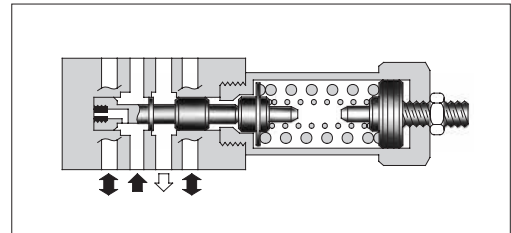


Relief Modular Valves

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

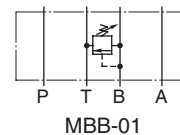
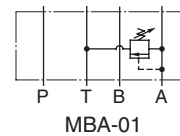
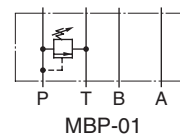
★ 1. See the "Minimum Adjustment Pressure" of the next page for the item marked *.

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

Instructions

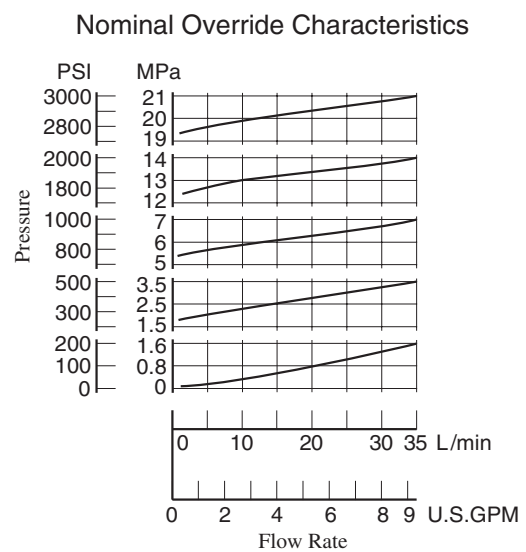
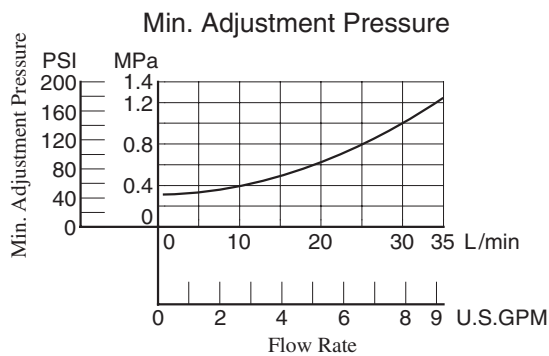
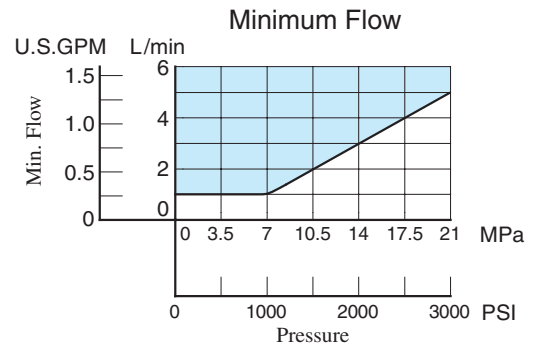
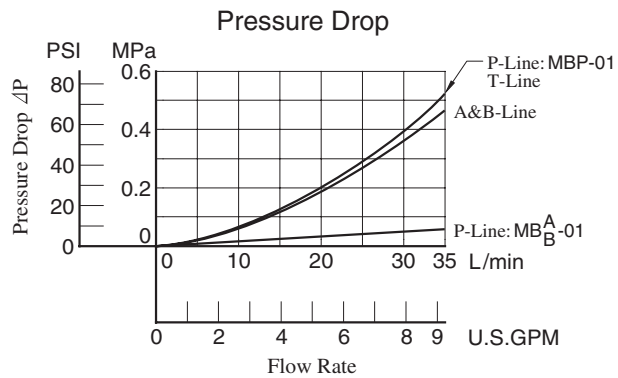
- The minimum adjustment pressure equals the value obtained from the minimum adjustment pressure characteristics plus the tank line back pressure of the [next page](#). This back pressure should include the value of the T-line pressure drop characteristics of the valves stacked to the base plate side 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



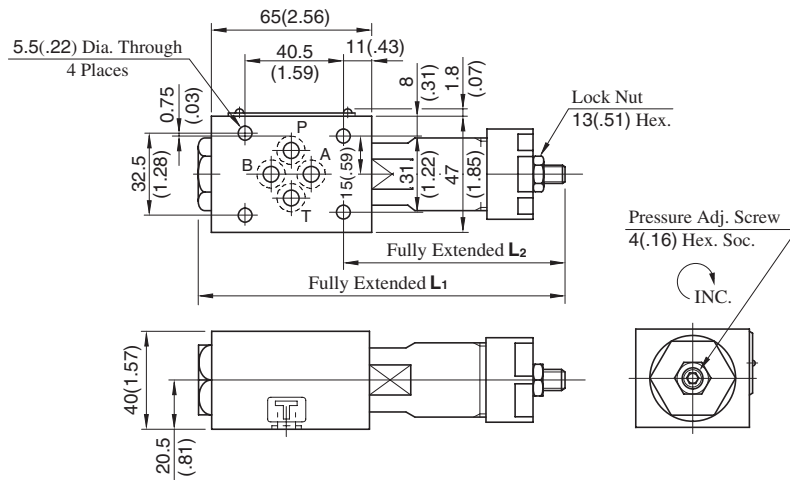
Typical Performance Characteristics

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



MBP-01-*-30

MBB-01-*-30

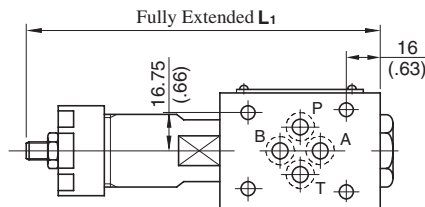


Model No.	L ₁	L ₂
MB*-01-C	151 (5.94)	92 (3.62)
MB*-01-H	166.5 (6.56)	107.5 (4.23)

Approx. Mass.....1.1 kg (2.4 lbs.)

**DIMENSIONS IN
MILLIMETRES (INCHES)**

MBA-01-*-30

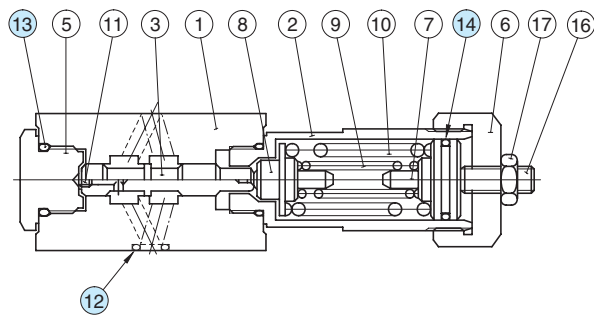


Approx. Mass.....1.1 kg (2.4 lbs.)

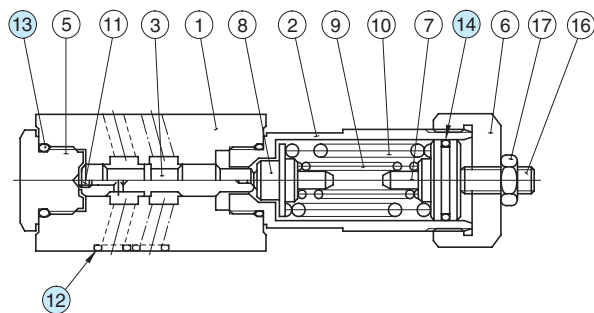
- For other dimensions, refer to above (MBP-01) drawing.

Spare Parts List

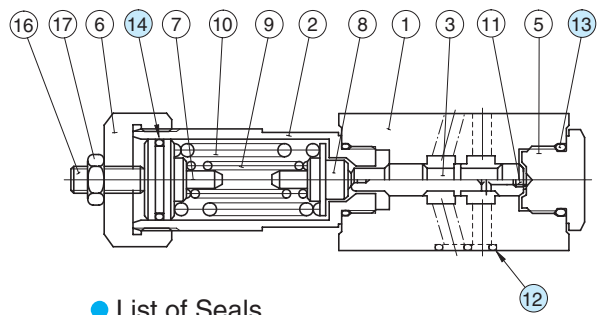
MBP-01-*-30



MBB-01-*-30



MBA-01-*-30



List of Seals

Item	Name of Parts	Part Numbers	Qty.
12	O-Ring	SO-NB-P9	4
13	O-Ring	SO-NB-P18	2
14	O-Ring	SO-NA-P20	1

Note: When ordering seals, please specify the seal kit number from the table below.

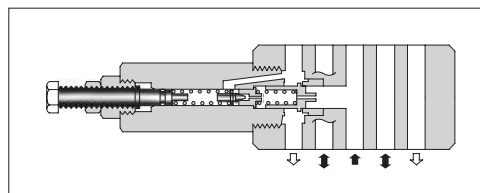
List of Seal Kit

Valve Model No.	Seal kit No.
MBP-01	KS-MBP-01-30
MBA-01	
MBB-01	

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

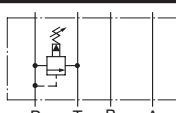
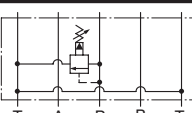
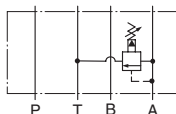
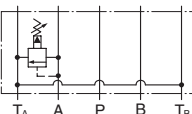
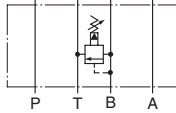
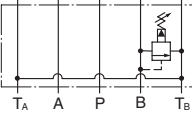
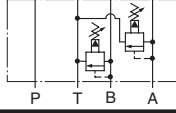
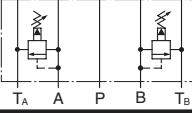
F-	MBA	-03	-B	-30	*
Special Seals	Series Number	Valve Size	Pres. Adj. Range MPa (PSI)	Design Number	Design Standard
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	MBP : Relief Valve for P-Line MBA : Relief Valve for A-Line MBB : Relief Valve for B-Line MBW : Relief Valve for 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

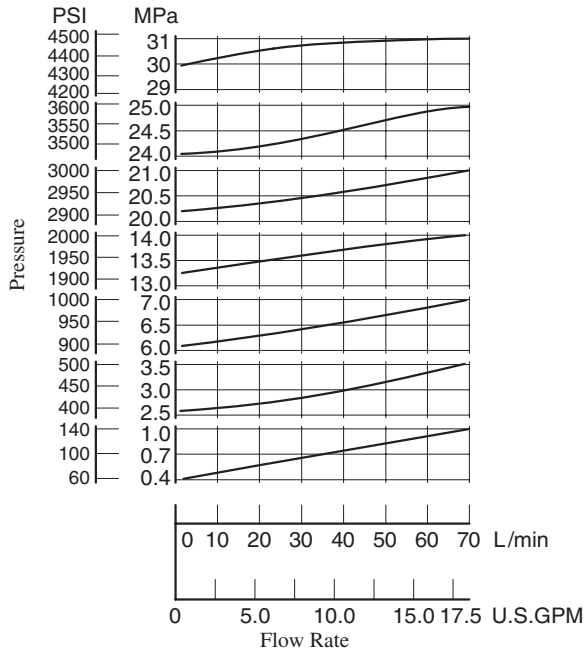
- The minimum adjustment pressure equals the value obtained from the minimum adjustment pressure characteristics plus the tank line back pressure of the [next page](#). This back pressure should include the value of the T-line pressure drop characteristics of the valves stacked to the base plate side 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		

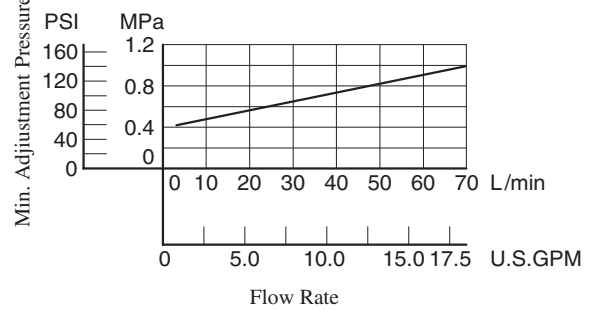
Typical Performance Characteristics

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

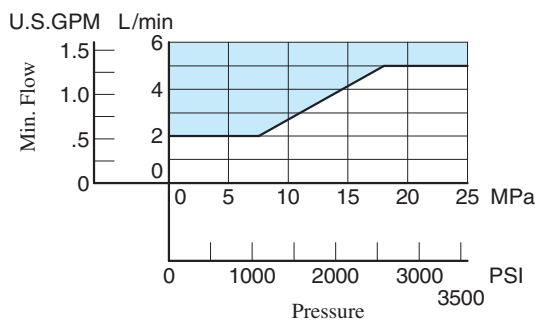
Nominal Override Characteristics



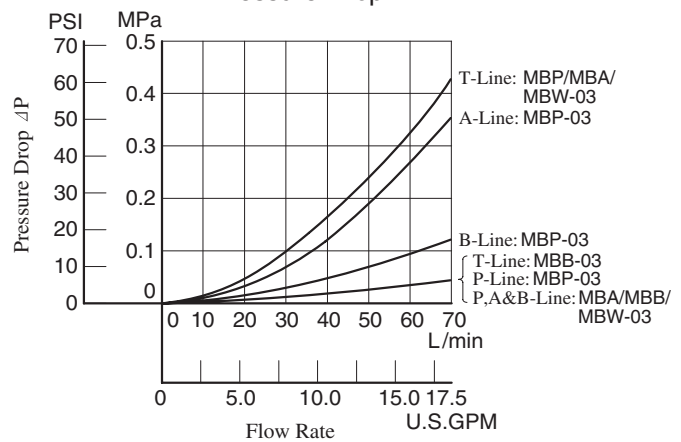
Min. Adjustment Pressure



Min. Flow vs. Adjustment Pressure



Pressure Drop

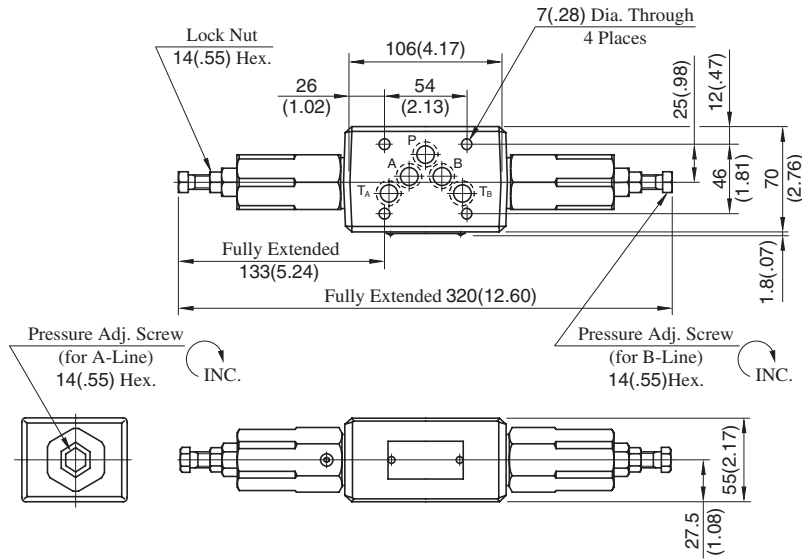


F

03 Series Modular Valves

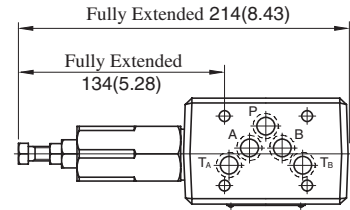
MBW-03-*-30

**DIMENSIONS IN
MILLIMETRES (INCHES)**



Approx. Mass.....3.8 kg (8.4 lbs.)

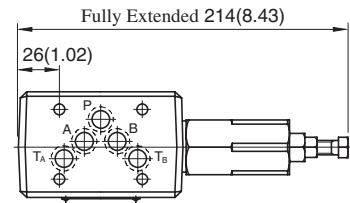
**MBP-03-*-30
MBA-03-*-30**



Approx. Mass.....3.1 kg (6.8 lbs.)

• For other dimensions, refer to "MBW-03" drawing left.

MBB-03-*-30

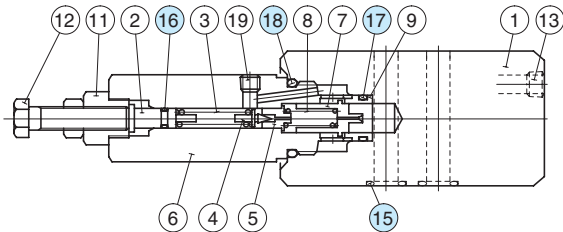


Approx. Mass.....3.1 kg (6.8 lbs.)

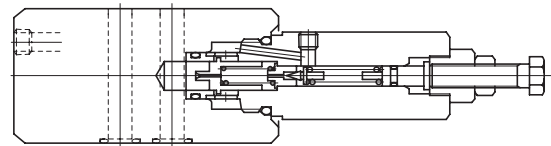
• For other dimensions, refer to "MBW-03" drawing left.

■ Spare Parts List

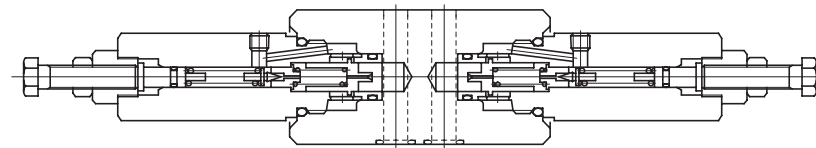
**MBP-03-*-30
MBA-03-*-30**



MBB-03-*-30



MBW-03-*-30



● List of Seals

Item	Name of Parts	Part Numbers	Quantity			
			MBP-03	MBA-03	MBB-03	MBW-03
15	O-Ring	SO-NB-A014	5	5	5	5
16	O-Ring	SO-NA-P6	1	1	1	2
17	O-Ring	SO-NB-P16	1	1	1	2
18	O-Ring	SO-NB-P26	1	1	1	2

Note: When ordering seals, please specify the seal kit number from the table right.

● List of Seal Kits

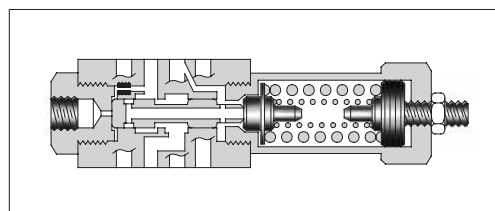
Valve Model Numbers	Seal kit Numbers
MBP-03	KS-MBP-03-30
MBA-03	
MBB-03	
MBW-03	KS-MBW-03-30

Reducing Modular Valves

Specifications

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

★ 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.



Model Number Designation

F-	MRP	-01	-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)	MRP: Reducing Valve for P-Line MRA: Reducing Valve for A-Line MRB: Reducing Valve for B-Line	01	B: *-7 (*-1020) ★ ¹ C: 3.5-14 (510-2030) H: 7-21 (1020-3050)	30	Refer to ★ ²

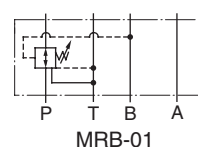
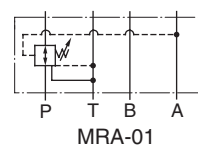
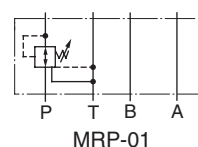
★¹ See the "Minimum Adjustment Pressure vs. Maximum Flow" of the next page for the item marked *.

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

Instructions

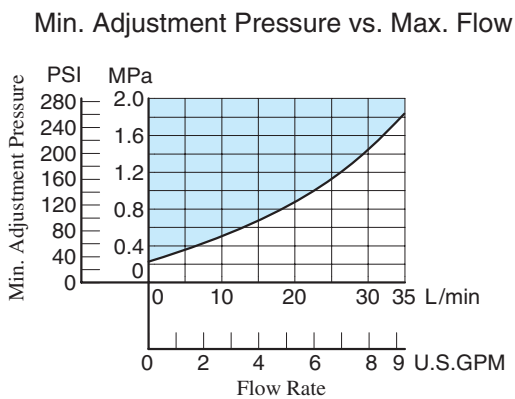
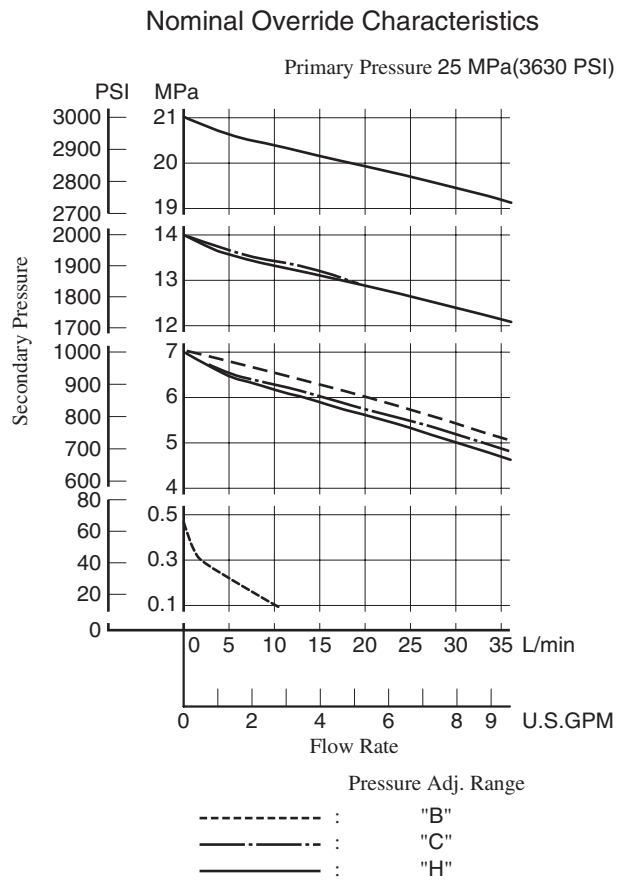
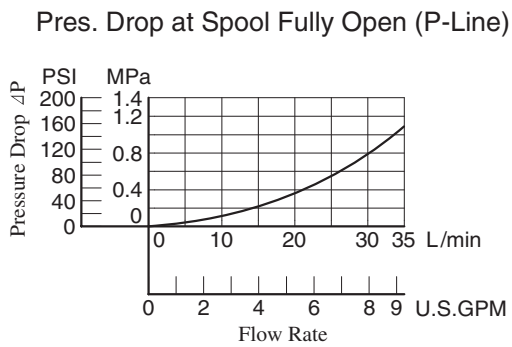
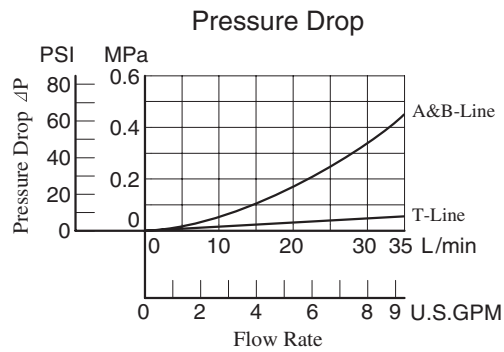
- The minimum adjustment pressure equals the value obtained from the minimum adjustment pressure characteristics plus the tank line back pressure of the next page. This back pressure should include the value of the T-line pressure drop characteristics of the valves stacked to the base plate side of the 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.

Graphic Symbols



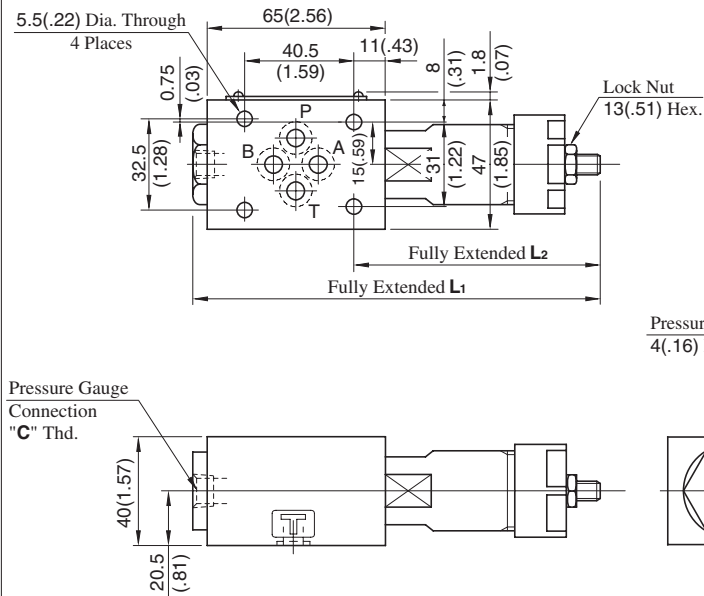
Typical Performance Characteristics

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



MRP-01-*-30/3090
MRA-01-*-30/3090
MRB-01-*-30/3090

DIMENSIONS IN
MILLIMETRES (INCHES)



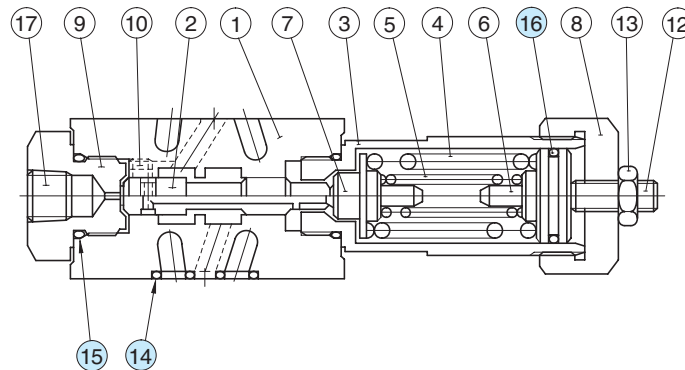
Model No.	L1	L2
MR*-01-B C	158 (6.22)	92 (3.62)
MR*-01-H	173.5 (6.83)	107.5 (4.23)

Model Numbers	Thread Size "C" Thd.
MR*-01-*-30	Rc 1/4 = 1/4 BSP.Tr
MR*-01-*-3090	1/4 NPT

Approx. Mass.....1.1 kg (2.4 lbs.)

Spare Parts List

MRP-01-*-30/3090
MRA-01-*-30/3090
MRB-01-*-30/3090



List of Seals

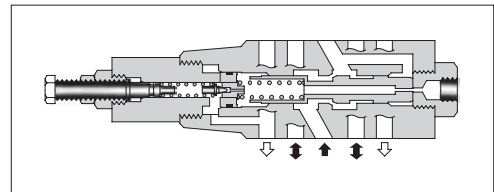
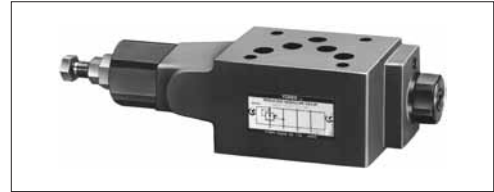
Item	Name of Parts	Part Numbers	Qty.	Remarks
14	O-Ring	SO-NB-P9	4	Included in Seal Kit Kit No.: KS-MBP-01-30
15	O-Ring	SO-NB-P18	2	
16	O-Ring	SO-NA-P20	1	

Reducing Modular Valves

Specifications

Model Numbers	Max. Operating Pressure MPa(PSI)	Max. Flow L/min (U.S.GPM)
MRP-03-* -30/3090 MRA-03-* -30/3090 MRB-03-* -30/3090	25 (3630)	70 (18.5) ★

★ In pressure adjustment range "H", if the pressure in the primary side is set above 20 MPa (2900 PSI) and the pressure in the secondary side is set below 10 MPa (1450 PSI), the maximum flow is limited to 50 L/min (13.2 U.S.GPM).



Model Number Designation

F-	MRP	-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)	MRP: Reducing Valve for P-Line MRA: Reducing Valve for A-Line MRB: Reducing Valve for B-Line	03	B: 1-7 (145-1020) H: 3.5-24.5 (510-3550)	30	Refer to ★

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

Instructions

- The minimum adjustment pressure equals the lower limit of either pressure adjustment range (B, H) 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.

Model Numbers	Graphic Symbols	Detailed Graphic Symbols
MRP-03		
MRA-03		
MRB-03		

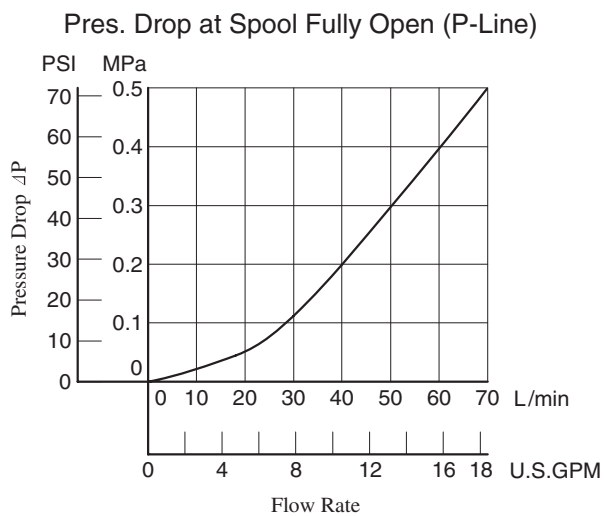
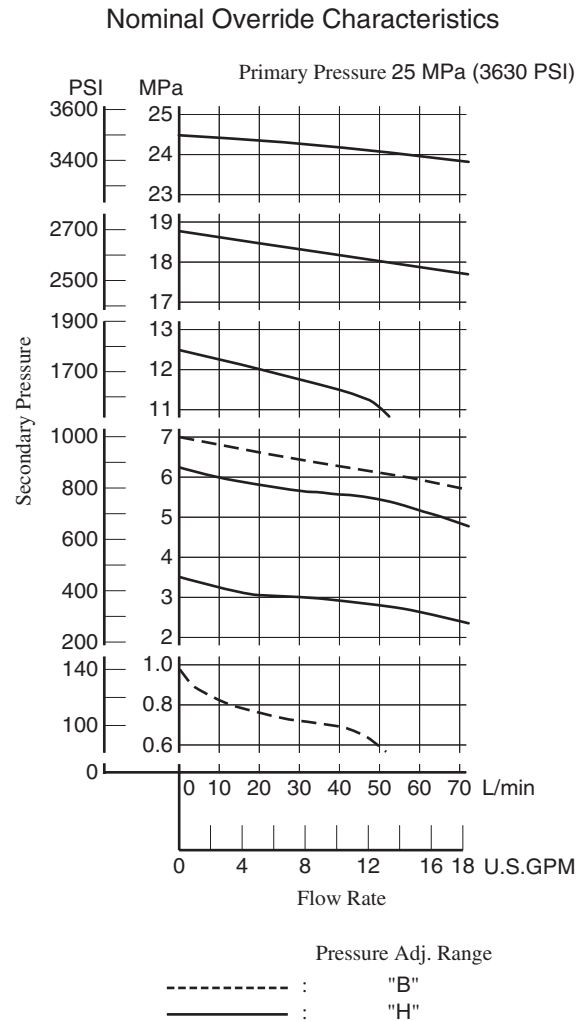
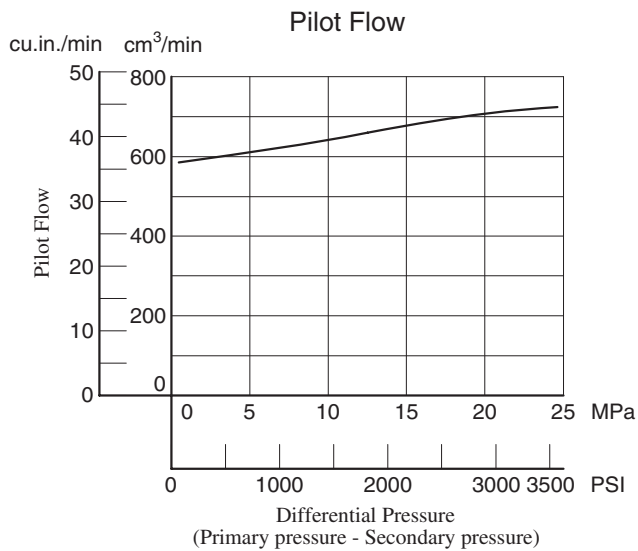
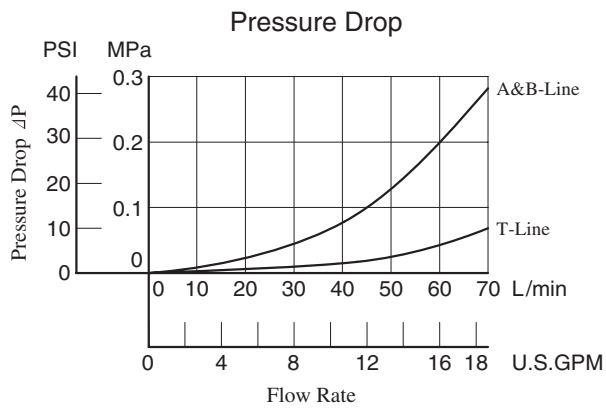
F



03 Series Modular Valves

■ Typical Performance Characteristics

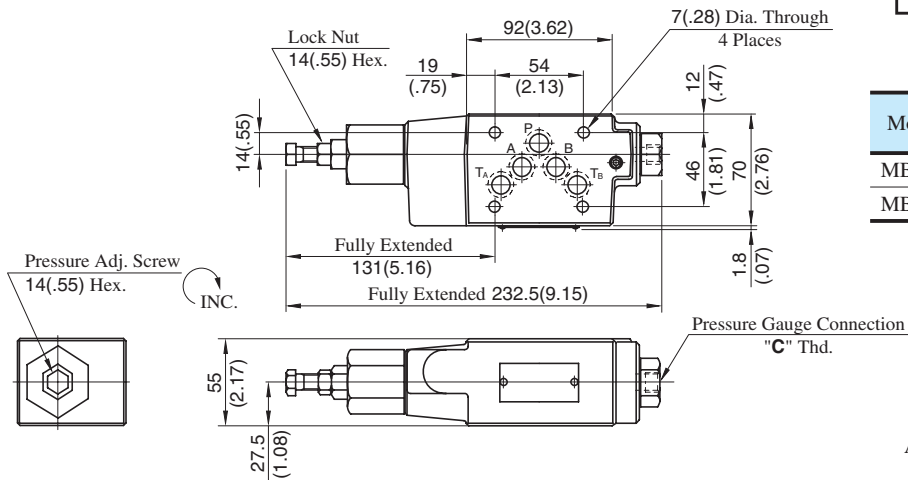
Hydraulic Fluid: Viscosity 35 mm²/s (164 SSU), Specific Gravity 0.850



MRP-03-*-30/3090

MRB-03-*-30/3090

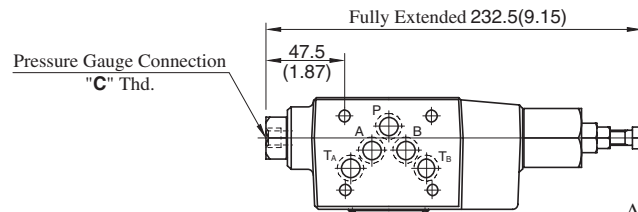
**DIMENSIONS IN
MILLIMETRES (INCHES)**



Model Numbers	Thread Size "C" Thd.
MB*-01-*-30	Rc 1/4 = 1/4 BSP.Tr
MB*-01-*-3090	1/4 NPT

Approx. Mass.....3.3 kg (7.5 lbs.)

MRA-03-*-30/3090



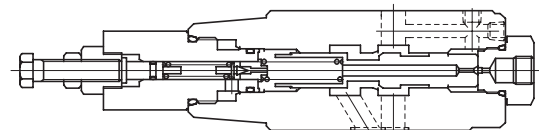
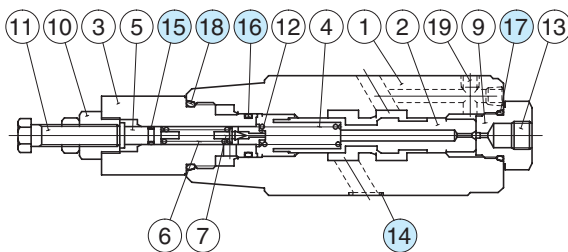
Approx. Mass.....3.3 kg (7.5 lbs.)

• For other dimensions, refer to "MRP-03" drawing above.

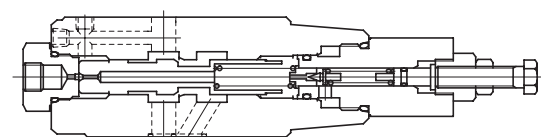
Spare Parts List

MRP-03-*-30/3090

MRB-03-*-30/3090



MRA-03-*-30/3090



List of Seals

Item	Name of Parts	Part Numbers	Qty.	Remarks
14	O-Ring	SO-NB-A014	5	Included in Seal Kit Kit No.: KS-MRP-03-30
15	O-Ring	SO-NA-P6	1	
16	O-Ring	SO-NB-P16	1	
17	O-Ring	SO-NB-P18	1	
18	O-Ring	SO-NB-P26	1	

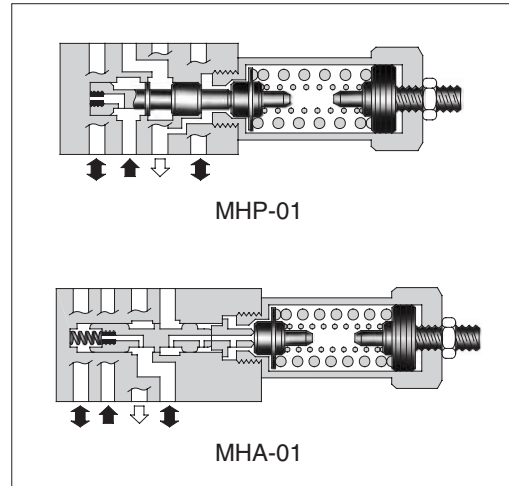
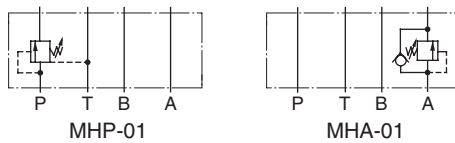
Sequence Modular Valves/Counterbalance Modular Valves

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



Model Number Designation

F-	MHP	-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)	MHP: Sequence Valve for P-Line MHB: Counterbalance Valve for A-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 *.

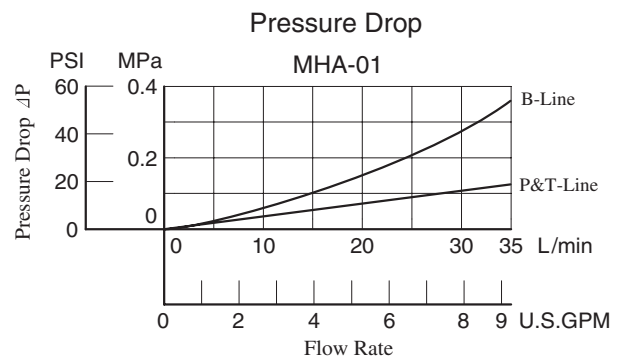
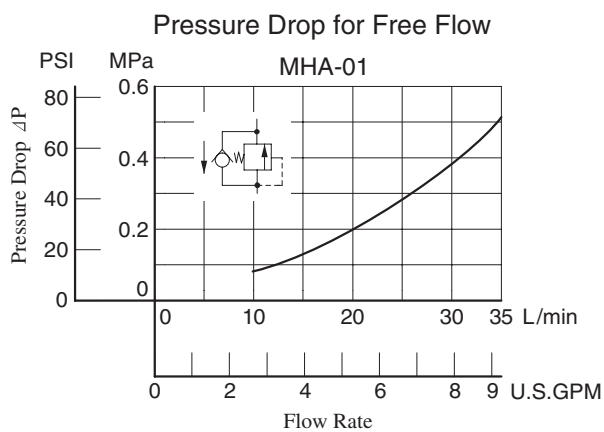
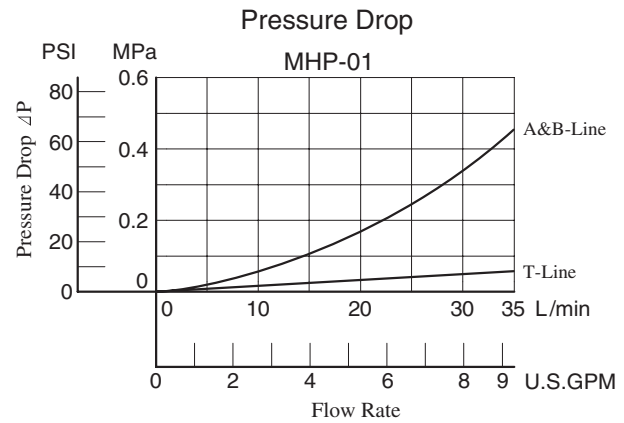
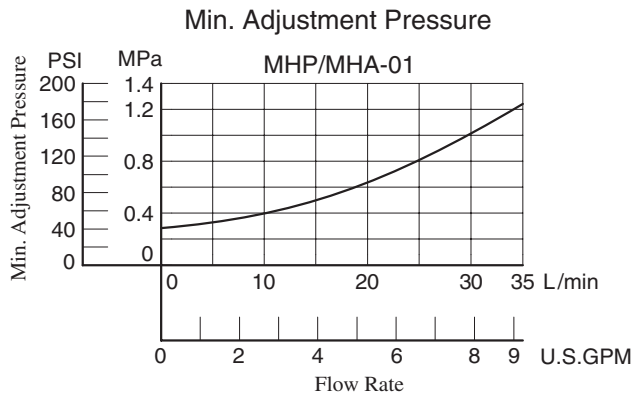
★². Design Standards: None Japanese Standard "JIS", European Design Standard and N. American Design Standard

Instructions

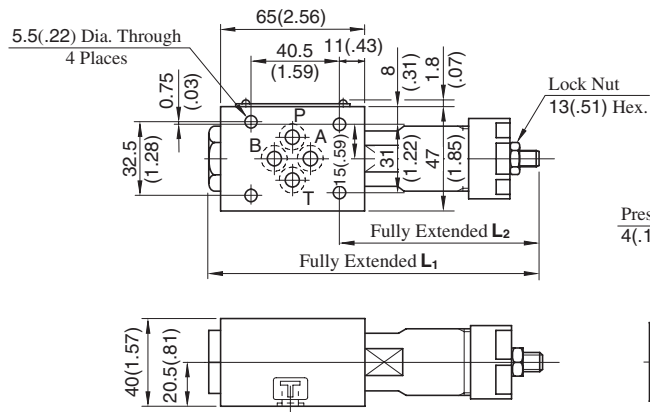
- The minimum adjustment pressure (MHP-01) equals the value obtained from the minimum adjustment pressure characteristics plus the tank line back pressure of the [next page](#). This back pressure should include the value of the T-line pressure drop characteristics of the valves stacked to the base plate 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.
- The minimum adjustment pressure (MHA-01) equals the value obtained from the minimum adjustment pressure characteristics plus the outlet-side back pressure of the valve on the [next page](#). The outlet-side back pressure should include the values of the A-line and T-line pressure drop characteristics of the valves to be stacked due to the valve with internal drain.

Typical Performance Characteristics

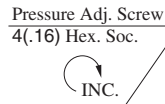
Hydraulic Fluid: Viscosity 35 mm²/s (164 SSU), Specific Gravity 0.850



MHP-01-*-30



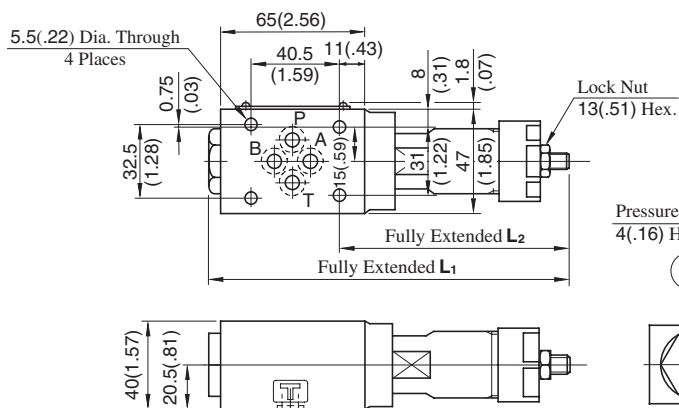
Model Numbers	L ₁	L ₂
MHP-01-C	151 (5.94)	92 (3.62)
MHP-01-H	166.5 (6.56)	107.5 (4.23)



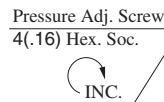
Approx. Mass.....1.1 kg (2.4 lbs.)

**DIMENSIONS IN
MILLIMETRES (INCHES)**

MHA-01-*-30



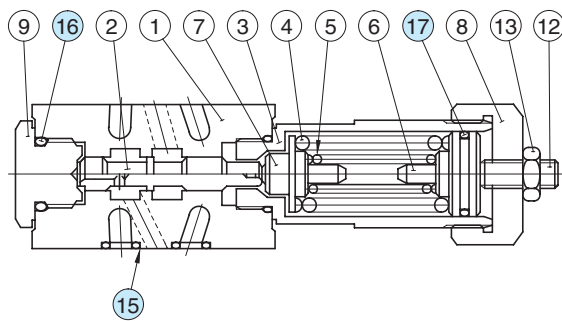
Model Numbers	L ₁	L ₂
MHA-01-C	171 (6.73)	112 (4.41)
MHA-01-H	186.5 (7.34)	127.5 (5.02)



Approx. Mass.....1.3 kg (2.9 lbs.)

Spare Parts List

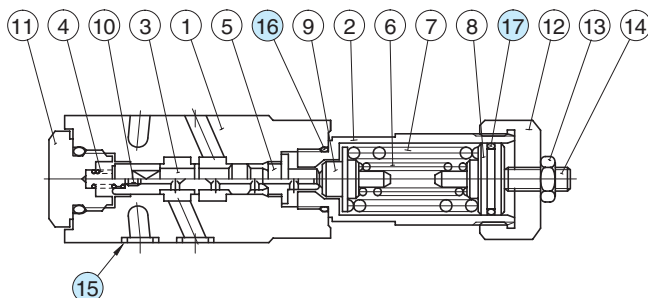
MHP-01-*-30



List of Seals

Item	Name of Parts	Part Numbers	Qty.	Remarks
15	O-Ring	SO-NB-P9	4	Included in Seal Kit Kit No.: KS-MBP-01-30
16	O-Ring	SO-NB-P18	2	
17	O-Ring	SO-NA-P20	1	

MHA-01-*-30



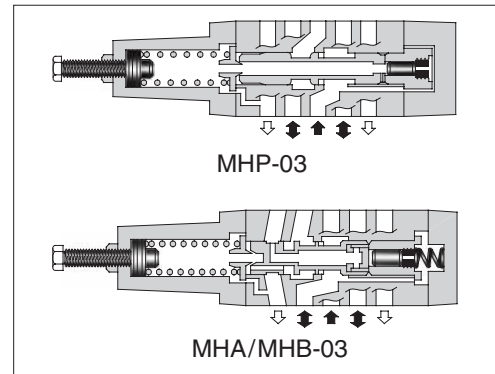
List of Seals

Item	Name of Parts	Part Numbers	Qty.	Remarks
15	O-Ring	SO-NB-P9	4	Included in Seal Kit Kit No.: KS-MHA-01-30
16	O-Ring	SO-NB-P18	2	
17	O-Ring	SO-NB-P20	1	

Sequence Modular Valves/Counterbalance Modular Valves

Specifications

Model Numbers	Max. Operating Pressure MPa (PSI)	Max. Flow L/min (U.S.GPM)	Max. Free Flow L/min (U.S.GPM)
MHP-03-*-20	25 (3630)	50 (13.2)	—
MHA-03-*-20			70 (18.5)
MHB-03-*-20			



Model Number Designation

F-	MHA	-03	-C	-20	*
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)	MHP: Sequence Valve for P-Line	03	N: *-1.8 (*-260) ★ ¹ A: 1.8-3.5 (260-510) B: 3.5-7 (510-1020) C: 7-14 (1020-2030)	20	Refer to ★ ²
	MHA: Counterbalance Valve for A-Line MHB: Counterbalance Valve for B-Line			20	

★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

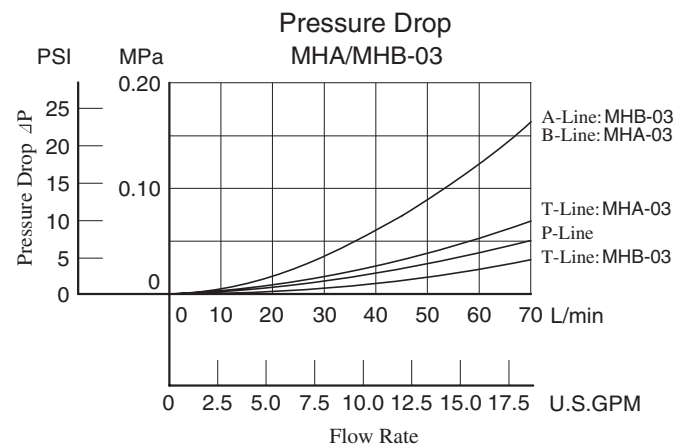
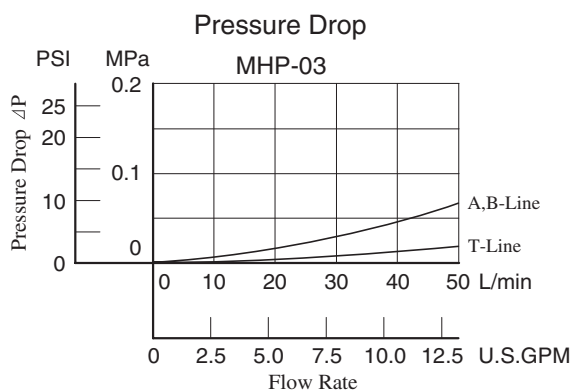
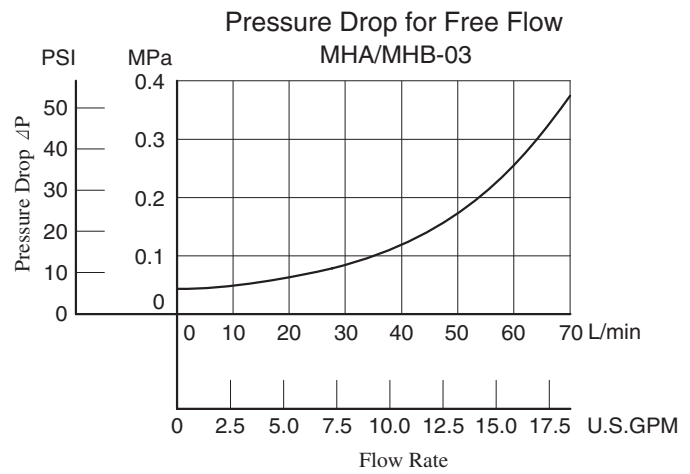
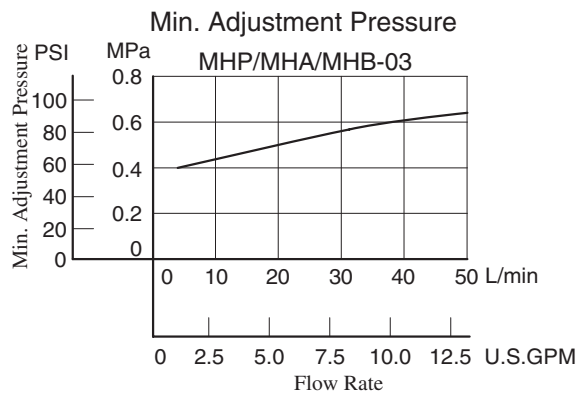
Instructions

- 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.

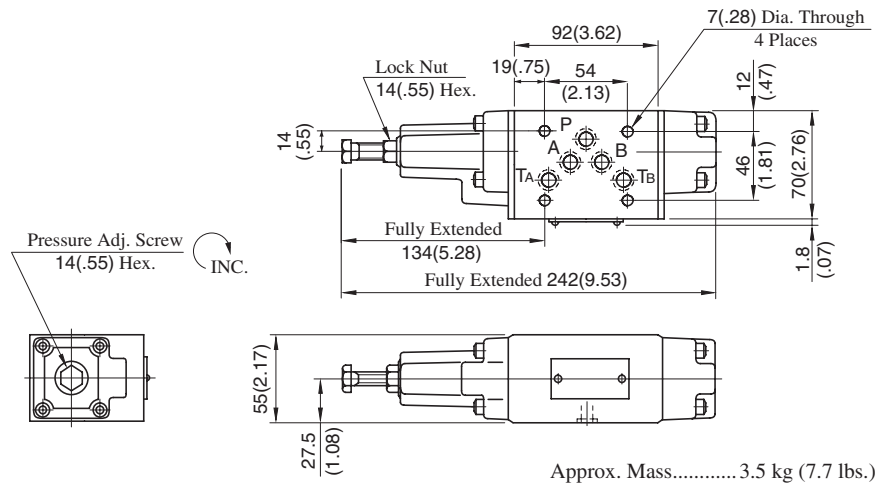
Model Numbers	Graphic Symbols	Detailed Graphic Symbols
MHP-03		
MHA-03		
MHB-03		

Typical Performance Characteristics

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

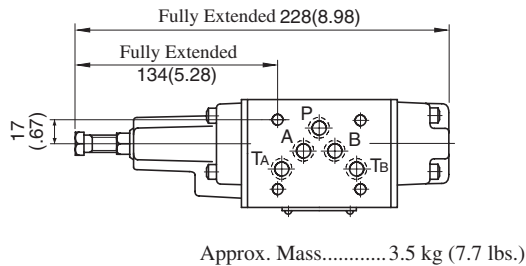


MHP-03-*-20

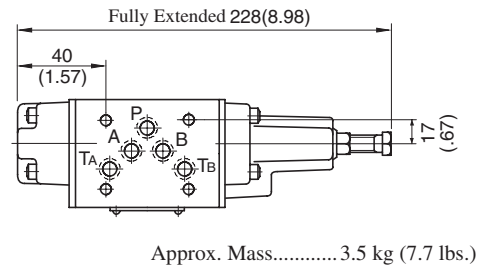


**DIMENSIONS IN
MILLIMETRES (INCHES)**

MHA-03-*-20



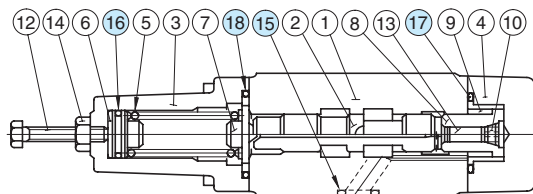
MHA-03-*-20



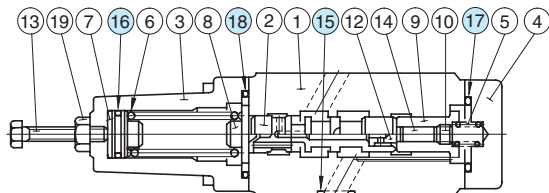
• For other dimensions, refer to "MHP-03" drawing above.

■ Spare Parts List

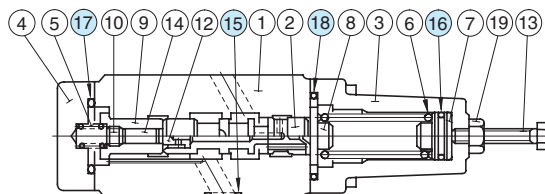
MHP-03-*-20



MHA-03-*-20



MHB-03-*-20



• **List of Seals**

MHP-03, MHA-03

Item	Name of Parts	Part Numbers	Qty.	Remarks
15	O-Ring	SO-NB-A014	5	Included in Seal Kit Kit No.:KS-MHP-03-20
16	O-Ring	SO-NB-P16	1	
17	O-Ring	SO-NB-P29	1	
18	O-Ring	SO-NB-P32	1	

MHB-03

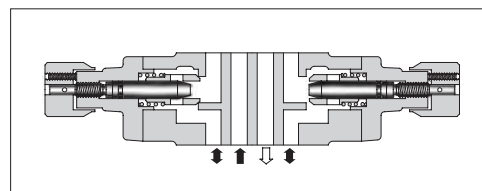
Item	Name of Parts	Part Numbers	Qty.	Remarks
15	O-Ring	SO-NB-A014	5	Included in Seal Kit Kit No.:KS-MHB-03-20
16	O-Ring	SO-NA-P16	1	
17	O-Ring	SO-NB-P29	1	
18	O-Ring	SO-NB-P32	1	

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.



Model Number Designation

F-	MSW	-01	-X	Y	-50	*
Special Seals	Series Number	Valve Size	Direction of Flow ("A" Line)	Direction of Flow ("B" Line)	Design Number	Design Standard
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	MSA : Throttle and Check Valve for A-Line	01	X: Metre-out Y: Metre-in	—	50	Refer to ★
	MSB : Throttle and Check Valve for B-Line		—	X: Metre-out Y: Metre-in		
	MSW : Throttle and Check Valve for A&B-Lines		X: Metre-out Y: Metre-in			
			X: Metre-out	Y: Metre-in		
			Y: Metre-in	X: Metre-out		

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

Instructions

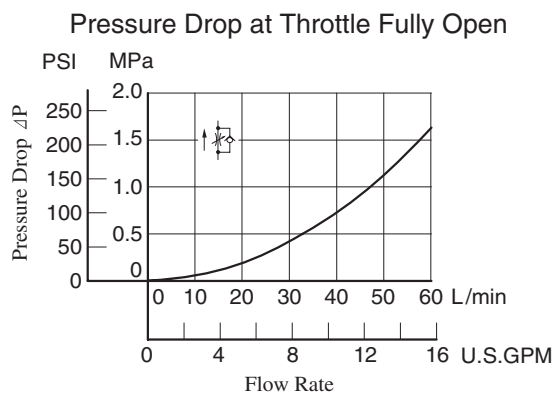
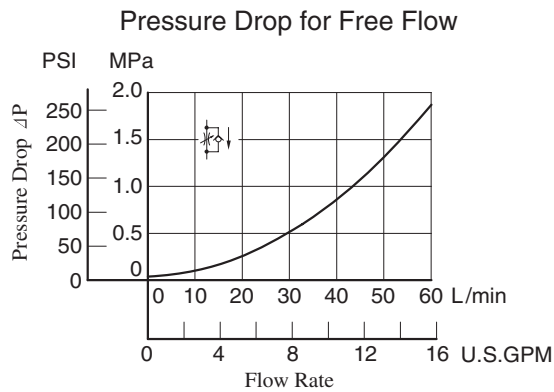
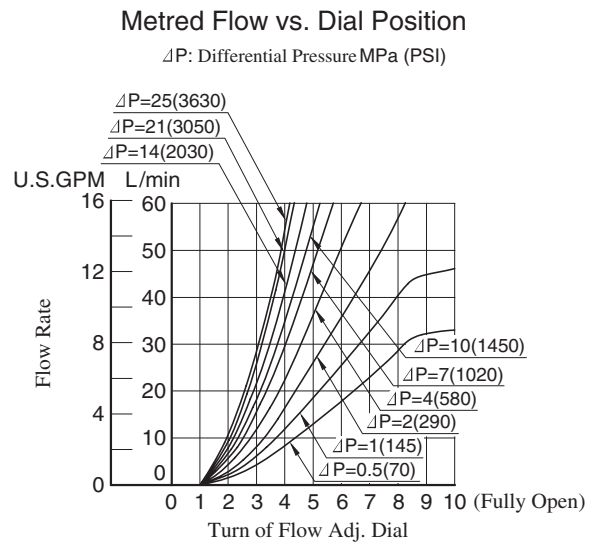
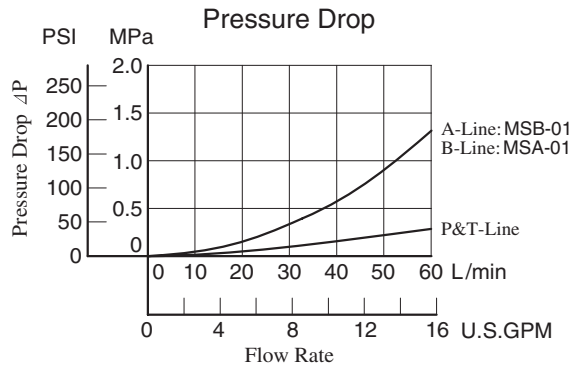
- To make flow rate adjustment, loosen locking screw for the dial and turn the flow adjustment dial clockwise or anti-clockwise. For a decrease of flow, turn the dial clockwise. Be sure to re-tighten the locking screw firmly after the adjustment of the flow rate.

Graphic Symbols

Metre-out	Metre-in
MSA-01-X	MSA-01-Y
MSB-01-X	MSB-01-Y
MSW-01-X	MSW-01-Y
Metre-out • Metre-in	Metre-in • Metre-out
MSW-01-XY	MSW-01-YX

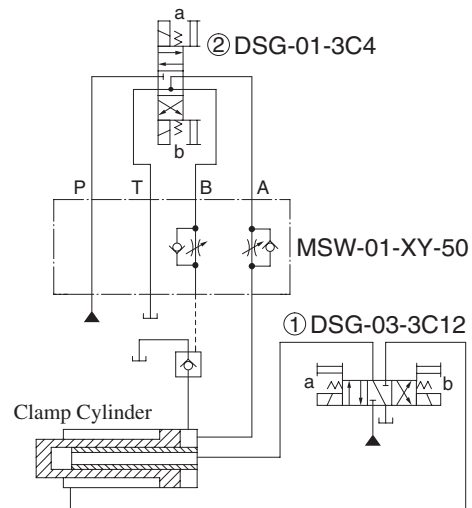
Typical Performance Characteristics

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



Application

Circuit of Clamp Cylinder for Injection Molding Machine

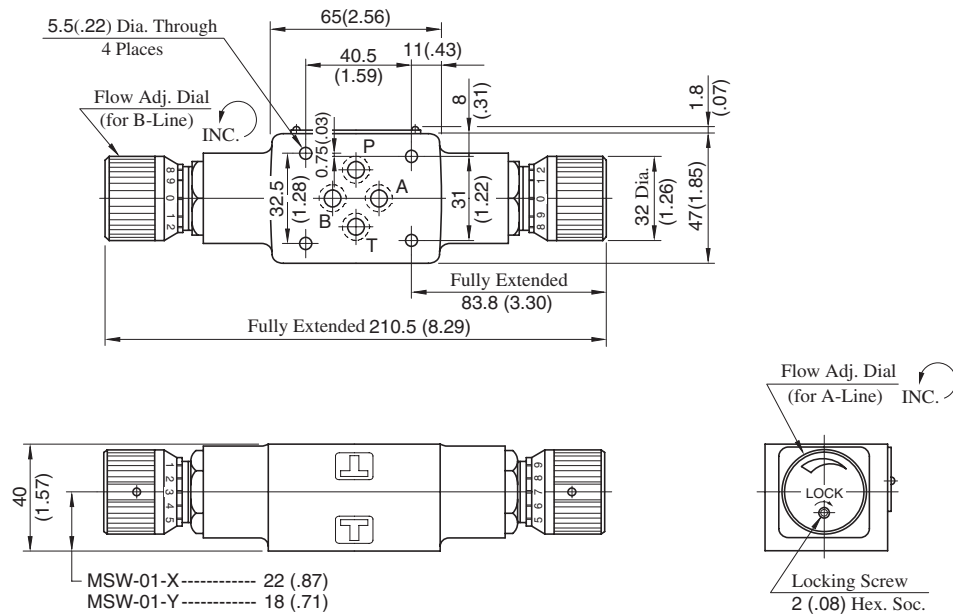


Operation Sequence

Clamp Cylinder	Advance	End Point Pressurisation	Decompression	Retreat
Solenoid Operated Directional Valve ①	Sol.a ON	→	Centre Position	Sol.b ON
Solenoid Operated Directional Valve ②	Sol.b ON	Sol.a ON	Sol.b ON	→

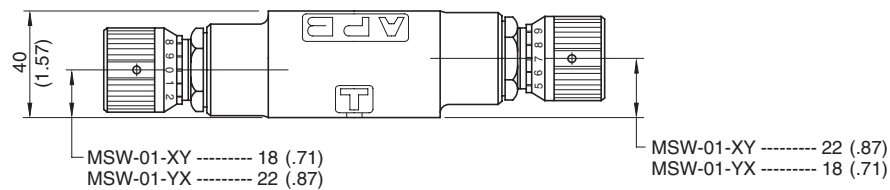
MSW-01-X_Y-50

DIMENSIONS IN
MILLIMETRES (INCHES)



Approx. Mass..... 1.5 kg (3.3 lbs.)

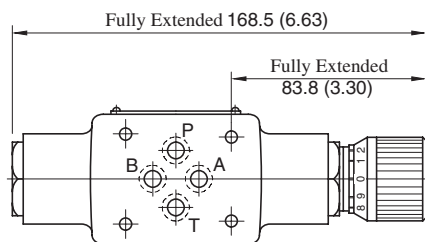
MSW-01-XY_{YX}-50



Approx. Mass..... 1.5 kg (3.3 lbs.)

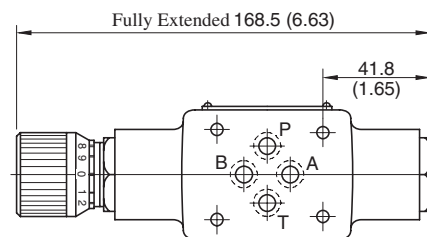
- For other dimensions, refer to "MSW-01-X_Y" drawing above.

MSA-01-X_Y-50



Approx. Mass..... 1.3 kg (2.9 lbs.)

MSB-01-X_Y-50



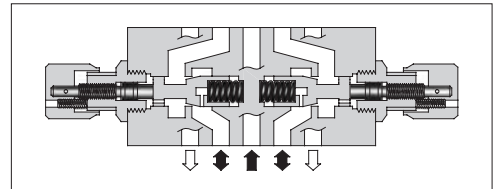
Approx. Mass..... 1.3 kg (2.9 lbs.)

- For other dimensions, refer to "MSW-01" drawing above.

Throttle and Check Modular Valves

Specifications

Model Numbers	Max. Operating Pressure MPa (PSI)	Max. Flow L/min (U.S.GPM)
MSA-03-*-40 MSB-03-*-40 MSW-03-*-40	25 (3630)	120 (31.7)



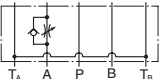
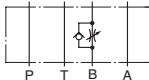
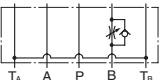
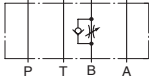
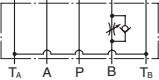
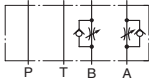
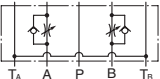
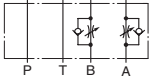
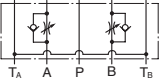
Model Number Designation

F-	MSW	-03	-X	-40	*
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)	MSA : Throttle and Check Valve for A-Line MSB : Throttle and Check Valve for B-Line MSW : Throttle and Check Valve for A&B-Lines	03	X : Metre-out Y : Metre-in	40	Refer to ★

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

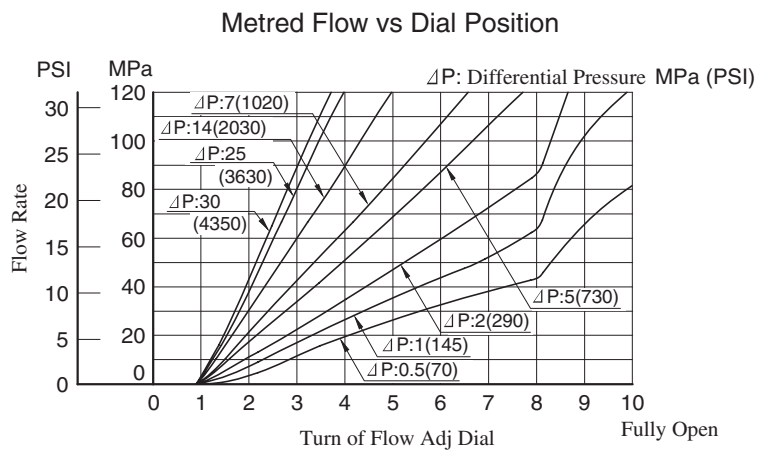
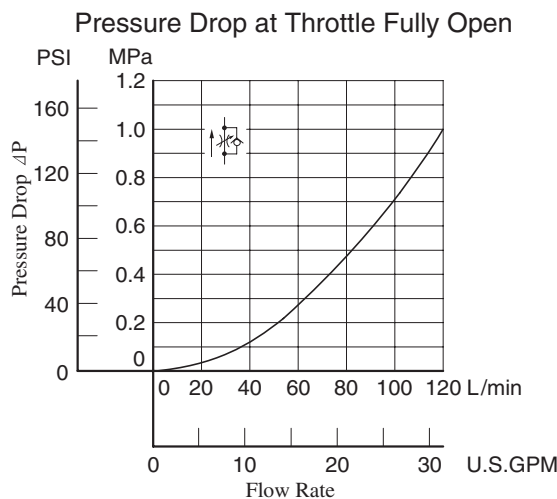
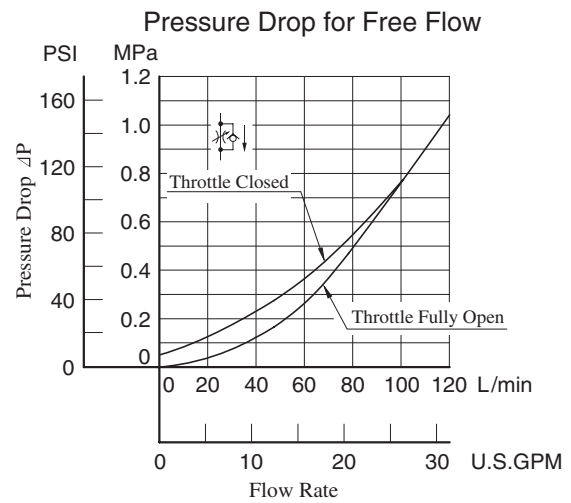
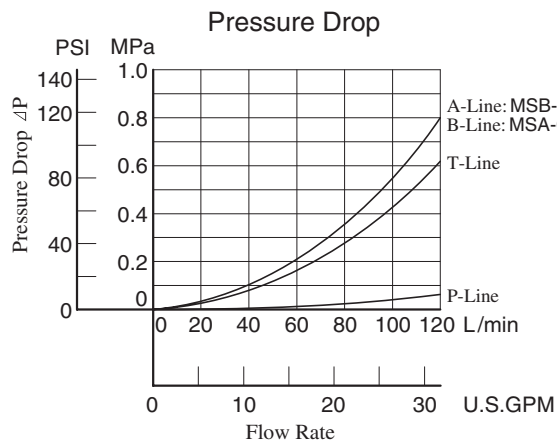
Instructions

- To make flow rate adjustment, loosen locking screw for the dial and turn the flow adjustment dial clockwise or anti-clockwise. For a decrease of flow, turn the dial clockwise. Be sure to re-tighten the locking screw firmly after the adjustment of the flow rate.

Model No.	Graphic Symbols	Detailed Graphic Symbols	Model No.	Graphic Symbols	Detailed Graphic Symbols
	Metre-out			Metre-in	
MSA-03-X			MSA-03-Y		
MSB-03-X			MSB-03-Y		
MSW-03-X			MSW-03-Y		

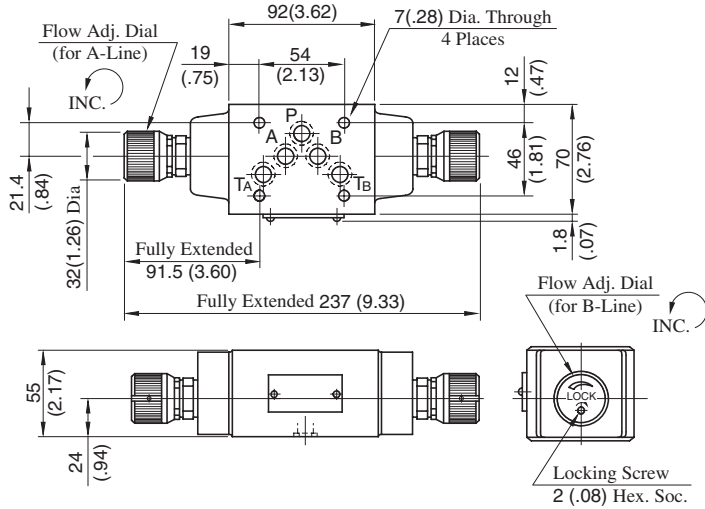
Typical Performance Characteristics

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



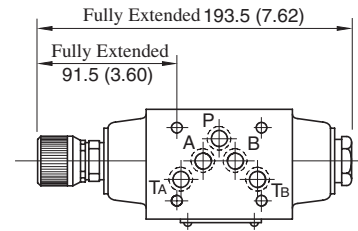
MSW-03-X-Y-40

**DIMENSIONS IN
MILLIMETRES (INCHES)**



Approx. Mass.....3.7 kg (8.2 lbs.)

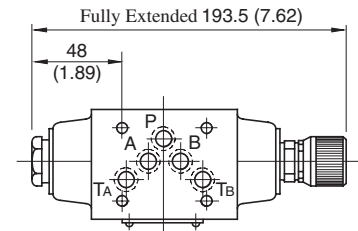
MSA-03-X-Y-40



Approx. Mass.....3.5 kg (7.7 lbs.)

• For other dimensions, refer to "MSW-03" drawing left.

MSB-03-X-Y-40

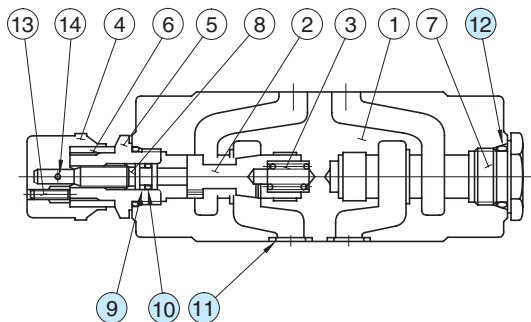


Approx. Mass.....3.5 kg (7.7 lbs.)

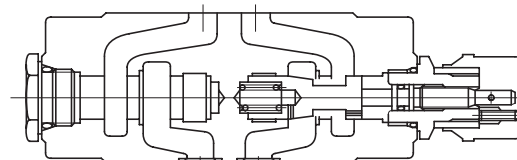
• For other dimensions, refer to "MSW-03" drawing left.

■ Spare Parts List

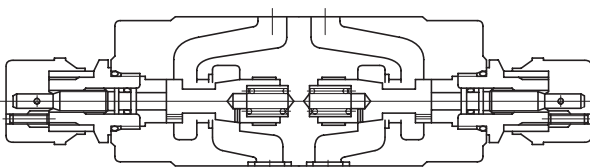
MSA-03-X-Y-40



MSB-03-X-Y-40



MSW-03-X-Y-40



● List of Seals

Item	Name of Parts	Part Numbers	Quantity		
			MSA-03	MSB-03	MSW-03
9	Back Up Ring	SO-BB-P8	1	1	2
10	O-Ring	SO-NA-P8	1	1	2
11	O-Ring	SO-NB-A014	5	5	5
12	O-Ring	SO-NB-P18	2	2	2

Note: When ordering seals, please specify the seal kit number from the table right.

● List of Seal Kits

Valve Model Numbers	Seal Kit Numbers
MSA-03	KS-MSA-03-40
MSB-03	
MSW-03	KS-MSW-03-40

Check Modular Valves

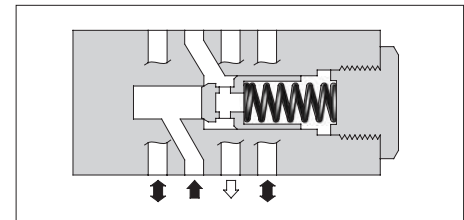
Specifications

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

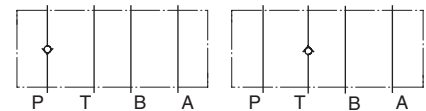
Model Number Designation

F-	MCP	-01	-0	-30	*
Special Seals	Series Number	Valve Size	Cracking Pressure MPa (PSI)	Design Number	Design Standard
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	MCP: Check Valve for P-Line MCT: Check Valve for T-Line	01	0: 0.035 (5) 2: 0.2 (29) 4: 0.4 (58)	30	Refer to ★

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



Graphic Symbols

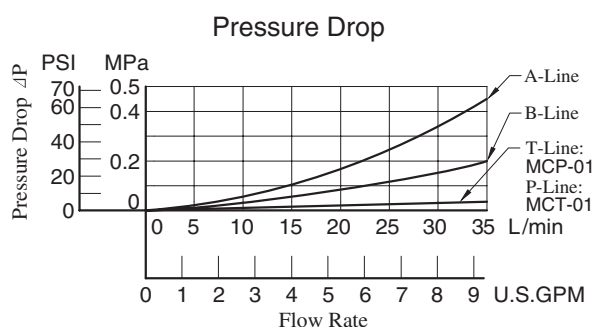
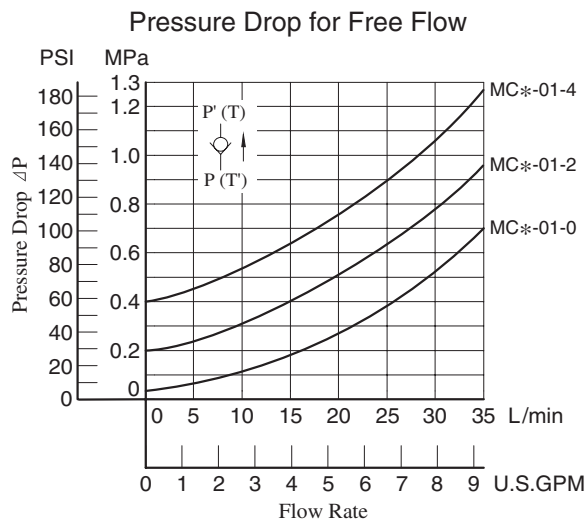


MCP-01

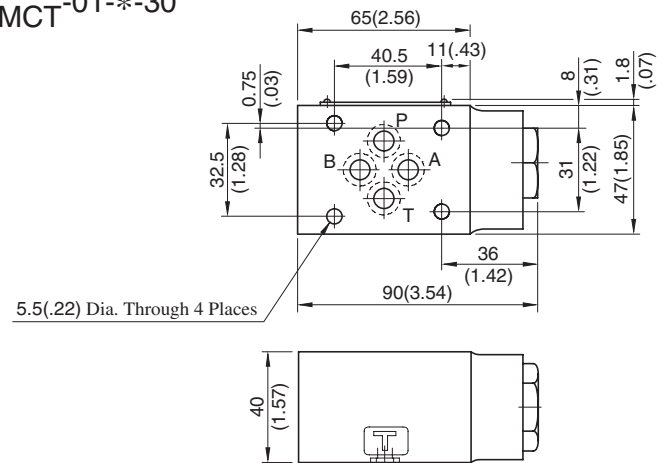
MCT-01

Typical Performance Characteristics

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

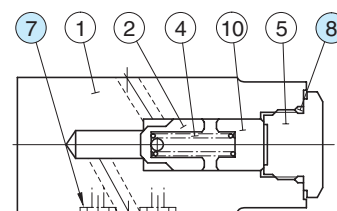


MCP
MCT-01-*-30



DIMENSIONS IN
MILLIMETRES (INCHES)

MCP
MCT-01-*-30



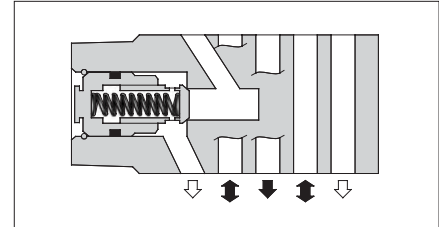
List of Seals

Item	Name of Parts	Part Numbers	Qty.	Remarks
7	O-Ring	SO-NB-P9	4	Included in Seal Kit
8	O-Ring	SO-NB-P18	1	Kit No.: KS-MCP-01-30

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)



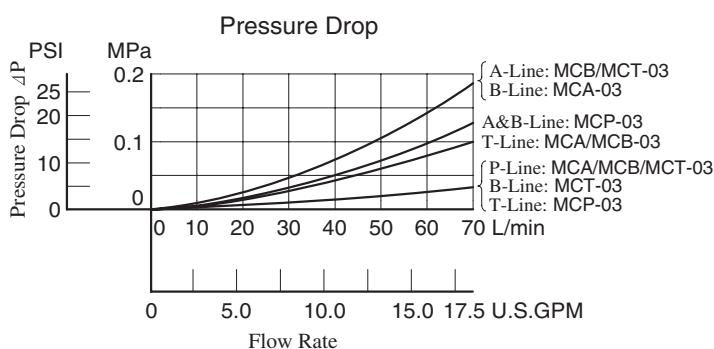
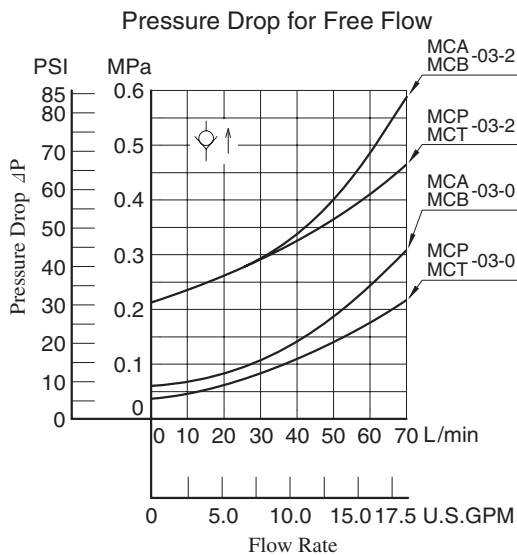
Model Number Designation

F-	MCP	-03	-0	-10	*
Special Seals	Series Number	Valve Size	Cracking Pressure MPa(PSI)	Design Number	Design Standard
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	MCP: Check Valve for P-Line	03	0: 0.035(5) 2: 0.2(29)	10	Refer to ★
	MCA: Check Valve for A-Line			20	
	MCB: Check Valve for B-Line			10	
	MCT: Check Valve for T-Line				

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

Typical Performance Characteristics

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



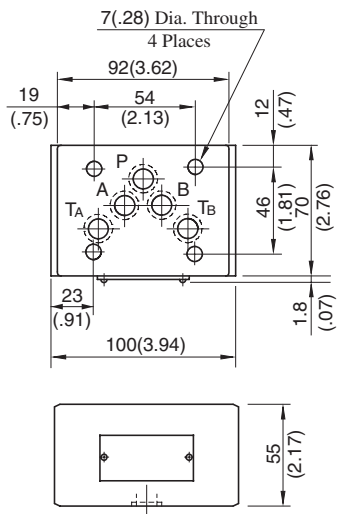
Model No.	Graphic Symbols	Detailed Graphic Symbols
MCP-03		
MCA-03		
MCB-03		
MCT-03		

Instructions

● Tank Line Used

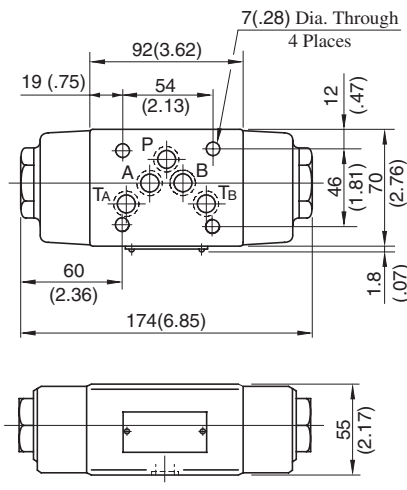
Check valve function of MCT-03 is included in T_A-Line. Therefore, the tank line for a circuit that uses this valve must be T_A-line.

MCP-03-*-10



Approx. Mass.....2.5 kg (5.5 lbs.)

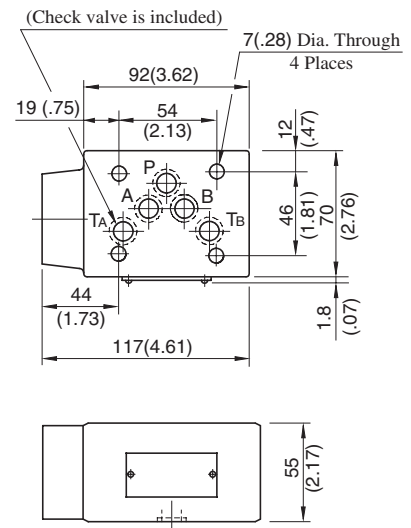
MCA-03-*-20 MCB-03-*-20



Approx. Mass.....3.5 kg (7.7 lbs.)

**DIMENSIONS IN
MILLIMETRES (INCHES)**

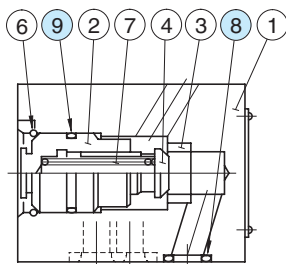
MCT-03-*-10



Approx. Mass.....2.8 kg (6.2 lbs.)

■ Spare Parts List

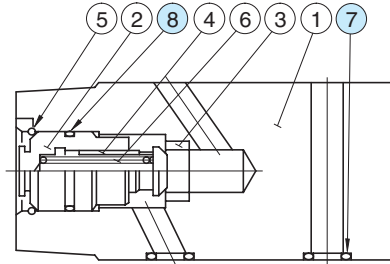
MCP-03-*-10



● List of Seals

Item	Name of Parts	Part Numbers	Qty.	Remarks
8	O-Ring	SO-NB-A014	5	Included in Seal Kit Kit No.: KS-MCP-03-10
9	O-Ring	SO-NB-P21	1	

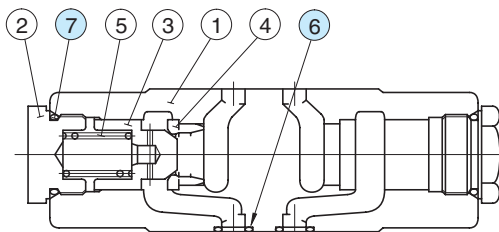
MCT-03-*-10



● List of Seals

Item	Name of Parts	Part Numbers	Qty.	Remarks
7	O-Ring	SO-NB-A014	5	Included in Seal Kit Kit No.: KS-MCP-03-10
8	O-Ring	SO-NB-P21	1	

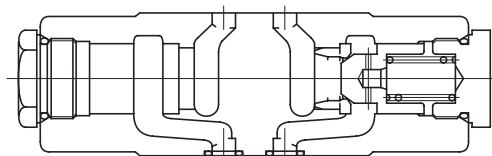
MCA-03-*-20



● List of Seals

Item	Name of Parts	Part Numbers	Qty.	Remarks
6	O-Ring	SO-NB-A014	5	Included in Seal Kit Kit No.: KS-MCA-03-20
7	O-Ring	SO-NB-P24	2	

MCB-03-*-20



Pilot Operated Check Modular Valves

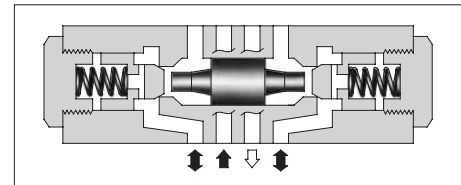
Specifications

Model Numbers		Max. Operating Pressure MPa (PSI)	Max. Flow L/min (U.S.GPM)
Standard	MP*-01-*-40	31.5 (4570)	35 (9.25)
Low Pilot Pressure Control Type	MP*-01-*-4001		

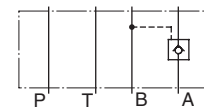
Model Number Designation

F-	MPA	-01	-2	-40	*
Special Seals	Series Number	Valve Size	Cracking Pressure MPa (PSI)	Design Number	Design Standard
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	MPA : Pilot Operated Check Valve for A-Line MPB : Pilot Operated Check Valve for B-Line MPW : Pilot Operated Check Valve for A&B-Lines	01	2 : 0.2 (29) 4 : 0.4 (58)	40 (Standard) 4001 (Low Pilot Pressure Control Type)	Refer to ★

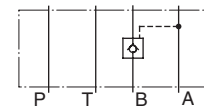
★ Design Standards: None Japanese Standard "JIS", European Design Standard and N. American Design Standard



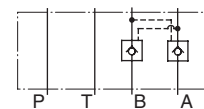
Graphic Symbols



MPA-01



MPB-01

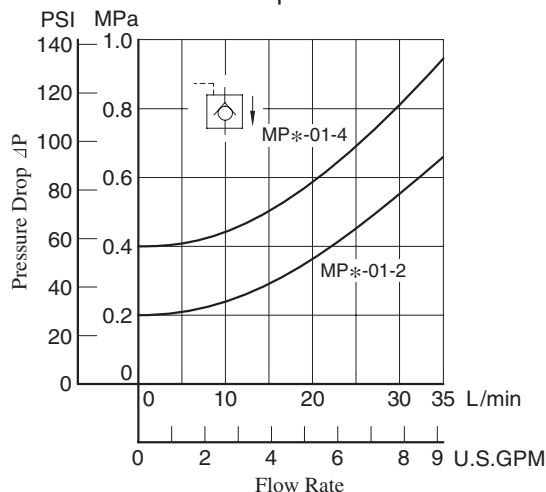


MPW-01

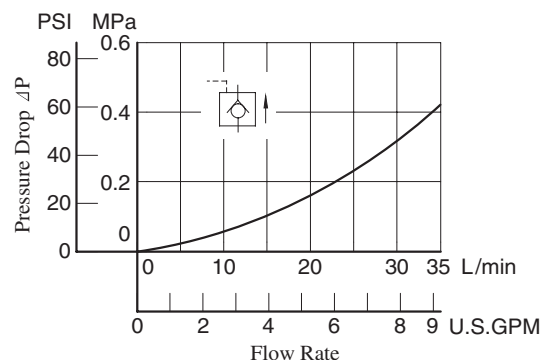
Typical Performance Characteristics

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

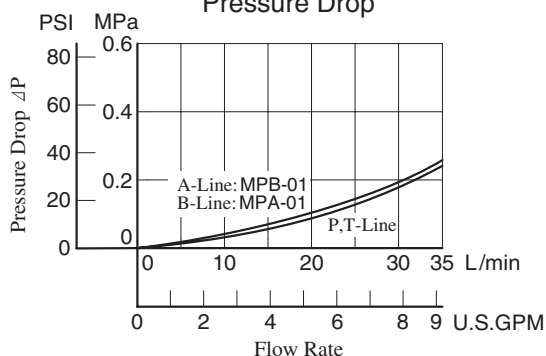
Pressure Drop for Free Flow



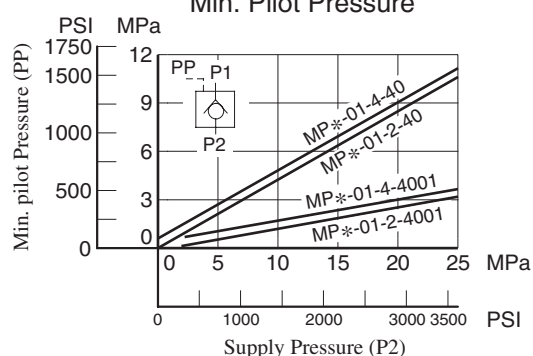
Pressure Drop for Reversed Controlled Flow



Pressure Drop

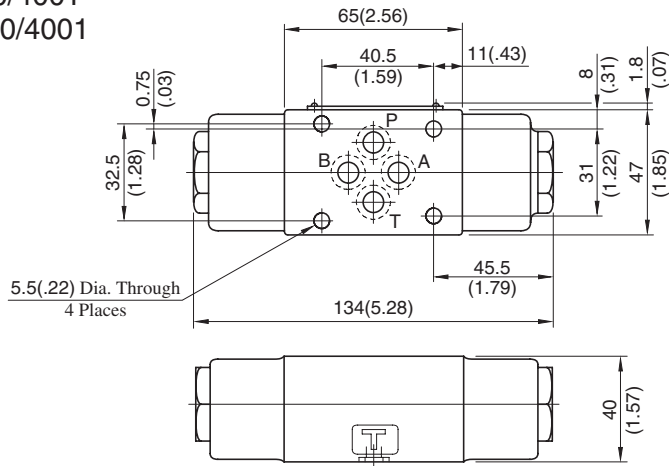


Min. Pilot Pressure



MPA-01-*-40/4001
MPB-01-*-40/4001
MPW-01-*-40/4001

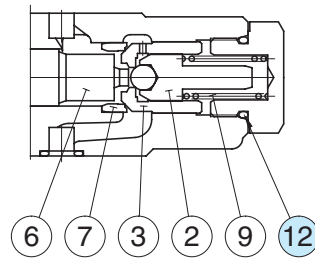
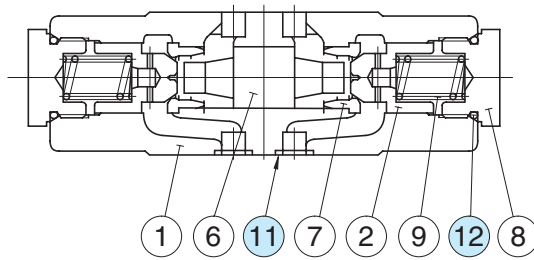
**DIMENSIONS IN
MILLIMETRES (INCHES)**



Approx. Mass..... 1.2 kg (2.6 lbs.)

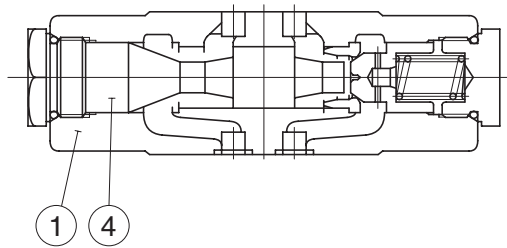
Spare Parts List

MPW-01-*-40

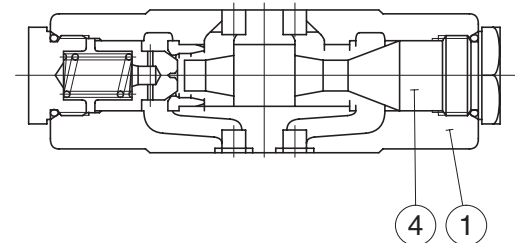


Low Pilot Pressure Control Type
(MPW-01-*-4001)

MPA-01-*-40



MPB-01-*-40



List of Seals

Item	Name of Parts	Part Numbers	Qty.	Remarks
11	O-Ring	SO-NB-P9	4	Included in Seal Kit Kit No.: KS-MAC-01-30
12	O-Ring	SO-NB-P18	2	

Pilot Operated Check Modular Valves

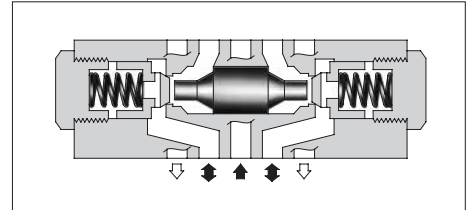
Specifications

Model Numbers		Max. Operating Pressure MPa (PSI)	Max. Flow L/min (U.S.GPM)
Standard	MP*-03-*-20	25 (3630)	70 (18.5)
Low Pilot Pressure Control Type	MP*-03-*-2001		



Model Number Designation

F-	MPA	-03	-2	-20	*
Special Seals	Series Number	Valve Size	Cracking Pressure MPa (PSI)	Design Number	Design Standard
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	MPA : Pilot Operated Check Valve for A-Line MPB : Pilot Operated Check Valve for B-Line MPW : Pilot Operated Check Valve for A&B-Lines	03	2 : 0.2 (29) 4 : 0.4 (58)	20 (Standard) 2001 (Low Pilot Pressure Control Type)	Refer to ★



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

Model No.	Graphic Symbols	Detailed Graphic Symbols
MPA-03		
MPB-03		
MPW-03		

Typical Performance Characteristics

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

