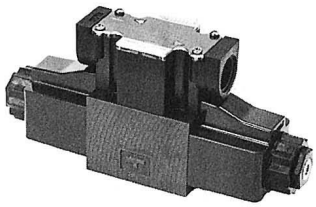
E

DIRECTIONAL CONTROLS

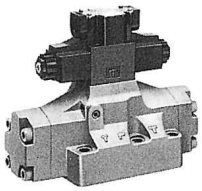
■Directional Valves

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

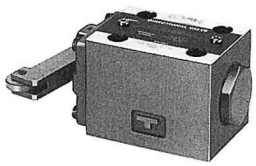
●Solenoid Operated Directional Valve



●Solenoid Controlled Pilot Operated Directional Valve



●Pilot / Mechanically Operated 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	Petroleum Base Oils
Petroleum Base Oil	Use fluids equivalent to ISO VG32 or VG46.
Synthetic Fluids [1)]	Use phosphate ester or polyol ester type. When phosphate estertype fluid is to be used, prefix "F-" to the model numberbecause a special seal (fluororubber) will be used.
Water Containing Fluids	Use water-glycol fluids or W/O emulsion type fluids.

Note1. For use with hydraulic fluids other than those listed above, please consult your SEWON representatives is 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	Degree of contamination
Solenoid Operated Directional Valves Solenoid Controlled Pilot Operated Directional Valves Poppet Type Solenoid Operated Directional Valves Mechanically Operated Directional Valves Check Valves Pilot Controlled Check Valves	15~400mm²/s{cSt}	−15℃ ~ + 70℃	ISO 21/18 NAS 1638-Grade 12

3. Control of Contamination

Due caution must be paid to maintaining control over contamination of the hydraulic fluids which may otherwise leadto breakdowns and shorter the life of the valve. Please maintain the degree of contamination within NAS 1638-Grade12. Use 25 μm or finer line filter.

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

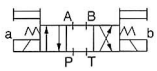
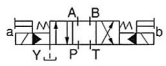
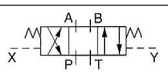
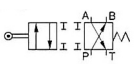
There properties are in compliance with the following standards.(The marking of O indicates compliance)

Item	Standard	Type	Description		Compliance: DSG-01 DSG-03	Compliance: DSHG-03 DSHG-04 DSHG-06 DSHG-10
★2 Water-proof	**JIS F 8001** Water-proof test for marine electric appliance	Class 1 water spray	Drip-proof construction		○	○
		Class 2 water spray	Froth-roof construction		○	○
	JIS D 0203 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.		○	○
	JIS C 0920 Water-proof test for electromechanical parts an 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 dirction.		○	○
		Jet-flow proof type	Not affected by jet flow from any direction.		○	○
	(I.E.C) PUBL.529	Protection Class 2: Drip-proof type (2)	Not affected by water drip falling at vertical angle of15 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. Not affected by jet flow from any direction.		○	○
Dust-proof	(I.E.C) PUBL.529	Protection Class 5: Jet-flow proof type	Not affected by jet flow from any direction.		×	×
		Protection Class 6	Fully protected from entry of dust.		○	○
Vibrationresistance	**JIS C 0911** Vibration test forsmall electricappliances	Resonace test (IC)	Vibration range: 7-59.5 Hz Duplex amplitude: 0.1 mm		○	○
		Fixed frequency resistance test (IIC)	Frequence: 20 Hz	Grade 1: duplex amplitude-0.5 mm	○	○
				Grade 2: duplex amplitude-1.2 mm	(2D※: ×)★1	(2N※: ×)★1
				Grade 3: duplex amplitude-1.8 mm	(2D※: ×)★1	(2N※: ×)★1
				Grade 4: duplex amplitude-2.4 mm	(2D※: ×)★1	(2N※: ×)★1
		Variable frequency resistance test (IIIC)	Frequency range: 7-59.5Hz	Grade1: duplex amplitude-0.3 mm	(2D※: ×)★1	(2N※: ×)★1
				Grade 2: duplex amplitude-0.5 mm	(2D※: ×)★1	(2N※: ×)★1
				Grade 3: duplex amplitude-0.75 mm	(2D※: ×)★1	(2N※: ×)★1
	JIS D 1601 Vibration test forautomobile parts	Class1: mainly for parts of passenger car	Grade A: Parts mounted on spring of body or chassishaving relatively low vibration.		○(2D※: ×)★1	○(2N※: ×)★1
			Grade B: Parts mounted on spring of body or chassishaving relatively low vibration.		○(2D※: ×)★1	○(2N※: ×)★1
			Grade C: Parts mounted in engine having relatively lowvibration.		○(2D※: ×)★1	○(2N※: ×)★1

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

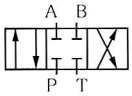
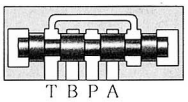
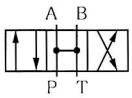
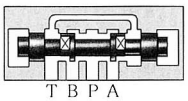
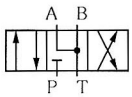
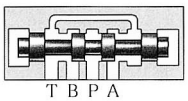
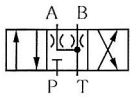
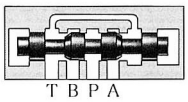
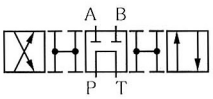
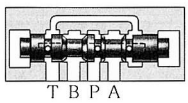
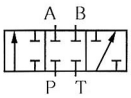
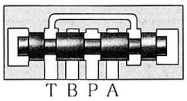
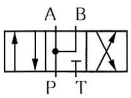
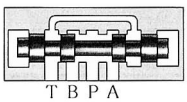
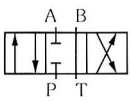
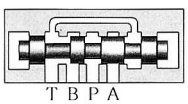
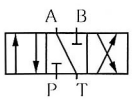
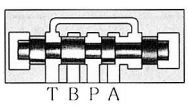
★2. For outdoor use, protect equipment with a cover, etc., to prevent direct exposure to water.

Solenoid Operated Directional Valves
Solenoid Controlled Pilot Operated Directional Valves
Pilot/Mechanically Operated Directional Valves

Valve Type	Graphic Symbols	Max.Operating Pressure MPa {kgf/cm²}	Maximum Flow L/min (1 2 5 10 20 50 100 200 500 1000 2000 5000)	Page
Solenoid Operated Directional Valves		35{357}	DSG-01	E-9
		31.5{321}	DSG-03	E-22
Solenoid Controlled Pilot Operated Directional Valve		25{255}	DSHG-03	E-35
		31.5 {321}	DSHG-04	
			DSHG-06	
			DSHG-10	
Pilot Operated Directional Valves		31.5{321}	DHG-04 06 10	E-56
Mechanically Operated Directional Valves		25{255}	Cam Operated (DC T G) 01 03	E-57

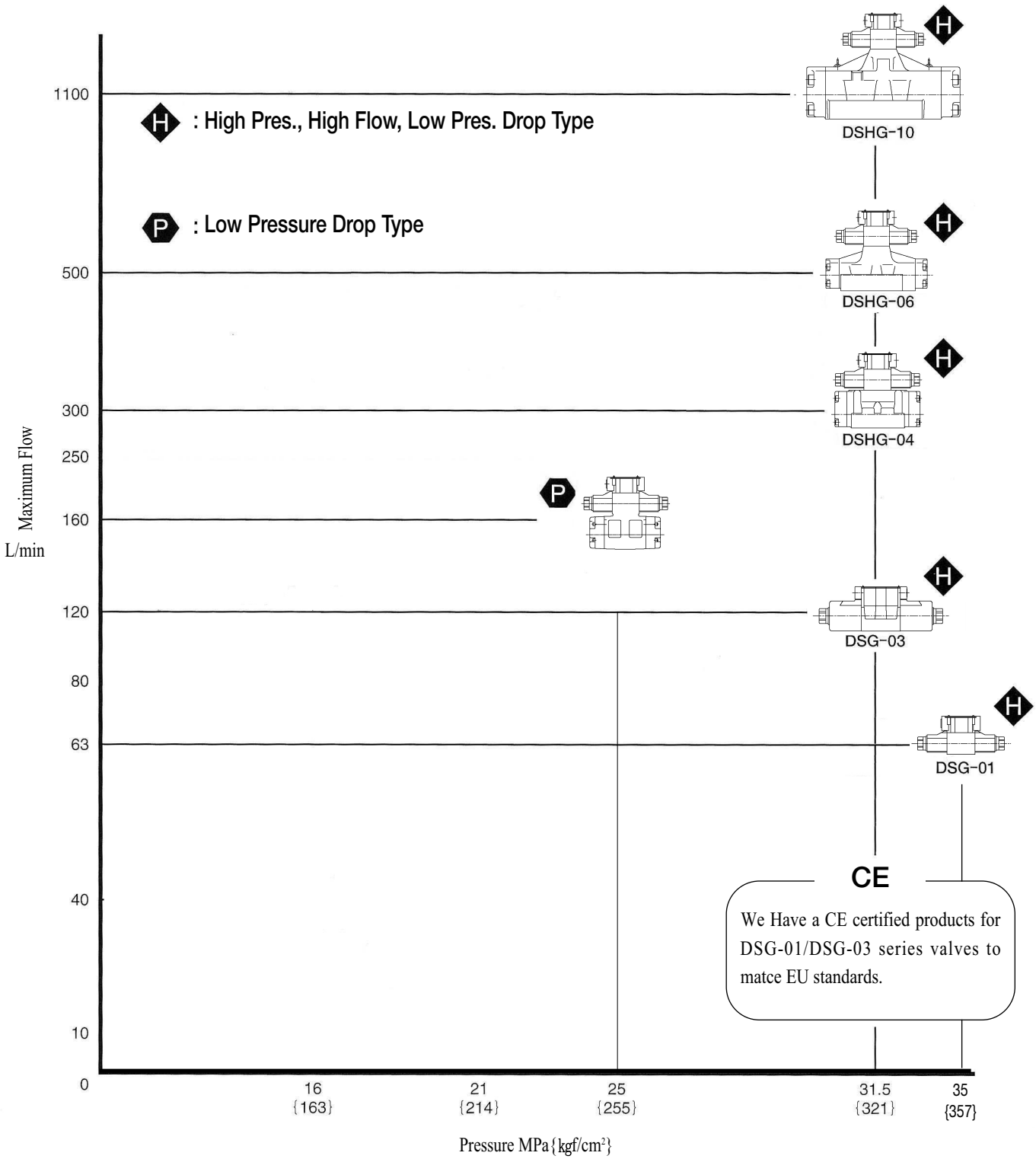
Spool Types

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. Careshould be paid if used as a 2-position type because shockoccurs 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 isreleased 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 beheld in transit. Shock during transit is less compared to spooltype "2".
"40" Open Centre A, B & T Restricted Flow			In a variation of spool type "4", a restrictor is provided in A-Tand B-T ports. Making it faster at stopping the actuator.
"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.
"8" 2-Way			Pump pressure 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 B & T			Regenerative circuit is provided at neutral.
"10" Open Centre P, A & B			Prevent actuator from one direction drift by leakage of P port at neutral.
"12" Open Centre A & T			Prevent actuator from one direction drift by leakage of P port at neutral.

Solenoid Operated / Solenoid Controlled Operated Directional Valves

WIDE RANGE OF MODELS .
Choose the optimum valve tomeet your needs from a largeselection available.

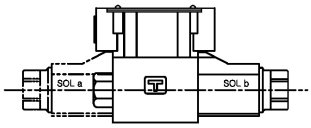
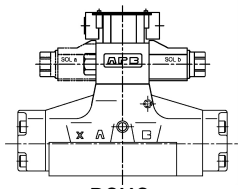


CE

We Have a CE certified products for DSG-01/DSG-03 series valves to matce EU standards.

Instructions

●Mounting

DSG-01 DSG-03	No-spring detented models not energised continuously must be installed so thatthe spool axis L-L' is horizontal. Otherwise there is no mounting restrictions.	 DSG-01/03
DSHG-03 DSHG-04 DSHG-06 DSHG-10	No-spring models not energised continuously must be installed so that the spoolaxis L-L' is horizontal. Otherwise there is no mounting restrictions.	 DSHG

●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

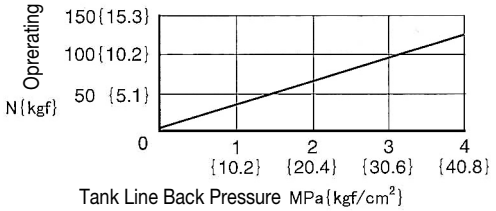
Avoid connecting the valve tank port to a line with possible surge pressure.
Piping end of tank line should be submerged in oil.

●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.

●Operating Force be Manual Actuator

Take care as the operating force by the manual actuator increases inproportion 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 rewiringwhen the applied frequency is changed.

■DC Solenoid (K-series Solenoid OperatedDirectional Valve)

These valves differ from conventional DC solenoidoperated directional valves and have the followingcharacteristics:

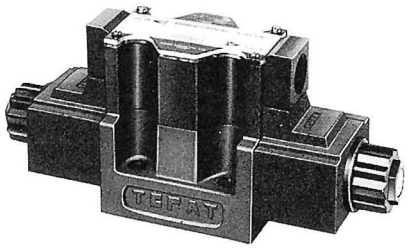
1. The spark between the relay contacts has beeneliminated and therefore the valve can be operated byminiature relays.
2. The surge voltage is approximately 10 % of thatnormally experienced.
3. Time lag on de-energisation is reduced byapproximately 50 %.

■Insulation Class of Solenoid

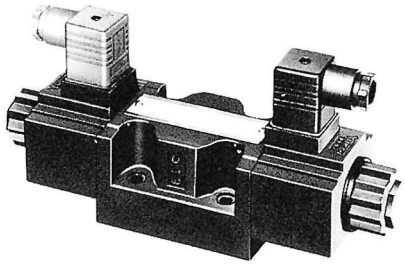
Model numbers	Insulation Class
DSG-01 DSG-03 E-DSG-01 DSHG-03/04/06/10	Class H

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

These are epoch-making solenoid operated valves of high pressure, high flowwhich have been developed incorporating a unique design concept into everypart of the valve including the solenoid. With wet type solenoids, thesevalves ensure the low noise and the long life, moreover, ensure no leakage ofoil outside of the valves.(CE certified products are available)



Terminal Box Type



Plug-in Connector Type

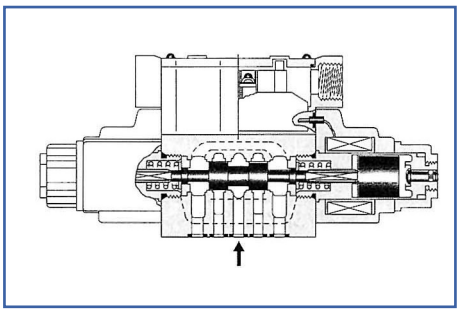
●Wide Range of Models

Choose the optimum valve to meet your need from a large selection available.
The DSG-03 80 design series solenoid operated directional valves are classified into the two basic models.

· Standard type ···. Useable at high pressure: 31.5 MPa {321kgf/cm²} and high flow : 140L/min

●Stable Operation

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



■Ratings

ValveType	Model Numbers	Max. Flow★ L/min	Max. Operating Pressure MPa{kgf/cm²}	Max. T-Line Back Pres. MPa{kgf/cm²}	Max. Changeover Frequencymin min⁻¹{Cycles/Min}	Approx. Mass kg Type of Solenoid AC	Approx. Mass kg Type of Solenoid DC
Standard Type	DSG-03-3C※-※-80	140	31.5{321}	16{163}	240	3.36	5
	DSG-03-2D2-※-80						
	DSG-03-2B※-※-80					2.9	3.6

★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” onpages E24 ~ E26.

■Sub-plate

Sub-plate Model Numbers	Thread Size Rc(PT)	Mounting Bolts Kg
DSGM-03-40	3/8	3
DSGM-03X-40	1/2	
DSGM-03Y-40	3/4	4.7

●Please order the sub-plate using above the model number when you see it.The mounting surface should be used roughly 6-S after grind when you made it yourself.

■Mounting Bolt

Soc. Hd. Cap Screw	Tightening Torque
M6×35L ····· 4pcs	12~15 Nm{1.2~1.5kgf · m}

■Solenoid Ratings

Valve Type	Electric source	Coil Type	Frequency (Hz)	Voltage (V)		Current & Power at Rated Voltage		
				Source Rating	Serviceable Range	Inrush ★2 (A)	Holding (A)	Power (W)
Standard Type	AC	A100	50	100	80~100	5.37	0.90	—
			60	110	100~120	5.03	0.77	
		A200	50	200	160~200	2.69	0.45	
			60	220	200~240	2.52	0.38	
	DC (K Series)	D 12	—	12	10.8~13.2	—	3.16	38
		D 24		24	21.6~26.4		1.57	

★1. Inrush current in the above table show rms valves at maximum stroke.

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

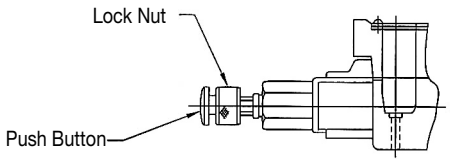
CSA / CE certified Products

CSA / CE certified Products are available. For details, please contact us.

■Options

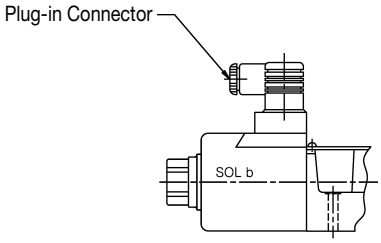
●Push Button with Lock Nut

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



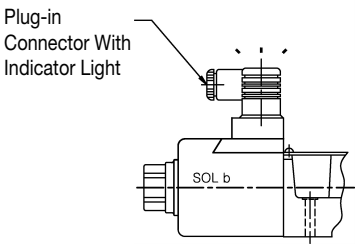
●Plug-in Connector (N)

Electrical wires are of the plug-in type which allows mountingand removal of the valve without removing connections.



●Plug-in Connector with Solenoid Indicator Light (N1)

These are the indicator light incorporated plug-in connectortype solenoids. Energisation or de-energisation of the solenoidcan 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 alsoavailable for supply as optional extras. In case the M8 screws are required, suffix “02” to the design number of both valve andsub-plate model number like below.

(Example)

Valve: DSG-03-3C2-A100-8002

Sub-plate: DSGM-03-4002

The valve is supplied with 4 pcs. hexagonsocket head cap screws M 8 × 38 Lg.

■Model Number Designation

S-	DSG	-03	-2	B	2	A	-D24	-C	-N	-80	-L
Valve Type	Series Number	Valve Size	Number of Valve Positions	Spool-Spring Arrangement	Spool Type	Special Two Position Valve(Omit if not required)	Coil Type	Manual Override	Electrical Conduit Connection	Design Number	Models with Reverse Mtg. of Solenoid
None: Standard Type	DSG Solenoid Operated Directional Valve	03	3	C : Spring Centred	2 ,3 4 ,40 5 ,60 9 ,10 11 ,12	—	AC A100 A200 DC D12 D24	None: Manual Override Pin	None: Terminal Box Type N .. Plug-in Connect or Type N1 ★2 .. Plug-in Connect or Type with Indicator Light (Option)	80	— L
			2	D : No-Spring Detented	2	—					
				B : Spring Offset	2 3 8	A : ★1 B : ★1					

★1. In case of the special two position valve, please refer to page E-28 for details.

★2. Special seals (Viton seals) are required when phosphate ester type fluids are used.
(Put "F-" before model number of valve when ordering.)

In the table above, the symbols or numbers highlighted with shade represent the optionalextras. 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

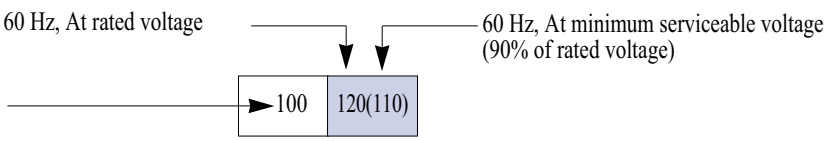
●Models with AC Solenoids : DSG-03-※※※-A※

No. of Valve Positions	Spool-Spring Arrangement	Model Numbers	Graphic Symbols	Max. Flow L/min											
				P→A, B→B (P→B, A→A)				P→A (Port "B" Blocked)				P→B (Port "A" Blocked)			
				Working Pressure MPa{kgf/cm²}				Working Pressure MPa{kgf/cm²}				Working Pressure MPa{kgf/cm²}			
				10 {102}	16 {163}	25 {255}	31.5 {321}	10 {102}	16 {163}	25 {255}	31.5 {321}	10 {102}	16 {163}	25 {255}	31.5 {321}
Three Positions	Spring Centred	DSG-03-3C2		120	120	120(110)	120(105)	108(59)	64(36)	41(23)	31(18)	108(59)	64(36)	41(23)	31(18)
		DSG-03-3C3 ◆★		100	100	100	100	100	100	100	100	100	100	100	100
		DSG-03-3C4		90	90	90	35(30)	100(55)	60(30)	35(20)	25(18)	100(55)	60(30)	35(20)	25(18)
		DSG-03-3C40		120	120	120	120	93(60)	71(39)	41(24)	30(18)	93(60)	71(39)	41(24)	30(18)
		DSG-03-3C60 ★		120(110)	120(110)	120(110)	120(110)	110	110	110	110	110	110	110	110
		DSG-03-3C9		120	120	120	120	99	99	99	99	99	99	99	99
		DSG-03-3C10 ◆		100	100	40(36)	35(30)	81(51)	63(32)	31(19)	23(15)	81(51)	63(36)	31(21)	23(17)
		DSG-03-3C12 ◆		115	115	55(48)	28(25)	81(51)	63(32)	31(19)	23(15)	81(51)	63(36)	31(21)	23(17)
Two Positions	No-Spring Detented	DSG-03-2D2		110	110	110	110	60	60	45	42	90	90	60	53
	Spring Offset	DSG-03-2B2		110	110	110	110	37	26	22	21	88(46)	80(40)	69(37)	56(36)
		DSG-03-2B3		110(83)	110(83)	110(83)	110(83)	63	63	63	63	110(63)	103(55)	94(34)	84(32)

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 ofany voltage variants within theserviceable voltage.



2. For the maximum flow rate in P→T of the valves with a ★mark, please see page E-27.

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

■List of Standard Models and The Maximum Flow

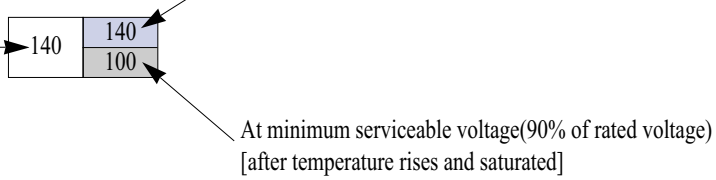
●Models with DC Solenoids : DSG-03-※※※-D※

No. of Valve Positions	Spool-Spring Arrangement	Model Numbers	Graphic Symbols	Max. Flow L/min											
				P → A, B → A, T (A → B)				P → A (Port "B" Blocked)				P → B (Port "A" Blocked)			
				Working Pressure MPa{kgf/cm²}				Working Pressure MPa{kgf/cm²}				Working Pressure MPa{kgf/cm²}			
				10 {102}	16 {163}	25 {255}	31.5 {321}	10 {102}	16 {163}	25 {255}	31.5 {321}	10 {102}	16 {163}	25 {255}	31.5 {321}
Three Positions	Spring Centred	DSG-03-3C2		140	140	140 130	140 125	120	140 120	100 65	65 55	140	140 120	100 65	65 55
		DSG-03-3C3◆★		125	125	125	125	125	125	125	125	125	125	125	125
		DSG-03-3C4		130	130	120	120	130	130	100 67	67 54	130	130	100 67	67 54
		DSG-03-3C40		130	130	130	130	130	130 112	67 62	53 45	130	130 112	67 62	53 45
		DSG-03-3C60★		130	130	125	125	130	130	130	130	130	130	130	130
		DSG-03-3C9		125	125	125	125	120	120	120	120	120	120	120	120
		DSG-03-3C10◆		125	125	125 75	90 65	125	120 80	75 55	65 45	125	120 80	75 55	65 45
		DSG-03-3C12◆		125	125	125 75	90 65	125	125 90	75 55	65 45	125	125 90	75 55	65 45
Two Positions	No-Spring Detented	DSG-03-2D2		110	110	110	110	60	60	45	42	90	90	60	53
	Spring Offset	DSG-03-2B2		111 100	111 100	111 100	111 100	78	60	44	44	126	120 87	79 61	66 50
		DSG-03-2B3		132	132	132	132	116	100	81	79	132	132	132	132 113

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 any voltage variants within the serviceable voltage.

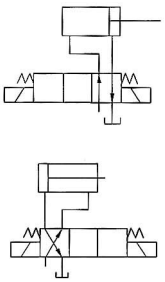


2. For the maximum flow rate in P→T of the valves with a ★mark, please see page E-27.

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

■Maximum Flow of Centre By-Pass (P → T)

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

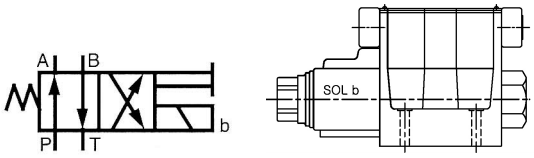


Model Numbers	Graphic Symbols	Max. Flow L/min			
		10 MPa {102 kgf/cm²}	16 MPa {163 kgf/cm²}	25 MPa {255 kgf/cm²}	31.5 MPa {321 kgf/cm²}
DSG-03-3C3-A※		160	150	140	140
DSG-03-3C3-D※					
DSG-03-3C60-A※		155	140	125	120
DSG-03-3C60-D※					

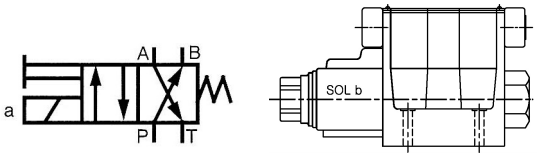
■Reverse Mounting of Solenoid

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 NeutralPosition and Side Position" given below.



Standard Mtg. of Solenoid

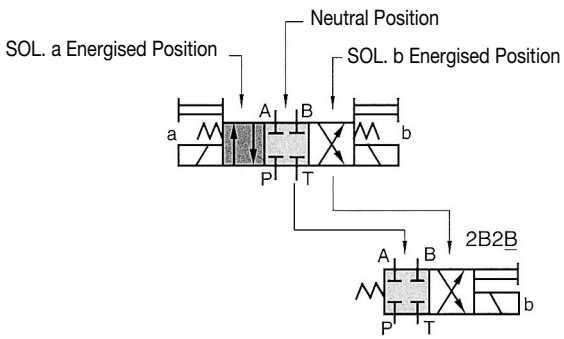


Reverse Mtg. of Solenoid

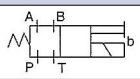
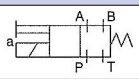
■Valves Using Neutral Position and Side Position (Special Two Position Valve)

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. The valve using the neutral position and SOL b position (2B※ B) is available.

(Example) In case of Spool Type "2"



"B": Use of Neutral and SOL. b Energised Position(2B2B)

Model Numbers	Graphic Symbols	
	Standard Mtg. Type	Reverse Mtg. Type
DSG-03-2B※B		
DSG-03-2B2B	★ 	★ 
DSG-03-2B3B		——
DSG-03-2B4B		——
DSG-03-2B60B	★ 	——
DSG-03-2B10B		——

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

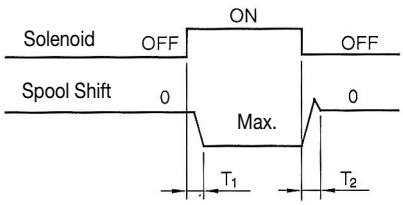
■Typical Changeover Time

●Standard Type (Without Shockless Function)

[Test Conditions]

Pressure : 16MPa {163kgf/cm²}
Flow Rate : 70L/min
Viscosity : 30mm²/s
Voltage : 100 %V (After coil temperature rises and saturated)

[Result of Measurement]

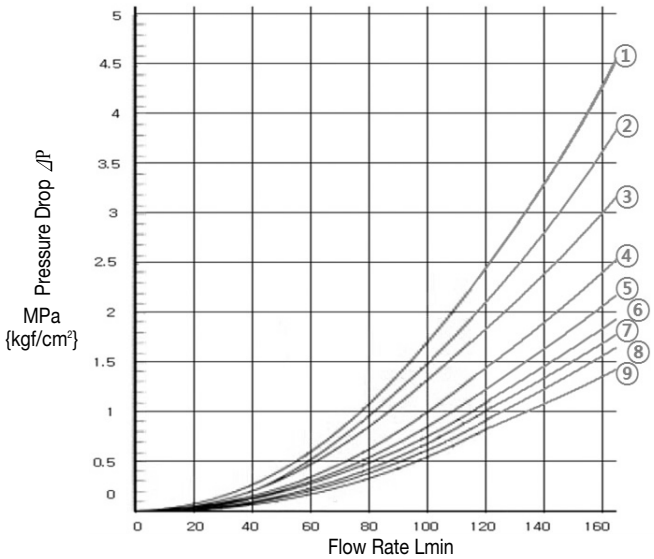


Type	Model Numbers	Changeover Time ms	
		T_1	T_2
Standard Type	DSG-03-3C2-A※	27	22
	DSG-03-3C2-D※	97	30

■Pressure Drop

Pressure drop curves based on viscosity of 35 mm2/s 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-03-3C60	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	–

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

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

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

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

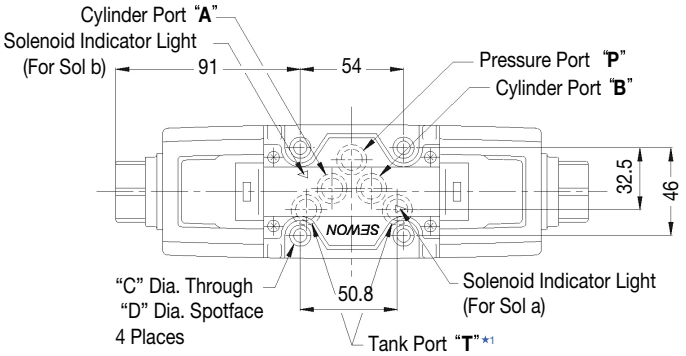
Mounting surface : ISO 4401-AC-05-4-A

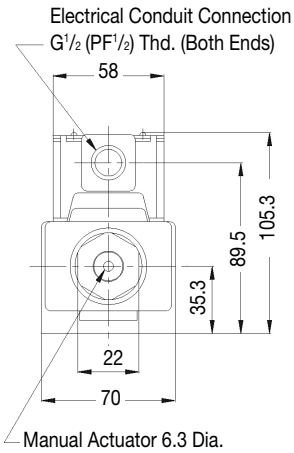
TERMINAL BOX TYPE

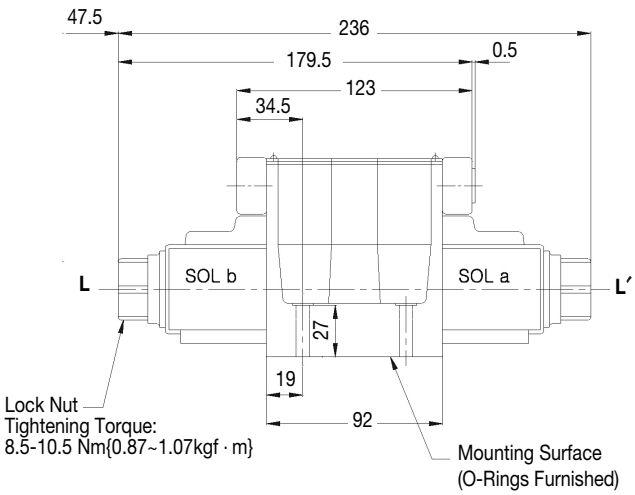
■Models with AC Solenoids : DSG-03-※※※-A※

●Spring Centred

●No-Spring Detended



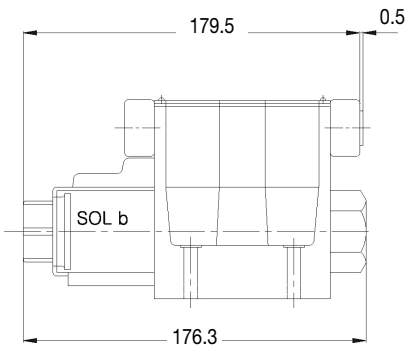




Model Numbers	C	D	Remarks
DSG-03-※※※-A※-80	7	11	Standard
DSG-03-※※※-A※-8002	8.8	14	Option

★1. 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.

●Single Solenoid ; Spring Offset

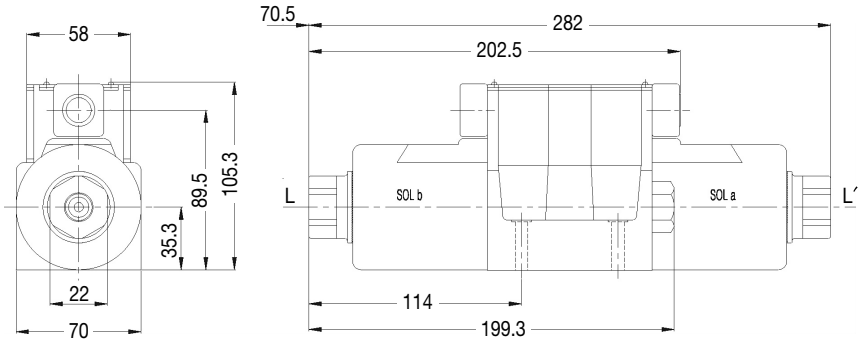


- For other dimensions, refer to to "Spring Centred and No-Spring Detented" medels.
- Solenoid being mounted in the reverse Position -SOL a side-is also available.

■Models with DC Solenoids : DSG-03-※※※-D※

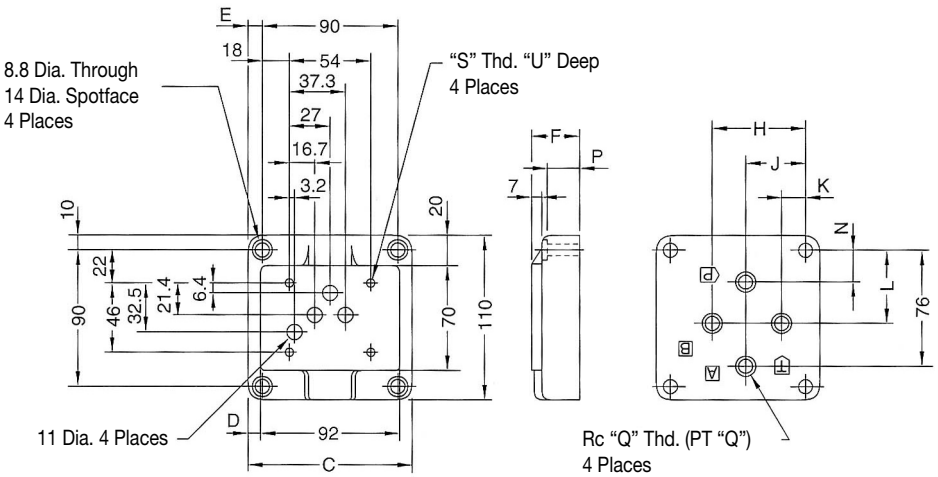
- ●Spring Centred
- ●No-Spring Detented
- ●Spring Offset

Space Needed to Remove Double Solenoid



• Solenoid-Each End Models Only For other dimensions, refer to Models with AC solenoids. (page E-29)

■Sub - Plates



Sub-plate Model Numbers	C	D	E	F	H	J	K	L	N	P	Q
DSGM-03-40/4002	110	9	10	32	62	40	16	48	21	24	3/8
DSGM-03X-40/4002											1/2
DSGM-03Y-40/4002	120	14	15	50	80	45	10	47	16	42	3/4

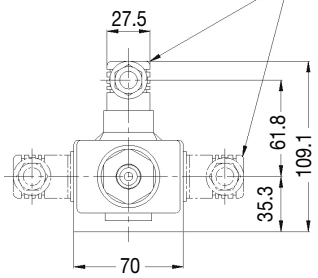
Sub-plate Model Numbers	S	U	Remarks
DSGM-03※-40	M6	13	Standard
DSGM-03※-4002	M8	14	Option

OPTION

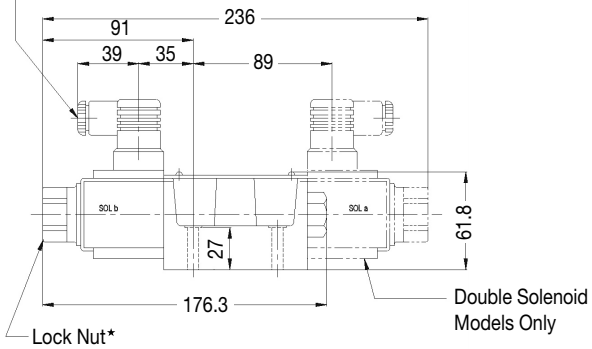
■PLUG-IN CONNECTOR TYPE (N) &PLUG-IN CONNECTOR WITH INDICATOR LIGHT (N1)OPTION

●Models with AC Solenoids : DSG-03-※※※-A※-N/N1

The position of the Plug-in connector can be changed asillustrated below by loosening the lock nut. Aftercompletion of the change, be sure to tighten the lock nutwith the torque as specified below. ★



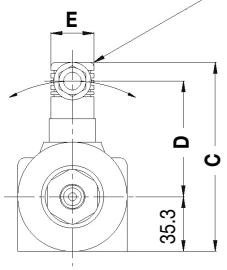
Cable Departure
Cable Applicable:
Outside Dia. 8-10mm
Conductor Area . . . . . Not Exceeding 1.5mm2



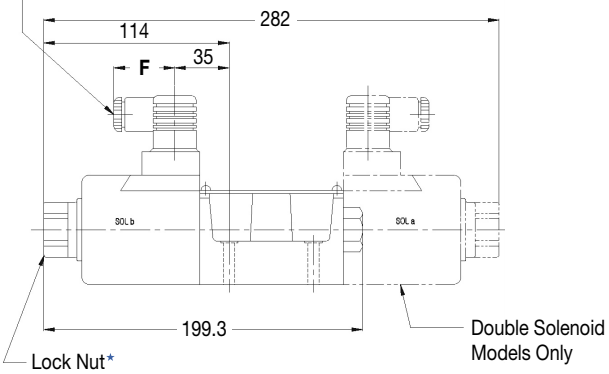
Lock Nut*
Tightening Torque:8.5 - 10.5 Nm{0.87~1.07kgf · m}

●Models with DC Solenoids : DSG-03-※※※-D※-N/N1

The position of the Plug-in connector can be changed asillustrated below by loosening the lock nut. Aftercompletion of the change, be sure to tighten the lock nutwith the torque as specified below. ★



Cable Departure
Cable Applicable:Outside Dia. 8-10mm
Conductor Area . . . . . Not Exceeding 1.5mm2



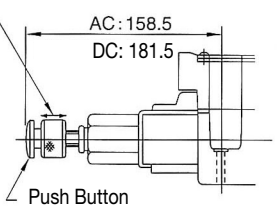
Lock Nut*
Tightening Torque:8.5 - 10.5 Nm
{1.87~1.07kgf · m}

Model Numbers	C	D	E	F
DSG-03-※※※-D※-N/N1	121.1	73.8	27.5	39

• For other dimensions, refer to "Teminal Box Type" (page E31~E32)

■ Options : Models with Push Button & Lock Nut
DSG-03-※※※-※-C

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

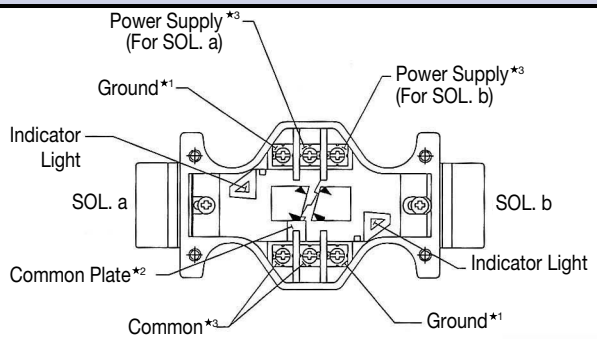


■ Wiring Method

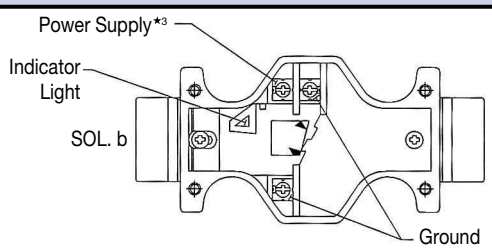
●Details of Receptacle

Terminal Box Type

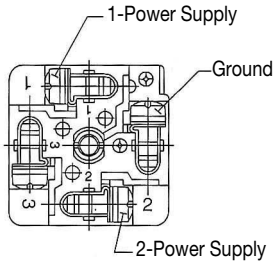
Double Solenoid Type



Single Solenoid Type (SOL b)



Plug-in Connector Type

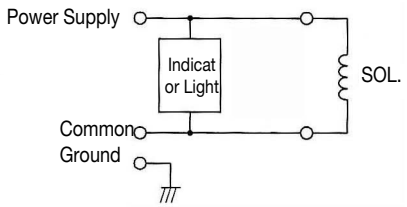


★1. There are two grounding terminals. You can use either one.
★2. If you do not need the common plate, remove it.
★3. With DC solenoids, polarity is no question.

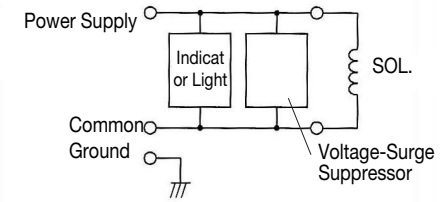
●Electrical Circuit

Terminal Box Type

AC

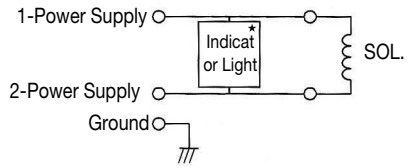


DC



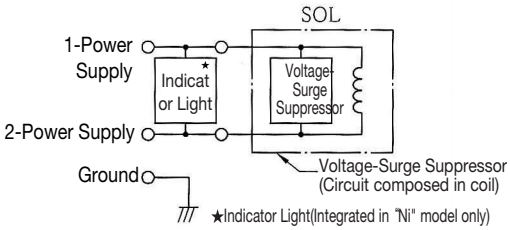
Plug-in Connector Type

AC



★Indicator Light(Integrated in "Ni" model only)

DC



★Indicator Light(Integrated in "Ni" model only)

⚠ DANGER

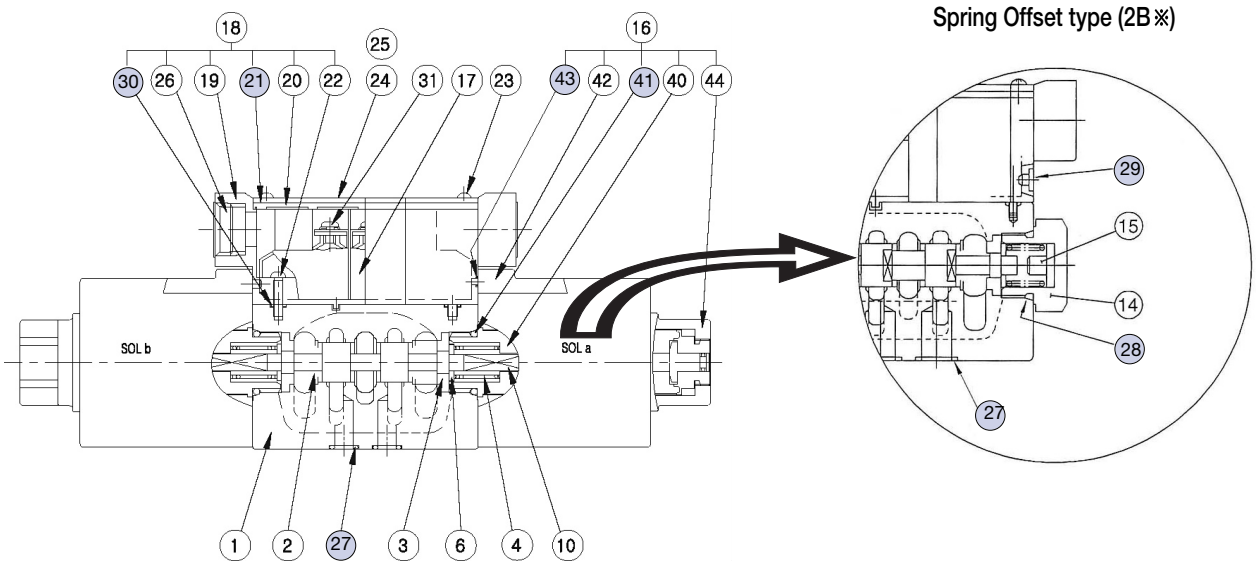
· Do not perform wiring while the power is on.
Doing so may result in electric shock, burns or death.
· Make the wiring properly. Improper wiring will cause anirregular movement of the machine, resulting in a graveaccident.

CAUTION

When making replacement of seals or solenoid assemblies, please do it carefully after reading through the relevant instructions in the Operator's Manual.

■List of Seals

DSG-03-※※※



●List of Seals

Item	Name of Parts	Part Numbers	Qty.			Remarks
			3C※	2D※	2B※	
21	Gasket	1751S-VK418689-6	1	1	1	
27	O-Ring	AS 568-014 (NBR, Hs90)	5	5	5	
28	O-Ring	JIS B 2401-1B-P21	–	–	1	
29	Plug	1790S-VK418329-2	–	–	2	
30	O-Ring	S6	2	2	2	
41	O-Ring	JIS B 2401-1B-P21	2	2	1	} Included in Solenoid Ass'y (Item ⑯)
43	O-Ring	JIS B 2401-1A-P4	4	4	2	

WARNING

Keep the following points before working.

If neglected, the operation of the device or hydraulic oil spewing during the work in progressare cause the heavy accident.

- The power switch off and then the motor and the engine make sure that are stopped.
- The pressure in the hydraulic pipe must be zero.