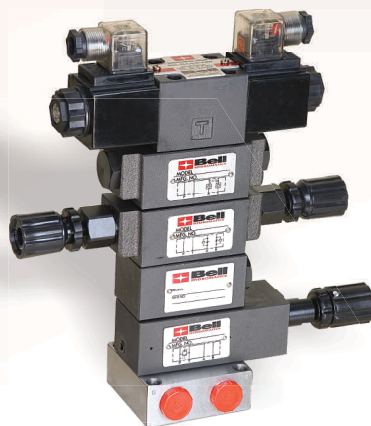
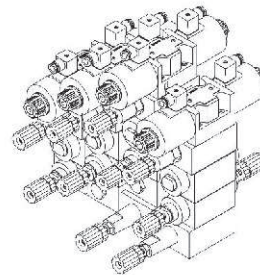


Modular valves

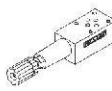
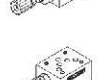


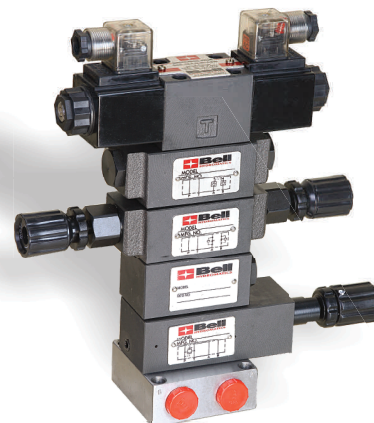
The diagram illustrates a 4/3-way directional control valve with the following components and connections:

- Ports:** P (Pressure), T (Tank/Return), B (Work Port 1), and A (Work Port 2).
- Valve Core:** A 4/3-way valve with a center position. The center position is shown with a dashed line, indicating a closed center configuration where flow to both ports B and A is blocked.
- SOL a:** A solenoid actuator that controls the valve's position. It is connected to the P line and the T line.
- SOL b:** A solenoid actuator that controls the valve's position. It is connected to the P line and the T line.
- Reducing Modular Valves:** Two reducing valves are shown in the center position, connected to the P line and the T line.
- Pilot Check Modular Valves:** Two pilot check valves are shown in the center position, connected to the P line and the T line.
- Flow Regulator Modular Valves:** Two flow regulator valves are shown in the center position, connected to the P line and the T line.
- Relief Modular Valves:** Two relief valves are shown in the center position, connected to the P line and the T line.



	Type	External View	Model Number				Description				Page
			01 Series	03 Series	04 Series	06 Series	P	T	B	A	
Pressure Control Valve	Relief Valve		MBP-01-*	MBP-03-*	MBP-04-*	MBP-06-*					175 - 178
			MBW-01-*	MBW-03-*	MBW-04-*	MBW-06-*					
			MBA-01-*	MBA-03-*	MBA-04-*	MBA-06-*					
			MBB-01-*	MBB-03-*	MBB-04-*	MBB-06-*					
	Brake Valve		MBR-01-*	MBR-03-*							179 - 181
			MRP-01-*	MRP-03-*	MRP-04-*	MRP-06-*					
			MRA-01-*	MRA-03-*	MRA-04-*	MRA-06-*					
			MRB-01-*	MRB-03-*	MRB-04-*	MRB-06-*					

	Type	External View	Model Number				Description				Page
			01 Series	03 Series	04 Series	06 Series	P	T	B	A	
Pressure Control Valve	Sequence Valves		MHP-01-*	MHP-03-*	MHP-04-*	MHP-06-*					
	Counter-balance Valves		MHA-01-*	MHA-03-*	MHA-04-*	MHA-06-*					
			MHB-01-*	MHB-03-*	MHB-04-*	MHB-06-*					
Flow Control Valve	Throttle Valves		MSP-01-*	MSP-03-*	MSP-04-*	MSP-06-*					
	Throttle with Check Valves (Meter-Out)		MSW-01-X	MSW-03-X	MSW-04-X	MSW-06-X					
			MSA-01-X	MSA-03-X	MSA-04-X	MSA-06-X					
			MSB-01-X	MSB-03-X	MSB-04-X	MSB-06-X					
	Throttle with Check Valves (Meter-In)		MSW-01-Y	MSW-03-Y	MSW-04-Y	MSW-06-Y					
			MSA-01-Y	MSA-03-Y	MSA-04-Y	MSA-06-Y					
			MSB-01-Y	MSB-03-Y	MSB-04-Y	MSB-06-Y					
Directional Control Valve	Check Valve		MCP-01-*	MCP-03-*	MCP-04-*	MCP-06-*					
			MCT-01-*	MCT-03-*	MCT-04-*	MCT-06-*					
			MCA-01-*	MCA-03-*	MCA-04-*	MCA-06-*					
			MCB-01-*	MCB-03-*	MCB-04-*	MCB-06-*					
Directional Control Valve	Pilot Operated Check Valve		MPW-01-*	MPW-03-*	MPW-04-*	MPW-06-*					
			MPA-01-*	MPA-03-*	MPA-04-*	MPA-06-*					
			MPB-01-*	MPB-03-*	MPB-04-*	MPB-06-*					



- The modular valves are available in size: 1/8" (01), 3/8" (03), 1/2" (04), 3/4" (06), all the mounting dimensions are based on ISO 4401 standard (Hydraulic fluid power four port directional control valves mounting surface). The types are available in pressure control valves, flow control valves, directional control valves, which are high pressure, large capacity to meet recent tendency-high pressure, high flow hydraulic circuits. Pressure up to (250 bar), flow up to 50lpm(size 01), 100lpm(size 03), 190lpm(size 04), 300lpm(size 06).

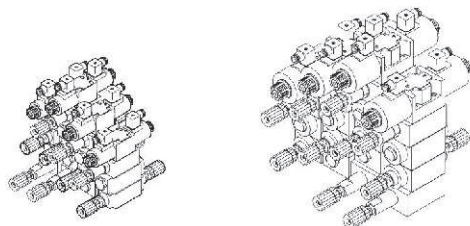
- Modular valves have been developed and designed to integrate the hydraulic circuit with hydraulic equipment. Any type of hydraulic circuit can be set up without piping simply by stacking modular valves one over another.

- The modular system has many features. For example, easy to install, easy alteration of hydraulic circuits reduces space, reduces cost, no vibration, no oil leakage, easy maintenance.....etc.

- M series relief modular valves (MB*-0*-*), throttle modular valves (MSP-0*-*), throttle with check modular valves (MS*-0*-*), reducing modular valves (MR*-0*-*), equipped with handknob (handle) are standard.

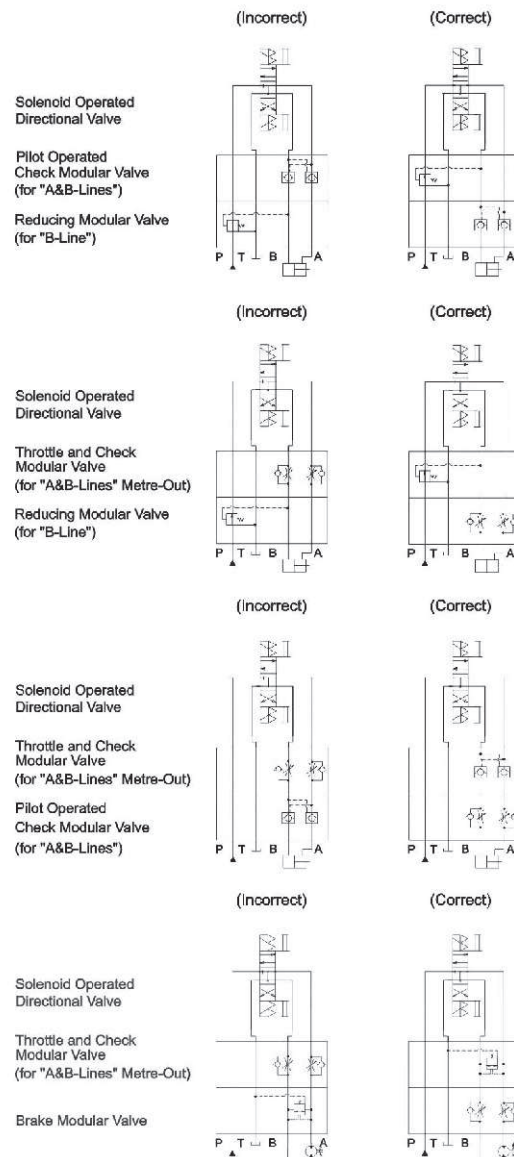
● MOUNTING BOLTS

Hexagonal socket head cap screw (Metric fixing Bolts UNC)-2 stacks supplied at standard no extra cost.
M5 x 85(95)Lg, 4pcs for 1/8" (01) modular valves.
M6 x 90Lg, 4pcs for 3/8" (03) modular valves.
M10 x 120Lg, 4 pcs and M6 x 125Lg, 2 pcs for 1/2" (04) modular valves. modular valves.
M12 x 140Lg, 6pcs for 3/4" (06) modular valves.



- The modular circuit designing examples as following tables.

The left side is incorrect, and the right side is correct.

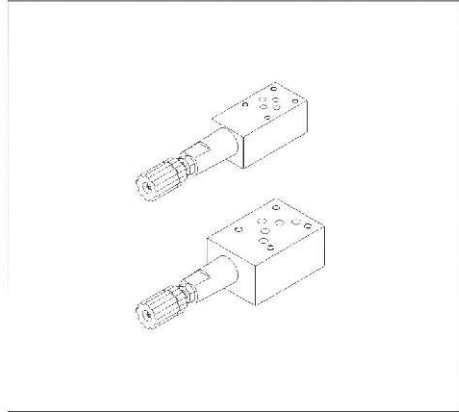


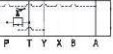
■ Mounting Surface

Series	CETOP	ISO	NFPA
01 Modules	CETOP 03	ISO Size 03	NFPA D03
03 Modules	CETOP 05	ISO Size 05	NFPA D05
04 Modules	CETOP 07	ISO Size 07	NFPA D07
06 Modules	CETOP 08	ISO Size 08	NFPA D08

RELIEF MODULAR VALVES

■ Relief Valves(Modular Type)



Model & Symbol	Model & Symbol
MBP-01 (03) 	MBP-04 (06) 
MBA-01 (03) 	MBA-04 (06) 
MBB-01 (03) 	MBB-04 (06) 
MBW-01 (03) 	

■ Ratings

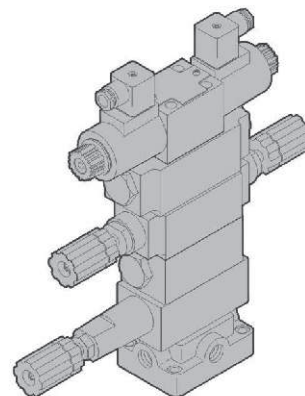
Model	Max Operating Pres bar (PSI)	Max Flow lpm (USgpm)	Valve Size	Weight kg (lb)
MB*-01-	250 (3600)	50 (13.2)	1/8"	1.1 (2.4)
MB*-03-	250 (3600)	100 (26.5)	3/8"	3.8 (8.3)
MB*-04-	250 (3600)	190 (50.2)	1/2"	7.0 (15.4)
MB*-06-	250 (3600)	300 (79.3)	3/4"	11.2 (24.6)

- This balanced piston type relief modular valve is an improved over the conventional type relief valve.
The valve is designed to control the maximum pressure of the hydraulic circuit and also serves as a safety valve.
- It can provide normal performance in a wide range of operating pressure from 8 up to 250 bar.
- Back Pressure in tank port should be as low as possible (under 5 bar).
- In case the valves are used as safety valves, pressure setting should be higher than max. circuit pressure by 10 ~ 15 bar.
- The pressure will be increased when the pressure adjustment handle is turned clockwise, and will be reduced when the pressure adjustment handle is turned counter-clockwise.
- Be sure to re-tighten the lock nut firmly after making adjustment to the pressure.

■ Ordering Code

MB P - 01 - C - 20 - S

Series No	Control Line	Valve Size	Pressure Adj. Range	Design No	Option Kits
Relief Modular Valves	P : P Port 	(DSG-) 01 (NFPA-D03) 	C: 8~ 140 bar 	20 DIN 912 bolts 	None: With Knob 
	A : A Port 	(DSG-) 03 (NFPA-D05) 	H: 70~ 210 bar 	2090 UNC bolts (North America) 	S: Soc. Hd. Cap Screw 
	B : B Port 	(DSHG-) 04 (NFPA-D07) 			
	W : A & B Port 	(DSHG-) 06 (NFPA-D08) 			



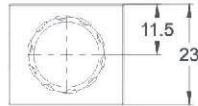
DIMENSIONS

MILLIMETERS(INCHES)

MBW-01 Relief Valves(Modular Type)

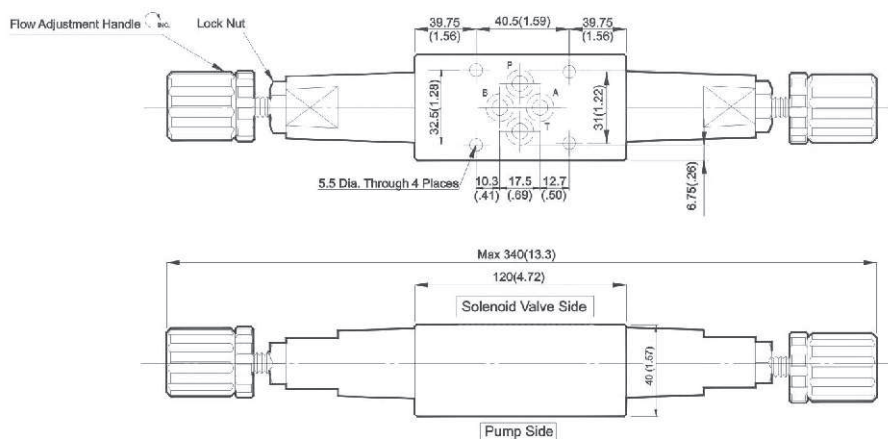
MOUNTING SURFACE:MB*-01-CETOP3
ISO 03-NFPAD03

OPTION
Design No: 30 (3090)



Valve Specifications & Attachment

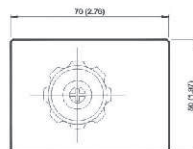
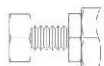
Flow Rating	50 lpm (13.2 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	1.1 (2.4)
CODE:20	M5 X95LgX4pcs
CODE:2090	10-24UNCX4*LgX4pcs
Mounting Surface O-Ring P9 x 2 pc	



MBW-03 Relief Valves(Modular Type)

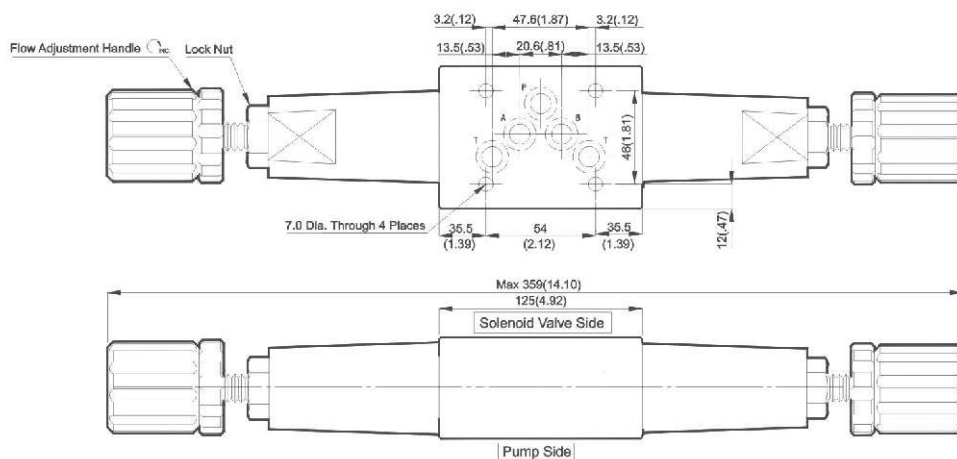
MOUNTING SURFACE:MB*-03-CETOP5
ISO 05-NFPAD05

OPTION
Design No: 30 (3090)



Valve Specifications & Attachment

Flow Rating	100 lpm (26.5 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	3.5 (7.7)
CODE:20	M6 X90LgX4pcs
CODE:2090	1/4-20UNCX3-1/2LgX4pcs
Mounting Surface O-Ring P12 x 5 pc	



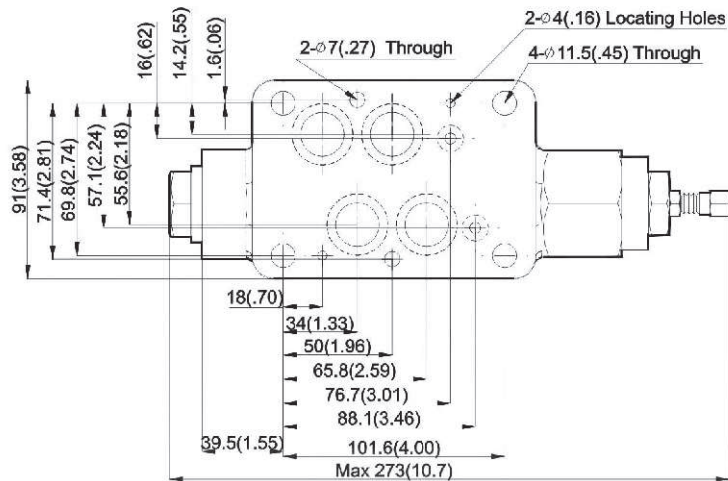
DIMENSIONS

MILLIMETERS(INCHES)

MB*-04

Relief Valves(Modular Type)

MOUNTING SURFACE:MB*-04-CETOP7
ISO 07-NFPAD07



MBA-04
MBB-04
MBP-04

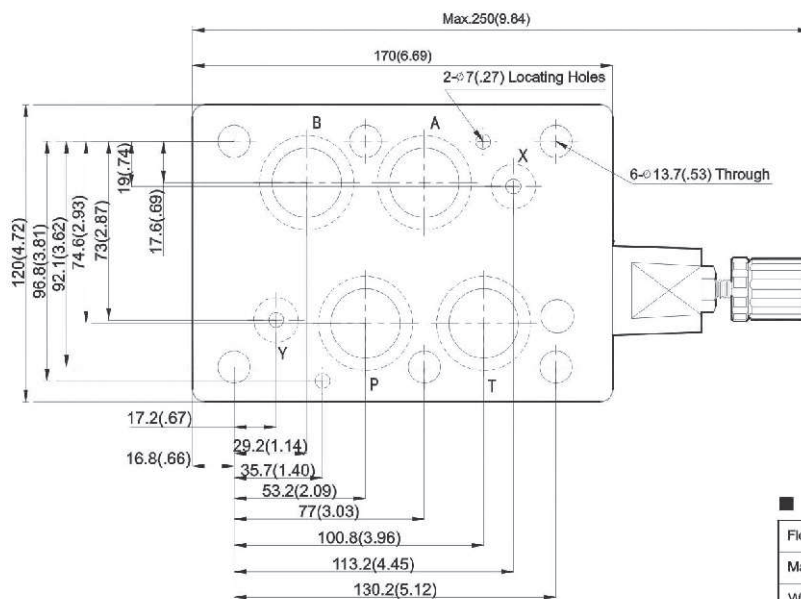
Valve Specifications & Attachment

Flow Rating	190 lpm (50.2 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	7.0 (15.4)
CODE:20	M8X125LgX2pcs M10X120LgX4pcs
CODE:2090	1/4-20UNCX4-7/8"LgX2pcs 3/8-16UNCX4-5/8"Lg X4pcs
Mounting Surface O-Ring P9 x 2 pc & P22A x 4 pcs	

MB*-06

Relief Valves(Modular Type)

MOUNTING SURFACE:MB*-06-CETOP8
ISO 08-NFPAD08



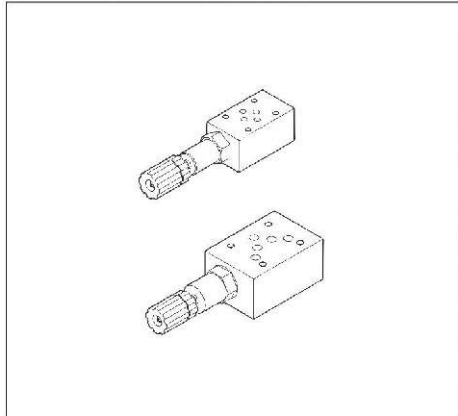
MBA-06
MBB-06
MBP-06

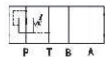
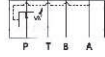
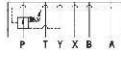
Valve Specifications & Attachment

Flow Rating	300 lpm (79.3 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	11.2 (24.6)
CODE:20	M12X140LgX6pcs
CODE:2090	1/2-13UNCX4-5/8"Lg X6pcs
Mounting Surface O-Ring P12 x 2 pc, P28 x 4 pcs	

REDUCING MODULAR VALVES

■ Reducing Valves(Modular Type)



Model & Symbol	Model & Symbol
MRP-01 (03) 	MRP-04 (06) 
MRA-01 (03) 	MRA-04 (06) 
MRB-01 (03) 	MRB-04 (06) 

■ Ratings

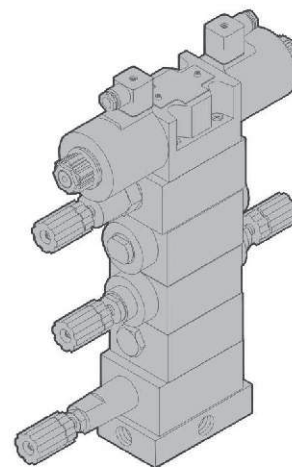
Model	Max Operating Pres bar (PSI)	Max Flow lpm (USgpm)	Valve Size	Weight kg (lb)
MR*-01-*	250 (3600)	50 (13.2)	1/8"	1.1 (2.4)
MR*-03-*	250 (3600)	100 (26.5)	3/8"	3.8 (8.3)
MR*-04-*	250 (3600)	190 (50.2)	1/2"	7.0 (15.4)
MR*-06-*	250 (3600)	300 (79.3)	3/4"	11.2 (24.6)

- This valve is employed to keep the pressure of some circuit lower than the main circuit pressure.
- Drain port should be connected to tank.
- Pressure difference between primary pressure and secondary pressure should be maintained over than 10 bar for good pressure reduction.
- Pressure cannot be adjusted if a certain flow rate cannot be obtained.
- The pressure will be increased when the pressure adjustment handle is turned clockwise, and will be reduced when the pressure adjustment handle is turned counter-clockwise.
- Be sure to re-tighten the lock nut firmly after making adjustment to the pressure.

■ Ordering Code

MR - P - 03 - C - 20 - S

Series No	Control Line	Valve Size	Pressure Adj. Range	Design No	Option Kits
Reducing Modular Valves	P : P Port 	(DSG-) 01 (NFPA-D03) 	B: 3~ 70 bar 	20 DIN 912 bolts 	None: With Knob 
	A : A Port 	(DSG-) 03 (NFPA-D05) 	C: 35~ 140 bar 	2090 UNC bolts (North America) 	S: Soc. Hd. Cap Screw 
	B : B Port 	(DSHG-) 04 (NFPA-D07) 	H: 70~ 210 bar 		
		(DSHG-) 06 (NFPA-D08) 			



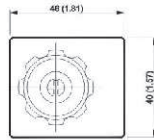
DIMENSIONS

MILLIMETERS(INCHES)

MR*-01

Reducing Valves(Modular Type)

MOUNTING SURFACE:MR*-01-CETOP3
ISO 03-NFPAD03

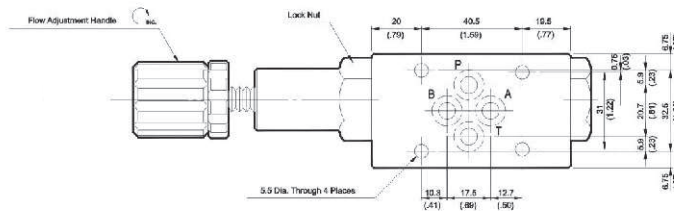


Valve Specifications & Attachment

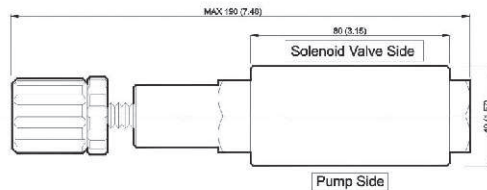
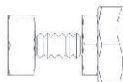
Flow Rating	50 lpm (13.2 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	1.1 (2.4)
CODE:20	M5 X85LgX4pcs
CODE:2090	10-24UNCX3-1/4"LgX4pcs
Mounting Surface O-Ring P9 x 4 pc	



SYMBOL



OPTION
Design No: 30 (3090)

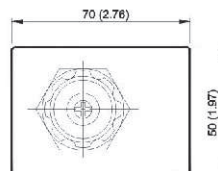
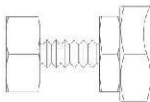


MR*-03

Reducing Valves(Modular Type)

MOUNTING SURFACE:MR*-03-CETOP5
ISO 05-NFPAD05

OPTION
Design No: 30 (3090)

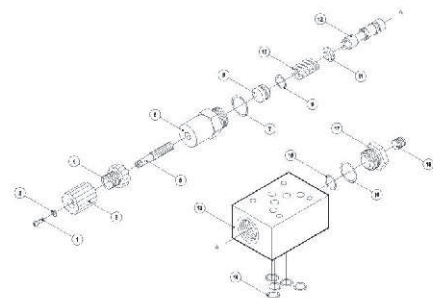
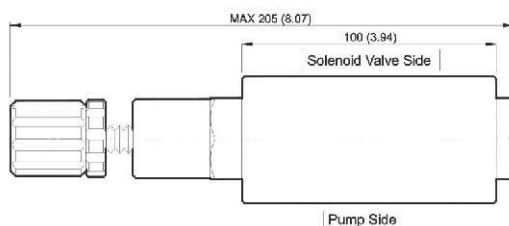
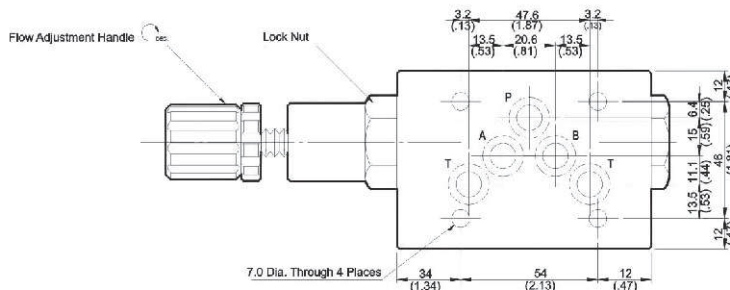


Valve Specifications & Attachment

Flow Rating	100 lpm (26.5 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	3.8 (8.4)
CODE:20	M6 X90LgX4pcs
CODE:2090	1/4-20UNCX3-1/2LgX4pcs
Mounting Surface O-Ring P12 x 5 pc	



SYMBOL



DIMENSIONS

MILLIMETERS(INCHES)

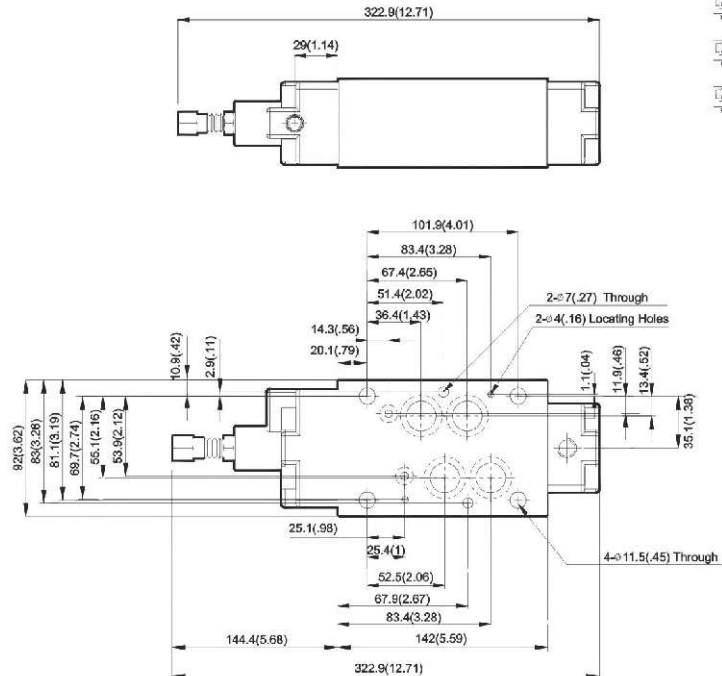
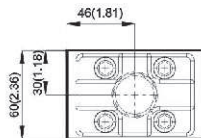
MR*-04

Reducing Valves(Modular Type)

MOUNTING SURFACE:MR*-04-CETOP7
ISO 07-NFPAD07

Valve Specifications & Attachment

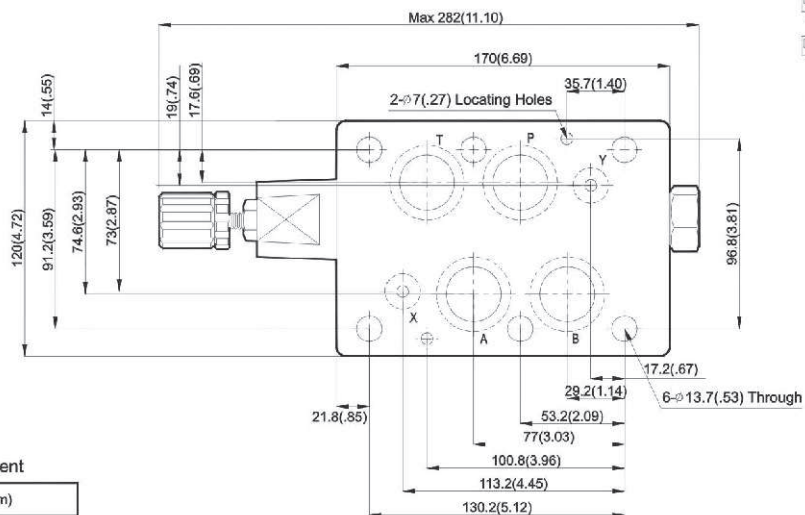
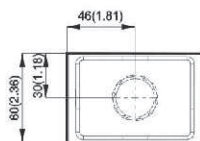
Flow Rating	190 lpm (50.2 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	7.0 (15.4)
CODE:20	M6X125LgX2pcs M10X120LgX4pcs
CODE:2090	1/4-20UNCX4-7/8"LgX2pcs 3/8-16UNCX4-5/8"Lg X4pcs
Mounting Surface O-Ring P9 x 2 pc & P22A x 4 pcs	



MR*-06

Reducing Valves(Modular Type)

MOUNTING SURFACE:MR*-06-CETOP8
ISO 08-NFPAD08



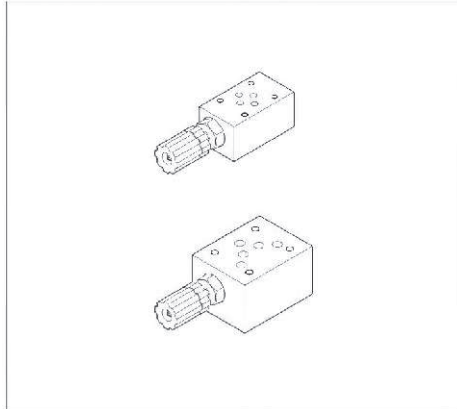
Valve Specifications & Attachment

Flow Rating	300 lpm (79.3 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	11.2 (24.6)
CODE:20	M12X140LgX6pcs
CODE:2090	1/2-13UNCX4-5/8"Lg X6pcs
Mounting Surface O-Ring P12 x 2 pc, P28 x 4 pcs	

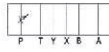
MRA-06
MRB-06
MRP-06

THROTTLE MODULAR VALVES

Throttle Valves(Modular Type)



Model & Symbol	Model & Symbol
MSP-01 (03)	MSP-04 (06)



Ratings

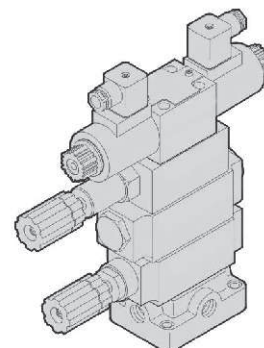
Model	Max Operating Pres bar (PSI)	Max Flow lpm (USgpm)	Valve Size	Weight kg (lb)
MSP-01	250 (3600)	50 (13.2)	1/8"	1.2 (2.6)
MSP-03	250 (3600)	100 (26.5)	3/8"	2.8 (6.1)
MSP-04	250 (3600)	190 (50.2)	1/2"	7.0 (15.4)
MSP-06	250 (3600)	300 (79.3)	3/4"	11.2 (24.6)

- The flow will be decreased when the flow adjustment handle is turned clockwise, and will be increased when the flow adjustment handle is turned counter-clockwise.
- Be sure to re-tighten the lock nut firmly after making adjustment to the flow.

Ordering Code

MS - P - 01 - H - 20 - S

Series No	Control Line	Valve Size	Pressure Adj. Range	Design No	Option Kits
Throttle Modular Valves (for P-Port)	P : P Port 	(DSG-) 01 (NFPA-D03)	L: 5~50 bar	20 DIN 912 bolts	None: With Knob DSG-01/03
		(DSG-) 03 (NFPA-D05)	H: 70~210 bar	2090 UNC bolts (North America)	S: Soc. Hd. Cap Screw
		(DSHG-) 04 (NFPA-D07)			
		(DSHG-) 06 (NFPA-D08)			



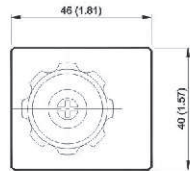
DIMENSIONS

MILLIMETERS(INCHES)

MSP-01

Throttle Valves(Modular Type)

MOUNTING SURFACE:MS*-01-CETOP3
ISO 03-NFPAD03

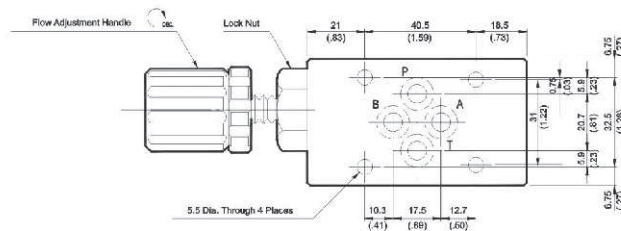


■ Valve Specifications & Attachment

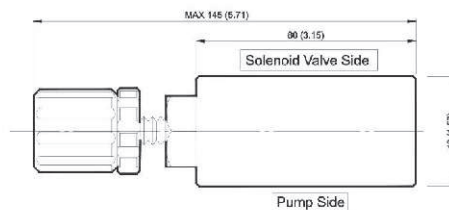
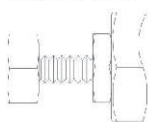
Flow Rating	50 lpm (13.2 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	1.2 (2.6)
CODE:20	M5 X85LgX4pcs
CODE:2090	10-24UNCX3-1/4"LgX4pcs
Mounting Surface O-Ring P9 x 4 pc	



SYMBOL



OPTION
Design No: 30 (3090)

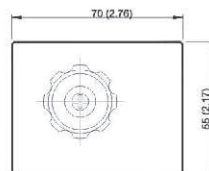
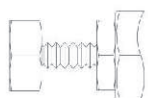


MSP-03

Throttle Valves(Modular Type)

MOUNTING SURFACE:MS*-03-CETOP5
ISO 05-NFPAD05

OPTION
Design No: 30 (3090)

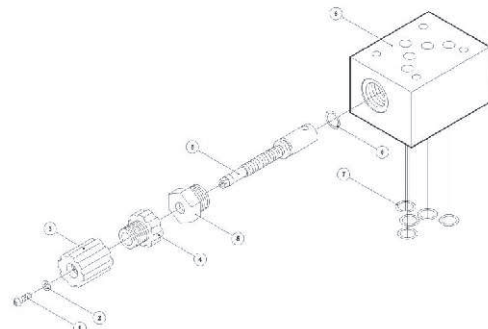
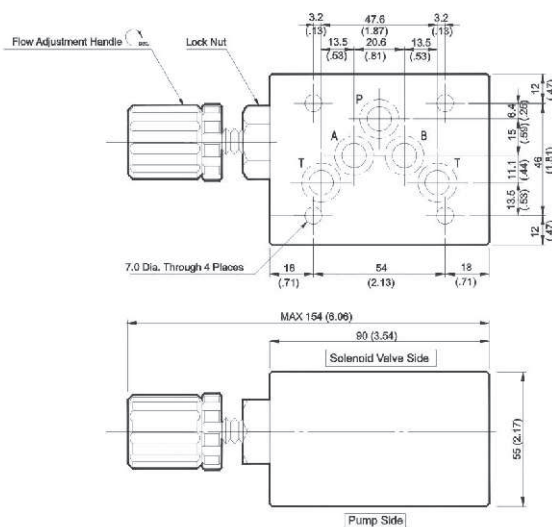


■ Valve Specifications & Attachment

Flow Rating	100 lpm (26.5 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	3.0 (6.6)
CODE:20	M6 X90LgX4pcs
CODE:2090	1/4-20UNCX3-1/2LgX4pcs
Mounting Surface O-Ring P12 x 5 pc	



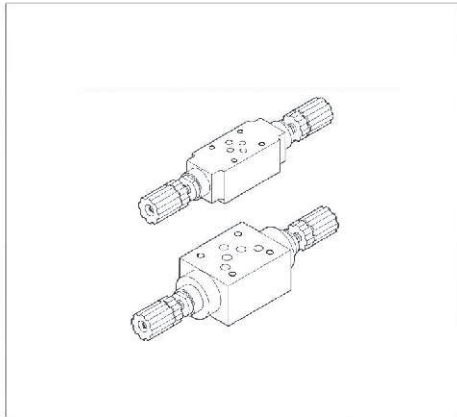
SYMBOL



Flow Rating	300 lpm (79.3 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	11.2 (24.6)
CODE:20	M12X140LgX6pcs
CODE:2090	1/2-13UNCX4-5/8"Lg X6pcs
Mounting Surface O-Ring P12 x 2 pc, P28 x 4 pcs	

THROTTLE WITH CHECK MODULAR VALVES

Throttle with Check Valves(Modular Type)



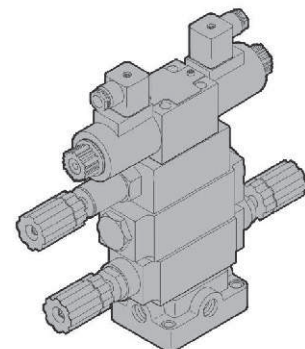
Ratings

Model	Max Operating Pres bar (PSI)	Max Flow lpm (USgpm)	Valve Size	Weight kg (lb)
MS*-01-*	250 (3600)	50 (13.2)	1/8"	1.5 (3.3)
MS*-03-*	250 (3600)	100 (26.5)	3/8"	3.7 (8.1)
MS*-04-*	250 (3600)	190 (50.2)	1/2"	7.0 (15.4)
MS*-06-*	250 (3600)	300 (79.3)	3/4"	12.2 (26.8)

Ordering Code

MS A - 03 - X - L - 20 - S

Series No	Control Line	Valve Size	Pressure Adj. Range	Pressure Adj. Range	Design No	Option Kits
Throttle Check Modular Valves	A : A Port 	(DSG-) 01 (NFFPA-D03) 	X : Meter out	L: 5~ 50 bar 	20 DIN 912 bolts 	None: With Knob 
	B : B Port 	(DSG-) 03 (NFFPA-D05) 	Y : Meter in	H: 50~ 250 bar 	2090 UNC bolts (North America) 	S: Soc. Hd. Cap Screw 
	W : A & B Port 	(DSHG-) 04 (NFFPA-D07) 				
		(DSHG-) 06 (NFFPA-D08) 				



Model & Symbol	Model & Symbol
MSA-01 (03)-X 	MSA-04 (06)-X 
MSB-01 (03)-X 	MSB-04 (06)-X 
MSW-01 (03)-X 	MSW-04 (06)-X 
MSA-01 (03)-Y 	MSA-04 (06)-Y 
MSB-01 (03)-Y 	MSB-04 (06)-Y 
MSW-01 (03)-Y 	MSW-04 (06)-Y 

- This valve is used for actuator speed control.
- Clockwise rotation of the adjusting handle decreases flow rate and counter-clockwise rotation increases it.
- Since the valve is of the spool type, oil flow cannot be shut off completely.
- Cracking pressure of check valve is 0.8 bar.

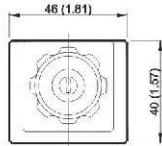
DIMENSIONS

MILLIMETERS(INCHES)

MSW-01

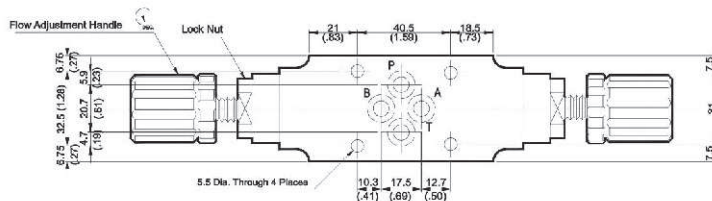
Throttle with Check Valves(Modular Type)

MOUNTING SURFACE:MS*-01-CETOP3
ISO 03-NFPAD03

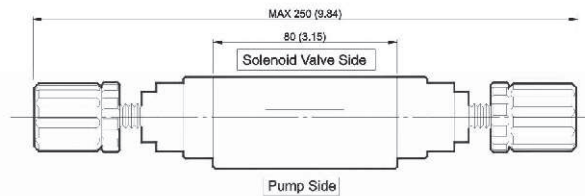
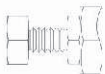


Valve Specifications & Attachment

Flow Rating	50 lpm (13.2 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	1.5 (3.3)
CODE:20	M5 X85LgX4pcs
CODE:2090	10-24UNCX3-1/4"LgX4pcs
Mounting Surface O-Ring P9 x 4 pc	



OPTION
Design No: 30 (3090)

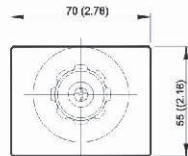
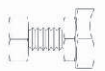


MSW-03

Throttle with Check Valves(Modular Type)

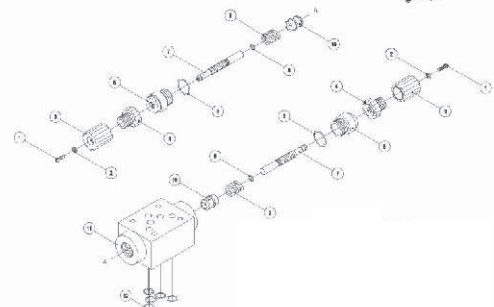
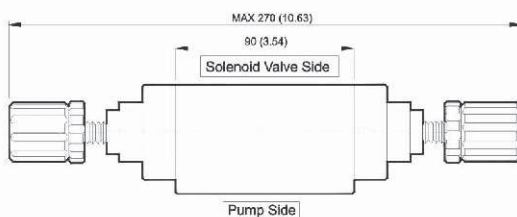
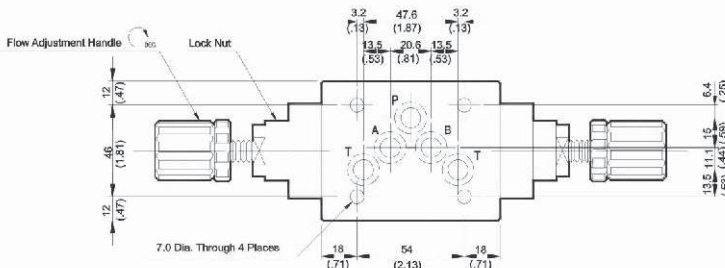
MOUNTING SURFACE:MS*-03-CETOP5
ISO 05-NFPAD05

OPTION
Design No: 30 (3090)



Valve Specifications & Attachment

Flow Rating	100 lpm (26.5 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	3.7 (8.2)
CODE:20	M6 X90LgX4pcs
CODE:2090	1/4-20UNCX3-1/2LgX4pcs
Mounting Surface O-Ring P12 x 5 pc	

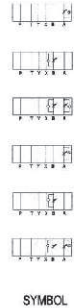
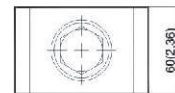
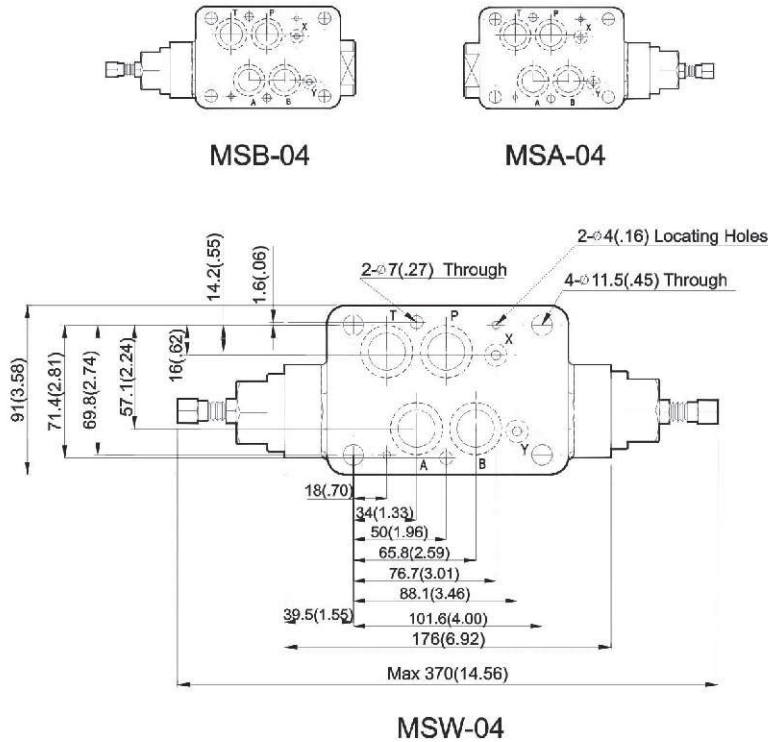


DIMENSIONS

MILLIMETERS(INCHES)

MS*-04 Throttle with Check Valves(Modular Type)

MOUNTING SURFACE:MS*-04-CETOP7
ISO 07-NFPAD07

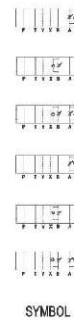
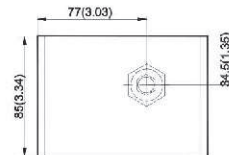
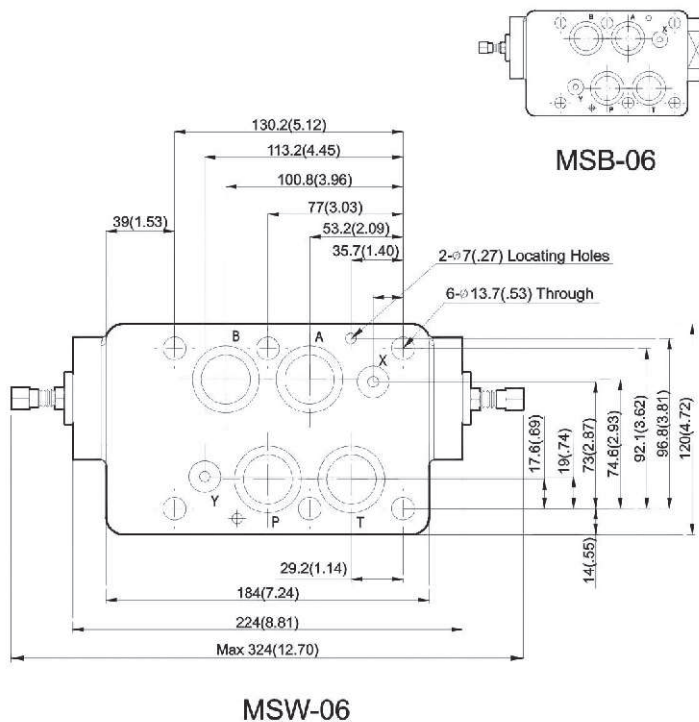


Valve Specifications & Attachment

Flow Rating	190 lpm (50.2 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	7.0 (15.4)
CODE:20	M6X125LgX2pcs M10X120LgX4pcs
CODE:2090	1/4-20UNCX4-7/8"LgX2pcs 3/8-16UNCX4-5/8"Lg X4pcs
Mounting Surface O-Ring P8 x 2 pc & P22A x 4 pcs	

MS*-06 Throttle with Check Valves(Modular Type)

MOUNTING SURFACE:MS*-06-CETOP8
ISO 08-NFPAD08

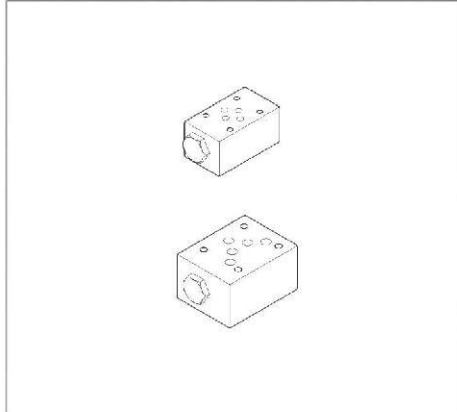


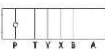
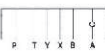
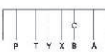
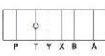
Valve Specifications & Attachment

Flow Rating	300 lpm (79.3 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	11.2 (24.6)
CODE:20	M12X140LgX6pcs
CODE:2090	1/2-13UNCX4-5/8"Lg X6pcs
Mounting Surface O-Ring P12 x 2 pc, P26 x 4 pcs	

CHECK MODULAR VALVES

Check Valves (Modular Type)



Model & Symbol	Model & Symbol
MCP-01 (03) 	MCP-04 (06) 
MCA-01 (03) 	MCA-04 (06) 
MCB-01 (03) 	MCB-04 (06) 
MCT-01 (03) 	MCT-04 (06) 

Ratings

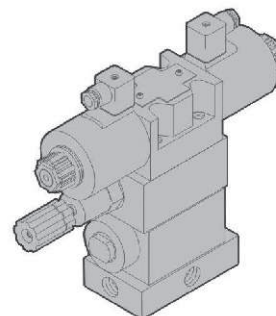
Model	Max Operating Pres bar (PSI)	Max Flow lpm (USgpm)	Valve Size	Weight kg (lb)
MC*-01-*	250 (3600)	50 (13.2)	1/8"	1.1 (2.4)
MC*-03-*	250 (3600)	100 (26.5)	3/8"	2.8 (6.1)
MC*-04-*	250 (3600)	190 (50.2)	1/2"	7.0 (15.4)
MC*-06-*	250 (3600)	300 (79.3)	3/4"	11.0 (24.2)

- This Valve is of the modular design improved from the check valve fitted in the P port or T port to prevent the oil from flowing in the reverse direction.
- With a valve of size 01, 03, 04, 06 the check valve is incorporated between A, B port and T port. This check modular valve of a certain type can be used for suction.

Ordering Code

MC - P - 03 - 2 - 20

Series No	Control Line	Valve Size	Cracking Pressure	Design No
Check Modular Valves	P : P Port 	(DSG-) 01 (NFPA-D03) 	0: 0.35 bar 	20 DIN 912 bolts 
	A : A Port 	(DSG-) 03 (NFPA-D05) 	2: 2 bar 	2090 UNC bolts (North America) 
	B : B Port 	(DSHG-) 04 (NFPA-D07) 	4: 4 bar 	
	T : T Port 	(DSHG-) 06 (NFPA-D08) 		



DIMENSIONS

MILLIMETERS(INCHES)

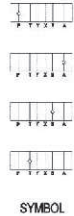
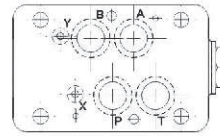
MCP-04 Check Valves(Modular Type)

MOUNTING SURFACE:MC*-04-CETOP7
ISO 07-NFPAD07

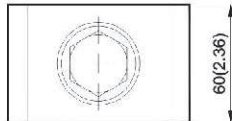
Valve Specifications & Attachment

Flow Rating	190 lpm (50.2 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	7.0 (15.4)
CODE:20	M6X125LgX2pcs M10X120LgX4pcs
CODE:2090	1/4-20UNCX4-7/8"LgX2pcs 3/8-16UNCX4-5/8"Lg X4pcs
Mounting Surface O-Ring P9 x 2 pc & P22A x 4 pcs	

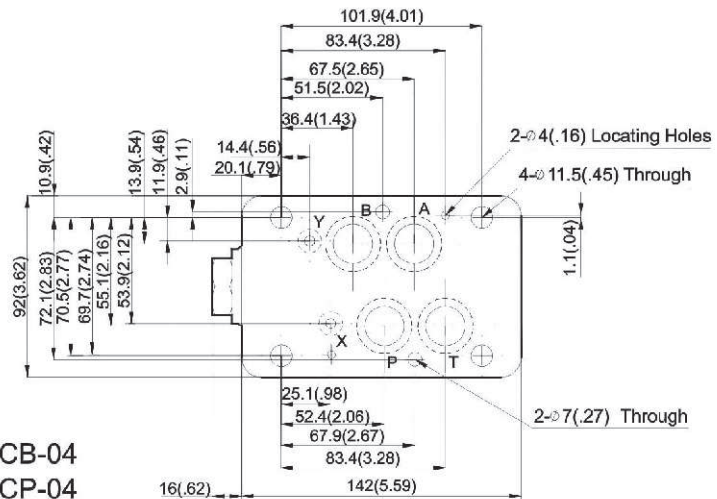
MCA-04
MCT-04



SYMBOL



MCB-04
MCP-04



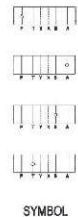
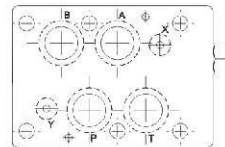
MCP-06 Check Valves(Modular Type)

MOUNTING SURFACE:MC*-06-CETOP8
ISO 08-NFPAD08

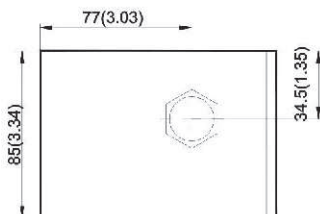
Valve Specifications & Attachment

Flow Rating	300 lpm (79.3 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	11.2 (24.6)
CODE:20	M12X140LgX6pcs
CODE:2090	1/2-13UNCX4-5/8"Lg X6pcs
Mounting Surface O-Ring P12 x 2 pc, P28 x 4 pcs	

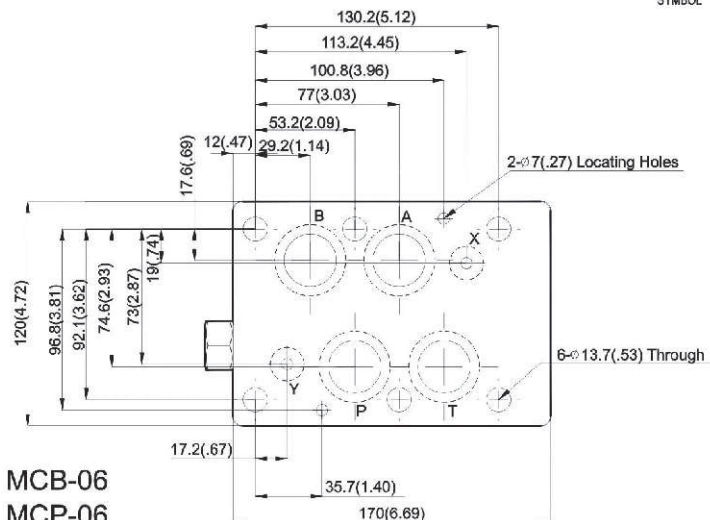
MCA-06
MCT-06



SYMBOL

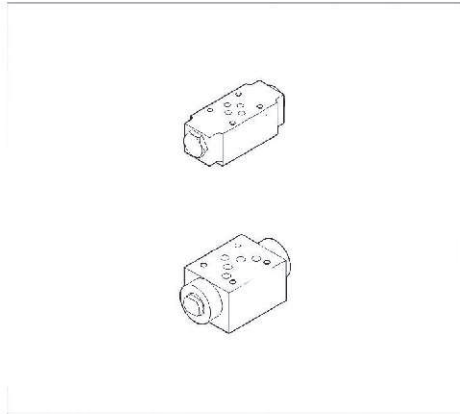


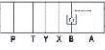
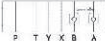
MCB-06
MCP-06



CHECK MODULAR VALVES

■ Pilot Operated Check Valves(Modular Type)



Model & Symbol	Model & Symbol
MPA-01 (03) 	MPA-04 (06) 
MPB-01 (03) 	MPB-04 (06) 
MPW-01 (03) 	MPW-04 (06) 

■ Ratings

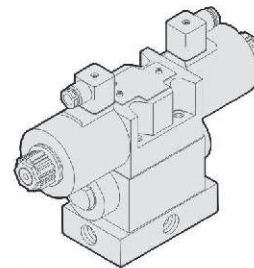
Model	Max Operating Pres bar (PSI)	Max Flow lpm (USgpm)	Valve Size	Weight kg (lb)
MP*-01-*	250 (3600)	50 (13.2)	1/8"	1.2 (2.6)
MP*-03-*	250 (3600)	100 (26.5)	3/8"	3.7 (8.1)
MP*-04-*	250 (3600)	190 (50.2)	1/2"	7.0 (15.4)
MP*-06-*	250 (3600)	300 (79.3)	3/4"	11.2 (24.6)

- This Valve is of the modular design improved from the pilot operated check valve used for preventing the actuator from self-operating, as well as for valve position holding.
- Cracking pressure of check valve is 2 bar.
- The valve is of the internal drain type.

■ Ordering Code

MP A - 03 - 2 - 20

Series No	Control Line	Valve Size	Cracking Pressure	Design No
Pilot Operated Check Modular Valves	A : A Port 	(DSG-) 01 (NFPA-D03) 	2: 2 bar 	20 DIN 912 bolts 
	B : B Port 	(DSG-) 03 (NFPA-D05) 	4: 4 bar 	2090 UNC bolts (North America) 
	W : A & B Port 	(DSHG-) 04 (NFPA-D07) 		Design No. 30 Decompression Type
		(DSHG-) 06 (NFPA-D08) 		



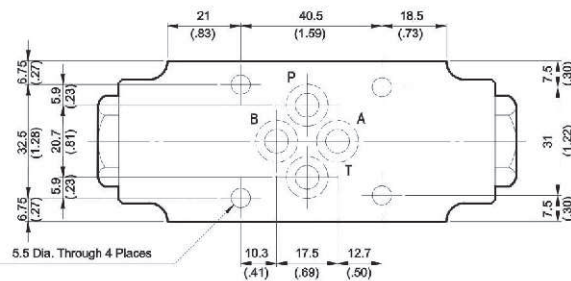
DIMENSIONS

MILLIMETERS(INCHES)

MPW - 01

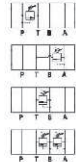
Pilot Operated Check Valves(Modular Type)

MOUNTING SURFACE:MP*-01-CETOP3
ISO 03-NFPAD03

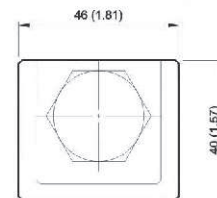
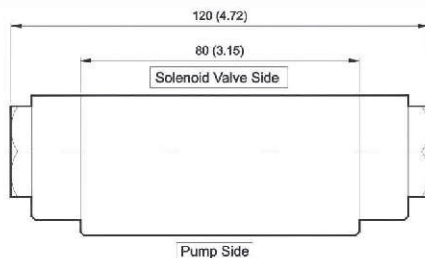


■ Valve Specifications & Attachment

Flow Rating	50 lpm (13.2 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	1.2 (2.6)
CODE:20	M5 X85LgX4pcs
CODE:2090	10-24UNCX3-1/4"LgX4pcs
Mounting Surface O-Ring P9 x 4 pc	



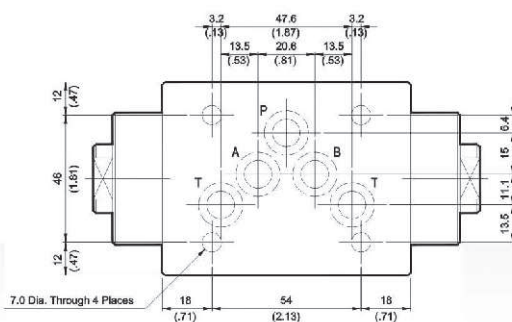
SYMBOL



MPW - 03

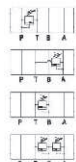
Pilot Operated Check Valves(Modular Type)

MOUNTING SURFACE:MP*-03-CETOP5
ISO 05-NFPAD05



■ Valve Specifications & Attachment

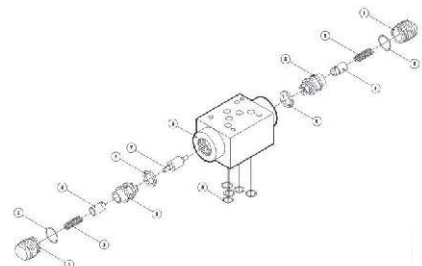
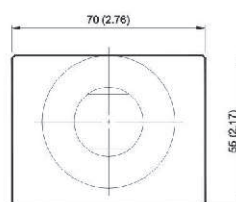
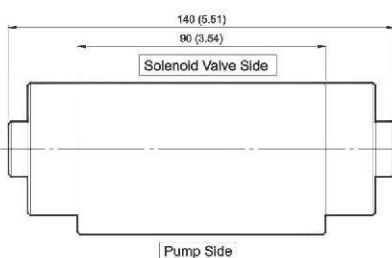
Flow Rating	100 lpm (26.5 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	3.5 (7.7)
CODE:20	M6 X90LgX4pcs
CODE:2090	1/4-20UNCX3-1/2LgX4pcs
Mounting Surface O-Ring P12 x 5 pc	



SYMBOL



MPW-03-30



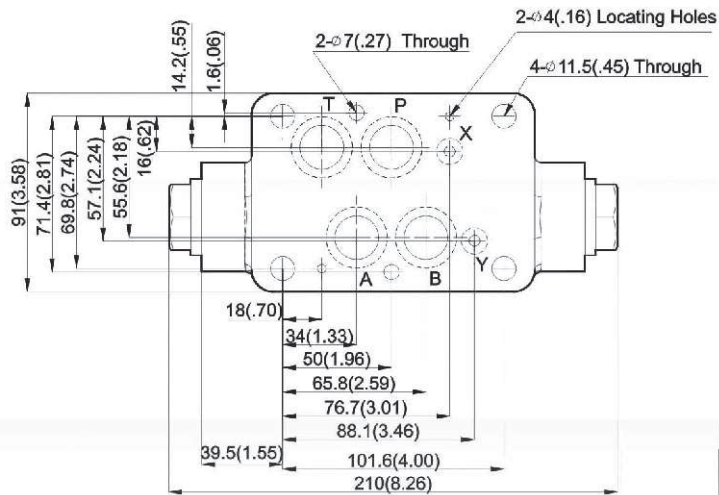
DIMENSIONS

MILLIMETERS(INCHES)

MPW - 04

Pilot Operated Check Valves(Modular Type)

MOUNTING SURFACE:MP*-04-CETOP7
ISO 07-NFPAD07



MPA-04
MPB-04
MPW-04

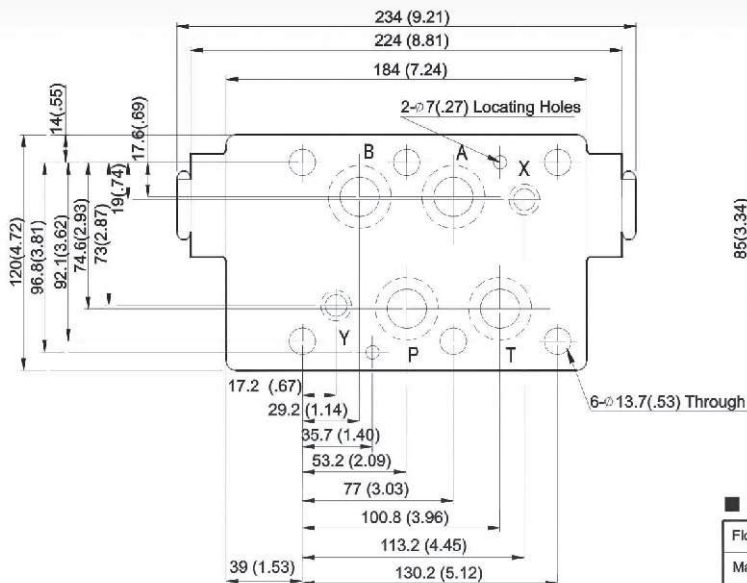
Valve Specifications & Attachment

Flow Rating	190 lpm (50.2 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	7.0 (15.4)
CODE:20	M6X125LgX2pcs M10X120LgX4pcs
CODE:2090	1/4-20UNCX4-7/8"LgX2pcs 3/8-16UNCX4-5/8"Lg X4pcs
Mounting Surface O-Ring P9 x 2 pc & P22A x 4 pcs	

MPW - 06

Pilot Operated Check Valves(Modular Type)

MOUNTING SURFACE:MP*-06-CETOP8
ISO 08-NFPAD08



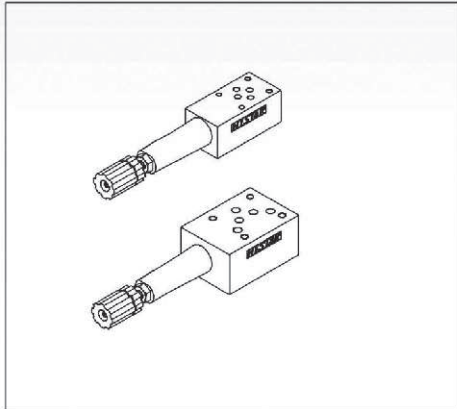
MPA-06
MPB-06
MPW-06

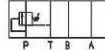
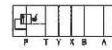
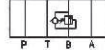
Valve Specifications & Attachment

Flow Rating	300 lpm (79.3 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	11.2 (24.6)
CODE:20	M12X140LgX6pcs
CODE:2090	1/2-13UNCX4-5/8"Lg X6pcs
Mounting Surface O-Ring P12 x 2 pc, P28 x 4 pcs	

SEQUENCE VALVES & COUNTER BALANCE MODULAR VALVES

- Sequence Valves (Modular Type) - MHP-0*-*
- Counter-balance Valves (Modular Type) - MHA(B)-0*-*



Model & Symbol	Model & Symbol
MHP-01 (03) 	MHP-04 (06) 
MHA-01 (03) 	MHA-04 (06) 
MHB-01 (03) 	MHB-04 (06) 

■ Ratings

Model	Max Operating Pres bar (PSI)	Max Flow lpm (USgpm)	Valve Size	Weight kg (lb)
MH*-01-*	250 (3600)	50 (13.2)	1/8"	1.1 (2.4)
MH*-03-*	250 (3600)	100 (26.5)	3/8"	3.8 (8.3)
MH*-04-*	250 (3600)	190 (50.2)	1/2"	7.0 (15.4)
MH*-06-*	250 (3600)	300 (79.3)	3/4"	11.2 (24.6)

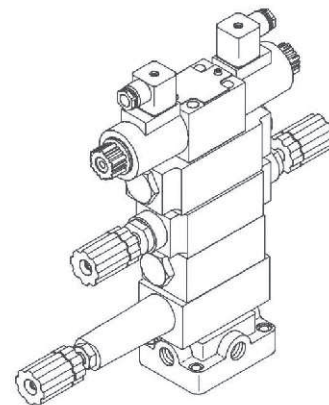
- This sequence modular valves (MHP-0*-*) is used for actuator sequential operation, as well as for circuit pressure holding. With wide adjustment range 6 ~ 250 bar. hydraulic circuit and also serves as a safety valve.

- MHA(B)-0*-* counter-balance modular valves is used for actuator back pressure control.

■ Ordering Code

MH - P - 01 - C - 20 - S

Series No	Control Line	Valve Size	Pressure Adj. Range	Design No	Special Kits
MHP Sequence Modular Valves	P : P Port 	(DSG-) 01 (NFPA-D03) 	N: 6~ 18 bar 	20 DIN 912 bolts 	None: With Knob 
MHA(B) Counterbalance Modular Valves	A : A Port 	(DSG-) 03 (NFPA-D05) 	A: 18~ 35 bar 	2090 UNC bolts (North America) 	S: Soc. Hd. Cap Screw 
	B : B Port 	(DSHG-) 04 (NFPA-D07) 	B: 35~ 70 bar 		
		(DSHG-) 06 (NFPA-D08) 	C: 70~ 250 bar 		



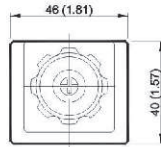
DIMENSIONS

MILLIMETERS(INCHES)

MHB-01

Counterbalance Valves(Modular Type)

MOUNTING SURFACE:MH*-01-CETOP3
ISO 03-NFPAD03

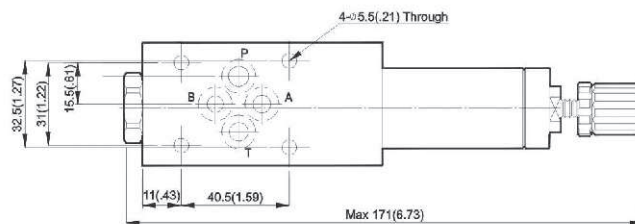


Valve Specifications & Attachment

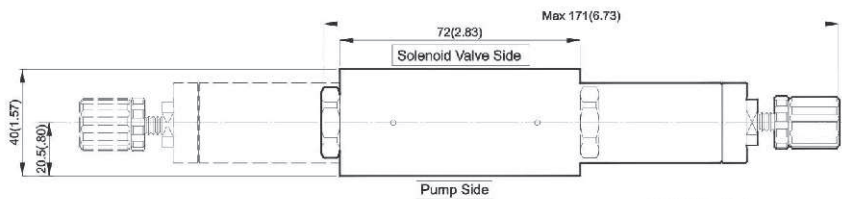
Flow Rating	50 lpm (13.2 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	1.1 (2.4)
CODE:20	M5 X85LgX4pcs
CODE:2090	10-24UNCX3-4/4"LgX4pcs
Mounting Surface O-Ring P9 x 2 pc	



SYMBOL



OPTION
Design No: 30 (3090)



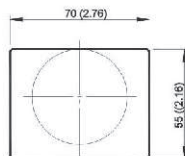
MHA-01

MHB-01

MHB-03

Counterbalance Valves(Modular Type)

MOUNTING SURFACE:MH*-03-CETOP5
ISO 05-NFPAD05

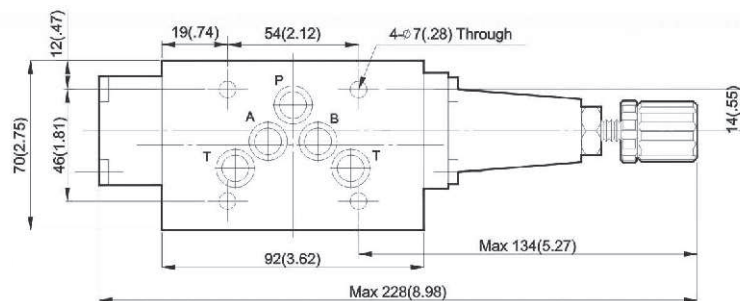


Valve Specifications & Attachment

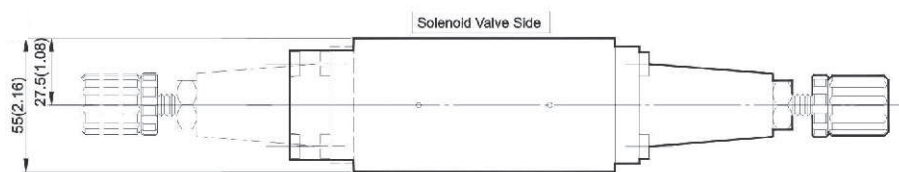
Flow Rating	100 lpm (26.5 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	3.5 (7.7)
CODE:20	M6 X90LgX4pcs
CODE:2090	1/4-20UNCX3-1/2LgX4pcs
Mounting Surface O-Ring P12 x 5 pc	



SYMBOL



OPTION
Design No: 30 (3090)



MHA-03

MHB-03

DIMENSIONS

MILLIMETERS(INCHES)

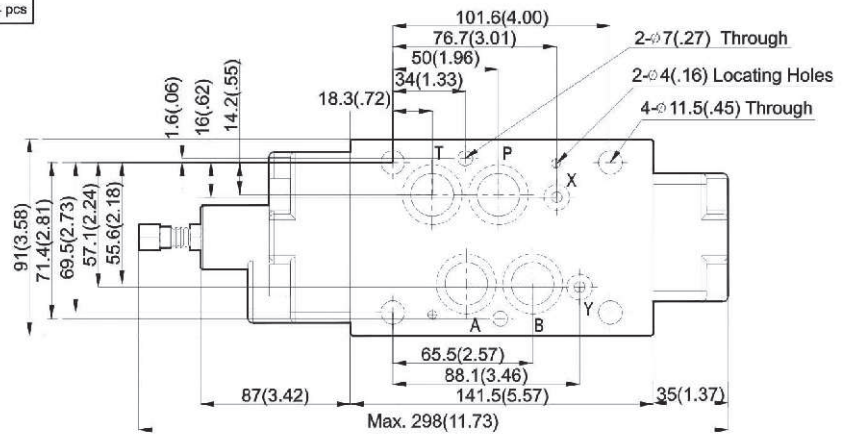
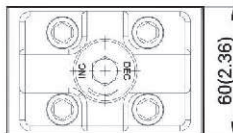
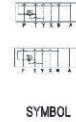
MHB-04

Counterbalance Valves(Modular Type)

MOUNTING SURFACE:MH*-04-CETOP7
ISO 07-NFPAD07

Valve Specifications & Attachment

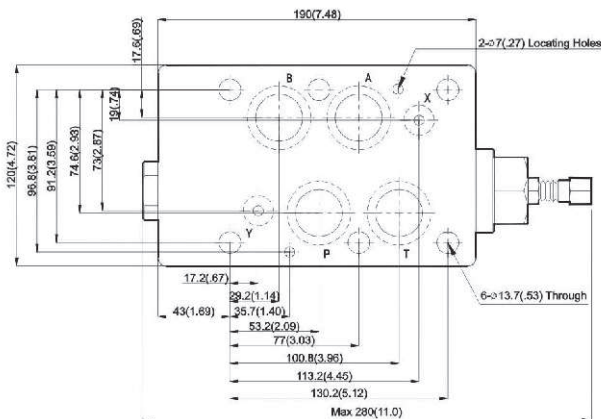
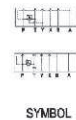
Flow Rating	190 lpm (50.2 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	7.0 (15.4)
CODE:20	M6X125LgX2pcs M10X120LgX4pcs
CODE:2090	1/4-20UNCX4-7/8"LgX2pcs 3/8-16UNCX4-5/8"Lg X4pcs
Mounting Surface O-Ring	P9 x 2 pc & P22A x 4 pcs



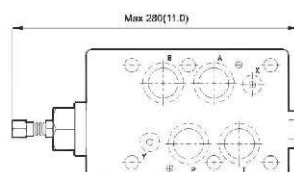
MHB-06

Counterbalance Valves(Modular Type)

MOUNTING SURFACE:MH*-06-CETOP8
ISO 08-NFPAD08



MHB-06



MHA-06

Valve Specifications & Attachment

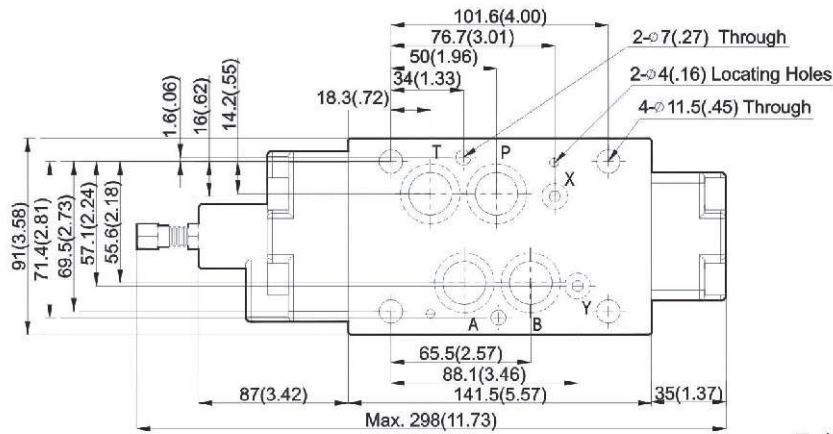
Flow Rating	300 lpm (79.3 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	11.2 (24.6)
CODE:20	M12X140LgX6pcs
CODE:2090	1/2-13UNCX4-5/8"Lg X8pcs
Mounting Surface O-Ring	P12 x 2 pc, P28 x 4 pcs

DIMENSIONS

MILLIMETERS(INCHES)

MHP-04 Sequence Valves(Modular Type)

MOUNTING SURFACE:MH*-04-CETOP7
ISO 07-NFPAD07

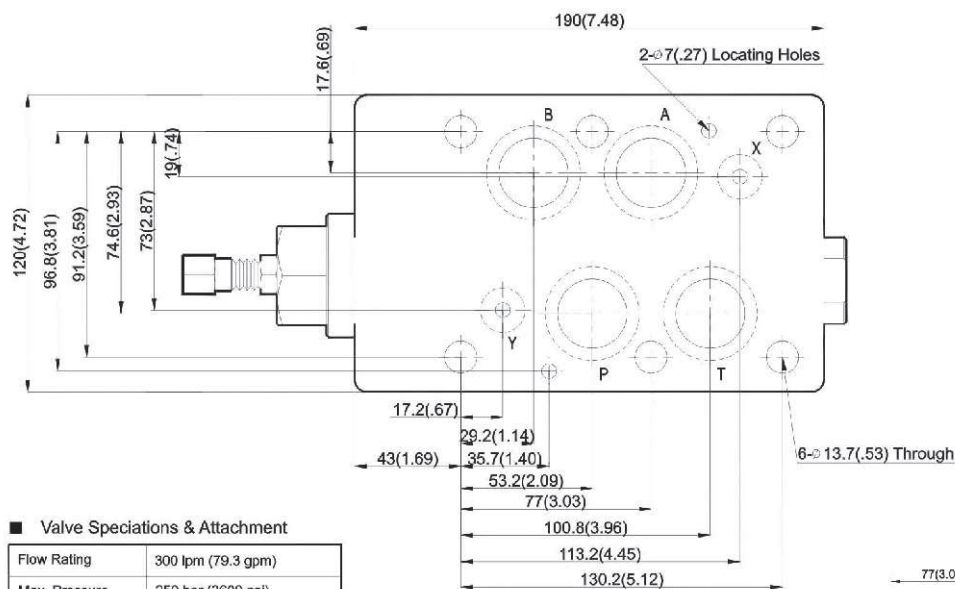


Valve Specifications & Attachment

Flow Rating	190 lpm (50.2 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	7.0 (15.4)
CODE:20	M6X125LgX2pcs M10X120LgX4pcs
CODE:2090	1/4-20UNCX4-7/8"LgX2pcs 3/8-16UNCX4-5/8"Lg X4pcs
Mounting Surface O-Ring	P9 x 2 pc & P22A x 4 pcs

MHP-06 Sequence Valves(Modular Type)

MOUNTING SURFACE:MH*-06-CETOP8
ISO 08-NFPAD08



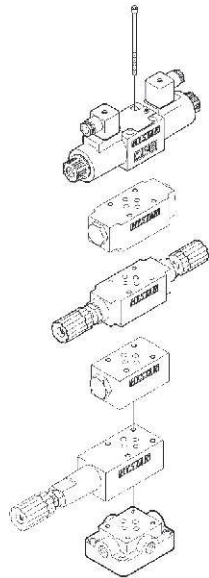
Valve Specifications & Attachment

Flow Rating	300 lpm (79.3 gpm)
Max. Pressure	250 bar (3600 psi)
Weight kg(lbs.)	11.2 (24.6)
CODE:20	M12X140LgX6pcs
CODE:2090	1/2-13UNCX4-5/8"Lg X6pcs
Mounting Surface O-Ring	P12 x 2 pc, P28 x 4 pcs

MOUNTING BOLTS KITS(DIN 912 / ANSI-ASME B18.3)

MBK-01

Hexagon Socket Head Cap Screw



Model	Symbol
DSG-3C*-N-01-*** Solenoid Operated Directional Valves	
MPW-01-*** Pilot Operated Check Modular Valves	
MSW-01-*** Throttle with Check Modular Valves	
MCP-01-*** Check Modular Valves	
MBP-01-*** Relief Modular Valves	
MMC-01 Base Plate	

Ordering Code

MBK - 01 - 3 - 20

Design No.
20: DIN 912 bolts
2090: UNC bolts (N American)

No. of Valves
1, 2, 3, 4, 5
(Refer to The Following Chart)

Size of Modular Valve 01(1/8")

Series Number
MBK: Bolt Kits for Modular Valves

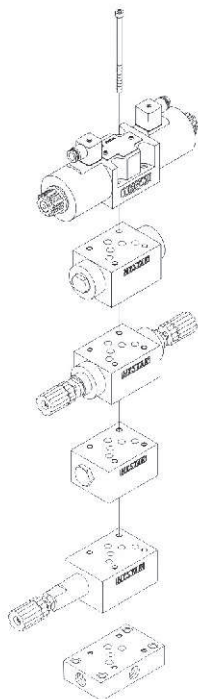
Hexagon Socket Head Cap Screw (DIN 912 / ANSI-ASME B18.3)	
Material	SCM 435
Tensile Strength	180 KSI < 1/2" (1220N/mm2)
Hardness	HRC 39 ~ 45

Code	No. of Valves	20: DIN 912 bolts	2090: UNC bolts North American (ANSI-ASME B18.3)	Weight (lbs)
MBK-01-01-20*	1	M5 X45LgX4pcs	10-24UNCX1-3/4"LgX4pcs	60(.13)
MBK-01-02-20*	2	M5 X85LgX4pcs	10-24UNCX3-3/8"LgX4pcs	100(.22)
MBK-01-03-20*	3	M5 X125LgX4pcs	10-24UNCX3-9/16"LgX4pcs	130(.29)
MBK-01-04-20*	4	M5 X165LgX4pcs	10-24UNCX3-1/2"LgX4pcs	160(.35)
MBK-01-05-20*	5	M5 X205LgX4pcs	10-24UNCX3-1/2"LgX4pcs	190(.42)

■ If assembled with MBW-01-*, the bolts height will be 10 mm longer.

MBK-03

Hexagon Socket Head Cap Screw



Model	Symbol
DSG-3C*-N-03-*** Solenoid Operated Directional Valves	
MPW-03-*** Pilot Operated Check Modular Valves	
MSW-03-*** Throttle with Check Modular Valves	
MCP-03-*** Check Modular Valves	
MBP-03-*** Relief Modular Valves	
MMC-03 Base Plate	

Ordering Code

MBK - 03 - 3 - 20

Design No.
20: DIN 912 bolts
2090: UNC bolts (N American)

No. of Valves
1, 2, 3, 4, 5
(Refer to The Following Chart)

Size of Modular Valve 03(3/8")

Series Number
MBK: Bolt Kits for Modular Valves

Hexagon Socket Head Cap Screw (DIN 912 / ANSI-ASME B18.3)	
Material	SCM 435
Tensile Strength	180 KSI < 1/2" (1220N/mm2)
Hardness	HRC 39 ~ 45

Code	No. of Valves	20: DIN 912 bolts	2090: UNC bolts North American (ANSI-ASME B18.3)	Weight (lbs)
MBK-03-01-20*	1	M6 X35LgX4pcs	1/4-20UNCX1-1/2"LgX4pcs	120(.26)
MBK-03-02-20*	2	M6 X90LgX4pcs	1/4-20UNCX3-5/8"LgX4pcs	160(.35)
MBK-03-03-20*	3	M6 X145LgX4pcs	1/4-20UNCX3-3/4"LgX4pcs	200(.44)
MBK-03-04-20*	4	M6 X200LgX4pcs	1/4-20UNCX3-1/2"LgX4pcs	240(.53)
MBK-03-05-20*	5	M6 X255LgX4pcs	1/4-20UNCX3-1/2"LgX4pcs	280(.62)