

Solenoid Operated Directional Valves

Solenoid Controlled Pilot Operated Directional Valves

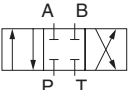
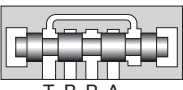
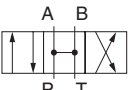
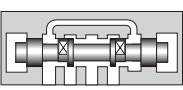
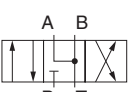
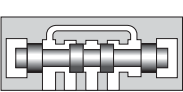
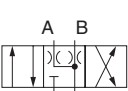
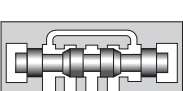
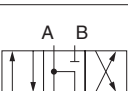
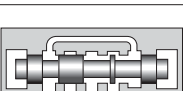
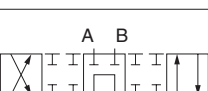
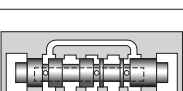
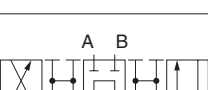
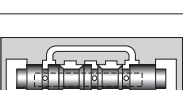
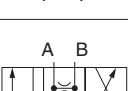


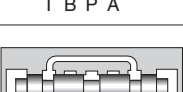




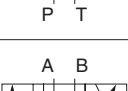



“G” Series Shockless Type Directional Valves

Pilot / Manually / Mechanically Operated Directional Valves

Valve Type	Graphic Symbols	Max. Operating Pressure MPa (PSI)	Maximum Flow																Page
			U.S.GPM																
			.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				
Solenoid Operated Directional Valves		25 (3600)	DSG-005																336
		16 (2320)	L-DSG-01																344
		25 (3600)	S-DSG-01																
		35 (5080)	DSG-01																
		16 (2320)	L-DSG-03																361
		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																
		DSHG-04/S-DSHG-04																	
		31.5 (4580)	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 ^T _G) 02																441
		25 (3600)	Cam Operated (DC ^T _G) 01 03																

Spool Types

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

Spool Type	Graphic Symbols	Schematic Drawing (Centre Position)	Functions and Applications
2 (Closed Centre 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.
3 (Open Centre 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.
4 (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".
40 (Open Centre A, B&T 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.
5 (Open Centre P, A&T)			It can be used when a pump is unloading at neutral and actuator is halted at one way flow.
6 (Open Centre P&T Closed Crossover)			Pump is unloading and actuator position held at neutral. Suitable for series operation.
60 (Open Centre P&T Open Crossover)			It is a variation of spool type "6". Shock is reduced as each port is released to tank on transit.
7 (Open Centre All Ports Restricted Flow)			Mainly used as a 2-position type. Shock is reduced on transit.
8 (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.
9 (Open Centre P, A&B)			Regenerative circuit is provided at neutral.
10 (Open Centre B&T)			Prevent actuator from one direction drift by leakage of P port at neutral.
11 (Open Centre P&A)			Halt actuator movement positively at B, T ports blocked P, A ports connected at neutral.
12 (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 DSHG-01 DMG-01 DCG-01	ISO 4401-AB-03-4-A
$\begin{pmatrix} S- \\ L- \\ E- \\ T- \\ G- \end{pmatrix}$ DSG-03 DMG-03 DCG-03	ISO 4401-AC-05-4-A
DSHG-03	ISO 4401-AC-05-4-A*
$\begin{pmatrix} S- \\ G- \end{pmatrix}$ DSHG-04 DHG-04 DMG-04	ISO 4401-AD-07-4-A
$\begin{pmatrix} S- \\ G- \end{pmatrix}$ DSHG-06 DHG-06 DMG-06	ISO 4401-AE-08-4-A
(S-) DSHG-10 DHG-10 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.

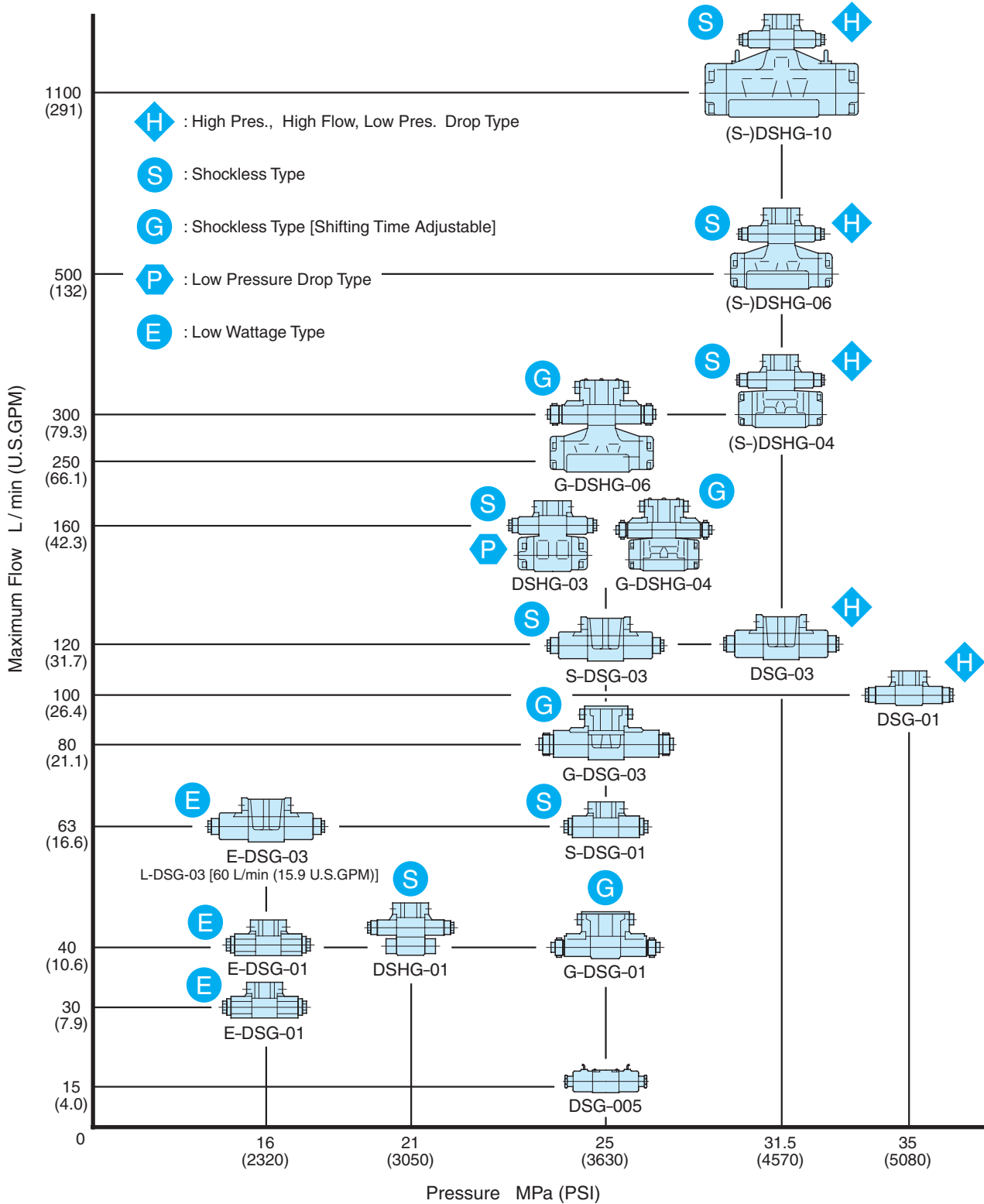
The difference between current and new design has been described on the paragraph of “Interchangeability in Installation between Current and New Design.” Refer to relevant pages on each series.

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 DSG-005-***-*- $\frac{N}{NI}$ -40/4090	Yes	—	<ul style="list-style-type: none"> ● High Flow ● Low Pressure Drop ● Din-connector type solenoid in addition
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"> ● High Pressure and High Flow ● Low Pressure Drop
1/8,3/8 Solenoid Controlled Pilot Operated Directional Valves	DSHG-01-***-*-13/1390 DSHG-03-***-*-13/1390	DSHG-01-***-*-14/1490 DSHG-03-***-*-14/1490	Yes	—	<ul style="list-style-type: none"> ● Pilot valve has been changed from DSG-01, 60 design to 70 design.
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"> ● Pilot valve has been changed from DSG-01, 60 design to 70 design.
3/4,1-1/4 Solenoid Controlled Pilot Operated Directional Valves	(S-) DSHG-06-***-*-52/5290 (S-) DSHG-10-***-*-42/4290	(S-) DSHG-06-***-*-53/5390 (S-) DSHG-10-***-*-43/4390	Yes	—	<ul style="list-style-type: none"> ● Pilot valve has been changed from DSG-01, 60 design to 70 design.



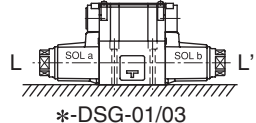
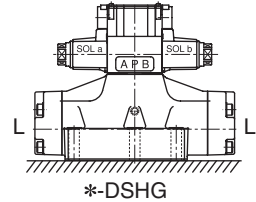
■ Solenoid Operated / Solenoid Controlled Operated Directional Valves

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 *-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 DSHG-03 (S-) DSHG-04 (S-) DSHG-06 (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.

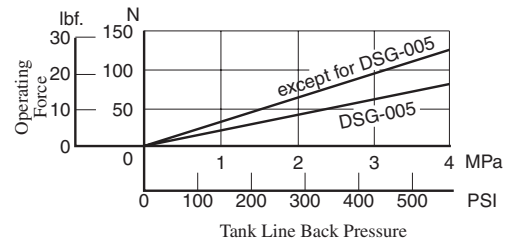
● Shockless Type

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 L-DSG-01, E-DSG-01, T-DSG-01 DSG-03, S-DSG-03, L-DSG-03 E-DSG-03, T-DSG-03 DSHG-01/03/04/06/10, S-DSHG-04/-06/10	Class H
G-DSG-01, G-DSG-03	Class F