

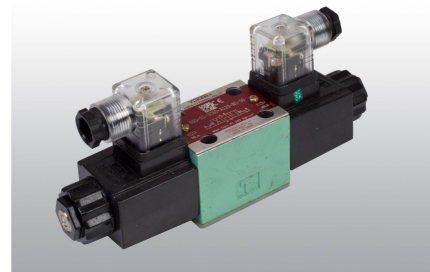
❖ 1/8 Solenoid Operated Directional Valves, DSG-01 Series

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

The DSG-01 50 series solenoid operated directional valve comes with two basic models:

⌘ **Standard type** ----- high pressure, high flow [315 kgf/cm² 63 l/min]

⌘ **Shock-less type** -----which greatly reduces noise which is a result of spool changeover and vibrating pipes



Plug-in Connector Type

The optimum valve for any system can be utilised since many spool types, and various solenoids are all available, along with other optional functions.

❖ Ratings

Valve Type	Model Numbers	Max. Flow l/min	Max. Operating Pressure kgf/cm ²	Max. T-Line Back Pressure kgf/cm ²	Max. Changeover Frequency Cycles/Min	Mass kg
Standard Type	DSG-01-3C*-50	63	315 (Spool Type 60 Only) 250	160	300 (R Type Sol. Only) 120	2.2
	DSG-01-2D2*-50					1.6
	DSG-01-2B*-50					1.6
Shockless Type	S-DSG-01-3C*-50	40	160	160	120	2.2
	S-DSG-01-2B2*-50					1.6

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 145 and 146 for details.

❖ Sub-Plates

Sub-plate Model Numbers	Thread Size	Approx. Mass kg
DSGM-01-3080	1/8 BSP.F	0.8
DSGM-01X-3080	1/4 BSP.F	0.8

Sub-plates are available. Specify sub-plate model 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.

Soc. Hd. Cap Screw	Qty.	Tightening Torque	Bolt kit Model No.
M5 x 45 Lg	4	0.5-0.7 kgf-m [Applicable to working pressure more than 250 kgf/cm ² : 0.6 - 0.7 kgf-m]	BKDSG-01-10

❖ Solenoid Ratings

Valve Type	Electric Source		(Hz)	Voltage (V)		Current & Power at Rated Voltage		
				Source Rating	Serviceable Range	Inrush (A)*2	Holding (A)	Power (W)
Standard Type	*1 AC	A100	50	100	80 - 110	2.38	0.46	—
			60	100	90 - 120	2.12	0.32	
				110		2.33	0.39	
		A120	50	120	96 - 132	1.98	0.38	
			60		108 - 144	1.77	0.27	
		A200	50	200	160 - 220	1.19	0.23	
			60	200	180 - 240	1.06	0.16	
				220		1.17	0.19	
			A240	50	240	192 - 264	0.99	
		60		216 - 288		0.89	0.13	
Shockless Type	DC (K Series)	D12	—	12	10.8- 13.2	—	2.2	26
		D24		24	21.6 - 26.4		1.1	
		D100		100	90 - 110		0.27	
	AC DC Rectified	R100	50/60	100	90 - 110	—	0.30	26
		R200		200	180 - 220		0.15	

*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.

❖ Model Number Designation

F	S	DSG	- 01	- 2	B	2	A	- A 100	- N	50	- L		
Special Seals	Shock-Less Type	Series Number	Valve Size	Number of Valve Positions	Spool Spring Arrangement	Spool Type	Special Two Position Valve [Omit if not required]	Coil Type	Electrical Conduit Connection	*3 Design Number	Models with Alternate Offset Solenoid [Omit if not required]		
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	None : Standard Type Detented	DSG : Solenoid Operated Directional Valve	01	3 :	C :	2. 3 4.40 5.60 7. 8 9.10 11.12	—	AC : A 100 A 120 A 200 A 240	N : With Plug-in Connector (DIN)	50	—		
				2 :	D :	2. 3 7. 8	A* ₁	DC : D 12 D 24 D 100			N1 : With Plug-in Connector with Indicator Light (Option)		
					B :	2. 3 8	A* ₁ B* ₁	R : (AC DC) R 100 R 200					
				3 :	C :	2. 4 40	—	DC : D 12 D 24 D 100			—		
	S : Shock Less Type			2 : Two Positions	N : No-Spring		2	R: *2 AC DC R 100 R 200	L				
					B:Spring Offset		2						

* 1. Another spool types for special 2-position valves are available in addition to spool type 2,3,7 and 8.

* 2. Coil type "R" is not available for plug-in connector with indicator light type "N1".

* 3. Design numbers subject to change. But installation dimensions remain as shown for design number 50 through 59.

❖ List of Spool Function of Standard Type

⌘ Models with AC Solenoids : DSG-01-***-A*

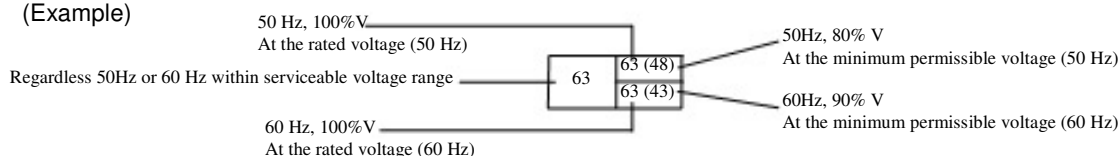
No. of Valve Positions	Spool-Spring Arrangements	Model Numbers	Graphic Symbols	Max. Flow l/min														
				P → A → B → T P → B → A → T					P A [Port "B" Blocked]					P B [Port "A" Blocked]				
				50 kgf/cm ²	100 kgf/cm ²	160 kgf/cm ²	250 kgf/cm ²	315 kgf/cm ²	50 kgf/cm ²	100 kgf/cm ²	160 kgf/cm ²	250 kgf/cm ²	315 kgf/cm ²	50 kgf/cm ²	100 kgf/cm ²	160 kgf/cm ²	250 kgf/cm ²	315 kgf/cm ²
Three Positions	Spring Centered	DSG-01-3C2		63	63	63	63	63	63 (30) 45 (25)	63 (23) 33 (18)	63 (15) 20 (10)	50 (10) 13 (5)	40 (10) 13 (5)	63 (30) 45 (25)	63 (23) 33 (18)	63 (15) 20 (10)	50 (10) 13 (5)	40 (10) 13 (5)
		DSG-01-3C3		63	63	63	63	63	63	63	63	63	63	63	63	63	63	63
		DSG-01-3C4		63	63	63	63	63 (48) 63 (43)	63 (25) 58 (20)	63 (23) 48 (18)	63 (20) 35 (15)	63 (13) 20 (8)	55 (10) 13 (5)	63 (25) 58 (20)	63 (23) 48 (18)	63 (20) 35 (15)	63 (13) 20 (8)	55 (10) 13 (5)
		DSG-01-3C40		63	63	63	63	63	63 (30) 45 (25)	63 (23) 33 (18)	63 (15) 20 (10)	50 (10) 13 (5)	40 (10) 13 (5)	63 (30) 45 (25)	63 (23) 33 (18)	63 (15) 20 (10)	50 (10) 13 (5)	40 (10) 13 (5)
		* DSG-01-3C5		45	43	40	40	—	45	43	40	40	—	45	43	40	40	—
		* DSG-01-3C60		45	43	40	40	—	45	43	40	40	—	45	43	40	40	—
		DSG-01-3C7		63	63	63	63	63	63	63	63	63	63	63	63	63	63	63
		DSG-01-3C8		—	—	—	—	—	63 (25) 63 (20)	63 (25) 38 (20)	63 (25) 28 (20)	63 (15) 20 (10)	63 (10) 15 (5)	63 (25) 63 (20)	63 (25) 38 (20)	63 (25) 28 (20)	63 (13) 20 (10)	63 (10) 15 (5)
		DSG-01-3C9		63	63	63	63	63	28	20	15	10	10	28	20	15	10	10
		DSG-01-3C10		63	63	63	63	63	63 (38) 63 (33)	63 (30) 45 (25)	63 (25) 30 (20)	63 (15) 20 (10)	63 (13) 15 (8)	63 (38) 63 (33)	63 (30) 45 (25)	63 (25) 30 (20)	63 (15) 20 (10)	63 (13) 15 (8)
		DSG-01-3C11		63	63	63	63	63	30	23	20	13	10	63 63 (58)	63 (50) 63 (45)	63 (50) 63 (45)	63 (50) 63 (45)	63 (50) 63 (45)
		DSG-01-3C12		63	63	63	63	63	63 (30) 63 (25)	63 (28) 35 (23)	63 (23) 25 (18)	63 (18) 18 (13)	63 (15) 15 (10)	63 (30) 63 (25)	63 (28) 35 (23)	63 (23) 25 (18)	63 (18) 18 (13)	63 (15) 15 (10)
Two Positions	No Spring Detented	DSG-01-2D2		63	63	63	63	63	45	45	45	45 (35) 40 (30)	45 (25) 30 (20)	45	45	45	45 (35) 40 (30)	45 (25) 30 (20)
		DSG-01-2D3		63	63	63	63	63	45	45	45	45 (35) 40 (30)	45 (25) 30 (20)	45	45	45	45 (35) 40 (30)	45 (25) 30 (20)
		DSG-01-2D7		63	63	63	63	63	45	45	45	45 (35) 40 (30)	45 (25) 30 (20)	45	45	45	45 (35) 40 (30)	45 (25) 30 (20)
		DSG-01-2D8		—	—	—	—	—	40 (30) 35 (30)	40 (30) 35 (30)	40 (30) 35 (30)	35 (30) 30 (25)	35 (25) 25 (20)	40 (30) 35 (30)	40 (30) 35 (30)	40 (30) 35 (30)	35 (30) 30 (25)	35 (25) 25 (20)
	Spring Offset	DSG-01-2B2		63	63	63	63	63	20	20	20	20	20	63 63 (50)	63 (55) 63 (50)	63 (50) 63 (45)	63 (50) 63 (45)	63 (45) 60 (40)
		DSG-01-2B3		63	63 63 (60)	63 63 (60)	63 63 (60)	63 63 (60)	50	50	50	50	50	63 63 (55)	63 63 (55)	63 63 (55)	63 63 (55)	63 63 (55)
		DSG-01-2B8		—	—	—	—	—	25	13	10	10	10	63 (28) 63 (23)	63 (25) 35 (20)	63 (20) 23 (15)	63 (13) 15 (8)	50 (10) 10 (5)

Note : 1. Maximum flow rates and applied current.

⌘ The single column describes maximum flow rates regardless AC solenoid 50 Hz or 60 Hz within serviceable voltage range.

⌘ Maximum flow rates at 50 Hz solenoid with serviceable voltage range refer to the figures in the upper column and 60 Hz solenoid within serviceable voltage range refer to the figures in the latter column. Where two figures are shown in the same column, the figure outside () is at rated voltage and inside () is at the minimum permissible solenoid voltage.

(Example)



2. For the maximum flow between P and T of those valves marked "*", refer to page 147

❖ List of Spool Function of Standard Type

⌘ Models with DC or R Type Solenoids : DSG-01-JJJ-DJ/RJ

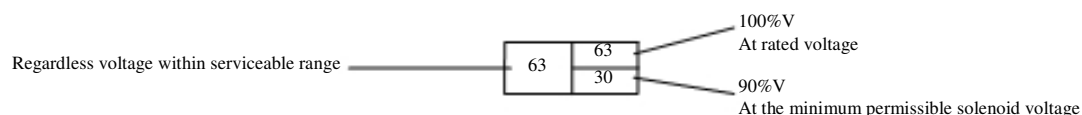
No. of Valve Positions	Spool-Spring Arrangements	Model Numbers	Graphic Symbols	Max. Flow l/min														
				P → A → B → T P → B → A → T					P A [Port "B" Blocked]					P B [Port "A" Blocked]				
				50 kgf/cm ²	100 kgf/cm ²	160 kgf/cm ²	250 kgf/cm ²	315 kgf/cm ²	50 kgf/cm ²	100 kgf/cm ²	160 kgf/cm ²	250 kgf/cm ²	315 kgf/cm ²	50 kgf/cm ²	100 kgf/cm ²	160 kgf/cm ²	250 kgf/cm ²	315 kgf/cm ²
Three Positions	Spring Centered	DSG-01-3C2		63	63	63	63	63	45 33	30 23	20 15	15 10	13 10	45 33	30 23	20 15	15 10	13 10
		DSG-01-3C3		63	63	63	63	63	63	63	63	63	63	63	63	63	63	63
		DSG-01-3C4		63	63	63	63 28	35 23	63 50	45 30	35 23	30 15	28 13	63 50	45 30	35 23	30 15	28 13
		DSG-01-3C40		63	63	63	63	63	45 33	30 23	20 15	15 10	13 10	45 33	30 23	20 15	15 10	13 10
		DSG-01-3C5*		45	43	40	40	—	45	43	40	40	—	45	43	40	40	—
		DSG-01-3C60*		45	43	40	40	—	45	43	40	40	—	45	43	40	40	—
		DSG-01-3C7		63	63	63	63	63	63	63	63	63	63	63	63	63	63	63
		DSG-01-3C8		—	—	—	—	—	63 55	50 28	30 18	20 13	15 10	63 55	50 28	30 18	20 13	15 10
		DSG-01-3C9		63	63	63	63	63	25	20	15	10	10	25	20	15	10	10
		DSG-01-3C10		63	63	63	63 33	45 23	63	55 40	40 28	28 18	20 13	63	55 40	40 28	28 18	20 13
		DSG-01-3C11		63	63	63	63	63	30	23	20	13	10	63	58 50	55 50	55 50	55 50
		DSG-01-3C12		63	63	63	63 30	38 23	63	60 38	40 28	25 20	20 15	63	60 38	40 28	25 20	20 15
Two Positions	No Spring Detented	DSG-01-2D2		63 58	63 55	63 55	63 55	63 55	45	45	45	40 30	30 25	45	45	45	40 30	30 25
		DSG-01-2D3		63 58	63 55	63 55	63 55	63 55	45	45	45	40 30	30 25	45	45	45	40 30	30 25
		DSG-01-2D7		63 58	63 55	63 55	63 55	63 55	45	45	45	40 30	30 25	45	45	45	40 30	30 25
		DSG-01-2D8		—	—	—	—	—	35 30	35 30	35 30	30 25	25 20	35 30	35 30	35 30	30 25	25 20
	Spring Offset	DSG-01-2B2		63 53	63 53	63 53	63 53	63 53	20	18	18	18	18	63	58 40	40 28	30 25	30 25
		DSG-01-2B3		38 28	38 28	38 28	38 28	38 28	48 45	48 45	45 40	45 40	40 38	63	63 60	63 60	63 60	63 60
		DSG-01-2B8		—	—	—	—	—	25	13	10	8	8	63	48 30	28 20	15 13	15 10

Note : 1. Maximum flow rates and applied current.

⌘ The single column describes maximum flow rates regardless voltage within serviceable voltage range.

⌘ Where two figures are shown in the same column, the upper is at rated voltage and the latter is at the minimum permissible solenoid voltage.

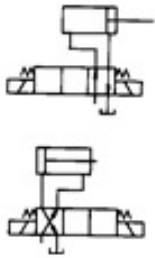
(Example)



2. For the maximum flow between P and T of those valves marked "*", refer to page 147

❖ Maximum Flow of Center By-Pass

In spool type 5 and 60, P T (Center By-Pass) flow rates are limited as shown the column below. Described maximum flow rates are regardless voltage within serviceable voltage range.



Model Numbers	Graphics Symbols	Max. Flow l/min			
		50 kgf/cm ²	100 kgf/cm ²	160 kgf/cm ²	250 kgf/cm ²
DSG-01-3C5-AJ/DJ/RJ		45	43	40	30
DSG-01-3C60-AJ/DJ/RJ		45	43	40	30

❖ List of Spool Function of Shock-Less Type

⌘ Models with Dc of R Type Solenoids : S-DSG-01-JJJ-DJ/RJ

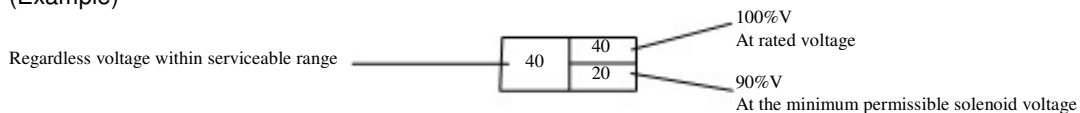
No. of Valve Positions	Spool Spring Arrangement	Model Numbers	Graphic Symbols	Max. Flow l/min								
				P → A → B → T P → B → A → T			P A [Port "B" Blocked]			P B [Port "A" Blocked]		
				50 kgf/cm ²	100 kgf/cm ²	160 kgf/cm ²	50 kgf/cm ²	100 kgf/cm ²	160 kgf/cm ²	50 kgf/cm ²	100 kgf/cm ²	160 kgf/cm ²
Three Positions	Spring Centered	S-DSG-01-3C2		40	40	40	40	40	30	40	40	30
								20	15		20	15
		S-DSG-01-3C4		40	40	40	40	40	30	40	40	30
								20	15		20	15
		S-DSG-01-3C40		40	40	40	40	40	25	40	40	25
						30		20	15		20	15
Two Positions	No-Spring	S-DSG-01-2N2		40	40	40	40	40	40	40	40	40
	Spring Offset	S-DSG-01-2B2		40	40	40	40	30	30	40	40	30
					35	35					20	15

Note : 1. Maximum flow rates and applied current.

⌘ The single column describes maximum flow rates regardless voltage within Serviceable voltage range.

⌘ Where two figures are shown in the same column, the upper is at rated voltage and the latter is at the minimum permissible solenoid voltage.

(Example)

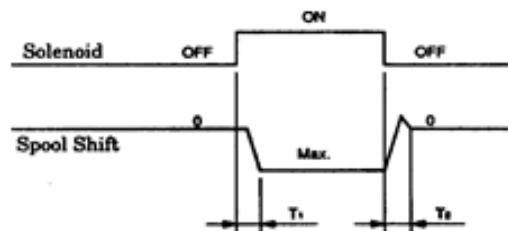


❖ Typical Changeover Time

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

⌘ Standard Type

(Without Shock-less Function)



[Test Conditions]

Pressure: 160 kgf/cm²

Flow Rate: 31.5 l/min

Viscosity: 35cSt(160 SSU)

Voltage: 100% V

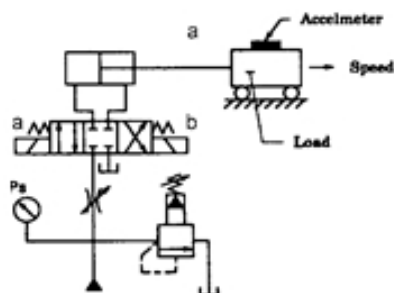
(After coil temperature rise and saturates)

[Result of Measurement]

Type	Model Numbers	Time	
		T1	T2
Standard Type	DSG-01-3C2-A*	15	23
	DSG-01-3C2-D*	48	19
	DSG-01-3C2-R*	50	100

⌘ Shock-less Type

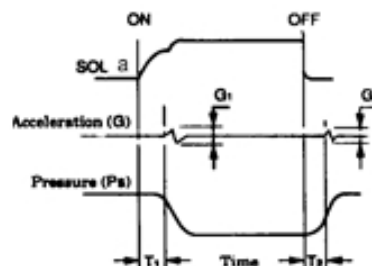
[Test Circuit and Conditions]



Setting Pressure (Ps): 70 kgf/cm²

Speed : 8m/min

[Result of Measurement]

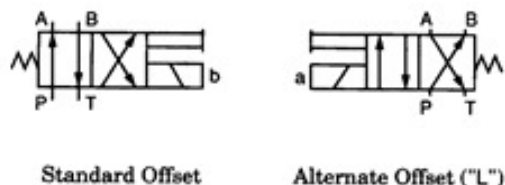


Type	Model Numbers	Time		Acceleration	
		T1	T2	G1	G2
Shock-less Type	S-DSG-01-3C2-D*	70	30	1.2	0.7
Standard Type	DSG-01-3C2-D*	35	25	1.8	1.5

❖ Spring Offset Valves with Alternate Solenoid

Though our standard spring offset models use solenoid "b", alternate models using solenoid "a" are also available. The graphic symbols are expressed below.

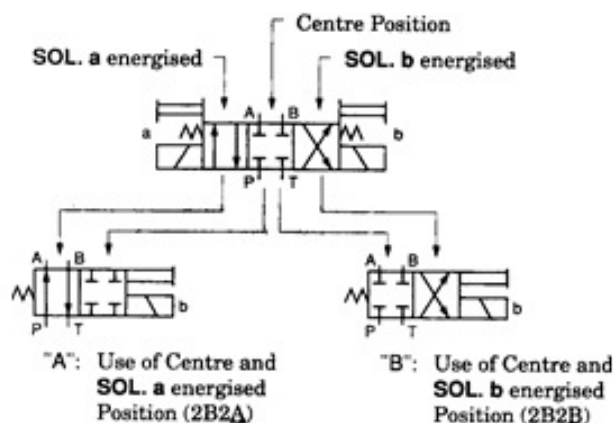
For Models 2 B*A and 2B*B, refer to table below.



❖ Valves with Centre Position and One Offset Position (Special Two Position Valve)

In addition to the standard two position valves shown on the table on pages 145 and 146 two kinds of valves are available with centre position and either one of two offset positions. Standard and alternate offset types use solenoid "b" and solenoid "a" respectively.

(Example) In case of Spool Type "2"



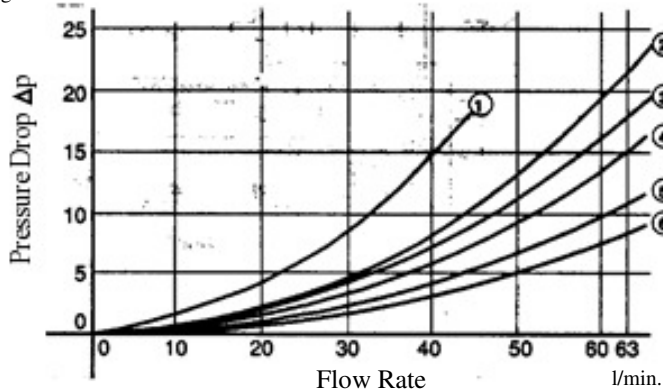
Model Numbers	Graphic Symbols		Model Numbers	Graphic Symbols		Model Numbers	Graphic Symbols
	Standard Offset Type	Alternate Offset Type		Standard Offset Type	Alternate Offset Type		Standard Offset Type
DSG-012B*A			DSG-012B*B			DSG-012D*A	
DSG-01-2B2A			DSG-01-2B2B			DSG-01-2D2A	
DSG-01-2B3A			DSG-01-2B3B			DSG-01-2D3A	
DSG-01-2B4A			DSG-01-2B4B			DSG-01-2D4A	
DSG-01-2B40A			DSG-01-2B40B			DSG-01-2D40A	
DSG-01-2B5A			DSG-01-2B5B			DSG-01-2D5A	
DSG-01-2B60A			DSG-01-2B60B			DSG-01-2D7A	
DSG-01-2B7A			DSG-01-2B7B			DSG-01-2D9A	
DSG-01-2B8A			DSG-01-2B8B			DSG-01-2D10A	
DSG-01-2B9A			DSG-01-2B9B			DSG-01-2D11A	
DSG-01-2B10A			DSG-01-2B10B			DSG-01-2D12A	
DSG-01-2B11A			DSG-01-2B11B				
DSG-01-2B12A			DSG-01-2B12B				

❖ Pressure Drop

Pressure drop based on viscosity of 35 cSt (mm²/s) (160 SSU) and specific gravity of 0.850.

⌘ Standard Type : DSG-01

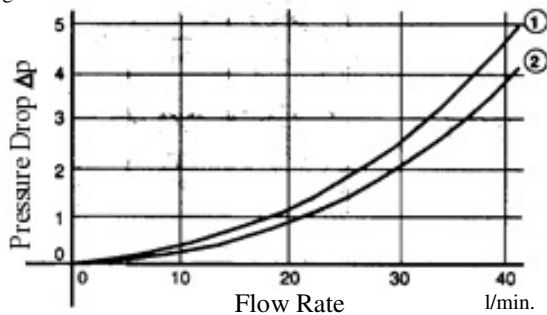
kgf/cm²



Model Numbers	Pressure Drop Curve Number					
	P → A	B → T	P → B	A → T	P → T	
DSG-01-3C2	5	5	5	5	—	
DSG-01-3C3	5	5	5	5	4	
DSG-01-3C4	5	5	5	5	—	
DSG-01-3C40	5	5	5	5	—	
DSG-01-3C5	1	1	1	1	4	
DSG-01-3C60	1	1	1	1	4	
DSG-01-3C7	5	5	5	5	—	
DSG-01-3C8	5	—	5	—	—	
DSG-01-3C9	5	5	5	5	—	
DSG-01-3C10	5	5	5	5	—	
DSG-01-3C11	5	5	5	5	—	
DSG-01-3C12	5	5	5	5	—	
DSG-01-2D2	5	2	5	2	—	
DSG-01-2D3	5	3	5	3	—	
DSG-01-2D7	5	3	5	3	—	
DSG-01-2D8	5	—	5	—	—	
DSG-01-2B2	2	2	5	2	—	
DSG-01-2B3	3	3	5	3	—	
DSG-01-2B8	5	—	5	—	—	
DSG-01-2N2	5	2	5	2	—	
DSG-01-2N3	5	3	5	3	—	
DSG-01-2N7	5	3	5	3	—	
DSG-01-2N8	5	—	5	—	—	

⌘ Shock-Less Type : S-DSG-01

kgf/cm²



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-01-3C40	1	2	1	2
S-DSG-01-2N2	1	1	1	1
S-DSG-01-2B2	1	1	1	1

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

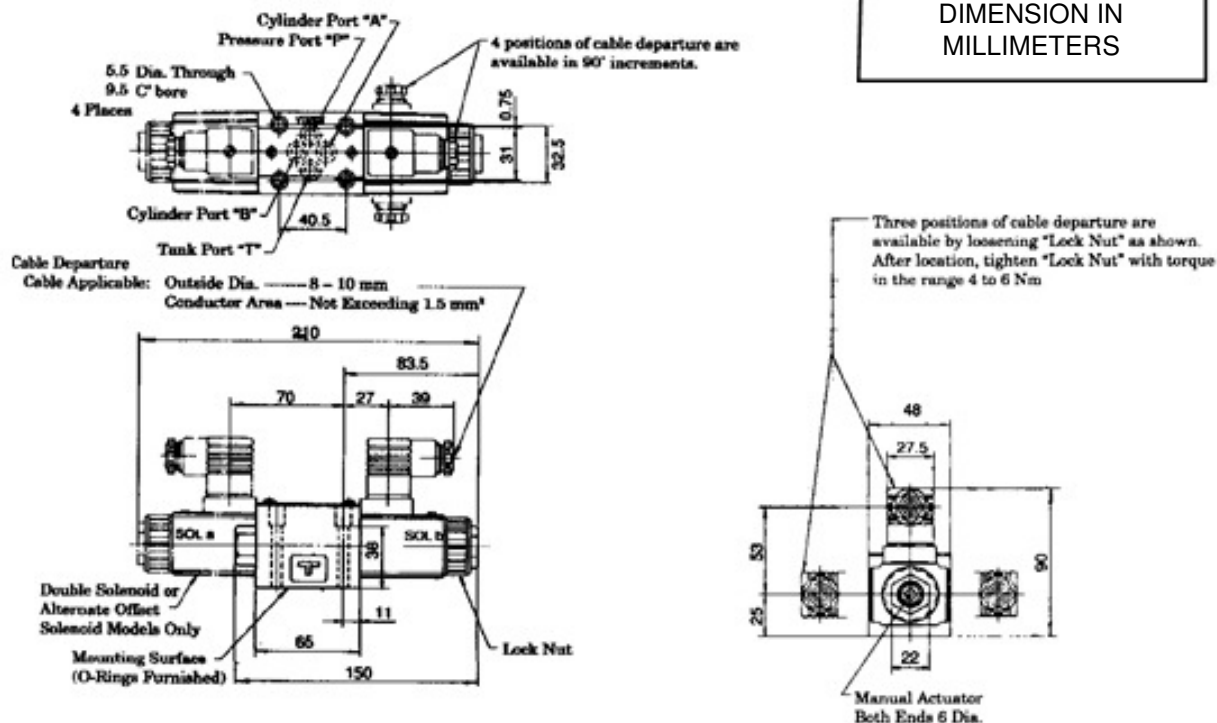
Viscosity	cSt (mm ² /s)	15	20	30	40	50	60	70	80	90	100
	SSU	77	98	141	186	232	278	324	371	417	464
	Factor	0.81	0.87	0.96	1.03	1.09	1.14	1.19	1.23	1.27	1.30

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

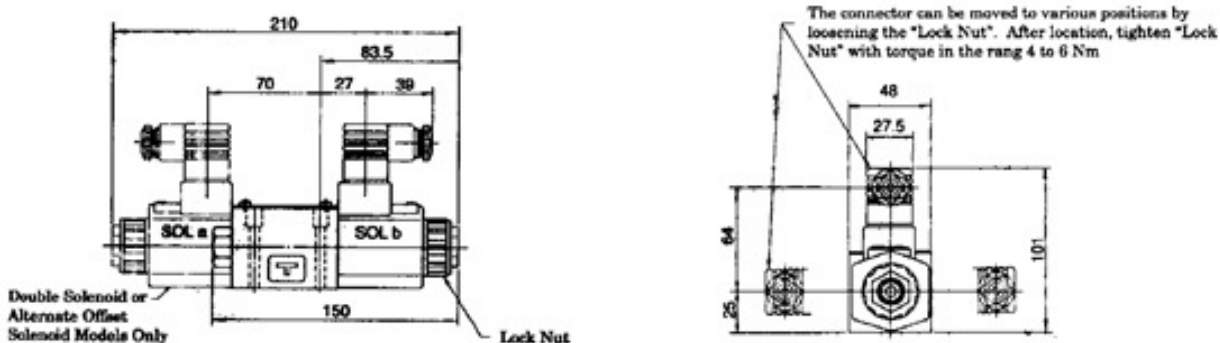
$$\Delta P' = P(G'/0.850)$$

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

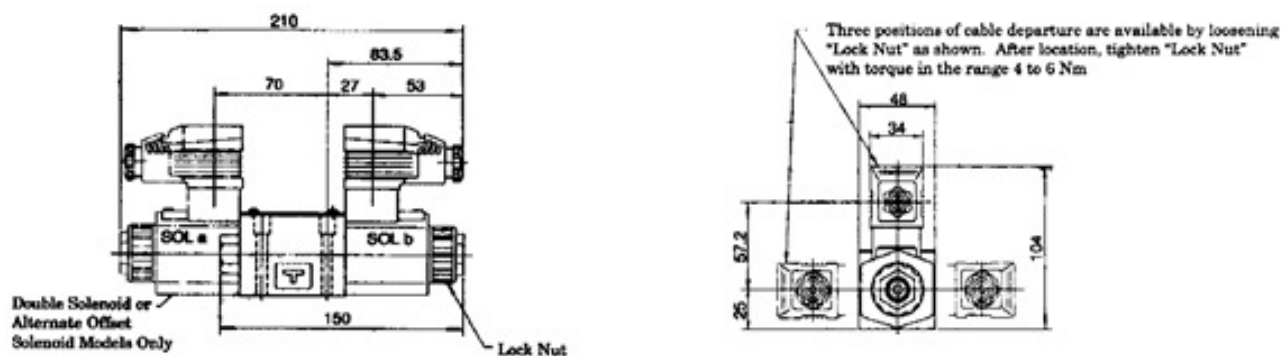
- ❖ Models with AC Solenoids : DSG-01-***-A* $\begin{matrix} N \\ N1 \end{matrix}$ -50



- ❖ Models with DC Solenoids : (S)-DSG-01-***-D* $\begin{matrix} N \\ N1 \end{matrix}$ -50



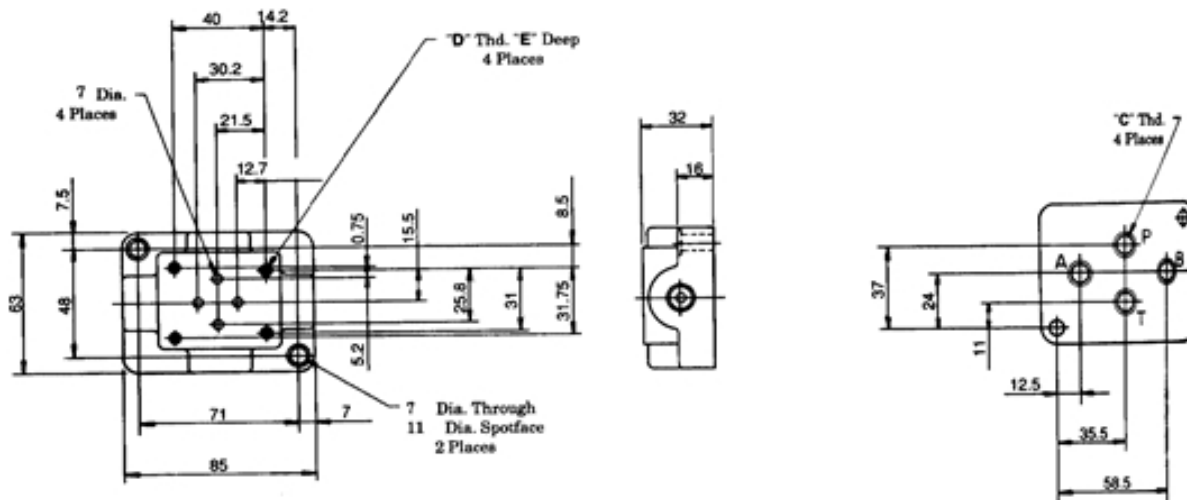
- ❖ Models with R Solenoids : (S)-DSG-01-***-R*-N-50



❖ Sub Plates

DSGM-01*-3080

DIMENSION IN
MILLIMETERS



Sub-Plate Model Numbers	'C' BSP.F	"D" Thd.	"E"
DSGM-01-3080	1/8	M5	10
DSGM-01X-3080	1/4		

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