

## HYSTAR-2002

*HYSTAR offers a solution for hydraulic control systems for the new and after markets, with a wide range of high quality products and an excellent customer service throughout a well-established worldwide distribution network.*

*Our commitment to a continuous improvement of quality standards is achieved by manufacturing HYSTAR products in accordance with a strict quality control standard and rigorous testing. Serving the customer efficiently and quickly is our priority.*

*Our directional control valves provide high performance and reliability. Available in five sizes that mount on standard CETOP (NFPA) configurations, our valves can be solenoid, hydraulic, pneumatic, cam or manually operated. The precision-machined spools allow a complete interchangeability for maximum flexibility. Reliability is enhanced through high performance wet armature construction AC and DC solenoids. These powerful solenoids offer plug-in (DIN connector type 43650), terminal box or lead-wire type are available. Manual override pins and optional **push-on protective caps**. CETOP 3 (NFPA D03) and CETOP 5 (NFPA D05) versions are also available with a built-in ramp to reduce shock caused by abrupt change of oil flow at a very low cost, i.e. shockless type.*

*Our modular valves series save space and reduce cost. Any type of hydraulic circuit can be installed without piping and fittings by stacking modular valves under the directional valve. "V" series modular valves is the latest version pressure up to 315 bar, size CETOP 3 (NFPA D03) flow up to 60l/min, size CETOP 5 (NFPA D05) flow up to 120l/min, compact type.*

*A full range of in-line, threaded connection and subplate mounted, directional, flow, pressure control valves, pressure switches and pressure gauge is part of our range of hydraulic components. Manifold blocks and subplates complete the range.*

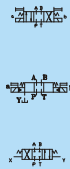
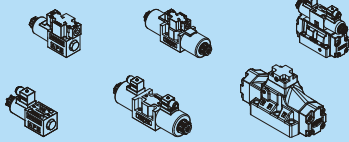
*Our pump program includes gear pumps, fixed displacement vane and variable displacement vane with an adjustable pressure compensator and a maximum flow volume control. For higher pressure, we offer our range of variable piston pumps with an adjustable pressure compensator and a maximum flow volume control.*

*New installations require more and more proportional controls. That is why at HYSTAR we have developed a range of proportional electro-hydraulic pressure and flow control valves. Plus electronic amplifiers to drive these proportional control valves.*

*Our manufacturing program includes logic valves, poppet valves, lift valves, linear position transducers, tie-rod hydraulic cylinders, injection screw, absorbers, bladder accumulators, spin-on filters, suction strainer, oil cooler, fan cooler, mounting brackets, sight level and temperature gauges.*

*HYSTAR offers quality products at sensible prices with the emphasis on proven design and 100% interchangeability. When designing or modifying a hydraulic circuit, our service and range of products make HYSTAR your PARTNER.*

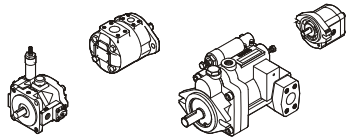
## SOLENOID VALVES



- Solenoid operated directional valves 5
- Solenoid controlled pilot operated directional valves. 41
- Hydraulic Operated Directional Valves. 59

A

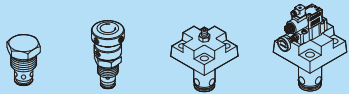
## PUMPS



- Variable Displacement Vane Pumps 71
- Fixed Displacement Vane Pumps 87
- Piston Pumps 146
- Gear Pumps 185

B

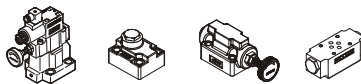
## CARTRIDGE VALVES



- Cartridge Valves (Screw-in Type) 206
- Cartridge Valves (Logic Elements) 240

C

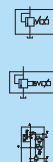
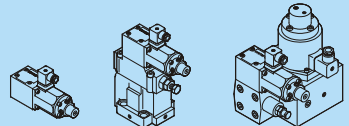
## CONTROLLED VALVES



- Pressure Control Valves 246
- Directional Control Valves & Pre-Fill Valves 263
- Flow Control Valves 291
- Modular Control Valves 315

D

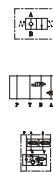
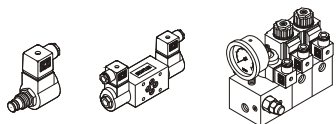
## PROPORTIONAL VALVE



- Proportional Electro-Hydraulic Pilot Relief Valves 343
- Proportional Electro-Hydraulic Relief Valves 346
- Proportional Electro-Hydraulic Relief & Flow Control Valves 350

E

## POPPET & LIFT VALVES



- Solenoid Check Valve (Cartridge Type) 364
- Solenoid Check Valve (Modular Type) 376
- Lift Valves 380

F

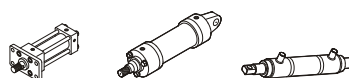
## SWITCHES & GAUGES



- Pressure Switches (Piston-Spring Type) 385
- Pressure Gauges (Liquid Filled Type) 400
- Thermometers 410

G

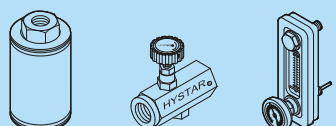
## CYLINDERS



- Hydraulic Cylinders (Industrial Machines) 417
- Hydraulic Cylinders (Packing Equipment) 425
- Hydraulic Cylinders (Lifting System) 428

H

## ACCESSORIES

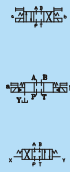
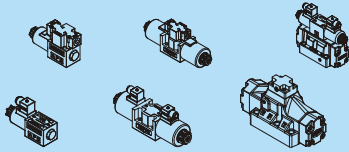


- Suction Filters(Strainer) 438
- In-Line mounting valves 450
- Fluid Level and Thermometer Gauges 441

I



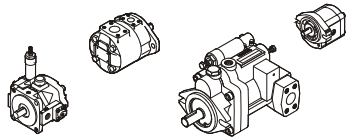
## SOLENOID VALVES



- Solenoid operated directional valves 5
- Solenoid controlled pilot operated directional valves. 41
- Hydraulic Operated Directional Valves. 59

A

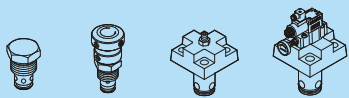
## PUMPS



- Variable Displacement Vane Pumps 71
- Fixed Displacement Vane Pumps 87
- Piston Pumps 146
- Gear Pumps 185

B

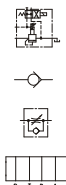
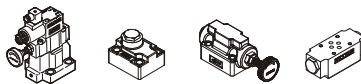
## CARTRIDGE VALVES



- Cartridge Valves (Screw-in Type) 206
- Cartridge Valves (Logic Elements) 240

C

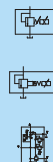
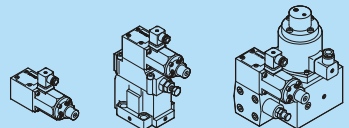
## CONTROLLED VALVES



- Pressure Control Valves 246
- Directional Control Valves & Pre-Fill Valves 263
- Flow Control Valves 291
- Modular Control Valves 315

D

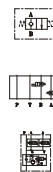
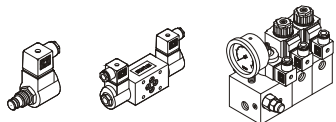
## PROPORTIONAL VALVE



- Proportional Electro-Hydraulic Pilot Relief Valves 343
- Proportional Electro-Hydraulic Relief Valves 346
- Proportional Electro-Hydraulic Relief & Flow Control Valves 350

E

## POPPET & LIFT VALVES



- Solenoid Check Valve (Cartridge Type) 364
- Solenoid Check Valve (Modular Type) 376
- Lift Valves 380

F

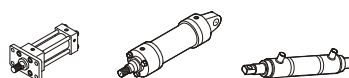
## SWITCHES & GAUGES



- Pressure Switches (Piston-Spring Type) 385
- Pressure Gauges (Liquid Filled Type) 400
- Thermometers 410

G

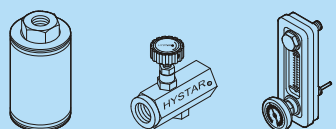
## CYLINDERS



- Hydraulic Cylinders (Industrial Machines) 417
- Hydraulic Cylinders (Packing Equipment) 425
- Hydraulic Cylinders (Lifting System) 428

H

## ACCESSORIES



- Suction Filters(Strainer) 438
- In-Line mounting valves 450
- Fluid Level and Thermometer Gauges 441

I

**A**

## HYSTAR®

MODEL	SOLENOID OPERATED DIRECTIONAL CONTROL VALVES		SOLENOID CONTROLLED PILOT OPERATED DIRECTIONAL CONTROL VALVES			
	01	03	04	06	10	
DSHG-N-**						
DSHG-**						
DSHG-Y-**						
DSHG-N-RW						
DSHG-RW						
DSHG-Y-RW						
DSG-N-**	 AC193(7.60) DC215(8.46)	 AC234(9.21) DC285(11.22)				
DSG-**	 AC193(7.60) DC215(8.46)	 AC234(9.21) DC285(11.22)				
DSG-Y-**	 AC193(7.60) DC215(8.46)	 AC234(9.21) DC285(11.22)				
DSGX-N-**	 AC160(6.30)					
DSGX-**	 AC160(6.30)					
DSGX-Y-**	 AC160(6.30)					
	Max. Flow : $\ell$ /min : U.S.GPM	63 16.6	120 31.7	300 79.3	500 132	1100 291

3 15  
(4500)

















Max. Pressure: bar(p.s.i)

















200  
(2900)



















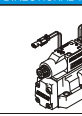

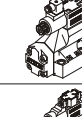

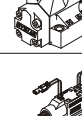

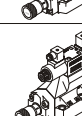

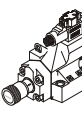

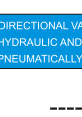

# "DSG" DIRECTIONAL VALVES







A



DIN TYPE HYDRAULIC SOLENOID VALVES	Graphic Symbol	Q max. lpm (USgpm)	P max. bar(PSI)	Valve Size	Ref. Pages
		63(16.64)	200(2900)	1/8"	11
		63(16.64)	315(4500)	1/8"	14
		63(16.64)	315(4500)	1/8"	14
		120(31.70)	315(4500)	3/8"	19
		120(31.70)	315(4500)	3/8"	19
		63(16.64)	200(2900)	1/8"	11
		63(16.64)	315(4500)	1/8"	14
		120(31.70)	315(4500)	3/8"	19

TERMINAL TYPE HYDRAULIC SOLENOID VALVES	Graphic Symbol	Q max. lpm (USgpm)	P max. bar(PSI)	Valve Size	Ref. Pages
		63(16.64)	200(2900)	1/8"	11
		63(16.64)	315(4500)	1/8"	15
		63(16.64)	315(4500)	1/8"	15
		120(31.70)	315(4500)	3/8"	20
		120(31.70)	315(4500)	3/8"	20
		63(16.64)	200(2900)	1/8"	11
		63(16.64)	315(4500)	1/8"	15
		120(31.70)	315(4500)	3/8"	20

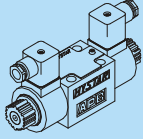

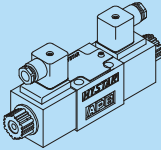

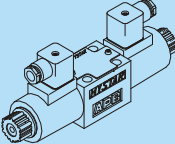

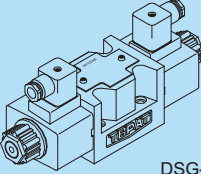

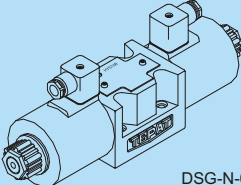

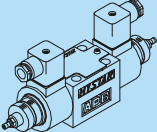

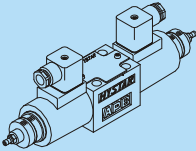

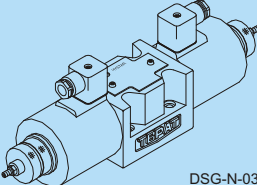

SWP TYPE HYDRAULIC SOLENOID VALVES	Graphic Symbol	Q max. lpm (USgpm)	P max. bar(PSI)	Valve Size	Ref. Pages
		63(16.64)	200(2900)	1/8"	12
		63(16.64)	315(4500)	1/8"	16
		63(16.64)	315(4500)	1/8"	16
		120(31.70)	315(4500)	3/8"	21
		120(31.70)	315(4500)	3/8"	21
		63(16.64)	200(2900)	1/8"	12
		63(16.64)	315(4500)	1/8"	16
		120(31.70)	315(4500)	3/8"	21

SOLENOID CONTROLLED PILOT OPERATED DIRECTIONAL VALVES	Graphic Symbol	Q max. lpm (USgpm)	P max. bar(PSI)	Valve Size	Ref. Pages
		300(79.26)	315(4500)	1/2"	46
		500(132.10)		3/4"	
		1100(290.62)		1-1/4"	
		300(79.26)	315(4500)	1/2"	47
		500(132.10)		3/4"	
		1100(290.62)		1-1/4"	
		300(79.26)	315(4500)	1/2"	48
		500(132.10)		3/4"	
		1100(290.62)		1-1/4"	
		300(79.26)	315(4500)	1/2"	46
		500(132.10)		3/4"	
		1100(290.62)		1-1/4"	
		300(79.26)	315(4500)	1/2"	47
		500(132.10)		3/4"	
		1100(290.62)		1-1/4"	
		300(79.26)	315(4500)	1/2"	48
		500(132.10)		3/4"	
		1100(290.62)		1-1/4"	

DIRECTIONAL VALVES(DHG TYPE) HYDRAULIC AND PNEUMATICALLY OPERATED	Graphic Symbol	Q max. lpm (USgpm)	P max. bar(PSI)	Valve Size	Ref. Pages
		63(16.64)	315(4500)	1/8"	63
		120(31.70)	315(4500)	3/8"	63
		300(79.26)	315(4500)	1/2"	64
		500(132.10)		3/4"	
		1100(290.62)		1-1/4"	

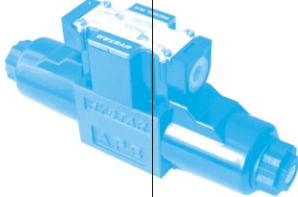
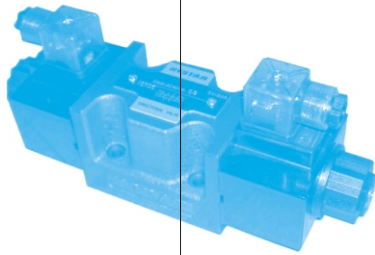
DIRECTIONAL VALVES(DHG TYPE) HYDRAULIC AND PNEUMATICALLY OPERATED	Graphic Symbol	Q max. lpm (USgpm)	P max. bar(PSI)	Valve Size	Ref. Pages
----	--	--	--	--	--
----	--	--	--	--	--
		300(79.26)	315(4500)	1/2"	64
		500(132.10)		3/4"	
		1100(290.62)		1-1/4"	



DIN TYPE HYDRAULIC SOLENOID VALVES	Graphic Symbol	Q max. lpm (USgpm)	P max. bar(PSI)	Valve Size	Ref. Pages
 <p>DSGX-N-01-AC/DC/RAC</p>		63(16.64)	200(2900)	1/8"	A15
 <p>DSG-N-01-AC</p>		63(16.64)	315(4500)	1/8"	A18
 <p>DSG-N-01-DC/RAC</p>		63(16.64)	315(4500)	1/8"	A18
 <p>DSG-N-03-AC</p>		120(31.70)	315(4500)	3/8"	A23
 <p>DSG-N-03-DC/RAC</p>		120(31.70)	315(4500)	3/8"	A23
 <p>DSGX-N-01-DC/RAC-RW</p>		63(16.64)	200(2900)	1/8"	A15
 <p>DSG-N-01-DC/RAC-RW</p>		63(16.64)	315(4500)	1/8"	A18
 <p>DSG-N-03-DC/RAC-RW</p>		120(31.70)	315(4500)	3/8"	A23

## MODEL NO SPECIFICATIONS ( DSG-01/03 Solenoid Operated Directional Valves )

**A**

Spool Type & Graphic Symbols		Rated Flow Capacity -Maximum Flow Capacity											
		DSG ( X ) - 01 ( 1/8" )					DSG - 03 ( 3/8" )						
		AC		RAC		DC	AC		RAC		DC		
SYMBOLS	MODEL NO	A1	A2	R1	R2	D1	D2	A1	A2	R1	R2	D1	D2
	DSG-2B2-**	 30~63 lpm (10.3~16.6USgpm)					 70~120 lpm (18.5~31.7USgpm)						
	DSG-2B3-**												
	DSG-2B8-**												
	DSG-2D2-**												
	DSG-2D3-**												
	DSG-3C2-**												
	DSG-3C3-**												
	DSG-3C4-**												
	DSG-3C40-**												
	DSG-3C7-**												
	DSG-3C9-**												
	DSG-3C10-**												
	DSG-3C11-**												
	DSG-3C12-**												
	DSG-3C5-**	30~45 lpm (7.9~11.9USgpm)					70~100 lpm (18.5~26.4USgpm)						
	DSG-3C6-**												
	DSG-3C60-**												
Max. Operating Pressure ( P.A.B ) ( bar )		315 ( 4500 PSI )											
Max. Operating Pressure 3C5/3C6 Types ( bar )		250 ( 3600 PSI )											
Permissible Back Pressure ( T ) ( bar )		160 ( 2300 PSI )											
Weight ( Kgs )	Double Solenoid	1.9		2.0		4.0		4.8					
	Single Solenoid	1.5		1.6		3.3		3.8					
Switching Frequency ( times/min )		280		120		280		240		120		240	
Hydraulic Fluids		Use Hydraulic Fluids Equivalent to ISO VG32 or VG46											
Operating Temperature Range Recommended ( °C )		-15 ~ +70 ( +5 ~ +160°F )											
Operating Viscosity ( cSt )		15 ~ 400 ( 80 ~ 1800SSU )											
Filtration		25 Microns Absolute or Finer											

DSGX series mini. type solenoid valves.

Max. pressure ( P.A.B ) : 200bar ( 2900PSI ), 3C5/3C6 spool types : 160bar ( 2300PSI ).

Permissible Back Pressure ( T ) : 100bar ( 1430PSI )

Weight : Double Solenoid : 1.6kgs., Single Solenoid : 1.1kgs

## LIST OF SPECIAL TWO POSITION VALVES ( DSG-01/03 )

**A**

SPRING OFFSET 2 POSITION	GRAPHIC SYMBOLS		SPRING OFFSET 2 POSITION	GRAPHIC SYMBOLS	
	STANDARD	(ALTERNATED)		STANDARD	(ALTERNATED)
2B2A(L)			2B2B(L)		
2B3A(L)			2B3B(L)		
2B4A(L)			2B4B(L)		
2B40A(L)			2B40B(L)		
2B5A(L)			2B5B(L)		
2B6A(L)			2B6B(L)		
2B60A(L)			2B60B(L)		
2B7A(L)			2B7B(L)		
2B8A(L)			2B8B(L)		
2B9A(L)			2B9B(L)		
2B10A(L)			2B10B(L)		
2B11A(L)			2B11B(L)		
2B12A(L)			2B12B		
2B25A(L)			2B25B(L)		
2B29A(L)			2B29B(L)		
2B48A(L)			2B48B(L)		

NOTE : Standard Model No. + L = Alternate Model.  
For example, 2B2A is Standard Model, 2B2AL is Alternate Model.



### Ordering Code

**DSG - 3C2 - N - 01 - D2 - 30 - RW - \*P\*D**

Series No	Spool Type	Type of Ele. Conduit	Valve Size	Coil Voltage	Design No	Special Kits	Pilot and Drain
DSGX 	3C94(-01) 	N: DIN Type 	(DSG-) 01 (NFFPA-D03) 	(N-01-) AC/DC 	30 DIN 912 bolts 	RW(RA/RB) Stroke Limiter 01/03  04/06 	*P Pilot Plug (1/16, 1/8, 1/4) 
DSG(-N-01) 	3C60(-03) 	None:Box Type 	(DSG-) 03 (NFFPA-D05) 	(N-03-) AC/DC 	3090 UNC bolts (North America) 	V: Viton Seal 	*D Drain Plug (1/16, 1/8, 1/4) 
DSG(-N-03) 	3C5(-04) 	Y:Lead-Wire 	(DSHG-) 04 (NFFPA-D07) 	(01-) AC/DC 		Orifice Plug 0.8/0.1/1.2 mm 	
DSHG(-0*) 	3C3(-06) 		(DSHG-) 06 (NFFPA-D08) 	(03-) AC/DC 	C: Check Valve P Port (5 bar) 	C: Check Valve P Port (5 bar)  Fig-1	
DHG(-0*) 	3C60(-10) 		DSHG-10 (NFFPA-D10) 	(Y-01/03-) DC 	Fig-1 	RAC Type Shockless Rectifier built-in 	

COIL TYPE POWER SOURCE VOLTAGE							
AC	A1:	AC100V(50/60Hz) AC110V(60Hz)	DC	D1:	DC12V	D2:DC24V	D3:DC36V
	A2:	AC200V(50/60Hz) AC220V(60Hz)		D4:	DC48V	D5:DC60V	D6:DC72V
	A3:	AC110V(50Hz)		D14.5:	DC14.5V	D28:	DC28V
	A4:	AC220V(50Hz)		R1:	RAC100	R2:	RAC200
	A5:	AC240V(50Hz)		R3:	RAC110	R4:	RAC220
RECTIFIED							

For voltages other than specified, consult HYKING for details.

**VALVE SIZE**  
01-(1/8") 03-(3/8") 04-(1/2") 06-(3/4") 10-(1-1/4")

**ELECTRICAL CONDUIT CONNECTION**  
N: DIN connector with light, DIN 43650.ISO6952.  
Y: SWP connector.  
None: Terminal box type with indicator lamp.

**SPOOL TYPES**

**SERIES NUMBER**  
DSG: Solenoid operated directional valves, subplate mounting.  
DSGX: Solenoid operated directional valves, mini type.  
DSGH: Solenoid controlled pilot operated directional valves.  
DHG: Hydraulic Operated Directional Valves.

**PILOT/DRAIN CONNECTION (DSHG ONLY)**

1P1D: Internal pilot,internal drain  
1P2D: Internal pilot,external drain  
2P1D: External pilot,internal drain  
2P2D: External pilot,external drain

**MODEL WITH SPECIAL KITS (OPTION - Omit If Not Required)**

C: Check Valve P Port (5 bar) V: Viton seals  
S: Shockless type RB: Stroke limiter "B" stroke  
RA: Stroke limiter "A" stroke SK: Surgeless (Surge Killer)  
RW: Stroke limiter "A+B" stroke WP: Water proof type.  
PK: Sparkless (Spark Killer) type. VP: Vibration proof type.

**DESIGN NO**

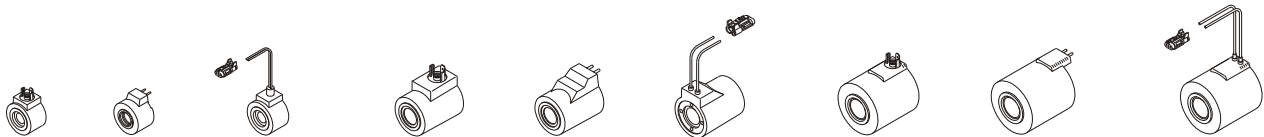
30: with DIN 912 bolts  
3090: with UNC (North American) bolts

Design number is changed from 20 to 30 (2090 to 3090).  
N (DIN Types), all parts are interchangeable with 20(2090)  
Terminal box type equipped with new conduit box design, reference page 35 for details.

## A

### SOLENOID SPECIFICATIONS

AC/DC CURRENT		AC				DC			
						RECTIFIED INSIDE			
VOLTAGE (V)		AC110V		AC220V		R110V	R220V	DC12	DC24
FREQUENCY (Hz)		50	60	50	60	50/60	50/60		
DSGX (01) 1/8"	Starting current (A)	0.56	0.50	0.27	0.25	-	-	-	-
	Holding current (A)	0.12	0.12	0.56	0.52	0.068	0.038	0.44	0.22
	Holding electrical power (W)	-	-	-	-	5.0	5.0	5.0	5.0
DSG (01) 1/8"	Starting current (A)	2.38	2.33	1.19	1.17	-	-	-	-
	Holding current (A)	0.40	0.45	0.20	0.23	0.30	0.15	2.2	1.1
	Holding electrical power (W)	-	-	-	-	26	26	26	26
DSG (03) 3/8"	Starting current (A)	5.37	5.03	2.69	2.52	-	-	-	-
	Holding current (A)	0.70	0.75	0.30	0.35	0.48	0.24	3.16	1.57
	Holding electrical power (W)	-	-	-	-	38	38	38	38
Permissible voltage		95~120		200~235		95~120	200~235	11.0~13.2	22~26.4
Insulation resistance (M Ω)		100 or above (500V)							



### VALVES RESPONSE CAPACITY

Model	Working Direction	Spring Centered Type (3C*)	No Spring Type (2D*)	Unit : Times/Second
				Spring Offset Type (2B*)
DSGX-01 AC	Energization	0.01~0.02	0.01~0.02	0.01~0.02
	Spring back	0.015~0.05	-----	0.015~0.05
DSGX-01 DC/RAC	Energization	0.02~0.05	0.02~0.05	0.02~0.05
	Spring back	0.015~0.05	-----	0.015~0.05
DSG-01-AC	Energization	0.01~0.02	0.01~0.02	0.01~0.02
	Spring back	0.015~0.05	-----	0.015~0.05
DSG-01-DC/RAC	Energization	0.02~0.05	0.02~0.05	0.02~0.05
	Spring back	0.015~0.05	-----	0.015~0.05
DSG-03-AC	Energization	0.005~0.025	0.010~0.020	0.01~0.02
	Spring back	0.005~0.030	-----	0.010~0.030
DSG-03-DC/RAC	Energization	0.030~0.090	0.030~0.090	0.030~0.050
	Spring back	0.020~0.050	-----	0.020~0.040

1) Above response time test condition base on follow terms.

DSG-01 based on 140 bar (2000 psi) , 30 lpm (7.9 USgpm)

DSG-03 based on 140 bar (2000 psi) , 45 lpm (11.9 USgpm)

2) Changeover response time changes a little by the test condition (pressure, flow, viscosity.....etc.).

## DESCRIPTIONS & INSTRUCTIONS

### □ HIGH FLOW

The high flow rate 63 *ℓ/min* (16.6 gpm) of the DSG-(N)-01 valves corresponds to conventional 03 valves.

DSG-(N)-03 is capable of controlling oil flow up to 120 *ℓ/min*. (31.7 gpm)

DSHG-(N)-04 are capable of controlling oil flow up to 300 *ℓ/min*. (79.3 gpm)

DSHG-(N)-06 are capable of controlling oil flow up to 500 *ℓ/min*. (132 gpm)

And DSHG-(N)-10 are capable of controlling oil flow up to 1000 *ℓ/min*. (291 gpm)

[Flow rate is a little different between different spool type.]

### □ HIGH PRESSURE

The DSG-(N)-01/03 solenoid valves, DSHG-(N)-04/06/10 Max operating pressure up to 315 bar(4500 PSI).

### □ LONG SERVICE LIFE

Durable Life: Durability to 50 million spool shifts.(Average)

Life Of Sealing : No oil leaks due to use of no-dynamic seals.

### □ POWERFUL QUIET WET ARMATURE SOLENOID.

Totally enclosed molded coil. Specially treated pressure resistant inner tube(SUS304). High grade steel cored(C2503) coil with wet solenoid. All moving parts are immersed in operating oil and muffled to provide low noise operation.

### □ NO OIL LEAKAGE

Special design of over-ride pins and seals prevent oil leakage.

### □ LOW PRESSURE DROP

See technical data of pressure drop for details. (P-25)

### □ HIGH BACKPRESSURE ALLOWED IN TANK (DRAIN) LINE.

The DSG-(N)-01/03 can be used with back pressure up to 160 bars(2300 PSI) on the tank port "T".

DSHG-(N)-04/06/10 permissible backpressure, internal drain 160 bars(2300 PSI),

and 210 bar (3000 PSI) for external drain type. Pipe the return back to tank below the oil level.

### □ INDICATOR LIGHTS (LEDS)

Solenoid indicator lights are standard, all DSG-01/03 (terminal box type), DSG-N-01/03 (DIN type) with all voltages, ensuring easy testing and maintenance at a glance.

DIN connector meet CE, IP 65, DIN 40050, ISO 6952 water proof standard.

( AC: Red led., DC: Yellow led. RAC: Green led. )

### □ COIL

Insulation high voltage test : 1500 V/min. (1800 V/sec.)

Double insulation wiring, hermetically sealed for moisture-resistance. Insulation class : H

Maximum allowable coil temperature: +150C (+300F)

Do not exceed permissible voltage range of the coil used.

Do not supply electric power to the AC solenoid unless the coil is mounted to the valve.

DIN type coil with 360 possible orientation.

No-spring type (DSHG-2N\*-04/06/10) one of the coil should be energized continuously to avoid malfunction.

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

### □ HI-TENSILE CAST IRON (FC 30)

Bodies are of high tensile cast iron with large shell cored passages. Spool bores are precision honed with accurately machined land locations.

### □ SPOOLS

Spoos are hardened alloy steel(SCM21), precision ground and incorporate balancing grooves. All spoos are interchangeable with valve body simplifying maintenance. Many options in spool type selection.

### □ 3 STANDARD ELECTRICAL CONNECTIONS TYPE, VARIOUS COIL VOLTAGES.

There are 3 types (DIN, Terminal Box, SWP) for standard electrical connection and variety of AC,DC & RAC coil voltages. Coil voltages. AC:AC100V/AC110V/AC200V/AC220V/AC240V (50/60HZ) DC:DC12/24/36/48

RAC:RAC100V/AC110V/AC200V/AC220V/AC240V

### □ HYDRAULIC SHOCKLESS TYPE (S)- LOW NOISE TYPE

The DC/RAC type solenoid valves with a cushion device, results in a smooth com- mutation from a position to another position (smooth start and stop performance). This will greatly reduce the noise which comes from changing over and vibrating pipes.

The optional stroke limiter (RW/RA/RB) can be 1/4., 1/3., 1/2 micro adjustments search for the best soft smooth cushion. When the stroke limiter is screwed in, the main spool stroke becomes shorter and flow rate becomes lower.The max adjustment range details as follow.

DSGX-(N)-01-DC/RAC: max. 1.4 mm

DSG-(N)-01-DC/RAC: max. 1.4 mm

DSG-(N)-03-DC/RAC: max. 2.2 mm

DSHG-(N)-04-AC/DC/RAC: max. 7 mm

DSHG-(N)-06-AC/DC/RAC: max. 12 mm

### □ SPECIAL TYPE, (VOLTAGES) ARE AVAILABLE.

(A) Shockless + shifting time adjustable. (B) Stroke limiter adjustable.(RA/RB/RW types)

(C) Lead wire type (SWP connector terminals) for marine, mobile parts.

(D) Explosion proof (flame proof) type. (E) Surgeless (Surge Killer) type.

(F) Sparkless (Spark Killer) type. (G) Water proof type. (H) Vibration proof type.

(I) AC24., DC 14.50., DC28., DC36., DC 48., DC110 ..... (J) Viton seals were available.

Consult local agent for details.

### □ ASSEMBLY INSTALLATION

The no-spring valves (DSHG-2N-04/06/10 TYPE) shall mounted with longitudinal axis horizontal as they work under impulse.

Spring centered (3C\*), spring offset (2B\*) and detented (2D\*) valves have no orientation limitation. The DSG-(N)-01/03 & DSHG-(N)-04/06/10 mounting surface dimensions conform to ISO 4401, Hydraulic fluid power-Four-port directional control valves-Mounting surface. The installation surface should be finer than 6.3 S.

### □ SUBPLATE & MANIFOLDS

Comprehensive range of sub-plates, multi-station manifolds and stackable modules.

### □ MOUNTING BOLTS + ACCESSORIES.

Hexagonal socket head cap screw (Metric or American fixing bolts), and DIN connector + led as standard with no extra cost.



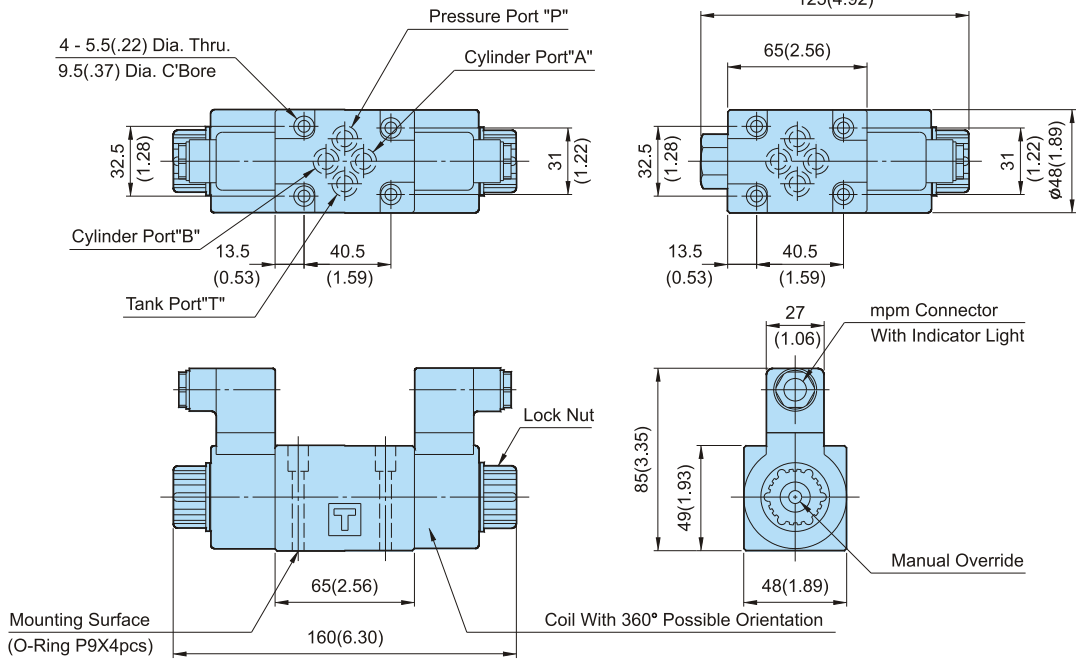
## DIMENSIONS

MILLIMETERS(INCHES)

A

DSGX-N-01-AC/DC/RAC

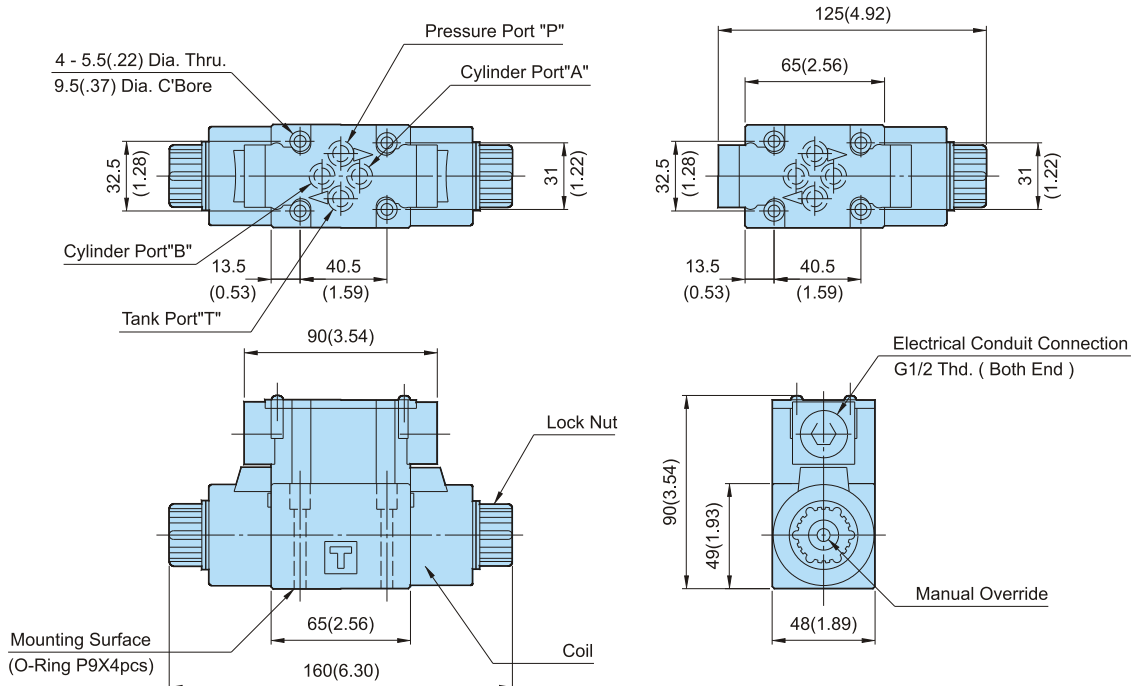
MOUNTING SURFACE:DSG-01-CETOP3  
ISO 03-NFPAD03



Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M5 X45LgX4pcs	5-7 Nm	30
Soc. Hd. Cap Screw	10-24UNCX1-3/4"LgX4pcs	43-60 in.lbs	3090

DSGX-01-AC/DC/RAC

MOUNTING SURFACE:DSG-01-CETOP3  
ISO 03-NFPAD03



Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M5 X45LgX4pcs	5-7 Nm	30
Soc. Hd. Cap Screw	10-24UNCX1-3/4"LgX4pcs	43-60 in.lbs	3090



# "DSG" DIRECTIONAL VALVES

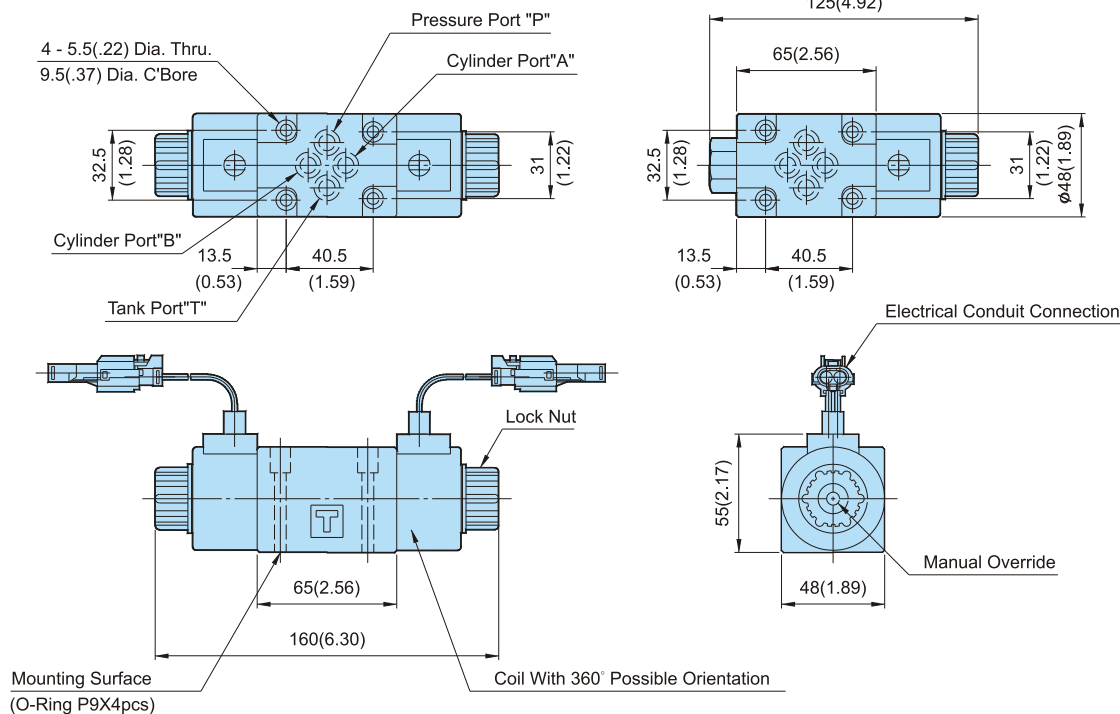
## DIMENSIONS

## MILLIMETERS(INCHES)

**A**

DSGX-Y-01-AC/DC/RAC

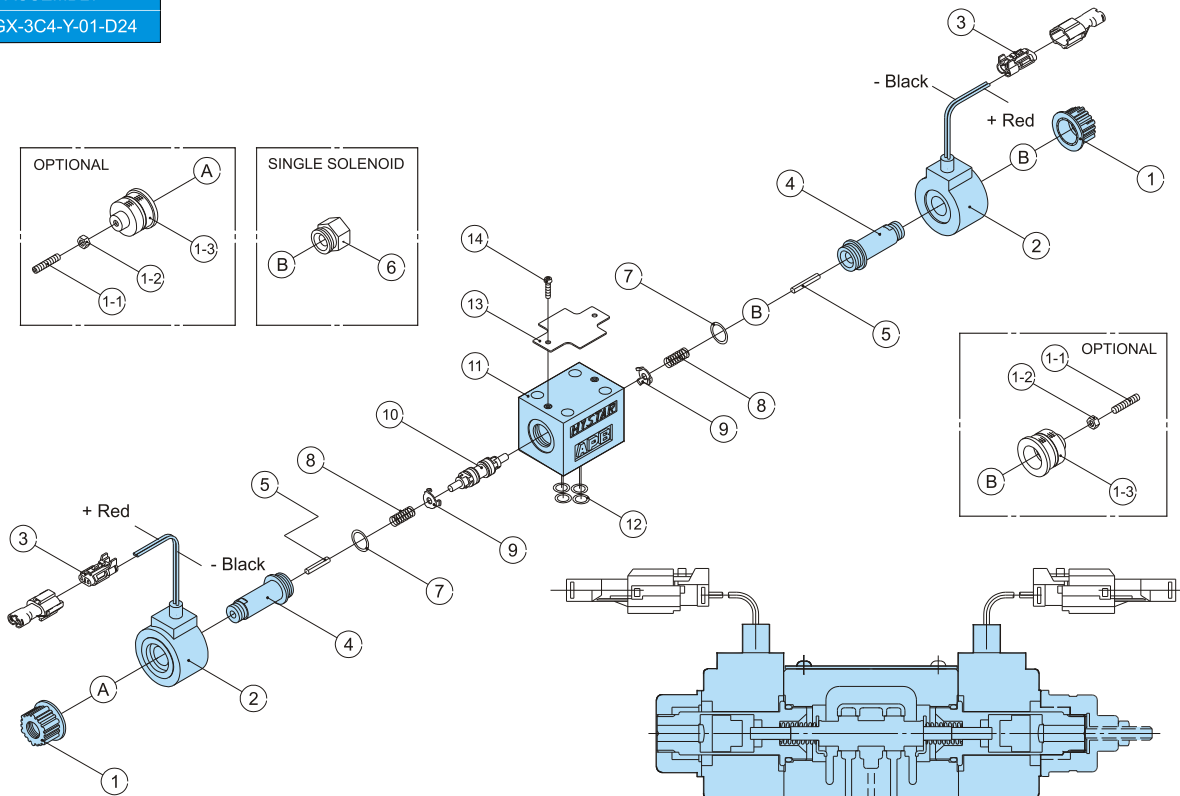
MOUNTING SURFACE: DSG-01-CETOP3  
ISO 03-NFPAD03



Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M5 X45LgX4pcs	5-7 Nm	30
Soc. Hd. Cap Screw	10-24UNCX1-3/4"LgX4pcs	43-60 in.lbs	3090

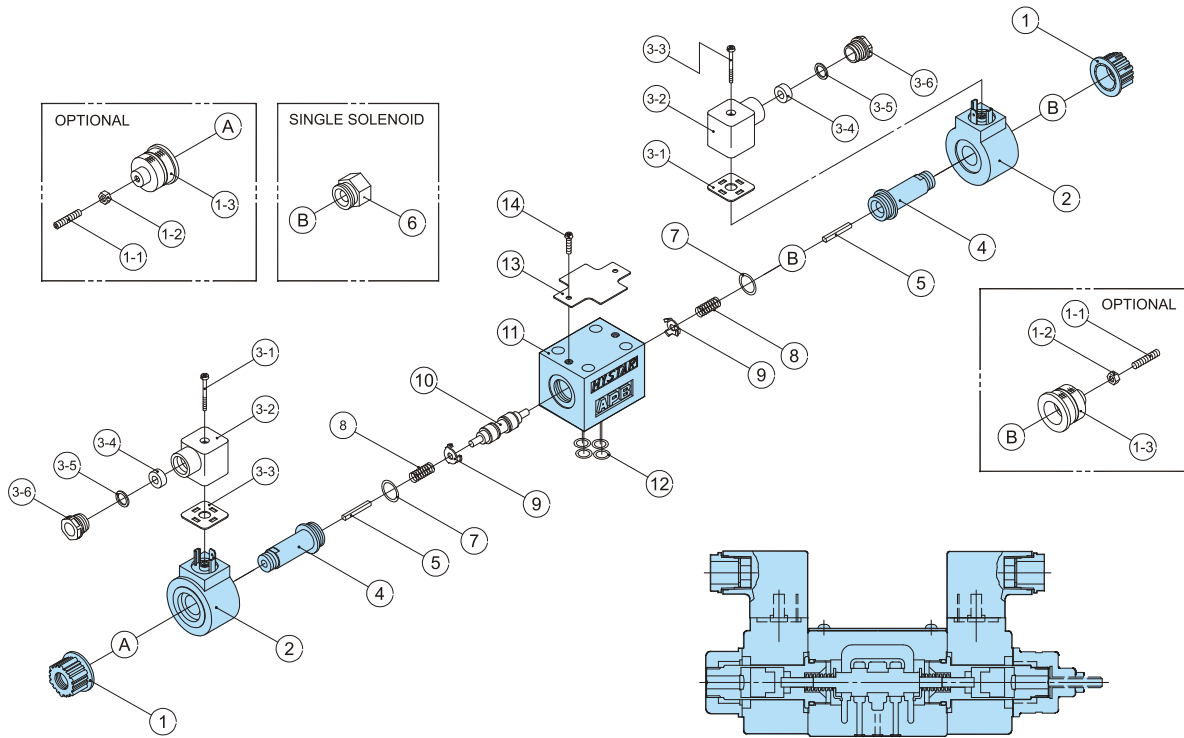
## ASSEMBLY

DSGX-3C4-Y-01-D24

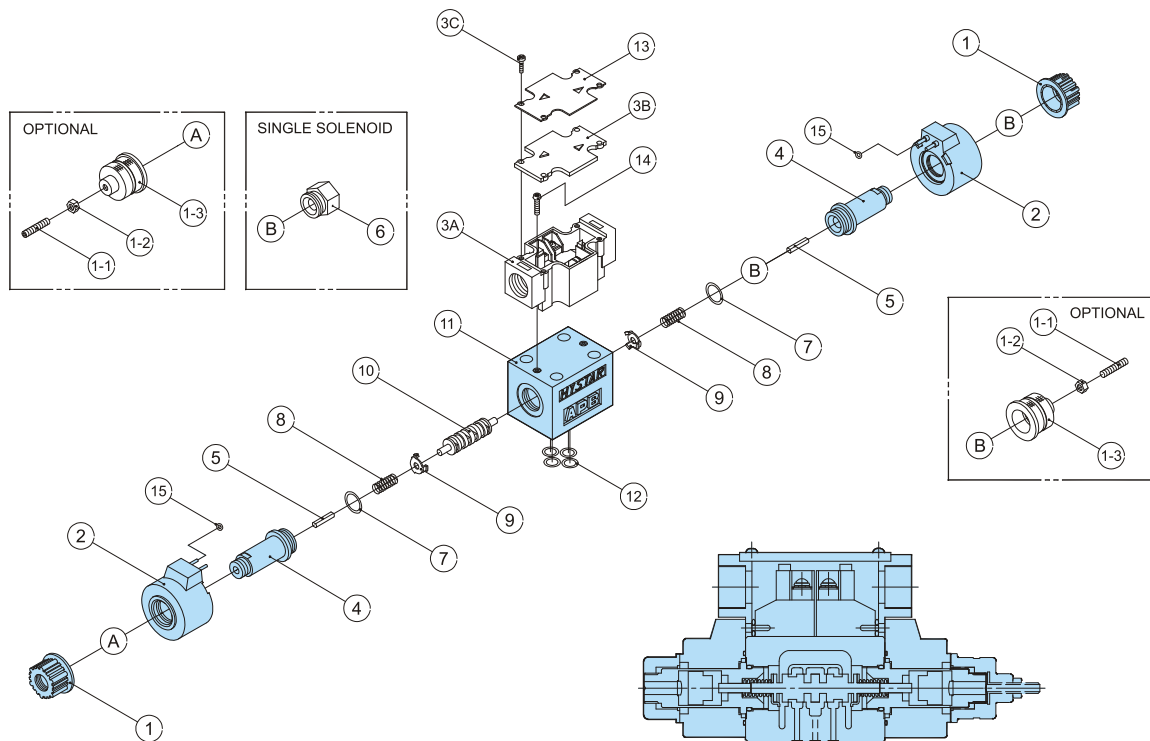


## A

**ASSEMBLY**  
DSGX-3C2-N-01-D24



**ASSEMBLY**  
DSGX-3C60-01-D24



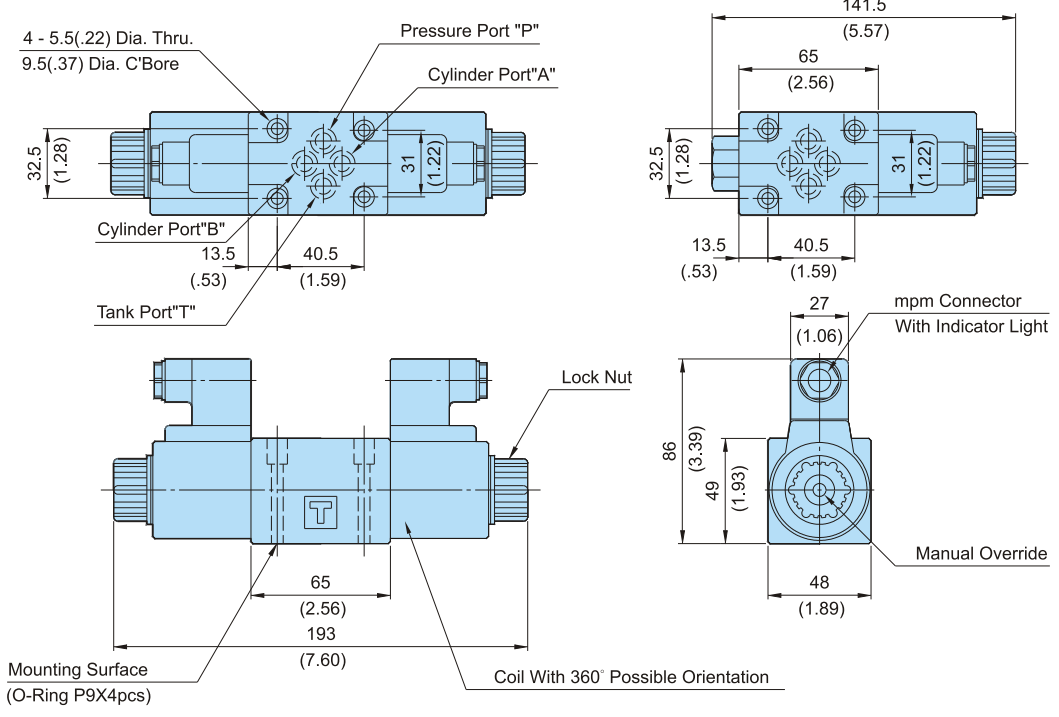


## DIMENSIONS

## MILLIMETERS(INCHES)

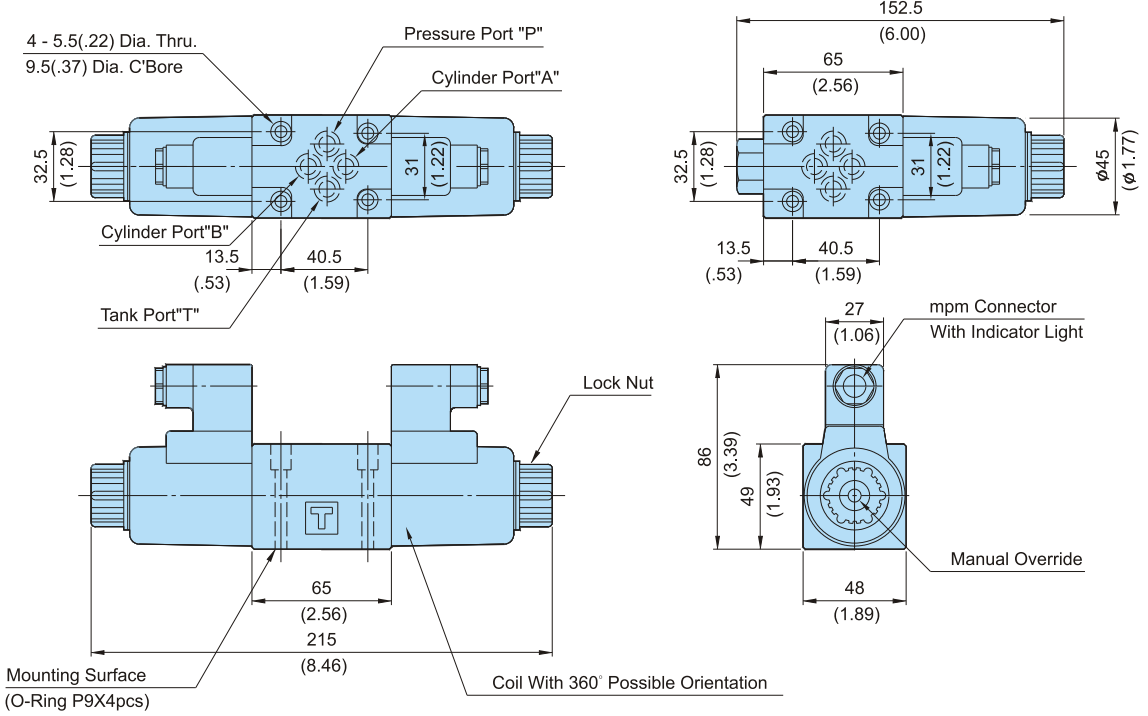
# A

**DSG-N-01-AC** **MOUNTING SURFACE:DSG-01-CETOP3**  
ISO 03-NFPAD03



Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M5 X45LgX4pcs	5-7 Nm	30
Soc. Hd. Cap Screw	10-24UNCX1-3/4"LgX4pcs	43-60 in.lbs	3090

**DSG-N-01-DC/RAC** **MOUNTING SURFACE:DSG-01-CETOP3**  
ISO 03-NFPAD03



Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M5 X45LgX4pcs	5-7 Nm	30
Soc. Hd. Cap Screw	10-24UNCX1-3/4"LgX4pcs	43-60 in.lbs	3090

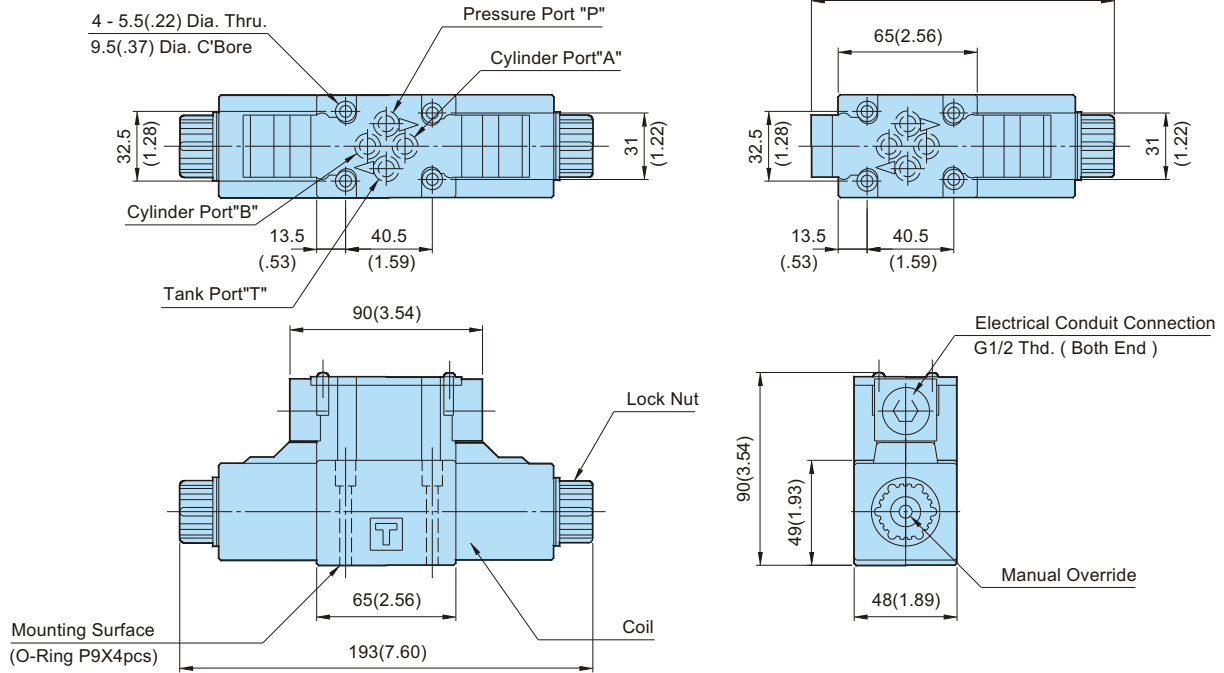
## DIMENSIONS

MILLIMETERS(INCHES)

A

DSG-01-AC

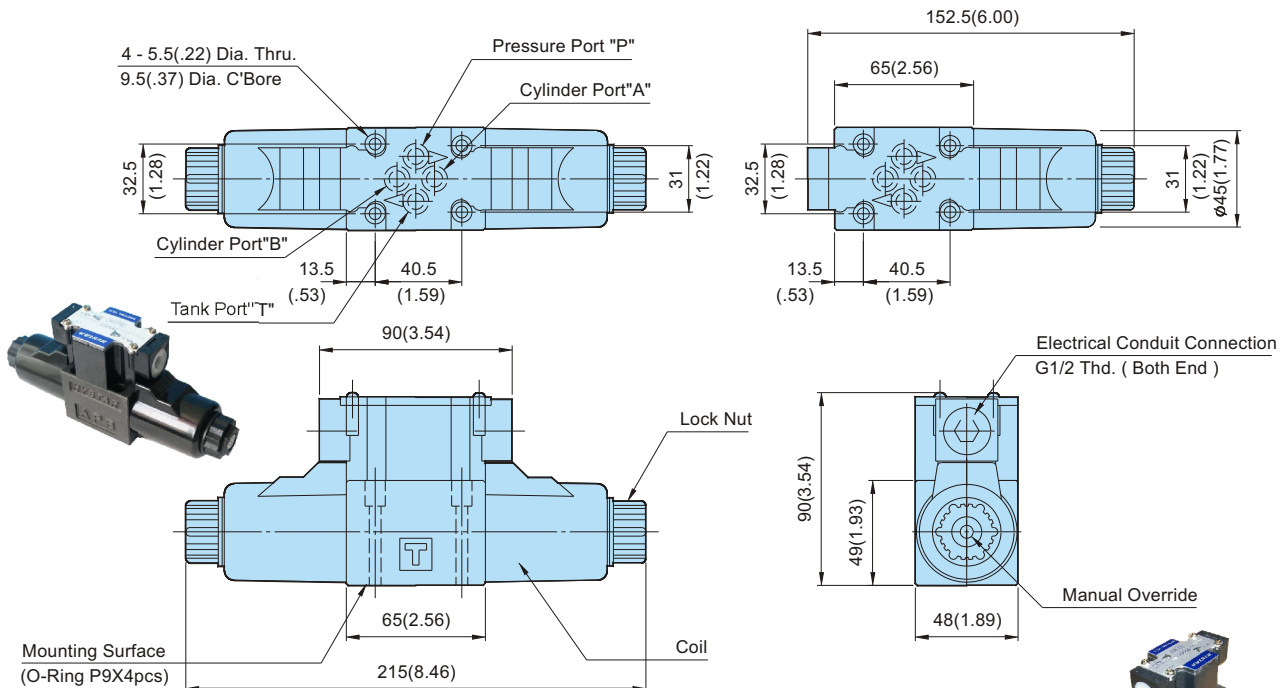
MOUNTING SURFACE: DSG-01-CETOP3  
ISO 03-NFPAD03



Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M5 X45LgX4pcs	5-7 Nm	30
Soc. Hd. Cap Screw	10-24UNCX1-3/4"LgX4pcs	43-60 in.lbs	3090

DSG-01-DC/RAC

MOUNTING SURFACE: DSG-01-CETOP3  
ISO 03-NFPAD03



Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M5 X45LgX4pcs	5-7 Nm	30
Soc. Hd. Cap Screw	10-24UNCX1-3/4"LgX4pcs	43-60 in.lbs	3090



# "DSG" DIRECTIONAL VALVES

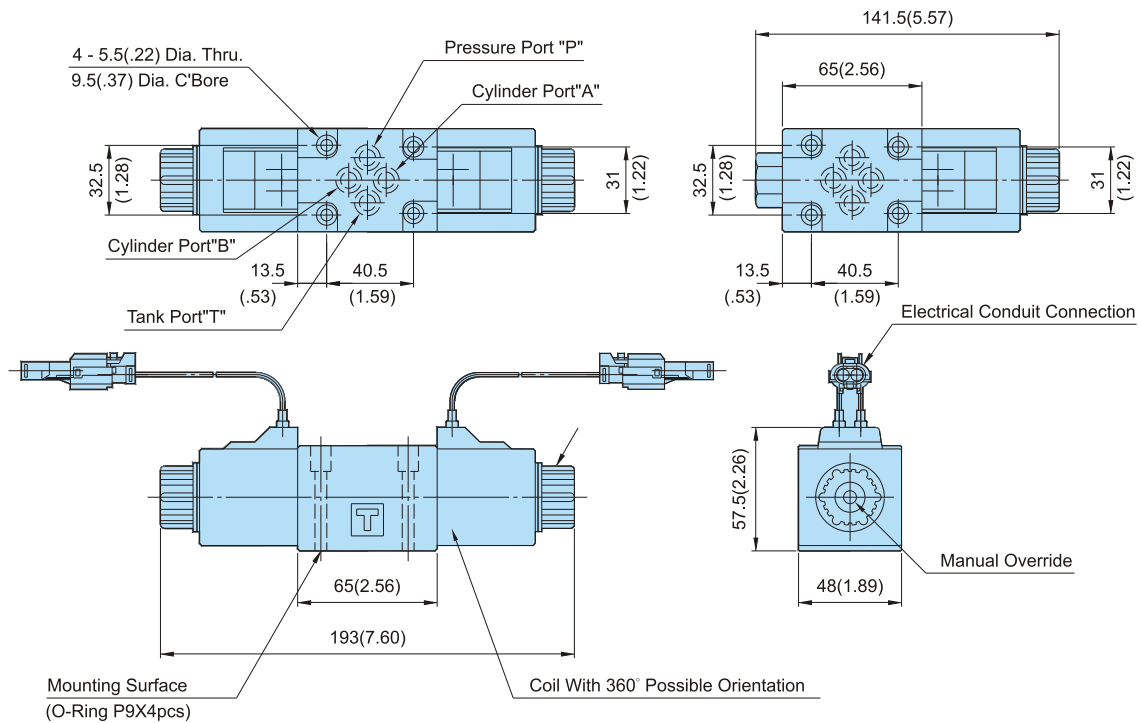
## DIMENSIONS

## MILLIMETERS(INCHES)

**A**

DSG-Y01-AC

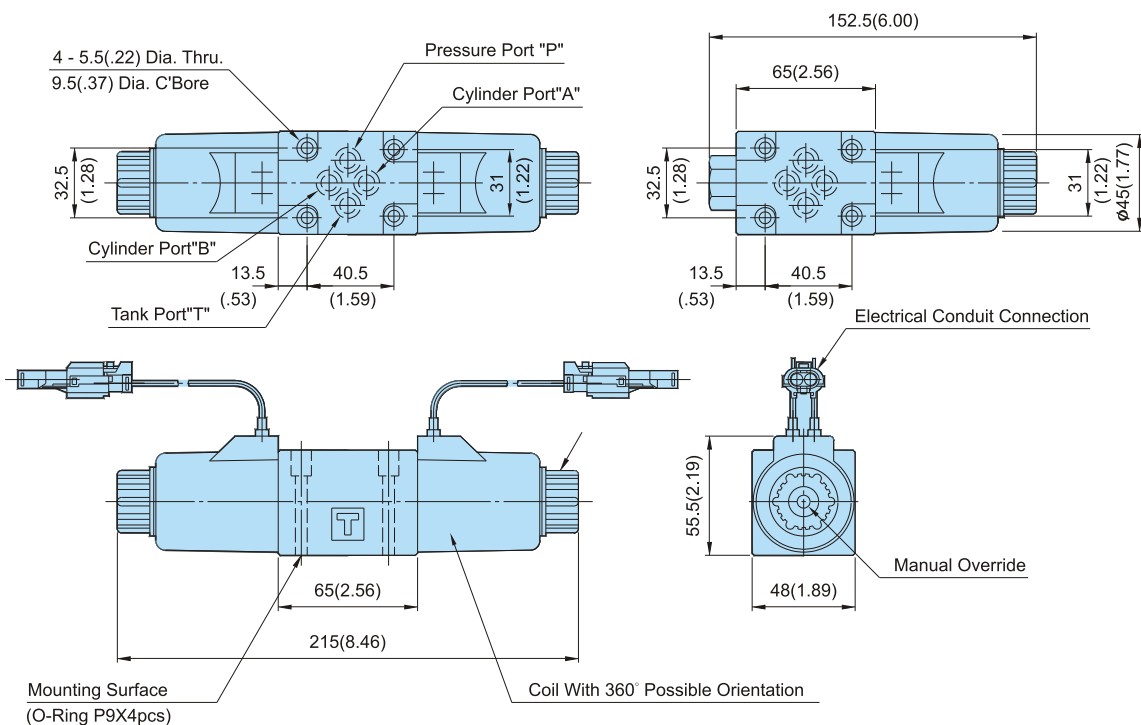
MOUNTING SURFACE: DSG-01-CETOP3  
ISO 03-NFPAD03



Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M5 X45LgX4pcs	5-7 Nm	30
Soc. Hd. Cap Screw	10-24UNCX1-3/4"LgX4pcs	43-60 in.lbs	3090

DSG-Y01-DC/RAC

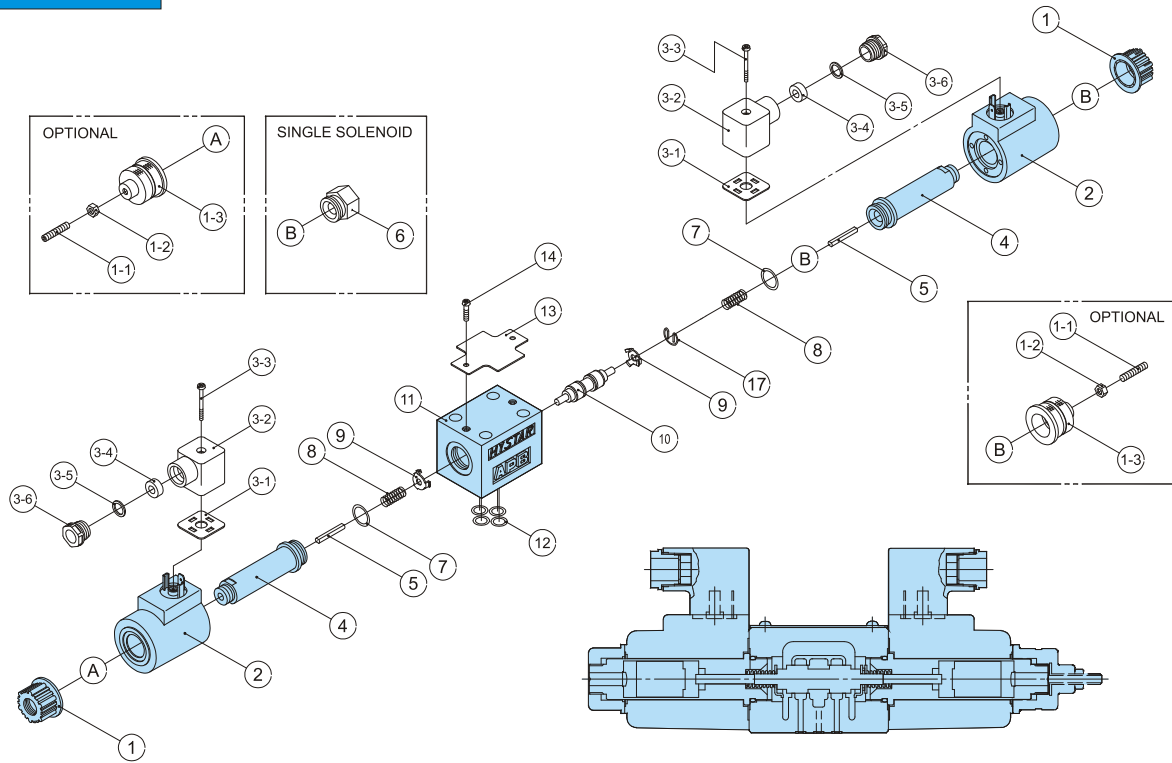
MOUNTING SURFACE: DSG-01-CETOP3  
ISO 03-NFPAD03



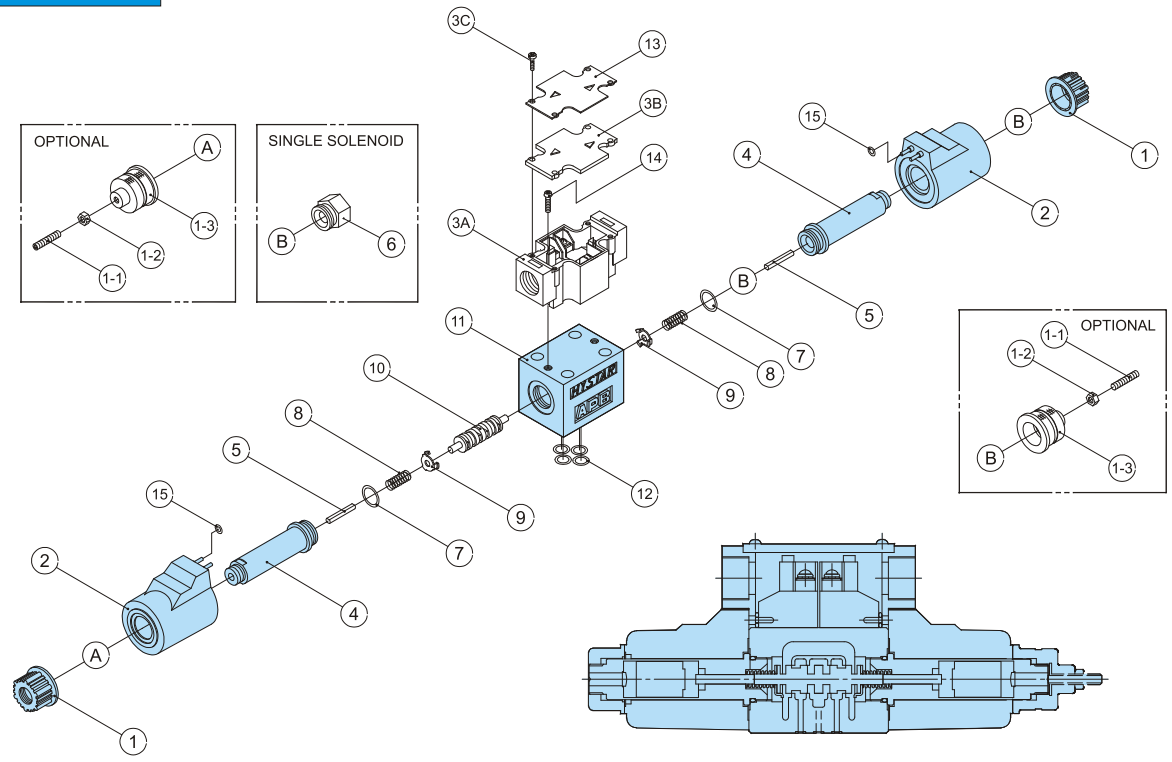
Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M5 X45LgX4pcs	5-7 Nm	30
Soc. Hd. Cap Screw	10-24UNCX1-3/4"LgX4pcs	43-60 in.lbs	3090

## A

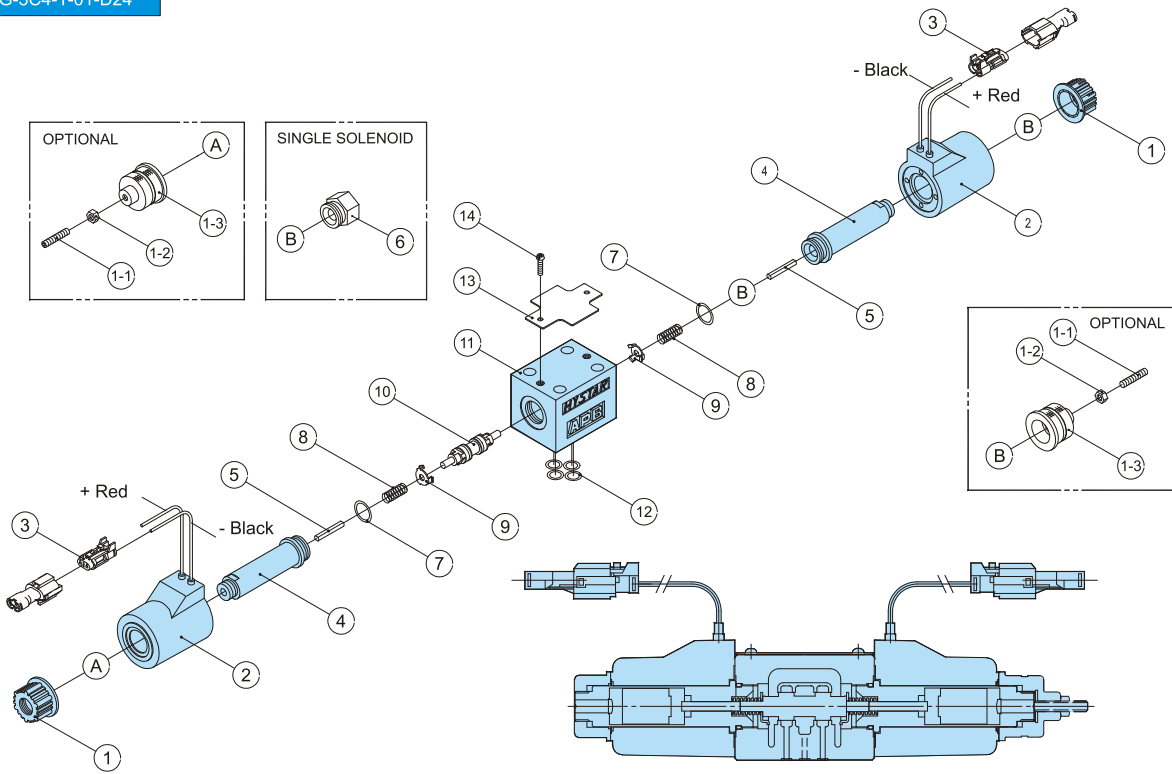
**ASSEMBLY**  
DSG-2D2-N-01-D24



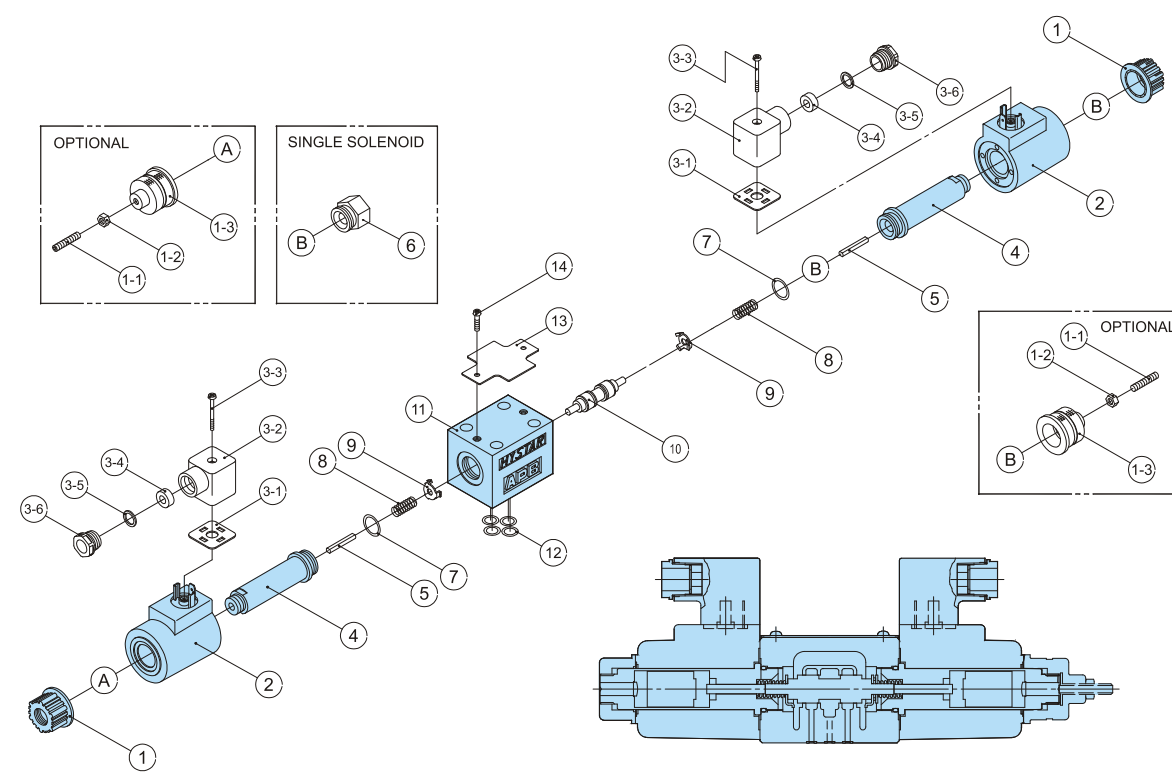
**ASSEMBLY**  
DSG-3C60-01-D24



**ASSEMBLY**  
DSG-3C4-Y-01-D24



**ASSEMBLY**  
DSG-3C2-N-01-D24





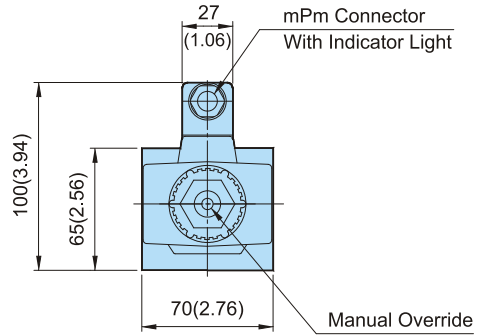
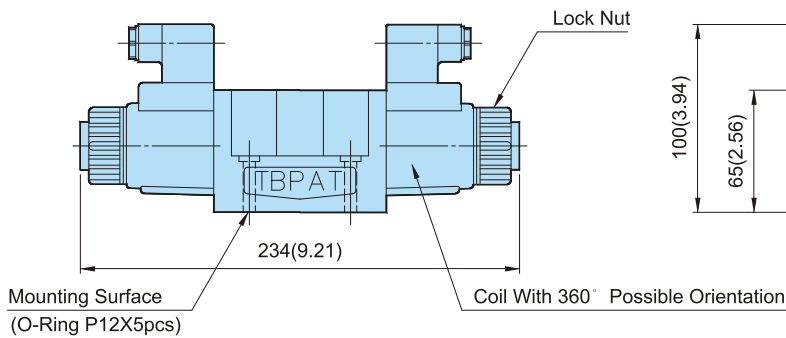
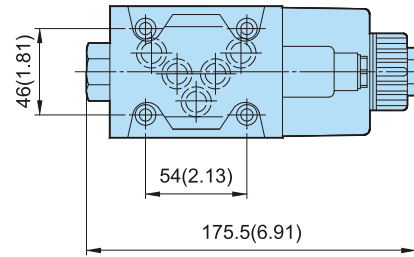
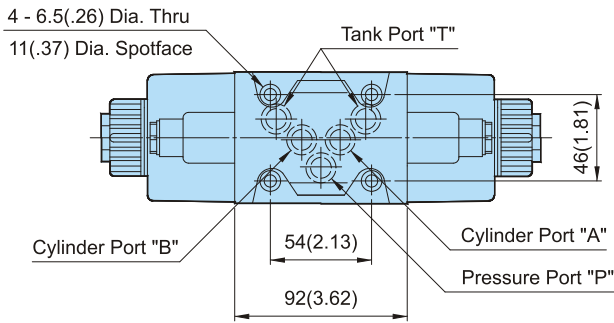
## DIMENSIONS

MILLIMETERS(INCHES)

A

DSG-N-03-AC

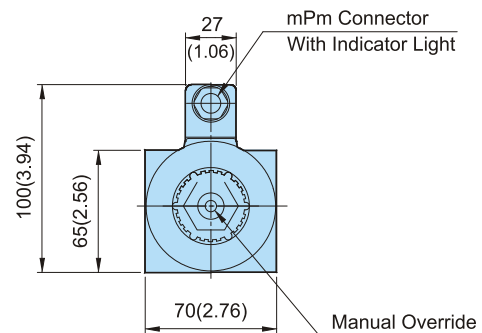
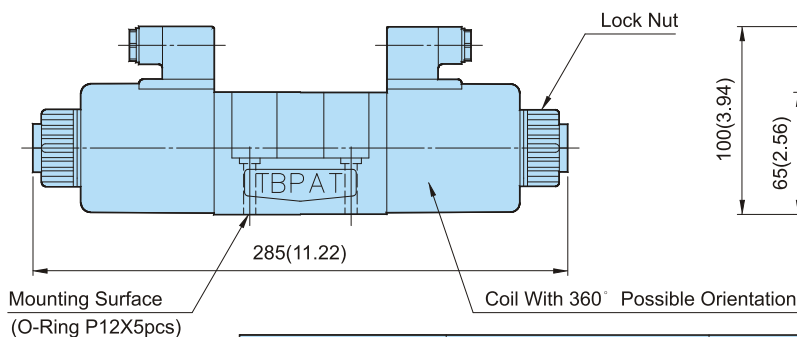
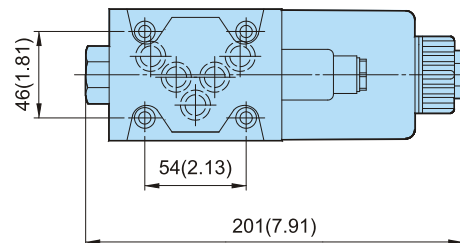
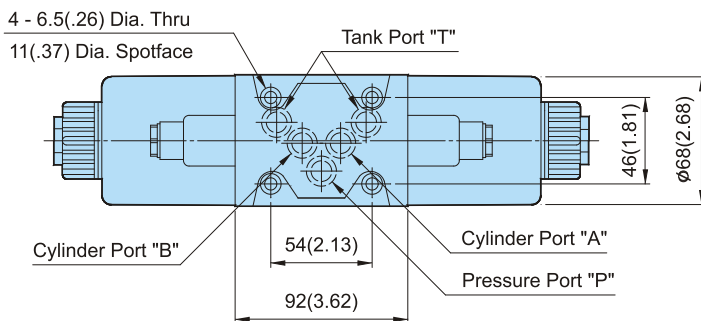
MOUNTING SURFACE:DSG-03-CETOP5  
ISO 05-NFPAD05



Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M6 X35LgX4pcs	12-15 Nm	30
Soc. Hd. Cap Screw	1/4-20UNCX1-1/2"LgX4pcs	105-130 in.lbs	3090

DSG-N-03-DC/RAC

MOUNTING SURFACE:DSG-03-CETOP5  
ISO 05-NFPAD05



Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M6 X35LgX4pcs	12-15 Nm	30
Soc. Hd. Cap Screw	1/4-20UNCX1-1/2"LgX4pcs	105-130 in.lbs	3090

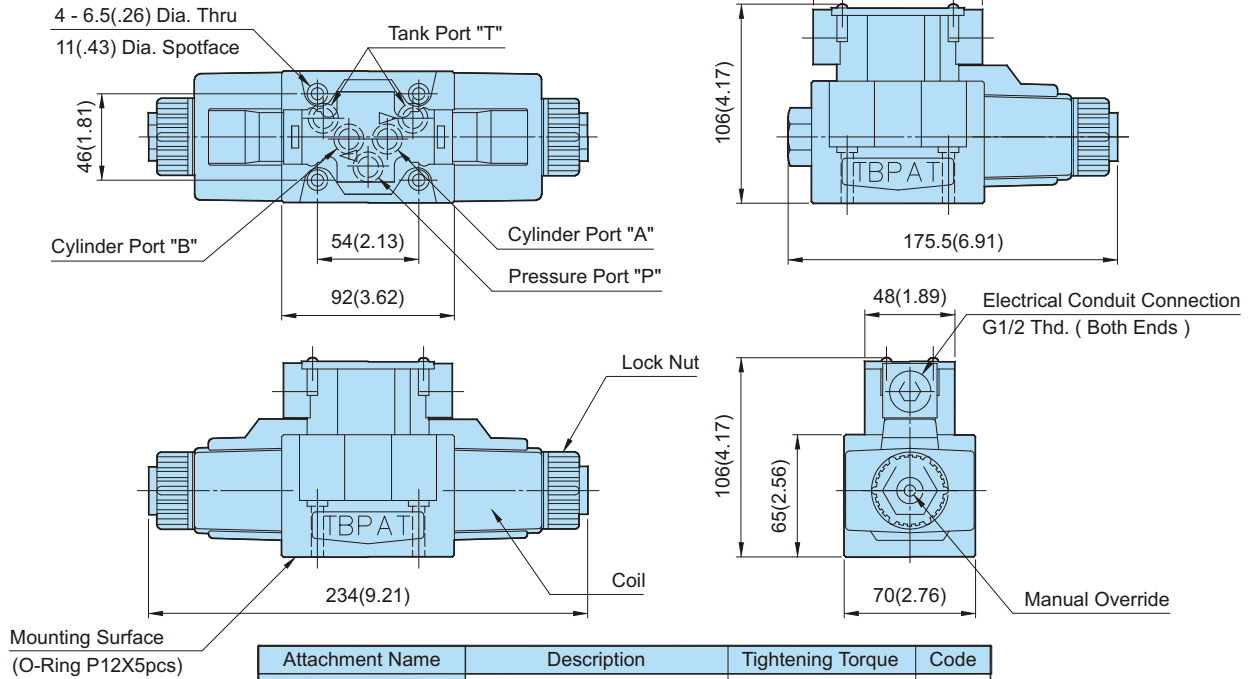
## DIMENSIONS

MILLIMETERS(INCHES)

**A**

**DSG-03-AC**

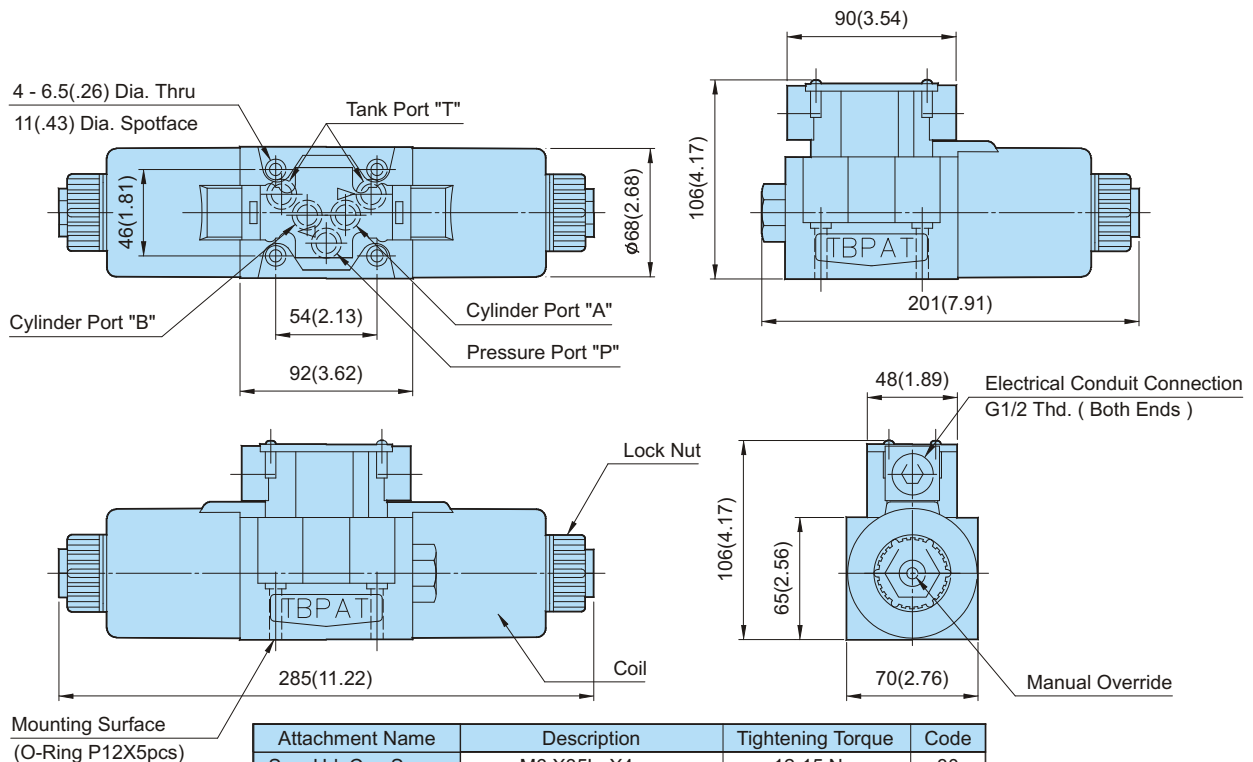
MOUNTING SURFACE:DSG-03-CETOP5  
ISO 05-NFPAD05



Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M6 X35LgX4pcs	12-15 Nm	30
Soc. Hd. Cap Screw	1/4-20UNCX1-1/2"LgX4pcs	105-130 in.lbs	3090

**DSG-03-DC/RAC**

MOUNTING SURFACE:DSG-03-CETOP5  
ISO 05-NFPAD05



Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M6 X35LgX4pcs	12-15 Nm	30
Soc. Hd. Cap Screw	1/4-20UNCX1-1/2"LgX4pcs	105-130 in.lbs	3090

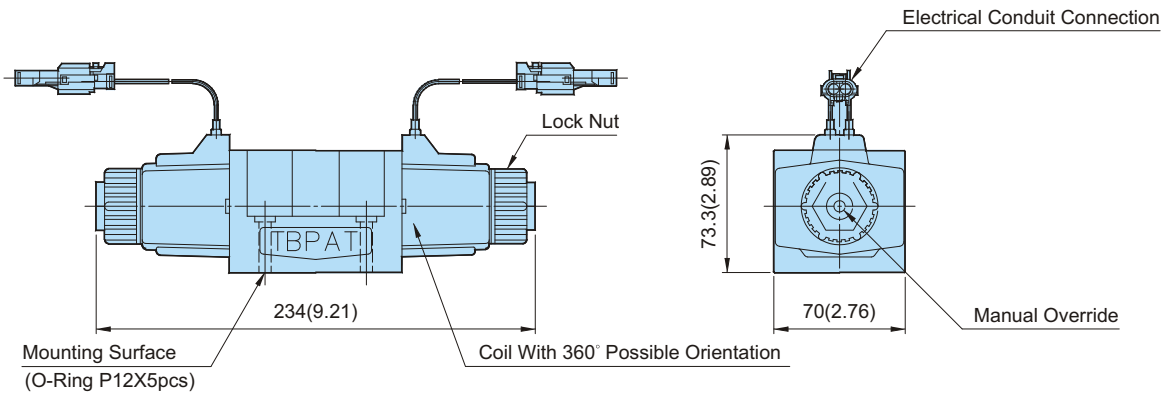
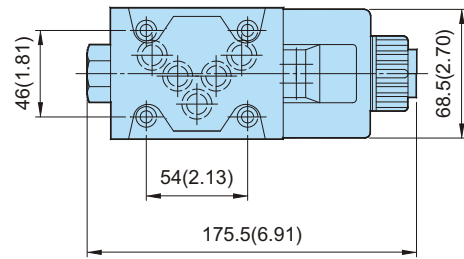
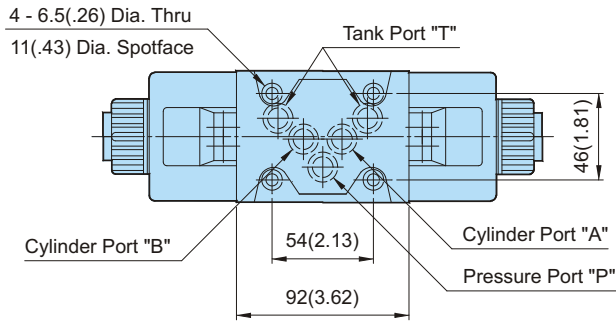
## DIMENSIONS

MILLIMETERS(INCHES)

A

### DSG-Y-03-AC

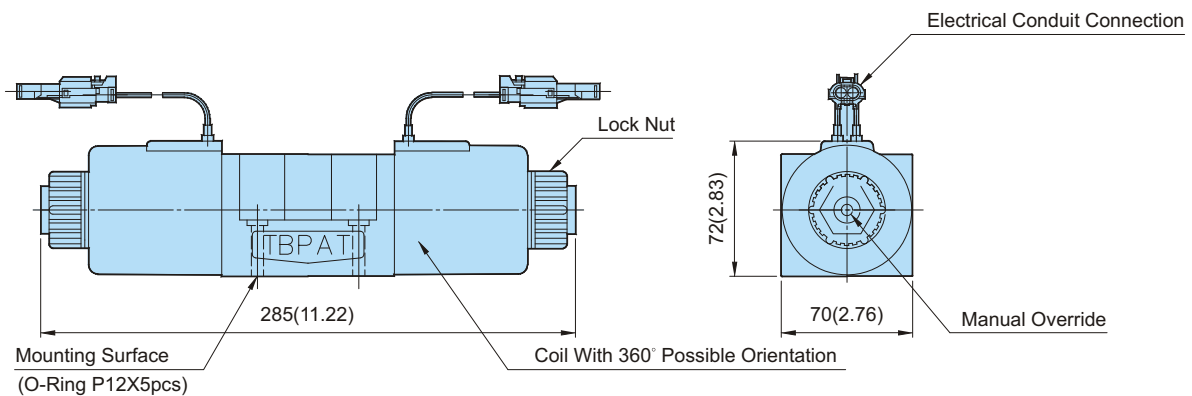
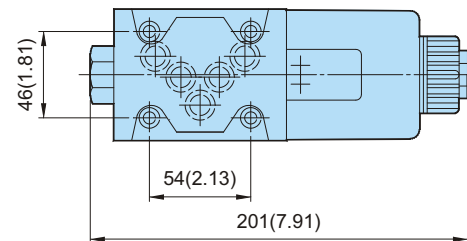
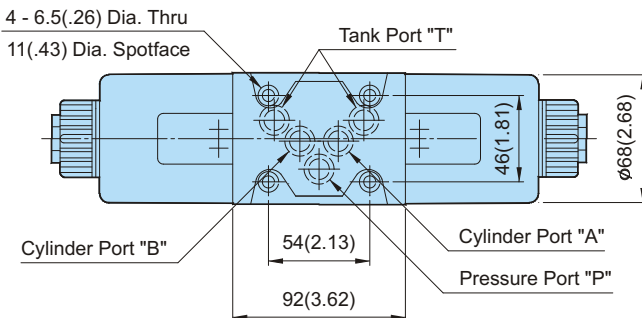
MOUNTING SURFACE:DSG-03-CETOP5  
ISO 05-NFPAD05



Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M6 X35LgX4pcs	12-15 Nm	30
Soc. Hd. Cap Screw	1/4-20UNCX1-1/2"LgX4pcs	105-130 in.lbs	3090

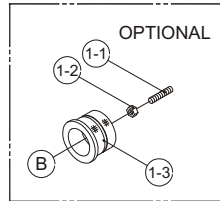
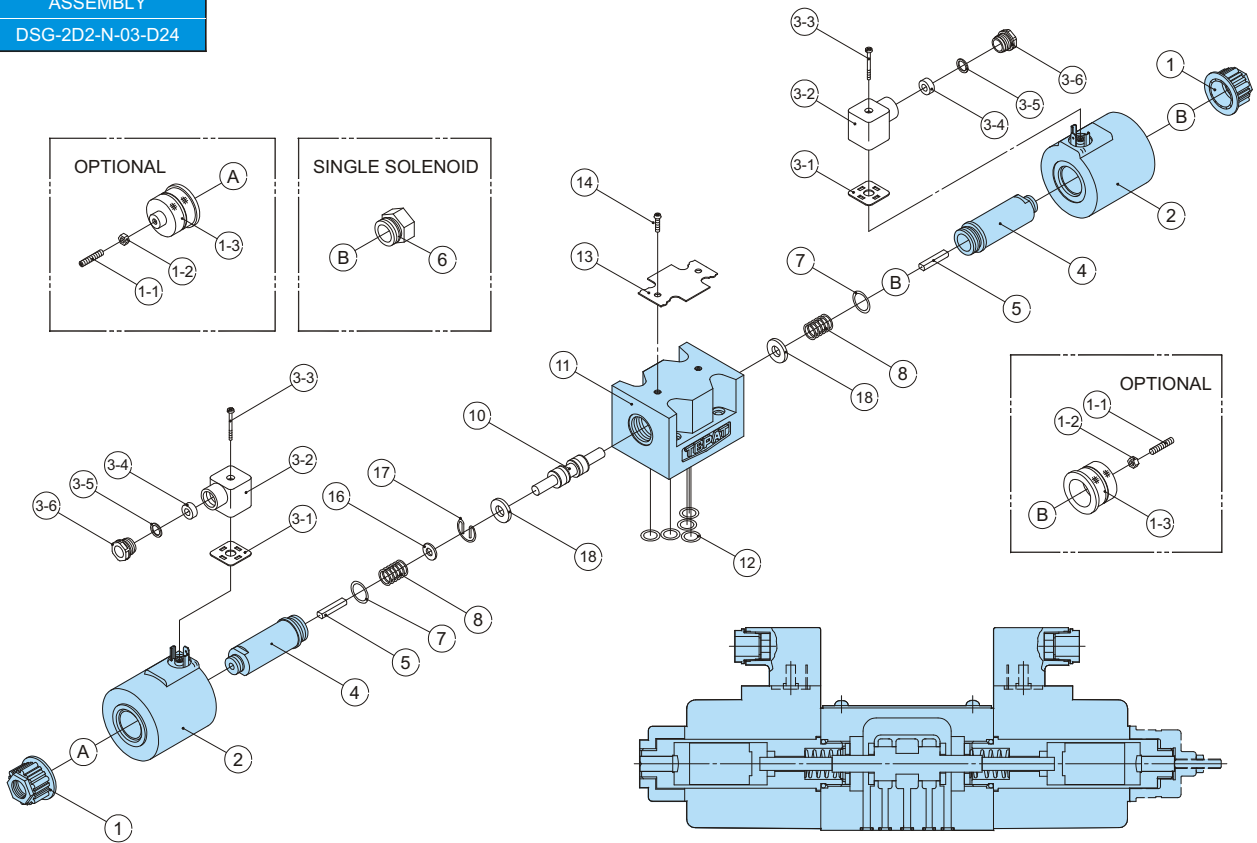
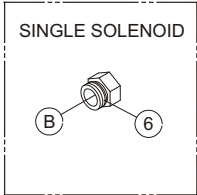
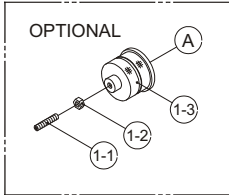
### DSG-Y-03-DC/RAC

MOUNTING SURFACE:DSG-03-CETOP5  
ISO 05-NFPAD05

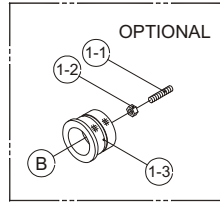
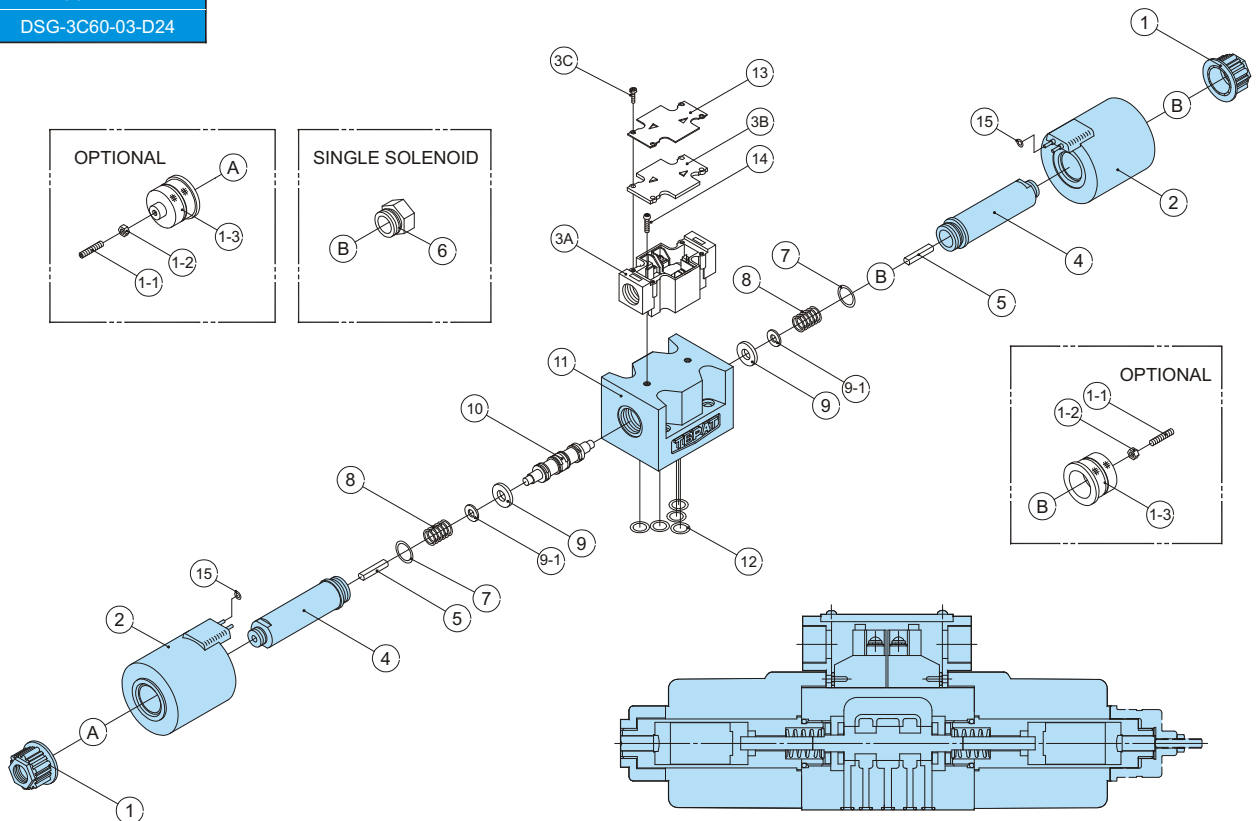
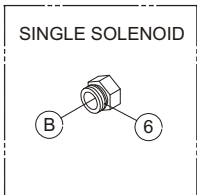
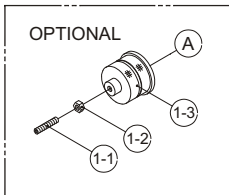


Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M6 X35LgX4pcs	12-15 Nm	30
Soc. Hd. Cap Screw	1/4-20UNCX1-1/2"LgX4pcs	105-130 in.lbs	3090

**ASSEMBLY**  
DSG-2D2-N-03-D24

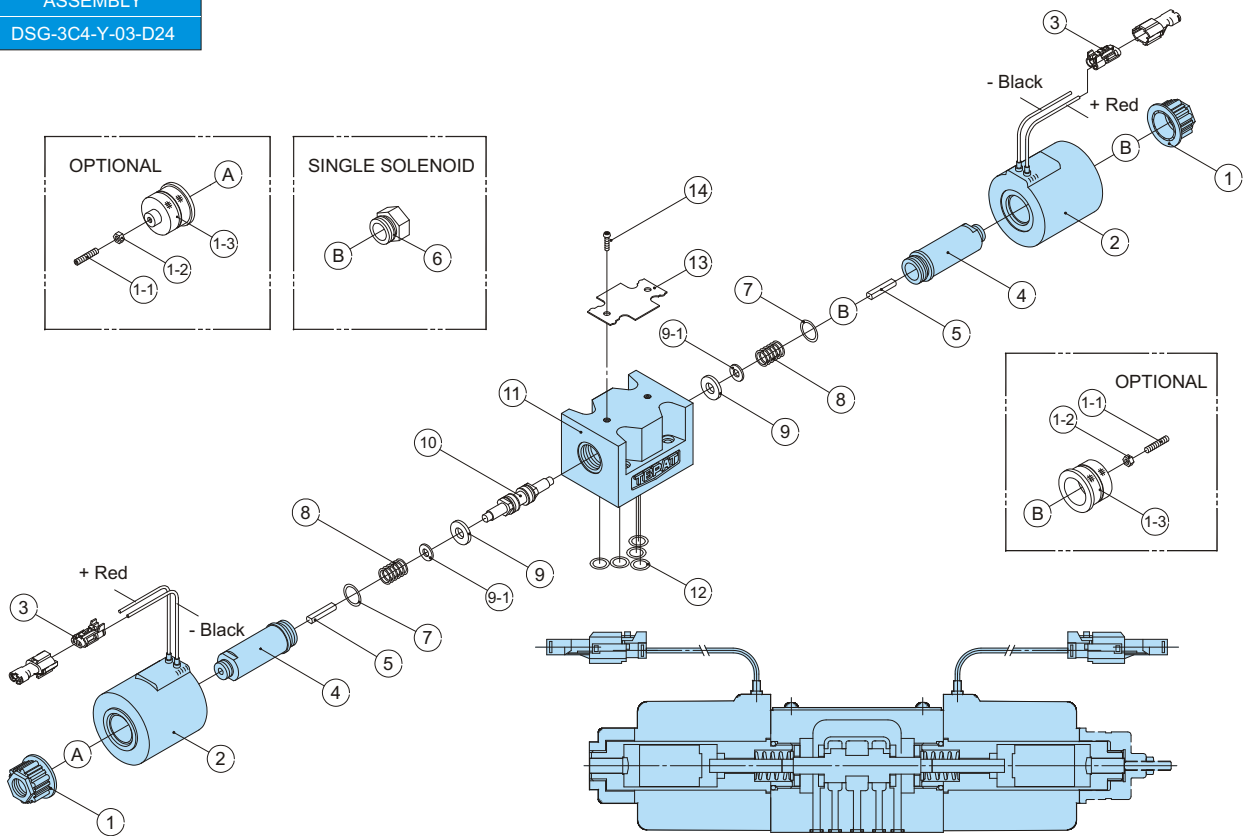
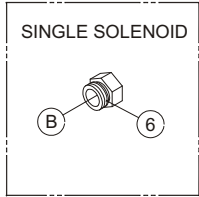
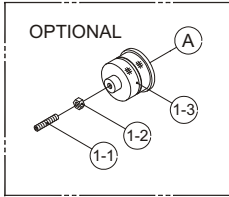


**ASSEMBLY**  
DSG-3C60-03-D24

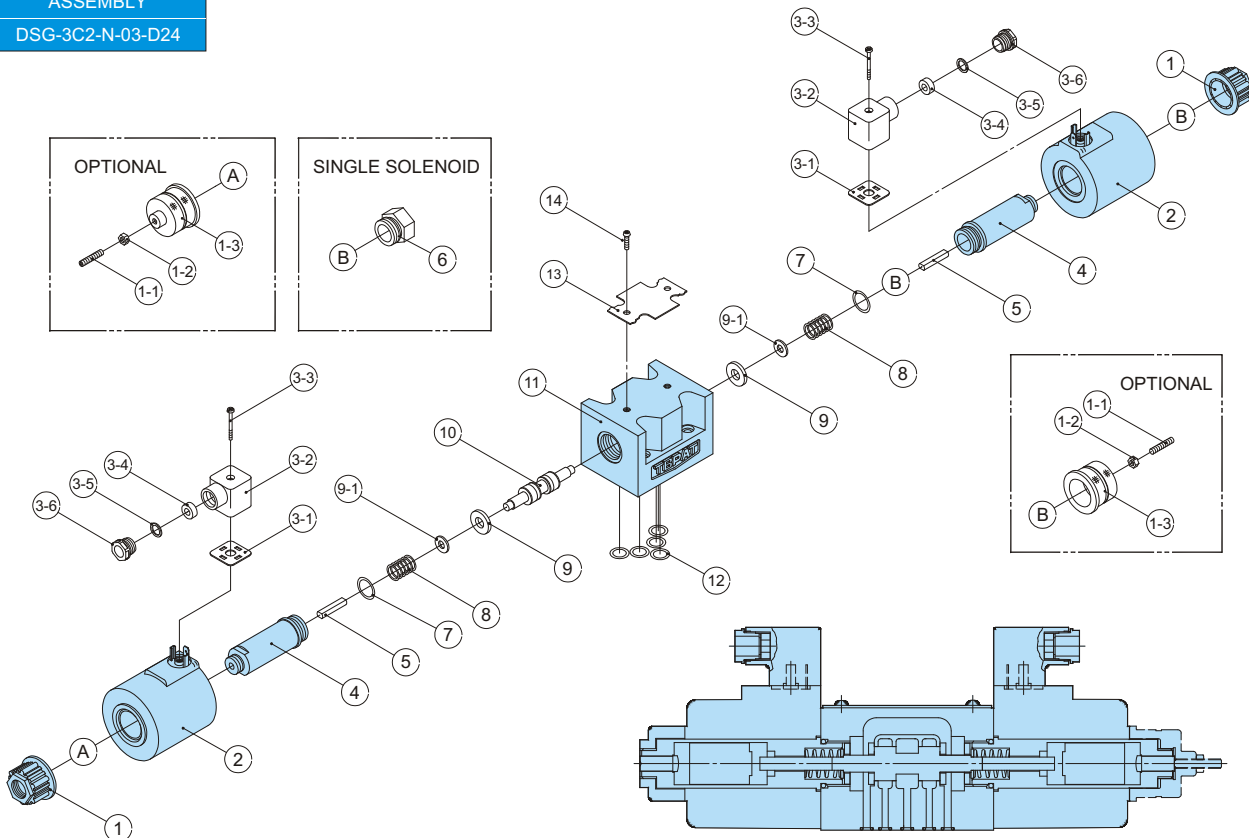
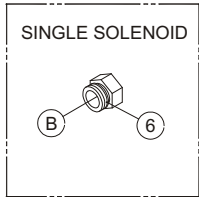
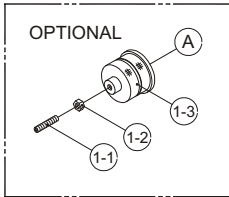


## A

**ASSEMBLY**  
DSG-3C4-Y-03-D24



**ASSEMBLY**  
DSG-3C2-N-03-D24





## PARTS LIST OF "DSG-01/03-(N)" SERIES

NO	PART NAME	DSGX-01	DSG-01-AC	DSG-01-DC	DSG-03-AC	DSG-03-DC
1	Lock Nut	GX01001	G01001	G01001	G03001	G03001
2	Coil	GX01002(★)	G01002(★)	G01002(★)	G03002(★)	G03002(★)
4	Solenoid Core	GX01004	G01004A	G01004D	G03004A	G03004D
5	Push Pin	GX01005	G01005	G01005	G03005	G03005
6/B	Back Cover	GX01006	G01006	G01006	G03006	G03006
7	O-Ring	P18 x 2pcs	P18 x 2pcs	P18 x 2pcs	P21 x 2pcs	P21 x 2pcs
8	Spring	GX01008	G01008	G01008	G03008(◆)	G03008(◆)
9	Retainer	G01009	G01009	G01009	G03009	G03009
9-1	Spring stop	-----	-----	-----	G03009-1	G03009-1
10	Spool	G01010(※)	G01010(※)	G01010(※)	G03010(※)	G03010(※)
11	Body	G01011	G01011	G01011	G03011	G03011
12	O-Ring	P9 x 4pcs	P9 x 4pcs	P9 x 4pcs	P12 x 5pcs	P12 x 5pcs
16	Detent Guide	G01016	G01016	G01016	G03016	G03016
17	Detent Kit	G01017	G01017	G01017	G03017	G03017
18	Detent Hold	-----	-----	-----	G03018	G03018
A	Stroke Limiter	GX01SLA	G01SLA	G01SLA	G03SLA	G03SLA
1-1	Fixing Screw	GX01SL1	G01SL1	G01SL1	G03SL1	G03SL1
1-2	Steel Nut	GX01SL2	G01SL2	G01SL2	G03SL2	G03SL2
1-3	Lock Nut	GX01SL3	G01SL3	G01SL3	G03SL3	G03SL3

### DIN CONNECTOR TYPE 'DIN 43650'

NO	PART NAME	DSGX-N-01	DSG-N-01-AC	DSG-N-01-DC	DSG-N-03-AC	DSG-N-03-DC
3	DIN Connector	43650 AC/DC	43650 AC	43650 DC	43650 AC	43650 DC
13	Nameplate	G01013(※)	G01013(※)	G01013(※)	G03013(※)	G03013(※)
14	Fixing Screw	G01014	G01014	G01014	G03014	G03014
3-1	Gasket	43650-1	43650-1	43650-1	43650-1	43650-1
3-2	Housing	43650-2	43650-2	43650-2	43650-2	43650-2
3-3	Fixing Screw	43650-3	43650-3	43650-3	43650-3	43650-3
3-4	Grommet	43650-4	43650-4	43650-4	43650-4	43650-4
3-5	Washer	43650-5	43650-5	43650-5	43650-5	43650-5
3-6	Gland Nut	43650-6	43650-6	43650-6	43650-6	43650-6

### LEAD-WIRE TYPE 'SWP CONNECTOR'

NO	PART NAME	DSGX-01	DSG-01-AC	DSG-01-DC	DSG-03-AC	DSG-03-DC
3	SWP Connector	ST 730496-3	ST 730496-3	ST 730496-3	ST 730496-3	ST 730496-3
13	Nameplate	G01013(※)	G01013(※)	G01013(※)	G03013(※)	G03013(※)
14	Fixing Screw	G01014	G01014	G01014	G03014	G03014

### TERMINAL BOX TYPE

NO	PART NAME	DSGX-01	DSG-01-AC	DSG-01-DC	DSG-03-AC	DSG-03-DC
3	Terminal Box	Ele TB ACT	Ele TB ACT	Ele TB DCT	Ele TB ACT	Ele TB DCT
13	Nameplate	G01013E(※)	G01013E(※)	G01013E(※)	G03013E(※)	G03013E(※)
14	Fixing Screw	G01014P	G01014P	G01014P	G03014P	G03014P
15	O-Ring	P4 x 2 pcs	P4 x 2 pcs	P4 x 2 pcs	P4 x 2 pcs	P4 x 2 pcs
3A	Terminal Box	Ele TB AC	Ele TB AC	Ele TB DC	Ele TB AC	Ele TB DC
3B	Plastic Cover	GPC96	GPC96	GPC96	GPC96	GPC96
3C	Fixing Screw	GPC96S	GPC96S	GPC96S	GPC96S	GPC96S

※: Spool Type: 2B2,2B3,3C2,3C3,3C4.....

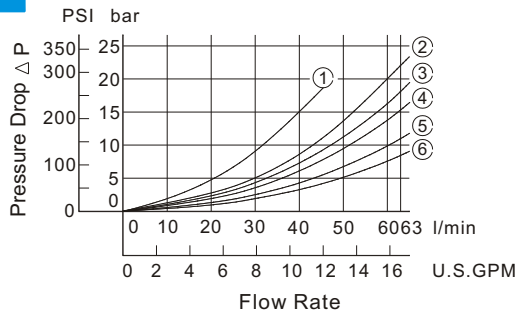
★: Coil Voltages:A110,A220.,D12,D24.,RAC110,RAC220.....

◆: Spring: The spool between 3C2-03 & 3C6-03 is different.

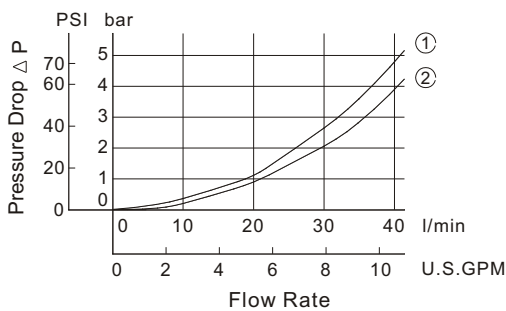
## PRESSURE DROP

# A

### DSG-01



### DSG-01-S

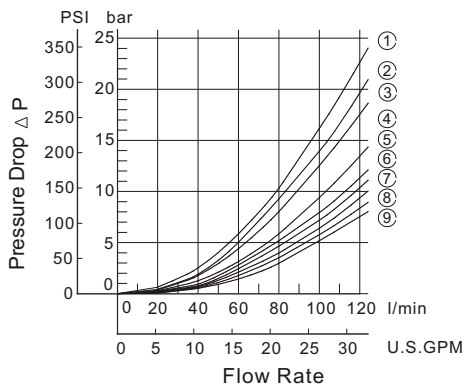


Series	Spool Type	Pressure Drop Curve Number				
		P→A	B→T	P→B	A→T	P→T
DSG-01	3C2	⑤	⑤	⑤	⑤	—
	3C3	⑥	⑥	⑥	⑥	④
	3C4	⑤	⑥	⑤	⑥	—
	3C40	⑤	⑤	⑤	⑤	—
	3C60	①	①	①	①	④
	3C9	⑥	⑤	⑥	⑤	—
	3C10	⑤	⑥	⑤	⑥	—
	3C12	⑤	⑤	⑤	⑥	—
	2D2	⑤	②	⑤	②	—
	2B2	②	②	⑤	⑤	—
	2B3	③	③	⑤	⑥	—
2B8	⑤	—	⑤	—	—	

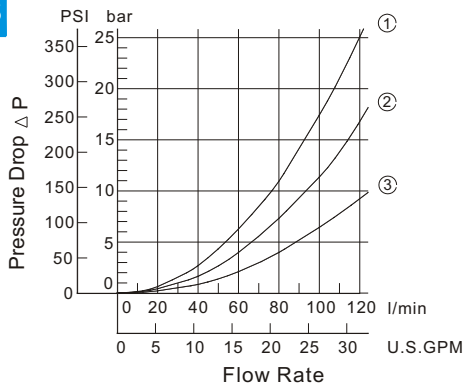
Series	Spool Type	Pressure Drop Curve Number			
		P→A	B→T	P→B	A→T
DSG-01-S	3C2	①	①	①	①
	3C4	①	②	①	②
	2B2	①	①	①	①

Graphs based on fluid viscosity of 35 cSt(162 SSU) .

### DSG-03



### DSG-03-S



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

Series	Spool Type	Pressure Drop Curve Number			
		P→A	B→T	P→B	A→T
DSG-03-S	3C2	②	②	②	②
	3C4	②	②	③	③
	2B2	①	②	②	②

Graphs based on fluid viscosity of 35 cSt(162 SSU) .

### FLOW LIMITATIONS :

Pressure drop is influenced by forces acting within the valve. The graphs shown assume simultaneous equal flow rates P to A or B, and from A or B to T.

Care should be taken in applications where high flow rates are used in conjunction with high pressure i.e. greater than 250 bar(3600PSI).

Also when single flow paths, or substantially different simultaneous flow rates are required between P to A or B, and A or B to T.

## FLOW RATINGS CHART

DSG-\*\*\*-(N)-01-AC.

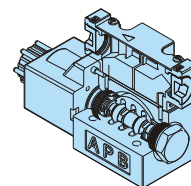
**A**

No. of Valve Positions	Spool -Spring Arrangement	Model Numbers & Description	Graphic Symbols	Max. Flow lpm (USgpm)									
							P → A [Port "B" Blocked]			P → B [Port "A" Blocked]			
				80bar (1140PSI)	190bar (2715PSI)	315bar (4500PSI)	80bar (1140PSI)	190bar (2715PSI)	315bar (4500PSI)	80bar (1140PSI)	190bar (2715PSI)	315bar (4500PSI)	
Two Positions	Spring Offset	DSG-2B2-01 P → A, B → T (2 Way)		63(16.6)	63(16.6)	63(16.6)	20(5.3)	20(5.3)	20(5.3)	63(16.6) 60(15.9)	63(16.6) 50(13.2)	63(16.6) 45(11.9)	
		DSG-2B3-01 P → A, B → T (2 Way)		63(16.6) 60(15.9)	63(16.6) 60(15.9)	63(16.6) 60(15.9)	50(13.2)	50(13.2)	50(13.2)	63(16.6) 55(14.5)	63(16.6) 55(14.5)	63(16.6) 55(14.5)	
		DSG-2B8-01 P → A, B & T Blocked (2 Way)		-	-	-	18(4.8)	10(2.6)	10(2.6)	63(16.6) 25(6.6) 50(13.2) 20(5.3)	63(16.6) 18(4.8) 18(4.8) 10(2.6)	63(16.6) 10(2.6) 10(2.6) 5(1.3)	
	No-Spring Detented	DSG-2D2-01 P → A, B → T Detented		63(16.6)	63(16.6)	63(16.6)	45(11.9)	45(11.9) 40(10.6) 43(11.4) 38(10)	45(11.9) 30(7.9) 20(5.3)	45(11.9)	45(11.9) 40(10.6) 43(11.4) 38(10)	45(11.9) 25(6.6) 30(7.9) 20(5.3)	
		DSG-3C2-01 Closed Center All Ports		63(16.6)	63(16.6)	63(16.6)	63(16.6) 25(6.6) 38(10) 20(5.2)	55(14.5) 13(3.4) 15(4.0)	40(10.6) 10(2.6) 13(3.4) 5(1.3)	63(16.6) 25(6.6) 38(10) 20(5.2)	55(14.5) 13(3.4) 15(4.0)	40(10.6) 10(2.6) 13(3.4) 5(1.3)	
		DSG-3C3-01 Open Center All Ports		63(16.6)	63(16.6)	63(16.6)	63(16.6)	63(16.6)	63(16.6)	63(16.6)	63(16.6)	63(16.6)	
Three Positions	Spring Centered	DSG-3C4-01 Closed Center P Only		63(16.6)	63(16.6)	63(16.6)	63(16.6) 48(12.7) 63(16.6) 43(11.4)	63(16.6) 23(6.1) 50(13.2) 18(4.8)	63(16.6) 15(4.0) 28(7.4) 13(3.4)	55(14.5) 10(2.6) 13(3.4) 5(1.3)	63(16.6) 23(6.1) 50(13.2) 18(4.8)	63(16.6) 15(4.0) 28(7.4) 13(3.4)	55(14.5) 10(2.6) 13(3.4) 5(1.3)
		DSG-3C40-01 Closed Center A & B Restricted to T		63(16.6)	63(16.6)	63(16.6)	63(16.6) 25(6.6) 38(10) 20(5.2)	55(14.5) 13(3.4) 15(4.0)	40(10.6) 10(2.6) 13(3.4)	63(16.6) 25(6.6) 38(10) 20(5.2)	55(14.5) 13(3.4) 15(4.0)	40(10.6) 10(2.6) 13(3.4) 5(1.3)	
		DSG-3C60-01 Tandem Open		43(11.4)	40(10.6)	-	43(11.4)	40(10.6)	-	43(11.4)	40(10.6)	-	
		DSG-3C9-01 Open Center T Blocked		63(16.6)	63(16.6)	63(16.6)	25(6.6)	13(3.4)	10(2.6)	25(6.6)	13(3.4)	10(2.6)	
		DSG-3C10-01 Open Center P & A Blocked		63(16.6)	63(16.6)	63(16.6)	63(16.6) 33(8.7) 55(14.5) 28(7.4)	63(16.6) 20(5.3) 25(6.6) 15(4.0)	63(16.6) 13(3.4) 15(4.0) 8(2.1)	63(16.6) 33(8.7) 55(14.5) 28(7.4)	63(16.6) 20(5.3) 25(6.6) 15(4.0)	63(16.6) 13(3.4) 15(4.0) 8(2.1)	
		DSG-3C12-01 Closed Center P & B		63(16.6)	63(16.6)	63(16.6)	63(16.6) 28(7.4) 50(13) 20(5.2)	63(16.6) 20(5.3) 20(5.3) 15(4.0)	63(16.6) 15(4.0) 15(4.0) 10(2.6)	63(16.6) 28(7.4) 50(13) 20(5.2)	63(16.6) 20(5.3) 20(5.3) 15(4.0)	63(16.6) 15(4.0) 15(4.0) 10(2.6)	

● : Closed Center Crossover

● : Open Center Crossover

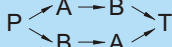
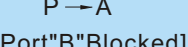

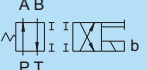

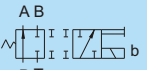

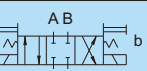

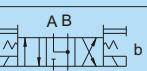


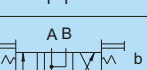
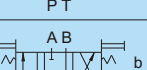
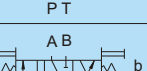
● Where two figures are shown in the same column, the upper is at rated voltage (50Hz), and the latter is at rated voltage (60Hz).



## FLOW RATINGS CHART

# A

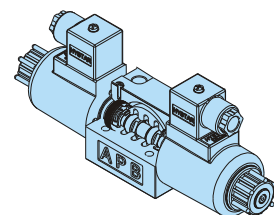
### DSG-\*\*\*-(N)-01-DC-RAC.

No. of Valve Positions	Spool-Spring Arrangement	Model Numbers & Description	Graphic Symbols	Max. Flow lpm(USgpm)								
							 [Port "B" Blocked]			 [Port "A" Blocked]		
				80bar (1140PSI)	190bar (2715PSI)	315bar (4500PSI)	80bar (1140PSI)	190bar (2715PSI)	315bar (4500PSI)	80bar (1140PSI)	190bar (2715PSI)	315bar (4500PSI)
Two Positions	Spring Offset	DSG-2B2-01 P → A, B → T (2 Way)		63(16.6)	63(16.6)	63(16.6)	20(5.3)	18(4.8)	18(4.8)	58(15.3)	35(9.2)	30(7.9)
		53(14)	53(14)	53(14)	40(10.6)	30(7.9)				25(6.6)		
		DSG-2B3-01 P → A, B → T (2 Way)		38(10)	38(10)	38(10)	48(12.7)	45(11.9)	40(10.6)	63(16.6)	63(16.6)	63(16.6)
	DSG-2B8-01 P → A, B & T Blocked (2 Way)		-	-	-	18(4.8)	8(2.1)	8(2.1)	35(9.2)	20(5.3)	15(4.0)	
	No-Spring Detented	DSG-2D2-01 P → A, B → T Detented		63(16.6)	63(16.6)	63(16.6)	45(11.9)	45(11.9)	30(7.9)	45(11.9)	45(11.9)	30(7.9)
		55(14.5)	55(14.5)	55(14.5)	25(6.6)	25(6.6)						
Three Positions	Spring Centered	DSG-3C2-01 Closed Center All Ports		63(16.6)	63(16.6)	63(16.6)	40(10.6)	18(4.8)	13(3.4)	40(10.6)	18(4.8)	13(3.4)
		28(7.4)	13(3.4)				10(2.6)	28(7.4)	13(3.4)	10(2.6)		
		DSG-3C3-01 Open Center All Ports		63(16.6)	63(16.6)	63(16.6)	63(16.6)	63(16.6)	63(16.6)	63(16.6)	63(16.6)	63(16.6)
		DSG-3C4-01 Closed Center P Only		63(16.6)	63(16.6)	35(9.2)	53(14)	33(8.7)	28(7.4)	53(14)	33(8.7)	28(7.4)
		23(6.1)	40(10.6)			20(5.3)	13(3.4)	40(10.6)	20(5.3)	13(3.4)		
		DSG-3C40-01 Closed Center A & B Restricted to T		63(16.6)	63(16.6)	63(16.6)	40(10.6)	18(4.8)	13(3.4)	40(10.6)	18(4.8)	13(3.4)
		28(7.4)	13(3.4)				10(2.6)	28(7.4)	13(3.4)	10(2.6)		
		DSG-3C60-01 Tandem Open		43(11.4)	40(10.6)	-	43(11.4)	40(10.6)	-	43(11.4)	40(10.6)	-
		DSG-3C9-01 Open Center T Blocked		63(16.6)	63(16.6)	63(16.6)	23(6.1)	13(3.4)	10(2.6)	23(6.1)	13(3.4)	10(2.6)
DSG-3C10-01 Open Center P & A Blocked		63(16.6)	63(16.6)	45(11.9)	55(14.5)	33(8.7)	20(5.3)	55(14.5)	33(8.7)	20(5.3)		
				23(6.1)	40(10.6)	23(6.1)	13(3.4)	40(10.6)	23(6.1)	13(3.4)		
DSG-3C12-01 Closed Center P & B		63(16.6)	63(16.6)	38(10)	60(15.9)	33(8.7)	20(5.3)	60(15.9)	33(8.7)	20(5.3)		
				23(6.1)	38(10)	25(6.6)	15(4.0)	38(10)	25(6.6)	15(4.0)		

●  : Closed Center Crossover

●  : Open Center Crossover

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



## FLOW RATINGS CHART

# A

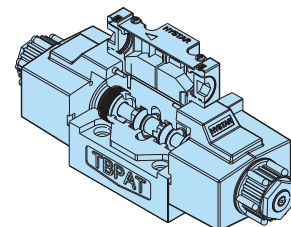
### DSG-(N)-03-AC.

No. of Valve Positions	Spool -Spring Arrangement	Model Numbers & Description	Graphic Symbols	Max. Flow lpm(USgpm)									
				100bar 1430PSI	205bar 2930PSI	315bar (4500PSI)	100bar 1430PSI	205bar 2930PSI	315bar (4500PSI)	100bar 1430PSI	205bar 2930PSI	315bar (4500PSI)	
Two Positions	Spring Offset	DSG-2B2-03 P → A, B → T (2 Way)		100(26.4) 100(26.4) 90(23.8)	100(26.4) 100(26.4) 90(23.8)	100(26.4) 100(26.4) 90(23.8)	34(9.0)	22(5.8)	19(5.0)	100(26.4) 62(16.4) 80(21.1) 42(11.1)	100(26.4) 53(14.0) 68(18.0) 35(9.2)	94(24.8) 37(9.8) 51(13.5) 33(8.7)	
		DSG-2B3-03 P → A, B → T (2 Way)		100(26.4) 100(26.4) 75(19.8)	100(26.4) 100(26.4) 75(19.8)	100(26.4) 100(26.4) 75(19.8)	57(15.1)	57(15.1)	57(15.1)	100(26.4) 79(20.9) 92(24.3) 92(24.3)	100(26.4) 68(18.0) 83(21.9) 37(9.8)	100(26.4) 59(15.6) 70(18.5) 27(7.1)	
		DSG-2B8-03 P → A, B & T Blocked(2 Way)		-	-	-	26(6.9)	18(4.8)	16(4.2)	100(26.4) 35(9.2) 45(11.9) 21(5.5)	74(19.5) 12(3.2) 24(6.3) 10(2.6)	49(12.9) 7(1.8) 11(2.9) 6(1.6)	
	No-Spring Detented	DSG-2D2-03 P → A, B → T Detented		100(26.4)	100(26.4)	100(26.4)	40(10.6)	35(9.2)	28(7.4)	60(15.9)	50(13.2)	35(9.3)	
	Three Positions	Spring Centered	DSG-3C2-03 Closed Center All Ports		100(26.4)	100(26.4)	100(26.4)	100(26.4) 70(18.5) 90(23.8) 49(13.0)	98(25.9) 38(10.0) 43(11.3) 43(11.4)	65(17.1) 24(6.3) 26(6.8) 15(4.0)	100(26.4) 70(18.5) 90(23.8) 49(13.0)	98(25.9) 38(10.0) 43(11.3) 43(11.4)	65(17.1) 24(6.3) 26(6.8) 15(4.0)
			DSG-3C3-03 Open Center All Ports		90(23.8)	90(23.8)	90(23.8)	100(26.4) 81(21.4) 100(26.4) 81(21.4)	100(26.4) 81(21.4) 100(26.4) 81(21.4)	100(26.4) 81(21.4) 100(26.4) 81(21.4)	100(26.4) 81(21.4) 100(26.4) 81(21.4)	100(26.4) 81(21.4) 100(26.4) 81(21.4)	100(26.4) 81(21.4) 100(26.4) 81(21.4)
DSG-3C4-03 Closed Center P Only				80(21.1)	80(21.1)	80(21.1)	100(26.4) 25(6.6) 30(7.9) 15(4.0)	88(23.2) 58(15.3) 90(23.8) 47(12.4)	46(12.1) 19(5.0) 22(5.8) 15(4.0)	100(26.4) 58(15.3) 90(23.8) 47(12.4)	88(23.2) 27(7.1) 39(10.3) 22(5.8)	46(12.1) 19(5.0) 22(5.8) 15(4.0)	
DSG-3C40-03 Closed Center A & B Restricted to T				100(26.4)	100(26.4)	100(26.4)	100(26.4) 75(19.8) 100(26.4) 25(6.6)	92(24.3) 62(16.4) 37(9.8) 40(10.6)	48(12.7) 30(7.9) 20(5.3) 21(11.1)	100(26.4) 62(16.4) 20(5.3) 12(3.2)	100(26.4) 62(16.4) 37(9.8) 40(10.6)	92(24.3) 30(7.9) 37(9.8) 21(11.1)	48(12.7) 18(4.8) 20(5.3) 12(3.2)
DSG-3C60-03 Tandem Open				70(18.5)	70(18.5)	-	100(26.4)	100(26.4)	-	100(26.4)	100(26.4)	-	
DSG-3C9-03 Open Center T Blocked				100(26.4)	100(26.4)	100(26.4)	60(15.9)	60(15.9)	60(15.9)	60(15.9)	60(15.9)	60(15.9)	60(15.9)
DSG-3C10-03 Open Center P & A Blocked				80(21.1)	80(21.1)	80(21.1)	80(21.1) 20(5.3) 20(5.3) 15(4.0)	100(26.4) 55(15.9) 60(15.9) 38(10)	80(21.1) 28(7.4) 35(6.6) 19(5)	34(9.0) 16(4.2) 17(4.5) 11(2.9)	100(26.4) 55(15.9) 60(15.9) 38(10)	80(21.1) 28(7.4) 35(6.6) 19(5)	34(9.0) 16(4.2) 17(4.5) 11(2.9)
DSG-3C12-03 Closed Center P & B				90(23.8)	90(23.8)	90(23.8)	90(23.8) 20(5.3) 20(5.3) 15(4.0)	100(26.4) 55(15.9) 60(15.9) 38(10)	80(21.1) 28(7.4) 35(6.6) 19(5)	34(9.0) 16(4.2) 17(4.5) 11(2.9)	100(26.4) 55(15.9) 60(15.9) 38(10)	80(21.1) 28(7.4) 35(6.6) 19(5)	34(9.0) 16(4.2) 17(4.5) 11(2.9)

● : Closed Center Crossover

● : Open Center Crossover

● Where two figures are shown in the same column, the upper is at rated voltage(50Hz), and the latter is at rated voltage(60Hz).

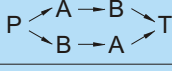
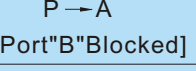
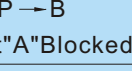
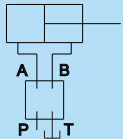
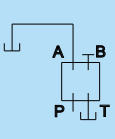
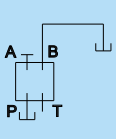
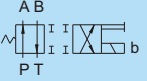

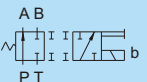
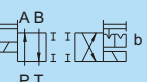
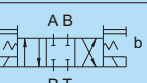
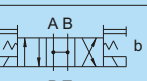
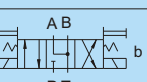
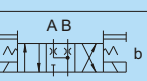
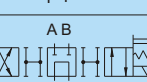
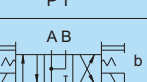
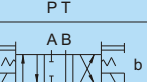





## FLOW RATINGS CHART

# A

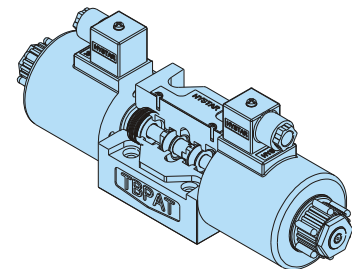
### DSG-(N)-03-DC-RAC.

No. of Valve Positions	Spool-Spring Arrangement	Model Numbers & Description	Graphic Symbols	Max. Flow lpm (USgpm)									
							 [Port "B" Blocked]			 [Port "A" Blocked]			
													
				100bar 1430PSI	205bar 2930PSI	315bar (4500PSI)	100bar (1430PSI)	205bar (2930PSI)	315bar (4500PSI)	100bar (1430PSI)	205bar (2930PSI)	315bar (4500PSI)	
Two Positions	Spring Offset	DSG-2B2-03 P → A, B → T (2 Way)		110(29.1)	110(29.1)	110(29.1)	68(18)	43(11.2)	38(10)	120(31.7)	94(24.8)	63(16.6)	
		DSG-2B3-03 P → A, B → T (2 Way)		120(31.7)	120(31.7)	120(31.7)					77(20.3)	77(20.3)	77(20.3)
		DSG-2B8-03 P → A, B & T Blocked (2 Way)		-	-	-	53(14)	28(7.4)	23(6.1)	120(31.7)	91(24)	47(12.4)	
	No-Spring Detented	DSG-2D2-03 P → A, B → T Detented		120(31.7)	120(31.7)	120(31.7)	45(11.9)	33(8.7)	28(7.4)	60(15.9)	50(13.2)	35(9.3)	
Three Positions	Spring Centered	DSG-3C2-03 Closed Center All Ports		120(31.7)	120(31.7)	120(31.7)	120(31.7)	100(26.4)	55(14.5)	120(31.7)	100(26.4)	55(14.5)	
		DSG-3C3-03 Open Center All Ports		120(31.7)	120(31.7)	120(31.7)	120(31.7)	120(31.7)	120(31.7)		120(31.7)	120(31.7)	120(31.7)
		DSG-3C4-03 Closed Center P Only		120(31.7)	120(31.7)	120(31.7)	120(31.7)	120(31.7)	64(16.9)	120(31.7)	120(31.7)	64(16.9)	
		DSG-3C40-03 Closed Center A & B Restricted to T		120(31.7)	120(31.7)	120(31.7)	120(31.7)	91(24)	49(12.9)		120(31.7)	91(24)	49(12.9)
		DSG-3C60-03 Tandem Open		120(31.7)	120(31.7)	-	120(31.7)	120(31.7)	-	120(31.7)	120(31.7)	-	
		DSG-3C9-03 Open Center T Blocked		120(31.7)	120(31.7)	120(31.7)	100(26.4)	100(26.4)	100(26.4)	100(26.4)	100(26.4)	100(26.4)	
		DSG-3C10-03 Open Center P & A Blocked		120(31.7)	120(31.7)	65(17.2)	120(31.7)	86(22.7)	51(13.5)	120(31.7)	86(22.7)	51(13.5)	
		DSG-3C12-03 Closed Center P & B		120(31.7)	120(31.7)	50(13.2)		57(15.0)	40(10.6)		120(31.7)	57(15.0)	40(10.6)
				65(17.2)	120(31.7)	91(24.0)	51(13.5)	120(31.7)	91(24.0)	51(13.5)			
				50(13.2)		66(17.4)	40(10.6)		120(31.7)	66(17.4)	40(10.6)		

●  : Closed Center Crossover

●  : Open Center Crossover

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



## ORDERING CODE

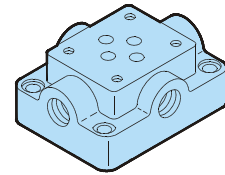
M01 - 03 - 4B - 30

DESIGN NO  
30: with PT thread  
3090: with NPT thread

PORT POSITION  
4S: four ports (A,B,P,T) side ports  
4B: four ports (A,B,P,T) back ports  
2S2B: two ports (A,B) in side and two ports (P,T) in back  
3S1B: three ports (A,B,P) in side and one port (T) in back  
3S1B2: three ports (A,B,P) in side (A+B one side) and one port (T) in back  
4S4B: four ports (A,B,P,T) in side ,four ports (A,B,P,T) in back and supplied with 4 pcs plugs.

PORT SIZE  
02: 1/4"  
03: 3/8"  
04: 1/2"  
06: 3/4"  
10: 1-1/4"

SERIES NUMBER  
M01: Subplates for DSG-01 and DSGX-01 solenoid valves  
M03: Subplates for DSG-03 solenoid valves  
M04: Subplates for DSHG-04 solenoid controlled pilot operated valves  
M06: Subplates for DSHG-06 solenoid controlled pilot operated valves  
M10: Subplates for DSHG-06 solenoid controlled pilot operated valves



The installation surfaces should be finer than  $\frac{6.3S}{\sqrt{VV}}$

## SUBPLATE PORT POSITION

MODEL	4S	4B	2S2B	3S1B	3S1B2
M01	O	O	O	O	X
M03	O	O	O	O	O
M04	O	O	X	X	X
M06	O	O	X	X	X
M10	X	O	X	X	X

## SUBPLATE PORT SIZE

MODEL	02	03	04	06	08	10
M01	O	O	X	X	X	X
M03	X	O	O	X	X	X
M04	X	X	O	O	X	X
M06	X	X	X	O	O	X
M10	X	X	X	X	X	O

## SUBPLATE WEIGHT

Unit: kgs/pc

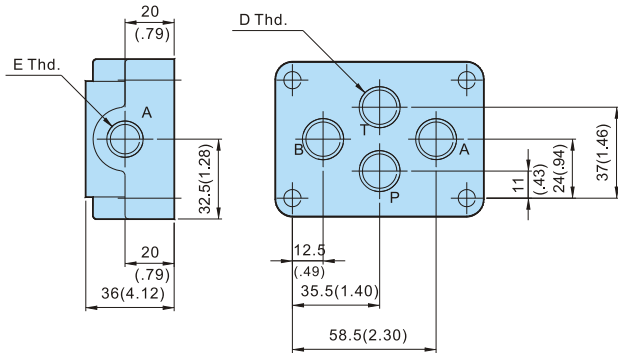
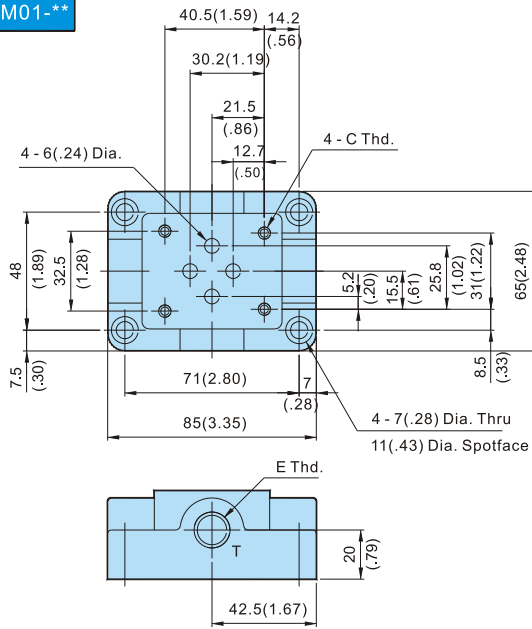
MODEL	4S	4B	2S2B	3S1B	3S1B2
M01	1.10	1.10	1.10	1.10	X
M03	3.10	2.20	3.10	3.10	3.10
M04	4.80	3.00	X	X	X
M06	9.50	4.60	X	X	X
M10	X	17.00	X	X	X

## SUBPLATE

## DIMENSIONS: MILLIMETERS (INCHES)

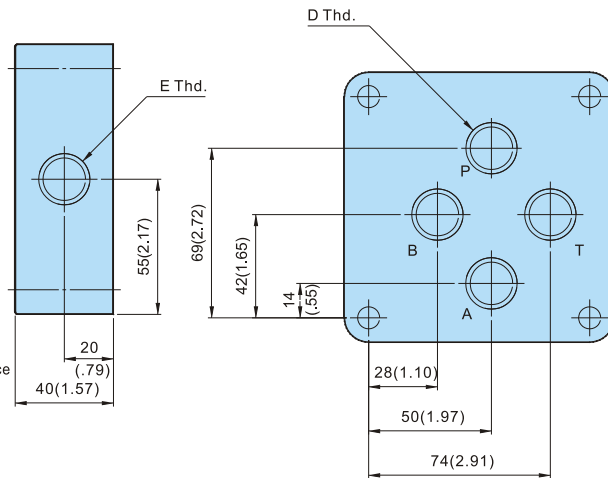
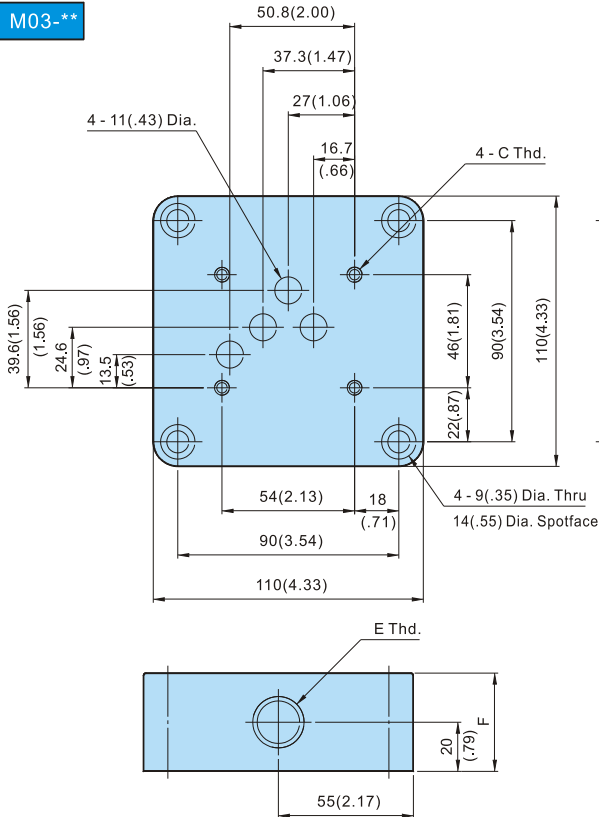
# A

**M01-\*\*-\*\***



CODE	C Thd.	D Thd.	E Thd.
M01-02-**-30	M5XP0.8	PT1/4	PT1/4
M01-02-**-3090	10-24UNC	NPT1/4	NPT1/4
M01-03-**-30	M5XP0.8	PT3/8	PT3/8
M01-03-**-3090	10-24UNC	NPT3/8	NPT3/8

**M03-\*\*-\*\***



CODE	C Thd.	D Thd.	E Thd.	F
M03-03-**-30	M6XP1.0	PT3/8	PT3/8	30(1.18)
M03-03-**-3090	1/4-20UNC	NPT3/8	NPT3/8	30(1.18)
M03-04-**-30	M6XP1.0	PT1/2	PT1/2	30(1.18)
M03-04-**-3090	1/4-20UNC	NPT1/2	NPT1/2	30(1.18)

" F " is for port position " 4B " type only.



## ORDERING CODE

MM01 - 5S - 30

DESIGN NO  
30: with PT thread  
3090: with NPT thread

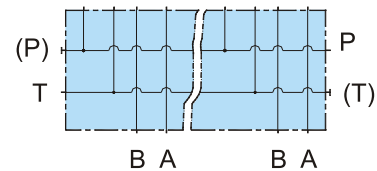
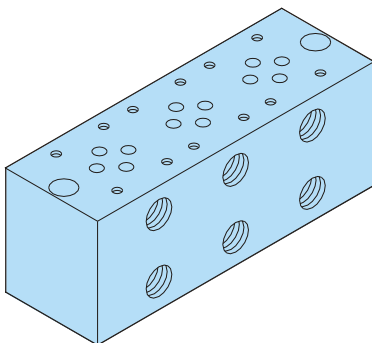
### NUMBER OF STATIONS

1S : 1 Station  
2S : 2 Stations  
3S : 3 Stations  
4S : 4 Stations  
5S : 5 Stations  
6S : 6 Stations  
7S : 7 Stations  
8S : 8 Stations  
9S : 9 Stations

### SERIES NUMBER

MM01: Manifolds for DSG-01 and DSGX-01 solenoid valves  
MM03: Manifolds for DSG-03 solenoid valves

1. The installation surface should be finer than  $\frac{6.3S}{\sqrt{A}}$
2. Material: Casting iron FC 30 ( or steel or aluminium )
3. Max Working Pressure: 315 bar

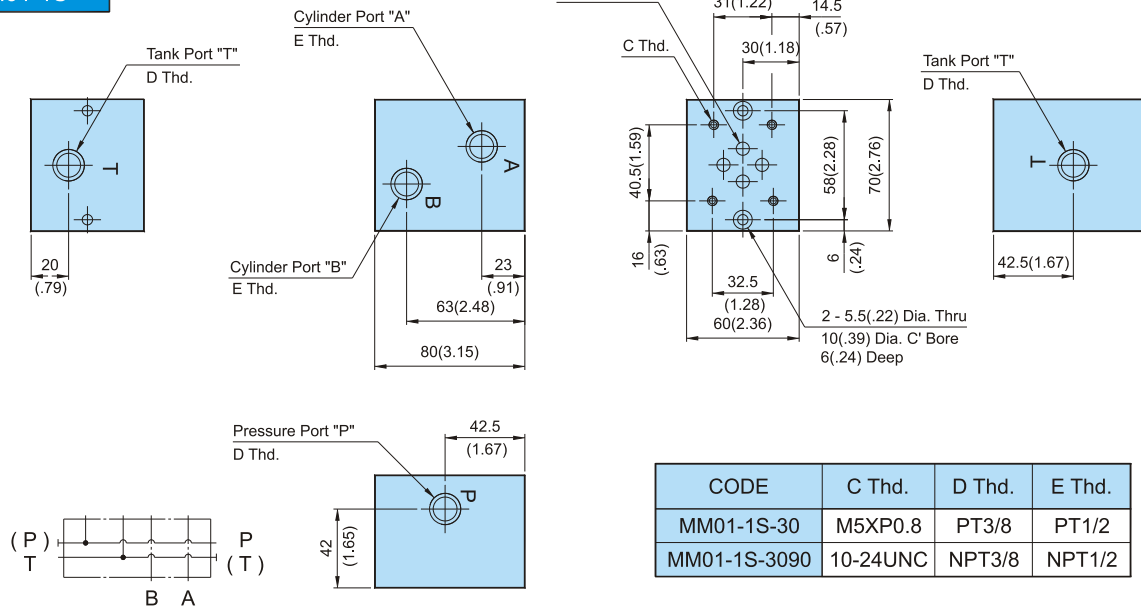


## MANIFOLDS

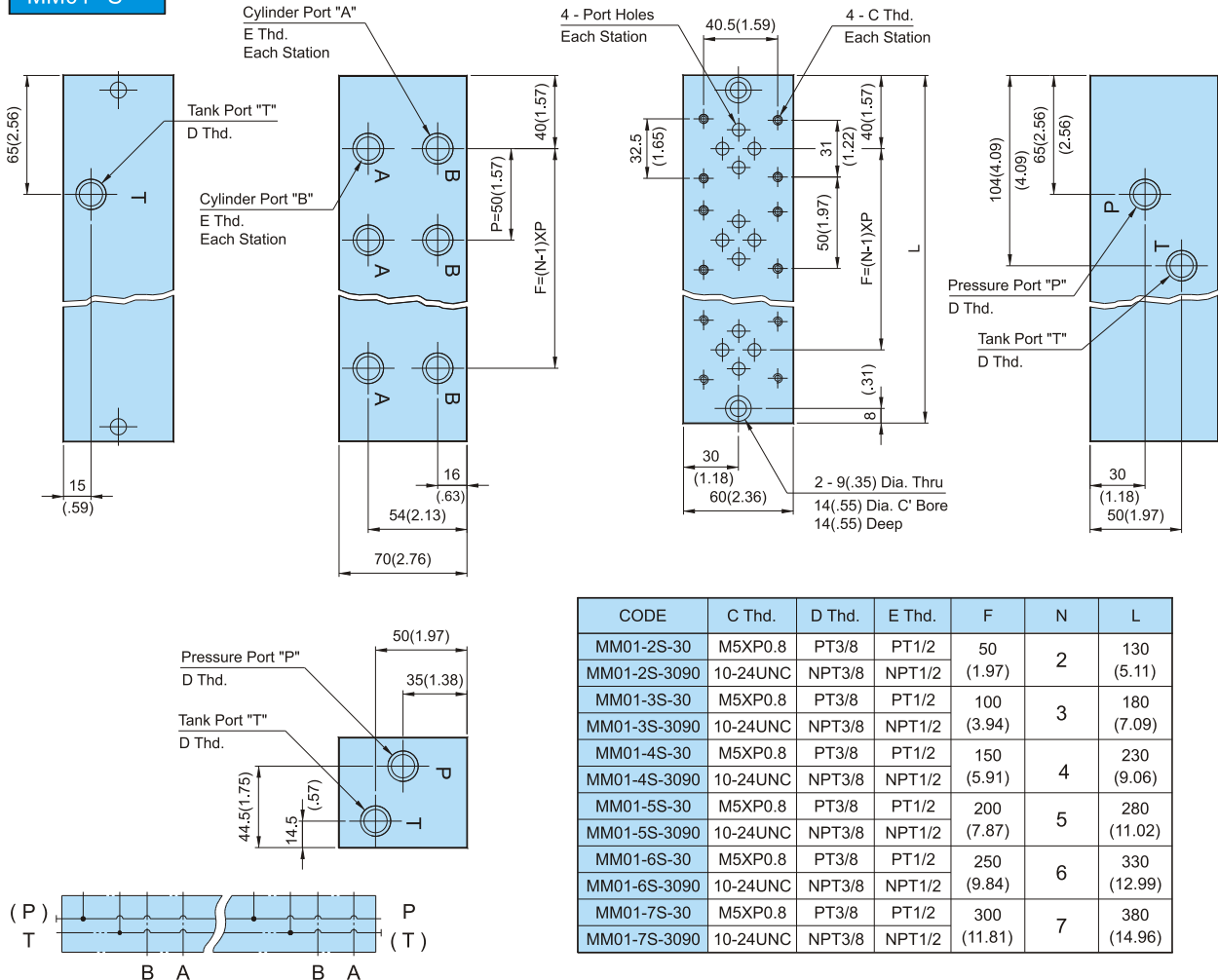
## DIMENSIONS: MILLIMETERS(INCHES)

# A

### MM01-1S-\*\*



### MM01-\*S-\*\*





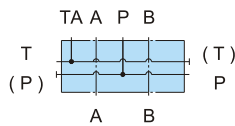
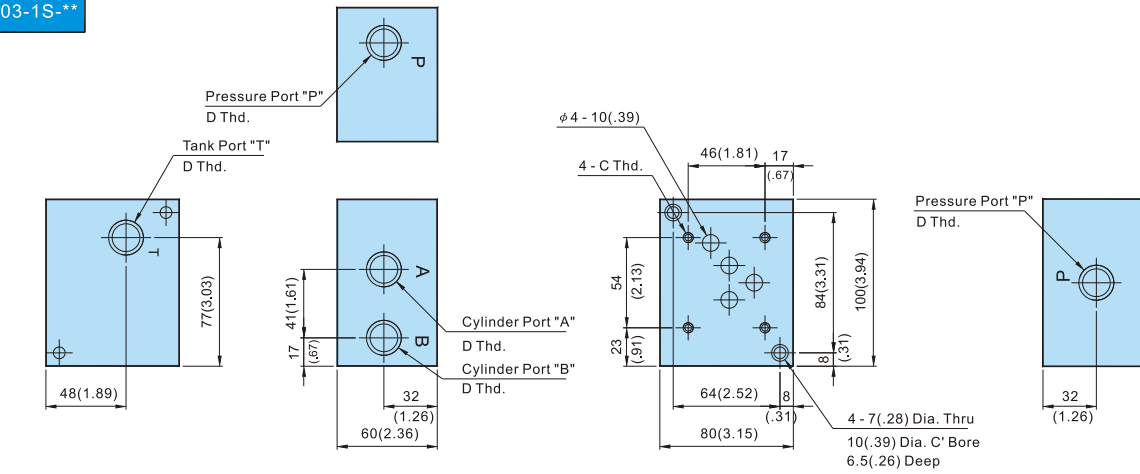
# "DSG" DIRECTIONAL VALVES

## MANIFOLDS

## DIMENSIONS: MILLIMETERS(INCHES)

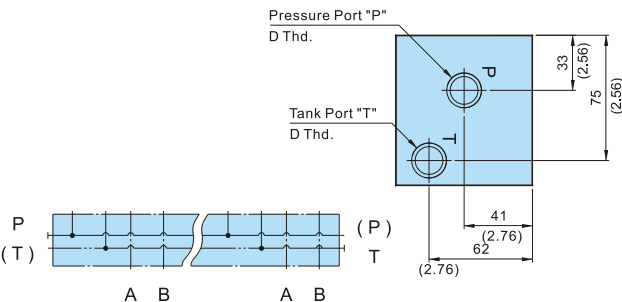
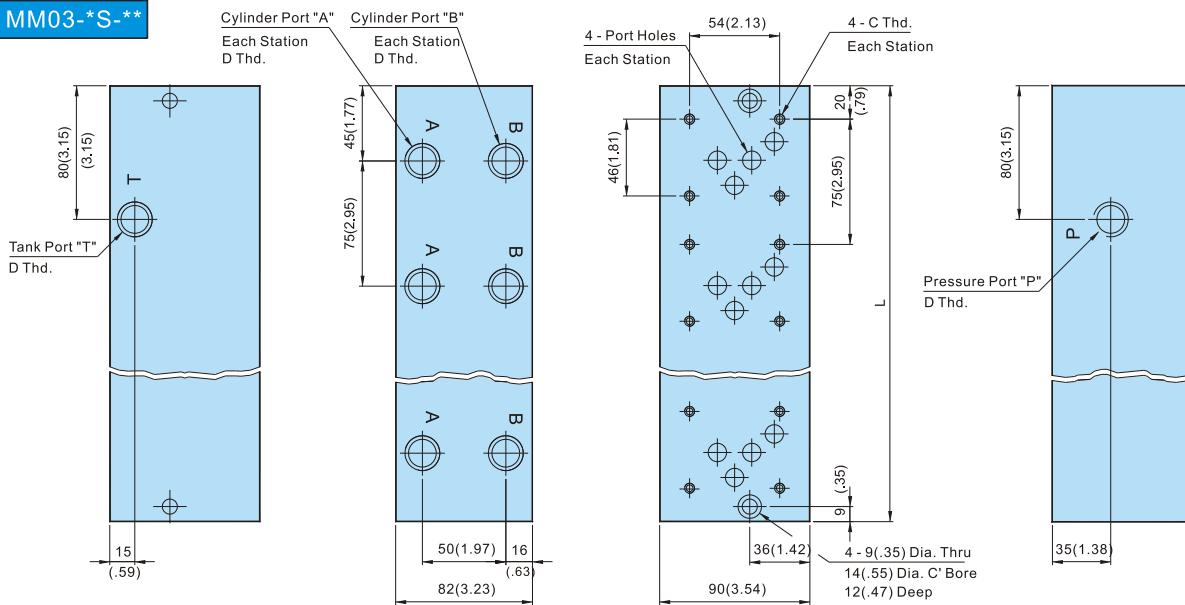
**A**

**MM03-1S-\*\***



CODE	C Thd.	D Thd.
MM03-1S-**-30	M6XP0.8	PT3/8
MM03-1S-**-3090	1/4-20UNC	NPT3/8

**MM03-\*S-\*\***



CODE	C Thd.	D Thd.	L
MM03-2S-30	M6XP1.0	PT1/2	160
MM03-2S-3090	1/4-20UNC	NPT1/2	(6.30)
MM03-3S-30	M6XP1.0	PT1/2	235
MM03-3S-3090	1/4-20UNC	NPT1/2	(9.25)
MM03-4S-30	M6XP1.0	PT1/2	310
MM03-4S-3090	1/4-20UNC	NPT1/2	(12.20)
MM03-5S-30	M6XP1.0	PT1/2	385
MM03-5S-3090	1/4-20UNC	NPT1/2	(15.16)
MM03-6S-30	M6XP1.0	PT1/2	460
MM03-6S-3090	1/4-20UNC	NPT1/2	(18.11)

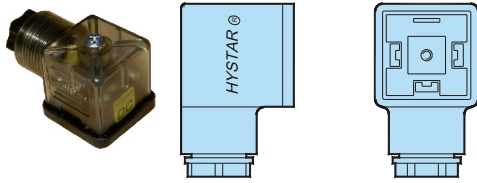


## ELECTRIC CIRCUIT DIAGRAM

### A

#### DIN Connector Type

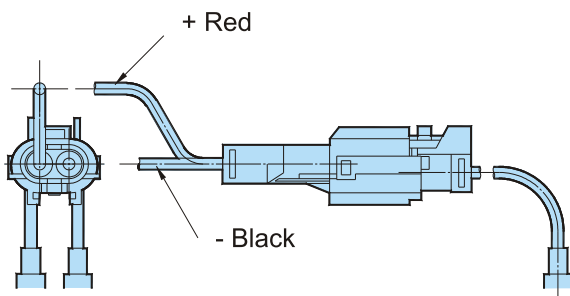
DIN 43650 - ( mPm connector )



- 1). German DIN standard 43650 plug.
- 2). Connector with indicator lights as standard.
- 3). Gland-nud : Pg9 or Pg11
- 4). Cable diameter :6-8mm (Pg9), 8-10mm (Pg11)
- 5). Number of poles : 2 + ground ( 3 + ground ).
- 6). Nominal voltages :  
AC 12V - 250V ; DC 9V - 225V.
- 7). Tighten the fixing screw to a torque of  
0.5 - 0.7 Nm ( 4.3 - 6.1 in-lbs.)
- 8). LED ( A.C : Red.,D.C : Yellow.,RAC : Green )

#### Lead Wire Connection Type

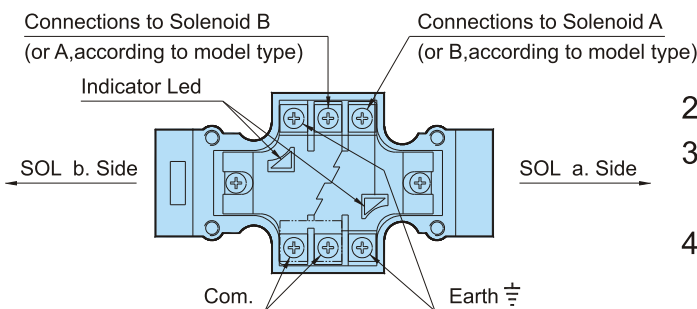
" SWP connector "



- 1). Plug-in connector.
- 2). Water proof.
- 3). Vibration proof.
- 4). Cable diameter : 6 - 10mm
- 6). Nominal voltages :  
AC 12V - 250V ; DC 9V - 225V.
- 5). Insulation : Group C - VDE0110

#### Terminal Strip and Led Options

( With indicator led )



- 1). Double solenoid valve is provided with common terminal to facilitate wiring. When it is not used,remove it by loosening the terminal screws.
- 2). Cable diameter : 6 - 10mm
- 3). Nominal voltages :  
AC 12V - 250V ; DC 9V - 225V.
- 4). Tighten the terminal screw to a torque of  
0.5 - 0.7 Nm ( 4.3 - 6.1 in-lbs.)

AC solenoid	DC solenoid	Rectifier built-in type

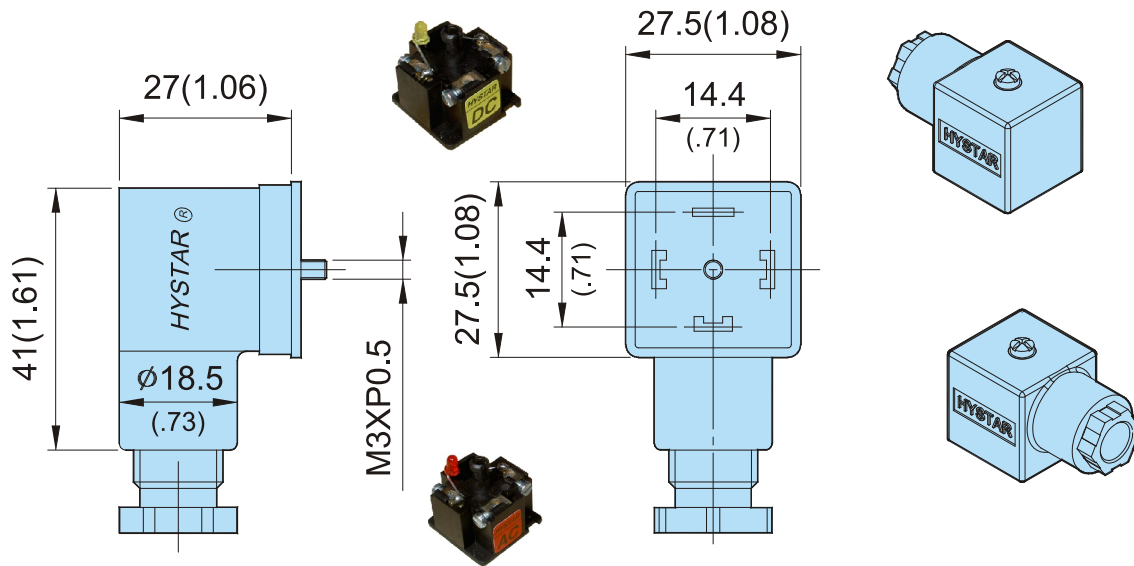


## DIMENSIONS

MILLIMETERS(INCHES)

A

SOLENOID/CONNECTOR DESIGN-A/DIN 43650



## ORDERING CODE :

TYPE :	HKA 2+GROUND ( 2 + $\frac{1}{3}$ )	HKB 3+GROUND ( 3 + $\frac{1}{3}$ )
--------	---------------------------------------	---------------------------------------

## TECHNICAL DATA :

HOUSING :	BLACK AND GREY : PA+30%GF CLEAR : POLYMIDE	
CONTACT HOLDER :	PA+30%GF	
GASKET :	THERMOPLASTIC RUBBER	
CONTACT MATERIAL :	Cu Zn ( Ag )	
MAX. VOLTAGE :	250AC/300V DC	
REF. TO CONNECTOR W/O ANY WIRING :		
MAX. CURRENT	16A	
OPERATING CURRENT :	10A	
SPACING :	18mm	
NO. OF CONTACTS :	2+GROUND ( 2 + $\frac{1}{3}$ )	3+GROUND ( 3 + $\frac{1}{3}$ )
MAX. WIRE CROSS-SECTION :	AWG 14	
CONNECTOR TYPE :	PG 9 ( 6 - 8 mm )	
CABLE DIAMETER :	PG 11 ( 8 - 10 mm )	
PROTECTION CLASS :	IP 65 DIN 40050	
INSULATION CLASS :	C - VDE0110	
OPERATING TEMPERATURE :	- 40°C ... +150°C	





## DIMENSIONS

MILLIMETERS(INCHES)

# A

### OPTIONAL

#### MODELS WITH STROKE LIMITER ( RW/RA/RB )

When the stroke limiter is screwed in, the main spool stroke becomes shorter and flow rate becomes lower.

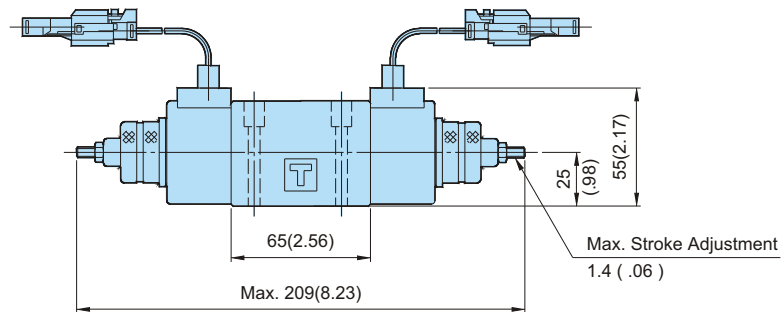
( DSGX-01/DSG-01/DSG-03 were available in DC / RAC only )

GRAPHIC SYMBOLS		CODE
	With Stroke Adjustment, "A+B" Stroke.	"RW"
	With Stroke Adjustment, Port "A" Stroke.	"RA"
	With Stroke Adjustment, Port "B" Stroke.	"RB"

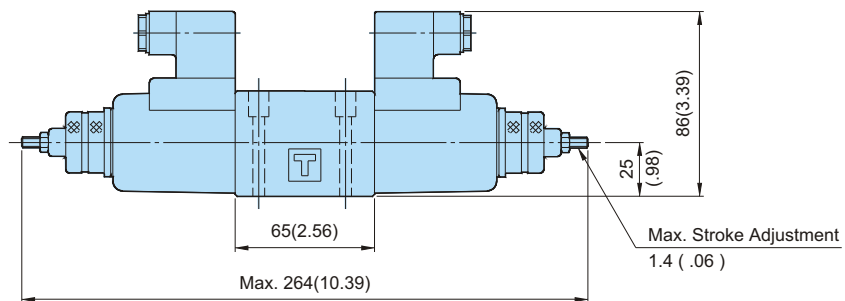
#### DSGX-\*\*\*-Y-01-DC/RAC-RW



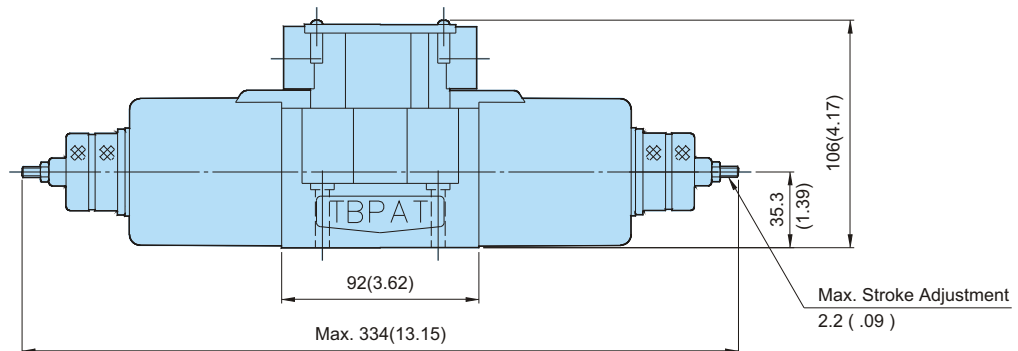
**RW-01**



#### DSG-\*\*\*-N-01-DC/RAC-RW

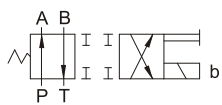


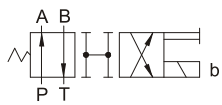


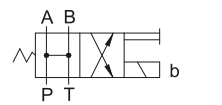


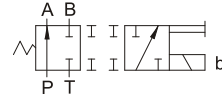


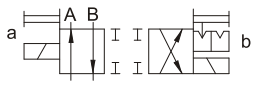


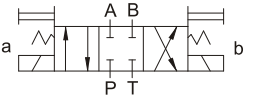


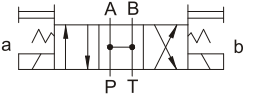


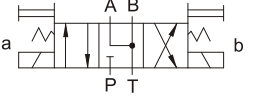


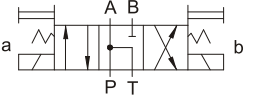


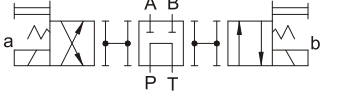


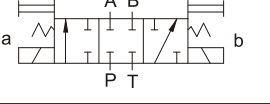


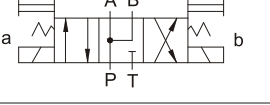


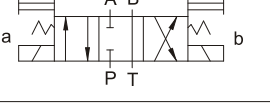


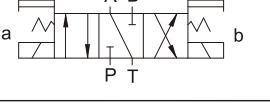




#### DSG-\*\*\*-03-DC/RAC-RW



## LIST OF NORMAL SPOOL STRUCTURE ( DSG-01/03 )

**A**

MODEL	HYD. SYMBOLS	DSG-01	DSG-03
DSG-2B2-**			
DSG-2B3-**			
DSG-2B3B-**			
DSG-2B8-**			
DSG-2D2-**			
DSG-3C2-**			
DSG-3C3-**			
DSG-3C4-**			
DSG-3C5-**			
DSG-3C60-**			
DSG-3C8-**			
DSG-3C9-**			
DSG-3C10-**			
DSG-3C12-**			



## CROSS OVER CONDITIONAL OF NORMAL SPOOL TYPE ( DSG-01/03 )

**A**

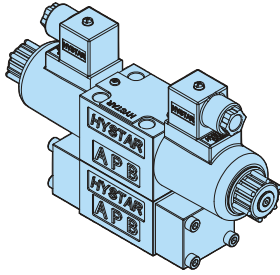
SPRING CENTERED 3 POSITIONS	GRAPHIC SYMBOL WITH DETAILS CROSS OVER	SPRING OFFSET 2 POSITIONS	GRAPHIC SYMBOL WITH DETAILS CROSS OVER
3C2		2A2	
3C3		2A3	
3C4		2A14	
3C40		2B2	
3C5		2B3	
3C6		2B8	
3C60		2B29	
3C7		2B2A	
3C8		2B3A	
3C9		2B4A	
3C10		2B60A	
3C11		2B2B	
3C12		2B3B	
3C25		2B4B	
3C29		2B60B	
3C48		2B10B	
3C94		2B12B	



## SOLENOID CONTROLLED PILOT OPERATED DIRECTIONAL VALVES DSHG TYPE

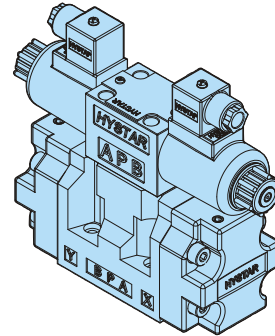
**A**

DSHG-N-01



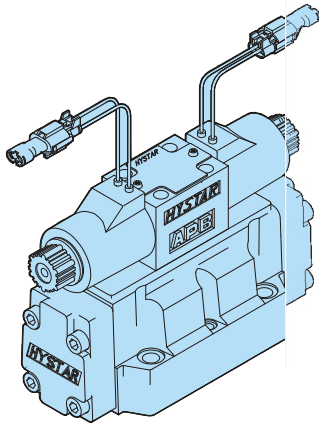
Max. Pressure : 210bar ( 3000PSI )  
 Max. Flow : 40lpm ( 10.6USgpm )

DSHG-N-03



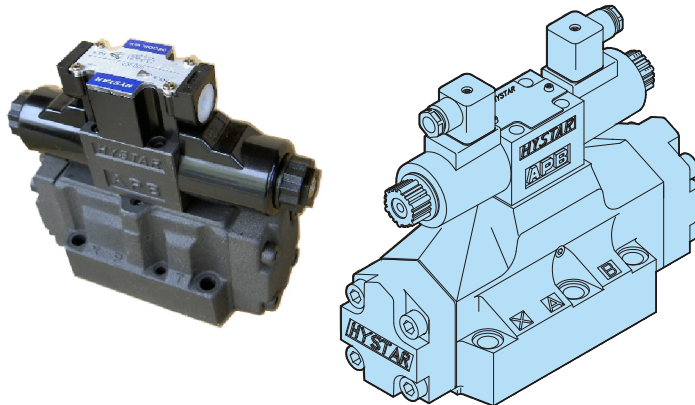
Max. Pressure : 250bar ( 3600PSI )  
 Max. Flow : 160lpm ( 42.3USgpm )

DSHG-Y-04



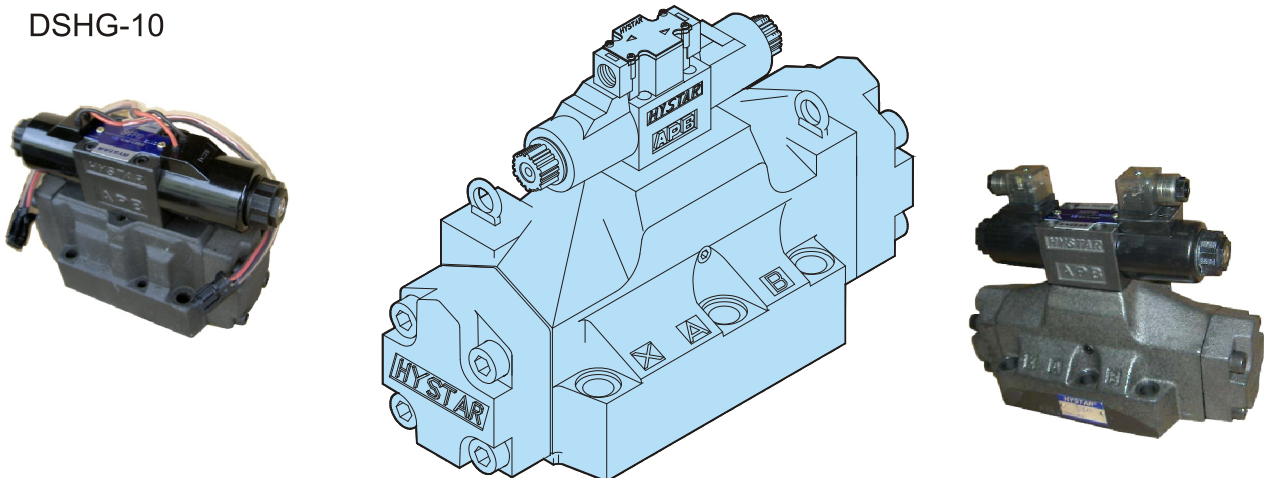
Max. Pressure : 250bar ( 3600PSI )  
 Max. Flow : 300lpm ( 79.3USgpm )

DSHG-N-06



Max. Pressure : 250bar ( 3600PSI )  
 Max. Flow : 500lpm ( 132USgpm )

DSHG-10



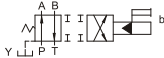

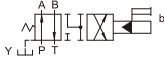
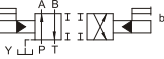

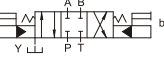





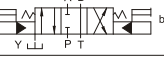
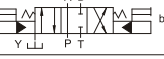
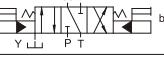

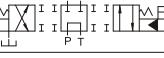
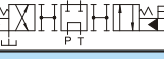
Max. Pressure : 250bar ( 3600PSI )

Max. Flow : 1100lpm ( 291USgpm )

# "DSHG" DIRECTIONAL VALVES

## MODEL NO SPECIFICATIONS ( Solenoid Controlled Pilot Operated Directional Valves )

A

Spool Type & Graphic Symbols		Rated Flow Capacity -Maximum Flow Capacity				
SYMBOLS	MODEL NO	DSHG-01	DSHG-03	DSHG-04	DSHG-06	DSHG-10
	DSHG-2B2-**	~40 lpm (~10.6USgpm)	60~160 lpm (15.9~42.3USgpm)	135~300 lpm (35.7~79.3USgpm)	310~500 lpm (82~132USgpm)	570~1100 lpm (150~291USgpm)
	DSHG-2B3-**					
	DSHG-2B4-**					
	DSHG-2N2-**					
	DSHG-2N3-**					
	DSHG-3C2-**					
	DSHG-3C3-**					
	DSHG-3C4-**					
	DSHG-3C40-**					
	DSHG-3C7-**					
	DSHG-3C9-**					
	DSHG-3C10-**					
	DSHG-3C11-**					
	DSHG-3C12-**					
	DSHG-3C5-**	~40 lpm (~10.6USgpm)	60~160 lpm (15.9~42.3USgpm)	245~280 lpm (64.8~74.5USgpm)	230~450 lpm (60.8~120USgpm)	570~950 lpm (150~250USgpm)
	DSHG-3C6-**					
	DSHG-3C60-**					
Max. Operating Pressure ( bar )						
Min. Required Pilot Pressure ( bar )		8 ( 114 PSI )				10 ( 143 PSI )
Max. Pilot Pressure ( bar )		250 ( 3600 PSI )				
Permissible Back Pressure ( T ) ( bar ) Ext. Drain		210 ( 3000 PSI )				
Permissible Back Pressure ( T ) ( bar ) Int. Drain		160 ( 2300 PSI )				
Weight ( Kgs )	Double Solenoid	3.5	7.2	8.9	12.8	45.4
	Single Solenoid	2.9	6.6	8.3	12.2	44.8
Switching Frequency ( times/min )		120	120	120	120	110
Hydraulic Fluids		Use Hydraulic Fluids Equivalent to ISO VG32 or VG46				
Operating Temperature Range Recommended ( °C )		-15 ~ +70 ( +5 ~ +160°F )				
Operating Viscosity ( cSt )		15 ~ 400 ( 80 ~ 1800SSU )				
Filtration		25 Microns Absolute or Finer				

## LIST OF SPOOL FUNCTIONS ( DSHG-04/06/10 )

**A**

SPRING OFFSET 2 POSITION	GRAPHIC SYMBOLS ( STANDARD )	SPRING CENTERED 3 POSITION	GRAPHIC SYMBOLS ( STANDARD )	NO SPRING 2 POSITION	GRAPHIC SYMBOLS ( STANDARD )
2A2		3C2		2N2	
2A3		3C3		2N3	
2A14		3C4		2N4	
2B2		3C40		2N40	
2B29		3C5		2N7	
2B3		3C6		2N2A	
2B4		3C60		2N3A	
2B40		3C7		2N4A	
2B7		3C8		2N40A	
		3C9		2N5A	
		3C10		2N6A	
		3C11		2N60A	
		3C12		2N7A	
		3C25		2N9A	
		3C29		2N10A	
		3C48		2N11A	
				2N12A	

**SPECIAL TWO POSITION VALVES ( DSHG-04/06/10 )**

A

SPRING OFFSET 2 POSITION	GRAPHIC SYMBOLS		SPRING OFFSET 2 POSITION	GRAPHIC SYMBOLS	
	STANDARD	ALTERNATED		STANDARD	ALTERNATED
2B2A(L)			2B2B(L)		
2B3A(L)			2B3B(L)		
2B4A(L)			2B4B(L)		
2B40A(L)			2B40B(L)		
2B5A(L)			2B5B(L)		
2B6A(L)			2B6B(L)		
2B60A(L)			2B60B(L)		
2B7A(L)			2B7B(L)		
2B8A(L)			2B8B(L)		
2B9A(L)			2B9B(L)		
2B10A(L)			2B10B(L)		
2B11A(L)			2B11B(L)		
2B12A(L)			2B12B		
2B25A(L)			2B25B(L)		
2B29A(L)			2B29B(L)		
2B48A(L)			2B48B(L)		

NOTE : Standard Model No. + L = Alternate Model.  
For example, 2B2A is Standard Model, 2B2AL is Alternate Model.

## DIMENSIONS

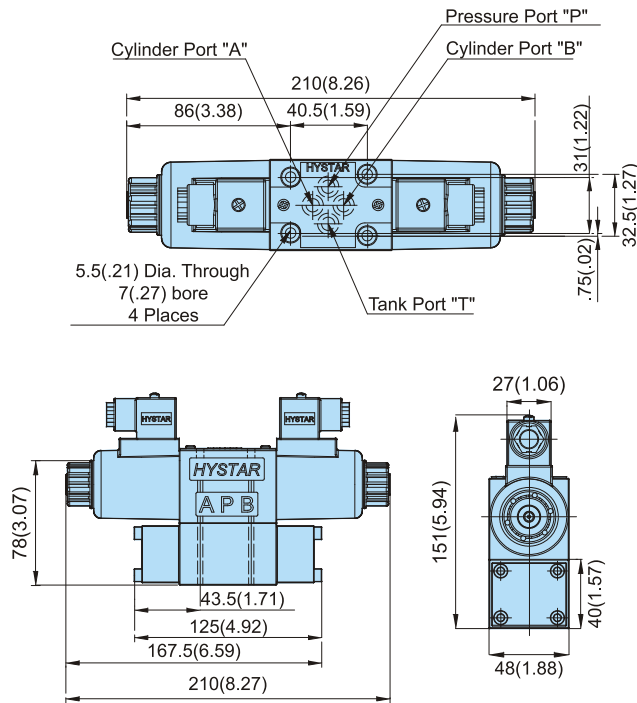
## MILLIMETERS(INCHES)

# A

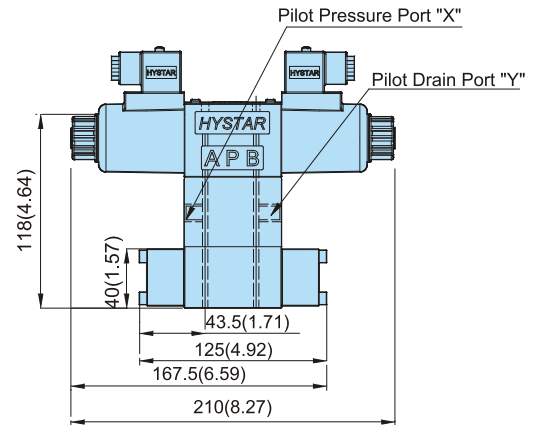
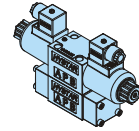
DSHG-01

1P1D: Internal pilot, internal drain

MOUNTING SURFACE: DSHG-01-CETOP3  
ISO 03-NFPAD03



1P2D: Internal pilot, external drain  
2P1D: External pilot, internal drain  
2P2D: External pilot, external drain

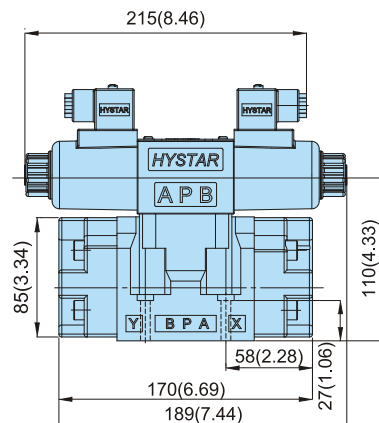
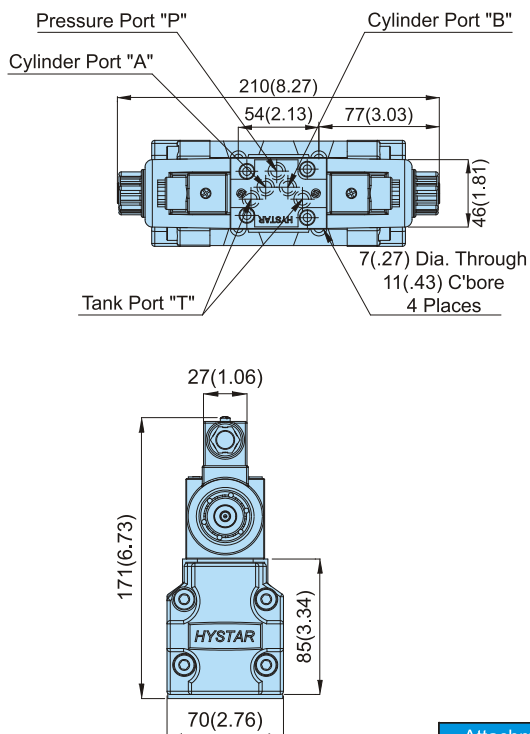


•Dimensions for models with terminal box type, reference page 15 for details.

Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M5 X45LgX4pcs	5-7 Nm	30
Soc. Hd. Cap Screw	10-24UNCX1-3/4"LgX4pcs	43-60 in.lbs	3090

DSHG-03

MOUNTING SURFACE: DSHG-03-CETOP5  
ISO 05-NFPAD05



•Dimensions for models with Din connector, reference page 15 for details.

Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M6 X35LgX4pcs	12-15 Nm	30
Soc. Hd. Cap Screw	1/4-20UNCX1-1/2"LgX4pcs	105-130 in.lbs	3090



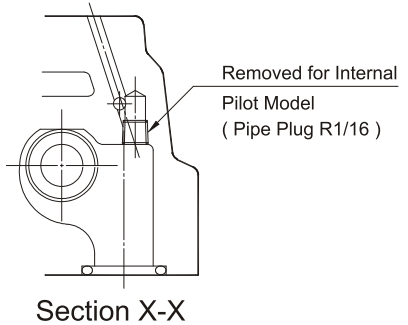
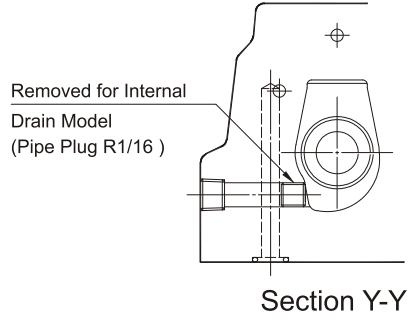
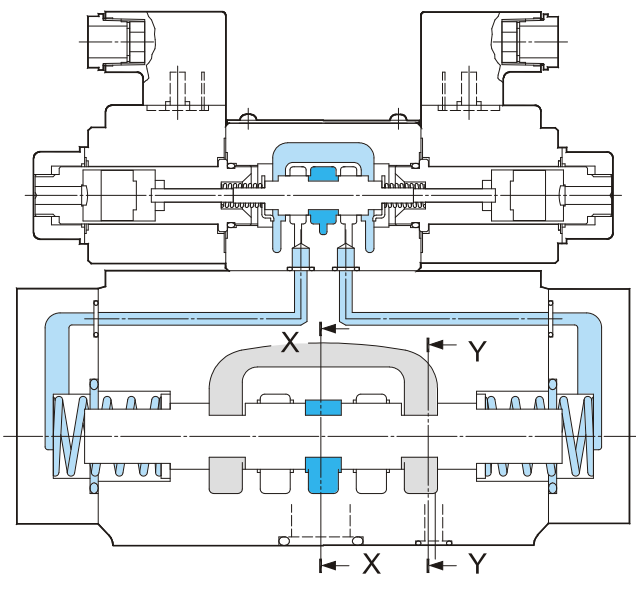
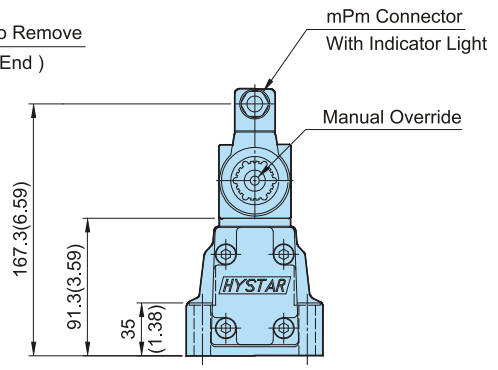
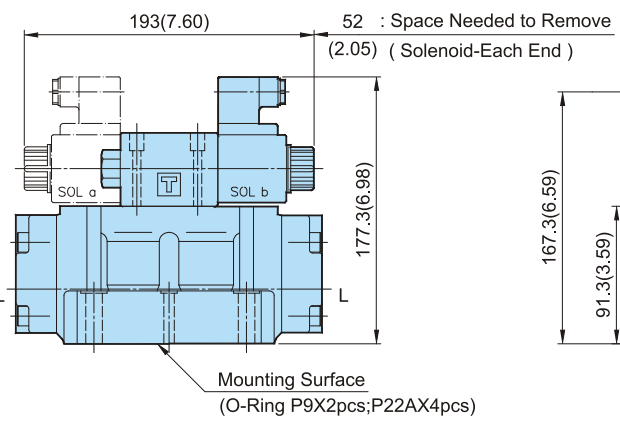
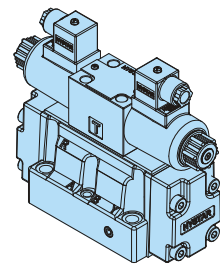
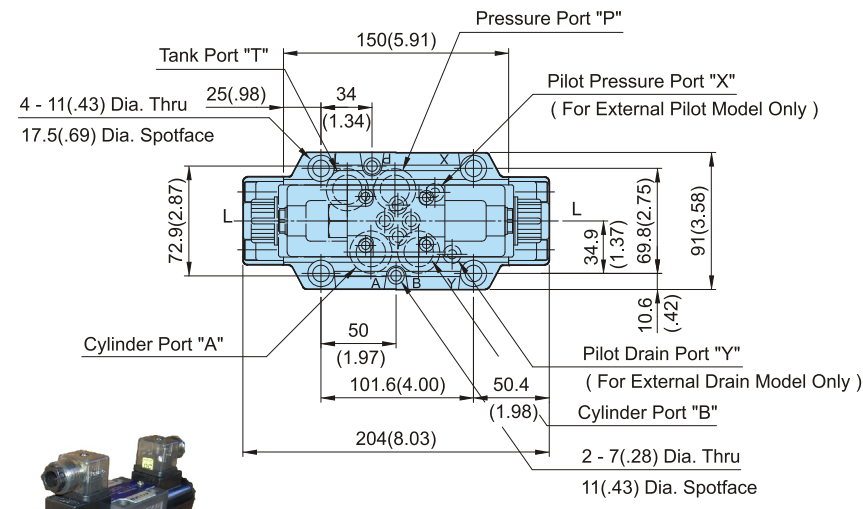
## DIMENSIONS

## MILLIMETERS(INCHES)

**A**

04(1/2")(S)DSHG-\*\*\*-N-04

MOUNTING SURFACE: DSHG-04-CETOP7  
ISO 07-NFPAD07



Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M6X45LgX2pcs	12-15 Nm	30
	M10X45LgX4pcs	58-72 Nm	
Soc. Hd. Cap Screw	1/4-20UNCX1-3/4"LgX2pcs	104-130 in.lbs	3090
	3/8-16UNCX1-3/4"Lg X4pcs	504-625 in.lbs	



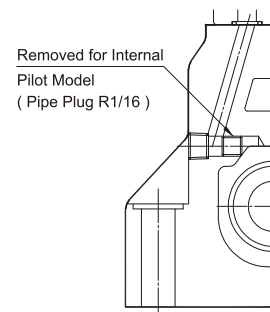
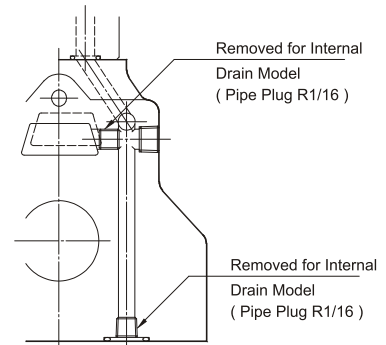
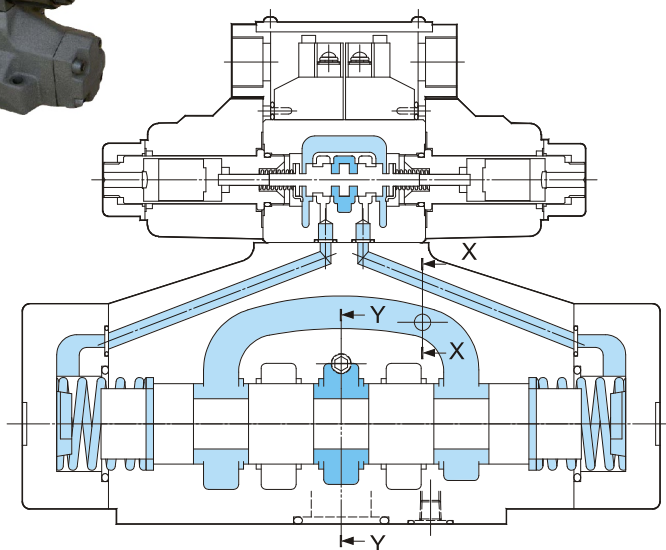
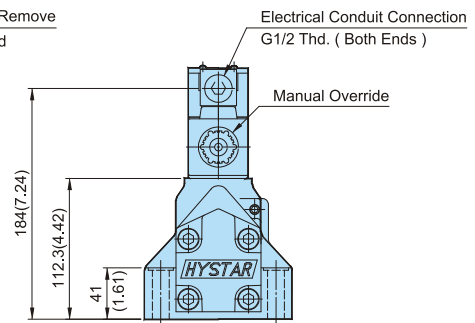
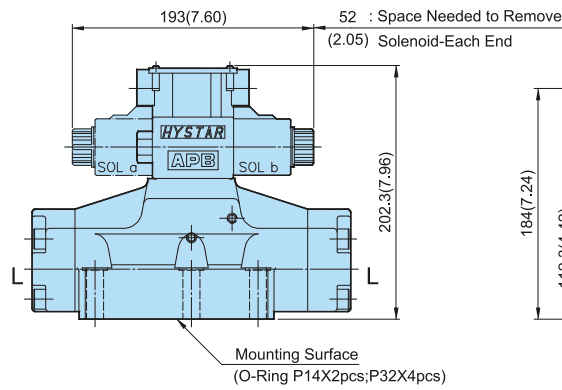
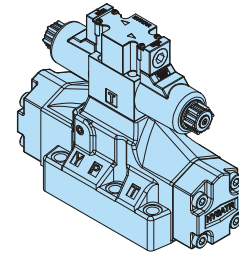
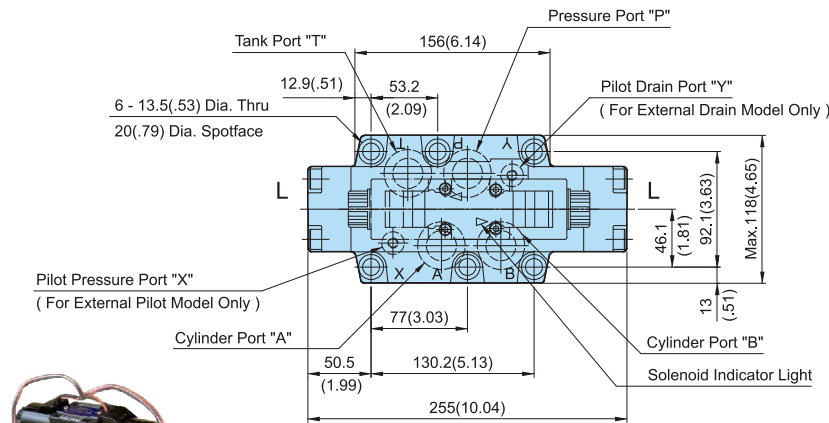
## DIMENSIONS

## MILLIMETERS(INCHES)

A

06(3/4" )S)DSHG-\*\*-06

MOUNTING SURFACE: DSHG-06-CETOP8  
ISO 08-NFPAD08



Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M12X55LgX6pcs	100-123 Nm	30
Soc. Hd. Cap Screw	1/2-13UNCX2-1/8"Lg X6pcs	868-1068 in.lbs	3090

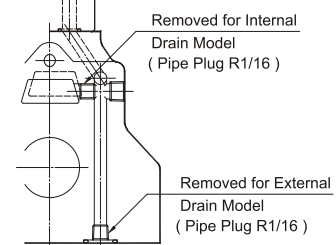
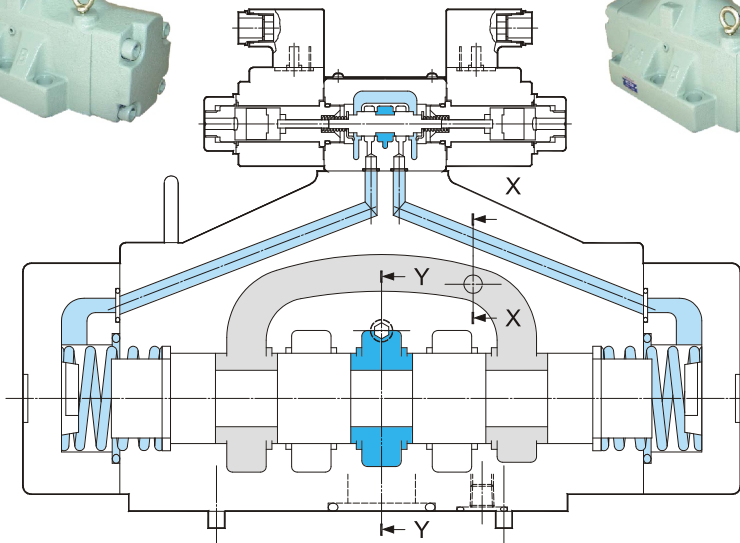
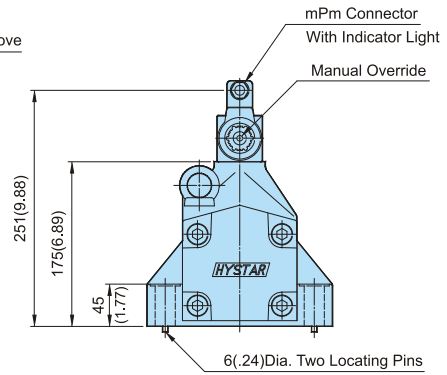
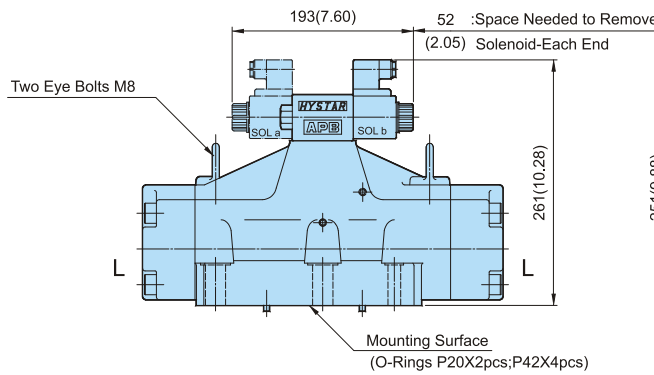
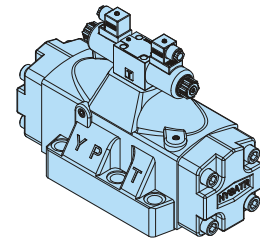
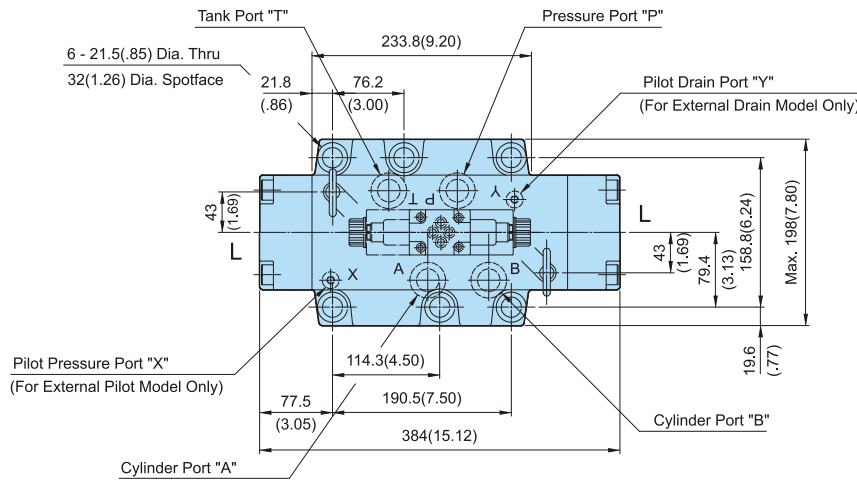
## DIMENSIONS

MILLIMETERS(INCHES)

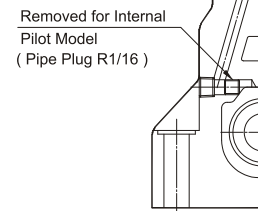
A

10(1-1/4")(S)DSHG-\*\*\*-10

MOUNTING SURFACE: DSHG-10-CETOP10  
ISO 10-NFPAD10



Section X-X



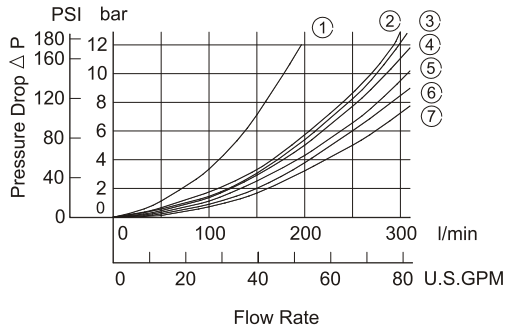
Section Y-Y

Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M20X75LgX6pcs	473-585 Nm	30
Soc. Hd. Cap Screw	3/4-10UNCX3"Lg X6pcs	4106-5078 in.lbs	3090

## PRESSURE DROP

A

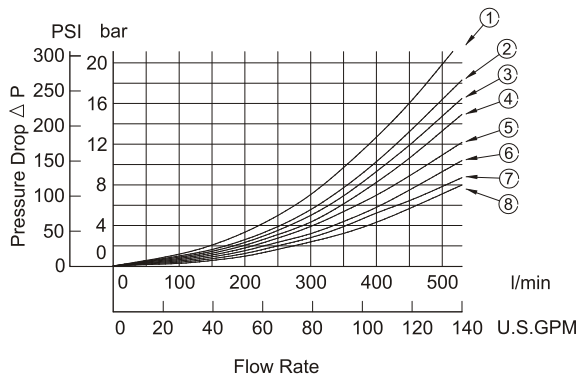
DSHG-04  
DSHG-04-S



Series	Spool Type	Pressure Drop Curve Number				
		P→A	B→T	P→B	A→T	P→T
DSHG-04 DSHG-04-S	3C2	5 (2)	4 (2)	5 (2)	6 (4)	—
	3C3	5	3	5	5	7
	3C4	5 (2)	3 (3)	5 (2)	5 (5)	—
	3C40	5 (2)	4 (4)	5 (2)	6 (6)	—
	3C5	7	4	5	5	5
	3C6	5 (6)	3 (4)	5 (6)	6 (7)	1 (2)
	3C60	7	5	7	7	2
	3C7	5	4	5	6	—
	3C9	5	4	5	6	—
	3C10	5 (2)	2 (2)	5 (2)	6 (4)	—
	3C11	6	4	5	6	—
	3C12	5 (2)	4 (2)	5 (2)	5 (5)	—

Graphs based on fluid viscosity of 35 cSt ( 162 SSU).  
Notes : ( ) curve No. is for shock-less type.

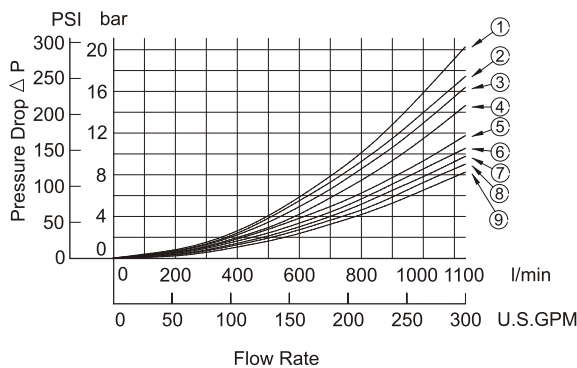
DSHG-06  
DSHG-06-S



Series	Spool Type	Pressure Drop Curve Number				
		P→A	B→T	P→B	A→T	P→T
DSHG-06 DSHG-06-S	3C2	8 (6)	5 (1)	8 (6)	7 (2)	—
	3C3	6	4	6	7	6
	3C4	8 (6)	5 (2)	8 (6)	7 (2)	—
	3C40	8	5	8	7	—
	3C5	8	4	5	7	2
	3C6	5	1	5	4	3
	3C60	6 (6)	5 (2)	6 (6)	7 (3)	3 (1)
	3C7	6	4	6	7	—
	3C9	6	5	6	7	—
	3C10	8	5	8	7	—
	3C11	8	4	5	7	—
	3C12	8	5	8	7	—

Graphs based on fluid viscosity of 35 cSt ( 162 SSU).  
Notes : ( ) curve No. is for shock-less type.

DSHG-10  
DSHG-10-S



Series	Spool Type	Pressure Drop Curve Number				
		P→A	B→T	P→B	A→T	P→T
DSHG-10 DSHG-10-S	3C2	9 (8)	6 (3)	9 (8)	8 (4)	—
	3C3	7	6	7	7	5
	3C4	9 (8)	6 (5)	9 (8)	6 (6)	—
	3C40	9	6	9	8	—
	3C5	9	6	8	6	1
	3C6	5	3	5	4	2
	3C60	8 (8)	5 (4)	8 (8)	5 (4)	3 (2)
	3C7	7	6	7	7	—
	3C9	7	6	7	8	—
	3C10	9	5	9	8	—
	3C11	9	6	8	7	—
	3C12	9	7	9	6	—

Graphs based on fluid viscosity of 35 cSt ( 162 SSU).  
Notes : ( ) curve No. is for shock-less type.

### FLOW LIMITATIONS :

Pressure drop is influenced by forces acting within the valve. The graphs shown assume simultaneous equal flow rates P to A or B, and from A or B to T.

Care should be taken in applications where high flow rates are used in conjunction with high pressure. i.e. greater than 250 bar (3600 PSI).

Also when single flow paths, or substantially different simultaneous flow rates are required between P to A or B, and A or B to T.

**FLOW RATINGS CHART [ DSHG-(N)-04 ]**

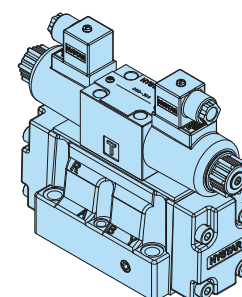
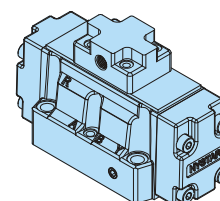
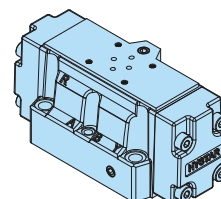
A

**Two Positions**

Spool Type	Spring Offset				No-Spring			
	Graphic Symbol 	Maximum Flow lpm(USgpm)			Graphic Symbol 	Maximum Flow lpm(USgpm)		
	Model Numbers	100bar (1430PSI)	205bar (2930PSI)	315bar (4500PSI)	Model Numbers	100bar (1430PSI)	205bar (2930PSI)	315bar (4500PSI)
	(S-)DSHG-2B2-04	300(79.3)	300(79.3)	300(79.3)	(S-)DSHG-2N2-04	300(79.3)	300(79.3)	300(79.3)
	DSHG-2B3-04	300(79.3)	300(79.3)	300(79.3)	DSHG-2N3-04	300(79.3)	300(79.3)	300(79.3)
	(S-)DSHG-2B4-04	300(79.3)	300(79.3)	300(79.3)				

**Three Positions**

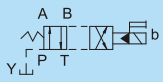
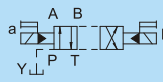



Spool Type	Spring Centered			
	Graphic Symbol 	Maximum Flow lpm(USgpm)		
	Model Numbers	100bar (1430PSI)	205bar (2930PSI)	315bar (4500PSI)
	DSHG-3C2-04	300(79.3)	250(66)	145(38.3)
	S-DSHG-3C2-04	300(79.3)	185(48.8)	110(29.1)
	DSHG-3C3-04	300(79.3)	300(79.3)	300(79.3)
	DSHG-3C4-04	300(79.3)	275(72.6)	165(43.6)
	S-DSHG-3C4-04	300(79.3)	220(58.1)	110(29.1)
	DSHG-3C40-04	300(79.3)	250(66)	145(38.3)
	S-DSHG-3C40-04	300(79.3)	185(48.8)	110(29.1)
	DSHG-3C5-04	250(66.1)	248(65.5)	245(64.7)
	DSHG-3C6-04	300(79.3)	253(66.8)	235(62.1)
	DSHG-3C60-04	300(79.3)	300(79.3)	300(79.3)
	S-DSHG-3C60-04			
	DSHG-3C7-04	300(79.3)	250(66.1)	145(38.3)
	DSHG-3C9-04	300(79.3)	290(76.6)	250(66.1)
	DSHG-3C10-04	300(79.3)	250(66.1)	150(39.6)
	S-DSHG-3C10-04	300(79.3)	185(48.8)	110(29.1)
	DSHG-3C11-04	300(79.3)	210(55.5)	140(37.0)
	DSHG-3C12-04	300(79.3)	225(59.4)	135(35.7)
	S-DSHG-3C12-04	300(79.3)	185(48.8)	110(29.1)



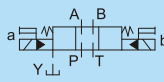






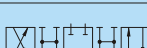





## FLOW RATINGS CHART [ DSHG-(N)-06 ]

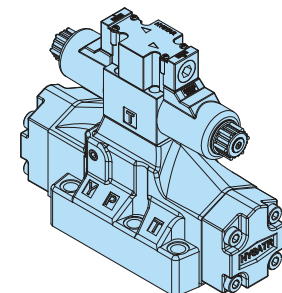
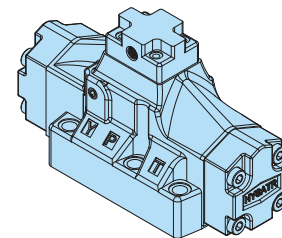
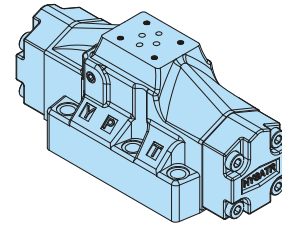
# A

### Two Positions

Spool Type	Spring Offset				No-Spring			
	Graphic Symbol 	Maximum Flow lpm(USgpm)			Graphic Symbol 	Maximum Flow lpm(USgpm)		
	Model Numbers	100bar (1430PSI)	205bar (2930PSI)	315bar (4500PSI)	Model Numbers	100bar (1430PSI)	205bar (2930PSI)	315bar (4500PSI)
	(S-)DSHG-06-2B2	500(132)	500(132)	500(132)	(S-)DSHG-06-2N2	500(132)	500(132)	500(132)
	DSHG-06-2B3	500(132)	500(132)	500(132)	DSHG-06-2N3	500(132)	500(132)	500(132)
	(S-)DSHG-06-2B4	500(132)	500(132)	500(132)				

### Three Positions

Spool Type	Spring Centered			
	Graphic Symbol 	Maximum Flow lpm(USgpm)		
	Model Numbers	100bar (1430PSI)	205bar (2930PSI)	315bar (4500PSI)
	(S-)DSHG-06-3C2	500(132)	455(120) 500(132)	310(81.9) 500(132)
	DSHG-06-3C3	500(132)	480(126.7)	370(97.8)
	(S-)DSHG-06-3C4	500(132)	455(120) 500(132)	310(81.9) 500(132)
	(S-)DSHG-06-3C40	500(132)	455(120) 500(132)	310(81.9) 500(132)
	DSHG-06-3C5	500(132)	462(122)	350(92.5)
	DSHG-06-3C6	475(125)	345(91.1)	230(60.8)
	(S-)DSHG-06-3C60	475(125)	380(100.3)	280(74.0)
	DSHG-06-3C7	500(132)	475(125.4)	360(95.1)
	DSHG-06-3C9	500(132)	475(125.4) 500(132)	360(95.1) 500(132)
	(S-)DSHG-06-3C10	500(132)	455(120) 500(132)	310(81.9) 500(132)
	DSHG-06-3C11	500(132)	455(120) 500(132)	310(81.9) 500(132)
	(S-)DSHG-06-3C12	500(132)	455(120) 500(132)	310(81.9) 500(132)





## FLOW RATINGS CHART [ DSHG-(N)-10 ]

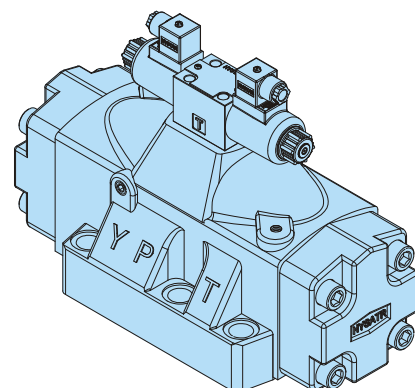
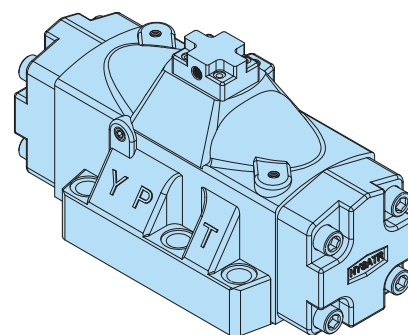
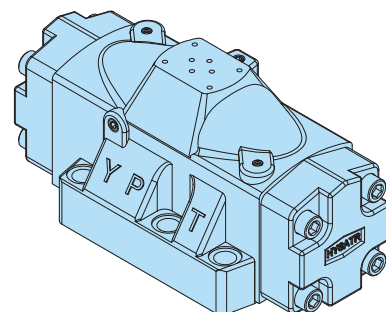
**A**

### Two Positions

Spool Type	Spring Offset				No-Spring			
	Graphic Symbol	Maximum Flow lpm(USgpm)			Graphic Symbol	Maximum Flow lpm(USgpm)		
Model Numbers	100bar (1430PSI)	205bar (2930PSI)	315bar (4500PSI)	Model Numbers	100bar (1430PSI)	205bar (2930PSI)	315bar (4500PSI)	
	(S-)DSHG-10-2B2	1100(291)	1100(291)	1100(291)	(S-)DSHG-10-2N2	1100(291)	1100(291)	1100(291)
	DSHG-10-2B3	1100(291)	1100(291)	1100(291)	DSHG-10-2N3	1100(291)	1100(291)	1100(291)
	(S-)DSHG-10-2B4	1100(291)	1100(291)	1100(291)				

### Three Positions

Spool Type	Spring Centered			
	Graphic Symbol	Maximum Flow lpm(USgpm)		
Model Numbers	100bar (1430PSI)	205bar (2930PSI)	315bar (4500PSI)	
	(S-)DSHG-10-3C2	1100(291)	1025(270.6) 1100(291)	750(198) 1100(291)
	DSHG-10-3C3	1100(291)	1080(285.1)	895(236)
	(S-)DSHG-10-3C4	1100(291)	1025(270.6) 1100(291)	750(198) 1100(291)
	(S-)DSHG-10-3C40	1100(291)	1025(270.6) 1100(291)	750(198) 1100(291)
	DSHG-10-3C5	1100(291)	1040(274.5)	850(225)
	DSHG-10-3C6	1050(277)	790(208.5)	570(151)
	(S-)DSHG-10-3C60	1050(277)	862(227.5)	680(180)
	DSHG-10-3C7	1100(291)	1070(282.5) 1100(291)	870(230) 1100(291)
	DSHG-10-3C9	1100(291)	1070(282.5)	870(230)
	(S-)DSHG-10-3C10	1100(291)	1025(270.6) 1100(291)	750(198) 1100(291)
	DSHG-10-3C11	1100(291)	1025(270.6) 1100(291)	750(198) 1100(291)
	(S-)DSHG-10-3C12	1100(291)	1025(270.6) 1100(291)	750(198) 1100(291)



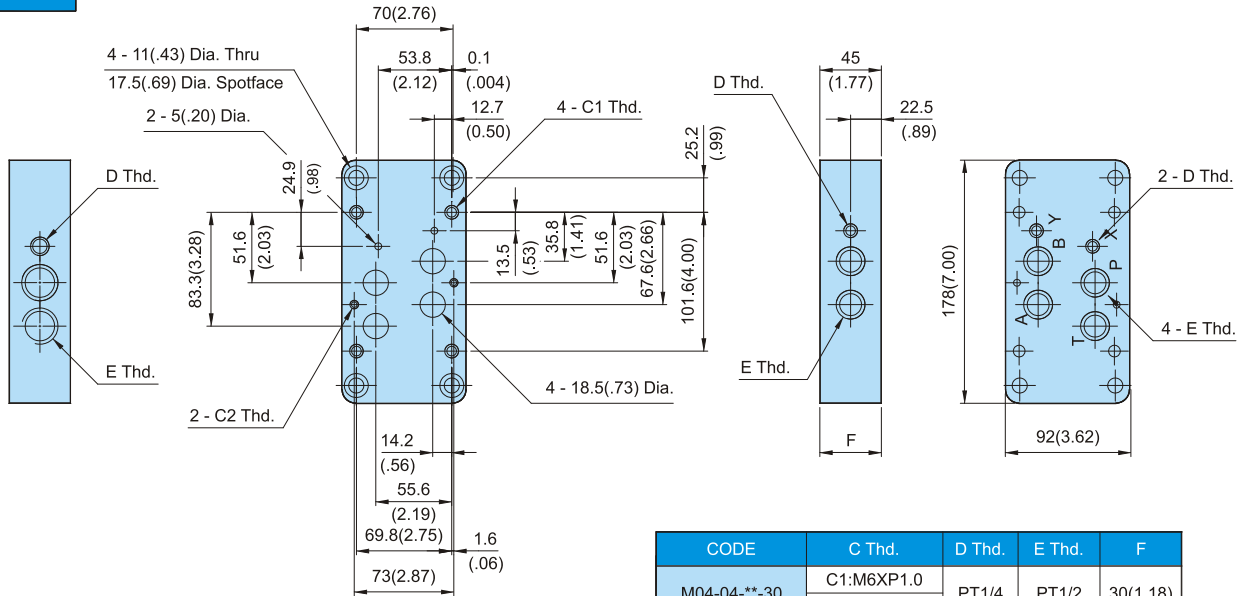


## SUBPLATE

## DIMENSIONS : MILLIMETERS(INCHES)

# A

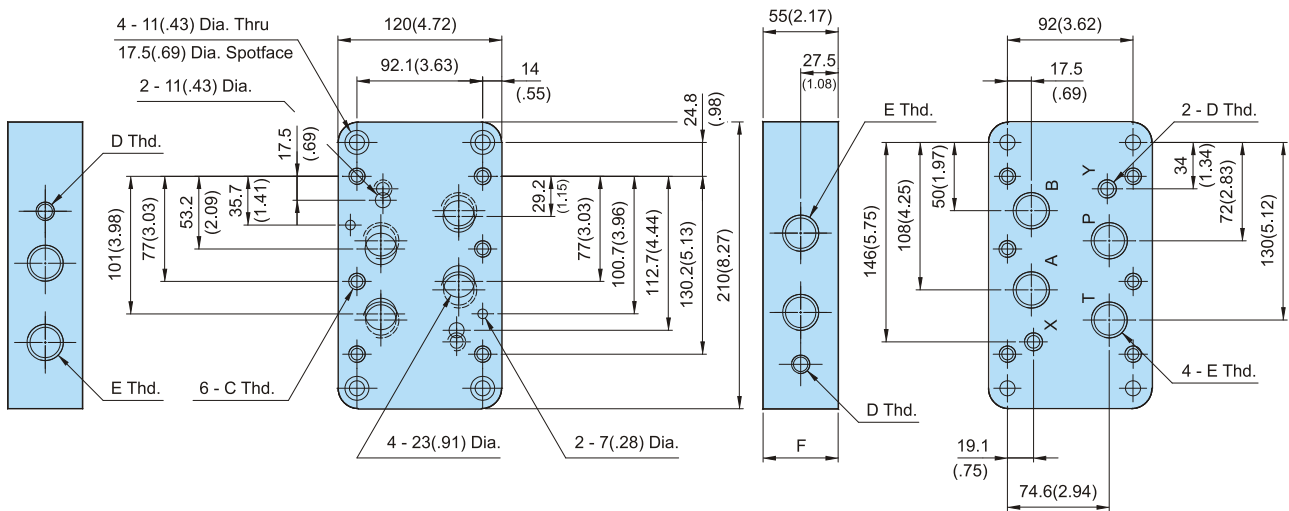
M04-\*\*



CODE	C Thd.	D Thd.	E Thd.	F
M04-04-**-30	C1:M6XP1.0	PT1/4	PT1/2	30(1.18)
	C2:M10XP1.25			
M04-04-**-3090	C1:1/4-20UNC	NPT1/4	NPT1/2	30(1.18)
	C2:3/8-16UNC			
M04-06-**-30	C1:M6XP1.0	PT3/8	PT3/4	—
	C2:M10XP1.25			
M04-06-**-3090	C1:1/4-20UNC	NPT3/8	NPT3/4	—
	C2:3/8-16UNC			

"F" is for port position "4B" type only.

M06-\*\*



CODE	C Thd.	D Thd.	E Thd.	F
M06-06-**-30	M12XP1.5	PT3/4	PT3/4	30(1.18)
M06-06-**-3090	1/2-13UNC	NPT3/4	NPT3/4	30(1.18)
M06-08-**-30	M12XP1.5	PT1"	PT1"	30(1.18)
M06-08-**-3090	1/2-13UNC	NPT1"	NPT1"	30(1.18)

"F" is for port position "4B" type only.



## LIST OF PILOT VALVES ( DSHG-04/06/10 )

### A

Valve Model Numbers	Pilot Valve Model Numbers
DSHG-2B※-04-★-▲-30(3090) (S)	DSG-2B2-01-★-▲-30(3090)
DSHG-2N※-04-★-▲-30(3090) (S)	DSG-2D2-01-★-▲-30(3090)
DSHG-3C※-04-★-▲-30(3090) (S)	DSG-3C4-01-★-▲-30(3090)
DSHG-2B※-06-★-▲-30(3090) (S)	DSG-2B2L-01-★-▲-30(3090)
DSHG-2N※-06-★-▲-30(3090) (S)	DSG-2D2-01-★-▲-30(3090)
DSHG-3C※-06-★-▲-30(3090) (S)	DSG-3C4-01-★-▲-30(3090)
DSHG-2B※-10-★-▲-30(3090) (S)	DSG-2B2L-01-★-▲-30(3090)
DSHG-2N※-10-★-▲-30(3090) (S)	DSG-2D2-01-★-▲-30(3090)
DSHG-3C※-10-★-▲-30(3090) (S)	DSG-3C4-01-★-▲-30(3090)

※: Spool Type ( 2B2,2B3,2N2,2N3,3C2,3C3,3C4..... ) .

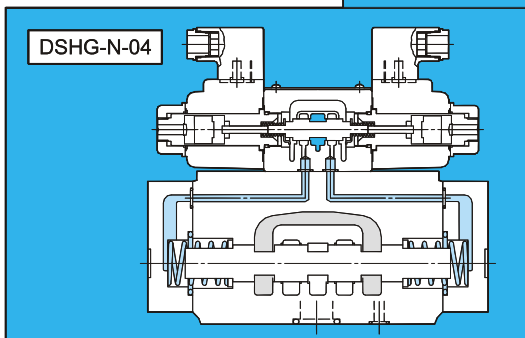
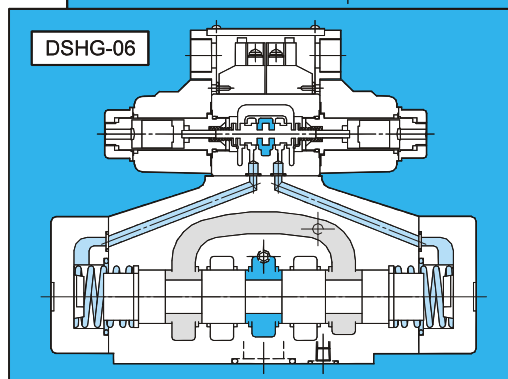
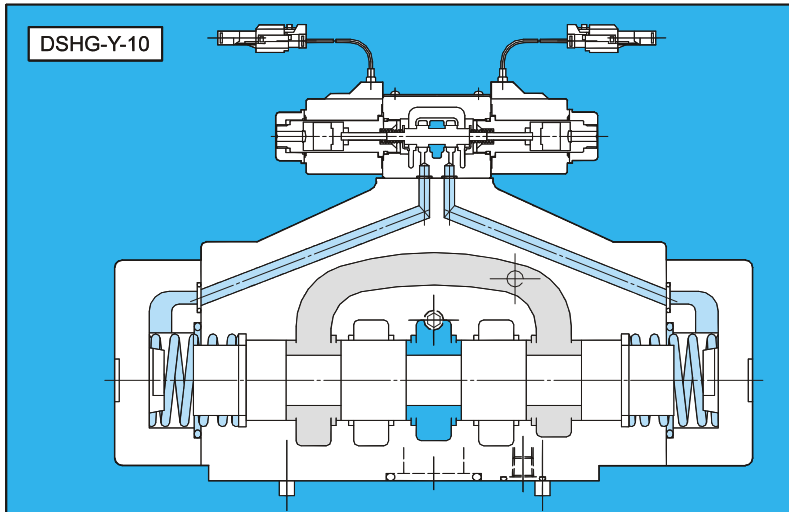
★: Coil Voltages ( A110,A220.,D12.D24.,,RAC110.RAC220..... ) .

▲: Connection Types.

N : German DIN Standard 43650 Plug Type ( With Light ) .

None : Terminal Box Type.

Y : Lead-Wire Type ( SWP Connector ) .





## DIMENSIONS

MILLIMETERS(INCHES)

**A**

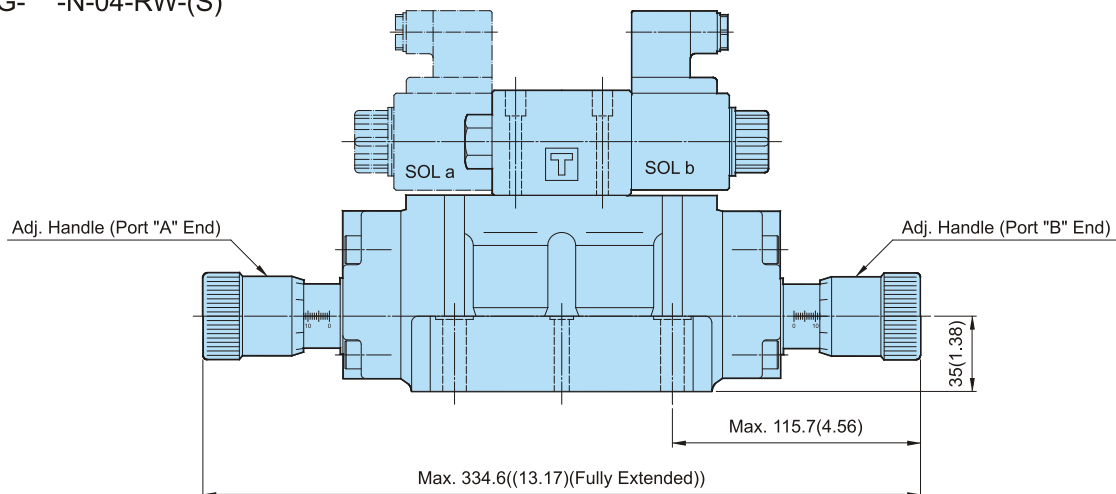
### OPTIONAL

#### MODELS WITH STROKE LIMITER(RW/RA/RB)

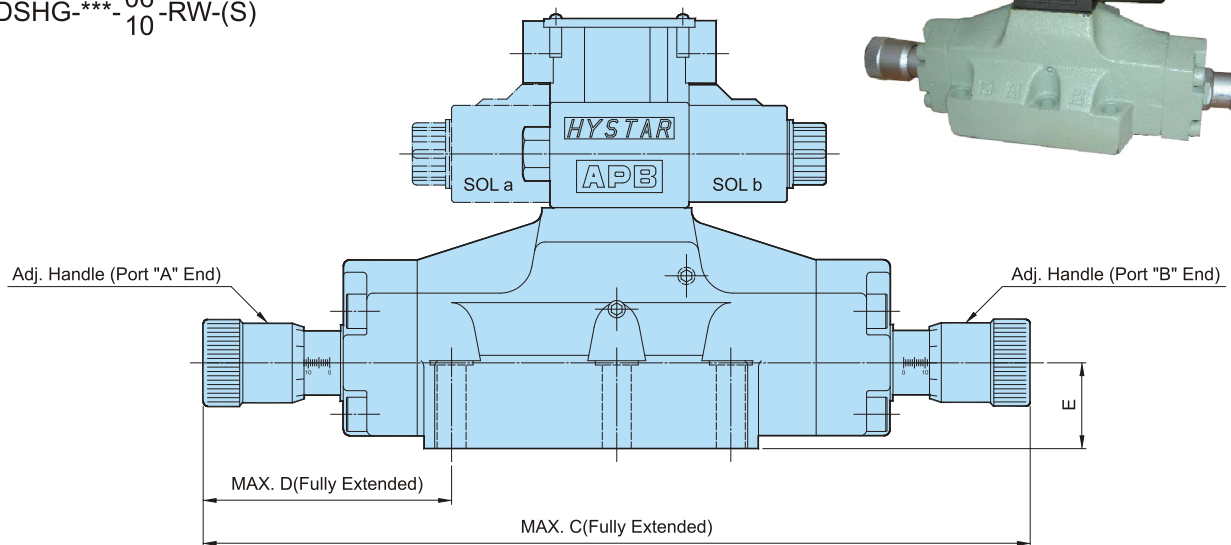
When the stroke adjustment is screwed in, the main spool stroke becomes shorter and flow rate becomes lower.

GRAPHIC SYMBOLS		CODE
	With Stroke Adjustment, "A+B" Stroke.	"RW"
	With Stroke Adjustment, Port "A" Stroke.	"RA"
	With Stroke Adjustment, Port "B" Stroke.	"RB"

#### DSHG-\*\*\*-N-04-RW-(S)



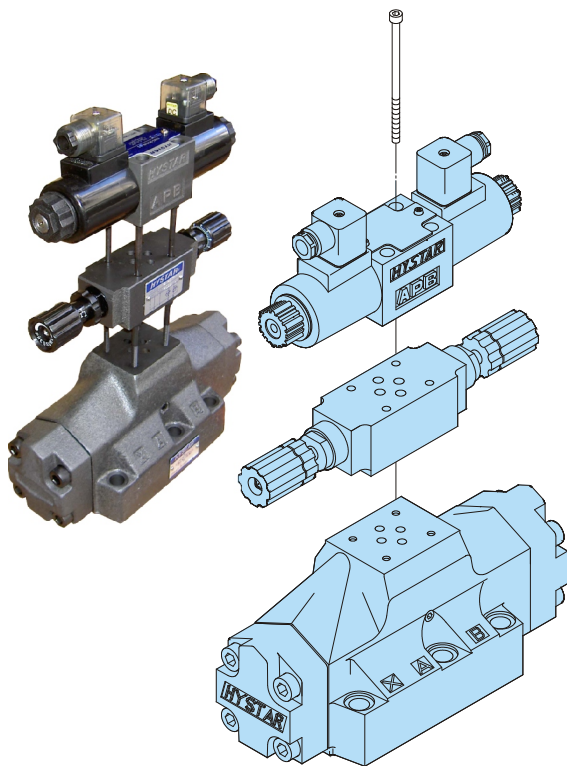
#### DSHG-\*\*\*-<sup>06</sup>/<sub>10</sub>-RW-(S)



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

**A**

Model	DSHG-04	DSHG-06/10
Front Face		
Simplified Symbol		
Detailed Symbol		

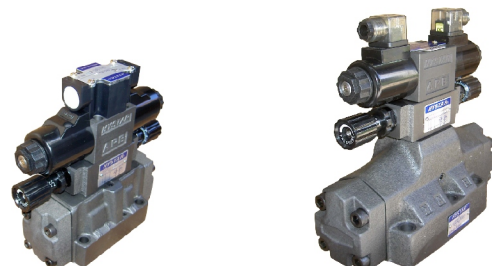


### PILOT CHOKE OPTIONS

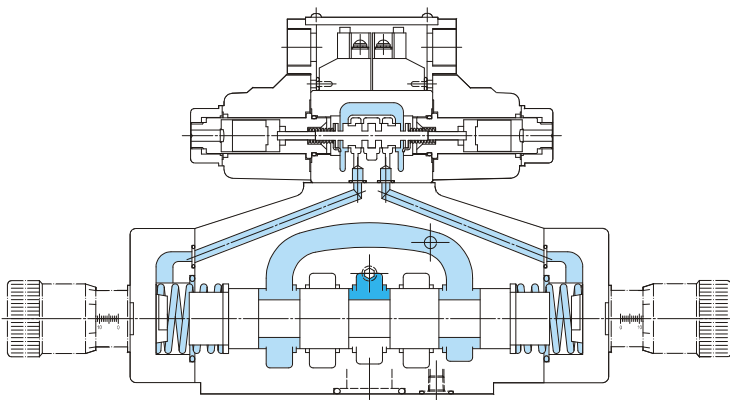
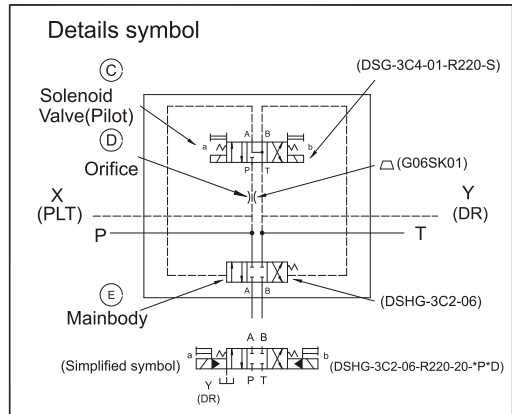
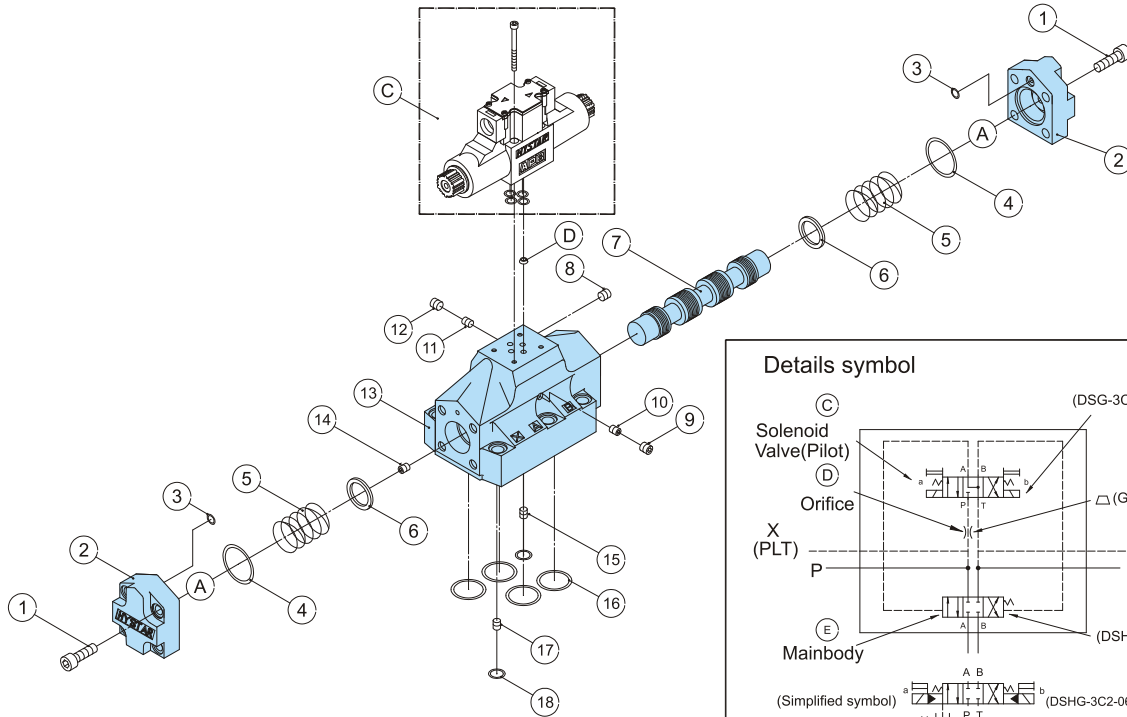
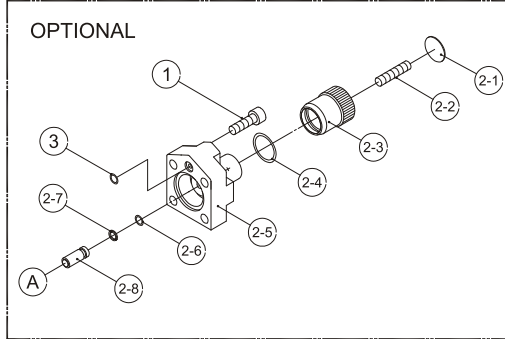
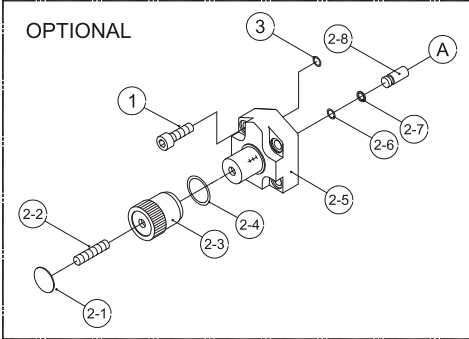
To control the shift speed of the main spool, providing smoother reversals and less hydraulic shock, a pilot choke may be incorporated on a DSHG valve. Two options are offered.

**OPTIONS 1 :** A meter-out design adjusts the flow in one direction with free flow in the other one. This is obtained by assembling our MSW-01-\* between the main stage (DSHG) and the pilot valve (DSG-01).

**OPTIONS 2 :** A fixed orifice of 0.8mm (0.032") is assembled in the "P" port of the pilot valve (DSG-01). See page 58 for details.



ASSEMBLY  
DSHG-\*\*\*-06



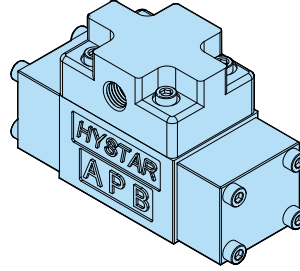
NO.	NAME OF PARTS	CODE
1	Screw	G06001
2	Side cover	G06002
3	O-ring	G06003
4	O-ring	G06004
5	Spring	G06005
6	Washer	G06006
7	Spool	G06007
8	Plug	G06008
9	Plug	G06009
10	Plug	G06010
11	Plug	G06011
12	Plug	G06012
13	Body	G06013
14	Plug	G06014
15	Plug	G06015
16	O-ring	G06016
17	O-ring	G06017
18	Plug	G06018
A	SOLENOID VALVE(PILOT)	DSG-3C4-01-R220-S
B	ORIFICE	G06SK01
C	MAIN BODY	DSHG-***-06



## DIRECTIONAL VALVES ( DHG TYPES ) HYDRAULICALLY AND PNEUMATICALLY OPERATED

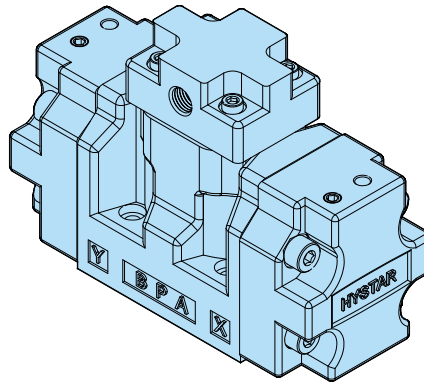
**A**

DHG-01 Directional Control Valves  
1/8" Hydraulically and Pneumatically Operated



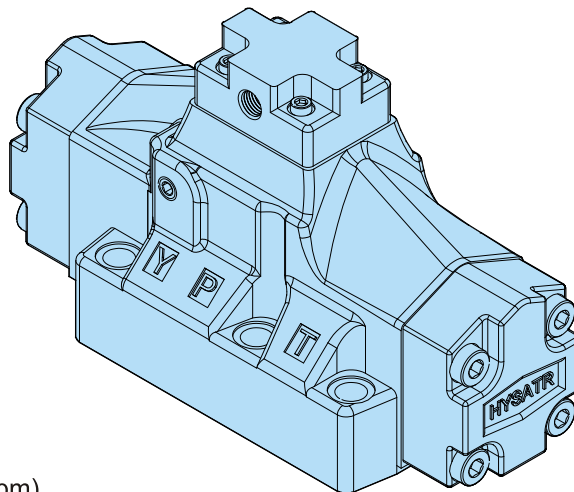
Max Press : 210bar ( 3000PSI )  
Max Flow : 40 lpm ( 10.6USgpm )

DHG-03 Directional Control Valves  
3/8" Hydraulically Operated



Max Press : 250bar ( 3600PSI )  
Max Flow : 160 lpm ( 42.3USgpm )

DHG-04/06/10 Pilot Operated Directional Valves  
Hydraulically Operated



Max Press : 250bar ( 3600PSI )  
Max Flow : 04 SIZE ⇔ 300 lpm ( 79.3USgpm )  
06 SIZE ⇔ 500 lpm ( 132USgpm )  
10 SIZE ⇔ 1100 lpm ( 291USgpm )



# "DHG" DIRECTIONAL VALVES

## MODEL NO SPECIFICATIONS ( DHG-04/06/10 Pilot Operated Directional Valves )

**A**

Spool Type & Graphic Symbols		Rated Flow Capacity -Maximum Flow Capacity									
SYMBOLS	MODEL NO	DHG-01	DHG-03	DHG-04	DHG-06	DHG-10					
	DHG-2B2-**		~40 lpm (~10.6USgpm)	60~160 lpm (15.9~42.3USgpm)	135~300 lpm (35.7~79.3USgpm)	310~500 lpm (82~132USgpm)	570~1100 lpm (150~291USgpm)				
	DHG-2B3-**										
	DHG-2N2-**										
	DHG-2N3-**										
	DHG-3C2-**										
	DHG-3C3-**										
	DHG-3C4-**										
	DHG-3C40-**										
	DHG-3C7-**										
	DHG-3C9-**										
	DHG-3C10-**										
	DHG-3C11-**										
	DHG-3C12-**										
	DHG-3C5-**	~40 lpm (~10.6USgpm)	60~160 lpm (15.9~42.3USgpm)	245~280 lpm (64.8~74.5USgpm)	230~450 lpm (60.8~120USgpm)	570~950 lpm (150~250USgpm)					
	DHG-3C6-**										
	DHG-3C60-**										
Max. Operating Pressure ( bar )							315 ( 4500 PSI )				
Min. Required Pilot Pressure ( bar )							8 ( 114 PSI )				10(143 PSI )
Max. Pilot Pressure ( bar )		250 ( 3600 PSI )									
Max. T-line Back Pressure ( bar )		210 ( 3000 PSI )									
Weight ( Kgs )		3.5 ( 7.7 lbs )	7.2 ( 15.9 lbs )	7.4 ( 16.3 lbs )	11.2 ( 24.7 lbs )	43.8 ( 96.6 lbs )					
Hydraulic Fluids		Use Hydraulic Fluids Equivalent to ISO VG32 or VG46									
Operating Temperature Range Recommended (°C)		-15 ~ +70 (+5 ~ +160°F)									
Operating Viscosity ( cSt )		15 ~ 400 ( 80 ~ 1800SSU )									
Filtration		25 Microns Absolute or Finer									

## LIST OF SPOOL FUNCTIONS ( DHG-04/06/10 )

**A**

SPRING CENTERED 3 POSITIONS	GRAPHIC SYMBOLS (STANDARD)	PRESSURE CENTERED 3 POSITIONS	GRAPHIC SYMBOLS (STANDARD)	NO SPRING 2 POSITIONS	GRAPHIC SYMBOLS (STANDARD)
3C2		3H2		2N2	
3C3		3H3		2N3	
3C4		3H4		2N4	
3C40		3H40		2N40	
3C5		3H5		2N7	
3C6		3H6		2N2A	
3C60		3H60		2N3A	
3C7		3H7		2N4A	
3C8		3H8		2N40A	
3C9		3H9		2N5A	
3C10		3H10		2N6A	
3C11		3H11		2N60A	
3C12		3H12		2N7A	
3C25		3H25		2N9A	
3C29		3H29		2N10A	
3C48		3H48		2N11A	
				2N12A	



# "DHG" DIRECTIONAL VALVES

## LIST OF SPECIAL TWO POSITION VALVES ( DHG-04/06/10 )

**A**

SPRING OFFSET 2 POSITION	GRAPHIC SYMBOLS		SPRING OFFSET 2 POSITION	GRAPHIC SYMBOLS	
	STANDARD	(ALTERNATED)		STANDARD	(ALTERNATED)
2B2A(L)			2B2B(L)		
2B3A(L)			2B3B(L)		
2B4A(L)			2B4B(L)		
2B40A(L)			2B40B(L)		
2B5A(L)			2B5B(L)		
2B6A(L)			2B6B(L)		
2B60A(L)			2B60B(L)		
2B7A(L)			2B7B(L)		
2B8A(L)			2B8B(L)		
2B9A(L)			2B9B(L)		
2B10A(L)			2B10B(L)		
2B11A(L)			2B11B(L)		
2B12A(L)			2B12B		
2B25A(L)			2B25B(L)		
2B29A(L)			2B29B(L)		
2B48A(L)			2B48B(L)		

NOTE : Standard Model No. + L = Alternate Model.  
For example, 2B2A is Standard Model, 2B2AL is Alternate Model.

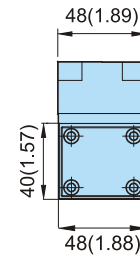
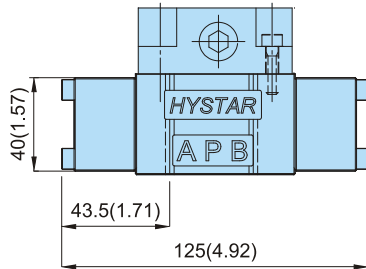
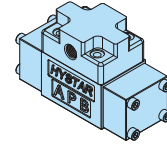
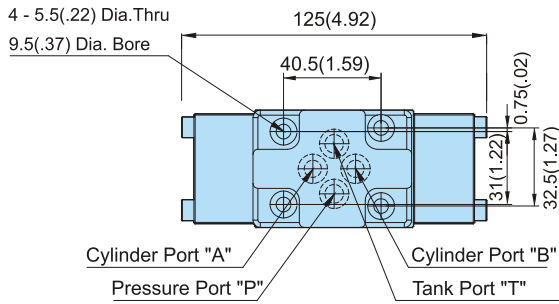
## DIMENSIONS

## MILLIMETERS(INCHES)

# A

DHG-01

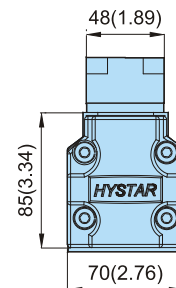
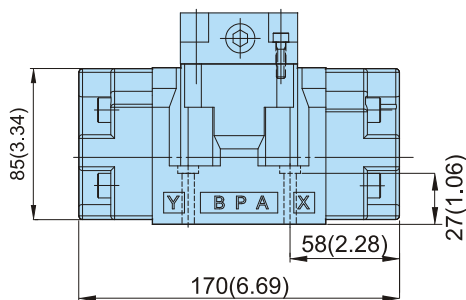
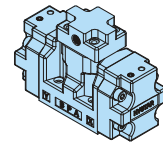
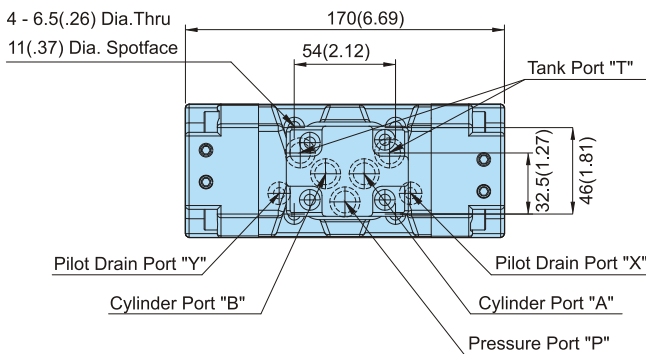
MOUNTING SURFACE:DHG-01-CETOP3  
ISO 03-NFPAD03



Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M5 X45LgX4pcs	5-7 Nm	30
Soc. Hd. Cap Screw	10-24UNCX1-3/4"LgX4pcs	43-60 in.lbs	3090

DHG-03

MOUNTING SURFACE:DHG-03-CETOP5  
ISO 05-NFPAD05



•Dimensions for models with Din connector, reference page 15 for details.

Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M6 X35LgX4pcs	12-15 Nm	30
Soc. Hd. Cap Screw	1/4-20UNCX1-1/2"LgX4pcs	105-130 in.lbs	3090



# "DHG" DIRECTIONAL VALVES

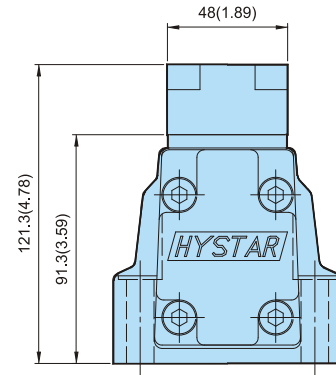
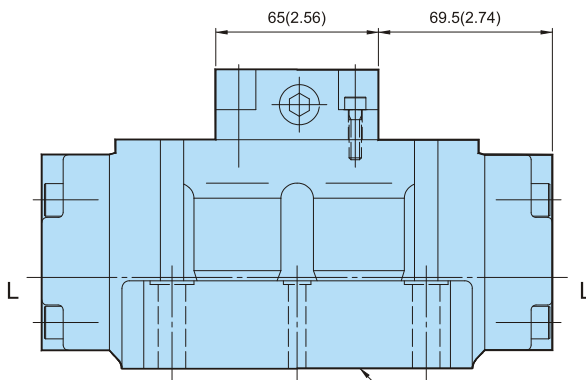
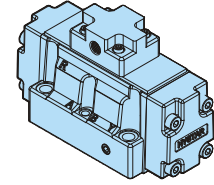
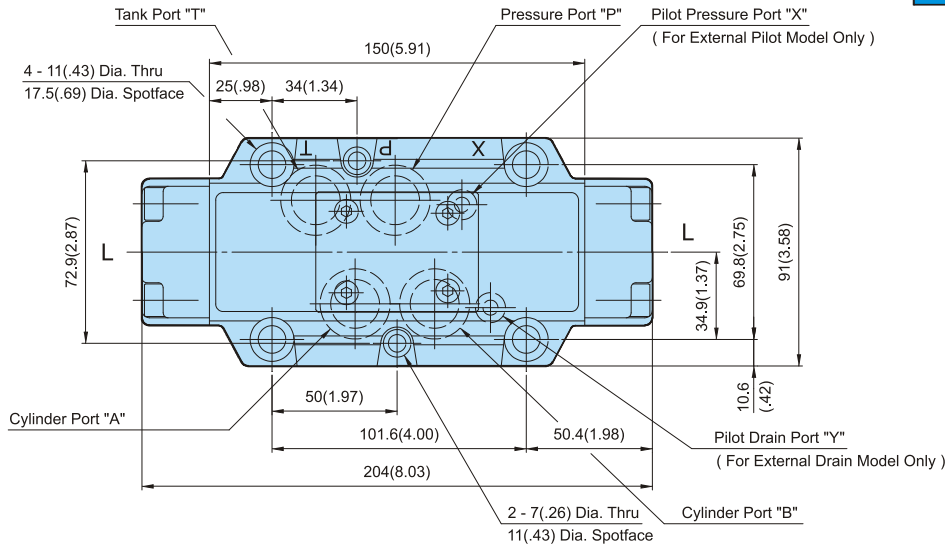
## DIMENSIONS

## MILLIMETERS(INCHES)

A

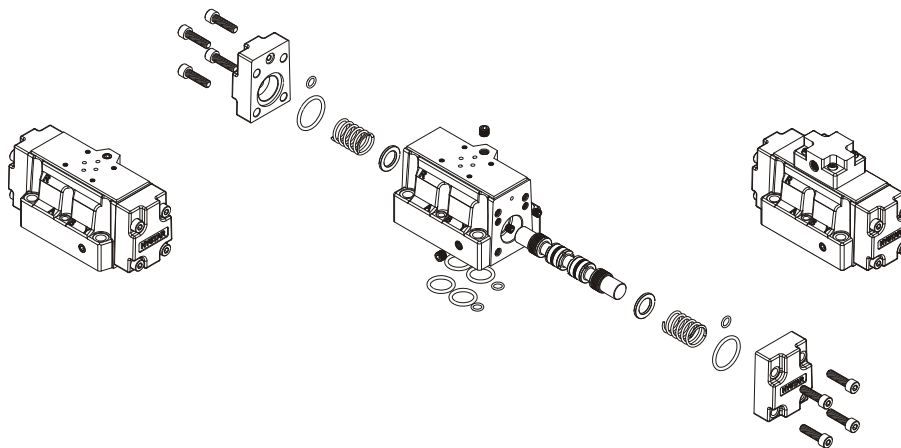
DHG-\*\*\*-04

MOUNTING SURFACE:DHG-04-CETOP7  
ISO 07-NFPAD07



Mounting Surface  
(O-Ring P9X2pcs;P22AX4pcs)

Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M6X45LgX2pcs	12-15 Nm	30
	M10X45LgX4pcs	58-72 Nm	
Soc. Hd. Cap Screw	1/4-20UNCX1-3/4"LgX2pcs	104-130 in.lbs	3090
	3/8-16UNCX1-3/4"Lg X4pcs	504-625 in.lbs	





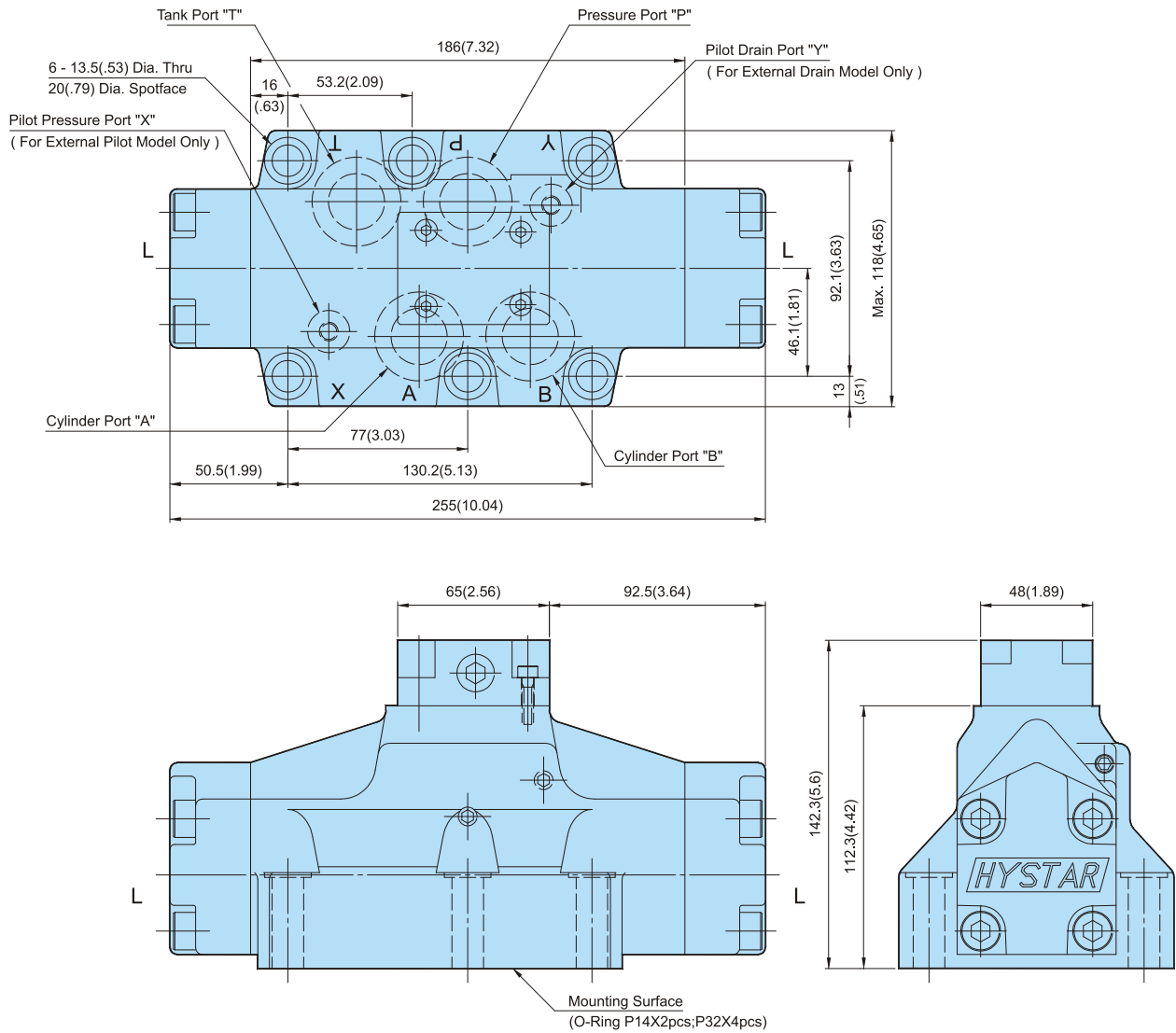
## DIMENSIONS

## MILLIMETERS(INCHES)

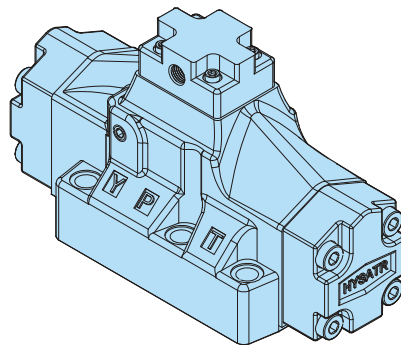
A

DHG-\*\*\*-06

MOUNTING SURFACE:DHG-06-CETOP8  
ISO 08-NFPAD08



Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M12X55LgX6pcs	100-123 Nm	30
Soc. Hd. Cap Screw	1/2-13UNCX2-1/8"LgX6pcs	868-1068 in.lbs	3090





# "DHG" DIRECTIONAL VALVES

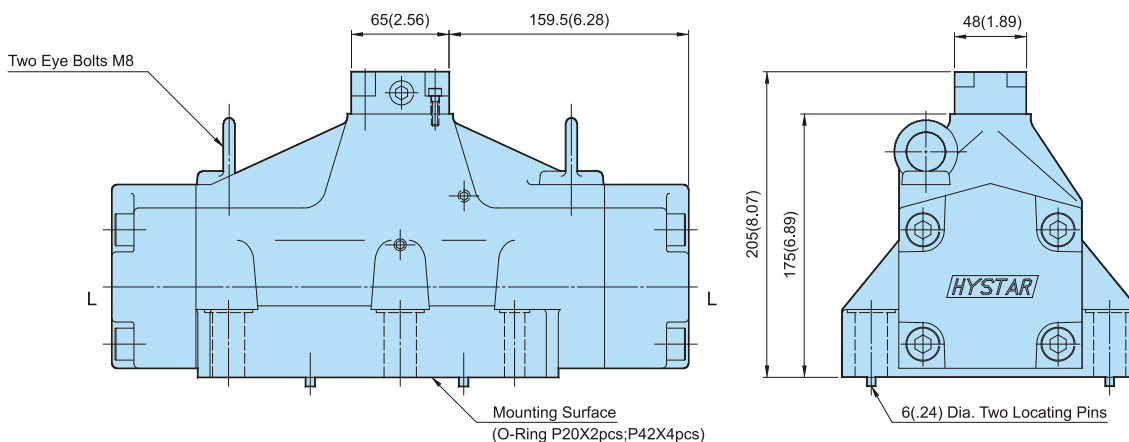
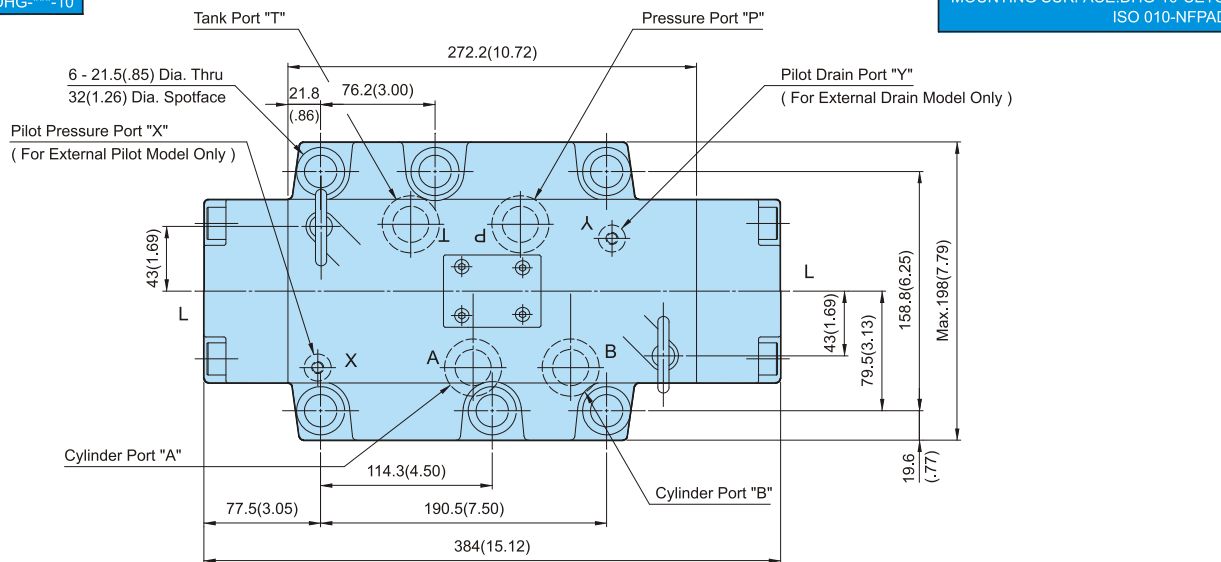
## DIMENSIONS

## MILLIMETERS(INCHES)

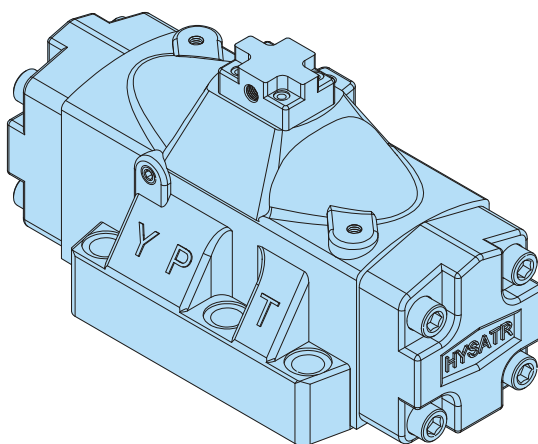
**A**

DHG-\*\*\*\*-10

MOUNTING SURFACE:DHG-10-CETOP10  
ISO 010-NFPAD010


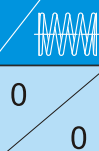


Attachment Name	Description	Tightening Torque	Code
Soc. Hd. Cap Screw	M20X75LgX6pcs	473-585 Nm	30
Soc. Hd. Cap Screw	3/4-10UNCX3"LgX6pcs	4106-5078 in.lbs	3090



## LIST OF NORMAL SPOOL STRUCTURE ( DSHG-04/06/10 )

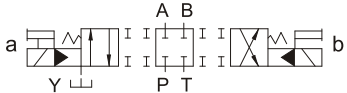
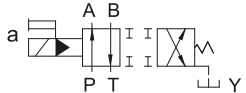
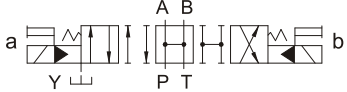
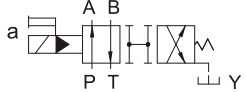
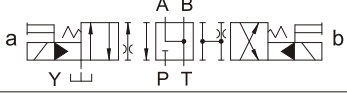
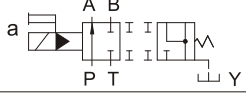
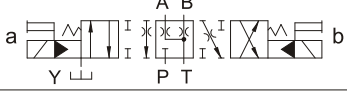
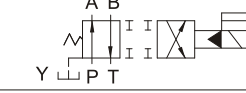
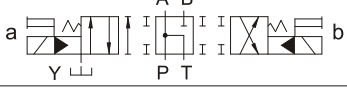

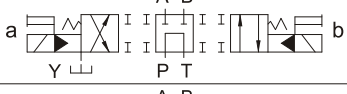
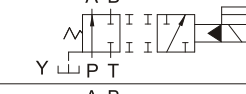
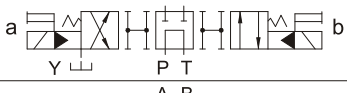
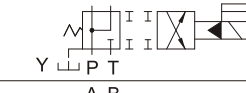
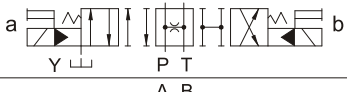
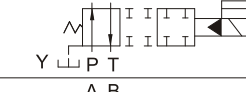
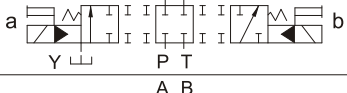

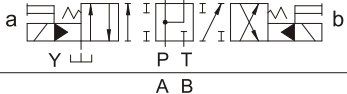
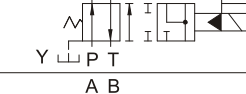
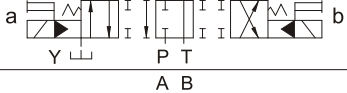

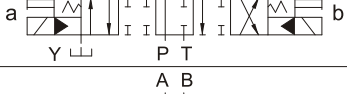

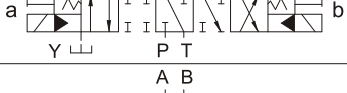

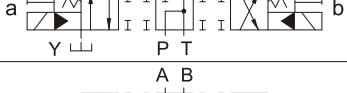



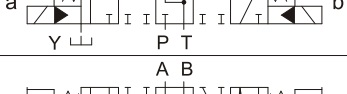

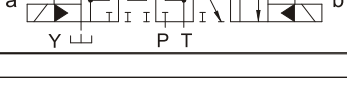

### A

MODEL	 / 	HYDRAULIC SYMBOLS	DSHG-04	DSHG-06	DSHG-10
2B2	0 / 0				
2B3	0 / 0				
2B8	0 / 0				
2N2	0 / 0				
2N3	0 / 0				
3C2	2 / 2				
3C3	2 / 2				
3C4	2 / 2				
3C5	2 / 2				
3C60	2 / 2				
3C8	2 / 2				
3C9	2 / 2				
3C10	2 / 2				
3C12	2 / 2				

Note :  is " Retainer ",  is " Spring ".

**CROSS OVER CONDITIONAL OF NORMAL SPOOL TYPE ( DSHG-04/06/10 )**

A

SPRING CENTERED 3 POSITIONS	GRAPHIC SYMBOLS WITH DETAILS CROSS OVER	SPRING OFFSET 2 POSITIONS	GRAPHIC SYMBOLS WITH DETAILS CROSS OVER
3C2		2A2	
3C3		2A3	
3C4		2A14	
3C40		2B2	
3C5		2B3	
3C6		2B8	
3C60		2B29	
3C7		2B2A	
3C8		2B3A	
3C9		2B4A	
3C10		2B60A	
3C11		2B2B	
3C12		2B3B	
3C25		2B4B	
3C29		2B60B	
3C48		2B10B	
3C94		2B12B	

## INTERFACE SIZE CROSS REFERENCE

# A

INTERFACE SIZE CROSS REFERENCE					
HYSTAR	CETOP	ISO	NFPA-NEW	NFPA-OLD	NG
DSG-01	3	03	D03	D01	6
DSG-03	5	05	D05	D02	10
DSHG-04	7	07	D07	D04	16
DSHG-06	8	08	D08	D06	25
DSHG-10	10	10	D10	D10	32

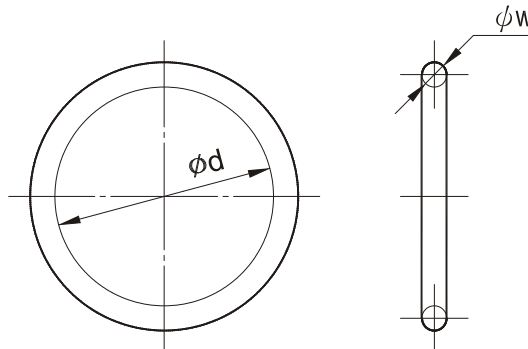
**CETOP :** A European trade association representing various country organizations similar to the NFPA in the USA.,BFPA in England,VDMA in Germany,.....  
(Comite' Europe'en des Transmissions Ole'ohydrauliques et Pneumatiques)

**ISO :** The International Standards Organization establishes the ISO interface standards.  
(International Organization for Standardization)

**NFPA :** National Fluid Power Association of the U.S.A.

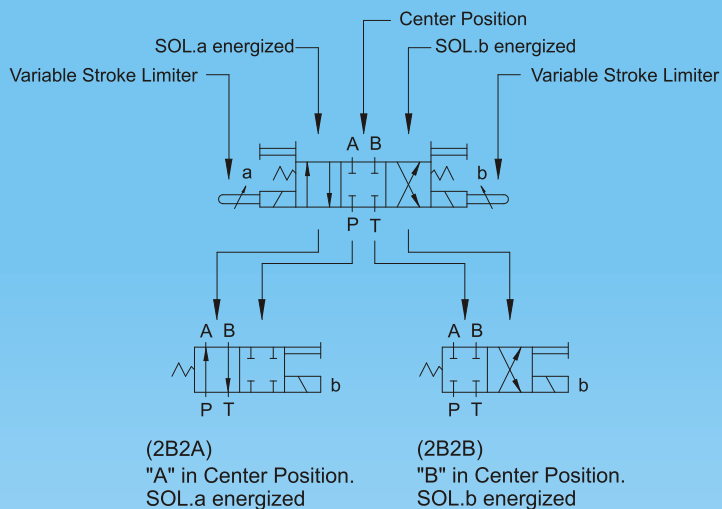
**NG :** A code related to port diameter expressed in millimeters.It's part of German " DIN " standard (similar to ANSI-American National Standards Institute) and covers port size only.It does not relate to the configuration of the rest of the interface.  
N.G translates to the configuration of the rest of the interface.  
N.G translates to nominal size.

### O-RING DATA SHEET

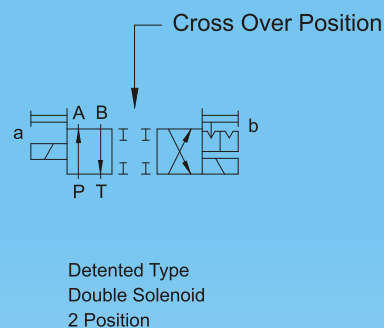


CODE	d(mm)	w(mm)	Hardness	DSG-01	DSG-03	DSHG-04	DSHG-06	DSHG-10
P3	2.8	1.9	HS-70	4	4			
P4	3.8	1.9	HS-70	15	15			
P9	8.8	1.9	HS-85	12		3/18/2-7	3/2-7	
P12	11.8	2.4	HS-85		12			
P14	13.8	2.4	HS-80				18	3/2-7
P18	17.8	2.4	HS-70	7				
P20	19.8	2.4	HS-80					18
P21	20.8	2.4	HS-70		7			
P22A	21.7	3.5	HS-80			16		
P32	31.7	3.5	HS-80			4	16	
P40	39.7	3.5	HS-80				4	
P42	41.7	3.5	HS-80					16
G30	29.4	3.1	HS-80			2-4	2-4	
G35	34.4	3.1	HS-80					2-4
G65	64.4	3.1	HS-80					4

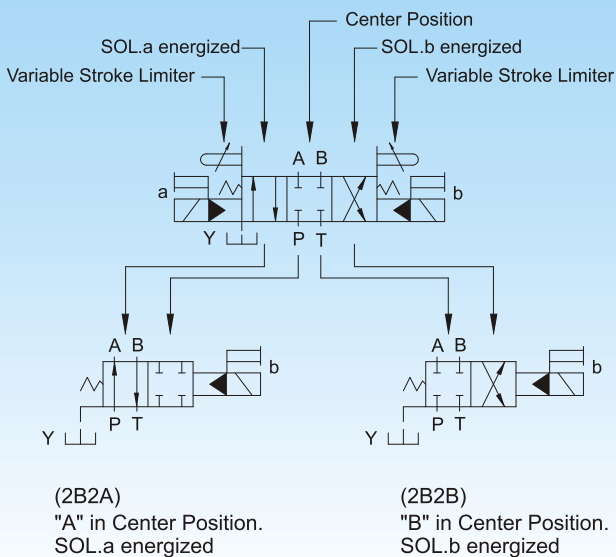
( DSG-3C2-01/03-RW )



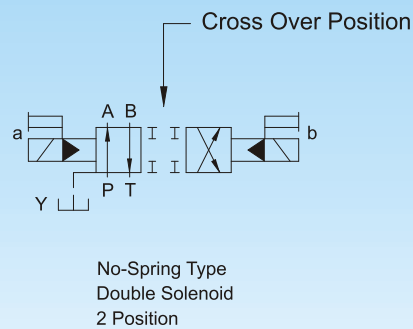
( DSG-2D2-01/03 )



( DSHG-3C2-04/06/10-RW )



( DSHG-2N2-04/06/10 )



a.	SOL.a energized side
b.	SOL.b energized side
A.	Cylinder Port "A"
B.	Cylinder Port "B"
P.	Pressure Port "P"
T.	Tank Port "T"
≡	Manual Override
⊞	Closed Line
⊞	Open Line
∧	Spring
↑	Connection Lines

⊞	Detented
a	Single Acting Solenoid
⊞	P → A,B T → Connections
⊞	A → T,P B → Connections
◀	Oil Pressure
≠	Variable Stroke Limiter
•	Connecting Point Of Lines And Passages
Y ⊞	Drain Line
⊞	Cross Over Position-All Ports Closed
⊞	Cross Over Position-All Ports Open