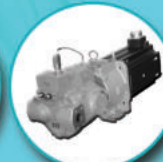




YUKEN

Authorized Distributor
Terminal Group



TMS&S



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YUKEN

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AUTHORIZATION LETTER OF DISTRIBUTORSHIP

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as one of our official Distributors in Thailand for the sale, installation, maintenance and after-sales service of YUKEN SEA CO., LTD Hydraulic components can be made in Japan, Taiwan and China.

重本 陽一

Yoichi Shigemoto
Managing Director



PISTON PUMPS



VANE PUMPS



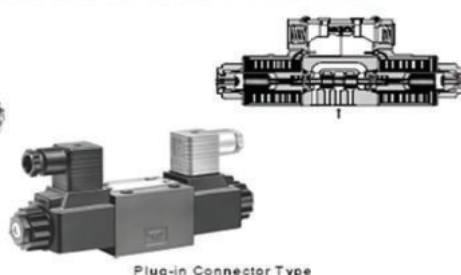
PROPORTIONAL CONTROLS



DIRECTINAL CONTROLS



Terminal Box Type



Plug-in Connector Type

Plug-in Connector Type

MODULAR VALVES



ELDFG Series
(Integrated Feedback Control)



PV2R (Single Stage) Series



DSHG-04/06/10 Series



DSG-01 Series



E Series (Conventional Type)



DSG-03 Series



A Series (Max. 28 MPa)



AH Series (Max. 31 MPa)



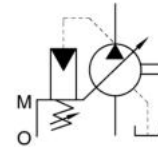
AR Series (Max. 16 MPa)

PISTON PUMPS

“ AR ” Series Variable Displacement Piston Pumps - Single Pump, Pressure Compensator Type



Graphic Symbol



Specifications

Model Numbers	Geometric Displacement cm ³ /rev (cu.in./rev)	Operating Pressure MPa (PSI)		Shaft Speed Range r/min.		Approx. Mass kg (lbs.)
		Rated	Intermittent *	Max.	Min.	
AR16-FR01*-20/2080/20950	15.8 (.964)	16 (2320)		1800	600	9.8 (21.6)
AR22-FR01*-20/2080/20950	22.2 (1.355)			1800	600	

* When setting the pressure, make sure the full cut-off pressure never exceeds the maximum intermittent pressure.

Model Number Designation

AR16	-F	R	01	B	S	-20	*
Series Number	Mounting	Direction of Rotation	Control Type	Pres. Adj. Range MPa (PSI)	Port Position	Design Number	Design Std.
AR16 (15.8 cm ³ /rev)	F: Flange Mtg.	(Viewed from Shaft End) R: ★ 1 Clockwise (Normal)	01: Pressure Compensator Type	B: 1.2 - 7 { 170 - 1020 }	None: Axial Port	20	Refer to ★ 2
AR22 (22.2 cm ³ /rev)				C: 2.0 - 16 { 290 - 2320 }	S: Side Port	20	

★ 1. Available to supply pump with anti-clockwise rotation.
Consult Yuken for details.

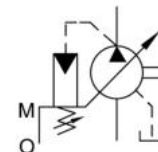
★ 2. Design Standards:
None.....Japanese Standard "JIS"
80.....European Design Standard
950.....N. American Design Standard

PISTON PUMPS

“ A ” Series Variable Displacement Piston Pumps - Single Pump, Pressure Compensator Type



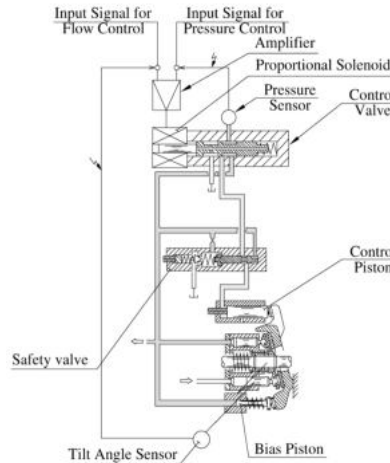
Graphic Symbol



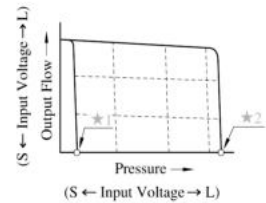
Specifications

Model Numbers	Geometric Displacement cm ³ /rev (cu. in. /rev)	Minimum Adj. Flow cm ³ /rev (cu. in. /rev)	Operating Pressure MPa (PSI)		Shaft Speed Range r/min		Approx. Mass kg (lbs.)	
			Rated ★ 2	Intermittent ★ 1	Max.	Min.	Flange Mtg.	Foot Mtg.
A10-FR01B-12*	10.0 (.610)	2 (.122)	16 (2320)	21 (3050)	1800	600	5.1 (11.2)	—
A10-FR01C/H-12*							8.5 (18.7)	—
A16-*-R-01-*-K-32*	15.8 (.964)	4 (.244)	16 (2320)	21 (3050)	1800	600	16.5 (36.4)	18.7 (41.2)
A22-*-R-01-*-K-32*	22.2 (1.355)	6 (.366)	16 (2320)	16 (2320)	1800	600	16.5 (36.4)	18.7 (41.2)
A37-*-R-01-*-K-32*	36.9 (2.25)	10 (.610)	16 (2320)	21 (3050)	1800	600	28.0 (61.7)	32.3 (71.2)
A56-*-R-01-*-K-32*	56.2 (3.43)	12 (.732)	16 (2320)	21 (3050)	1800	600	35.0 (77.2)	39.3 (86.7)
A70-*-R01*S-60*	70.0 (4.27)	30 (1.83)	25 (3630)	28 (4060)	1800	600	58.5 (129)	70.5 (155)
A90-*-R01*S-60*	91.0 (5.55)	56 (3.42)	25 (3630)	28 (4060)	1800	600	72.5 (160)	93 (205)
A145-*-R01*S-60*	145 (8.85)	83 (5.06)	25 (3630)	28 (4060)	1800	600	92.5 (204)	117.5 (259)

"A" Series Variable Displacement Piston Pumps - Single Pump, Electro-Hydraulic Proportional pressure & Flow Control Type

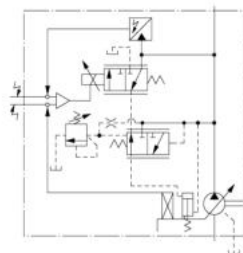


Performance Characteristics

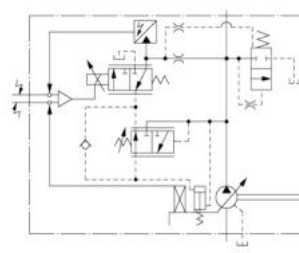


- ★1 Unloading pressure when input signal is 0 V.
- ★2 Safety valve setting pressure

Graphic Symbols



A16/A22/A37/A56



A70/A90/A145

PISTON PUMPS

Model Number Designation

A70	-F	R	04E	16	M	A	-60	-60	*
Series Number	Mounting	Direction of Rotation	Control Type	Control Pressure at Input Signal is 5 V	Unit of Control Pressure	Type of Outboard Pump	Compensation Number	Design Number	Design Std.
A16 (15.8 cm ³ /rev)	F: Flange Mtg. L: Foot Mtg.	R: Viewed from Shaft End R: Clockwise (Normal)	04E: Proportional Pressure & Flow Control Type	Use the same measure of the control pressure as shown on the right, 6.9 MPa specify within the range of maximum operating pressure	M: MPa P: PSI	None ^{★2}	06	42	Refer to ★4
A22 (22.2 cm ³ /rev)							11	42	
A37 (36.9 cm ³ /rev)							01	42	
A56 (56.2 cm ³ /rev)							02	42	
A70 (70.0 cm ³ /rev)						A: ★3 B: ★3	60	60	
A90 (91.0 cm ³ /rev)							60	60	
A145 (145.0 cm ³ /rev)							60	60	

★1. Available to supply pump with anti-clockwise rotation. Consult Yuken for details.

★2. These pumps, except A16 and A22 types, can be connected to outboard pumps.

- A37/A56 type (outboard pump connection symbol: **None**): spigot diameter: 82.55 mm (3.250 in.) (A16, A22, and PV2R1).

- A70/A90/A145 type (outboard pump connection symbol: **"A"**): spigot diameter: 82.55 mm (3.250 in.) (A16, A22, and PV2R1).

- A70/A90/A145 type (outboard pump connection symbol: **"B"**): spigot diameter: 101.6 mm (4.000 in.) (A37 and PV2R2).

★3. Amplifier Compensation Number may differ according to the main machine conditions. Consult Yuken for detail.

★4. Design Standards: None Japanese Standard "JIS"

80 European Design Standard

• Consult Yuken when "N. American Design Standard" is required.

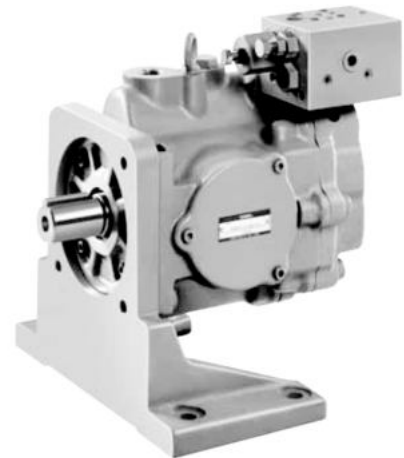
"A3H" Series Variable Displacement Piston Pumps



Pressure Compensator Type



Constant Power (Torque)
Control Type



Load Sensing Type

"A3H" Series Variable Displacement Piston Pumps

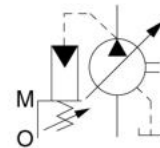
Pump Type	Graphic Symbol	Geometric Displacement		Maximum Operating Pressure MPa (PSI)	Page
		cm ³ /rev	cu. in./rev		
Single Pump		A3H16		35 (5080)	120
		A3H37			
		A3H56			
		A3H71			
		A3H100			
		A3H145			
		A3H180			



"A" Series Variable Displacement Piston Pumps - Single Pump, Pressure Compensator Type



Graphic Symbol



Specifications

Model Numbers	Geometric Displacement cm ³ /rev (cu.in./rev)	Minimum Adj. Flow cm ³ /rev (cu.in./rev)	Operating Pressure MPa (PSI)		Shaft Speed Range r/min		Approx. Mass kg (lbs.)	
			Rated ^{*1}	Intermittent	Max. ^{*2}	Min.	Flange Mtg.	Foot Mtg.
A3H 16-*R01KK-10*	16.3 (.995)	8.0 (.488)	28 (4060)	35 (5080)	3600	600	14.5 (32.0)	23.4 (51.6)
A3H 37-*R01KK-10*	37.1 (2.26)	16.0 (.976)			2700	600	19.5 (43.0)	27.0 (59.5)
A3H 56-*R01KK-10*	56.3 (3.44)	35.0 (2.14)			2500	600	25.7 (56.7)	33.2 (73.2)
A3H 71-*R01KK-10*	70.7 (4.31)	45.0 (2.75)			2300	600	35.0 (77.2)	42.5 (93.7)
A3H100-*R01KK-10*	100.5 (6.13)	63.0 (3.84)			2100	600	44.6 (98.3)	72.6 (160)
A3H145-*R01KK-10*	145.2 (8.86)	95.0 (5.80)			1800	600	60.0 (132)	88.0 (194)
A3H180-*R01KK-10*	180.7 (11.03)	125.0 (7.63)			1800	600	70.4 (155)	98.4 (217)

★1. Consult Yuken when pump is used over rated pressure because there is a restriction on operating condition.

★2. The maximum shaft speeds shown in the above table are at suction pressure 0 kPa (0 PSIG).

★3. The table above shows specifications for using petroleum based oils.

Pumps (customized design) for special fluids are also available. Their operating pressure and maximum shaft speed however differ from the values in the table above depending on the fluid type.

Range of operating temperature and viscosities may differ from those of petroleum based oils due to their characteristics.

Specifications and Design numbers for Special Fluids

Type of Fluids	Operating Pressure MPa (PSI)		Allowable Maximum Shaft Speed r/min		Temperature Range °C (°F)	Viscosity Range mm ² /s (SSU)	Design Numbers for Special Fluid (Occasion of Japanese Std. "JIS") ^{*2}
	Rated	Intermittent	Rated	Max.			
Water-Glycols	21 (3050)	21 (3050)	1200	(1800) ^{*1}	0 - 50 (32 - 104)	20 - 200 (98 - 927)	1030
Phosphate Ester Type	21 (3050)	21 (3050)	1200	(1800) ^{*1}	0 - 60 (32 - 140)		1006
Polyol Ester Type	21 (3050)	25 (3630)	1200	1800	0 - 60 (32 - 140)		10450

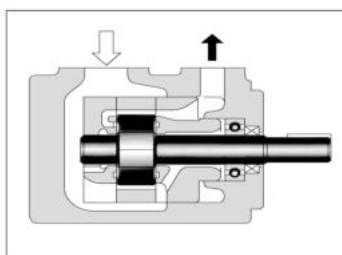
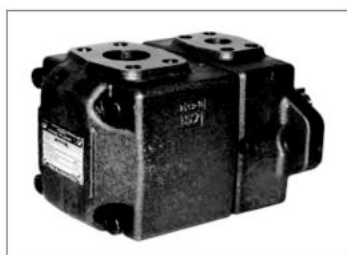
★1. As the specific gravities of water-glycol fluids and phosphate ester type fluids are higher than one, an overhead reservoir is required when pumps are operated at 1500 r/min or more.

★2. For the design numbers of pumps for European Design and North American Design Standards, please contact us.

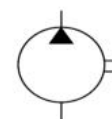
VANE PUMPS

" PV2R " Series Single Vane Pumps

These pumps are of high pressure and high performance, which have been developed especially for low noise operation. To comply with a variety of applications including injection moulding machines, PV2R series single pumps provide the output flow of such a wide range as from 5.8 to 237 cm³/rev (.354 to 14.46 cu.in./rev). The integral driving parts of the pumps are combined into a kit form and available for supply as a cartridge kit. Therefore, the replacement of the driving parts can be done easily.



Graphic Symbol



Model Number Designation

F-	PV2R1	-6	-L	-R	A	A	-42	-*
Special Seals	Series Number	Nominal Displacement cm ³ /rev	Type of Mounting	Shaft Rotation	Discharge Port Position	Suction Port Position	Design Number	Design Standards
F: For phosphate ester type fluids (Omit if not required)	PV2R1	6, 8, 10, 12 14, 17, 19 23, 25, 31	L: Foot Mounting	(Viewed from Shaft End)			42	Refer to ★ 2
	PV2R2	41, 47, 53 59, 65		R: Clockwise* (Normal)	A: Upwards (Normal)	A: Upwards (Normal)	41	
	PV2R3	76, 94, 116	F: Flange Mounting				31	
	PV2R4	136, 153, 184 200, 237					30	

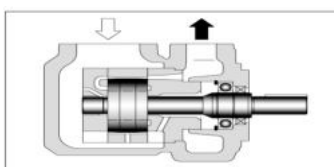
* 1. Available to supply pump with anti-clockwise rotation. Consult Yuken for details.

* 2. Design Standards: None.....Japanese Standard "JIS"
80.....European Design Standard
90.....N. American Design Standard

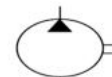
VANE PUMPS

" PV2R4A " Series Single Vane Pumps

These high pressure, high performance pumps have been developed to meet space-saving requirements. These pumps are a very compact version of the PV2R4, a vane pump series that has proven to exhibit outstanding low noise characteristics.



Graphic Symbol



Specifications

Model Numbers	Geometric Displacement cm ³ /rev (cu.in./rev)	Max. Operating Pressure MPa (PSI)					Output Flow & Input Power	Shaft Speed Range r/min	
		Petroleum Base Oils		Water Containing Fluids		Synthetic Fluids		Max.	Min.
		Anti-Wear Type	R & O Type	Anti-Wear*1 Type Water-Glycols	Water Glycols	Water in Oil Emulsions	Phosphate Esters		
PV2R4A-138	138.5 (8.45)	17.2 (2500)	14 (2030)	16 (2320)	7 (1020)	7 (1020)	14 (2030)	Refer to Pages 179 & 180	1800 (1200)*3
PV2R4A-162	162.6 (9.92)								1800 (1200)*3
PV2R4A-193	194.4 (11.86)								1800 (1200)*3

* 1. For the brands of anti-wear type water-glycols, see the item of "Hydraulic Fluids" on page 160.

* 2. If PV2R4A-193 is used at speed above 1700 r/min, the suction pressure is limited to 0 kPa (0 in. Hg.).

* 3. If phosphate ester or water containing fluids are used, the maximum speed is limited to 1200 r/min.

Model Number Designation

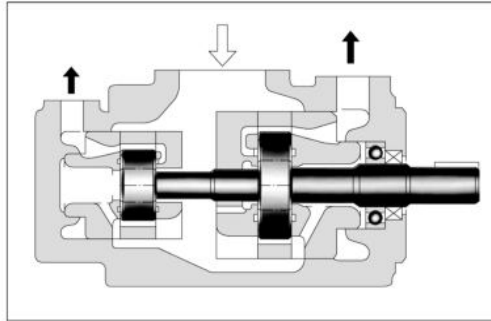
F-	PV2R4A	-138	-L	-R	A	A	-10	-*
Special Seals	Series Number	Nominal Displacement cm ³ /rev	Type of Mounting	Shaft Rotation	Discharge Port Position	Suction Port Position	Design Number	Design Standards
F: For phosphate ester type fluids (Omit if not required)	PV2R4A	138, 162, 193	L: Foot Mounting F: Flange Mounting	(Viewed from Shaft End)			10	Refer to ★ 2
				R: Clockwise*1 (Normal)	A: Upwards (Normal)	A: Upwards (Normal)		

* 1. Available to supply pump with anti-clockwise rotation. Consult Yuken for details.

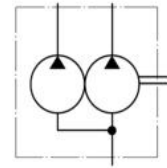
* 2. Design Standards: None.....Japanese Standard "JIS"
80.....European Design Standard
90.....N. American Design Standard

“ PV2R ” Series Double Vane Pumps

These double pumps consist of two PV2R series single pumps combined in tandem within a single housing and driven by a common shaft. A single suction port and two discharge ports are provided so that the output flow can be supplied to separate circuits.



Graphic Symbol



Model Number Designation

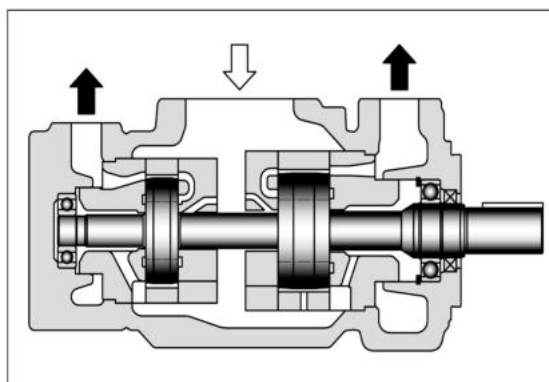
F-	PV2R13	-6	-76	-L	-R	A	A	A	-40	*			
Special Seals	Series Number	Small Volume Pump Nominal Displacement cm ³ /rev	Large Volume Pump Nominal Displacement cm ³ /rev	Mounting	Direction of Rotation	Small Volume Pump Discharge Port Position	Large Volume Pump Discharge Port Position	Suction Port Position	Design Number	Design Standards			
F: Special seals for phosphate ester type fluids (Omit if not required)	PV2R12	6, 8 10, 12 14, 17 19, 23 25, 31	26, 33 41, 47 53, 59 65	L: Foot Mtg.	R: ★ Clockwise (Normal)	(Viewed from Shaft End)		A: Upwards (Normal)	42	Refer to ★ 2			
	PV2R13	6, 8 10, 12 14, 17 19, 23 25, 31	76, 94 116			A: Upwards (Normal)	A: Upwards (Normal)		42				
	PV2R23	41, 47 53, 59 65	52, 60 66, 76 94, 116			E: Left 45° Upwards (Normal)	A: Upwards (Normal)		41				
	PV2R33	76, 94 116	76, 94 116	F: Flange Mtg.		A: Upwards (Normal)	A: Upwards (Normal)	A: Upwards (Normal)	31				
	PV2R14	6, 8 10, 12 14, 17 19, 23	136, 153 184, 200 237			A: Upwards (Normal)			32				
	PV2R24	26, 33 41, 47				31							
	PV2R34	52, 60 66, 76 94, 116				E: Left 45° Upwards (Normal)			31				

★ 1. Available to supply pump with anti-clockwise rotation.
Consult Yuken for details.

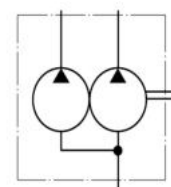
★ 2. Design Standards: None Japanese Standard "JIS" and European Design Standard
90 N. American Design Standard

" PV2R24A/34A " Series Double Vane Pumps

These double pumps incorporate the new PV2R4A series pumps for the large volume side, a feature that permits discharge to separate circuits.



Graphic Symbol



Model Number Designation

F-	PV2R24A	-26	-193	-L	-R	E	A	A	-10	*	
Special Seals	Series Number	Small Volume Pump Nominal Displacement cm ³ /rev	Large Volume Pump Nominal Displacement cm ³ /rev	Mounting	Direction of Rotation	Small Volume Pump Discharge Port Position	Large Volume Pump Discharge Port Position	Suction Port Position	Design Number	Design Standards	
F: Special seals for phosphate ester type fluids (Omit if not required)	PV2R24A	26, 33 41, 47 53, 59 65	138, 162 193	L: Foot Mtg. F: Flange Mtg.	R: Clockwise (Normal)	(Viewed from Shaft End)		A: Upwards (Normal)	A: Upwards (Normal)	10	Refer to ★2
	PV2R34A	76, 94 116				A: Upwards (Normal)	10				

★ 1. Available to supply pump with anti-clockwise rotation.

Consult Yuken for details.

★ 2. Design Standards: None Japanese Standard "JIS" and European Design Standard

90 N. American Design Standard

PRESSURE CONTROLS

Valve Type	Graphic Symbols	Maximum Operating Pressure MPa (PSI)	Maximum Flow												U.S.GPM	
			.5	1	2	5	10	20	50	100	200	300	500	1000	2000	L/min
Remote Cont. Relief Valves		25 (3630)	DT DG 01													
Direct Type Relief Valves		21 (3050)	DT/DG				02									
Pilot Operated Relief Valves		25 (3630)							BT/BG		03	06				
Low Noise Type Pilot Operated Relief Valves		25 (3630)							S-BG		03	06	10			
Sol. Cont. Relief Valves		25 (3630)							BST/BSG		03	06	10			
Low Noise Type Sol. Cont. Relief Valves		25 (3630)							S-BSG		03	06	10			
H Type Press. Cont. Valves / HC Type Press. Cont. Valves		21 (3050)	HT/HG HCT/HCG							03	06	10	HF HCF 16			
Press. Reducing Valves / Press. Reducing & Check Valves		21 (3050)	RT/RG RCT/RCG							03	06	10	RF RCF 16			
Pres. Reducing & Relieving Valves		03 : 14(2030) 06 : 25(3630)	RBG							03	06					
Unloading Relief Valves		21 (3050)	BUG								06	10				
Brake Valves		25 (3630)	UBGR							03	06	10				
Semiconductor Type Pressure Switches		35 (5080)	JT-02													
Pressure Monitoring System		20(2900) 35(5080)														

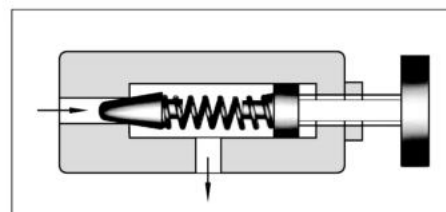
PRESSURE CONTROLS

Remote Control Relief Valves

This valve is used as a remote control valve for pilot operated type pressure control valves.

Specifications

Model Numbers		Max. Operating Pres. MPa (PSI)	Approx. Mass kg (lbs.)	
Threaded Connection	Sub-plate Mounting		DT type	DG type
DT-01-22*	DG-01-22*	25 (3630)	1.6 (3.5)	1.4 (3.1)



Model Number Designation

F-	D	T	-01	-22	*
Special Seals	Series Number	Type of Mounting	Valve Size	Design Number	Design Standards
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	D: Remote Control Relief Valves	T: Threaded Connection	01	22	None: Japanese Std. "JIS" 80: European Design Std. 90: N. American Design Std.
		G: Sub-plate Mounting		22	None: Japanese Std. "JIS" and European Design Std. 90: N. American Design Std.

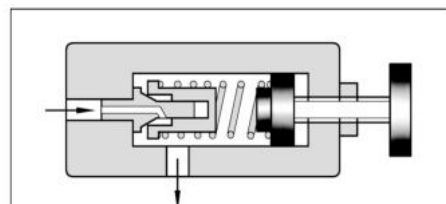
Direct Type Relief Valves

This valve is used in a hydraulic circuit to prevent damage due to over pressure and to adjust the maximum circuit pressure of small capacity.

Specifications

Model Numbers		Max. Operating Pressure MPa (PSI)	Pres. Adj. Range MPa (PSI)	Max. Flow L/min (U.S.GPM)	Approx. Mass kg (lbs.)	
Threaded Connection	Sub-plate Mounting				DT type	DG type
DT-02-*-22*	DG-02-*-22*	21 (3050)	Note)	16 (4.23)	1.5 (3.3)	1.5 (3.3)

Note: Refer to the Model Number Designation.



Model Number Designation

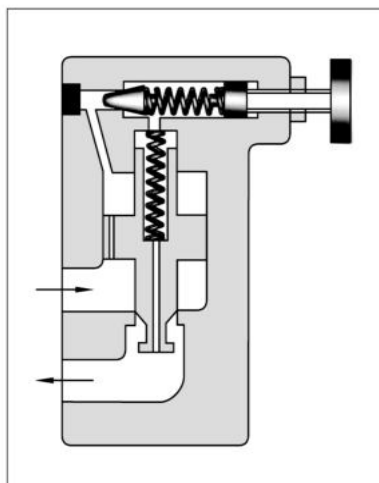
F-	D	T	-02	-B	-22	*
Special Seals	Series Number	Type of Mounting	Valve Size	Pres. Adj. Range MPa (PSI)	Design Number	Design Standards
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	D: Direct Type Relief Valves	T: Threaded Connection	02	B: ★-7 (★-1020)	22	None: Japanese Std. "JIS" 80: European Design Std. 90: N. American Design Std.
		G: Sub-plate Mounting		C: 3.5-14 (510-2030) H: 7-21 (1020-3050)	22	None: Japanese Std. "JIS" and European Design Std. 90: N. American Design Std.

★ Refer to the Minimum Adjustment Pressure Characteristics.

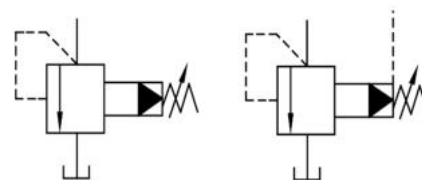
PRESSURE CONTROLS

Pilot Operated Relief Valves

These valves protect the hydraulic system from excessive pressure, and can be used to maintain constant pressure in a hydraulic system. Remote control and unloading are permitted by using vent circuits.



Graphic Symbols



Vent Connection

Specifications

Model Numbers		Max. Operating Pressure MPa (PSI)	Pres. Adj. Range MPa (PSI)	Max. Flow L/min (U.S.GPM)	Approx. Mass kg (lbs.)	
Threaded Connection	Sub-plate Mounting				BT type	BG type
BT-03-*-32*	BG-03-*-32*	25 (3630)	Note) ★-25 (★-3630)	100 (26.4)	5.0 (11.0)	4.7 (10.4)
BT-06-*-32*	BG-06-*-32*			200 (52.8)	5.0 (11.0)	5.6 (12.3)
BT-10-*-32*	BG-10-*-32*			400 (106)	8.5 (18.7)	8.7 (19.2)

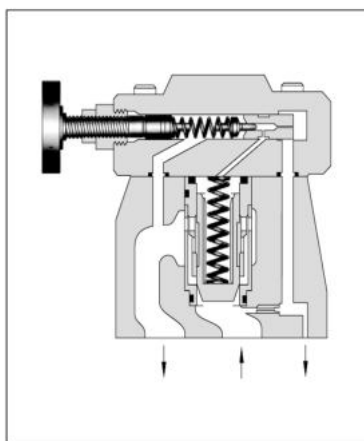
Model Number Designation

F-	B	T	-03	-V	-32	*
Special Seals	Series Number	Type of Mounting	Valve Size	High Venting* Pres. Feature	Design Number	Design Standards
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	B: Pilot Operated Relief Valves	T: Threaded Connection	03	V: For High Venting Pressure Feature (Omit if not required)	32	None: Japanese Std. "JIS" 80: European Design Std. 90: N. American Design Std.
			06		32	
			10		32	
		G: Sub-plate Mounting	03		32	None: Japanese Std. "JIS" and European Design Std. 90: N. American Design Std.
			06		32	
			10		32	

★ Use high venting pressure type to reduce the response time from unload to onload.

Low Noise Type Pilot Operated Relief Valves

Pilot operated relief valves here have been particularly developed as low-noise types. Able to protect pumps and control valves against excessive pressures, they are used to control the pressure in the hydraulic system to a constant level. Remote control and unloading are permitted by using vent circuits.



Graphic Symbols



Vent Connection

Specifications

Model Numbers	Max. Operating Pressure MPa (PSI)	Pres. Adj. Range MPa (PSI)	Max. Flow L/min (U.S.GPM)	Approx. Mass kg (lbs.)
S-BG-03-*-40*	25 (3630)	Note)	100 (26.4)	4.1 (9.0)
S-BG-06-*-40*		★-25	200 (52.8)	5.0 (11.0)
S-BG-10-*-40*		(★-3630)	400 (106)	10.5 (23.2)

Model Number Designation

F-	S-	B	G	-03	-V	-L	-40	*
Special Seals	Low Noise Type	Series Number	Type of Mounting	Valve Size	High Venting ^{★1} Pres. Feature	Direction of Handle	Design Number	Design Std.
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	S: Low Noise Type	B: Pilot Operated Relief Valves	G: Sub-plate Mounting	03	V: For High Venting Pressure Feature (Omit if not required)	(Viewed from pressure) gauge connection	40	Refer to ★2
				06		L: Left (Normal) R: Right	40	
				10		_____	40	

★ 1. Use the high venting pressure type where it is necessary to reduce the response time from unloading to onloading.

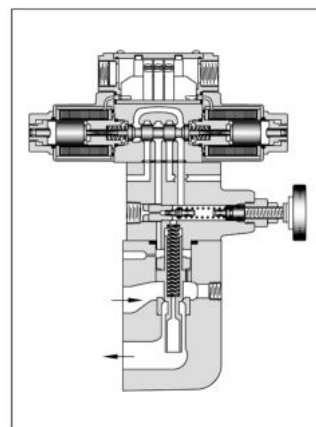
★ 2. Design Standards: None Japanese Standard "JIS" and European Design Standard 90 N. American Design Standard

Solenoid Controlled Relief Valves

These valves are a combination of a pilot operated relief valve and a solenoid operated directional valve. Piping between the two is eliminated as the solenoid valve is directly mounted on the relief valve and connected with the relief valve vent. Pump pressure may be unloaded remotely by an electrical signal to the solenoid, or by connecting pilot relief valves to the solenoid valve ports.

Specifications

Model Numbers		Max. Operating Pressure MPa (PSI)	Pressure Adj. Range MPa (PSI)	Max. Flow L/min (U.S.GPM)	Approx. Mass kg (lbs.)		
					Double Sol.	Single Sol.	With Vent Restrictor
Threaded Connection	BST-03-*-**-48*	25 (3630)	Note) ★-25 (★-3630)	100 (26.4)	7.1 (15.7)	6.6 (14.6)	7.6 (16.8)
	BST-06-*-**-48*			200 (52.8)	7.1 (15.7)	6.6 (14.6)	7.6 (16.8)
	BST-10-*-**-48*			400 (106)	10.8 (23.8)	10.3 (22.7)	11.3 (24.9)
Sub-plate Mounting	BSG-03-*-**-48*	25 (3630)	Note) ★-25 (★-3630)	100 (26.4)	6.8 (15.0)	6.3 (13.9)	7.3 (16.1)
	BSG-06-*-**-48*			200 (52.8)	7.7 (17.0)	7.2 (15.9)	8.2 (18.1)
	BSG-10-*-**-48*			400 (106)	11.0 (24.3)	10.5 (23.2)	11.5 (25.4)



Model Number Designation

F-	A-	BS	T	-03	-V	-2B3A	-A100	-N	-48	*
Special Seals	With Vent Restrictor	Series Number	Type of Mounting	Valve Size	High Venting Pres. Feature	Vent Type	Coil Type*	Type of Electrical Con.	Design Number	Design Standards
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	A: With Vent Restrictor (Option-Omit if not required)	BS: Solenoid Controlled Relief Valves	T: Threaded Connection G: Sub-plate Mounting	03 06 10	V: For High Venting Pressure Feature (Omit if not required)	2B3A ^{*3} 2B3B 2B2B 2B2 3C2 3C3	AC: A100, A120 A200, A240 DC: D12, D24 D48 AC→DC: R100, R200	None: Terminal Box Type N: With Plug-in Connector (DIN) N: With Plug-in Connector (DIN)	48	None: Japanese Std. "JIS" 90: N. American Design Std. 80: European Design Std.

PRESSURE CONTROLS

H/HC Type Pressure Control Valves

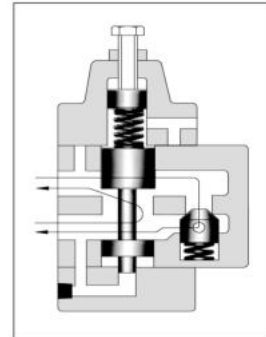
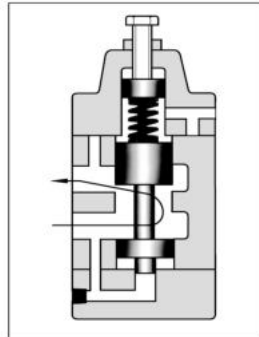
These valves are hydraulically damped, direct operated, pressure control valves which can be actuated by internal or external pilot pressure.

H Type Pressure Control Valves

There are various types of valve including sequence, unloading and low pressure relief valves, all of which are operated by a pressure rise in the circuit, sensed either internally or remotely.

HC Type Pressure Control Valves

They are available with integral check valves for use when free reverse flow from secondary port to the primary port is desired. There are various types of valve including sequence and counterbalance valves, all of which are operated by a pressure rise in the circuit, sensed either internally or remotely.



Specifications

Series	Model Numbers		Max. Operating Pres. MPa (PSI)	Max. Flow L/min (U.S.G.P.M.)	Approx. Mass kg (lbs.)	
	Threaded Connection	Sub-plate Mounting			Threaded Connection	Sub-plate Mounting
H Type Pressure Control Valves	HT-03-**-*/-22/2280/2290	HG-03-**-*/-22/2290	21(3050)	50 (13.2)	3.7 (8.2)	4.0 (8.8)
	HT-06-**-*/-22/2280/2290	HG-06-**-*/-22/2290		125 (33)	6.2 (13.7)	6.1 (13.5)
	HT-10-**-*/-22/2280/2290	HG-10-**-*/-22/2290		250 (66)	12.0 (26.5)	11.0 (24.3)
HC Type Pressure Control Valves	HCT-03-**-*/-22/2280/2290	HCG-03-**-*/-22/2290	21(3050)	50 (13.2)	4.1 (9.0)	4.8 (10.6)
	HCT-06-**-*/-22/2280/2290	HCG-06-**-*/-22/2290		125 (33)	7.1 (15.7)	7.4 (16.3)
	HCT-10-**-*/-22/2280/2290	HCG-10-**-*/-22/2290		250 (66)	13.8 (30.4)	13.8 (30.4)

Model Number Designation

F-	H	T	-03	-C	3	-P	-22	*
Special Seals	Series Number	Type of Mounting	Valve Size	Pres. Adj. Range MPa (PSI)	Valve Type	With Auxiliary Pilot Pressure	Design Number	Design Standards
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	H: H Type Pressure Control Valves	T: Threaded Connection	03	L: 0.25 - 0.45 (36 - 65) M: 0.45 - 0.9 (65 - 130) N: 0.9 - 1.8 (130 - 260) A: 1.8 - 3.5 (260 - 510) B: 3.5 - 7.0 (510 - 1020) C: 7.0 - 14 (1020 - 2030)	1*2 2 3 4	P: With Auxiliary Pilot Pressure	22	None: Japanese Std. "JIS" 80: European Design Std. 90: N. American Design Std.
			06				22	
			10				22	
		G: Sub-plate Mounting	03				22	None: Japanese Std. "JIS" & European Design Std. 90: N. American Design Std.
			06				22	
			10				22	
	HC: HC Type Pressure Control Valves	T: Threaded Connection	03		1 2 3 4		22	None: Japanese Std. "JIS" 80: European Design Std. 90: N. American Design Std.
			06				22	
			10				22	
		G: Sub-plate Mounting	03				22	None: Japanese Std. "JIS" & European Design Std. 90: N. American Design Std.
			06				22	
			10				22	

*1. For the details of valve types, see the following page.

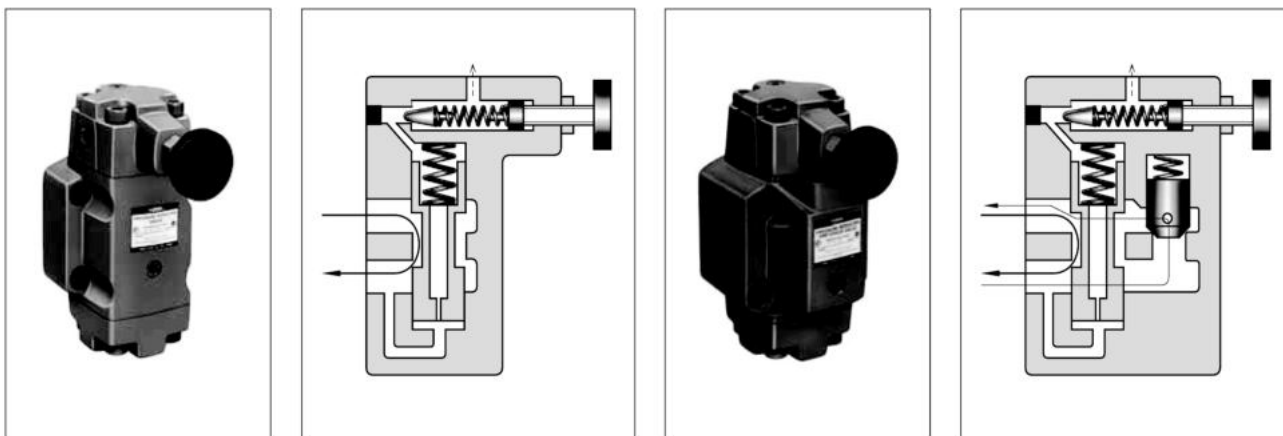
*2. Type 1 is only possible for pressure adjustment ranges L and M.

*3. Models with auxiliary pilots are used where valves must be operated under a lower external pilot pressure than the adjusted pressure (types N, A, and B: about 1/8 of adjusted pressure; type C: about 1/16). This does not apply to pressure adjustment ranges L and M and valve type 1.

PRESSURE CONTROLS

Pressure Reducing Valves / Pressure Reducing and Check Valves

Pressure reducing valves are used to set the pressure of a hydraulic circuit below that of the main circuit. In addition, operation under remote control is possible by using the remote control port. Pressure reducing and check valves have check valves, which allow a free flow from the secondary side to the primary.



Specifications

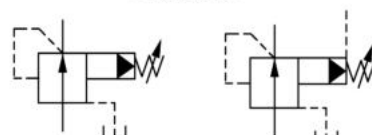
Valve Name	Model Numbers		Max. Operating Pressure MPa (PSI)	Max. Flow ^{*1}		Drain Flow ^{*2} L/min (U.S.GPM)	Approx. Mass kg (lbs.)	
	Threaded Connection	Sub-plate Mounting		Setting Pressure MPa (PSI)	Max. Flow L/min (U.S.GPM)		Threaded Connection	Sub-plate Mounting
Pressure Reducing Valve	RT-03-*-22*	RG-03-*-22*	21 (3050)	0.7 - 1.0 (102 - 145)	40 (10.6)	0.8 - 1.0 (.21 - .26)	4.3 (9.5)	4.5 (9.9)
				1.0 - 20.5 (145 - 2970)	50 (13.2)			
				0.7 - 1.0 (102 - 145)	50 (13.2)			
	RT-06-*-22*	RG-06-*-22*	21 (3050)	1.0 - 1.5 (145 - 220)	100 (26.4)	0.8 - 1.1 (.21 - .29)	6.9 (15.2)	6.8 (15.0)
				1.5 - 20.5 (220 - 2970)	125 (33.0)			
				0.7 - 1.0 (102 - 145)	130 (34.3)			
	RT-10-*-22*	RG-10-*-22*	21 (3050)	1.0 - 1.5 (145 - 220)	180 (47.6)	1.2 - 1.5 (.32 - .40)	12.0 (26.5)	11.0 (24.3)
				1.5 - 10.5 (220 - 1520)	220 (58.1)			
				10.5 - 20.5 (1520 - 2970)	250 (66.0)			
Pressure Reducing and Check Valve	RCT-03-*-22*	RCG-03-*-22*	21 (3050)	0.7 - 1.0 (102 - 145)	40 (10.6)	0.8 - 1.0 (.21 - .26)	4.8 (10.6)	5.4 (11.9)
				1.0 - 20.5 (145 - 2970)	50 (13.2)			
				0.7 - 1.0 (102 - 145)	50 (13.2)			
	RCT-06-*-22*	RCG-06-*-22*	21 (3050)	1.0 - 1.5 (145 - 220)	100 (26.4)	0.8 - 1.1 (.21 - .29)	7.8 (17.2)	8.1 (17.9)
				1.5 - 20.5 (220 - 2970)	125 (33.0)			
				0.7 - 1.0 (102 - 145)	130 (34.3)			
	RCT-10-*-22*	RCG-10-*-22*	21 (3050)	1.0 - 1.5 (145 - 220)	180 (47.6)	1.2 - 1.5 (.32 - .40)	13.8 (30.4)	13.8 (30.4)
				1.5 - 10.5 (220 - 1520)	220 (58.1)			
				10.5 - 20.5 (1520 - 2970)	250 (66.0)			

★ 1. The max. flow rates are those shown at the primary pressure at 21 MPa (3050 PSI).

★ 2. The drain flow rates are equal to pilot flow rates when differential pressure between primary and secondary pressure is at 20.5 MPa (2970 PSI).

Graphic Symbols

● RT / RG

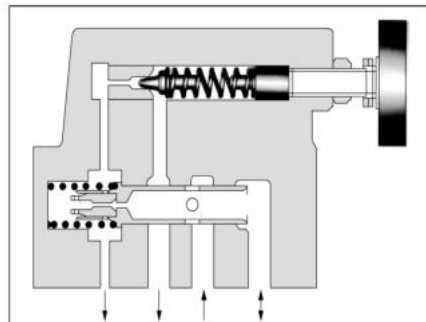


Remote control connection

● RCT / RCG

Pressure Reducing and Relieving Valves

Pressure reducing and relieving valves are composite pressure control valves having pressure reducing and counterbalancing functions developed for hydraulic balancing circuits.



Specifications

Model Numbers	Max. Operating Pressure MPa (PSI)	Pres. Adj. Range MPa (PSI)	Max. Flow L/min (U.S.GPM)	Relieving Flow L/min (U.S.GPM)	Drain Flow L/min (U.S.GPM)	Approx. Mass kg (lbs.)
RBG-03-*-10*	14 (2030)	0.6-13.5 (90-1960)	50 (13.2)	50 (13.2)	0.6-1 (.16-.26)	4.2 (9.3)
RBG-06-*-10*	25 (3630)	0.8-24.5 (120-3550)	125 (33)	125 (33)	1.5-2 (.40-.53)	11 (24.3)

Model Number Designation

F-	RB	G	-03	-R	-10	*
Special Seals	Series Number	Type of Mounting	Valve Size	Drain Type	Design Number	Design Standards
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	RB: Pressure Reducing and Relieving Valves	G: Sub-plate Mounting	03	None: Internal Drain	10	Refer to ★
			06	R: External Drain	10	

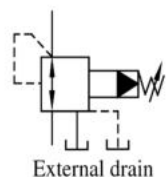
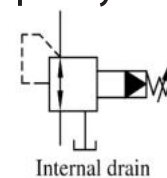
★ Design Standards: None Japanese Standard "JIS"
 80 European Design Standard
 90 N. American Design Standard

Attachment

Mounting Bolts

Valve Model Numbers	Socket Head Cap Screw (4 pcs.)	
	Japanese Standard "JIS" European Design Standard	N. American Design Standard
RBG-03	M10 × 65 Lg.	3/8-16 UNC × 2-1/2 Lg.
RBG-06	M10 × 70 Lg.	3/8-16 UNC × 2-3/4 Lg.

Graphic Symbol



Unloading Relief Valves

These valves are used to operate the pumps with minimum load in accumulator circuits or in high-low pump circuits.

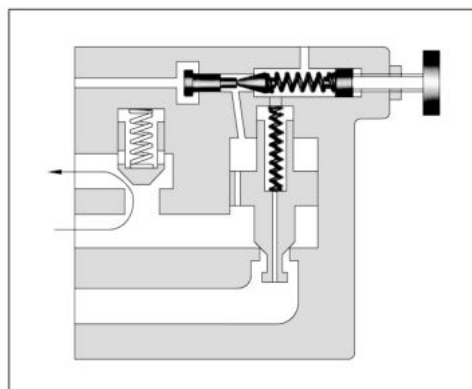
In accumulator circuits, when the system pressure reaches to a cut out pressure (adjusted maximum), the valve acts to divert the pump delivery to the reservoir at low pressure, thus the pump is unloaded automatically.

When the accumulator pressure drops to the cut in pressure the valve directs the pump delivery system.

to the accumulator and hydraulic system.

An integral check valve prevents reverse flow through the valve from the accumulator.

In high-low pump circuits, the valve acts to unload the large volume pump with the same manner as described above during load operation of the small volume pump.



Specifications

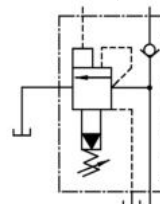
Model Numbers	Max. Operating Pres. MPa (PSI)	Max. Flow L/min (U.S.GPM)	Approx. Mass kg(lbs.)
BUCG-06-**-30/3080/3090	21 (3050)	125 (33)	12 (26.5)
BUCG-10-**-25/2580/2590		250 (66)	21.5 (47.4)

Model Number Designation

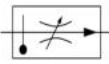
F-	BUC	G	-06	-B	V	-30	*
Special Seals	Series Number	Type of Mounting	Valve Size	Cut-out Pres. Adj. Range MPa (PSI)	High Venting* Pres. Feature	Design Number	Design Standards
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	BUC: Unloading Relief Valve	G: Sub-plate Mounting	06	B: 2.5-7.0 (360-1020) C: 3.5-14 (510-2030) H: 7.0-21 (1020-3050)	V: For High Venting Pressure Feature (Omit if not required)	30	None: Japanese Std. "JIS"
			10			25	80: European Design Std. 90: N. American Design Std.

★ Use the high-venting-pressure type to reduce the shift time from unloading to onloading.

Graphic Symbols



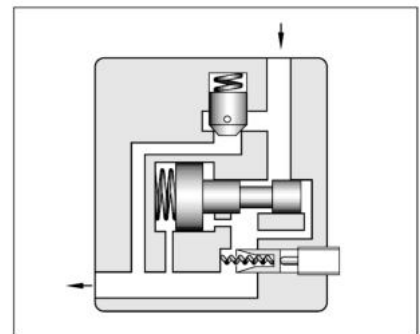
FLOW CONTROLS

Valve Type	Graphic Symbols	Maximum Operating Pressure MPa (PSI)	Maximum Flow																U.S.GPM																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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			1	2	3	5	10	20	30	50	100	200	300	500	1000	2000	3000	5000	L/min																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
Flow Control Valves		21 (3050)	FG			01			02				03		06		10																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													</

★ Rated flow stands for approximate flow rate when the pressure drop between inlet and outlet ports of the valve in fully opened condition becomes 0.3 MPa (44 PSI) maximum at fluid's specific gravity of 0.85 and kinematic viscosity of 20 mm²/s (98 SSU).

Flow Control Valves / Flow Control and Check Valves

These valves are pressure and temperature compensating type valves and maintain a constant flow rate independent of change in system pressure (load) and temperature (viscosity of the fluid). They control flow rate of the hydraulic circuit and eventually control speed of the actuator precisely. Valves with an integral check valve allow a controlled flow and reverse free flow. Repeated resetting can be made easily with a digital readout.



Specifications

Model Numbers	Max. Metred Flow Capacity L/min (U.S.GPM)	Min. Metred Flow Capacity L/min (U.S.GPM)	Max. Operating Pressure MPa (PSI)	Approx. Mass kg (lbs.)
FG -01- $\frac{4}{8}$ -*-11*	4(1.06) 8(2.1)	0.02(.005) {0.04 (.011)} *	14 (2030)	1.3 (2.9)
FG -02-30-*-30*	30(7.9)	0.05 (.013)	21 (3050)	3.8 (8.4)
FG -03-125-*-30*	125(33)	0.2 (.053)		7.9 (17.4)
FG -06-250-*-30*	250(66)	2 (.53)		23 (50.7)
FG -10-500-*-30*	500(132)	4 (1.06)		52 (115)

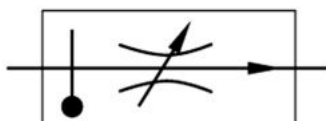
★ The figures in the brace are for pressures above 7 MPa (1020 PSI).

Model Number Designation

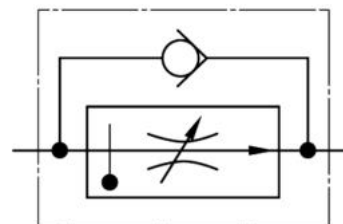
F-	FC	G	-01	-8	-N	-11	*
Special Seals	Series Number	Type of Mounting	Valve Size	Max. Metred Flow Capacity L/min (U.S.GPM)	Pres. Compensator Stroke Adjustment	Design Number	Design Standards
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	F: Flow Control Valves FC: Flow Control and Check Valves	G: Sub-plate Mounting	01	4 : 4 (1.06) 8 : 8 (2.1)	N: Applicable only for Pres. Compensator Stroke Adjustment (Option - Omit if not required)	11	Refer to ★
			02	30 : 30 (7.9)		30	
			03	125 : 125 (33)		30	
			06	250 : 250 (66)		30	
			10	500 : 500 (132)		30	

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

Graphic Symbols



FG

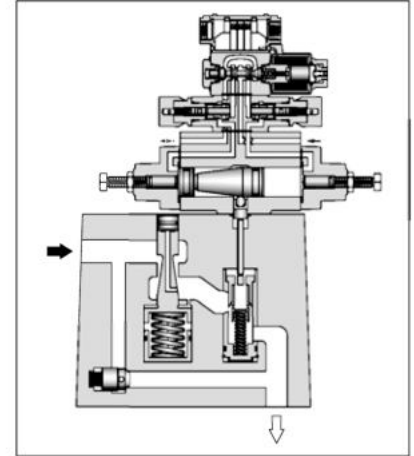


FCG

FLOW CONTROLS

Pilot Operated Flow Control Valves / Pilot Operated Flow Control and Check Valves

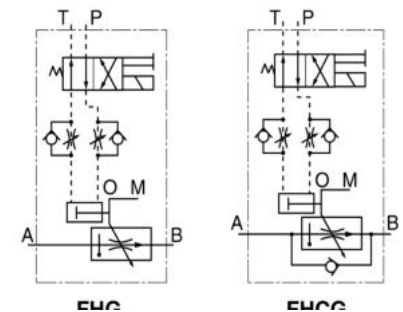
Flow control of these valves is continuously made by a hydraulically operated pilot piston mechanism which controls opening area of the orifice of the valve. With the use of these valves, shockless operation either in acceleration or deceleration can be obtained. With the compensator for the pressure and temperature, stable flow control can be obtained regardless of the changes in the pressure (load) and temperature (oil viscosity).



Specifications

Model Numbers	Max. Metred Flow Capacity L/min (U.S.GPM)	Min. Metred Flow Capacity L/min (U.S.GPM)	Max. Operating Pressure MPa (PSI)	Min. Pilot Pressure MPa (PSI)	Approx. Mass kg (lbs.)
FHG/FHCG-02-30-*-13*	30 (7.9)	0.05 (.013)	21 (3050)	1.5 (220)	13 (28.7)
FHG/FHCG-03-125-*-13*	125 (33)	0.2 (.053)			17 (37.5)
FHG/FHCG-06-250-*-13*	250 (66)	2 (.53)			32 (70.6)
FHG/FHCG-10-500-*-13*	500 (132)	4 (1.06)			61 (135)

Graphic Symbols



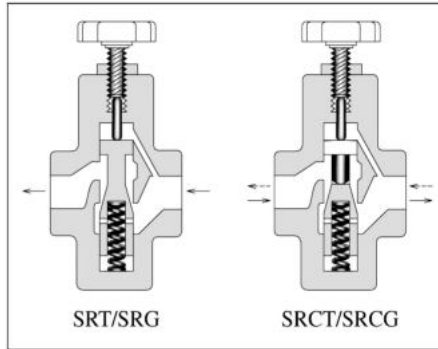
Model Number Designation

F-	FHC	G	-02	-30	-N	-O	-A100	-N	-13	*
Special Seals	Series Number	Type of Mounting	Valve Size	Max. Metred Flow L/min (U.S.GPM)	Pressure *3 Compensator Stroke Adj.	With No Pilot Valve *1	Coil *2 Type	Type of Electrical Connections	Design Number	Design Standards
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	FH: Pilot Operated Flow Control Valves FHC: Pilot Operated Flow Cont. & Check Valves	G: Sub-plate Mounting	02	30: 30 (7.9)	N: Applicable only for Pres. Compensator Stroke Adjustment (Option - Omit if not required)	O: Applicable only for Without Pilot Valve	AC: A100 A120 A200 A240 DC: D12 D24 D48 AC → DC: R100 R200	None: Terminal Box Type N: With Plug-in Connector (Din) N: With Plug-in Connector (Din)	13	None: Japanese Std. "JIS" 90: N.American Design Std. 80: European Design Std.
			03	125: 125 (33)					13	
			06	250: 250 (66)					13	
			10	500: 500 (132)					13	

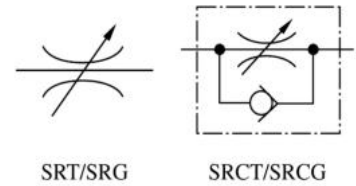
FLOW CONTROLS

Restrictors / One Way Restrictors

This valve is used to regulate an actuator speed in a circuit where line pressure is almost steady and small fluctuation of oil flow due to pressure changes is permitted. Integrated check valve allows reversed free flow from outlet to inlet port. Pressure balanced construction provides less effort in adjustment at high pressure.

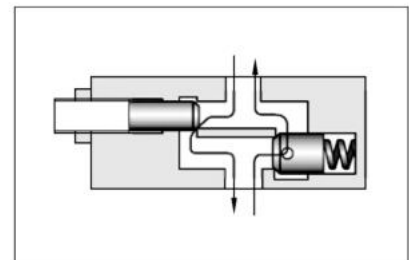


Graphic Symbols



Throttle Modules / Throttle and Check Modules

Used as pilot choke valves for solenoid controlled pilot operated directional valves and pilot operated directional valves.



Graphic Symbols

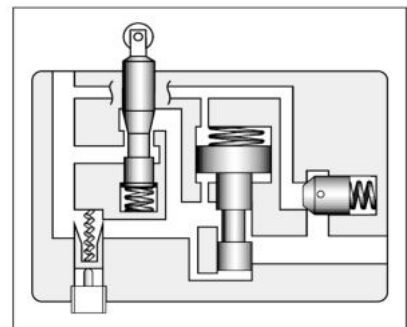
Valve Size	Throttle Modules		Throttle and Check Modules	
	Standard Type	With Check	Standard (Metre-out) Type	Metre-in Type
01	Solenoid Operated Directional Valve P A B T TC1G-01	 P A B T TC1G-01-C	Solenoid Operated Directional Valve P A B T TC2G-01	 P A B T TC2G-01-A
03	Solenoid Operated Directional Valve P A B T TC1G-03	Solenoid Operated Directional Valve P A B T TC1G-03-C	Solenoid Operated Directional Valve P A B T TC2G-03	Solenoid Operated Directional Valve P A B T TC2G-03-A

Feed Control Valves

These valves are the combination of flow control valve, a deceleration valve and a check valve and used mainly for controlling rapid traverse and feed cycles machine tools. Switching from rapid traverse to feed is made by a cam operation, and fine feed control is accomplished by dial rotation regardless of pressure and oil temperature variation. Rapid return is free of cam actuation.

Specifications

Model Numbers	Max. Flow L/min (U.S.GPM)	Metred Flow Range L/min (U.S.GPM)		Max. Reversed Free Flow L/min (U.S.GPM)	Max. Operating Pressure MPa (PSI)	Approx. Mass kg (lbs.)
		Feed	Fine Feed			
UCF1G-01-4-A-*-11*	16 [12] (4.2 [3.2])	0.03-4 (.008-1.06) {0.05-4} (.013-1.06)	—	20 (5.3)	14 (2030)	1.6 (3.5)
UCF1G-01-4-B-*-11*	12 [8] (3.2 [2.1])					
UCF1G-01-4-C-*-11*	8 [4] (2.1 [1.06])					
UCF1G-01-8-A-*-11*	20 [12] (5.3 [3.2])	0.03-8 (.008-2.1) {0.05-8} (.013-2.1)	—			
UCF1G-01-8-B-*-11*	16 [8] (4.2 [2.1])					
UCF1G-01-8-C-*-11*	12 [4] (3.2 [1.06])					
UCF1G-03-4-*-10*	40 [40] (10.6 [10.6])	0.05-4 (.013-1.06)	—	40 (10.6)		2.6 (5.7)
UCF1G-03-8-*-10*		0.05-8 (.013-2.1)	—			
UCF2G-03-4-*-10*	40 [40] (10.6 [10.6])	0.1-4 (.026-1.06)	0.05-4 (.013-1.06)	40 (10.6)		2.7 (6.0)
UCF2G-03-8-*-10*		0.1-8 (.026-2.1)	0.05-4 (.013-1.06)			
UCF1G-04-30-30*	80 [40] (21.1 [10.6])	0.1-22 (.026-5.8)	—	80 (21.1)		6.5 (14.3)
UCF2G-04-30-30*		0.1-22 (.026-5.8)	0.1-17 (.026-4.5)			9.2 (20.3)



FLOW CONTROLS

Needle Valves

Used as stop valves for pressure gauge lines and small-capacity line. Also can be used as restrictors for regulating flow rates in pilot lines.

Specifications

Model Numbers		Max. Flow L/min (U.S.GPM)	Max. Operating Pressure MPa (PSI)	Approx. Mass kg (lbs.)
In-Line Type	Angle Type			
GCT-02-32*	GCTR-02-32*	★	35 (5080)	0.34 (.75)

★ Depends on allowable pressure drops. See Flow vs. Adjustment Revolutions characteristics and Pressure Drop at Full Open characteristics.

Model Number Designation

F-	GCT	-02	-32	*
Special Seals	Series Number	Valve Size	Design Number	Design Standards
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	GCT : In-line Type Needle Valve, Threaded Connection	02	32	Refer to *
	GCTR : Angle Type Needle Valve, Threaded Connection			



Graphic Symbols



Directional Valves

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

● Solenoid Operated Directional Valves



● Solenoid Controlled Pilot Operated Directional Valves



● "G" Series Shockless Type Directional Valves



● Pilot/Manually/Mechanically Operated Directional Valves



● Poppet Type Directional Valves

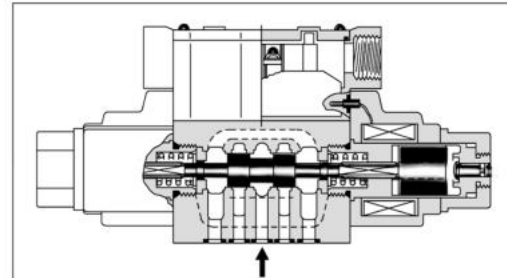
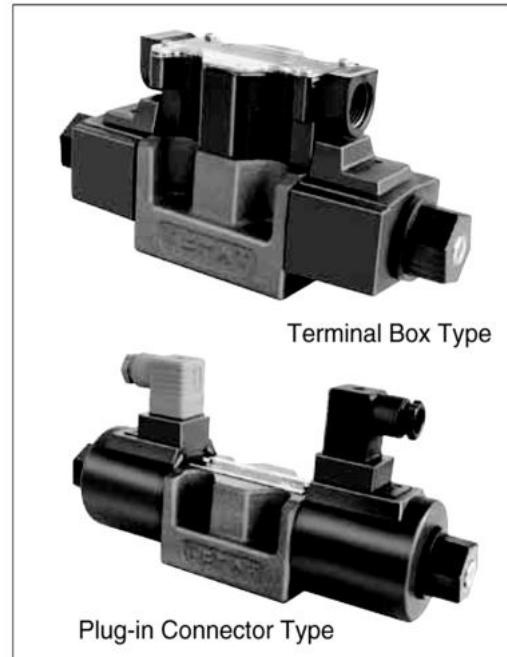
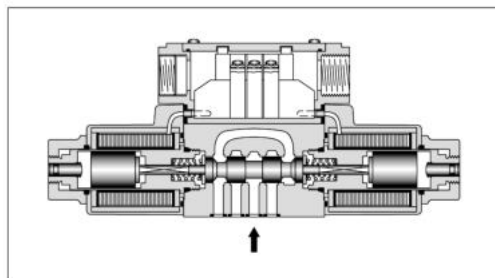
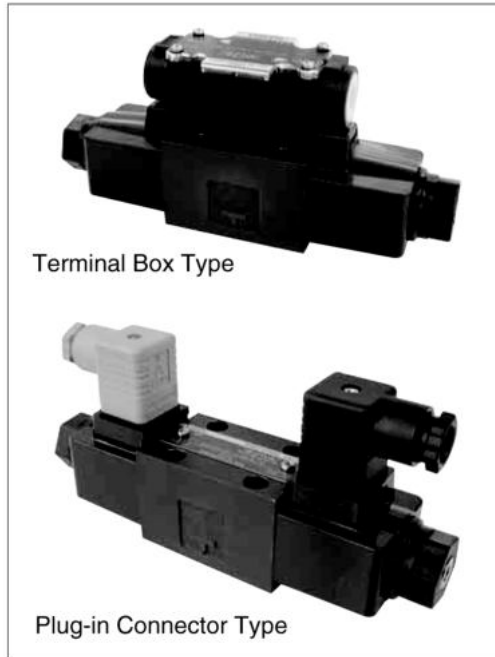


● Check/Pilot Controlled Check Valves



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

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



Valve Type	Graphic Symbols	Max. Operating Pressure MPa (PSI)	Maximum Flow											
			U.S.GPM											
			.3	.5	1	2	5	10	20	50	100	200	500	1000
			L/min											
Solenoid Operated Directional Valves		25 (3600)	DSG-005											
		16 (2320)	L-DSG-01											
		25 (3600)	S-DSG-01											
		35 (5080)	DSG-01											
		16 (2320)	L-DSG-03											
		25 (3600)	S-DSG-03											
		31.5 (4580)	DSG-03											
Low Wattage (5W) Type Dolenoid Operated Directional Valves		16 (2320)	E-DSG-01											
			E-DSG-03											
Electronic Relay Incorporated Solenoid Operated Directional Valves		25 (3600)	T-S-DSG-01											
		35 (5080)	T-DSG-01											
		25 (3600)	T-S-DSG-03											
		31.5 (4580)	T-DSG-03											
Solenoid Controlled Pilot Operated Directional Valve		21 (3050)	DSHG-01											
		25 (3600)	DSHG-03											
			DSHG-04/S-DSHG-04											
		31.5 (4580)	DSHG-06/S-DSHG-06											
			DSHG-10/S-DSHG-10											
“G” Series Shockless Type Solenoid Operated Directional Valves		25 (3600)	G-DSG-01											
			G-DSG-03											
“G” Series Shockless Type Solenoid Controlled Pilot Operated Directional Valves		25 (3600)	G-DSHG-04											
			G-DSHG-06											
Pilot Operated Directional Valves		31.5 (4580)	DHG-04 06 10											
Manually Operated Directional Valves		21 (3050)	Threaded Connection (DMT) 03 06 10											
		31.5 (4580)	Sub-plate connection (DMG) 01 03 04 06 10											
Mechanically Operated Directional Valves		7 (1020)	Rotary (DR _G ^T) 02											
		25 (3600)	Cam Operated (DC _G ^T) 01 03											

Spool Types

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

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

Model Number Designation

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

Model Number Designation

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

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

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

● High Pressure & High Flow Rate

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

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

● Low Pressure Drop

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

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

● Compact & Small Mass

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

● Shockless type available

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

● Stable Operation

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

● IP65-equivalent high dust- and water-proof

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

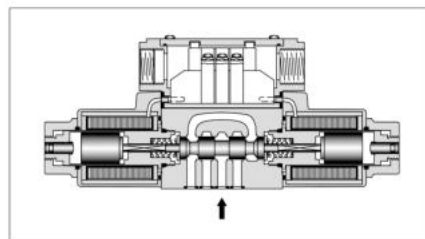
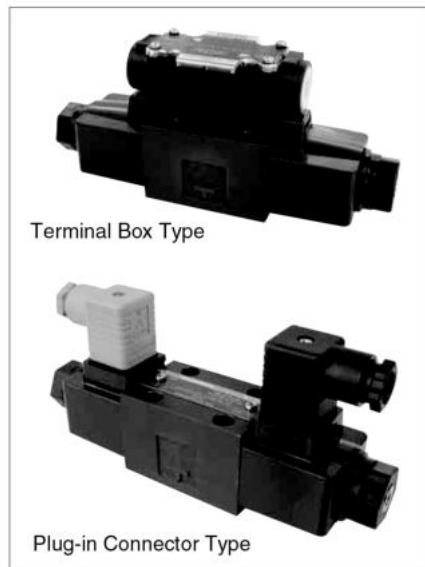
● Usable in products of various standards

These standard valves are CE certified for installation in equipment overseas.

UL/CSA certified products are also available.

■ Specifications

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



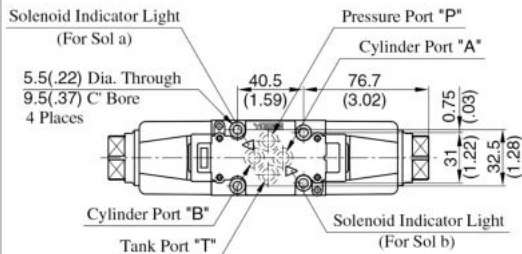
DIRECTIONAL CONTROLS

TERMINAL BOX TYPE

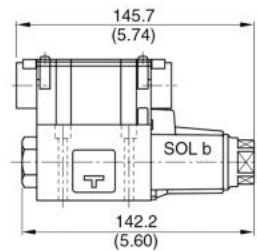
Mounting surface: ISO 4401-AB-03-4-A

- Models with AC Solenoids
- Double Solenoid: Spring Centred & No-Spring Detented

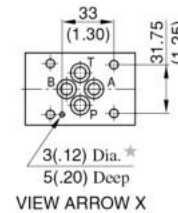
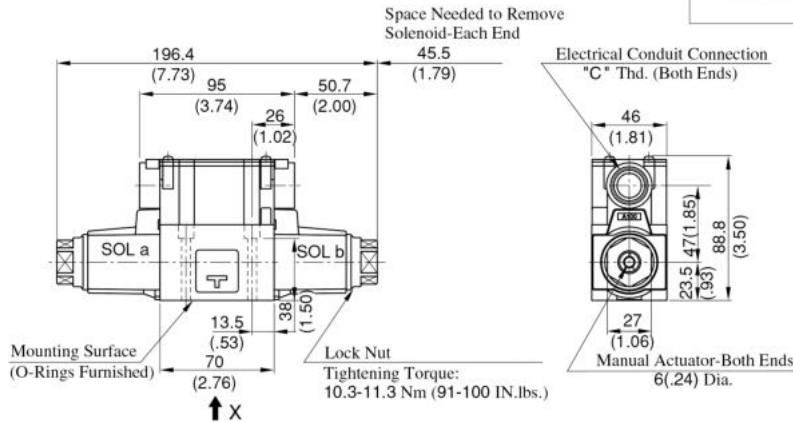
DSG-01- 3C*
2D2 -A*-70/7090



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



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

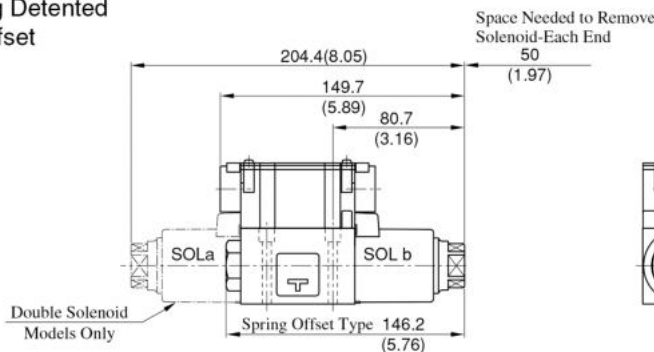


Model Numbers	"C" Thd.
DSG-01-***-A*-70	G 1/2
DSG-01-***-A*-7090	1/2 NPT

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

**DIMENSIONS IN
MILLIMETRES (INCHES)**

- Models with DC Solenoids: (S)-DSG-01-***-D*-70/7090
- Models with R Type Solenoids: (S)-DSG-01-***-R*-70/7090
- Spring Centred
- No-Spring Detented
- Spring Offset



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

DIRECTIONAL CONTROLS

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

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

● Wide Range of Models

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

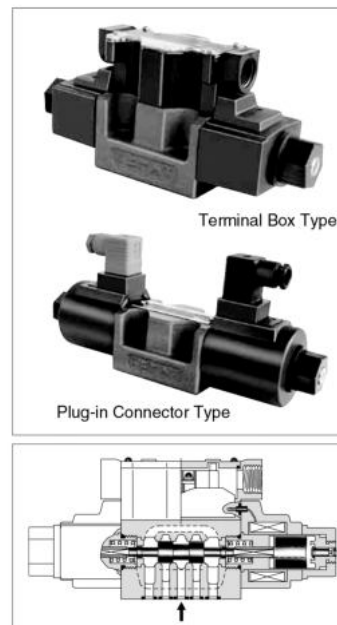
- Standard type Useable at high pressure: 31.5 MPa (4570 PSI) and high flow: 120 L/min (31.7 U.S.GPM)
- Shockless type A noise at spool changeover and a vibration in piping can be reduced to a minimum.

● Stable Operation

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

● Usable in products of various standards

CE/UL/CSA certified products are available.



Specifications

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

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

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

Sub-plate

Piping Size	Japanese Standard "JIS"		European Design Standard		N.American Design Standard		Approx. Mass kg (lbs.)
	Sub-plate Model Numbers	Thread Size	Sub-plate Model Numbers	Thread Size	Sub-plate Model Numbers	Thread Size	
3/8	DSGM-03-40	Rc 3/8	DSGM-03-2180	3/8 BSP.F	DSGM-03-2190	3/8 NPT	3.0 (6.6)
1/2	DSGM-03X-40	Rc 1/2	DSGM-03X-2180	1/2 BSP.F	DSGM-03X-2190	1/2 NPT	3.0 (6.6)
3/4	DSGM-03Y-40	Rc 3/4	DSGM-03Y-2180	3/4 BSP.F	DSGM-03Y-2190	3/4 NPT	4.7 (10.4)

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

Mounting Bolts

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

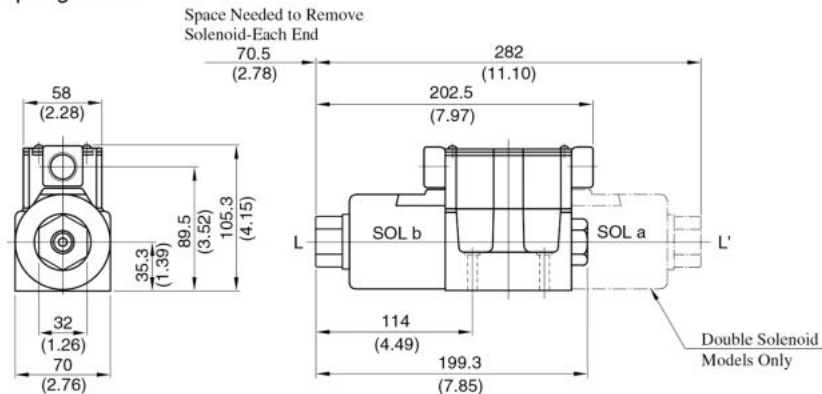
Descriptions	Soc. Hd. Cap Screw (4 pcs.)	Tightening Torque
Japanese Standard "JIS"	M6 × 35 Lg.	12 - 15 Nm (106 - 133 in. lbs.)
European Design Standard		
N. American Design Standard	1/4-20 UNC × 1-1/2 Lg.	

DIRECTIONAL CONTROLS

TERMINAL BOX TYPE

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

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

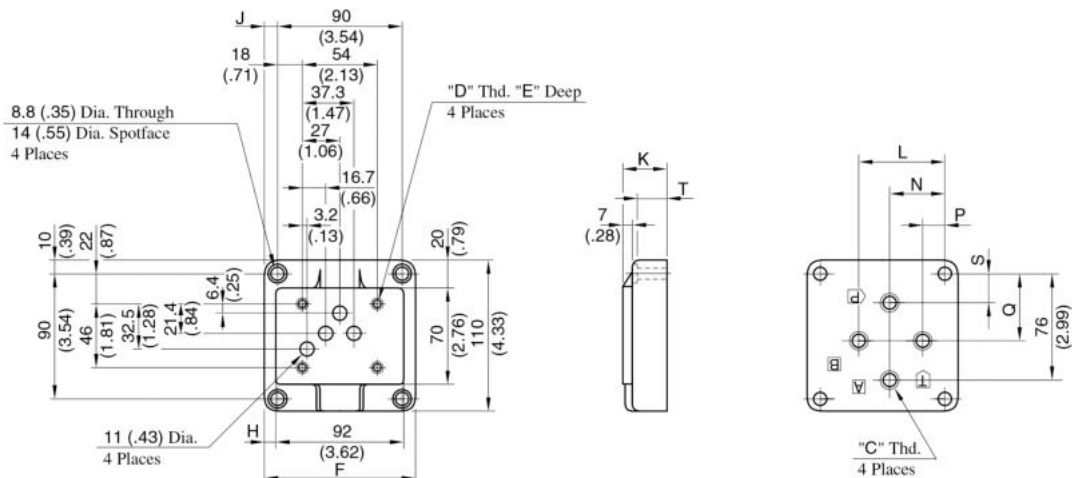


• For other dimensions, refer to Models with AC solenoids (Page 372).

DIMENSIONS IN MILLIMETRES (INCHES)

Sub- plates

DSGM-03*-40/2180/2190



Sub-plate Model Numbers	Piping Size "C" Thd.	"D" Thd.	Dimensions mm (Inches)										
			E	F	H	J	K	L	N	P	Q	S	T
DSGM-03-40	Rc 3/8	M6	13 (.51)	110 (4.33)	9 (.35)	10 (.39)	32 (1.26)	62 (2.44)	40 (1.57)	16 (.63)	48 (1.89)	21 (.83)	24 (.94)
DSGM-03-2180	3/8 BSP.F												
DSGM-03-2190	3/8 NPT		1/4-20 UNC	15 (.59)									
DSGM-03X-40	Rc 1/2	M6	13 (.51)	110 (4.33)	9 (.35)	10 (.39)	32 (1.26)	62 (2.44)	40 (1.57)	16 (.63)	48 (1.89)	21 (.83)	24 (.94)
DSGM-03X-2180	1/2 BSP.F												
DSGM-03X-2190	1/2 NPT		1/4-20 UNC	15 (.59)									
DSGM-03Y-40	Rc 3/4	M6	13 (.51)	120 (4.72)	14 (.55)	15 (.59)	50 (1.97)	80 (3.15)	45 (1.77)	10 (.39)	47 (1.85)	16 (.63)	42 (1.65)
DSGM-03Y-2180	3/4 BSP.F												
DSGM-03Y-2190	3/4 NPT		1/4-20 UNC	15 (.59)									

DIRECTIONAL CONTROLS

Solenoid Controlled Pilot Operated Directional Valves

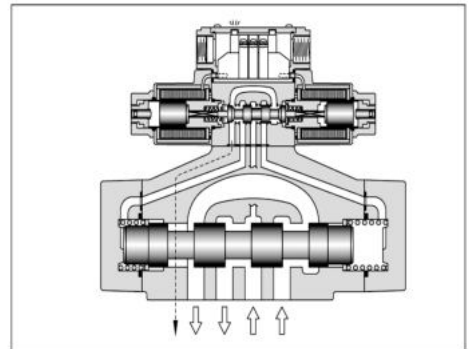
These valves are composed of a solenoid operated pilot valve and a pilot operated slave valve. When a solenoid is energised the pilot valve directs the flow to move the spool of the slave valve, thus changing the direction of flow in the hydraulic circuit.

- **High Pressure High Flow**

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

- **Lower Pressure Drop**

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



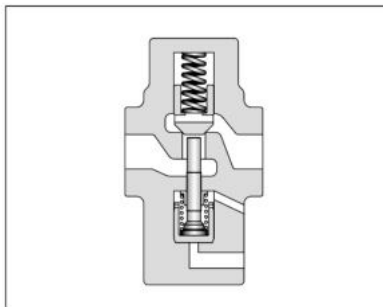
Specifications

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

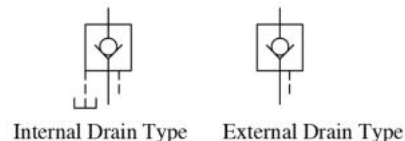


Pilot Operated Check Valves

These check valves allow flow in one direction and prevent flow in the reverse direction, until operated by pilot pressure to allow free reverse flow. The specified cracking pressure is required to open the valve to allow free flow direction.



Graphic Symbols



Specifications

Type of Connection	Model Numbers	Rated Flow * L/min (U.S.GPM)	Max. Operating Pres. MPa (PSI)	Cracking Pres. MPa (PSI)	Approx. Mass kg (lbs.)
Threaded Connection	CPT/CPDT-03-*-50*	40 (10.6)	25 (3630)	0.04 (6)	3.0 (6.6)
	CPT/CPDT-06-*-50*	125 (33)		0.2 (29)	5.5 (12.1)
	CPT/CPDT-10-*-50*	250 (66)		0.35 (50)	9.6 (21.2)
Sub-plate Mounting	CPG/CPDG-03-*-50*	40 (10.6)	25 (3630)	0.04 (6)	3.3 (7.3)
	CPG/CPDG-06-*-50*	125 (33)		0.2 (29)	5.4 (11.9)
	CPG/CPDG-10-*-50*	250 (66)		0.35 (50)	8.5 (18.7)

* Rated flow is the approximate flow rate, when there is a free flow pressure drop of maximum 0.3 MPa (44 PSI), the fluid has a specific gravity of 0.85 and a kinematic viscosity of 20 mm²/s (98 SSU), and the cracking pressure is 0.04 MPa (6 PSI).

Model Number Designation

F-	CP	T	03	-E	-04	-50	*
Special Seals	Series Number	Type of Connection	Valve Size	Drain Connection	Cracking Pres. MPa (PSI)	Design Number	Design Standards
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	CP: Pilot Operated Check Valve	T: Threaded Connection	03	None: Internal Drain	04: 0.04 (6)	50	None: Japanese Std. "JIS" 80: European Design Std. 90: N. American Design Std.
			06			50	
			10			50	
	CPD: Decompression Type Pilot Operated Check Valve	G: Sub-plate Mounting	03	E: External Drain	35: 0.35 (50) 50: 0.5 (70)	50	None: Japanese Std. "JIS" & European Design Std. 90: N. American Design Std.
			06			50	
			10			50	

Mounting Bolts

Socket head cap screws in the table below are included.

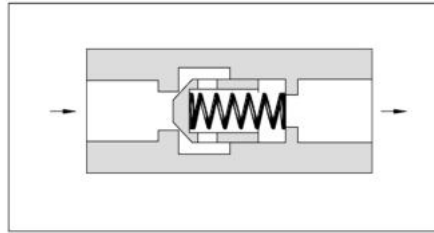
Valve Model Numbers	Socket Head Cap Screw		Qty.
	Japanese Standard "JIS" & European Design Standard	N.American Design Standard	
CP*G-03	M10 × 45 Lg.	3/8-16 UNC × 1-3/4 Lg.	4
CP*G-06	M10 × 50 Lg.	3/8-16 UNC × 2 Lg.	4
CP*G-10	M10 × 55 Lg.	3/8-16 UNC × 2-1/4 Lg.	6

Yuken can offer flanged connection valves described below.
For details, contact us.

Model Numbers	Rated Flow L/min (U.S.GPM)	Max. Operating Pressure MPa (PSI)
CP*F-10-*-50*	250 (66)	25 (3630)
CP*F-16-*-50*	600 (159)	25 (3630)

In-Line Check Valves

These valves allow free flow in one direction and prevent flow in the reverse direction. Cracking pressure specified is the pressure required to open the valve and allow free flow.



Graphic Symbols



Specifications

Model Numbers	Rated Flow* L/min (U.S.GPM)	Max. Operating Pres. MPa (PSI)	Cracking Pres. MPa (PSI)	Approx. Mass kg (lbs.)
CIT-02-*50/5080/5090	16 (4.23)	25 (3630)	0.04 (6) 0.35 (50) 0.5 (70)	0.1 (.22)
CIT-03-*50/5080/5090	30 (7.93)			0.3 (.66)
CIT-06-*50/5080/5090	85 (22.5)			0.8 (1.8)
CIT-10-*50/5080/5090	230 (60.8)			2.3 (5.1)

* Rated flow is the approximate flow rate, when there is a free flow pressure drop of maximum 0.3 MPa (44 PSI), the fluid has a specific gravity of 0.85 and a kinematic viscosity of 20 mm²/s (98 SSU), and the cracking pressure is 0.04 MPa (6 PSI).

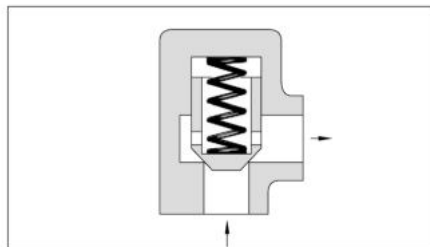
Model Number Designation

CI	T	-03	-04	-50	*
Series Number	Type of Connection	Valve Size	Cracking Pressure MPa (PSI)	Design Number	Design Standards
CI: In-Line Check Valve	T: Threaded Connection	02	04: 0.04 (6) 35: 0.35 (50) 50: 0.5 (70)	50	None: Japanese Std. "JIS" 80: European Design Std. 90: N. American Design Std.
		03		50	
		06		50	
		10		50	

Note: For In-Line Check Valves, standard type (for petroleum base oils) can be used phosphate ester type fluid.

Right Angle Check Valves

These valves allow free flow in one direction and prevent flow in the reverse direction. Cracking pressure specified is the pressure required to open the valve and allow free flow.



Graphic Symbols



Specifications

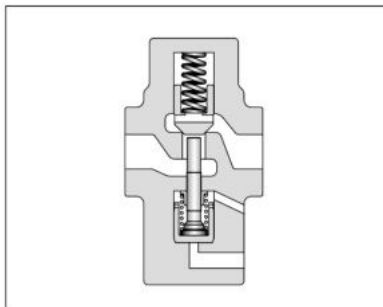
Type of Connection	Model Numbers	Rated Flow* L/min (U.S.GPM)	Max. Operating Pres. MPa (PSI)	Cracking Pres. MPa (PSI)	Approx. Mass kg (lbs.)
Threaded Connection	CRT-03-*50/5080/5090	40 (10.6)	25 (3630)	0.04 (6)	0.9 (2.0)
	CRT-06-*50/5080/5090	125 (33)		0.35 (50)	1.7 (3.7)
	CRT-10-*50/5080/5090	250 (66)		0.5 (70)	5.6 (12.3)
Sub-plate Mounting	CRG-03-*50/5090	40 (10.6)	25 (3630)	0.04 (6)	1.7 (3.7)
	CRG-06-*50/5090	125 (33)		0.35 (50)	2.9 (6.4)
	CRG-10-*50/5090	250 (66)		0.5 (70)	5.5 (12.1)

* Rated flow is the approximate flow rate, when there is a free flow pressure drop of maximum 0.3 MPa (44 PSI), the fluid has a specific gravity of 0.85 and a kinematic viscosity of 20 mm²/s (98 SSU), and the cracking pressure is 0.04 MPa (6 PSI).

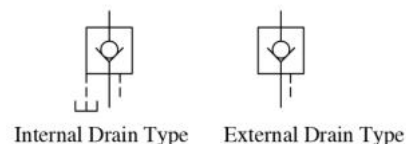


Pilot Operated Check Valves

These check valves allow flow in one direction and prevent flow in the reverse direction, until operated by pilot pressure to allow free reverse flow. The specified cracking pressure is required to open the valve to allow free flow direction.



Graphic Symbols



Specifications

Type of Connection	Model Numbers	Rated Flow * L/min (U.S.GPM)	Max. Operating Pres. MPa (PSI)	Cracking Pres. MPa (PSI)	Approx. Mass kg (lbs.)
Threaded Connection	CPT/CPDT-03-*-50*	40 (10.6)	25 (3630)	0.04 (6)	3.0 (6.6)
	CPT/CPDT-06-*-50*	125 (33)		0.2 (29)	5.5 (12.1)
	CPT/CPDT-10-*-50*	250 (66)		0.35 (50)	9.6 (21.2)
Sub-plate Mounting	CPG/CPDG-03-*-50*	40 (10.6)	25 (3630)	0.04 (6)	3.3 (7.3)
	CPG/CPDG-06-*-50*	125 (33)		0.2 (29)	5.4 (11.9)
	CPG/CPDG-10-*-50*	250 (66)		0.35 (50)	8.5 (18.7)

* Rated flow is the approximate flow rate, when there is a free flow pressure drop of maximum 0.3 MPa (44 PSI), the fluid has a specific gravity of 0.85 and a kinematic viscosity of 20 mm²/s (98 SSU), and the cracking pressure is 0.04 MPa (6 PSI).

Model Number Designation

F-	CP	T	03	-E	-04	-50	*
Special Seals	Series Number	Type of Connection	Valve Size	Drain Connection	Cracking Pres. MPa (PSI)	Design Number	Design Standards
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	CP: Pilot Operated Check Valve	T: Threaded Connection	03	None: Internal Drain	04: 0.04 (6)	50	None: Japanese Std. "JIS" 80: European Design Std. 90: N. American Design Std.
			06			50	
			10			50	
	CPD: Decompression Type Pilot Operated Check Valve	G: Sub-plate Mounting	03	E: External Drain	35: 0.35 (50) 50: 0.5 (70)	50	None: Japanese Std. "JIS" & European Design Std. 90: N. American Design Std.
			06			50	
			10			50	

Mounting Bolts

Socket head cap screws in the table below are included.

Valve Model Numbers	Socket Head Cap Screw		Qty.
	Japanese Standard "JIS" & European Design Standard	N.American Design Standard	
CP*G-03	M10 × 45 Lg.	3/8-16 UNC × 1-3/4 Lg.	4
CP*G-06	M10 × 50 Lg.	3/8-16 UNC × 2 Lg.	4
CP*G-10	M10 × 55 Lg.	3/8-16 UNC × 2-1/4 Lg.	6

Yuken can offer flanged connection valves described below.
For details, contact us.

Model Numbers	Rated Flow L/min (U.S.GPM)	Max. Operating Pressure MPa (PSI)
CP*F-10-*-50*	250 (66)	25 (3630)
CP*F-16-*-50*	600 (159)	25 (3630)

High Pressure, High Flow Rate Modular Valves

■ Features

1. Installation and mounting space can be minimized.
2. No special skill is required for assembly and any addition or alteration of the hydraulic circuit can be made quickly and easily.
3. Problems such as oil-leaks, vibration and noise which may be caused by piping are minimized, increasing the reliability of the hydraulic system.
4. Maintenance and system check-ups can be easily carried out as they are normally installed in stackable units.

■ Specifications

Series	Valve Size	Max. Operating Pressure MPa (PSI)	Max. Flow L/min (U.S.GPM)	Number of Stack ^{★2}
005 Series	—	25 (3630)	15 (3.96)	1 to 4 stacks
01 Series	1/8	31.5 (4570)	35 [60] ^{★1} (9.24 [15.9]) ^{★1}	1 to 5 stacks ^{★3}
03 Series	3/8	25 [31.5] ^{★4} (3630 [4570]) ^{★4}	70 [120] ^{★1} (18.5 [31.7]) ^{★1}	1 to 5 stacks
06 Series	3/4	25 (3630)	500 (132)	
10 Series	1-1/4	25 (3630)	800 (211)	

- ★ 1. The values in parentheses represent the max. flow rates for throttle modular valves (MSP) and throttle check modular valves (MSA/MSB/MSW).
- ★ 2. Solenoid operated directional valve is included in the number of stack.
- ★ 3. Solenoid operated directional valve is included in the number of stack. If the working pressure is above 25 MPa (3630 PSI), the maximum number of layers in a stack is 4 including the solenoid operated directional valve.
- ★ 4. The value range in parentheses represents the tightening torque requirements if the operating pressure is above 25 MPa (3630 PSI).

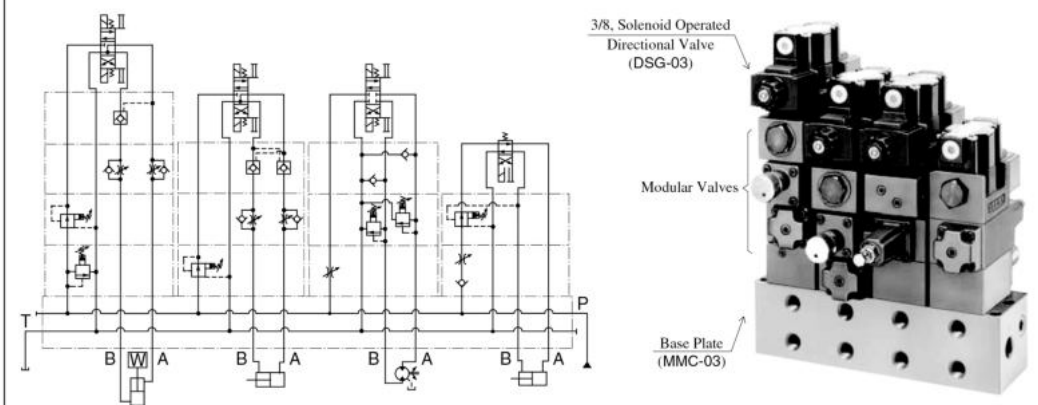
■ Mounting Surface

Mounting surface dimensions conform to ISO 4401 (Hydraulic fluid power four port directional control valves mounting surface) as listed in the table below.

Name of Valve	ISO Mtg. Surface Code No.
01 Series Modular Valve	ISO 4401-AB-03-4-A
03 Series Modular Valve	ISO 4401-AC-05-4-A
06 Series Modular Valve	ISO 4401-AE-08-4-A
10 Series Modular Valve	ISO 4401-AF-10-4-A

■ Stacking Example

● 03 Series



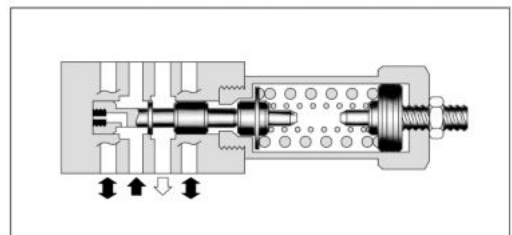
■ Type of Modular Valve

Class	Model Numbers	Graphic Symbols	Class	Model Numbers	Graphic Symbols
Pressure Control Valves	Solenoid Operated Directional Valve (S-)DSG-01-***-70/7090 E-DSG-01-***-D-60/6090 T-DSG-01-***-D24-70/7090 G-DSG-01-***-50/5090		Flow Control Valves	Throttle Valves (for "P-Line") MSP-01-50	
	Relief Valves (for "P-Line") MBP-01-30			Check and Throttle Valves (for "P-Line") MSCP-01-30	
	Relief Valves (for "A-Line") MBA-01-30			Throttle and Check Valves (for "A-Line", Metre-out) MSA-01-X-50	
	Relief Valves (for "B-Line") MBB-01-30			Throttle and Check Valves (for "A-Line", Metre-in) MSA-01-Y-50	
	Reducing Valves (for "P-Line") MRP-01-30/3090			Throttle and Check Valves (for "B-Line", Metre-out) MSB-01-X-50	
	Reducing Valves (for "A-Line") MRA-01-30/3090			Throttle and Check Valves (for "B-Line", Metre-in) MSB-01-Y-50	
	Reducing Valves (for "B-Line") MRB-01-30/3090			Throttle and Check Valves (for "A&B-Lines", Metre-out) MSW-01-X-50	
	Brake Valves MBR-01-30			Throttle and Check Valves (for "A&B-Lines", Metre-in) MSW-01-Y-50	
	Sequence Valves (for "P-Line") MHP-01-30			Throttle and Check Valves (for "A&B-Lines", Metre-out, Metre-in) MSW-01-XY-50	
	Counterbalance Valves (for "A-Line") MHA-01-30		Directional Control Valves	Check Valves (for "P-Line") MCP-01-30	
	Pressure Switch Valves (for "P-Line") MJP-01-30			Check Valves (for "T-Line") MCT-01-30	
	Pressure Switch Valves (for "A-Line") MJA-01-30			Anti-Cavitation Valves MAC-01-30	
	Pressure Switch Valves (for "B-Line") MJB-01-30			Pilot Operated Check Valves (for "A-Line") MPA-01-40/4001	
Flow Control Valves	Flow Control Valves (for "P-Line") MFP-01-10			Pilot Operated Check Valves (for "B-Line") MPB-01-40/4001	
	Flow Control and Check Valves (for "A-Line", Metre-out) MFA-01-X-10			Pilot Operated Check Valves (for "A&B-Lines") MPW-01-40/4001	
	Flow Control and Check Valves (for "A-Line", Metre-in) MFA-01-Y-10		Modular Plates and Mounting Bolts	End Plates (Blocking plates) MDC-01-A-30	
	Flow Control and Check Valves (for "B-Line", Metre-out) MFB-01-X-10			End Plates (Bypass plates) MDC-01-B-30	
	Flow Control and Check Valves (for "B-Line", Metre-in) MFB-01-Y-10			Connecting Plates (for "P&A-Lines") MDS-01-PA-30/3090	
	Flow Control and Check Valves (for "A&B-Lines", Metre-out) MFW-01-X-10			Connecting Plates (for "P&B-Lines") MDS-01-PB-30/3090	
	Flow Control and Check Valves (for "A&B-Lines", Metre-in) MFW-01-Y-10			Connecting Plates (for "A&T-Lines") MDS-01-AT-30/3090	
	Temperature Compensated Throttle and Check Valves (for "A-Line", Metre-out) MSTA-01-X-10			Base Plates MMC-01-40/4080/4090	
	Temperature Compensated Throttle and Check Valves (for "B-Line", Metre-out) MSTB-01-X-10			Bolt Kits MBK-01-30/3090	
	Temperature Compensated Throttle and Check Valves (for "A&B-Lines", Metre-out) MSTW-01-X-10				

Relief Modular Valves

Specifications

Model Numbers	Max. Operating Pressure MPa (PSI)	Max. Flow L/min (U.S.GPM)
MBP-01-*-30 MBA-01-*-30 MBB-01-*-30	21 (3050)	35 (9.25)



Model Number Designation

F-	MBP	-01	-C	-30	*
Special Seals	Series Number	Valve Size	Pres. Adj. Range MPa (PSI)	Design Number	Design Standard
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	MBP: Relief Valve for P-Line MBA: Relief Valve for A-Line MBB: Relief Valve for B-Line	01	C: *-14 *1 (*2030) H: 7-21 (1020-3050)	30	Refer to ★ 2

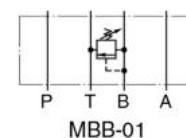
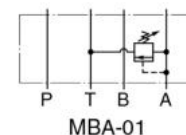
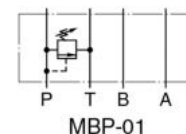
★ 1. See the "Minimum Adjustment Pressure" of the next page for the item marked *.

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

Instructions

- The minimum adjustment pressure equals the value obtained from the minimum adjustment pressure characteristics plus the tank line back pressure of the next page. This back pressure should include the value of the T-line pressure drop characteristics of the valves stacked to the base plate side of the modular valve.
- To make pressure adjustment, loosen the lock nut and turn the pressure adjustment screw clockwise or anti-clockwise. For an increase of pressure, turn the screw clockwise. Be sure to re-tighten the lock nut firmly after making adjustment to the pressure.
- In case of a small flow, the setting pressure may become unstable. To avoid this, refer to the minimum flow characteristic curve of the next page and use the valve within a range as shown with .

Graphic Symbols



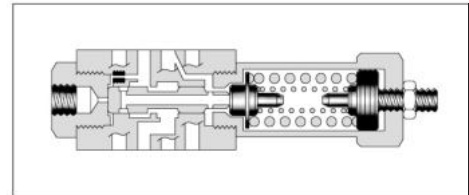
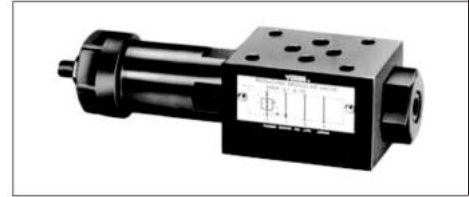
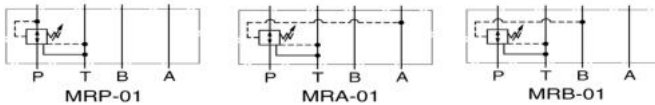
Reducing Modular Valves

Specifications

Model Numbers	Max. Operating Pressure MPa(PSI)	Max. Flow L/min (U.S.GPM)
MRP-01-*-30/3090 MRA-01-*-30/3090 MRB-01-*-30/3090	31.5 (4570)	35 (9.25) *

★ If the pressure is set below 1.9 MPa (280 PSI), the maximum flow is limited.
See the minimum adjustment pressure vs. maximum flow characteristics
and during use, stay within the shaded zone on the graph.

Graphic Symbols

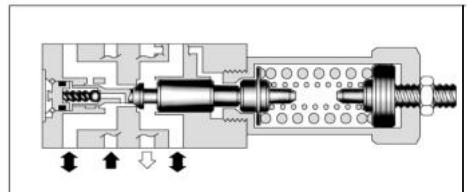
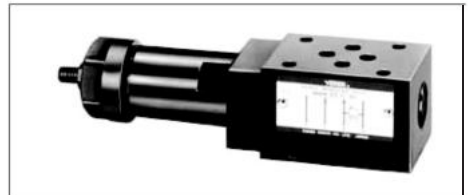
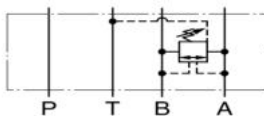


Brake Modular Valves

Specifications

Model Numbers	Max. Operating Pressure MPa (PSI)	Max. Flow L/min (U.S.GPM)
MBR-01-*-30	25 (3630)	35 (9.25)

Graphic Symbols

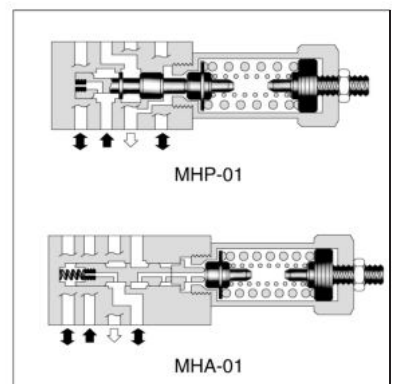
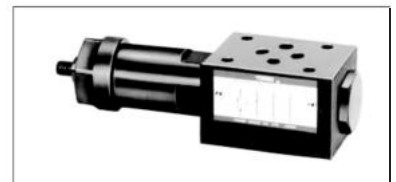
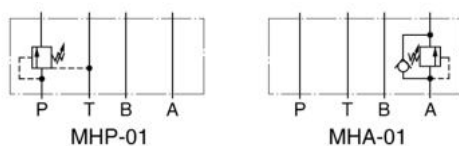


Sequence Modular Valves/Counterbalance Modular Valves

Specifications

Model Numbers	Max. Operating Pressure MPa (PSI)	Max. Flow L/min (U.S.GPM)	Free Flow L/min (U.S.GPM)
MHP-01-*-30	25 (3630)	35 (9.25)	—
MHA-01-*-30			35 (9.25)

Graphic Symbols

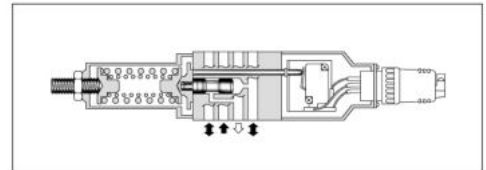
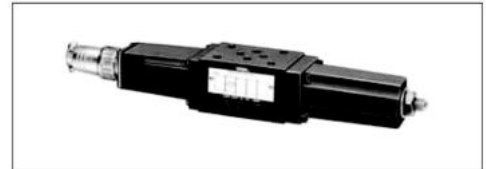


MODULAR VALVES

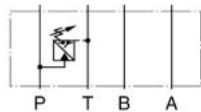
Pressure Switch Modular Valves

Specifications

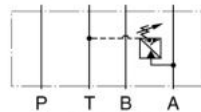
Model Numbers	Max. Operating Pressure MPa(Pa)	Max. Flow L/min (U.S.GPM)
MJ*-01-M-*-10	31.5 (4570)	35 (9.25)
MJ*-01-J-35-10	10 (1450)	
MJ*-01-J-100-10	10 (1450)	
MJ*-01-J-200-10	20 (2900)	
MJ*-01-J-350-10	35 (5080)	



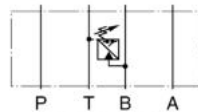
Graphic Symbols



MJP-01-M



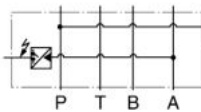
MJA-01-M



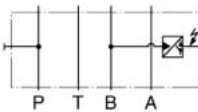
MJB-01-M



MJP-01-J



MJA-01-J

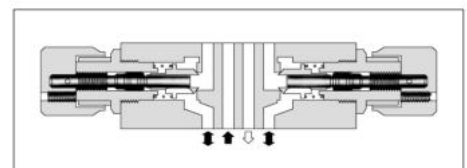


MJB-01-J

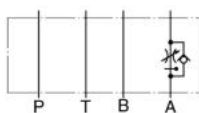
Temperature Compensated Throttle and Check Modular Valves

Specifications

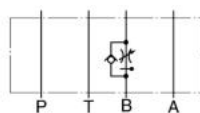
Model Numbers	Max. Operating Pressure MPa (PSI)	Max. Differential Pressure MPa (PSI)	Max. Metred Flow L/min (U.S.GPM)	Min. Metred Flow L/min (U.S.GPM)	Max. Free Flow L/min (U.S.GPM)
MSTA-01-X-10 MSTB-01-X-10 MSTW-01-X-10	31.5 (4570)	14 (2030)	35 (9.25)	0.5 (.13)	35 (9.25)



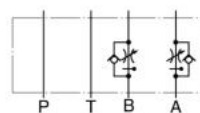
Graphic Symbols



MSTA-01-X



MSTB-01-X



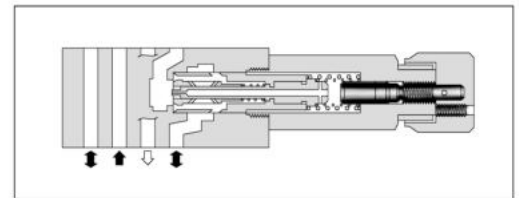
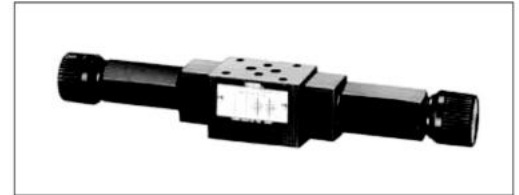
MSTW-01-X

MODULAR VALVES

Pressure and Temperature Compensated Flow Control (and Check) Modular Valves

Specifications

Model Numbers	Max. Operating Pressure MPa (PSI)	Max. Metred Flow L/min (U.S.GPM)	Max. Free Flow L/min (U.S.GPM)
MFP-01-10	16 (2320)	35 (9.25)	—
MFA-01-*10			35 (9.25)
MFB-01-*10 MFW-01-*10			

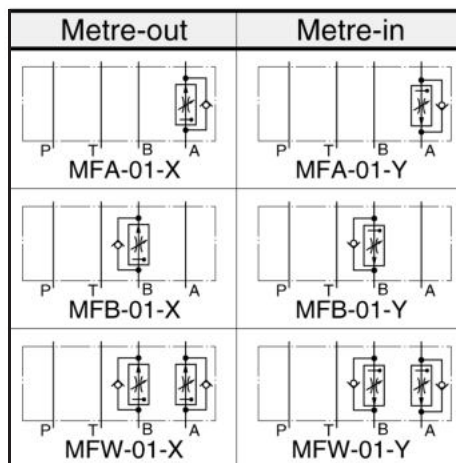
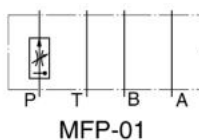


Model Number Designation

F-	MFA	-01	-X	-10	
Special Seals	Series Number	Valve Size	Direction of Flow	Design Number	Design Standard
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	MFP : Flow Control Valve for P-Line	01	—	10	Refer to ★
	MFA : Flow Control and Check Valve for A-Line MFB : Flow Control and Check Valve for B-Line MFW : Flow Control and Check Valve for A&B-Lines		X : Metre-out Y : Metre-in	10	

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

Graphic Symbols



Throttle Modular Valves

Specifications

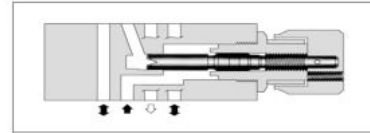
Model Number	Max. Operating Pressure MPa (PSI)	Max. Flow L/min (U.S.GPM)
MSP-01-50	31.5 (4570)	60 (15.9) *

★ At the low differential pressure, maximum flow is limited. See "Pressure Drop at Throttle Fully Open".

Model Number Designation

F-	MSCP	-01	-30	*
Special Seals	Series Number	Valve Size	Design Number	Design Standard
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	MSCP : Check and Throttle Valve for P-Line	01	30	Refer to ★

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



Graphic Symbols



Check and Throttle Modular Valves

Specifications

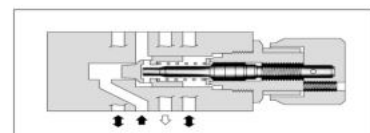
Model Number	Max. Operating Pressure MPa (PSI)	Max. Flow L/min (U.S.GPM)
MSCP-01-30	31.5 (4570)	35 (9.25) *

★ At the low differential pressure, maximum flow is limited. See "Pressure Drop at Throttle Fully Open".

Model Number Designation

F-	MSCP	-01	-30	*
Special Seals	Series Number	Valve Size	Design Number	Design Standard
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	MSCP : Check and Throttle Valve for P-Line	01	30	Refer to ★

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



Graphic Symbols



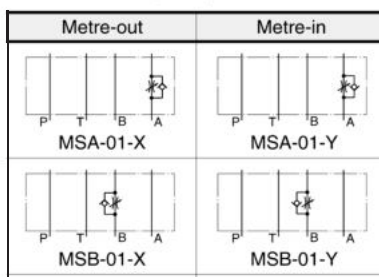
Throttle and Check Modular Valves

Specifications

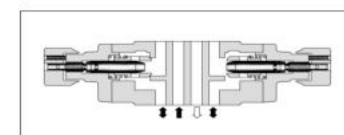
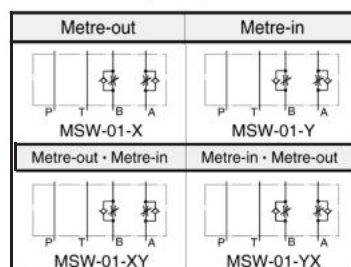
Model Numbers	Max. Operating Pressure MPa (PSI)	Max. Flow L/min (U.S.GPM)
MSA-01-**-50 MSB-01-**-50 MSW-01-**-50	31.5 (4570)	60 (15.9) *

★ At the low differential pressure, maximum flow is limited. See "Pressure Drop at Throttle Fully Open" of the next page.

Graphic Symbols



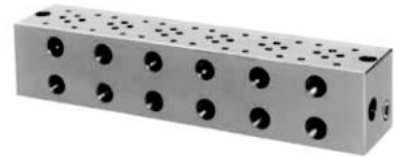
Graphic Symbols



Base Plates For Modular Valves

Specifications

Max. Operating Pressure ----- 25 MPa (3630 PSI)

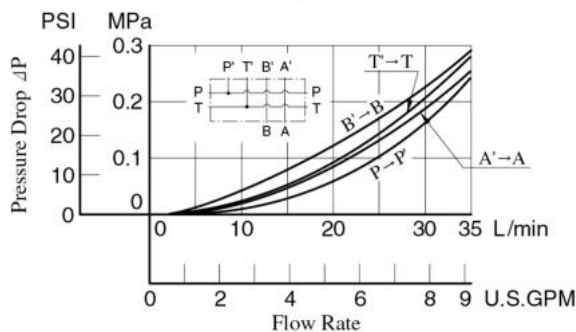


Model Number Designation

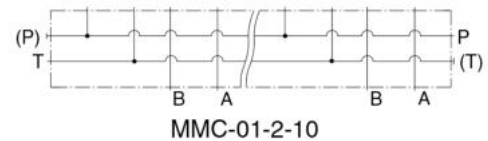
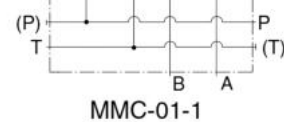
MMC	-01	-6	-40	*
Series Number	Plate Size	Number of Stations		Design Standard
MMC : Base Plate	01	1: 1 Station	6: 6 Stations	None : Japanese Standard "JIS" 80 : European Design Standard 90 : N.American Design Standard
		2: 2 Stations	7: 7 Stations	
		3: 3 Stations	8: 8 Stations	
		4: 4 Stations	9: 9 Stations	
		5: 5 Stations	10: 10 Stations	
			40	

Pressure Drop

Hydraulic Fluid: Viscosity 35 mm²/s (164 SSU), Specific Gravity 0.850



Graphic Symbols



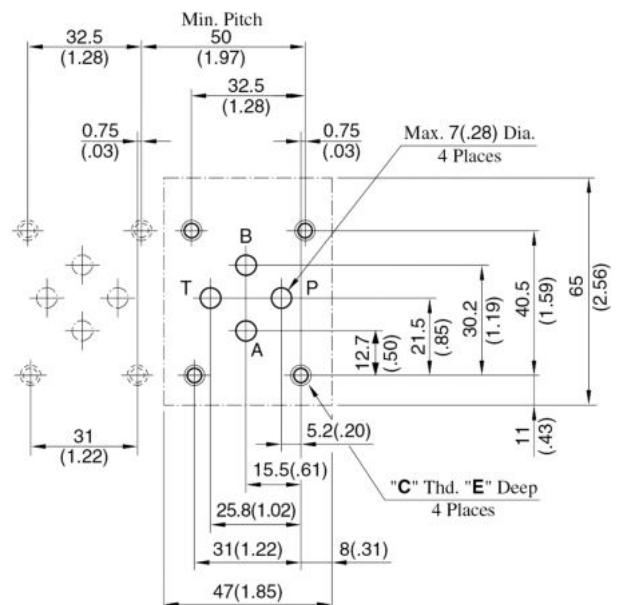
Instructions

- **Port Used:** Base plate has three (two, in case of 1 station type) **pressure port "P"**s and four **tank port "T"**s. Any one of these ports or two or more ports may be used. However, please note that the ports marked with (P) or (T) in the drawing are normally plugged. Remove the plugs when using such ports. Make sure that ports that are not currently used are properly plugged.

Interface Mounting Surface Dimensions for 1/8 Modular Valve

When standard base plates (MMC-01) are not used, the mounting surface described on right must be prepared. The mounting surface should have a good machined finish.

Design Std.	"C" Thd.	E
Japanese Standard "JIS" and European Design Standard	M5	10 (.39)
N.American Design Standard	No. 10-24 UNC	12 (.47)



DIMENSIONS IN MILLIMETRES (INCHES)

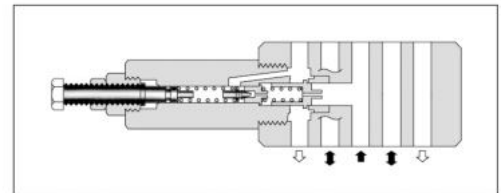
■ Type of Modular Valve

Class	Model Numbers	Graphic Symbols	Class	Model Numbers	Graphic Symbols
	Solenoid Operated Directional Valve (S-)DSG-03-***-50/5090 E-DSG-03-***-D*50/5090 T-DSG-03-***-D24*50/5090 G-DSG-03-***-50/5090				
Pressure Control Valves	Relief Valves (for "P-Line") MBP-03-**-30		Flow Control Valves	Temperature Compensated Throttle and Check Valves (for "A&B-Lines", Metre-out) MSTW-03-X-20	
	Relief Valves (for "A-Line") MBA-03-**-30			Throttle Valves (for "P-Line") MSP-03-30	
	Relief Valves (for "B-Line") MBB-03-**-30			Check and Throttle Valves (for "P-Line") MSCP-03-20	
	Relief Valves (for "A&B-Lines") MBW-03-**-30			Throttle and Check Valves (for "A-Line", Metre-out) MSA-03-X-40	
	Reducing Valves (for "P-Line") MRP-03-**-30/3090			Throttle and Check Valves (for "A-Line", Metre-in) MSA-03-Y-40	
	Reducing Valves (for "A-Line") MRA-03-**-30/3090			Throttle and Check Valves (for "B-Line", Metre-out) MSB-03-X-40	
	Reducing Valves (for "B-Line") MRB-03-**-30/3090			Throttle and Check Valves (for "B-Line", Metre-in) MSB-03-Y-40	
	Reducing Valves for Low Pressure Setting (for "P-Line") MRLP-03-10/1090			Throttle and Check Valves (for "A&B-Lines", Metre-out) MSW-03-X-40	
	Reducing Valves for Low Pressure Setting (for "A-Line") MRLA-03-10/1090			Throttle and Check Valves (for "A&B-Lines", Metre-in) MSW-03-Y-40	
	Reducing Valves for Low Pressure Setting (for "B-Line") MRLB-03-10/1090		Directional Control Valves	Check Valves (for "P-Line") MCP-03-**-10	
Flow Control Valves	Sequence Valves (for "P-Line") MHP-03-**-20			Check Valves (for "A-Line") MCA-03-**-20	
	Counterbalance Valves (for "A-Line") MHA-03-**-20			Check Valves (for "B-Line") MCB-03-**-20	
	Counterbalance Valves (for "B-Line") MHB-03-**-20			Check Valves (for "T-Line") MCT-03-**-10	
	Flow Control Valves (for "P-Line") MFP-03-11			Check Valves (for "P&T-Lines") MCPT-03-P*-T*-10	
	Flow Control and Check Valves (for "A-Line", Metre-out) MFA-03-X-11			Anti-Cavitation Valves MAC-03-10	
	Flow Control and Check Valves (for "A-Line", Metre-in) MFA-03-Y-11			Pilot Operated Check Valves (for "A-Line") MPA-03-**-20/2001	
	Flow Control and Check Valves (for "B-Line", Metre-out) MFB-03-X-11			Pilot Operated Check Valves (for "B-Line") MPB-03-**-20/2001	
	Flow Control and Check Valves (for "B-Line", Metre-in) MFB-03-Y-11			Pilot Operated Check Valves (for "A&B-Lines") MPW-03-**-20/2001	
	Flow Control and Check Valves (for "A&B-Lines", Metre-out) MFW-03-X-11		Modular Plates and Mounting Bolts	End Plates (Blocking Plates) MDC-03-A-10	
	Flow Control and Check Valves (for "A&B-Lines", Metre-in) MFW-03-Y-11			End Plates (Bypass Plates) MDC-03-B-10	
	Temperature Compensated Throttle and Check Valves (for "A-Line", Metre-out) MSTA-03-X-20			Connecting Plates MDS-03-10/1090	
	Temperature Compensated Throttle and Check Valves (for "B-Line", Metre-out) MSTB-03-X-20			Base Plates MMC-03-T*-21/2180/2190	
				Bolt Kits MBK-03-**-10/1090	

Relief Modular Valves

Specifications

Model Numbers	Max. Operating Pressure MPa (PSI)	Max. Flow L/min (U.S.GPM)
MBP-03-* -30 MBA-03-* -30 MBB-03-* -30 MBW-03-* -30	31.5 (4570)	70 (18.5)



Model Number Designation

F-	MBA	-03	-B	-30	*
Special Seals	Series Number	Valve Size	Pres. Adj. Range MPa (PSI)	Design Number	Design Standard
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	MBP : Relief Valve for P-Line MBA : Relief Valve for A-Line MBB : Relief Valve for B-Line MBW : Relief Valve for A&B-Lines	03	B : *-7 *1 (*-1020) H : 3.5-31.5 (510-4570)	30	Refer to ★2

★ 1. See the "Minimum Adjustment Pressure" of the next page for the item marked *.

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

Instructions

- The minimum adjustment pressure equals the value obtained from the minimum adjustment pressure characteristics plus the tank line back pressure of the next page. This back pressure should include the value of the T-line pressure drop characteristics of the valves stacked to the base plate side of the modular valve.
- To make pressure adjustment, loosen the lock nut and turn the pressure adjustment screw clockwise or anti-clockwise. For an increase of pressure, turn the screw clockwise. Be sure to re-tighten the lock nut firmly after making adjustment to the pressure.
- In case of a small flow, the setting pressure may become unstable. To avoid this, refer to the minimum flow characteristic curve of the next page and use the valve within a range as shown with.

Model Numbers	Graphic Symbols	Detailed Graphic Symbols
MBP-03		
MBA-03		
MBB-03		
MBW-03		

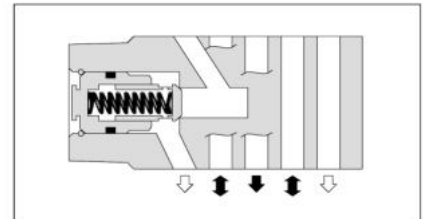
MODULAR VALVES

Check Modular Valves

Specifications

Model Numbers	Max. Operating Pressure MPa (PSI)	Max. Flow L/min (U.S.GPM)
MCP-03-**-10 MCA-03-**-20 MCB-03-**-20 MCT-03-**-10	25 (3630)	70 (18.5)

Model No.	Graphic Symbols	Detailed Graphic Symbols
MCP-03		
MCA-03		
MCB-03		
MCT-03		

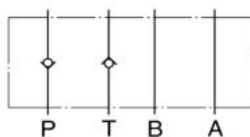


Check Modular Valves For "P&T" Lines

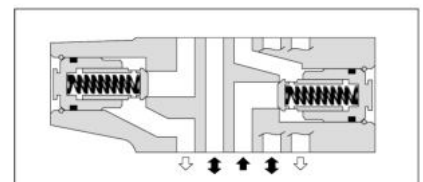
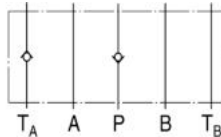
Specifications

Model Numbers	Max. Operating Pressure MPa (PSI)	Max. Flow L/min (U.S.GPM)
MCPT-03-P*-T*-10	25 (3630)	70 (18.5)

Graphic Symbols



Graphic Symbols



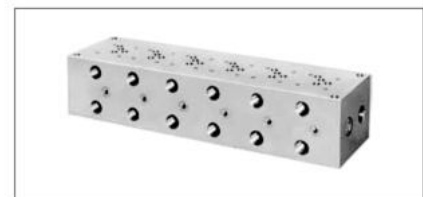
Base Plates For Modular Valves

Specifications

Max. Operating Pressure ----- 25 MPa (3630 PSI)

Model Number Designation

MMC	-03	-T	-6	-21	*
Series Number	Plate Size	Type of Connection	Number of Stations	Design Number	Design Standard
MMC : Base Plate	03	T : Threaded Connection	1: 1 Station 2: 2 Stations 3: 3 Stations 4: 4 Stations 5: 5 Stations 6: 6 Stations 7: 7 Stations	21	None: Japanese Standard "JIS" 80: European Design Standard 90: N.American Design Standard



Logic Valves

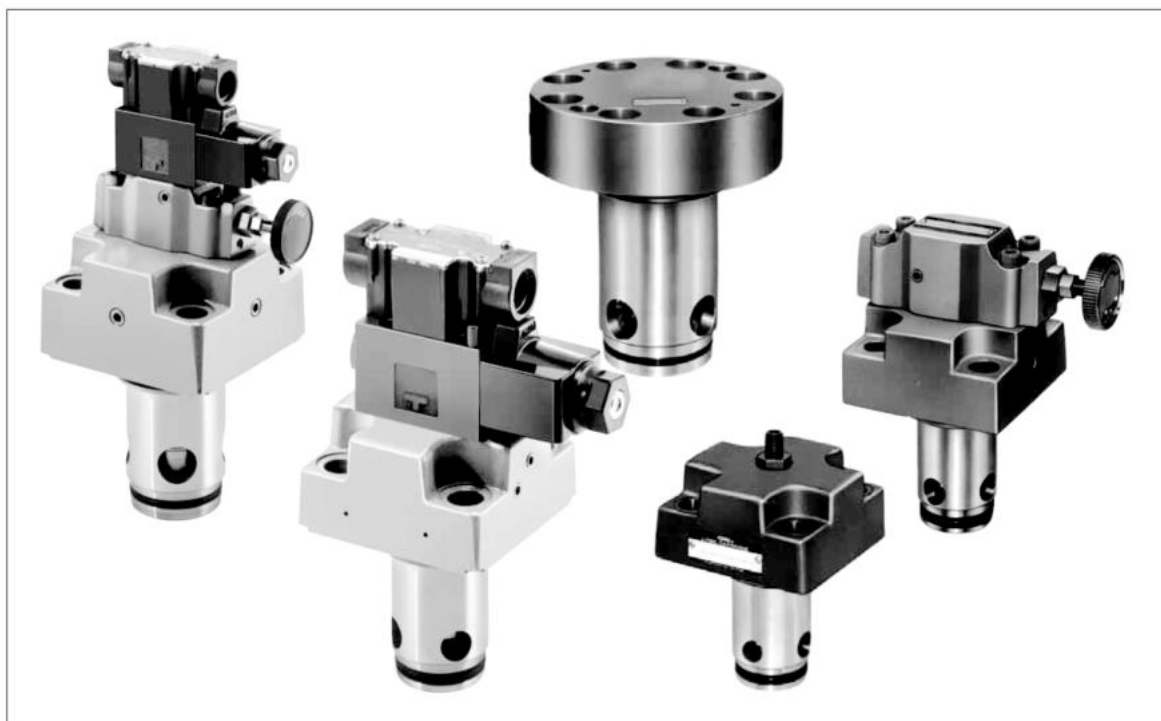
Yuken Logic Valves comprise cartridge typed elements and covers with pilot passages. Various types may be combined for direction, flow rate and pressure control.

Yuken Logic Valves can be incorporated in manifold blocks to form optimum integrated hydraulic circuits and compact hydraulic power units. Being a poppet type, the elements permit high-pressure, high flow rates, high speed and shockless shifting with low pressure drop.

Typical applications include steel mill machines, injection moulding machines, machine tools and so on. In addition, Yuken Logic Valves cavity specifications conform to ISO standards.

Features

- Multifunction performance in terms of direction, flow and pressure can be obtained by combining elements and covers.
- Poppet-type elements virtually eliminate internal leakage and hydraulic locking. Because there are no overlaps, response times are very high, permitting high-speed shifting.
- For high pressure, large capacity systems, optimum performance is achieved with low pressure losses.
- Since the logic valves are directly incorporated in cavities provided in blocks, the system is free from problems related to piping such as oil leakage, vibration and noise, and higher reliability is achieved.
- Multi-function logic valves permit compact integrated hydraulic systems which reduce manifold dimensions and mass and achieve lower cost conventional types.



PROPORTIONAL ELECTRO-HYDRAULIC CONTROLS

■ EH Series-Hybrid Components



■ E Series



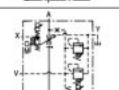
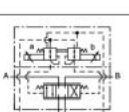
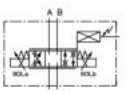
EH Series-Hybrid Components

Proportional Electro-Hydraulic Controls

Types	Graphic Symbols	Max. Operating Pressure MPa (PSI)	Maximum Flow													
			U.S.GPM								L/min					
			.5	1	2	3	5	10	20	30	50	100	200	300	500	1000
Pilot Relief Valves		24.5 (3550)	EHDG 01													
Pressure Control Valves		SB1110: 24.5(3550) SB1190: 7(1020)														
Relief Valves		24.5 (3550)														
Relieving and Reducing Valves		24.5 (3550)														
Flow Control (and Check) Valves		03: 20.6 (2990) 06: 24.5 (3550)														
Flow Control and Relief Valves		24.5 (3550)														
High Flow Series Flow Control and Relief Valves		24.5 (3550)														
Directional and Flow Control Valves		24.5 (3550)														
High Responses Type Directional and Flow Control Valves		15.7 (2280)														

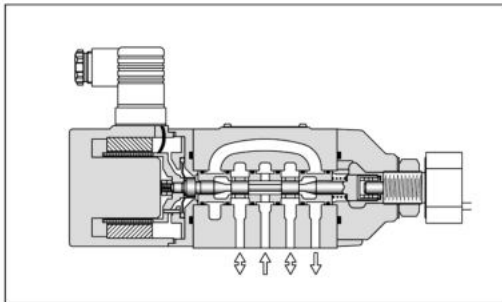
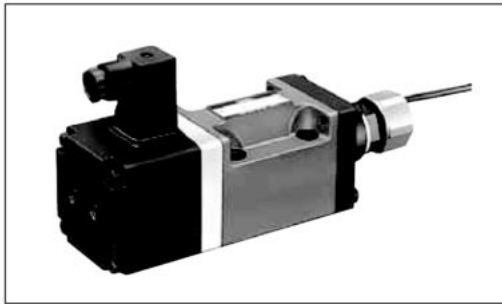
Consult Yuken when detailed material such as dimensions figures is required.

E Series Proportional Electro-Hydraulic Controls

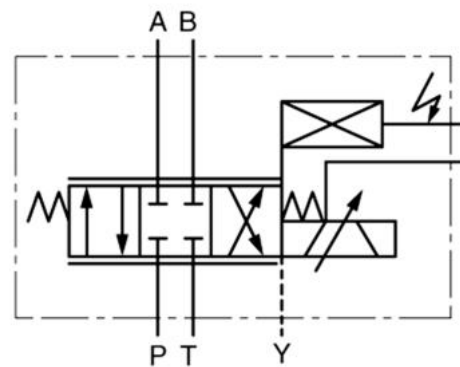
Types	Graphic Symbols	Max. Operating Pressure MPa (PSI)	Maximum Flow													
			U.S.GPM								L/min					
			.5	1	5	10	50	100	200	300	500	1000				
Pilot Relief Valves		24.5 (3550)	EDG 01													
Relief Valves		24.5 (3550)			EBG 03				06	10						
Relieving and Reducing Valves		24.5 (3550)			ERBG 06				10							
40 Ω Series Flow Control (and Check) Valves		20.6 (3000)	EFG EFCG 02				03		06	10						
10 Ω Series Flow Control (and Check) Valves		03: 20.6 (3000) 06: 24.5 (3550)	EFG EFCG 03						06							
40 Ω - 10 Ω Series Flow Control and Relief Valves		24.5 (3550)	EFBG 03						06	10						
10 Ω - 10 Ω Series Flow Control and Relief Valves		24.5 (3550)	EFBG 03						06	10						
High Flow Series Flow Control and Relief Valves		24.5 (3550)	EFBG 03						06	10						
Shockless Type Directional and Flow Control Valves		25 (3630)	EDFG 01													
Directional and Flow Control Valves		25 (3630)	EDFHG 03						04	06						
High Responses Type Directional and Flow Control Valves		01/03: 31.5 (4570) 04/06: 35 (5080)	ELDFG 01 03						ELDFHG 04	06						

SERVO VALVES

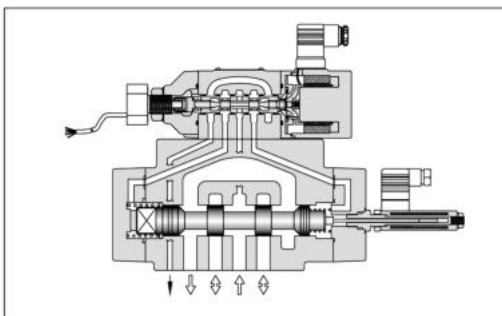
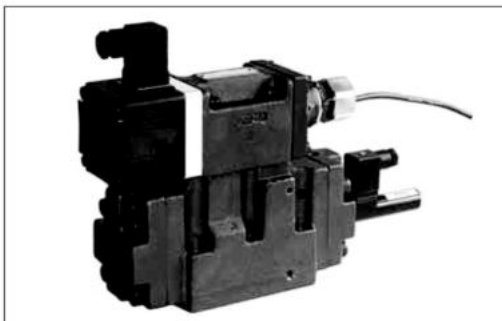
Direct Type High Speed Linear Servo Valves



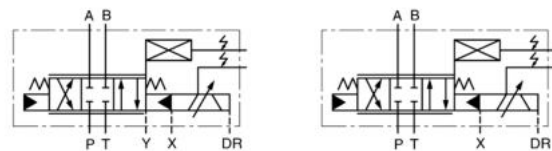
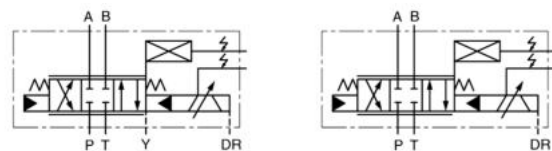
Graphic Symbol



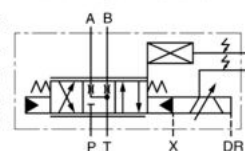
Two Stage Type High Speed Linear Servo Valves



Graphic Symbol



Note) The symbols above indicate the spool types "2" and "2P". The graphic symbol of the spool type "40" is shown on the right (external pilot/ internal drain type).



Linear Servo Amplifier



SERVO VALVES

OBE (On-Board Electronics) Type Linear Servo Valves

- High accurate, simple and convenient — Ideal on-board electronics type linear servo valves

Convenient

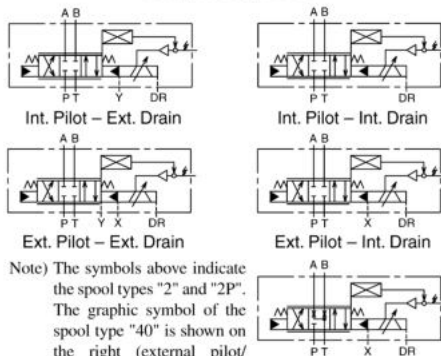
Fault diagnosis is easy to conduct with the alarm indication when the command signal and the spool position differ due to abnormality in the system.

Colour	Description of Alarm Indicator
Green	Indication of power supply (Normal operation)
Red	Deviation alarm for the pilot valve
Yellow	Deviation alarm for the main valve

High Accuracy

Closed loop control by the combination of the position sensors for the pilot valve and the main valve in the compact amplifiers ensures excellent linearity, hysteresis and stability on control.

Graphic Symbols



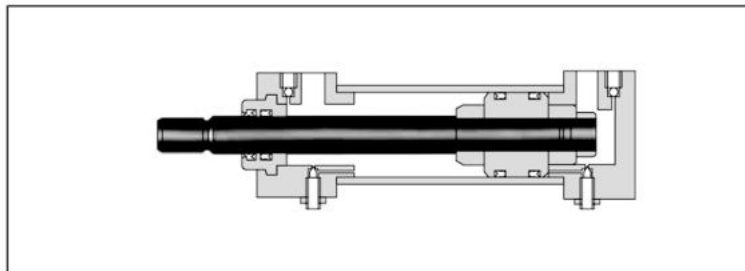
Simple

Highly accurate hydraulic control can be obtained only by supplying 24 V DC power and inputting a command signal.

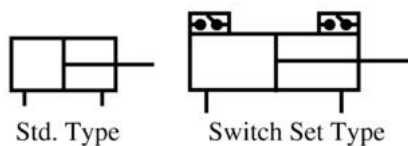


ACTUATORS

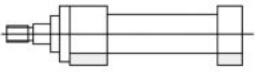
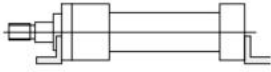
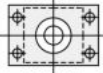
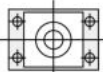
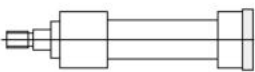
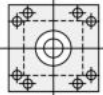
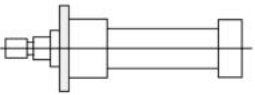
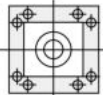
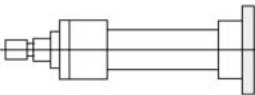
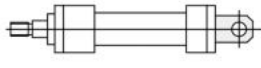
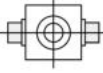
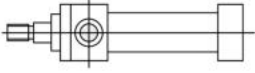
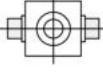
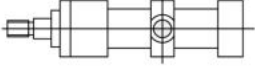
“ CJT ” Series Hydraulic Cylinders



Graphic Symbols



Mounting

Symbol	Name	Illustration of Mounting Type		CJT35 CJT35L	CJT70 CJT70L	CJT140 CJT140L	CJT210
LA	Foot Mounting Side Lugs			☐	☐	☐	☐
LB	Foot Mounting Side End Angles			☐	☐	☐	
FA	Rod Rectangular Flange			☐	☐		☐
FE					☐	☐	
FY					☐	☐	
FB	Head Rectangular Flange			☐	☐		☐
FF					☐	☐	
FC	Rod Square Flange				☐	☐	
FD	Head Square Flange				☐	☐	
CA	Cap Detachable Eye			☐	☐	☐	☐
CB	Cap Detachable Clevis			☐	☐	☐	
TA	Rod Trunnion			☐	☐	☐	
TC	Intermediate Trunnion			☐	☐	☐	☐
SD	Basic Type			☐	☐	☐	☐

● The mark ☐ in above chart show selectable Mounting Types.

Standard Hydraulic Power Units Power Packages

Energy-Saving Hydraulic Units and Controllers

Energy-Saving Control System for
Hydraulic Units
(Energy-Saving Controller)



Equipped with the variable
displacement vane pump
<YM-e Pack>

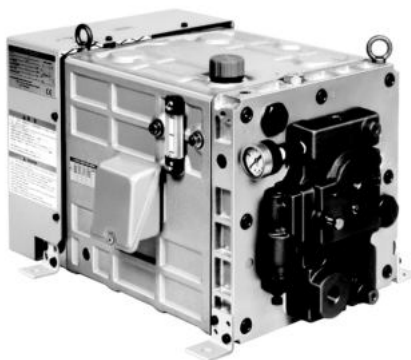


Equipped with the variable
displacement piston pump
<YA-e Pack>



Standard Hydraulic Power Units

Space-Saving & Low Noise
<YF Pack>



Low Noise & Small Type
<YP Pack>



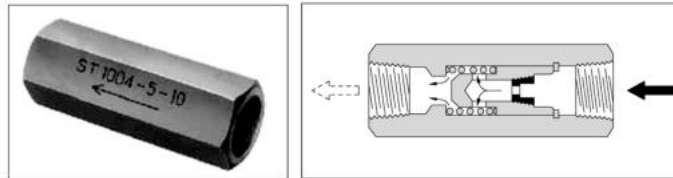
AC Servo Motor Driven Hydraulic Pump Control System

Intelligent Hydraulic
Servo Drive Pack



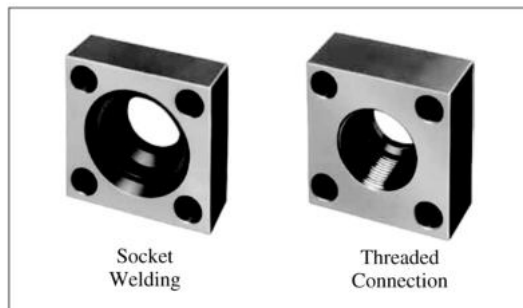
ACCESSORIES & OTHERS

■ Air Bleed Valves

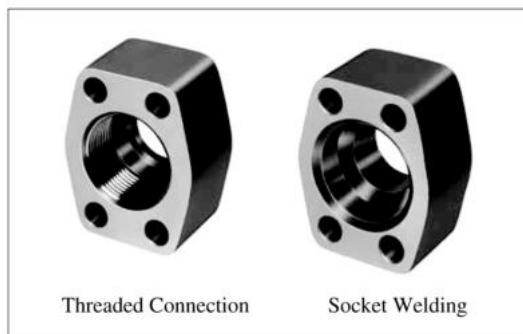


ACCESSORIES

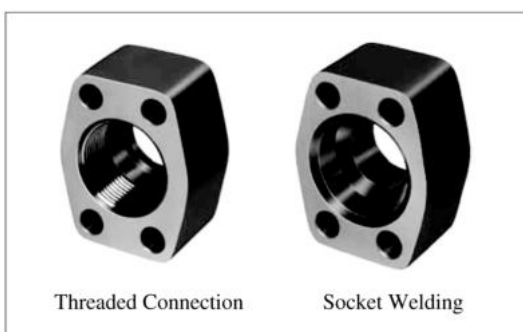
■ " F3 " Series Pipe Flange Kits



■ " F5 " Series Pipe Flange Kits



■ " F6 " Series Pipe Flange Kits



Note



Terminal Group

TMS&S



บริษัท เทอร์มินอลซีล แอนด์ เซอร์วิส จำกัด
TERMINAL SEAL AND SERVICE CO., LTD.

TMW



บริษัท เทอร์มินอล แมชชีนเวิร์ค จำกัด
TERMINAL MACHINE WORK CO., LTD.

T.M.G.



บริษัท ที.เอ็ม.จี. รับเบอร์พาร์ท จำกัด
T.M.G. RUBBERPART CO., LTD.



TERMINAL GROUP consists of three companies;

Terminal seal and service Co., Ltd. ,
Terminal machinework Co.,Ltd.
and T.M.G. Rubber Parts Co., Ltd.
Terminal Group was founded in 1998.

- ✓ Produce customized and specialized seals ID 4-2000mm. by modern CNC lathing machine with the latest technology and high quality semi-finished materials from Europe.
- ✓ Import and distribute world-leading brands of seals, O-rings, O-Ring Kits, O-Ring equipments, seals installation tools, mechanical seals, seal kits for excavators, cylinder seal kits , worldwide with Japanese, European, and American standard.
- ✓ Build and repair custom-made industrial machines, power units, control units, hydraulic and pneumatic cylinders, X-lift and etc. , according to customer 's requirements with leading technology and excellent engineers to take care of every process of the production.
- ✓ Import and distribute hydraulic and pneumatic equipments, hoses, fittings, machinery parts in several world-leading brands from Japan, Europe, America, Asia-Pacific.
- ✓ We have consulting and overhaul services for systems and machinery maintenance, including maintenance for several machines made by other than Terminal Group.
- ✓ Produce varied forms of made-to-order products, molding parts with plastic and rubber materials by press and injection production process.

เทอร์มินอลกรุ๊ป ก่อตั้งเมื่อปี 2541 ประกอบด้วย บริษัท เทอร์มินอลซีล แอนด์ เซอร์วิส จำกัด บริษัท เทอร์มินอล แมชชีนเวิร์ค จำกัด และ บริษัท ที.เอ็ม.จี. รับเบอร์พาร์ท จำกัด ดำเนินธุรกิจหลักดังนี้

- ✓ ผู้ผลิตซีลด้านสั่งทำ ซีลสเปเชียลขนาด ID 4-2000mm ด้วยเครื่อง CNC ผลิตซีล ซึ่งเป็นเทคโนโลยีใหม่ล่าสุด และวัตถุดิบถึงสำเร็จรูปคุณภาพสูงจากยุโรป
- ✓ ผู้นำเข้าและจำหน่ายซีล โอริง โอริงคิตส์ อุปกรณ์เกี่ยวกับโอริง อุปกรณ์เกี่ยวกับซีล แมคคานิคอลซีล ซีลชุดสำหรับรถขุด-รถตัก ซีลชุดสำหรับกระบอกสูบ หลากหลายแบรนด์ชั้นนำจากทั่วโลก มาตราฐาน ญี่ปุ่น ยุโรปและอเมริกา
- ✓ ผู้สร้างเครื่องจักรอุตสาหกรรม ชุดต้นกำลัง (พาวเวอร์ยูนิต) ชุดคอนโทรล กระบอกไฮดรอลิก-นิวแมติก เอ็กซัลฟิท ฯลฯ ตามความต้องการของลูกค้า รวมทั้งรับซ่อม เราทำการผลิตด้วยเทคโนโลยีชั้นนำและทีมวิศวกรชั้นแนวหน้า ที่จะคอยดูแลอย่างใกล้ชิดทุกขั้นตอนการผลิต
- ✓ ผู้นำเข้าและจำหน่าย อุปกรณ์ไฮดรอลิก-นิวแมติก สายไฮดรอลิก-สายลม ฟิตติงส์ อุปกรณ์เครื่องจักรกลโรงงาน หลากหลายแบรนด์ชั้นนำระดับโลก ทั้งจากญี่ปุ่น ยุโรป อเมริกา เอเชีย-แปซิฟิก
- ✓ บริการให้คำปรึกษาระบบ เปลี่ยนอุปกรณ์ และซ่อมบำรุงรักษา เครื่องจักรไม่ว่าเครื่องจักรนั้นจะผลิตจากที่ใดก็ตาม
- ✓ ผู้ผลิตและให้บริการชิ้นงานสั่งทำ งานโมลด์ งานพลาสติก งานยาง รูปแบบต่างๆตามความต้องการของลูกค้า โดยใช้กรรมวิธีการผลิตแบบเพรสและอินเจคชั่น



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