimensions, see "DSLHG-10-5W" drawing left.

# Plug-in Connector Type

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

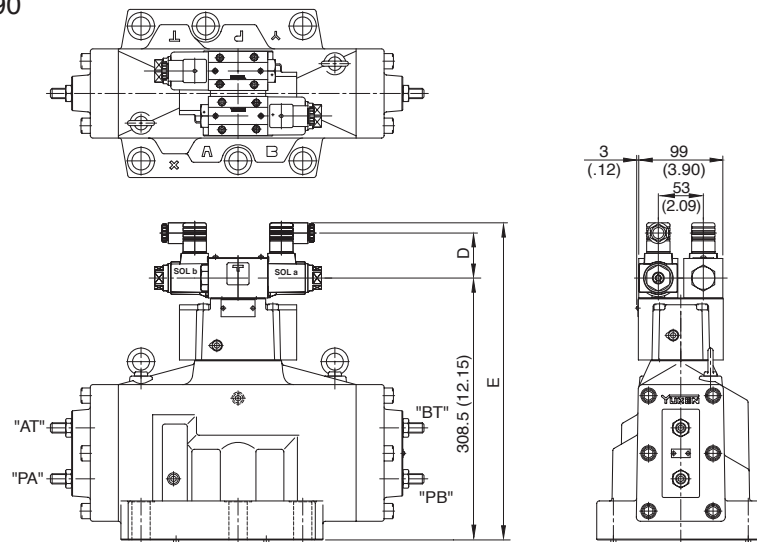
DSLHG-10- $\frac{1}{2}$ -\*-N-13/1390



| 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)   |

$\star$  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) |

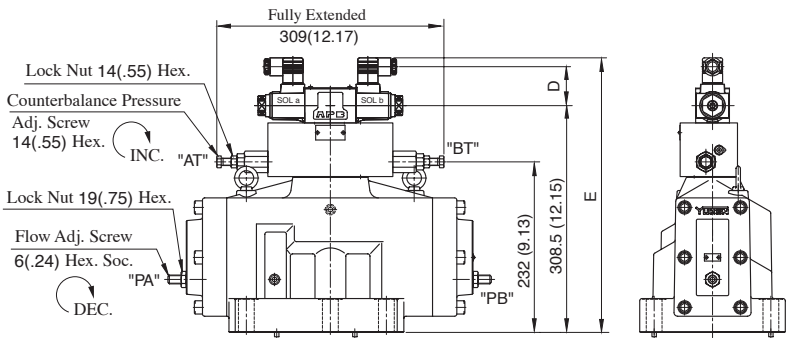
DIMENSIONS IN  
MILLIMETRES (INCHES)

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

Plug-in Connector Type

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

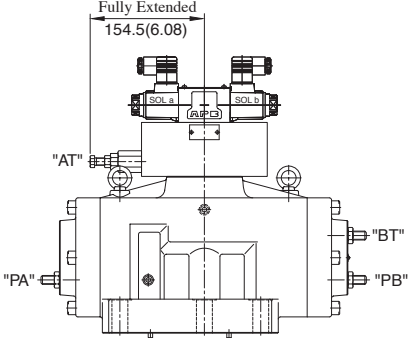
DSLHG-10-4W-\*-N-13/1390



| 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) |

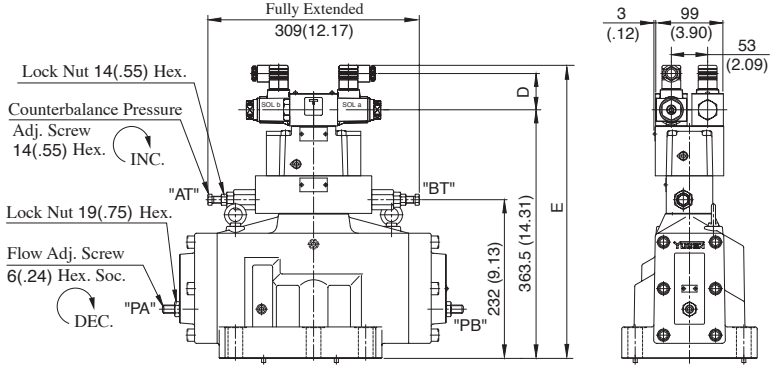
For other dimensions, see DSLHG-10- $\frac{1}{2}$ -\*-N on the [previous page](#).

DSLHG-10-4A-\*-N-13/1390



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

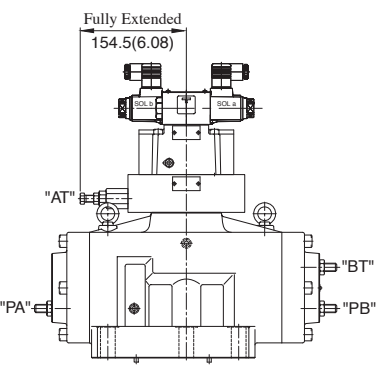
DSLHG-10-5W-\*-N-13/1390



| 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

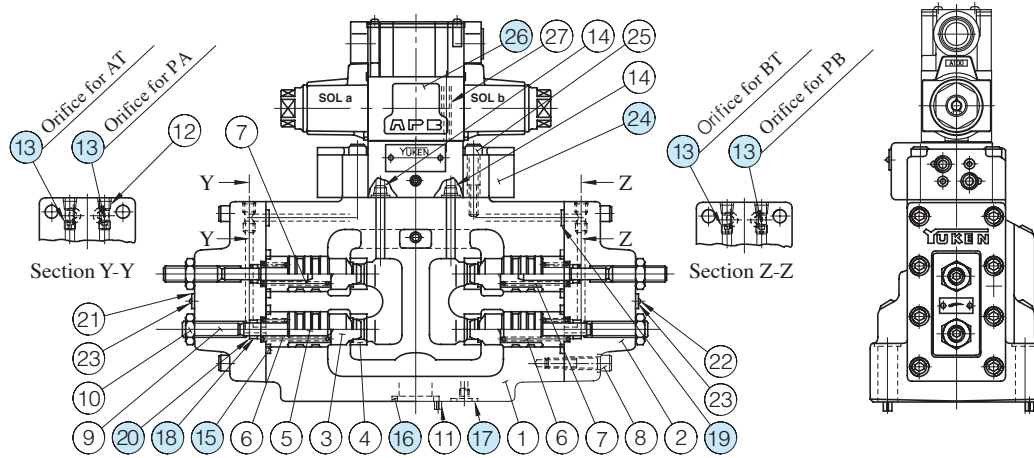


For other dimensions, see  
"DSLHG-10-5W-\*-N" drawing left.

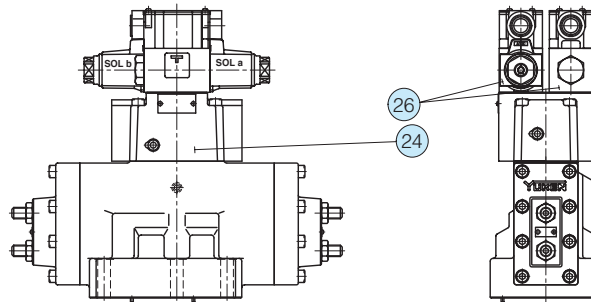
DIMENSIONS IN  
MILLIMETRES (INCHES)

■ 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         |                    |                                             |
|---------------|-------------------------|--------------------|---------------------------------------------|
|               | Orifice Diameter "d" mm |                    |                                             |
| Model Numbers | 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                                         |
| DSLHG-06      | 1.2                     | 1.2, 1.4, 1.6, 1.8 |                                             |
| DSLHG-10      | 1.4                     | 2.0, 2.5           | 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                            |

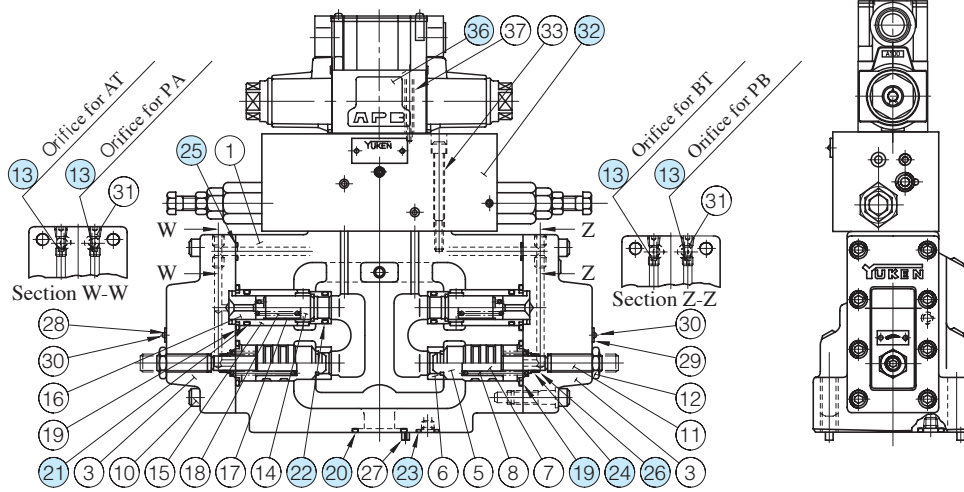
Note: For details of Pilot Selector Valve, see page 476.

● Pilot Valve

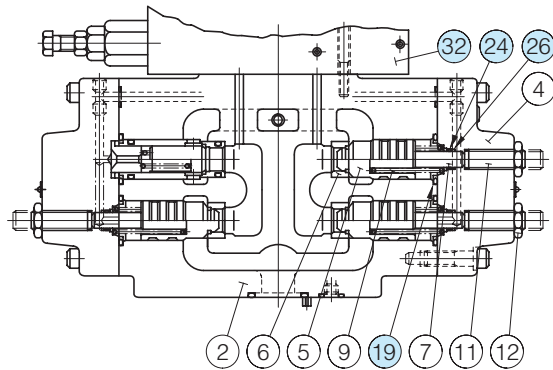
Refer to page 478 for Pilot Valve Model Numbers.

## List of Seals for Main Valves and Pilot Selector Valve

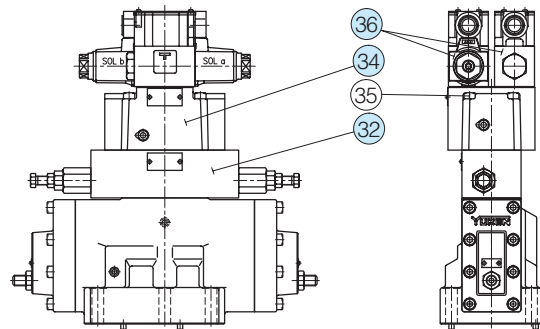
### DSLHG-04/06/10-4W-\*-12/1290



### 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                        |            |

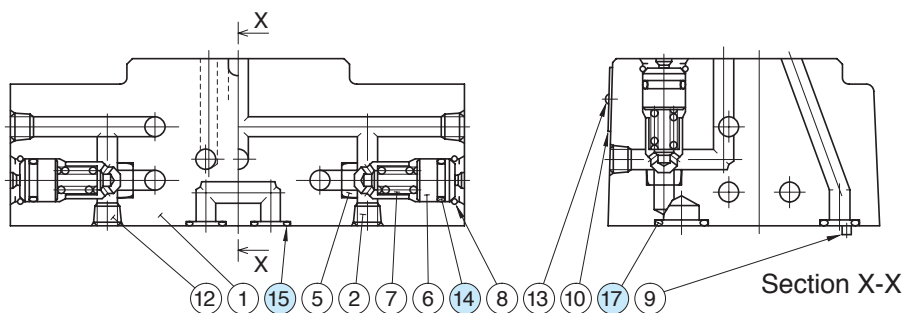
Note: Fill "B" or "H" representing the pressure adjustment range in section marked with ■.

See [page 477](#) for the details of the pilot selector valves.

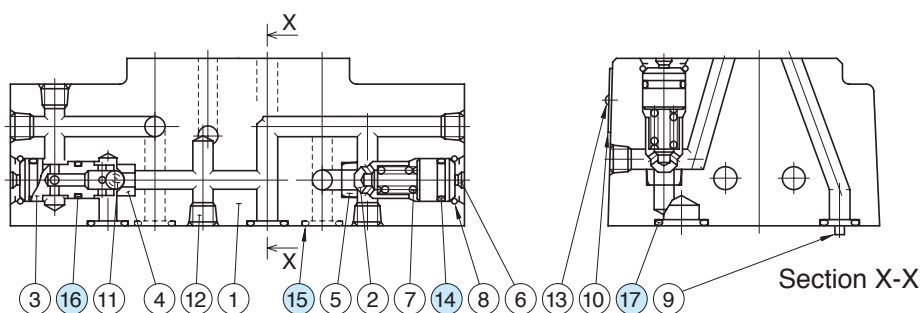
● See the [previous page](#) for Item (13) Orifice.

■ List of Seals (Pilot Selector Valves)

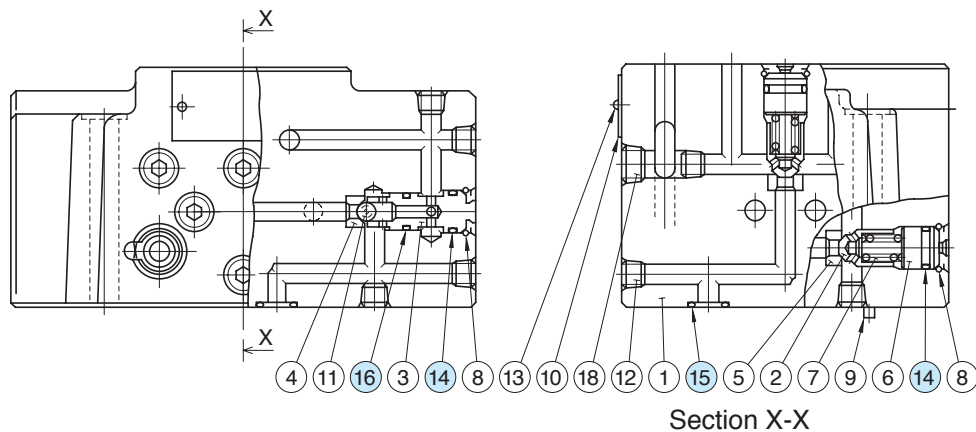
CG-04/06-1-10



CG-04/06-2-10



CG-04/06-3-10



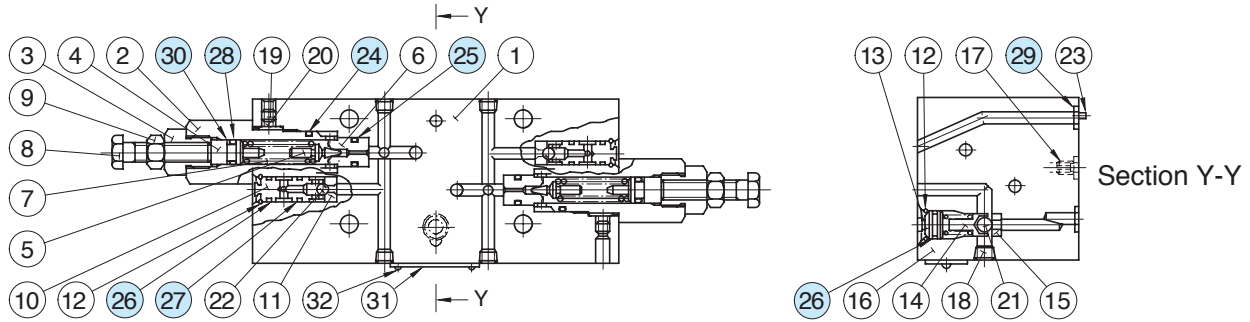
● List of Seals

| Item | Name of Parts | CG-04        |          |         |         | CG-06        |          |         |         |
|------|---------------|--------------|----------|---------|---------|--------------|----------|---------|---------|
|      |               | Part Numbers | Quantity |         |         | Part Numbers | 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       | —       |

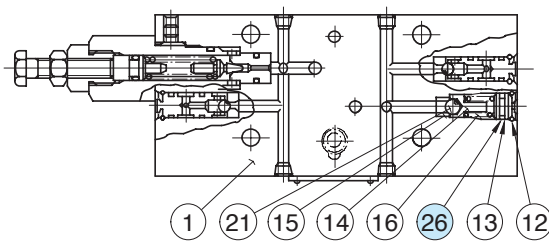
Note: When ordering the o-rings, please specify the seal kit number listed in [page 478](#).

## List of Seals (Pilot Selector Valves)

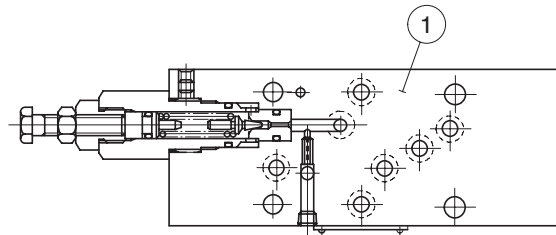
CG-04/06-4W-10



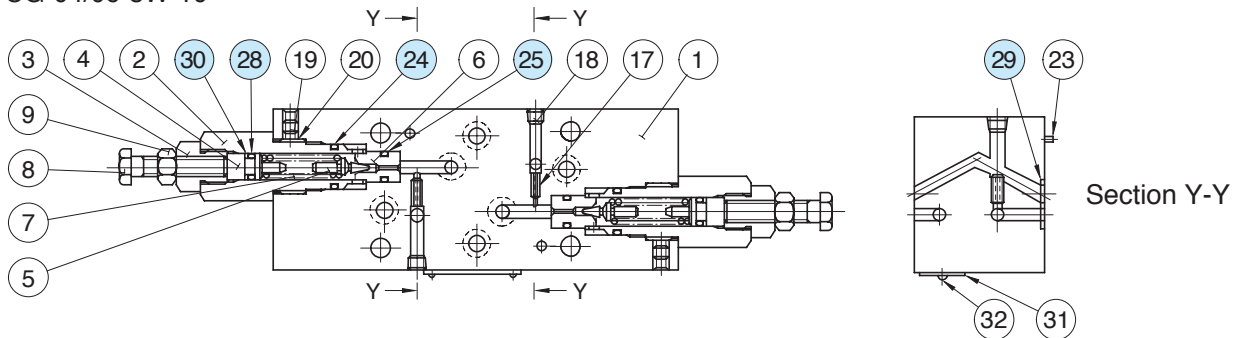
CG-04/06-4A-10



CG-04/06-5A-10



CG-04/06-5W-10



### List of Seals

| Item | Name of Parts | CG-04        |          |      |      |      | CG-06        |          |      |      |      |
|------|---------------|--------------|----------|------|------|------|--------------|----------|------|------|------|
|      |               | Part Numbers | Quantity |      |      |      | Part Numbers | 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<br>DSLHG-04-1-★-▲-1390   | DSG-01-3C9-★-▲-70<br>DSG-01-3C9-★-▲-7090 | KS-DSLHG-04-1-▲-13  | KS-CG-04-1-10             | KS-DSG-01-▲-70<br>(1 Set Req'd) |
| DSLHG-04-2-★-▲-13<br>DSLHG-04-2-★-▲-1390   | DSG-01-3C9-★-▲-70<br>DSG-01-3C9-★-▲-7090 | KS-DSLHG-04-2-▲-13  | KS-CG-04-2-10             |                                 |
| DSLHG-04-3-★-▲-13<br>DSLHG-04-3-★-▲-1390   | DSG-01-2B2-★-▲-70<br>DSG-01-2B2-★-▲-7090 | KS-DSLHG-04-3-▲-13  |                           | KS-DSG-01-▲-70<br>(2 Set Req'd) |
| DSLHG-04-4A-★-▲-13<br>DSLHG-04-4A-★-▲-1390 | DSG-01-3C9-★-▲-70<br>DSG-01-3C9-★-▲-7090 | KS-DSLHG-04-4A-▲-13 | KS-CG-04-4A-10            | KS-DSG-01-▲-70<br>(1 Set Req'd) |
| DSLHG-04-4W-★-▲-13<br>DSLHG-04-4W-★-▲-1390 | DSG-01-3C9-★-▲-70<br>DSG-01-3C9-★-▲-7090 | KS-DSLHG-04-4W-▲-13 | KS-CG-04-4W-10            |                                 |
| DSLHG-04-5A-★-▲-13<br>DSLHG-04-5A-★-▲-1390 | DSG-01-2B2-★-▲-70<br>DSG-01-2B2-★-▲-7090 | KS-DSLHG-04-5A-▲-13 | KS-CG-04-5A-10            | KS-DSG-01-▲-70<br>(2 Set Req'd) |
| DSLHG-04-5W-★-▲-13<br>DSLHG-04-5W-★-▲-1390 | DSG-01-2B2-★-▲-70<br>DSG-01-2B2-★-▲-7090 | KS-DSLHG-04-5W-▲-13 | KS-CG-04-5W-10            |                                 |
| DSLHG-06-1-★-▲-13<br>DSLHG-06-1-★-▲-1390   | DSG-01-3C9-★-▲-70<br>DSG-01-3C9-★-▲-7090 | KS-DSLHG-06-1-▲-13  | KS-CG-06-1-10             | KS-DSG-01-▲-70<br>(1 Set Req'd) |
| DSLHG-06-2-★-▲-13<br>DSLHG-06-2-★-▲-1390   | DSG-01-3C9-★-▲-70<br>DSG-01-3C9-★-▲-7090 | KS-DSLHG-06-2-▲-13  | KS-CG-06-2-10             |                                 |
| DSLHG-06-3-★-▲-13<br>DSLHG-06-3-★-▲-1390   | DSG-01-2B2-★-▲-70<br>DSG-01-2B2-★-▲-7090 | KS-DSLHG-06-3-▲-13  | KS-CG-06-3-10             | KS-DSG-01-▲-70<br>(2 Set Req'd) |
| DSLHG-06-4A-★-▲-13<br>DSLHG-06-4A-★-▲-1390 | DSG-01-3C9-★-▲-70<br>DSG-01-3C9-★-▲-7090 | KS-DSLHG-06-4A-▲-13 | KS-CG-06-4A-10            | KS-DSG-01-▲-70<br>(1 Set Req'd) |
| DSLHG-06-4W-★-▲-13<br>DSLHG-06-4W-★-▲-1390 | DSG-01-3C9-★-▲-70<br>DSG-01-3C9-★-▲-7090 | KS-DSLHG-06-4W-▲-13 | KS-CG-06-4W-10            |                                 |
| DSLHG-06-5A-★-▲-13<br>DSLHG-06-5A-★-▲-1390 | DSG-01-2B2-★-▲-70<br>DSG-01-2B2-★-▲-7090 | KS-DSLHG-06-5A-▲-13 | KS-CG-06-5A-10            | KS-DSG-01-▲-70<br>(2 Set Req'd) |
| DSLHG-06-5W-★-▲-13<br>DSLHG-06-5W-★-▲-1390 | DSG-01-2B2-★-▲-70<br>DSG-01-2B2-★-▲-7090 | KS-DSLHG-06-5W-▲-13 | KS-CG-06-5W-10            |                                 |
| DSLHG-10-1-★-▲-13<br>DSLHG-10-1-★-▲-1390   | DSG-01-3C9-★-▲-70<br>DSG-01-3C9-★-▲-7090 | KS-DSLHG-10-1-▲-13  | KS-CG-06-1-10             | KS-DSG-01-▲-70<br>(1 Set Req'd) |
| DSLHG-10-2-★-▲-13<br>DSLHG-10-2-★-▲-1390   | DSG-01-3C9-★-▲-70<br>DSG-01-3C9-★-▲-7090 | KS-DSLHG-10-2-▲-13  | KS-CG-06-2-10             |                                 |
| DSLHG-10-3-★-▲-13<br>DSLHG-10-3-★-▲-1390   | DSG-01-2B2-★-▲-70<br>DSG-01-2B2-★-▲-7090 | KS-DSLHG-10-3-▲-13  | KS-CG-06-3-10             | KS-DSG-01-▲-70<br>(2 Set Req'd) |
| DSLHG-10-4A-★-▲-13<br>DSLHG-10-4A-★-▲-1390 | DSG-01-3C9-★-▲-70<br>DSG-01-3C9-★-▲-7090 | KS-DSLHG-10-4A-▲-13 | KS-CG-06-4A-10            | KS-DSG-01-▲-70<br>(1 Set Req'd) |
| DSLHG-10-4W-★-▲-13<br>DSLHG-10-4W-★-▲-1390 | DSG-01-3C9-★-▲-70<br>DSG-01-3C9-★-▲-7090 | KS-DSLHG-10-4W-▲-13 | KS-CG-06-4W-10            |                                 |
| DSLHG-10-5A-★-▲-13<br>DSLHG-10-5A-★-▲-1390 | DSG-01-2B2-★-▲-70<br>DSG-01-2B2-★-▲-7090 | KS-DSLHG-10-5A-▲-13 | KS-CG-06-5A-10            | KS-DSG-01-▲-70<br>(2 Set Req'd) |
| DSLHG-10-5W-★-▲-13<br>DSLHG-10-5W-★-▲-1390 | DSG-01-2B2-★-▲-70<br>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.

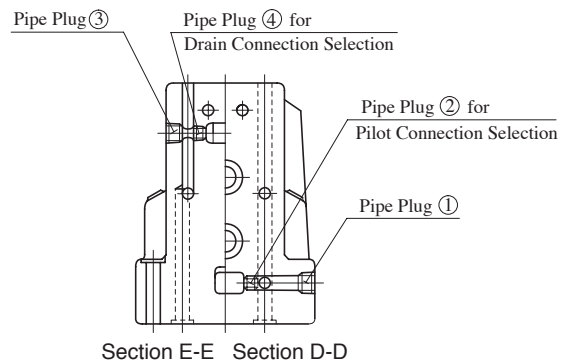
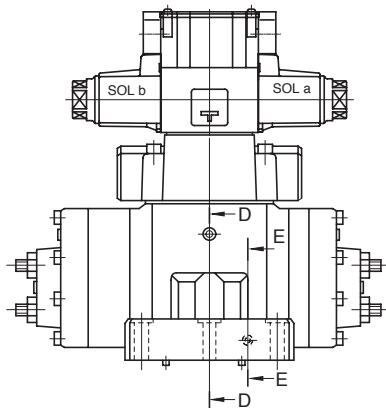
#### External Pilot → Internal Pilot (See Section E-E)

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

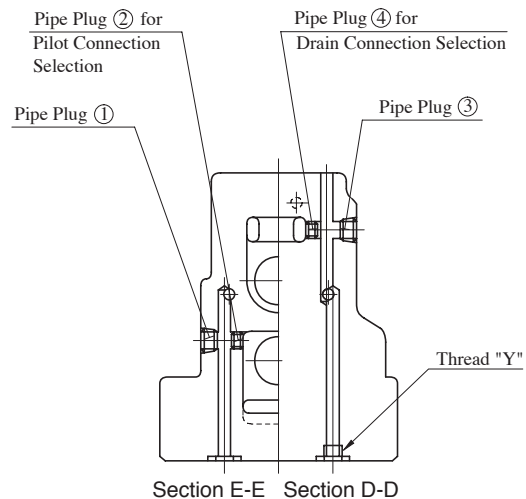
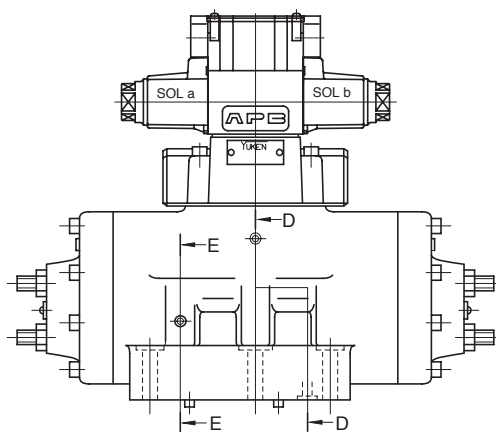
#### External Drain → Internal Drain (See Section D-D)

- 1) Remove pipe plug ③.
- 2) Remove pipe plug ④.
- 3) Wind a sealing tape around the pipe plug ③, 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 L/min (U.S.GPM)★ <sup>1</sup> | Max. Operating Pressure MPa (PSI)★ <sup>2</sup> | Internal leakage cm <sup>3</sup> /min (cu.in./min) or less 0.25 (.015) | Max. Changeover Frequency min <sup>-1</sup> (Cycles/Min) | Approx. Mass kg (lbs.) |
|---------------------|-----------------------------------------|-------------------------------------------------|------------------------------------------------------------------------|----------------------------------------------------------|------------------------|
| CDSC-01-C-D24-10*   | 15 (4.0)                                | 21 (3050)                                       | 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<br>DC: 240<br>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        |           |
|                 | A120      | 50             | 110           | 96 - 132          | 0.86                             | 0.36        |           |
|                 |           | 60             | 120           | 108 - 144         | 0.93                             | 0.46        |           |
|                 | A200      | 50             | 200           | 160 - 220         | 0.79                             | 0.33        |           |
|                 |           | 60             | 200           | 180 - 240         | 0.56                             | 0.28        |           |
|                 | A240      | 50             | 220           | 192 - 264         | 0.48                             | 0.20        |           |
|                 |           | 60             | 240           | 216 - 288         | 0.43                             | 0.18        |           |
|                 | D12       | —              | 12            | 10.8 - 13.2       | —                                | 2.20        | 26        |
|                 |           |                | 24            | 21.6 - 26.4       |                                  | 1.10        |           |
| DC (K Series)   | D24★      |                | 48            | 43.2 - 52.8       |                                  | 0.55        |           |
|                 | D48       |                | —             | —                 |                                  | —           |           |
| 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.)

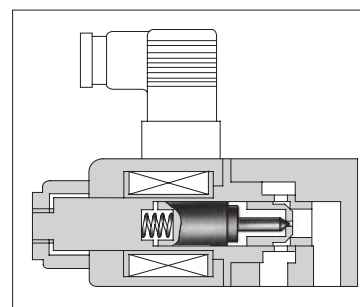
### Model Number Designation

| 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   | 21            | None: Japanese Std. "JIS" 80: European Design Std. 90: N. American Design Std. |
|                                                                         |                                                   | T: Threaded Connection | 03W (Piping Size 1/4) 03 (Piping Size 3/8) |                    | DC D12, D24, D100          | 21            | None: Japanese Std. "JIS" & European Design Std. 90: N. American Design Std.   |
|                                                                         |                                                   | G: Gasket Mounting     | 03                                         |                    | AC→DC Rectified R100, R200 | 21            | None: Japanese Std. "JIS" & European Design Std. 90: N. American Design Std.   |

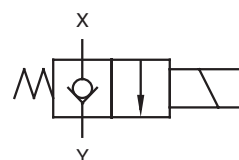
### Mounting Bolts

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.       |



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

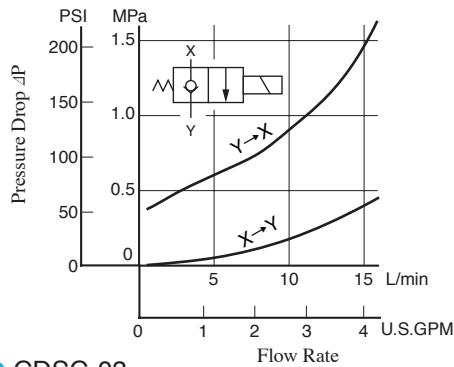
At the time of test run, there is a possibility that the oil may not flow even after the solenoid is energised because of the residual air in the valve.

#### Mounting

There are no mounting restrictions for any models.

## Pressure Drop

- **CDSC-01** Hydraulic Fluid: Viscosity 30 mm<sup>2</sup> (141 SSU), Specific Gravity 0.850



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

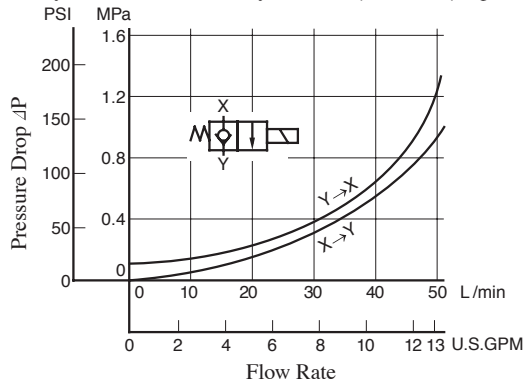
| Viscosity | mm <sup>2</sup> /s | 15   | 20   | 30   | 40   | 50   | 60   | 70   | 80   | 90   | 100  |
|-----------|--------------------|------|------|------|------|------|------|------|------|------|------|
| SSU       |                    | 77   | 98   | 141  | 186  | 232  | 278  | 324  | 371  | 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 (ΔP') may be obtained from the formula below.

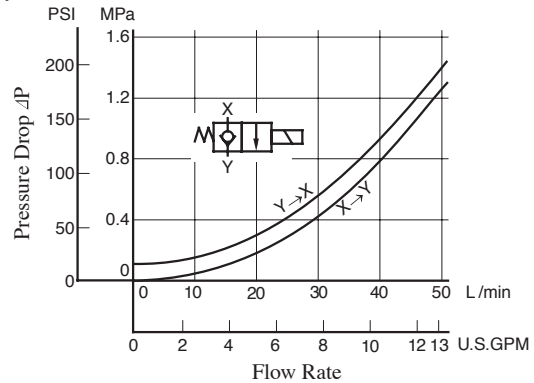
$$\Delta P' = \Delta P (G'/0.850)$$

- **CDSC-03**
- **CDST-03**
- **CDSG-03**

Hydraulic Fluid: Viscosity 35 mm<sup>2</sup> (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 | mm <sup>2</sup> /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 |

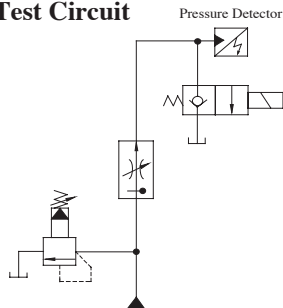
- For any other specific gravity (G'), the pressure drop (ΔP') may be obtained from the formula below.

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

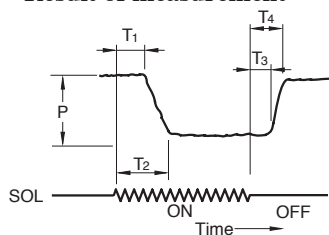
## Changeover Time

Changeover time, T<sub>2</sub> and T<sub>4</sub>, 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**

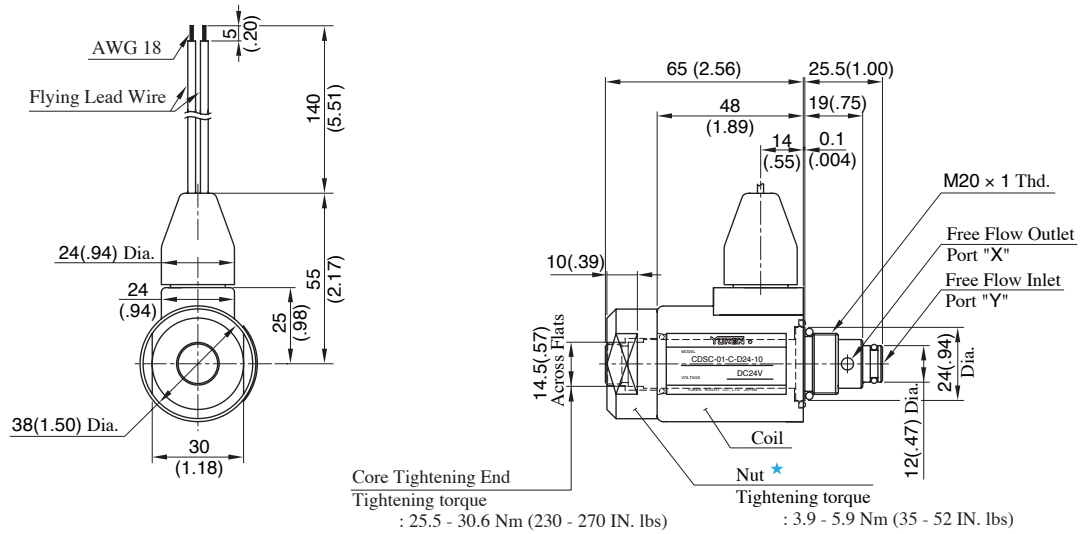


- **Result of measurement**



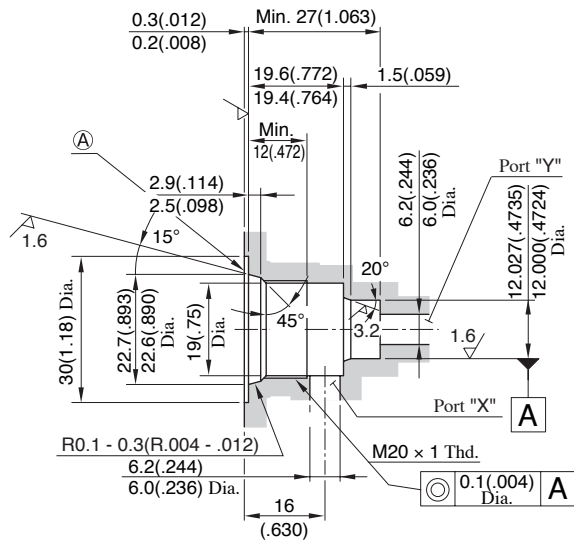
| Model Number | Solenoid Types  | Condition                 |                              | Shifting time (ms)   |          |                       |          |
|--------------|-----------------|---------------------------|------------------------------|----------------------|----------|-----------------------|----------|
|              |                 | Pressure "P"<br>MPa (PSI) | Flow Rate<br>L/min (U.S.GPM) | SOL "ON"(Open→Close) |          | SOL "OFF"(Open→Close) |          |
| CDSC-01      | DC              | 10 (1450)                 | 15 (4.0)                     | T1                   | T2 (ex.) | T3                    | T4 (ex.) |
|              |                 | 21 (3050)                 | 15 (4.0)                     | 21.4                 | 44.0     | 29.0                  | 38.4     |
| 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.

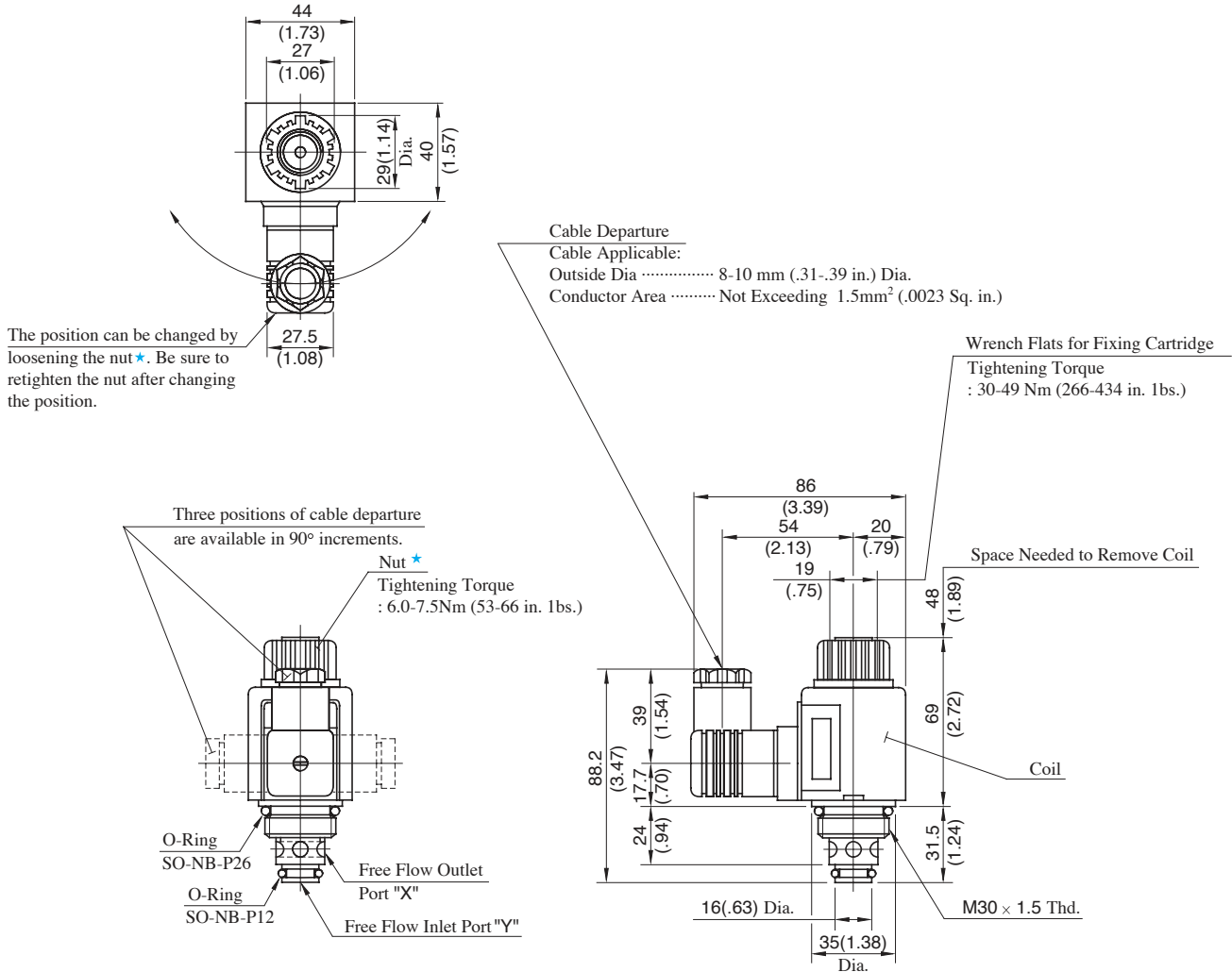
How to Mount

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 (A) surface in the left drawing).
3. Attach the coil and secure it with a nut.

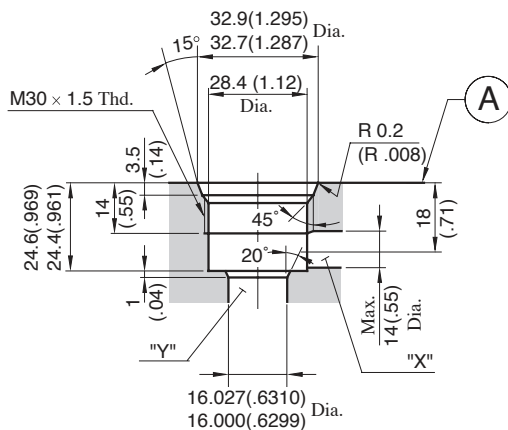
CDSC-03-C-A\*-21/2190

## 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 (A 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.

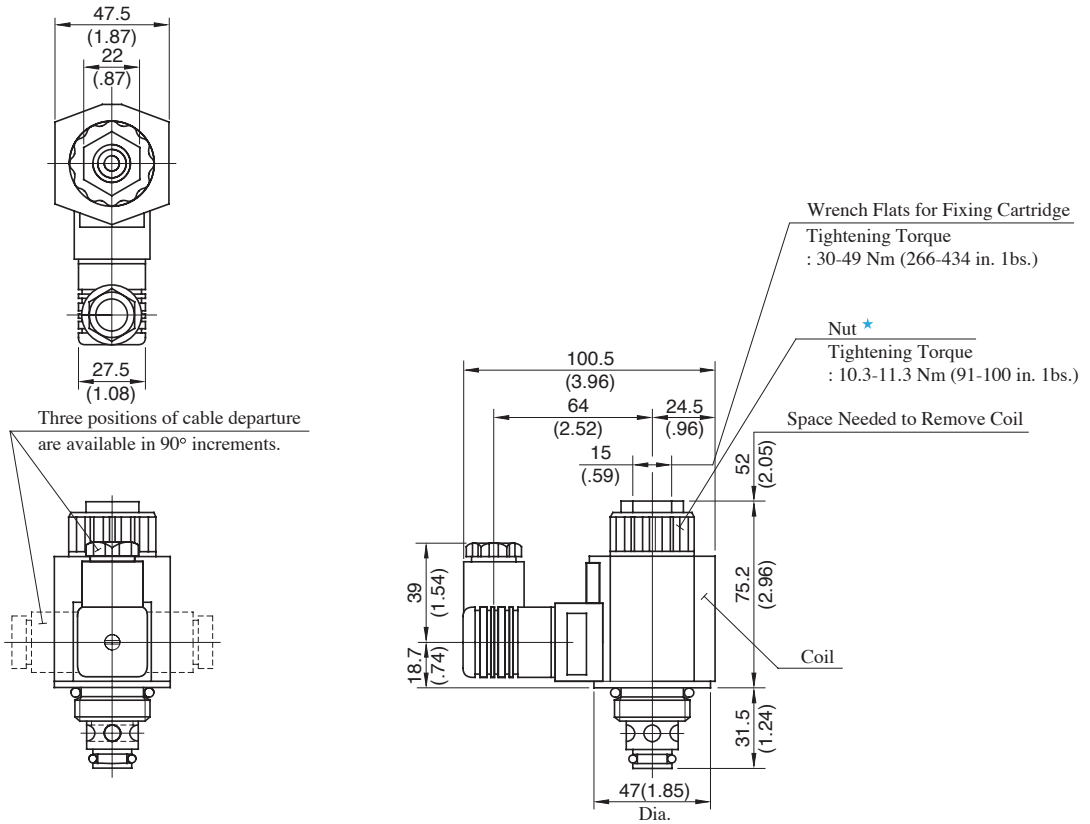
E



Solenoid Operated Poppet Type Two-Way Valves

CDSC-03-C-D\*-21/2190

Models with DC Solenoids

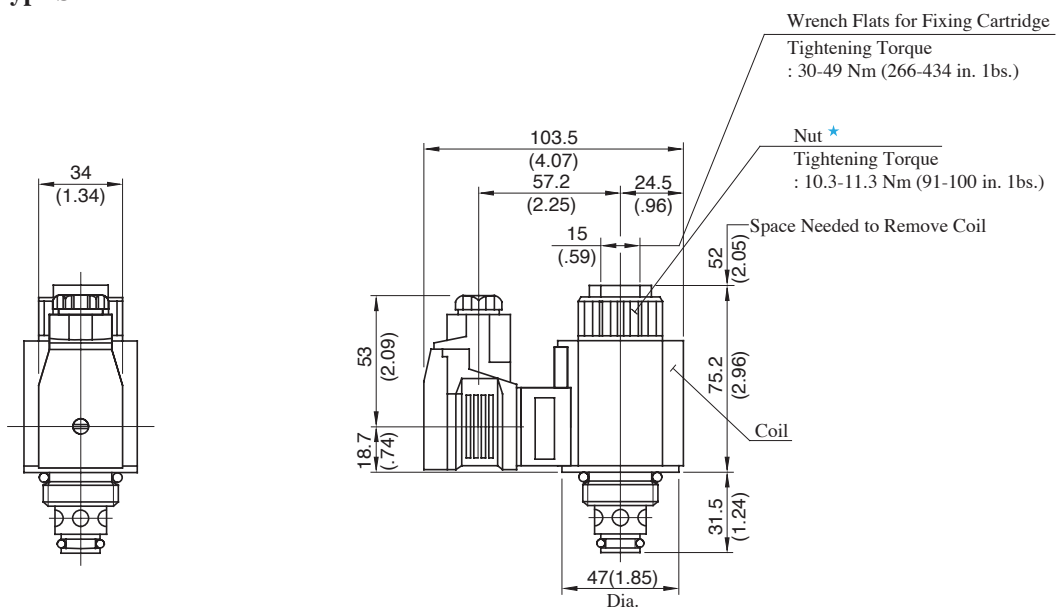


For other dimensions, refer to the "Models with AC Solenoids".

DIMENSIONS IN  
MILLIMETRES (INCHES)

CDSC-03-C-R\*-21/2190

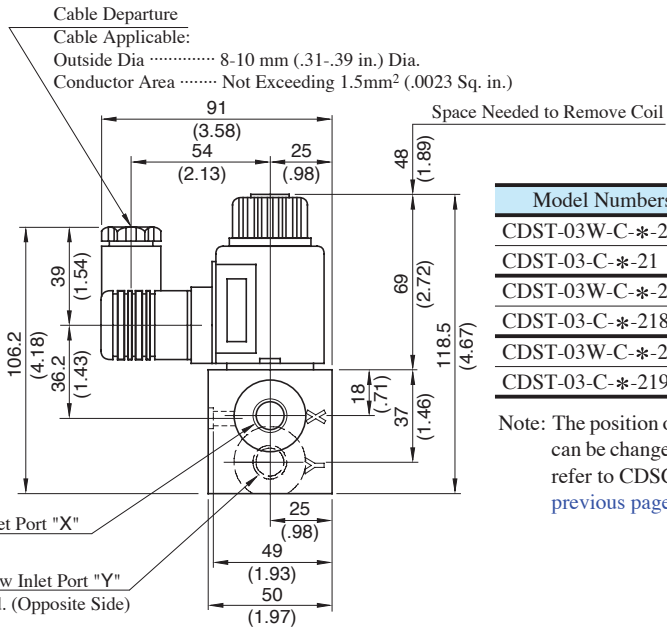
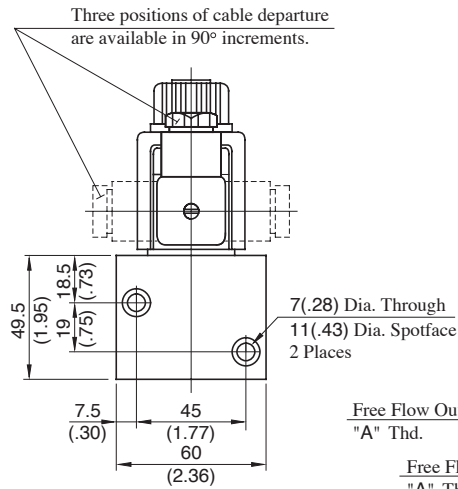
Models with R Type Solenoids



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

### CDST-03, 03W-C-\* -21/2180/2190

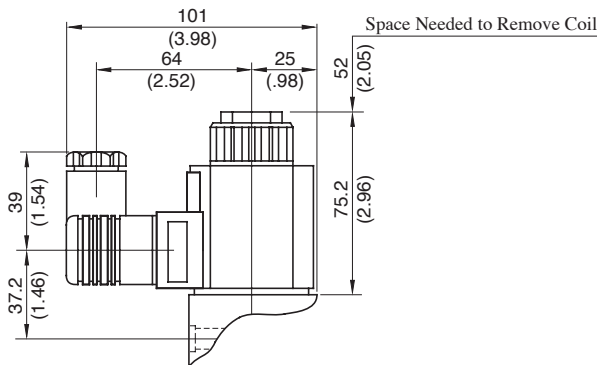
#### Models with AC Solenoids



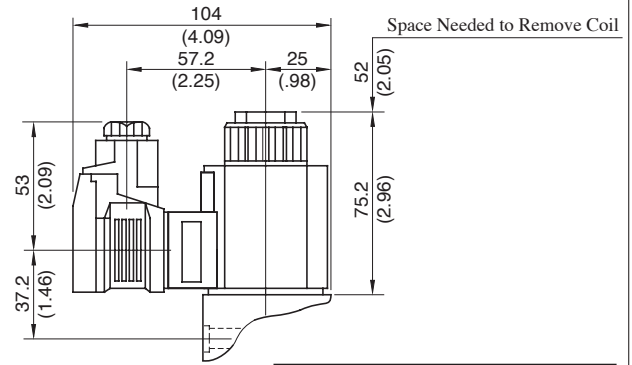
| Model Numbers      | "A" Thd.  |
|--------------------|-----------|
| CDST-03W-C-* -21   | Rc 1/4    |
| CDST-03-C-* -21    | Rc 3/8    |
| CDST-03W-C-* -2180 | 1/4 BSP.F |
| CDST-03-C-* -2180  | 3/8 BSP.F |
| CDST-03W-C-* -2190 | 1/4 NPT   |
| CDST-03-C-* -2190  | 3/8 NPT   |

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

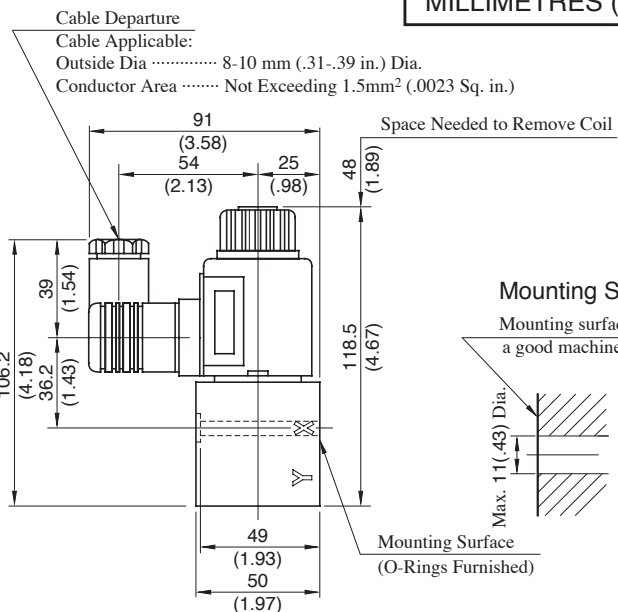
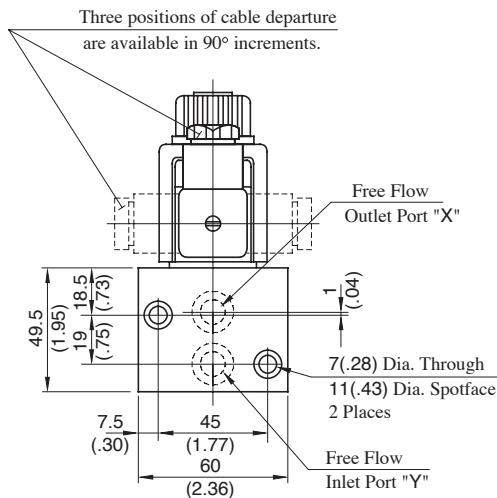


For other dimensions, refer to the "Models with AC Solenoids".

**DIMENSIONS IN MILLIMETRES (INCHES)**

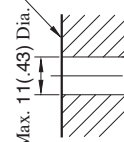
### CDSG-03-C-\* -21/2190

#### Models with AC Solenoids



#### Mounting Surface

Mounting surface should have a good machined finish.

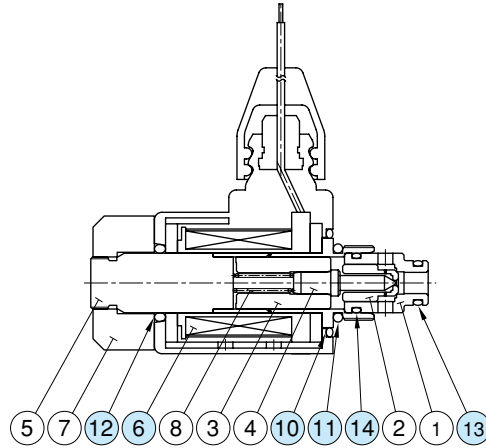


Note 1: For models with DC solenoids and models with R type solenoids, refer to CDST-03, 03W.

Note 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    |                  |

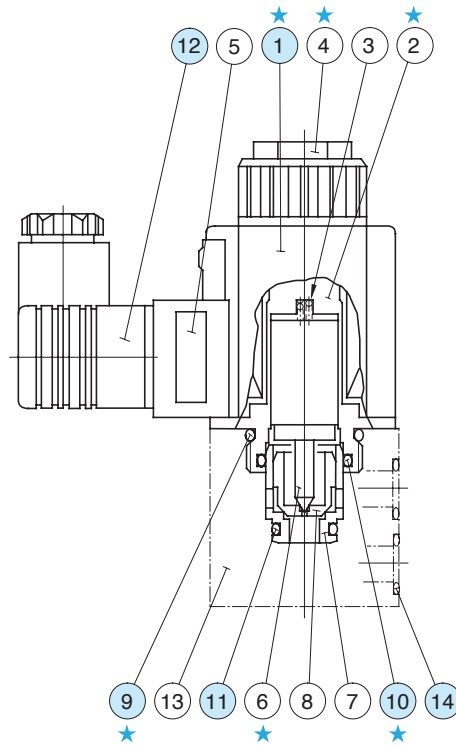
Note: When ordering the seals, please specify the seal kit number.

## 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

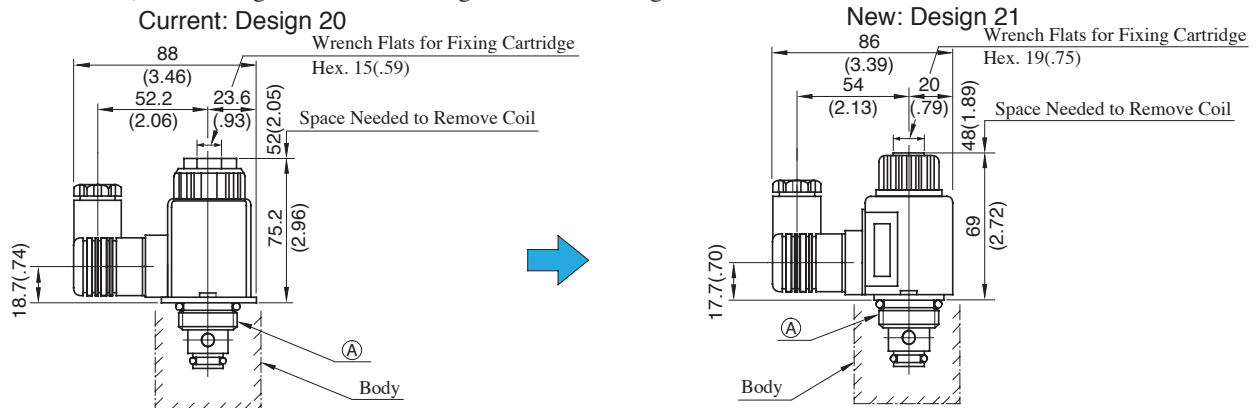
There are changes in the inrush current, holding current and power as shown below. No other changes.

| 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

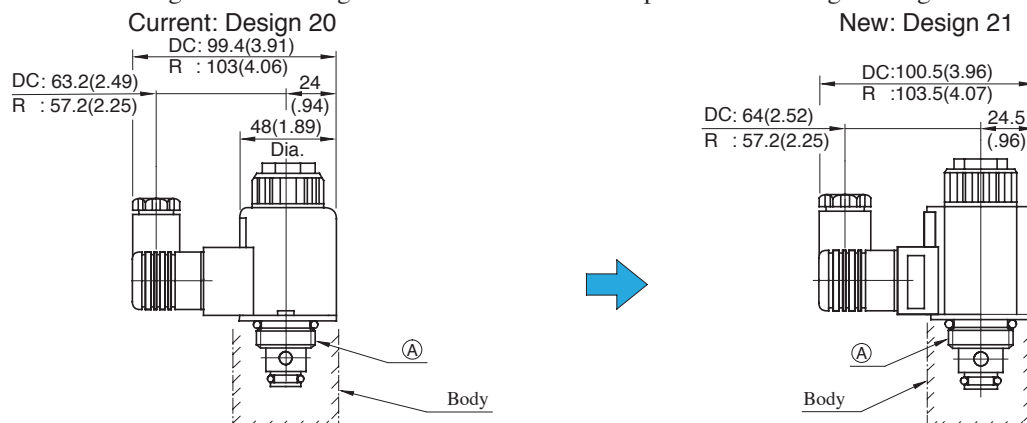
### ● AC Solenoids

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.



### ● 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.

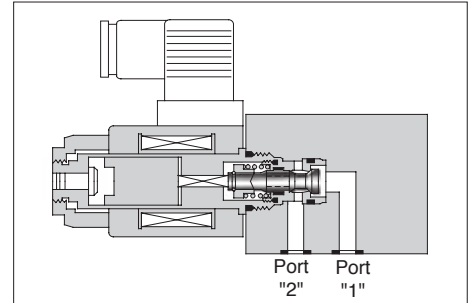
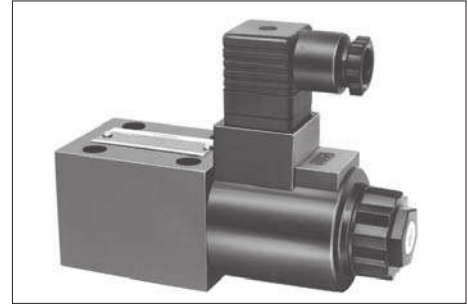


Note: The above drawings give illustrations for the cartridge type. The dimension (A) at the mounting section remains unchanged. In case of the Thread Connection Type and Gasket Mounting Type, a body is mounted to the hatched section. The dimensions of the body remain unchanged.

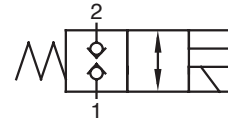
## Shut-off Type Solenoid Operated Directional Valves

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

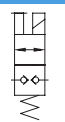
| Model Numbers                               | Max. Flow<br>L/min<br>(U.S.GPM) <sup>★1</sup> | Max. Operating Pressure |                    |             | Max.<br>Changeover<br>Frequency<br>min <sup>-1</sup><br>(Cycles/Min) | Internal<br>leakage<br>cm <sup>3</sup> /min<br>(cu.in./min) | Approx.<br>Mass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



## 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                                                                               |
| <b>F:</b><br>Special Seals for Phosphate Ester Type Fluids (Omit if not required) | <b>DSP:</b><br>Shut-Off Type Solenoid Operated Directional Valves | <b>C:</b><br>Cartridge Type<br><b>G:</b><br>Sub-plate Mounting | <b>01</b>  | <b>C:</b><br>Normally Closed | AC<br><b>A 100</b><br><b>A 200</b> | <b>20</b>     | <b>None:</b> Japanese Std. "JIS" & European Design Std.<br><b>90:</b> N. American Design Std. |
|                                                                                   |                                                                   |                                                                | <b>03</b>  |                              | DC<br><b>D12</b><br><b>D24</b>     | <b>10</b>     |                                                                                               |

## Solenoid Ratings

| Electric Source                | Coil Type | Frequency (Hz) | Voltage (V)   |                   | Current & Power at Rated Voltage |      |             |      |           |    |
|--------------------------------|-----------|----------------|---------------|-------------------|----------------------------------|------|-------------|------|-----------|----|
|                                |           |                | Source Rating | Serviceable Range | Inrush (A) <sup>★1</sup>         |      | 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 <sup>★2</sup><br>(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<br>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.

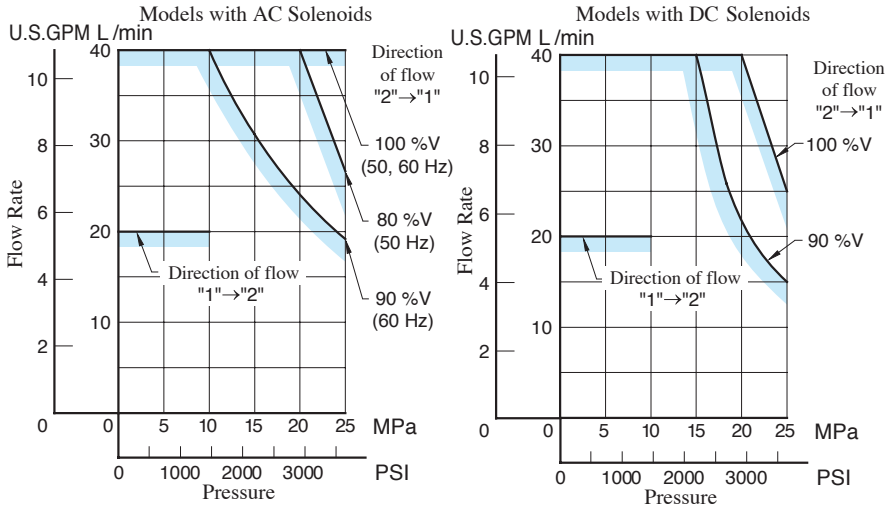
| Valve Model Numbers | Descriptions                                         | Soc. Hd. Cap Screw (4 pcs.) | Tightening Torque               |
|---------------------|------------------------------------------------------|-----------------------------|---------------------------------|
| DSPG-01             | Japanese Standard "JIS" and European Design Standard | M5 × 50 Lg.                 | 5-7 Nm<br>(44 -62 in. lbs.)     |
|                     | 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<br>(106 -133 in. lbs.) |
|                     | N. American Design Standard                          | 1/4-20 UNC × 3-1/4 Lg.      |                                 |

Typical Performance Characteristics at Viscosity 30 mm<sup>2</sup>/s (141 SSU) [ISO VG 46 oils, 50°C(122°F)]

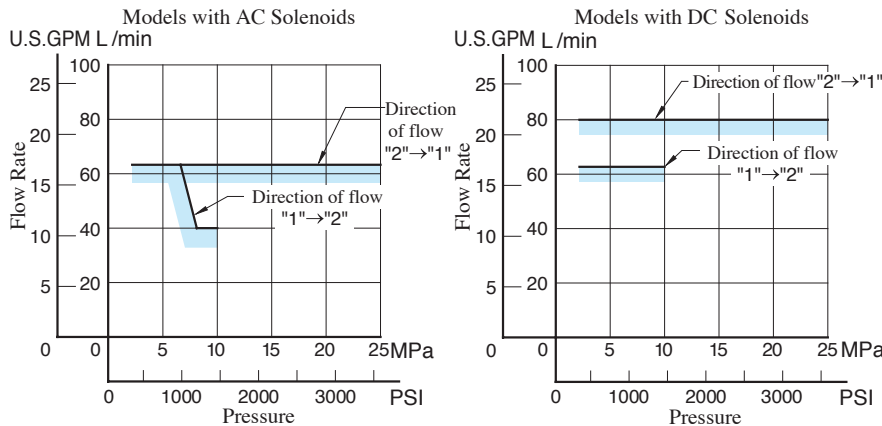
## Maximum Flow Rate

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

### DSPC/DSPG-01



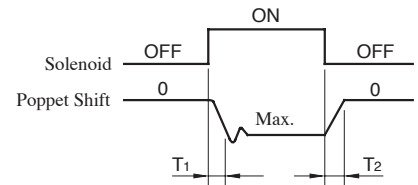
### DSPC/DSPG-03



## Typical Changeover Time

### [Test Conditions]

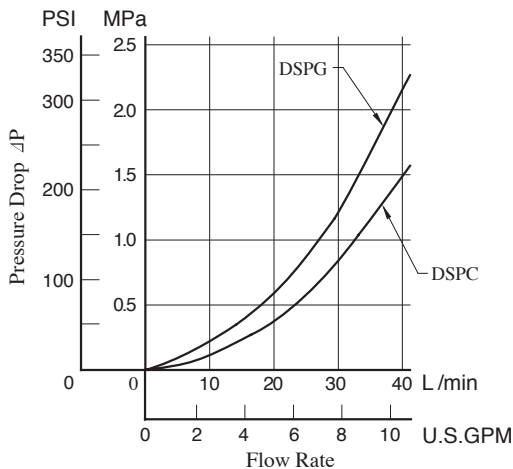
- Pressure: 15 MPa (2180 PSI)
- Flow Rate: (01) 30 L/min (7.9 U.S.GPM)  
(03) 63 L/min (16.6 U.S.GPM)
- Viscosity: 30 mm<sup>2</sup>/s (141 SSU)
- Voltage: 100 % V  
(After coil temperature rise and saturates)
- Direction of Flow: "2" → "1"



| Model Numbers     | Shifting Time (ms) |                |
|-------------------|--------------------|----------------|
|                   | T <sub>1</sub>     | T <sub>2</sub> |
| 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

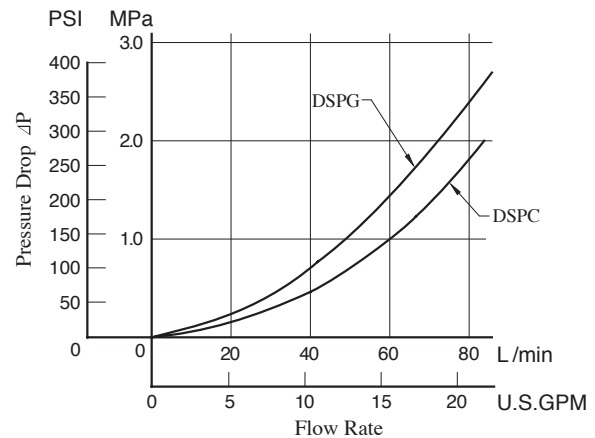
### DSPC/DSPG-01



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

| Viscosity | mm <sup>2</sup> /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.

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

E



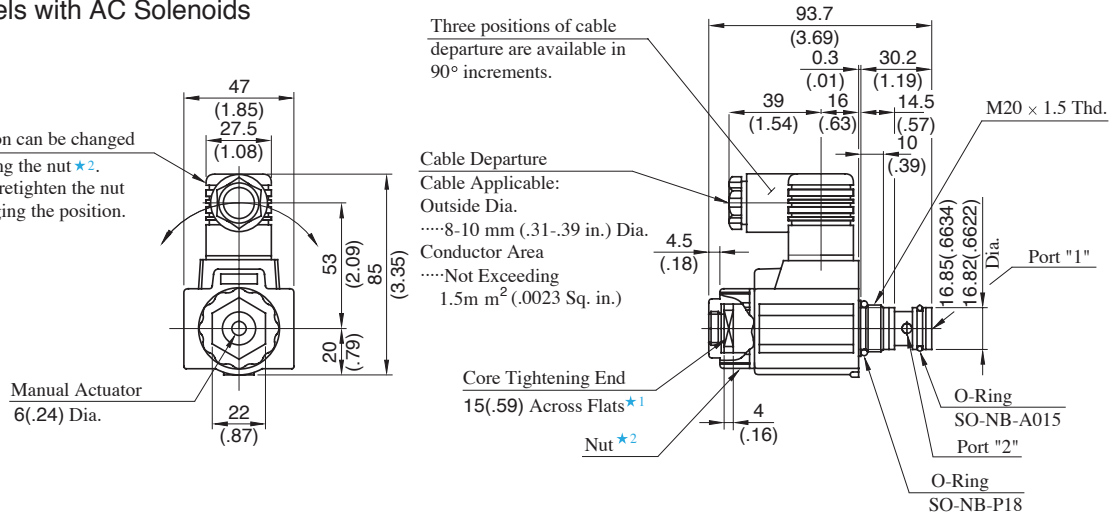
Shut-off Type  
Solenoid Operated Directional Valves

DSPC-01-C-\*20/2090

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

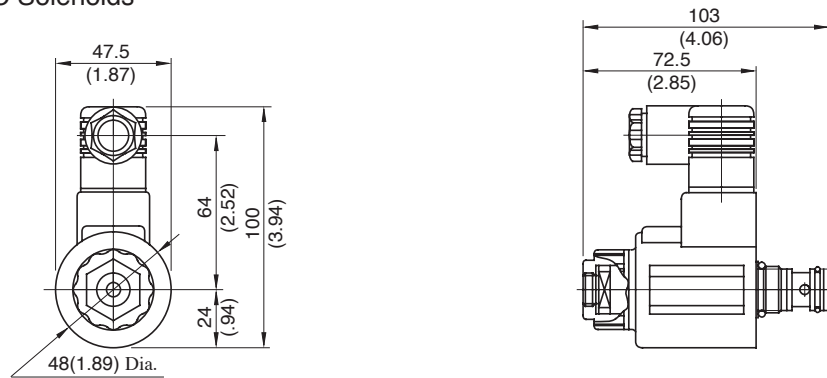
● Models with AC Solenoids

The position can be changed by loosening the nut ★2. Be sure to retighten the nut after changing the position.



- ★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.)

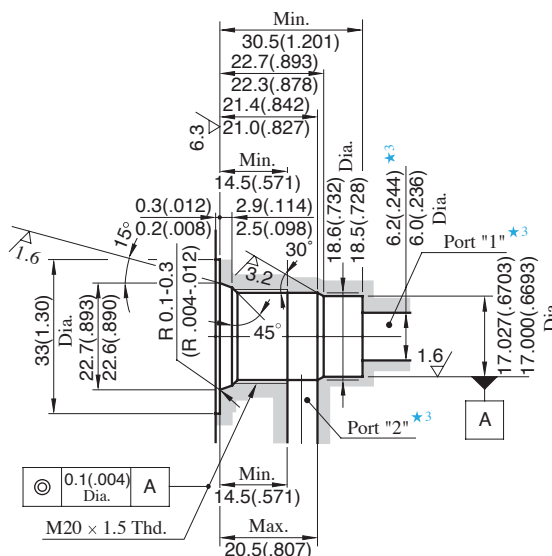
● Models with DC Solenoids



● 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.

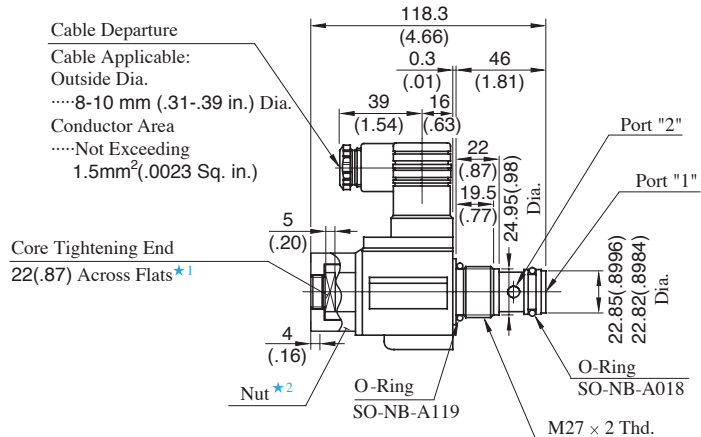
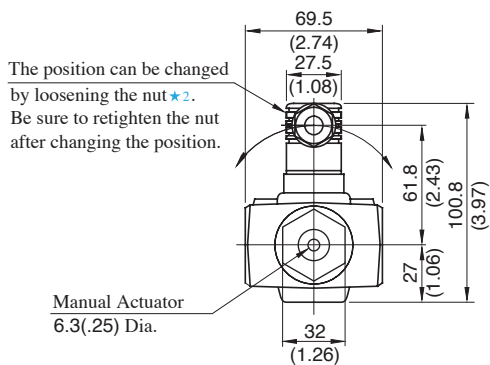
1. Loosen the coil fastening the nut and remove the coil.
2. Making use of the core tightening end, screw the cartridge in.
3. Attach the coil and fix it with the nut.

- ★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

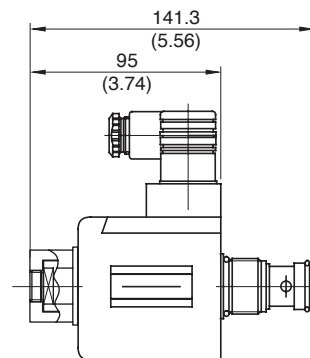
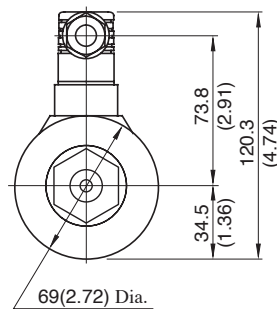
## Models with AC Solenoids



★1. Tightening torque for iron core assembly: 110-140 Nm (970-1240 IN. lbs.)

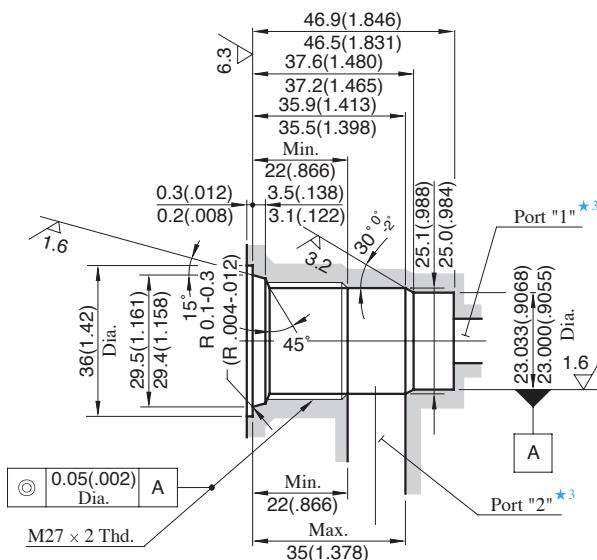
★2. Tightening torque for nuts: 8.5-10.5 Nm (75-93 IN. lbs.)

## 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.

E

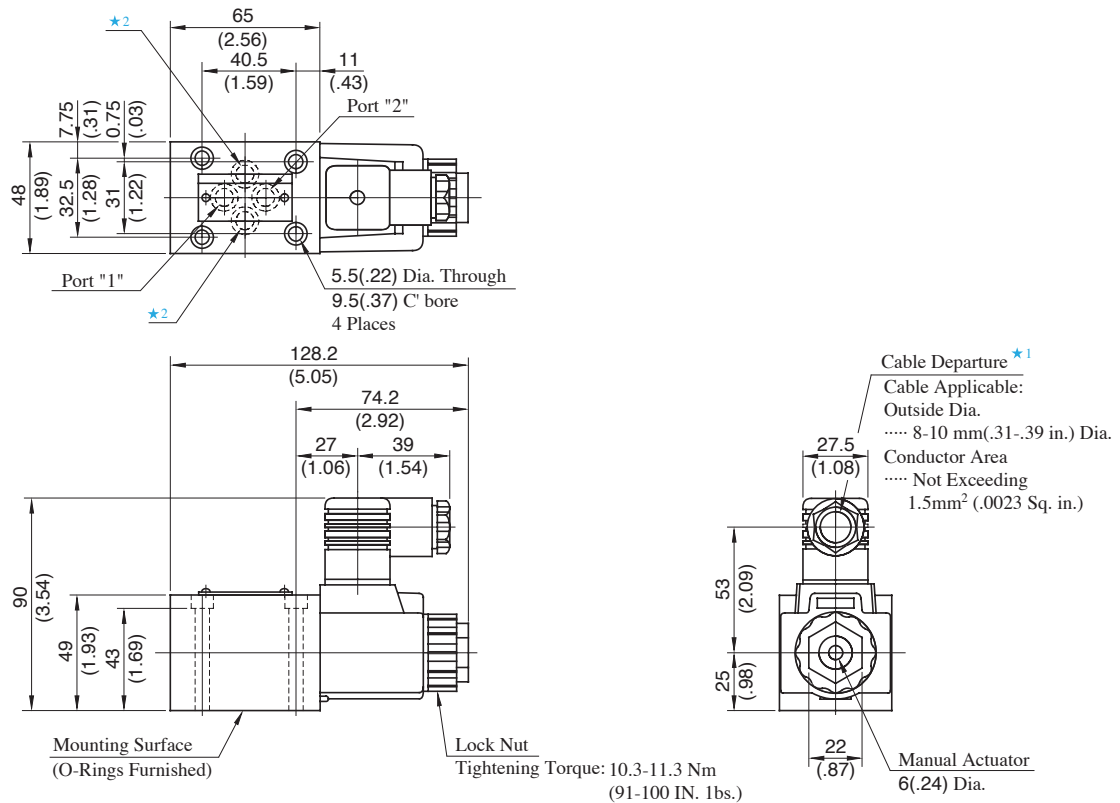


Shut-off Type  
Solenoid Operated Directional Valves

DSPG-01-C-\* -20/2090

Models with AC Solenoids

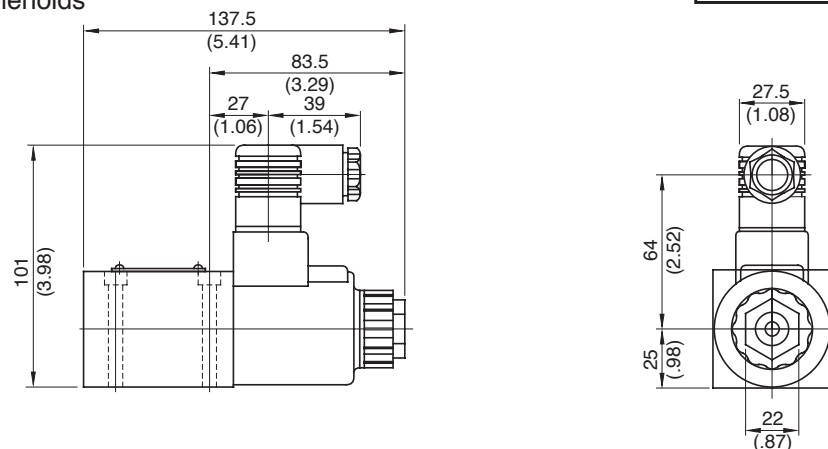
Mounting Surface: ISO 4401-AB-03-4-A



- ★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".

DSPG-03-C-\*/-10/1090

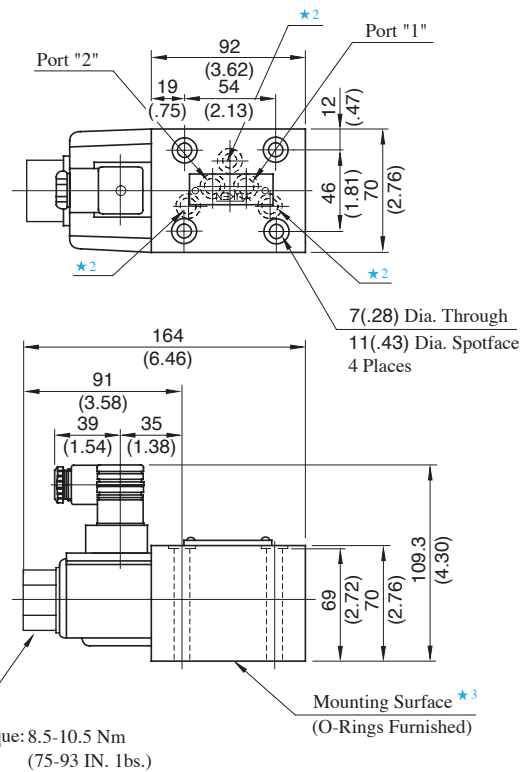
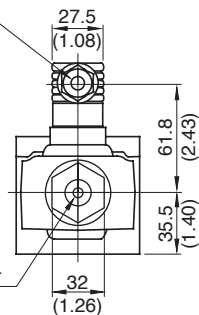
Models with AC Solenoids

Mounting Surface: ISO 4401-AC-05-4-A

Cable Departure ★1

Cable Applicable:  
Outside Dia.  
.....8-10 mm (.31-.39 in.) Dia.  
Conductor Area  
.....Not Exceeding  
1.5mm<sup>2</sup> (.0023 Sq. in.)

Manual Actuator  
6.3(.25) Dia.

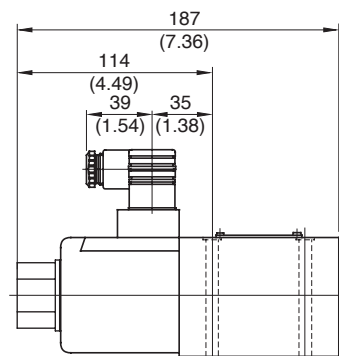
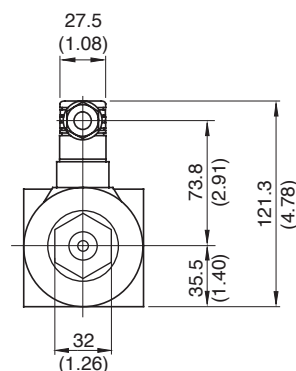


Lock Nut  
Tightening Torque: 8.5-10.5 Nm  
(75-93 IN. lbs.)

- ★1. The location and the position of the cable departure can be changed. For details, see [the cartridge type](#).
- ★2. These ports (3) are not used. In addition, the body has the O-ring grooves and O-rings are included in the body.
- ★3. The dimensions of mounting surface conform to ISO 4401-AC-05-4-A. Ports A and B are used as port 2 and port 1 respectively.
- ★4. O-rings for each port: SO-NB-A014

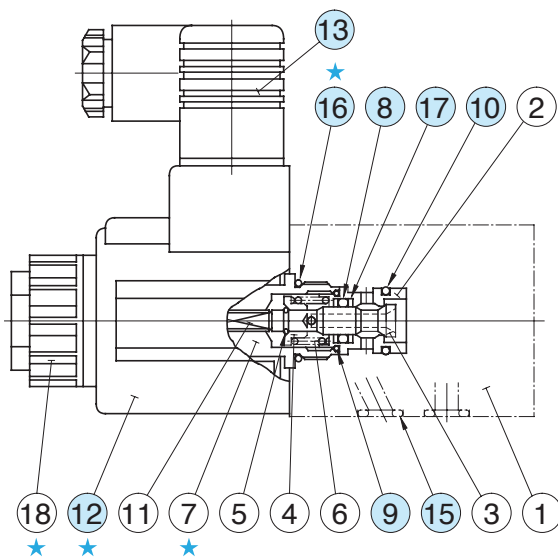
DIMENSIONS IN  
MILLIMETRES (INCHES)

Models with DC Solenoids



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

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



Solenoid assembly is composed of the parts marked with ★.

● List of Seals

| Item | Name of Parts | DSP*-01         |      | DSP*-03         |      | Remarks         |
|------|---------------|-----------------|------|-----------------|------|-----------------|
|      |               | Part Numbers    | Qty. | Part Numbers    | Qty. |                 |
| 8    | O-Ring        | SO-NA-P8        | 1    | SO-NA-P12       | 1    | ————            |
| 9    | O-Ring        | SO-NB-A014      | 1    | SO-NB-A017      | 1    | ————            |
| 10   | O-Ring        | SO-NB-A015      | 1    | SO-NB-A018      | 1    | ————            |
| 15   | O-Ring        | SO-NB-P9        | 4    | SO-NB-A014      | 5    | ————            |
| 16   | O-Ring        | SO-NB-P18       | 1    | SO-NB-A119      | 1    | only for "DSPG" |
| 17   | Back Up Ring  | 5701-VK413831-9 | 2    | 2691-VK418550-0 | 2    | ————            |

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

● List of Seal Kits

| Valve Model Numbers | Seal Kit Numbers |
|---------------------|------------------|
| DSPC-01-C-*-20*     | KS-DSPC-01-C-10  |
| DSPC-03-C-*-10*     | KS-DSPC-03-C-10  |
| DSPG-01-C-*-20*     | KS-DSPG-01-C-10  |
| DSPG-03-C-*-10*     | KS-DSPG-03-C-10  |

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

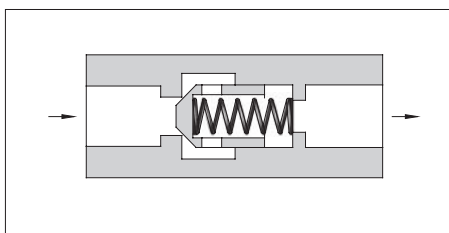
| Valve Model No.             | Solenoid Ass'y No. | ⑫ Coil No.     | ⑬ Connector No. |
|-----------------------------|--------------------|----------------|-----------------|
| DSPC/DSPG-01-C-A100-20/2090 | SA1-100-N-6055     | C-SA1-100-N-60 | GDM-211-B-11    |
| DSPC/DSPG-01-C-A200-20/2090 | SA1-200-N-6055     | C-SA1-200-N-60 |                 |
| DSPC/DSPG-01-C-D12-20/2090  | SD1-12-N-6055      | C-SD1-12-N-60  |                 |
| DSPC/DSPG-01-C-D24-20/2090  | SD1-24-N-6055      | C-SD1-24-N-60  |                 |
| DSPC/DSPG-03-C-A100-10/1090 | SA3-100-N-5130     | C-SA3-100-N-50 |                 |
| DSPC/DSPG-03-C-A200-10/1090 | SA3-200-N-5130     | C-SA3-200-N-50 |                 |
| DSPC/DSPG-03-C-D12-10/1090  | SD3-12-N-5130      | C-SD3-12-N-50  |                 |
| DSPC/DSPG-03-C-D24-10/1090  | SD3-24-N-5130      | C-SD3-24-N-50  |                 |

# Check/Pilot Controlled Check Valves

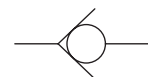
| Valve Type                  | Graphic Symbols                                                                     | Max. Operating Pressure<br>MPa (PSI) | U.S.GPM                                                        |    |   |    |    |    |     |     |     |      |      |      | Page |
|-----------------------------|-------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------------------------------|----|---|----|----|----|-----|-----|-----|------|------|------|------|
|                             |                                                                                     |                                      | .3                                                             | .5 | 1 | 2  | 5  | 10 | 20  | 50  | 100 | 200  | 500  | 1000 |      |
|                             |                                                                                     |                                      | 1                                                              | 2  | 5 | 10 | 20 | 50 | 100 | 200 | 500 | 1000 | 2000 | 5000 |      |
|                             |                                                                                     |                                      | L/min                                                          |    |   |    |    |    |     |     |     |      |      |      |      |
| Check Valves                |  | 25<br>(3630)                         | In-Line (CIT) 02 03 06 10                                      |    |   |    |    |    |     |     |     |      |      |      | 498  |
|                             |                                                                                     |                                      | Right Angle (CRT/CRG) 03 06 10                                 |    |   |    |    |    |     |     |     |      |      |      |      |
|                             |                                                                                     |                                      | Right Angle, Flanged Connection (CRF) 10 16 24                 |    |   |    |    |    |     |     |     |      |      |      |      |
| Pilot Operated Check Valves |  | 25<br>(3630)                         | Threaded Connection(CP*T)<br>Sub-plate Mounting(CP*G) 03 06 10 |    |   |    |    |    |     |     |     |      |      |      | 504  |
|                             |                                                                                     |                                      | Flanged Connection(CP*F) 10 16                                 |    |   |    |    |    |     |     |     |      |      |      |      |

## In-Line Check Valves

These valves allow free flow in one direction and prevent flow in the reverse direction. Cracking pressure specified is the pressure required to open the valve and allow free flow.



Graphic Symbol



### Specifications

| Model Numbers         | Rated Flow*<br>L/min (U.S.GPM) | Max. Operating Pres.<br>MPa (PSI) | Cracking Pres.<br>MPa (PSI)       | Approx. Mass<br>kg (lbs.) |
|-----------------------|--------------------------------|-----------------------------------|-----------------------------------|---------------------------|
| CIT-02-*-50/5080/5090 | 16 (4.23)                      | 25<br>(3630)                      | 0.04 (6)<br>0.35 (50)<br>0.5 (70) | 0.1 (.22)                 |
| CIT-03-*-50/5080/5090 | 30 (7.93)                      |                                   |                                   | 0.3 (.66)                 |
| CIT-06-*-50/5080/5090 | 85 (22.5)                      |                                   |                                   | 0.8 (1.8)                 |
| CIT-10-*-50/5080/5090 | 230 (60.8)                     |                                   |                                   | 2.3 (5.1)                 |

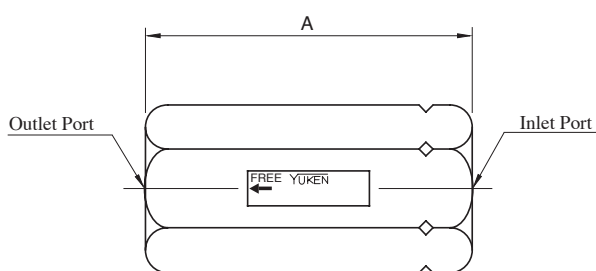
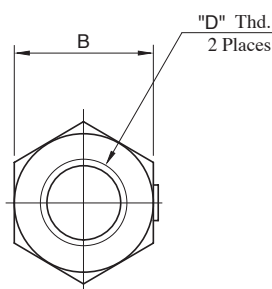
★ Rated flow is the approximate flow rate, when there is a free flow pressure drop of maximum 0.3 MPa (44 PSI), the fluid has a specific gravity of 0.85 and a kinematic viscosity of 20 mm<sup>2</sup>/s (98 SSU), and the cracking pressure is 0.04 MPa (6 PSI).

### Model Number Designation

| CI                                | T                                | -03        | -04                                                                | -50           | *                                                                                                         |
|-----------------------------------|----------------------------------|------------|--------------------------------------------------------------------|---------------|-----------------------------------------------------------------------------------------------------------|
| Series Number                     | Type of Connection               | Valve Size | Cracking Pressure MPa (PSI)                                        | Design Number | Design Standards                                                                                          |
| <b>CI:</b><br>In-Line Check Valve | <b>T:</b><br>Threaded Connection | <b>02</b>  | <b>04:</b> 0.04 (6)<br><b>35:</b> 0.35 (50)<br><b>50:</b> 0.5 (70) | <b>50</b>     | <b>None:</b> Japanese Std. "JIS"<br><b>80:</b> European Design Std.<br><b>90:</b> N. American Design Std. |
|                                   |                                  | <b>03</b>  |                                                                    | <b>50</b>     |                                                                                                           |
|                                   |                                  | <b>06</b>  |                                                                    | <b>50</b>     |                                                                                                           |
|                                   |                                  | <b>10</b>  |                                                                    | <b>50</b>     |                                                                                                           |

Note: For In-Line Check Valves, standard type (for petroleum base oils) can be used phosphate ester type fluid.

CIT-02-\*-50/5080/5090  
CIT-03-\*-50/5080/5090  
CIT-06-\*-50/5080/5090  
CIT-10-\*-50/5080/5090



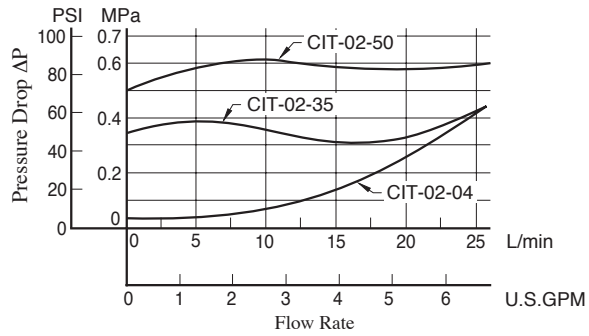
| Model Numbers | mm (Inches) |           | "D" Thd.    |
|---------------|-------------|-----------|-------------|
|               | A           | B         |             |
| CIT-02-*-50   | 58 (2.28)   | 19 (.75)  | Rc 1/4      |
| CIT-02-*-5080 | 65 (2.56)   | 22 (.87)  | 1/4 BSP.F   |
| CIT-02-*-5090 | 58 (2.28)   | 19 (.75)  | 1/4 NPT     |
| CIT-03-*-50   | 76 (2.99)   | 27 (1.06) | Rc 3/8      |
| CIT-03-*-5080 | 83 (3.27)   |           | 3/8 BSP.F   |
| CIT-03-*-5090 | 76 (2.99)   |           | 3/8 NPT     |
| CIT-06-*-50   | 95 (3.74)   | 41 (1.61) | Rc 3/4      |
| CIT-06-*-5080 | 102 (4.02)  |           | 3/4 BSP.F   |
| CIT-06-*-5090 | 95 (3.74)   |           | 3/4 NPT     |
| CIT-10-*-50   | 133 (5.24)  | 60 (2.36) | Rc 1-1/4    |
| CIT-10-*-5080 |             |           | 1-1/4 BSP.F |
| CIT-10-*-5090 |             |           | 1-1/4 NPT   |

DIMENSIONS IN  
MILLIMETRES (INCHES)

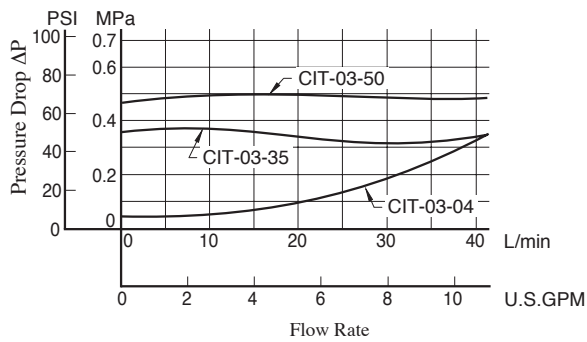
## Pressure Drop

Hydraulic Fluid: Viscosity 30 mm<sup>2</sup>/s (141 SSU), Specific Gravity 0.850

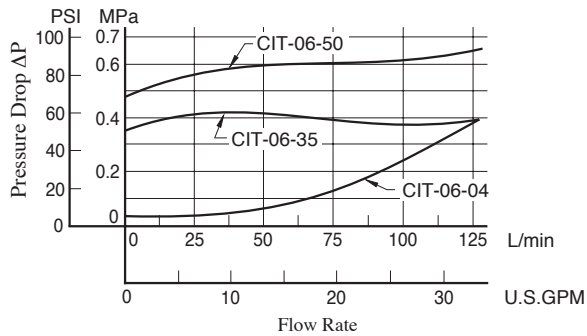
### CIT-02



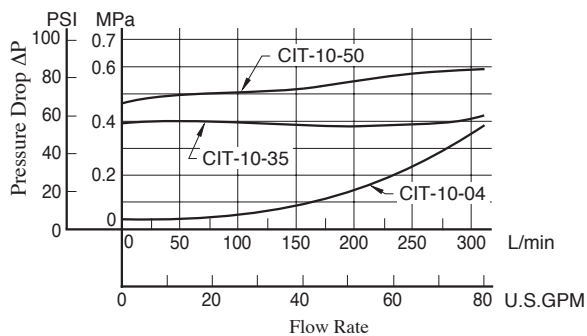
### CIT-03



### CIT-06

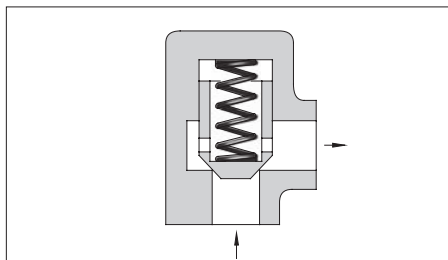


### CIT-10

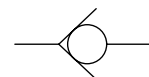


## Right Angle Check Valves

These valves allow free flow in one direction and prevent flow in the reverse direction. Cracking pressure specified is the pressure required to open the valve and allow free flow.



Graphic Symbol



### Specifications

| Type of Connection  | Model Numbers        | Rated Flow*<br>L/min (U.S.GPM) | Max. Operating Pres.<br>MPa (PSI) | Cracking Pres.<br>MPa (PSI) | Approx. Mass<br>kg (lbs.) |
|---------------------|----------------------|--------------------------------|-----------------------------------|-----------------------------|---------------------------|
| Threaded Connection | CRT-03-*50/5080/5090 | 40 (10.6)                      | 25 (3630)                         | 0.04 (6)                    | 0.9 (2.0)                 |
|                     | CRT-06-*50/5080/5090 | 125 (33)                       |                                   | 0.35 (50)                   | 1.7 (3.7)                 |
|                     | CRT-10-*50/5080/5090 | 250 (66)                       |                                   | 0.5 (70)                    | 5.6 (12.3)                |
| Sub-plate Mounting  | CRG-03-*50/5090      | 40 (10.6)                      | 25 (3630)                         | 0.04 (6)                    | 1.7 (3.7)                 |
|                     | CRG-06-*50/5090      | 125 (33)                       |                                   | 0.35 (50)                   | 2.9 (6.4)                 |
|                     | CRG-10-*50/5090      | 250 (66)                       |                                   | 0.5 (70)                    | 5.5 (12.1)                |

\* Rated flow is the approximate flow rate, when there is a free flow pressure drop of maximum 0.3 MPa (44 PSI), the fluid has a specific gravity of 0.85 and a kinematic viscosity of 20 mm<sup>2</sup>/s (98 SSU), and the cracking pressure is 0.04 MPa (6 PSI).

### Model Number Designation

| F-                                                                                | CR                                    | T                                | -03        | -04                         | -50           | *                                                                                                         |
|-----------------------------------------------------------------------------------|---------------------------------------|----------------------------------|------------|-----------------------------|---------------|-----------------------------------------------------------------------------------------------------------|
| Special Seals                                                                     | Series Number                         | Type of Connection               | Valve Size | Cracking Pressure MPa (PSI) | Design Number | Design Standards                                                                                          |
| <b>F:</b><br>Special seals for phosphate ester type fluids (Omit if not required) | <b>CR:</b><br>Right Angle Check Valve | <b>T:</b><br>Threaded Connection | <b>03</b>  | <b>04:</b> 0.04 (6)         | <b>50</b>     | <b>None:</b> Japanese Std. "JIS"<br><b>80:</b> European Design Std.<br><b>90:</b> N. American Design Std. |
|                                                                                   |                                       |                                  | <b>06</b>  | <b>35:</b> 0.35 (50)        | <b>50</b>     |                                                                                                           |
|                                                                                   |                                       |                                  | <b>10</b>  | <b>50:</b> 0.5 (70)         | <b>50</b>     |                                                                                                           |
|                                                                                   |                                       | <b>G:</b><br>Sub-plate Mounting  | <b>03</b>  | <b>04:</b> 0.04 (6)         | <b>50</b>     | <b>None:</b> Japanese Std. "JIS"<br>& European Design Std.<br><b>90:</b> N. American Design Std.          |
|                                                                                   |                                       |                                  | <b>06</b>  | <b>35:</b> 0.35 (50)        | <b>50</b>     |                                                                                                           |
|                                                                                   |                                       |                                  | <b>10</b>  | <b>50:</b> 0.5 (70)         | <b>50</b>     |                                                                                                           |

### Sub-plate

| Valve Model Numbers | Japanese Standard "JIS" |             | European Design Standard |             | N.American Design Standard |             | Approx. Mass<br>kg (lbs.) |
|---------------------|-------------------------|-------------|--------------------------|-------------|----------------------------|-------------|---------------------------|
|                     | Sub-plate Model Numbers | Thread Size | Sub-plate Model Numbers  | Thread Size | Sub-plate Model Numbers    | Thread Size |                           |
| CRG-03              | CRGM-03-50              | Rc 3/8      | CRGM-03-5080             | 3/8 BSP.F   | CRGM-03-5090               | 3/8 NPT     | 1.6 (3.5)                 |
|                     | CRGM-03X-50             | Rc 1/2      | CRGM-03X-5080            | 1/2 BSP.F   | CRGM-03X-5090              | 1/2 NPT     | 1.6 (3.5)                 |
| CRG-06              | CRGM-06-50              | Rc 3/4      | CRGM-06-5080             | 3/4 BSP.F   | CRGM-06-5090               | 3/4 NPT     | 2.4 (5.3)                 |
|                     | CRGM-06X-50             | Rc 1        | CRGM-06X-5080            | 1 BSP.F     | CRGM-06X-5090              | 1 NPT       | 3.0 (6.6)                 |
| CRG-10              | CRGM-10-50              | Rc 1-1/4    | CRGM-10-5080             | 1-1/4 BSP.F | CRGM-10-5090               | 1-1/4 NPT   | 4.8 (10.6)                |
|                     | CRGM-10X-50             | Rc 1-1/2    | CRGM-10X-5080            | 1-1/2 BSP.F | CRGM-10X-5090              | 1-1/2 NPT   | 5.7 (12.6)                |

● 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.

Yuken can offer flanged connection valves described below.

For details, contact us.

| Model No.   | Rated Flow<br>L/min (U.S.GPM) | Max. Operating Pressure<br>MPa (PSI) |
|-------------|-------------------------------|--------------------------------------|
| CRF-10-*50* | 300 (79.3)                    | 25 (3630)                            |
| CRF-16-*50* | 600 (159)                     |                                      |
| CRF-24-*50* | 1300 (343)                    |                                      |

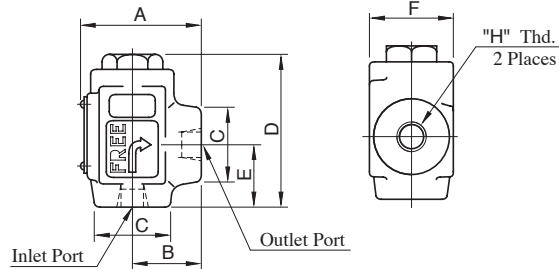
### Mounting Bolts

Socket head cap screws in the table below are included.

| Valve Model Numbers | Socket Head Cap Screw                               |                            | Qty. |
|---------------------|-----------------------------------------------------|----------------------------|------|
|                     | Japanese Standard "JIS"<br>European Design Standard | N.American Design Standard |      |
| CRG-03              | M10 × 45 Lg.                                        | 3/8-16 UNC × 1-3/4 Lg.     | 4    |
| CRG-06              | M10 × 50 Lg.                                        | 3/8-16 UNC × 2 Lg.         | 4    |
| CRG-10              | M10 × 55 Lg.                                        | 3/8-16 UNC × 2-1/4 Lg.     | 6    |

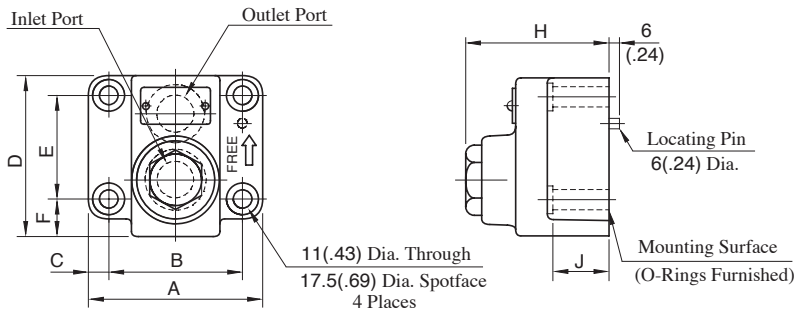
CRT-03-\*50/5080/5090  
 CRT-06-\*50/5080/5090  
 CRT-10-\*50/5080/5090

**DIMENSIONS IN  
 MILLIMETRES (INCHES)**



| Model Numbers | Dimensions mm (Inches) |        |                |        |        |        | "H" Thd.    |
|---------------|------------------------|--------|----------------|--------|--------|--------|-------------|
|               | A                      | B      | C              | D      | E      | F      |             |
| CRT-03-*50    | 62                     | 36     | 38             | 80.5   | 33     | 44     | Rc 3/8      |
| CRT-03-*5080  | (2.44)                 | (1.42) | (1.50)<br>Dia  | (3.17) | (1.30) | (1.73) | 3/8 BSP.F   |
| CRT-03-*5090  |                        |        |                |        |        |        | 3/8 NPT     |
| CRT-06-*50    | 74                     | 45     | 54             | 104.5  | 49     | 54     | Rc 3/4      |
| CRT-06-*5080  | (2.91)                 | (1.77) | (2.13)<br>Dia. | (4.11) | (1.93) | (2.13) | 3/4 BSP.F   |
| CRT-06-*5090  |                        |        |                |        |        |        | 3/4 NPT     |
| CRT-10-*50    | 107                    | 65     | 80             | 130    | 65     | 80     | Rc 1-1/4    |
| CRT-10-*5080  | (4.21)                 | (2.56) | (3.15)<br>SQ.  | (5.12) | (2.56) | (3.15) | 1-1/4 BSP.F |
| CRT-10-*5090  |                        |        |                |        |        |        | 1-1/4 NPT   |

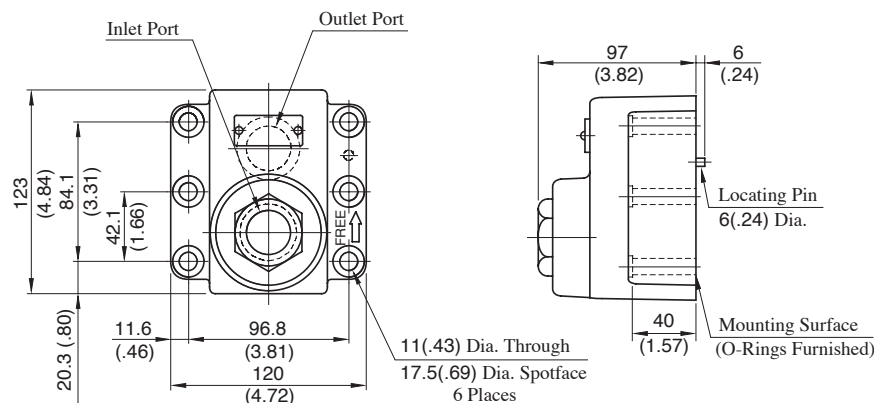
CRG-03-\*50/5090  
 CRG-06-\*50/5090



| Model Numbers | Dimensions mm (Inches) |                |               |              |                |               |                |              | Mounting Surface   |
|---------------|------------------------|----------------|---------------|--------------|----------------|---------------|----------------|--------------|--------------------|
|               | A                      | B              | C             | D            | E              | F             | H              | J            |                    |
| CRG-03        | 90<br>(3.54)           | 66.7<br>(2.63) | 11.7<br>(.46) | 72<br>(2.83) | 42.9<br>(1.69) | 17.5<br>(.69) | 72.5<br>(2.85) | 30<br>(1.18) | ISO 5781-AG-06-2-A |
| CRG-06        | 102<br>(4.02)          | 79.4<br>(3.13) | 11.3<br>(.44) | 93<br>(3.66) | 60.3<br>(2.37) | 21.4<br>(.84) | 84.5<br>(3.33) | 35<br>(1.38) | ISO 5781-AH-08-2-A |

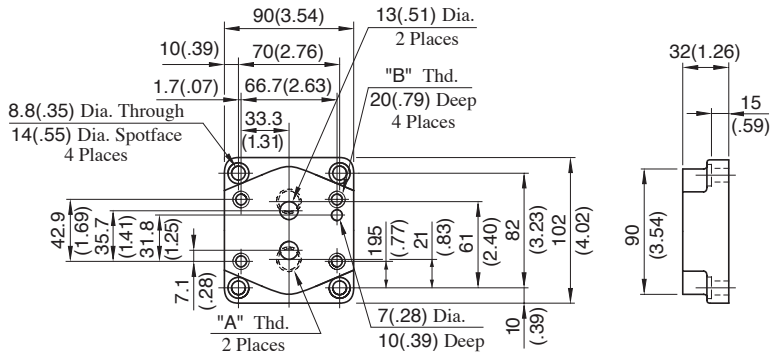
CRG-10-\*50/5090

Mounting surface: ISO 5781-AJ-10-2-A



**Sub-plate**

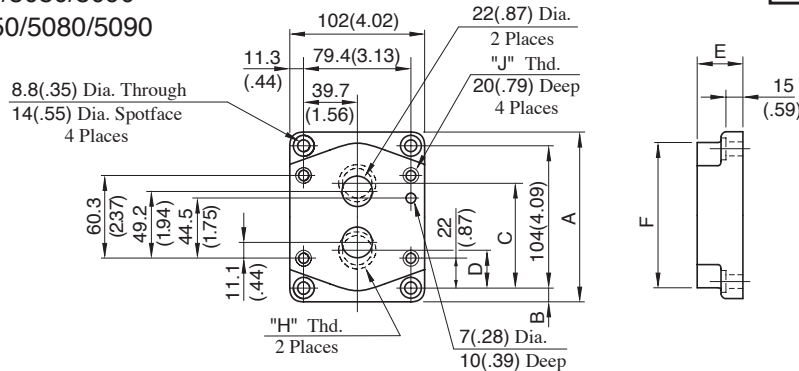
**CRGM-03-50/5080/5090**  
**CRGM-03X-50/5080/5090**



| Sub-plate<br>Model Numbers | Thread Size |            |
|----------------------------|-------------|------------|
|                            | "A" Thd.    | "B" Thd.   |
| CRGM-03-50                 | Rc 3/8      | M10        |
| CRGM-03-5080               | 3/8 BSP.F   |            |
| CRGM-03-5090               | 3/8 NPT     | 3/8-16 UNC |
| CRGM-03X-50                | Rc 1/2      | M10        |
| CRGM-03X-5080              | 1/2 BSP.F   |            |
| CRGM-03X-5090              | 1/2 NPT     | 3/8-16 UNC |

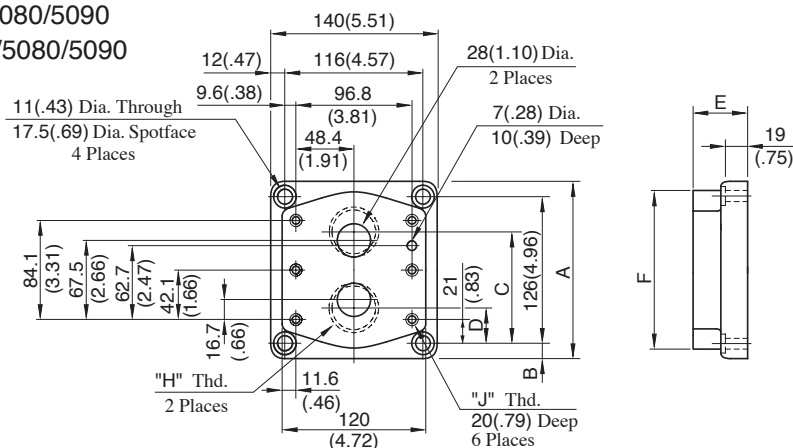
**DIMENSIONS IN  
MILLIMETRES (INCHES)**

**CRGM-06-50/5080/5090**  
**CRGM-06X-50/5080/5090**



| Sub-plate<br>Model Numbers | Dimensions mm (Inches) |             |              |              |              |               | Thread Size |            |
|----------------------------|------------------------|-------------|--------------|--------------|--------------|---------------|-------------|------------|
|                            | A                      | B           | C            | D            | E            | F             | "H" Thd.    | "J" Thd.   |
| CRGM-06-50                 | 124<br>(4.88)          | 10<br>(.39) | 77<br>(3.03) | 27<br>(1.06) | 36<br>(1.42) | 110<br>(4.33) | Rc 3/4      | M10        |
| CRGM-06-5080               |                        |             |              |              |              |               | 3/4 BSP.F   |            |
| CRGM-06-5090               |                        |             |              |              |              |               | 3/4 NPT     | 3/8-16 UNC |
| CRGM-06X-50                | 136<br>(5.35)          | 16<br>(.63) | 82.3 (3.24)  | 22 (.87)     | 45<br>(1.77) | 130<br>(5.12) | Rc 1        | M10        |
| CRGM-06X-5080              |                        |             | 80 (3.15)    | 24 (.94)     |              |               | 1 BSP.F     |            |
| CRGM-06X-5090              |                        |             | 82.3 (3.24)  | 22 (.87)     |              |               | 1 NPT       | 3/8-16 UNC |

**CRGM-10-50/5080/5090**  
**CRGM-10X-50/5080/5090**

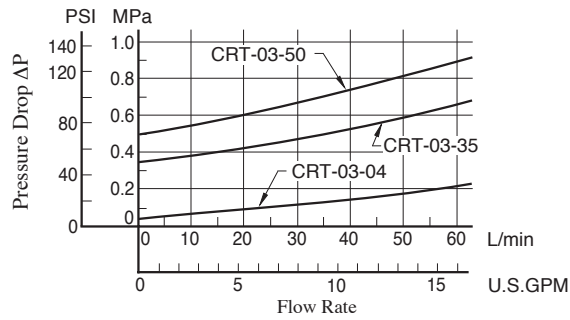


| Sub-plate<br>Model Numbers | Dimensions mm (Inches) |                |               |              |              |               | Thread Size |            |
|----------------------------|------------------------|----------------|---------------|--------------|--------------|---------------|-------------|------------|
|                            | A                      | B              | C             | D            | E            | F             | "H" Thd.    | "J" Thd.   |
| CRGM-10-50                 | 150<br>(5.91)          | 12<br>(.47)    | 96<br>(3.78)  | 30<br>(1.18) | 45<br>(1.77) | 135<br>(5.31) | Rc 1-1/4    | M10        |
| CRGM-10-5080               |                        |                |               |              |              |               | 1-1/4 BSP.F |            |
| CRGM-10-5090               |                        |                |               |              |              |               | 1-1/4 NPT   | 3/8-16 UNC |
| CRGM-10X-50                | 177<br>(6.97)          | 25.5<br>(1.00) | 104<br>(4.09) | 22<br>(.87)  | 50<br>(1.97) | 167<br>(6.57) | Rc 1-1/2    | M10        |
| CRGM-10X-5080              |                        |                |               |              |              |               | 1-1/2 BSP.F |            |
| CRGM-10X-5090              |                        |                |               |              |              |               | 1-1/2 NPT   | 3/8-16 UNC |

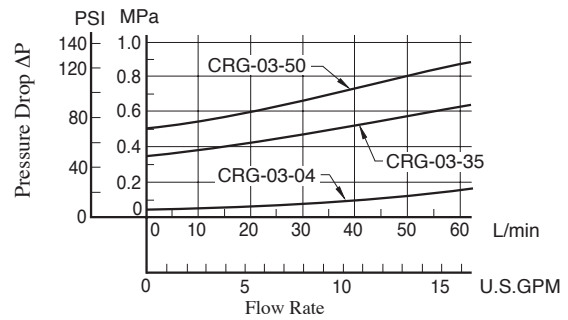
## Pressure Drop

Hydraulic Fluid: Viscosity 30mm<sup>2</sup>/s (141 SSU), Specific Gravity 0.850

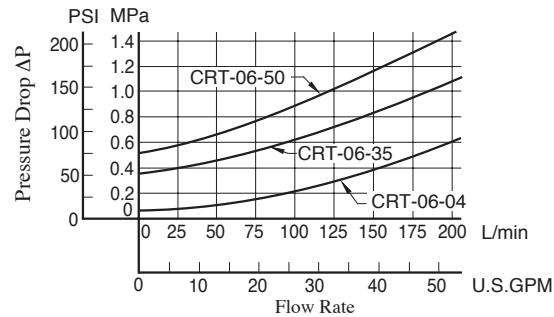
### CRT-03



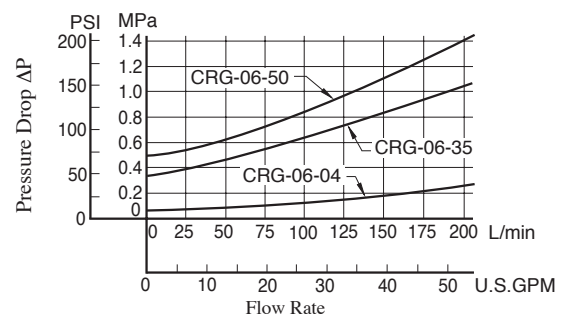
### CRG-03



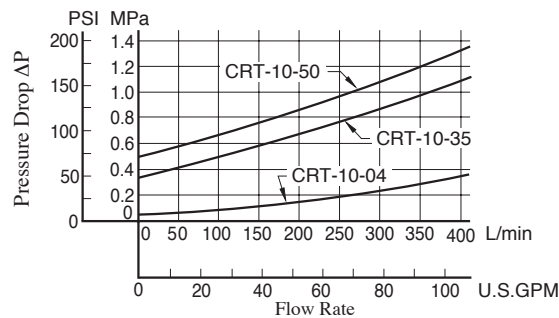
### CRT-06



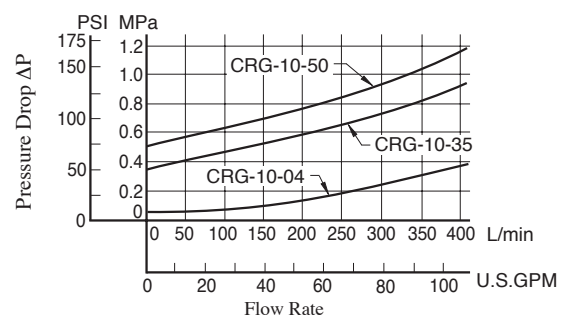
### CRG-06



### CRT-10

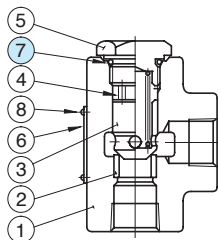


### CRG-10

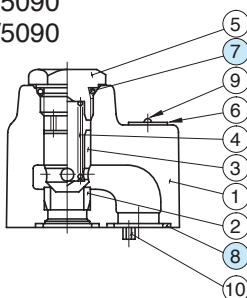


## List of Seals

CRT-03-50/5080/5090  
CRT-06-50/5080/5090  
CRT-10-50/5080/5090



CRG-03-50/5090  
CRG-06-50/5090  
CRG-10-50/5090



### List of Seals & Seal Kits

| Item | Name of Parts | Part Numbers |              |              | Qty. |
|------|---------------|--------------|--------------|--------------|------|
|      |               | CRT-03       | CRT-06       | CRT-10       |      |
| 7    | O-Ring        | SO-NB-P21    | SO-NB-P24    | SO-NB-P32    | 1    |
| ★    | Seal Kit      | KS-CRT-03-50 | KS-CRT-06-50 | KS-CRT-10-50 | —    |

★ When ordering the O-Rings, please specify the seal kit number from the table above.

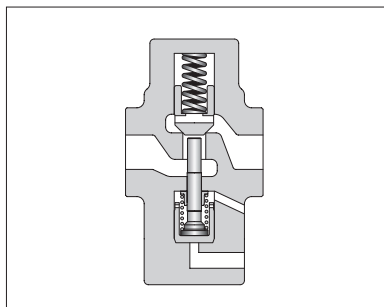
### List of Seals & Seal Kits

| Item | Name of Parts | Part Numbers |              |              | Qty. |
|------|---------------|--------------|--------------|--------------|------|
|      |               | CRG-03       | CRG-06       | CRG-10       |      |
| 7    | O-Ring        | SO-NB-P21    | SO-NB-P24    | SO-NB-P32    | 1    |
| 8    | O-Ring        | SO-NB-P18    | SO-NB-P28    | SO-NB-P32    | 2    |
| ★    | Seal Kit      | KS-CRG-03-50 | KS-CRG-06-50 | KS-CRG-10-50 | —    |

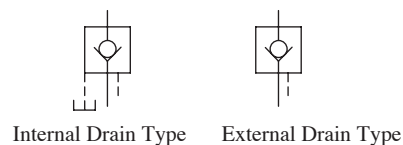
★ When ordering the O-Rings, please specify the seal kit number from the table above.

## Pilot Operated Check Valves

These check valves allow flow in one direction and prevent flow in the reverse direction, until operated by pilot pressure to allow free reverse flow. The specified cracking pressure is required to open the valve to allow free flow direction.



Graphic Symbols



### Specifications

| Type of Connection  | Model Numbers     | Rated Flow*<br>L/min (U.S.GPM) | Max. Operating Pres.<br>MPa (PSI) | Cracking Pres.<br>MPa (PSI) | Approx. Mass<br>kg (lbs.) |
|---------------------|-------------------|--------------------------------|-----------------------------------|-----------------------------|---------------------------|
| Threaded Connection | CPT/CPDT-03-*-50* | 40 (10.6)                      | 25 (3630)                         | 0.04 (6)                    | 3.0 (6.6)                 |
|                     | CPT/CPDT-06-*-50* | 125 (33)                       |                                   | 0.2 (29)                    | 5.5 (12.1)                |
|                     | CPT/CPDT-10-*-50* | 250 (66)                       |                                   | 0.35 (50)                   | 9.6 (21.2)                |
| Sub-plate Mounting  | CPG/CPDG-03-*-50* | 40 (10.6)                      | 25 (3630)                         | 0.04 (6)                    | 3.3 (7.3)                 |
|                     | CPG/CPDG-06-*-50* | 125 (33)                       |                                   | 0.2 (29)                    | 5.4 (11.9)                |
|                     | CPG/CPDG-10-*-50* | 250 (66)                       |                                   | 0.35 (50)                   | 8.5 (18.7)                |

★ Rated flow is the approximate flow rate, when there is a free flow pressure drop of maximum 0.3 MPa (44 PSI), the fluid has a specific gravity of 0.85 and a kinematic viscosity of 20 mm<sup>2</sup>/s (98 SSU), and the cracking pressure is 0.04 MPa (6 PSI).

### Model Number Designation

| F-                                                                         | CP                                                                                         | T                         | 03         | -E                      | -04                                                       | -50           | *                                                                                    |
|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|---------------------------|------------|-------------------------|-----------------------------------------------------------|---------------|--------------------------------------------------------------------------------------|
| Special Seals                                                              | Series Number                                                                              | Type of Connection        | Valve Size | Drain Connection        | Cracking Pres. MPa (PSI)                                  | Design Number | Design Standards                                                                     |
| F:<br>Special Seals for Phosphate Ester Type Fluids (Omit if not required) | CP:<br>Pilot Operated Check Valve<br>CPD:<br>Decompression Type Pilot Operated Check Valve | T:<br>Threaded Connection | 03         | None:<br>Internal Drain | 04:0.04 (6)<br>20:0.2 (29)<br>35:0.35 (50)<br>50:0.5 (70) | 50            | None: Japanese Std. "JIS"<br>80: European Design Std.<br>90: N. American Design Std. |
|                                                                            |                                                                                            |                           | 06         |                         |                                                           | 50            |                                                                                      |
|                                                                            |                                                                                            |                           | 10         |                         |                                                           | 50            |                                                                                      |
|                                                                            |                                                                                            | G:<br>Sub-plate Mounting  | 03         | E:<br>External Drain    |                                                           | 50            | None: Japanese Std. "JIS" & European Design Std.<br>90: N. American Design Std.      |
|                                                                            |                                                                                            |                           | 06         |                         |                                                           | 50            |                                                                                      |
|                                                                            |                                                                                            |                           | 10         |                         |                                                           | 50            |                                                                                      |

### Mounting Bolts

Socket head cap screws in the table below are included.

| Valve Model Numbers | Socket Head Cap Screw                              |                            | Qty. |
|---------------------|----------------------------------------------------|----------------------------|------|
|                     | Japanese Standard "JIS" & European Design Standard | N.American Design Standard |      |
| CP*G-03             | M10 × 45 Lg.                                       | 3/8-16 UNC × 1-3/4 Lg.     | 4    |
| CP*G-06             | M10 × 50 Lg.                                       | 3/8-16 UNC × 2 Lg.         | 4    |
| CP*G-10             | M10 × 55 Lg.                                       | 3/8-16 UNC × 2-1/4 Lg.     | 6    |

Yuken can offer flanged connection valves described below.  
For details, contact us.

| Model Numbers | Rated Flow<br>L/min (U.S.GPM) | Max. Operating Pressure<br>MPa (PSI) |
|---------------|-------------------------------|--------------------------------------|
| CP*F-10-*-50* | 250 (66)                      | 25 (3630)                            |
| CP*F-16-*-50* | 600 (159)                     | 25 (3630)                            |

## Sub-plate

| Valve 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 |                        |
| CP*G-03             | HGM-03-20               | Rc 3/8      | HGM-03-2080              | 3/8 BSP.F   | HGM-03-2090                 | 3/8 NPT     | 1.6 (3.5)              |
|                     | HGM-03X-20              | Rc 1/2      | HGM-03X-2080             | 1/2 BSP.F   | HGM-03X-2090                | 1/2 NPT     | 1.6 (3.5)              |
| CP*G-06             | HGM-06-20               | Rc 3/4      | HGM-06-2080              | 3/4 BSP.F   | HGM-06-2090                 | 3/4 NPT     | 2.4 (5.3)              |
|                     | HGM-06X-20              | Rc 1        | HGM-06X-2080             | 1 BSP.F     | HGM-06X-2090                | 1 NPT       | 3.0 (6.6)              |
| CP*G-10             | HGM-10-20               | Rc 1-1/4    | HGM-10-2080              | 1-1/4 BSP.F | HGM-10-2090                 | 1-1/4 NPT   | 4.8 (10.6)             |
|                     | HGM-10X-20              | Rc 1-1/2    | HGM-10X-2080             | 1-1/2 BSP.F | HGM-10X-2090                | 1-1/2 NPT   | 5.7 (12.6)             |

- 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 H Type Pressure Control Valves. Refer to [pages 244 to 246](#) for dimensions.

## Instructions

### Operation of internal and external drain types

When the outlet side P1 is directly connected to the tank in reversed free flow (Fig. a), the internal drain type is normally used. When the back pressure is applied to the outlet side P1 (Fig. b), be sure to use the external drain type.

### Minimum pilot pressure characteristics

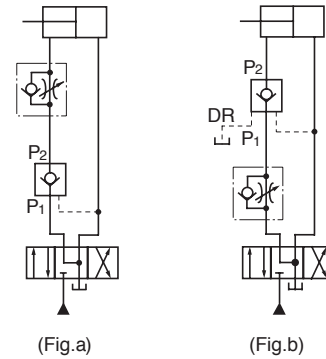
That depends on the pressure of the inlet side P2 in the reversed free flow.

This value can be determined from the characteristics chart.

### Caution on replacement of 20 design low cracking pressure type valves with 50 design valves.

In 20 design valve with cracking pressure of 0.035 MPa (5 PSI) (Code "5"), for closing the valve completely and certainly, it was necessary to introduce the pressurized oil into the drain port to push down the piston compulsory.

While in 50 design valve with cracking pressure of 0.04 MPa (6 PSI) (Code "6"), it has such structure that the valve can be closed completely and certainly without introducing the pressurized oil into the drain port. On the contrary, what is worse is that if the pressurized oil is introduced into the drain port, the oil acts towards the direction of opening the valve, which is very dangerous and has to be absolutely avoided. Therefore, please do not supply any pressurized oil into the drain port in case of using 50 design valve.



(Fig.a)

(Fig.b)

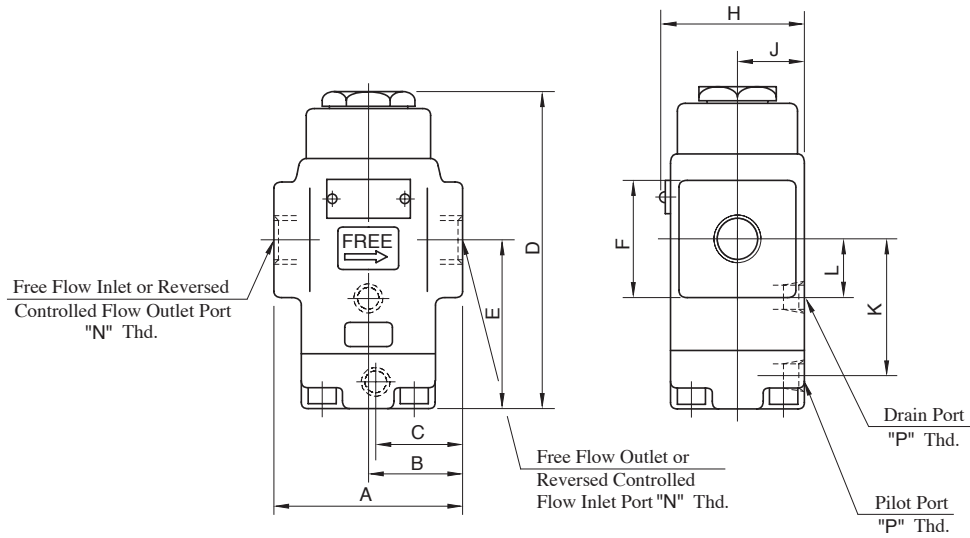


### WARNING

The machinery, if misused due to failure to observe the "Cautions" on the left, may perform unforeseeable movements, resulting in a disastrous accident.

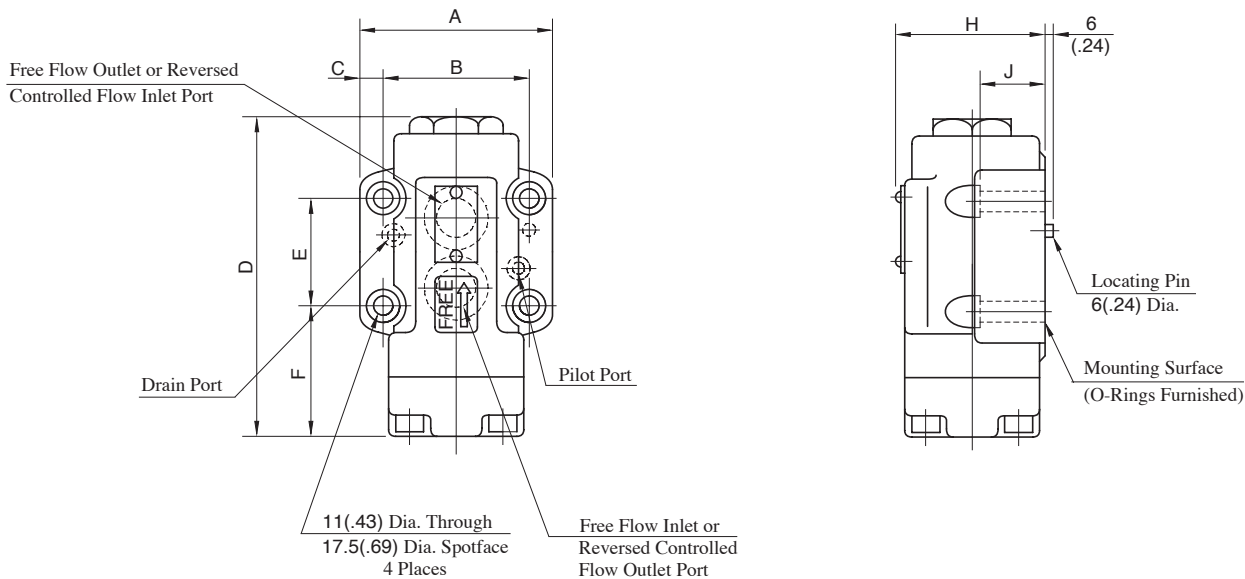


CPT/CPDT-03-\*-50/5080/5090  
 CPT/CPDT-06-\*-50/5080/5090  
 CPT/CPDT-10-\*-50/5080/5090



| Model Numbers      | Dimensions mm (Inches) |              |              |                 |                |                      |              |              |                |                | Thread Size |           |
|--------------------|------------------------|--------------|--------------|-----------------|----------------|----------------------|--------------|--------------|----------------|----------------|-------------|-----------|
|                    | A                      | B            | C            | D               | E              | F                    | H            | J            | K              | L              | "N" Thd.    | "P" Thd.  |
| CPT/CPDT-03-*-50   | 80<br>(3.15)           | 40<br>(1.57) | 39<br>(1.54) | 150.5<br>(5.93) | 84.5<br>(3.33) | 38<br>(1.50)<br>Dia. | 60<br>(2.36) | 29<br>(1.14) | 67.5<br>(2.66) | 26.5<br>(1.04) | Rc 3/8      | Rc 1/4    |
| CPT/CPDT-03-*-5080 |                        |              |              |                 |                |                      |              |              |                |                | 3/8 BSP.F   | 1/4 BSP.F |
| CPT/CPDT-03-*-5090 |                        |              |              |                 |                |                      |              |              |                |                | 3/8 NPT     | 1/4 NPT   |
| CPT/CPDT-06-*-50   | 96<br>(3.78)           | 48<br>(1.89) | 47<br>(1.85) | 171.5<br>(6.75) | 92.5<br>(3.64) | 62<br>(2.44)<br>SQ.  | 72<br>(2.83) | 35<br>(1.38) | 75.5<br>(2.97) | 31<br>(1.22)   | Rc 3/4      | Rc 1/4    |
| CPT/CPDT-06-*-5080 |                        |              |              |                 |                |                      |              |              |                |                | 3/4 BSP.F   | 1/4 BSP.F |
| CPT/CPDT-06-*-5090 |                        |              |              |                 |                |                      |              |              |                |                | 3/4 NPT     | 1/4 NPT   |
| CPT/CPDT-10-*-50   | 140<br>(5.51)          | 70<br>(2.76) | 64<br>(2.52) | 203.5<br>(8.01) | 113<br>(4.45)  | 80<br>(3.15)<br>SQ.  | 82<br>(3.23) | 40<br>(1.57) | 96<br>(3.78)   | 43<br>(1.69)   | Rc 1-1/4    | Rc 1/4    |
| CPT/CPDT-10-*-5080 |                        |              |              |                 |                |                      |              |              |                |                | 1-1/4 BSP.F | 1/4 BSP.F |
| CPT/CPDT-10-*-5090 |                        |              |              |                 |                |                      |              |              |                |                | 1-1/4 NPT   | 1/4NPT    |

CPG/CPDG-03-\*\*-50/5090  
CPG/CPDG-06-\*\*-50/5090

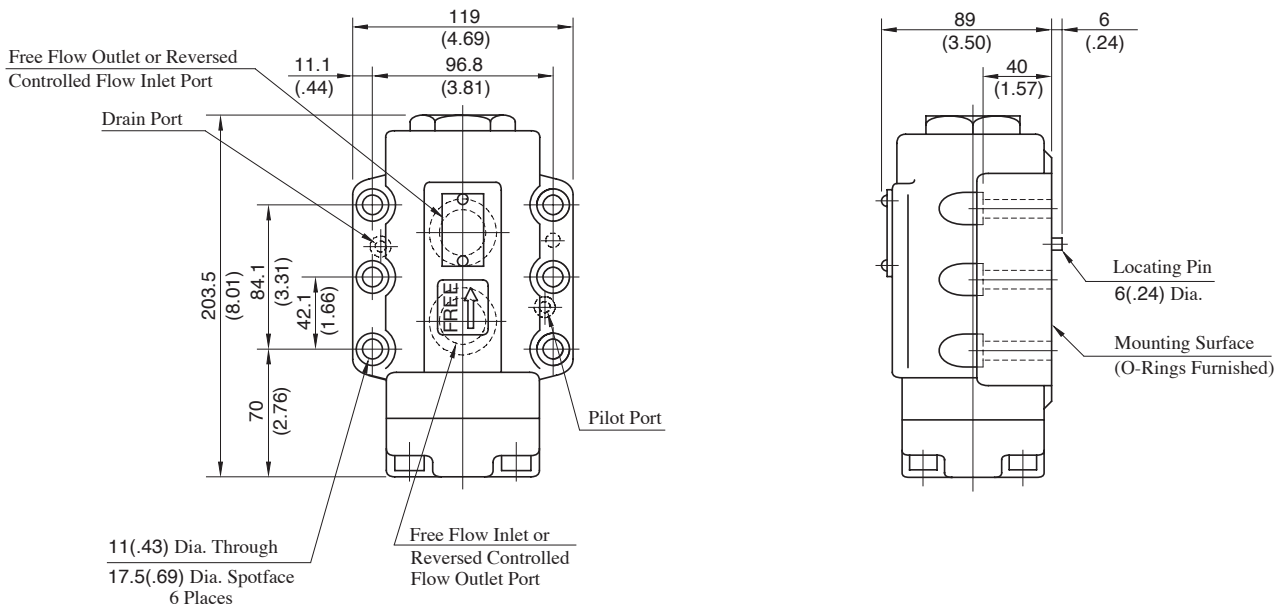


| Model Numbers          | Dimensions mm (Inches) |                |               |                 |                |                |              |              | Mounting Surface   |
|------------------------|------------------------|----------------|---------------|-----------------|----------------|----------------|--------------|--------------|--------------------|
|                        | A                      | B              | C             | D               | E              | F              | H            | J            |                    |
| CPG/CPDG-03-**-50/5090 | 90<br>(3.54)           | 66.7<br>(2.63) | 11.7<br>(.46) | 150.5<br>(5.93) | 42.9<br>(1.69) | 66<br>(2.60)   | 62<br>(2.44) | 30<br>(1.18) | ISO 5781-AG-06-2-A |
| CPG/CPDG-06-**-50/5090 | 102<br>(4.02)          | 79.4<br>(3.13) | 11.3<br>(.44) | 171.5<br>(6.75) | 60.3<br>(2.37) | 67.5<br>(2.66) | 74<br>(2.91) | 35<br>(1.38) | ISO 5781-AH-08-2-A |

CPG/CPDG-10-\*\*-50/5090

Mounting surface: ISO 5781-AJ-10-2-A

DIMENSIONS IN  
MILLIMETRES (INCHES)



E

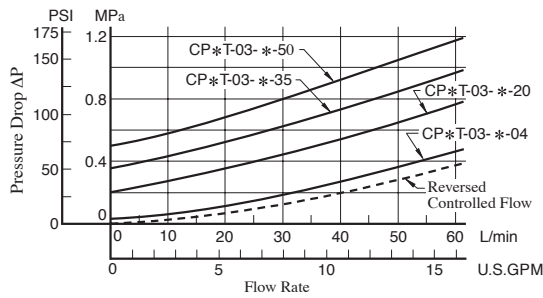


Pilot Operated Check Valves

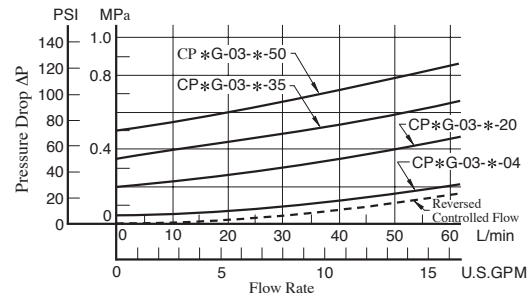
Hydraulic Fluid: Viscosity 30 mm<sup>2</sup>/s (141 SSU), Specific Gravity 0.850

## Pressure Drop

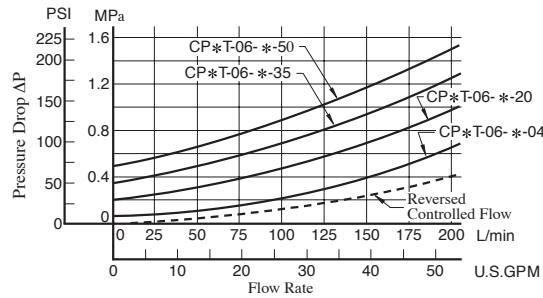
### ● CPT-03, CPDT-03



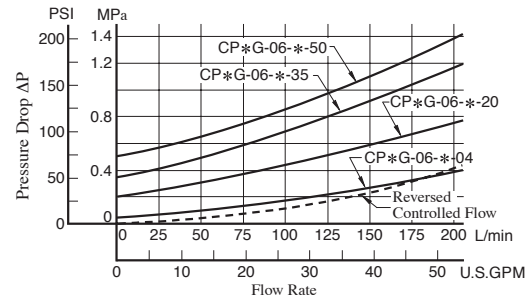
### ● CPG-03, CPDG-03



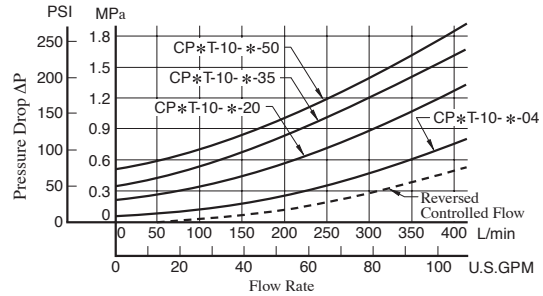
### ● CPT-06, CPDT-06



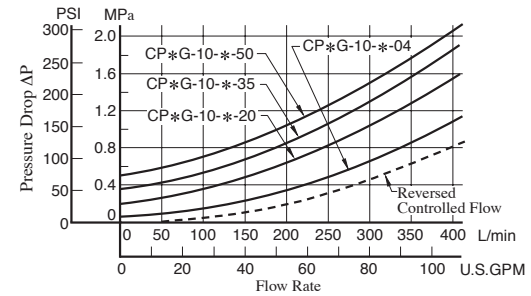
### ● CPG-06, CPDG-06



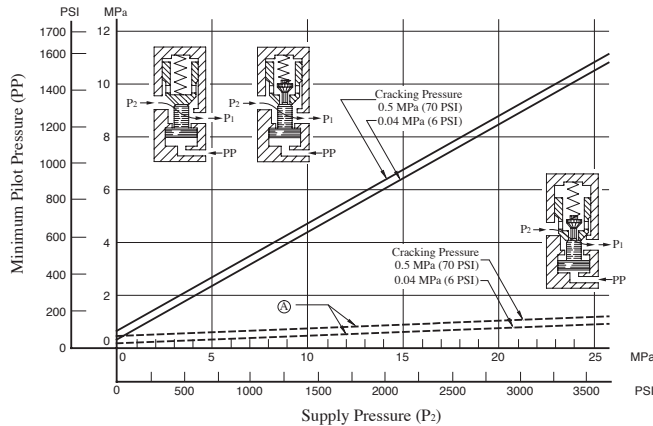
### ● CPT-10, CPDT-10



### ● CPG-10, CPDG-10



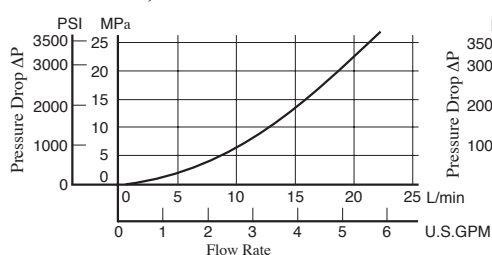
## Min. Pilot Pressure Chart



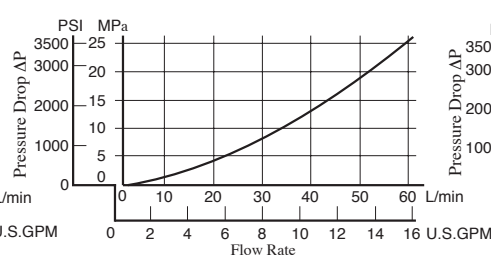
Ⓐ : Min. Pilot Pressure to open the Decompression Valve

## Pressure Drop for Reversed Controlled Flow Only when Decompression Valve is Opened

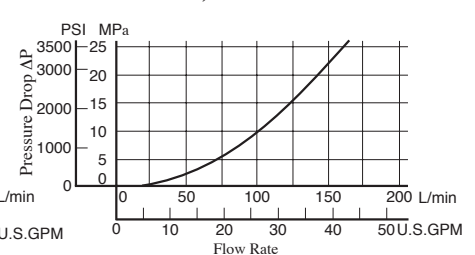
### ● CPDT-03, CPDG-03



### ● CPDT-06, CPDG-06

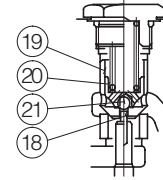
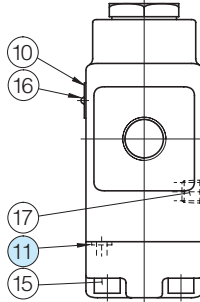
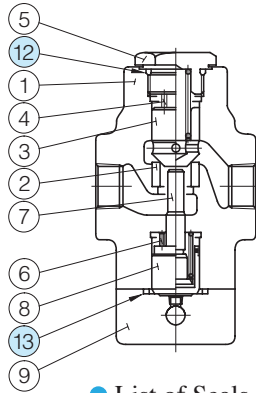


### ● CPDT-10, CPDG-10



## List of Seals

CPT/CPDT-03-\*\*-50/5080/5090  
CPT/CPDT-06-\*\*-50/5080/5090  
CPT/CPDT-10-\*\*-50/5080/5090



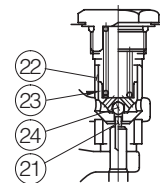
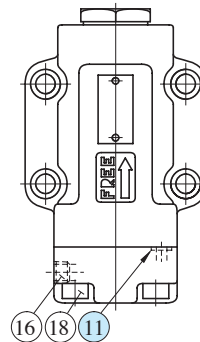
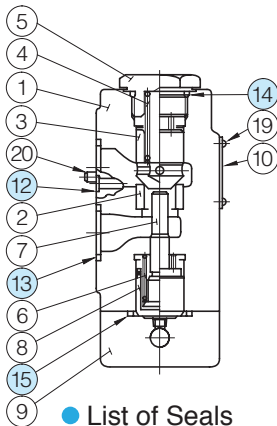
CPDT-03/06/10

### List of Seals

| Item | Name of Parts | Part Numbers |             |             | Qty. |
|------|---------------|--------------|-------------|-------------|------|
|      |               | CPT/CPDT-03  | CPT/CPDT-06 | CPT/CPDT-10 |      |
| 11   | O-Ring        | SO-NB-P7     | SO-NB-P9    | SO-NB-P9    | 1    |
| 12   | O-Ring        | SO-NB-P21    | SO-NB-P29   | SO-NB-P36   | 1    |
| 13   | O-Ring        | SO-NB-G25    | SO-NB-P32   | SO-NB-P42   | 1    |

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

CPG/CPDG-03-\*\*-50/5090  
CPG/CPDG-06-\*\*-50/5090  
CPG/CPDG-10-\*\*-50/5090



CPDG-03/06/10

### List of Seals

| Item | Name of Parts | Part Numbers |             |             | Qty. |
|------|---------------|--------------|-------------|-------------|------|
|      |               | CPG/CPDG-03  | CPG/CPDG-06 | CPG/CPDG-10 |      |
| 11   | O-Ring        | SO-NB-P7     | SO-NB-P9    | SO-NB-P9    | 1    |
| 12   | O-Ring        | SO-NB-P9     | SO-NB-P9    | SO-NB-P9    | 2    |
| 13   | O-Ring        | SO-NB-P18    | SO-NB-P28   | SO-NB-P32   | 2    |
| 14   | O-Ring        | SO-NB-P21    | SO-NB-P29   | SO-NB-P36   | 1    |
| 15   | O-Ring        | SO-NB-G25    | SO-NB-P32   | SO-NB-P42   | 1    |

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

### List of Seal Kits

| Model Numbers               | Seal Kit Numbers |
|-----------------------------|------------------|
| CPT/CPDT-03-**-50/5080/5090 | KS-CPT-03-50     |
| CPT/CPDT-06-**-50/5080/5090 | KS-CPT-06-50     |
| CPT/CPDT-10-**-50/5080/5090 | KS-CPT-10-50     |
| CPG/CPDG-03-**-50/5090      | KS-CPG-03-50     |
| CPG/CPDG-06-**-50/5090      | KS-CPG-06-50     |
| CPG/CPDG-10-**-50/5090      | KS-CPG-10-50     |



