

F

MODULES

YUKEN's Modular Valves are stack type valves, and require no piping. They not only rationalise system build, but they also meet the technical requirements for a variety of hydraulic systems. Stacking systems is a new era in hydraulics.

The valves have standardized mounting surface conforming to ISO 4401 and optimum thickness for each size. Any hydraulic circuits can be easily composed by stacking the valves with mounting bolts. The valves can be used widely for hydraulic systems for various industries such as machine tools, special purpose machines, ships and steel mill equipment.

Valve Type	Max. Operating Pressure MPa (PSI)	Maximum Flow		Page
		L/min	U.S.GPM	
005 Series Modular Valves	25 (3630)	005		517
01 Series Modular Valves	31.5 (4570)	01	01 *	535
03 Series Modular Valves	25 (3630)	03	03 *	577
06 Series Modular Valves	25 (3630)	06		619
10 Series Modular Valves	25 (3630)	10		633

★ Maximum Flow for Throttle and Check Modular Valves.

Hydraulic Fluids

Fluid Types

Any type of hydraulic fluid listed in the table below can be used.

Petroleum Base Oils	Use fluids equivalent to ISO VG 32 or VG 46.
Synthetic Fluids	Use phosphate ester or polyol ester fluids. When phosphate ester fluid is used, prefix "F-" to the model number because the special seals (fluororubber) are required to be used.
Water-containing Fluids	Use water-glycol fluid.

Note: For use with hydraulic fluids other than those listed above, please consult your Yuken representatives in advance.

Recommended Fluid Viscosity and Temperature

Use hydraulic fluids which satisfy the both recommended viscosity and oil temperatures given in the table below.

Name	Viscosity	Temperature
005 Series Modular Valves	15 - 200 mm ² /s (77 - 900 SSU)	-15 - +60°C (5 - 140°F)
01 Series Modular Valves 03 Series Modular Valves 06 Series Modular Valves 10 Series Modular Valves	15 - 400 mm ² /s (77 - 1800 SSU)	-15 - +70°C (5 - 160°F)

Control of Contamination

Due caution must be paid to maintaining control over contamination of the hydraulic fluids which may otherwise lead to breakdowns and shorten the life of the valve.

Name	Contamination	Nominal Filtration
005 Series Modular Valves	Within NAS1638 - Grade 11	20 μm or less
01 Series Modular Valves 03 Series Modular Valves 06 Series Modular Valves 10 Series Modular Valves	Within NAS1638 - Grade 12	20 μm or less

High Pressure, High Flow Rate Modular Valves

Features

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

Specifications

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

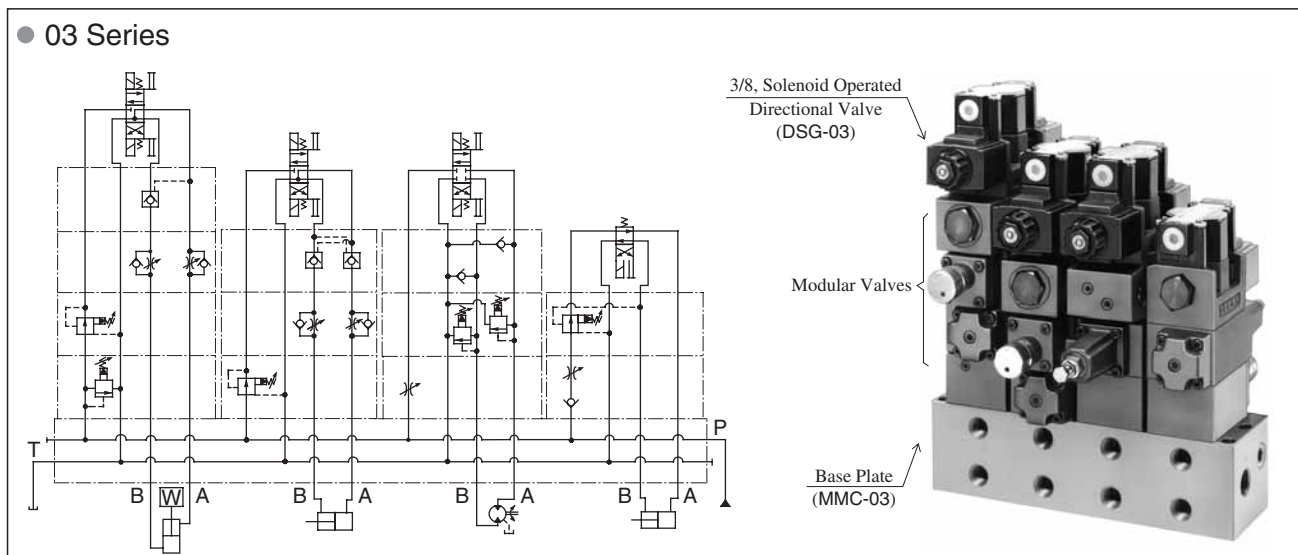
- ★ 1. The values in parentheses represent the max. flow rates for throttle modular valves (MSP) and throttle check modular valves (MSA/MSB/MSW).
- ★ 2. Solenoid operated directional valve is included in the number of stack.
- ★ 3. Solenoid operated directional valve is included in the number of stack.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

Mounting Surface

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

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

Stacking Example



Instructions

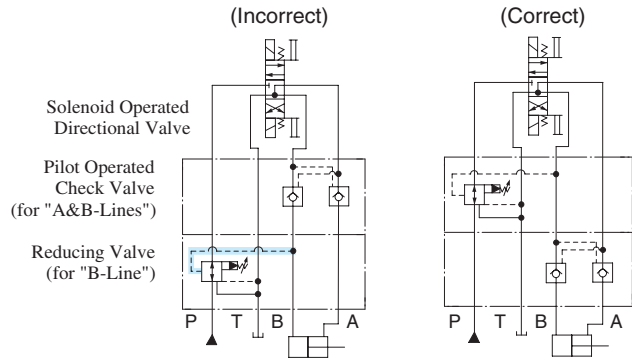
Caution in the selection of valves and circuit designing

The selection of modular valves, to suit a particular function or hydraulic circuit, are made in exactly the same way as conventional valves, taking into account of the flow and pressure of each valve to be used. In some cases, the stacking system may be restricted, so please refer to the following instructions for stacking sequence. Please note, that when designing a system using modular stacking valves, due consideration should be given to working space for future maintenance.

Stacking sequence when using reducing valves (for "A" or "B" line) and pilot operated check valves.

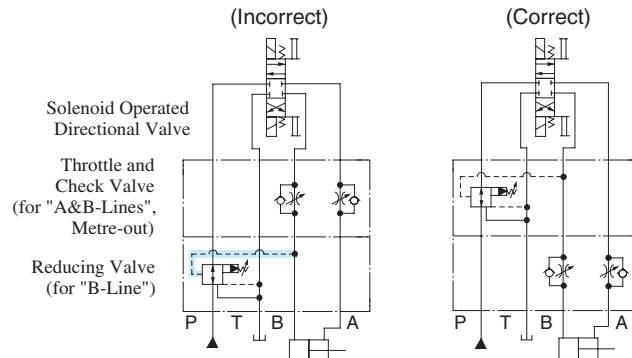
Because reducing valves are spool type, there is an internal leakage. In the stacking sequence shown in the drawing left (incorrect), the cylinder moves due to leakage through the pilot pressure line.

Consequently, retaining the position of the cylinder using a pilot operated check valve becomes impossible. The stacking sequence shown in the drawing right (correct) is required in order to retain the cylinder position.



Stacking sequence when using reducing valves (for "A" or "B" line) and throttle and check valves (for metre-out).

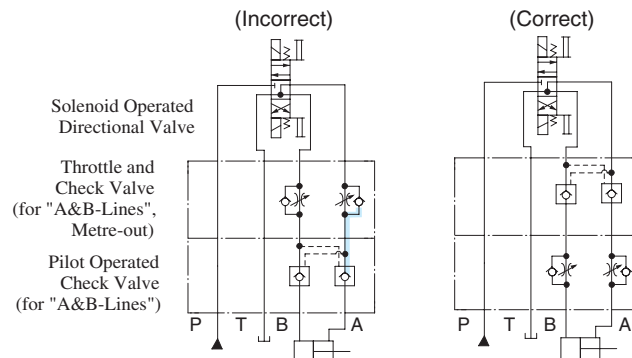
In B to T flow in the drawing left (incorrect), pressure is generated at part with a throttle effect of the throttle and check valve. Depending upon the pressure so generated, the reducing valve may perform a pressure reducing function which causes a shortage of output power of the cylinder and spoils the smooth operation of the cylinder. Therefore, stacking sequence in the drawing right (correct) is required in this combination.



Stacking sequence when using pilot operated check valves and throttle and check valves (metre-out).

In A to T flow in the drawing left (incorrect), pressure is generated at part with a throttle effect of the throttle and check valve.

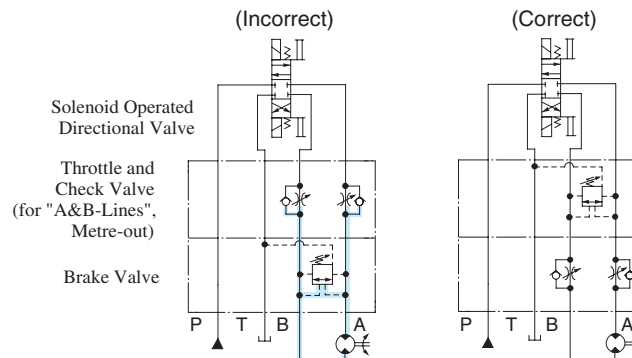
The pressure so generated acts to shut the pilot operated check valve and eventually creates an open and shut operation of the valve repeatedly which may cause the cylinder to have a knocking effect (the same effect will occur in the case of B to T flow). Therefore, the stacking sequence in the drawing right (correct) is required in this combination.



Stacking sequence when using brake valves and throttle and check valves.

In the drawing left (incorrect), pressure is generated at part (a load pressure and a back pressure from throttle effect). For structural reasons of the brake valve, the load pressure and back pressure act to open the valve, therefore, the setting pressure should be more than the pressure equal to the load pressure plus back pressure ($P_a + P_b$). If the setting pressure is less than $P_a + P_b$, the brake valve acts and brakes the movement of the actuator in operation, this eventually reduces the speed of the actuator.

On the contrary, if the setting pressure is more than $P_a + P_b$, shock may occur when braking the actuator since the setting pressure is too high against the load pressure. Therefore, the stacking sequence in the drawing right (correct) is required in this combination.



Base Plates and Sub-Plates

When mounting the modular valves, use base plates and sub-plates specified below. If these base plates and the sub-plates are not used, ensure that the mounting surface has a good machined finish.

Series	Base Plates		Sub-Plates	
	Model Numbers	Page	Model Numbers	Page
005 Series	MMC-005-*-20	531	DSGM-005*-20	342
01 Series	MMC-01-*-40	573	DSGM-01*-31	356
03 Series	MMC-03-T-*-21	615	DSGM-03*-40	373
06 Series	Consult your Yuken representative in advance.	—	DHGM-06*-50	402
10 Series		—	DHGM-10*-40	403

Assembly

Assembly should be carried out in clean conditions and in accordance with the following procedure. Cautious attention should be paid to ensure that the interface of the valves are clean and free from dirt or other foreign materials.

Assembly Procedure:

- 005 Series
 - 1) To stack modular valves and solenoid operated directional valves according to circuit requirements, match the O-ring surfaces to the mounting surface and check the alignment of the locating pins.
 - 2) Align the right and left sides of the stacked valves.
 - 3) Tighten the four mounting bolts to the specified tightening torque.
 - 4) Perform an operational test and re-check mounting bolt torque, re-tightening if required.
- 01-10 Series
 - 1) Screw-in the four stud bolts(06 and 10 series: six stud bolts), fully into the tapped holes on the mounting surface of the specified base plate, sub-plate or manifold.
 - 2) Stack the modular valves and solenoid operated directional valves in accordance with the hydraulic circuit, place the O-ring inserted surface face onto the base plate and make sure that the port arrangement of the modular valves are in the correct position before stacking the valves onto the stud bolts.
 - 3) Align both the end of the valves stacked.
 - 4) Screw-in the four nuts(06 and 10 series: six nuts) onto the stud bolts and tighten with the specified torque. After the test run, be sure to re-tighten the nuts firmly within the specified torque.

Pressure Drop

Pressure drop curves of the modular valves are those based on viscosity of 35 mm²/s (164 SSU) and specific gravity of 0.850.

When using the modular valves in conditions other than the above mentioned, find the appropriate values referring to the following table and formula.

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

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

- For any other specific gravity (G'), the pressure drop ($\Delta P'$) may be obtained from the following formula.

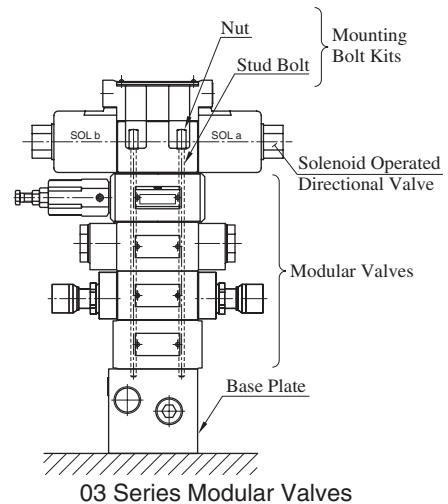
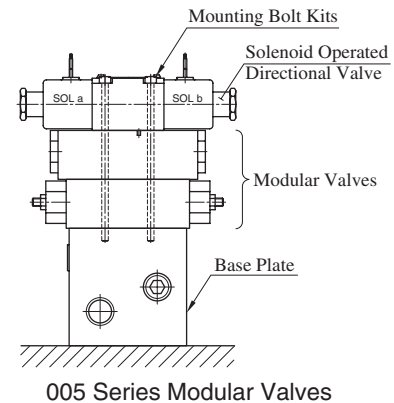
$$\Delta P' = \Delta P (G'/0.850)$$

Mounting Bolts

Modular valves are mounted using stud bolts which are supplied in a kit form. When mounting, see the following table for tightening torque. After the test run, be sure to tighten again firmly within the specified torque.

Series	Bolt Kit Model Numbers	Tightening Torque Nm (in. lbs.)
005 Series	MBK-005-*-20	2.5-3.5 (22-31)
01 Series	MBK-01-*-30	5-6[6-7] (44-53[53-62])*
03 Series	MBK-03-*-10	12-15 (106-133)
06 Series	MBK-06-*-30	50-60 (443-531)
10 Series	MBK-10-*-10	150-170 (1330-1505)

★ The value range in parentheses represents the tightening torque requirements if the operating pressure is above 25 MPa (3630 PSD).

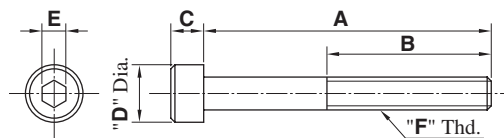


■ Interchangeability in Installation between Current and New Design

The model changed for the following models have been made.

Models	Model Numbers		Mtg. Interchangeability	Main changes	
	Current	New			
005 Series	Throttle and Check Modular Valves	MSW-005-*-10	^A MSB-005-*-20 _W	Yes	<ul style="list-style-type: none"> ● Modification for large flow use. ● Addition of the valve for A & B lines.
	Pilot Operated Check Modular Valves	^B MP _W -005-2-10	^A MPB-005-2-20 _W	Yes	<ul style="list-style-type: none"> ● Modification for large flow use. ● Addition of the valve for A lines.
	Base Plates	MMC-005-*-10	MMC-005-*-20	Yes	Change of the port hole dia. for large flow use (3.4 Dia. → 4.3 Dia.).
	Bolt Kits	MBK-005-*-10	MBK-005-*-20	Yes	<ul style="list-style-type: none"> ● Addition of bolt kit for 4-stage stacking. ● Change the bolt kit model numbers to conform to the required bolt length for the 01 to 10 series (See the table below for details.)
01 Series	Throttle Modular Valves	MSP-01-30	MSP-01-50	Yes	Modification for large flow use.
	Throttle and Check Modular Valves	^A MSB-01-**-40 _W	^A MSB-01-**-50 _W	Yes	Improved Controllability and Operatability.
03 Series	Relief Modular Valves	MB*-03-*-20	MB*-03-*-30	Yes	Higher Operating Pressure.
	Reducing Modular Valves	^P MRA-03-*-20 _B	^P MRA-03-*-30 _B	Yes	Modification for large flow use.

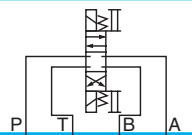
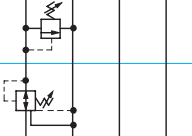
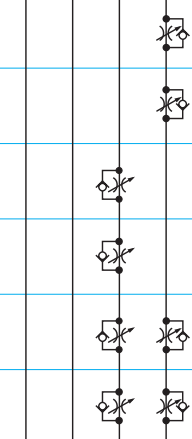
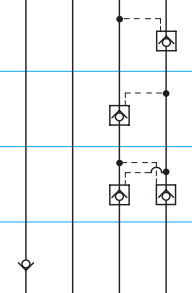
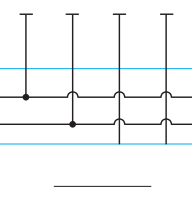
■ Comparison of MBK-005 bolt kit model numbers



Bolt Kit Model Numbers		Dimensions mm (Inches)					"F" Thd.	The number of the laminating steps quantity of valves to be stacked including solenoid operated directional Valve
(New) 20 Design	(Old) 10 Design	A	B	C	D	E		
MBK-005-01-20	MBK-005-02-10	65(2.56)	20 (0.79)	4 (0.16)	7 (0.28)	3 (0.12)	M4	2
MBK-005-02-20	MBK-005-03-10	95(3.74)						3
MBK-005-03-20	—————	125(4.92)						4
MBK-005-05-20	MBK-005-05-10	35(1.38)						1
MBK-005-01-2090	MBK-005-02-1090	65.1(2-9/16)	22.4 (0.88)	4.17 (0.164)	6.86 (0.27)	3.6 (9/64)	No.8-32 UNC	2
MBK-005-02-2090	MBK-005-03-1090	95.2(3-3/4)						3
MBK-005-03-2090	—————	125.4(4-15/16)						4
MBK-005-05-2090	MBK-005-05-1090	34.9(1-3/8)						1

005 Series Modular Valves

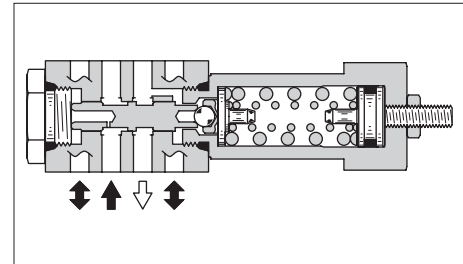
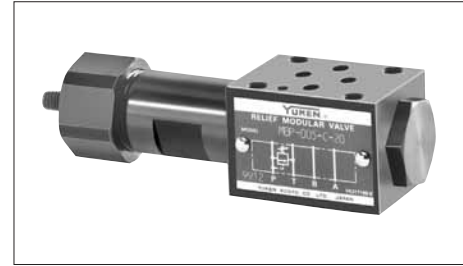
Type of Modular Valve

Class	Model Numbers	Graphic Symbols	Page
	Solenoid Operated Directional Valve DSG-005-***-*-40		336
Pressure Control Valves	Relief Valves (for "P-Line") MBP-005-*-20		518
	Reducing Valves (for "P-Line") MRP-005-*-20/2090		521
Flow Control Valves	Throttle and Check Valves (for "A-Line", Metre-out) MSA-005-X-20		524
	Throttle and Check Valves (for "A-Line", Metre-in) MSA-005-Y-20		
	Throttle and Check Valves (for "B-Line", Metre-out) MSB-005-X-20		
	Throttle and Check Valves (for "B-Line", Metre-in) MSB-005-Y-20		
	Throttle and Check Valves (for "A&B-Lines", Metre-out) MSW-005-X-20		
	Throttle and Check Valves (for "A&B-Lines", Metre-in) MSW-005-Y-20		
Directional Control Valves	Pilot Operated Check Valves (for "A-Line") MPA-005-2-20		527
	Pilot Operated Check Valves (for "B-Line") MPB-005-2-20		
	Pilot Operated Check Valves (for "A&B-Lines") MPW-005-2-20		
	Check Valves (for "P-Line") MCP-005-0-20		
Modular Plates and Mounting Bolts	End Plates (Blocking plates) MDC-005-A-20		530
	Base Plates MMC-005-*-20/2080/2090		531
	Bolts Kits MBK-005-*-20/2090		534

Relief Modular Valves

Specifications

Model Numbers	Max. Operating Pressure MPa (PSI)	Max. Flow L/min (U.S.GPM)
MBP-005-*-20	25 (3630)	15 (3.96)



Model Number Designation

F-	MBP	-005	-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)	MBP : Relief Valve for P-Line	005	C: *-16 ^{★1} (*-2320) H: 7-25 (1020-3630)	20	Refer to ^{★2}

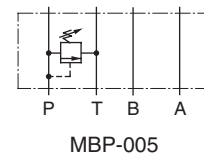
★ 1. See the "Minimum Adjustment Pressure" of the next page for the item marked *.

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

Instructions

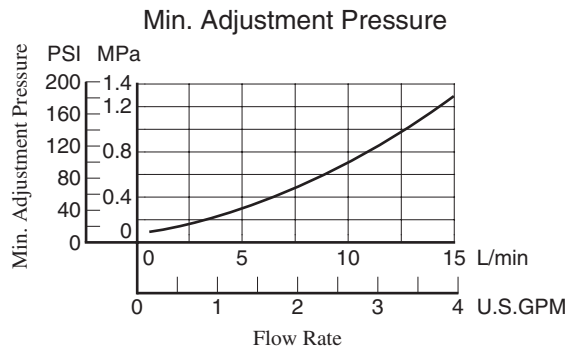
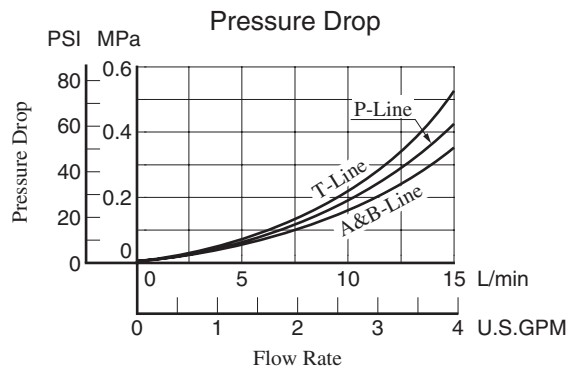
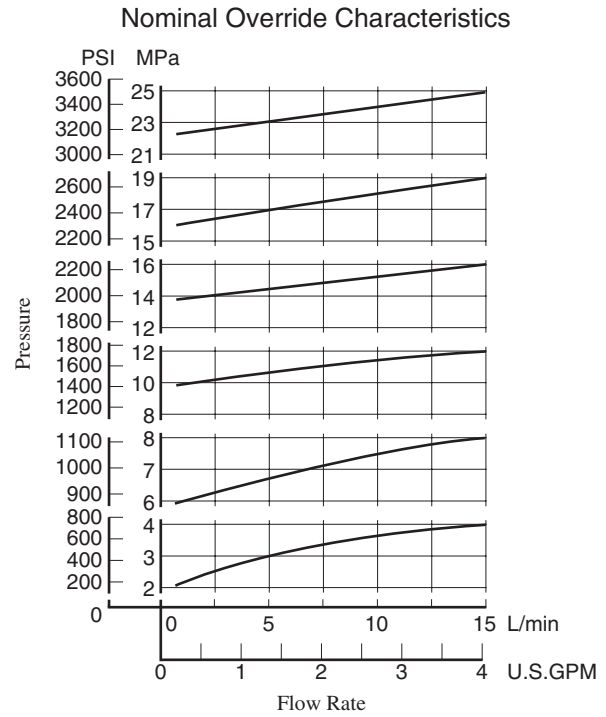
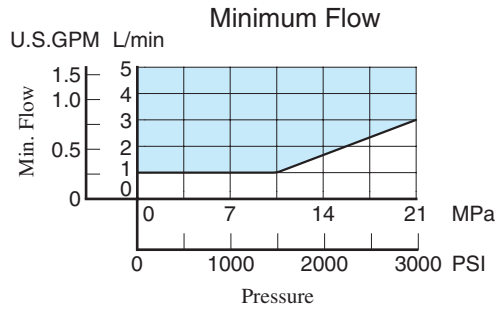
- The minimum adjustment pressure equals the value obtained from the minimum adjustment pressure characteristics plus the tank line back pressure of the next page. This back pressure should include the value of the T-line pressure drop characteristics of the valves stacked to the base plate side of the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



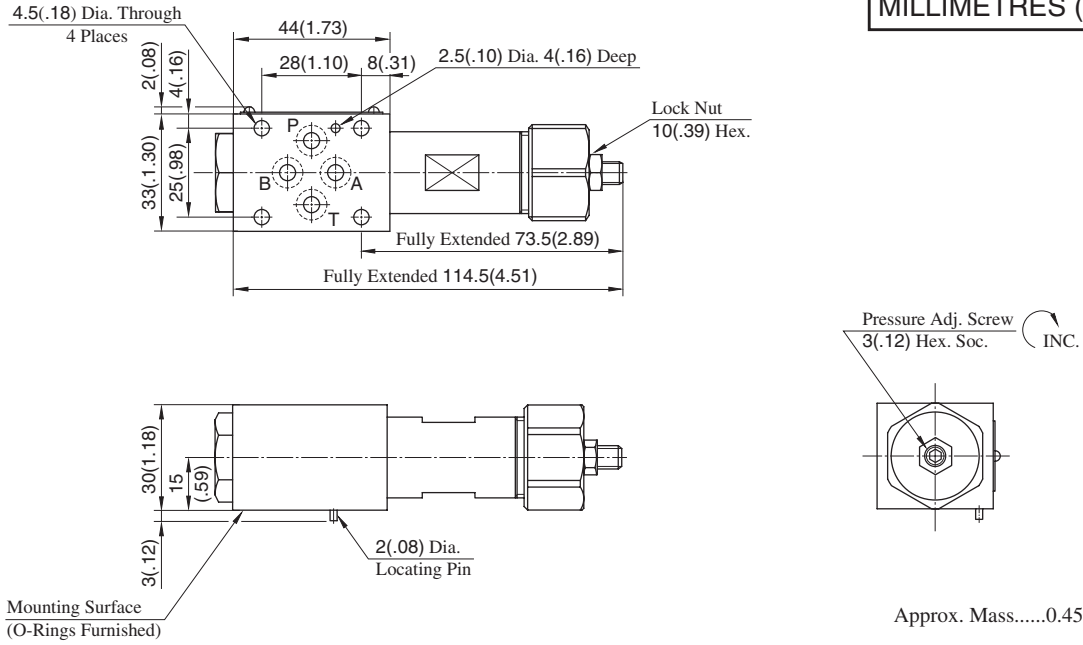
Typical Performance Characteristics

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



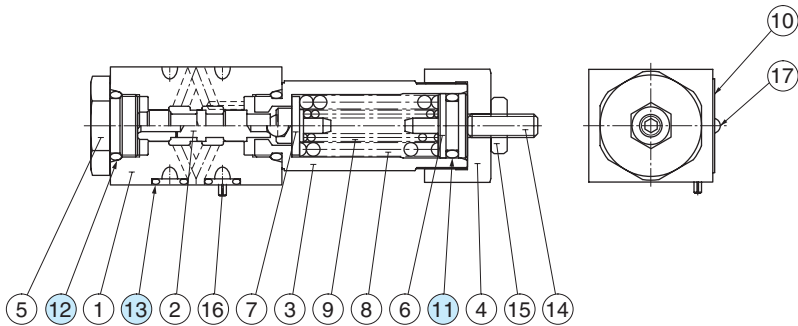
MBP-005-*-20

**DIMENSIONS IN
MILLIMETRES (INCHES)**



■ Spare Parts List

MBP-005-*-20



● List of Seals

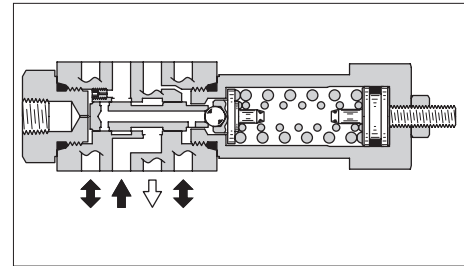
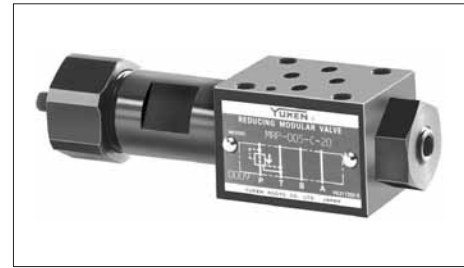
Item	Name of Parts	Part Numbers	Qty.	Remarks
11	O-Ring	SO-NA-P12.5	1	Included in Seal Kit Kit No. : KS-MBP-005-20
12	O-Ring	SO-NB-P14	2	
13	O-Ring	SO-NB-P6	4	

Reducing Modular Valves

Specifications

Model Numbers	Max. Operating Pressure MPa (PSI)	Max. Flow L/min (U.S.GPM)
MRP-005-* -20/2090	25 (3630)	15 (3.96) *

★ If the pressure is set below 1.6 MPa (232 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	-005	-B	-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)	MRP: Reducing Valve for P-Line	005	B: *-7 (*-1020) * ¹ C: 3.5-16 (510-2320) H: 7-24.5 (1020-3550)	20	Refer to ★ ²

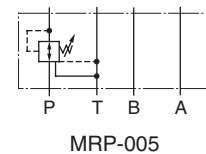
★ 1. See the "Minimum Adjustment Pressure vs. Maximum Flow" of the next page for the item marked *.

★ 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.

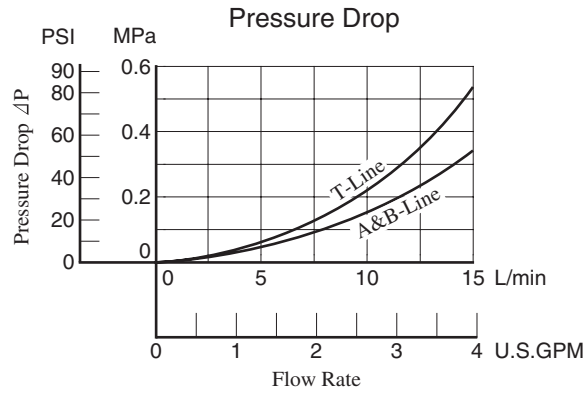
Graphic Symbol



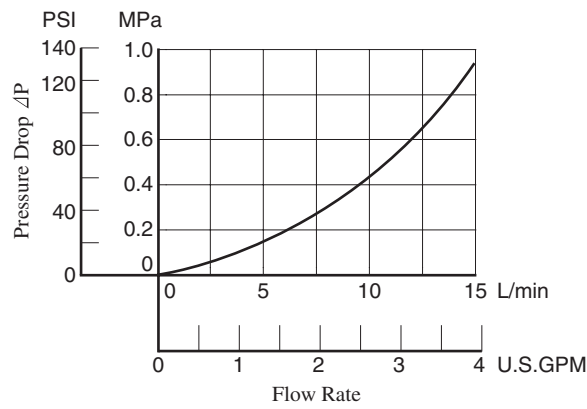
F
005 Series Modular Valves

■ Typical Performance Characteristics

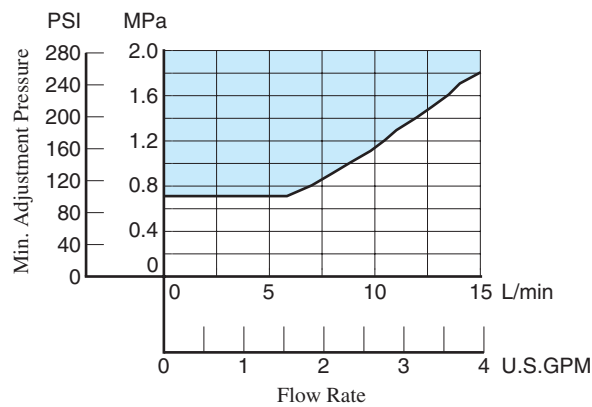
Hydraulic Fluid: Viscosity 35 mm²/s (164 SSU), Specific Gravity 0.850



Pres. Drop at Spool Fully Open (P-Line)

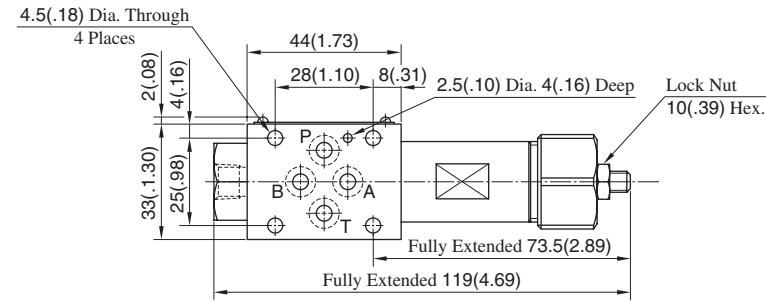


Min. Adjustment Pressure vs. Max. Flow

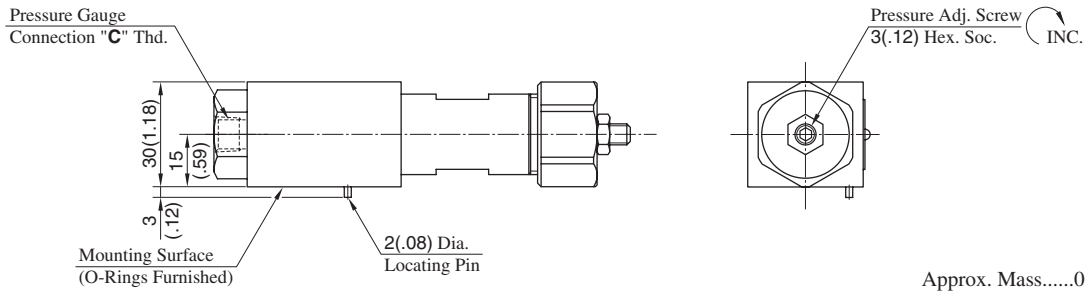


MRP-005-*-20/2090

**DIMENSIONS IN
MILLIMETRES (INCHES)**



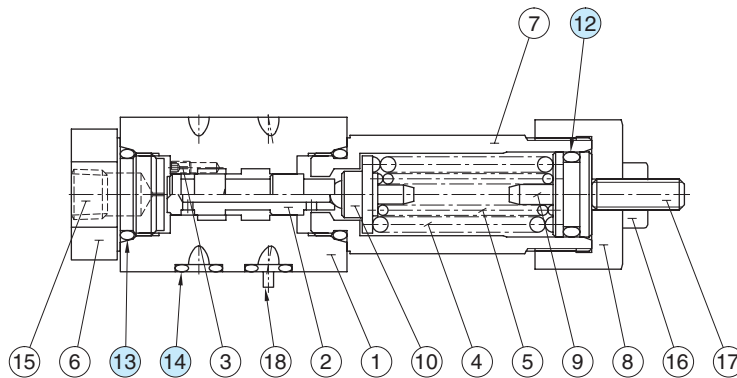
Model Numbers	Thread Size "C" Thd.
MR*-005-*-20	Rc 1/8 = 1/8 BSP.Tr
MR*-005-*-2090	1/8 NPT



Approx. Mass.....0.45 kg(.99 lbs.)

■ Spare Parts List

MRP-005-*-20/2090



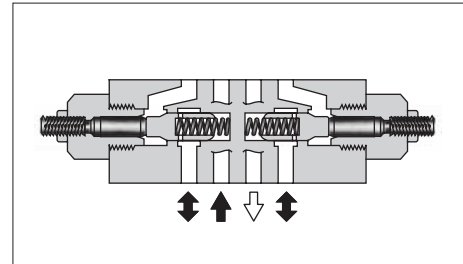
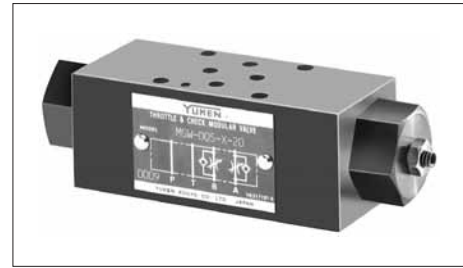
● List of Seals

Item	Name of Parts	Part Numbers	Qty.	Remarks
12	O-Ring	SO-NA-P12.5	1	Included in Seal Kit Kit No. : KS-MRP-005-20
13	O-Ring	SO-NB-P14	2	
14	O-Ring	SO-NB-P6	4	

Throttle and Check Modular Valves

Specifications

Model Numbers	Max. Operating Pressure MPa (PSI)	Max. Flow L/min (U.S.GPM)
MSW-005-*-20 MSA-005-*-20 MSB-005-*-20	25 (3630)	15 (3.96)



Model Number Designation

F-	MSW	-005	-X	-20	*
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	005	X: Metre-out Y: Metre-in	20	Refer to ★
	MSB: Throttle and Check Valve for B-Line				
	MSW: Throttle and Check Valve for A&B-Lines				

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

Flow Adjustment

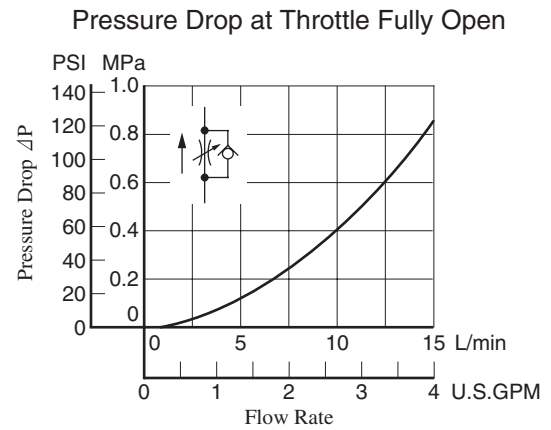
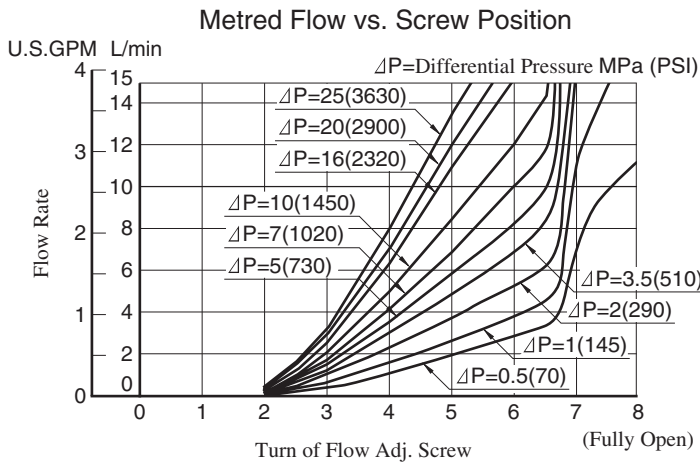
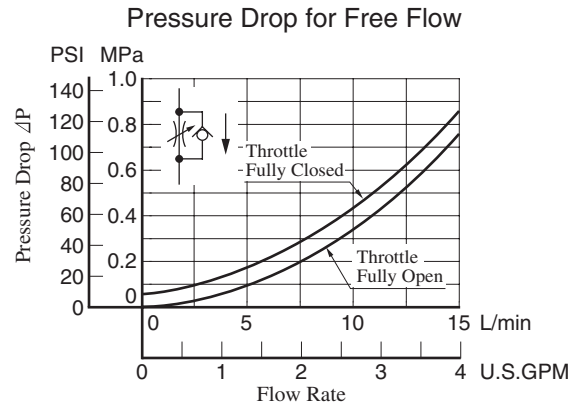
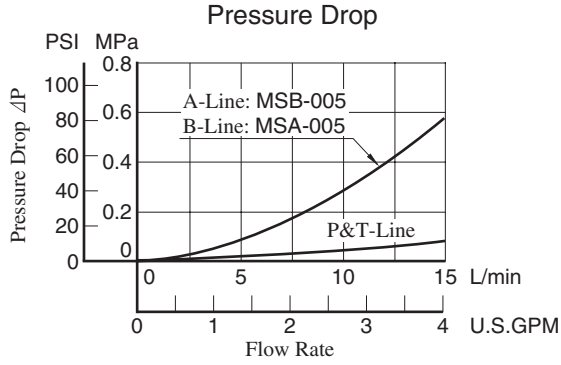
To make flow rate adjustment, loosen the lock nut and turn the flow adjustment screw clockwise or anti-clockwise. To throttle the flow, turn the screw clockwise. Be sure to re-tighten the lock nut firmly after the adjustment of the flow rate is completed.

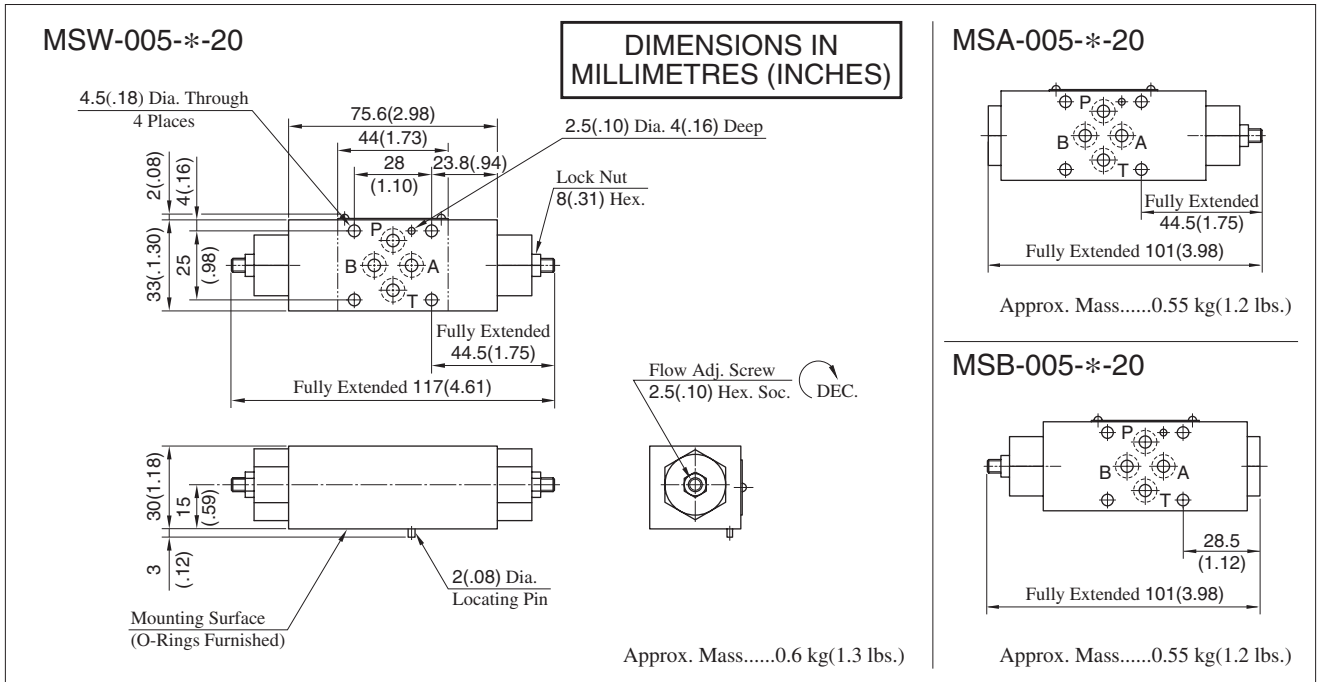
Graphic Symbols

Metre-out	Metre-in
<p>MSA-005-X</p>	<p>MSA-005-Y</p>
<p>MSB-005-X</p>	<p>MSB-005-Y</p>
<p>MSW-005-X</p>	<p>MSW-005-Y</p>

Typical Performance Characteristics

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





■ Spare Parts List

MSA-005-X_Y-20

MSB-005-X_Y-20

MSW-005-X_Y-20

● List of Seals

Item	Name of Parts	Part Numbers	Qty.	
			MSA MSB	MSW
7	O-Ring	SO-NA-P3	1	2
8	O-Ring	SO-NB-P6	4	4
9	O-Ring	SO-NB-P14	2	2
10	Back Up Ring	SO-BB-P3	1	2

● List of Seal Kits

Valve Model Numbers	Seal Kit Numbers
MSA-005	KS-MSA-005-20
MSB-005	
MSW-005	KS-MSW-005-20

Pilot Operated Check Modular Valves

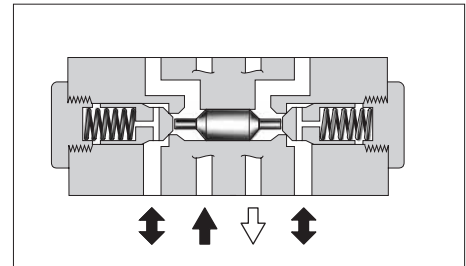
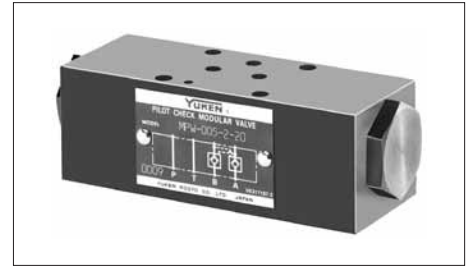
Specifications

Model Numbers	Max. Operating Pressure MPa (PSI)	Max. Flow L/min (U.S.GPM)
MPA-005-2-20 MPB-005-2-20 MPW-005-2-20	25 (3630)	15 (3.96)

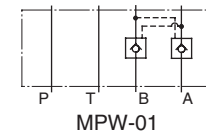
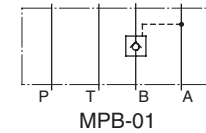
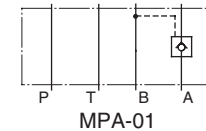
Model Number Designation

F-	MPW	-005	-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	005	2: 0.2 (29)	20	Refer to ★

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

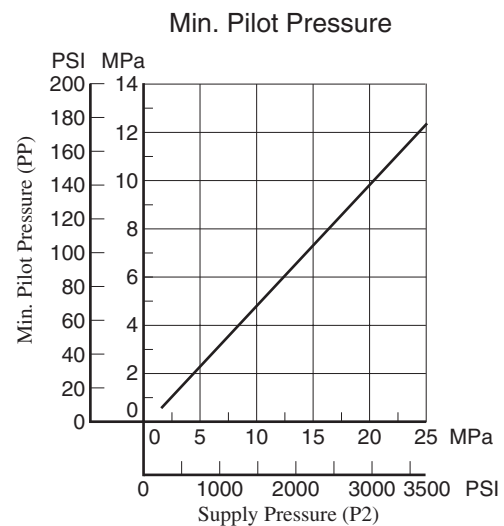
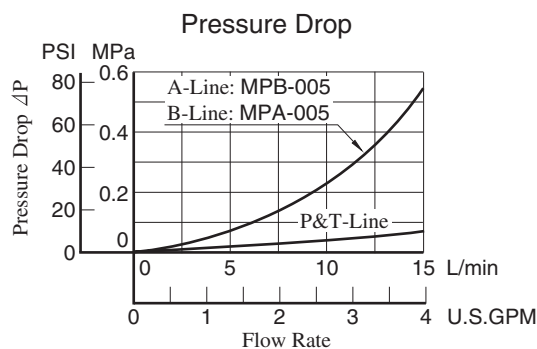
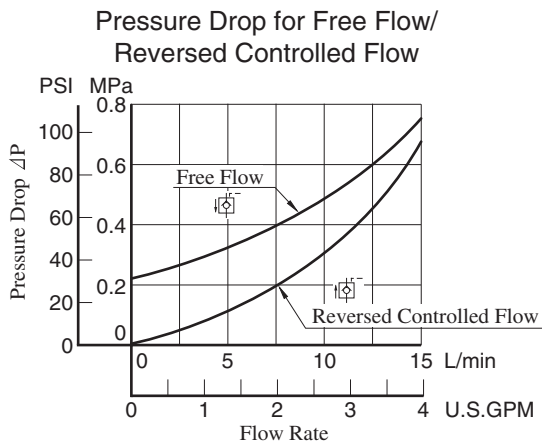


Graphic Symbols



Typical Performance Characteristics

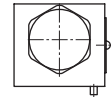
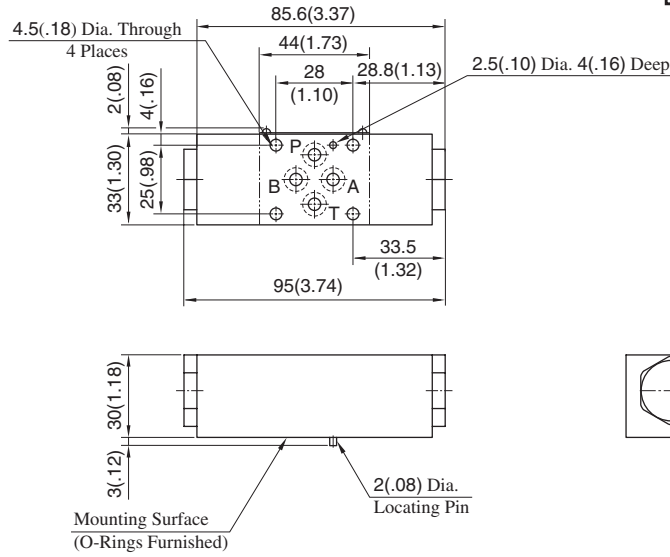
Hydraulic Fluid: Viscosity 35 mm²/s (164 SSU), Specific Gravity 0.850



F
005 Series Modular Valves

MPA-005-2-20
 MPB-005-2-20
 MPW-005-2-20

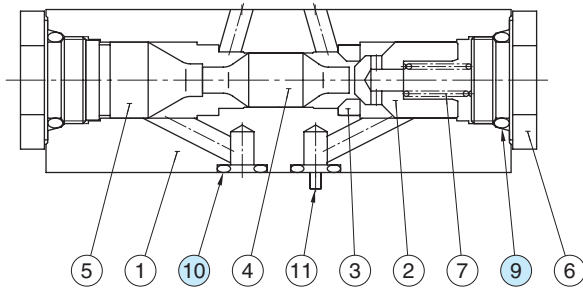
**DIMENSIONS IN
 MILLIMETRES (INCHES)**



Approx. Mass.....0.55 kg(1.2 lbs.)

Spare Parts List

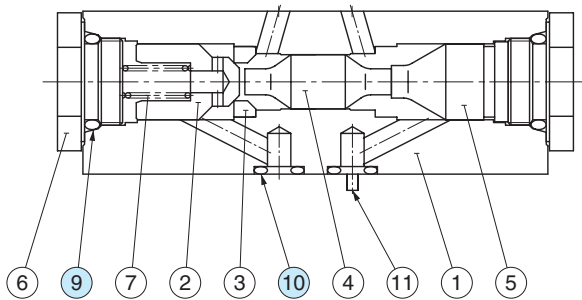
MPA-005-2-20



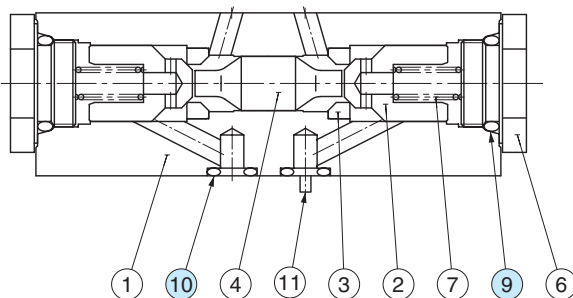
List of Seals

Item	Name of Parts	Part Numbers	Qty.	Remarks
9	O-Ring	SO-NB-P14	2	Included in Seal Kit
10	O-Ring	SO-NB-P6	4	Kit No. : KS-MPA-005-20

MPB-005-2-20



MPW-005-2-20



Check Modular Valves

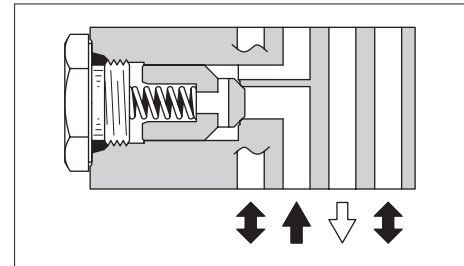
Specifications

Model Number	Max. Operating Pressure MPa (PSI)	Max. Flow L/min (U.S.GPM)
MCP-005-0-20	25 (3630)	15 (3.96)

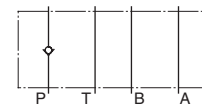
Model Number Designation

F-	MCP	-005	-0	-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)	MCP: Check Valve for P-Line	005	0: 0.035(5)	20	Refer to ★

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



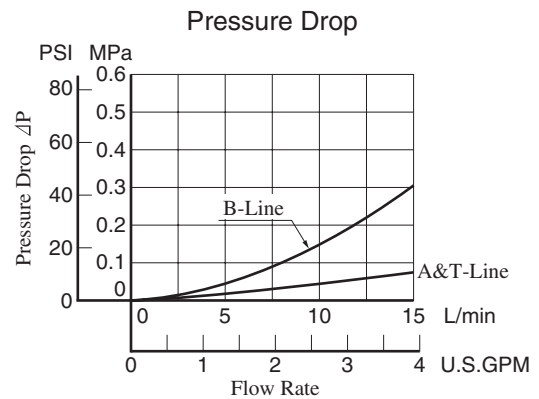
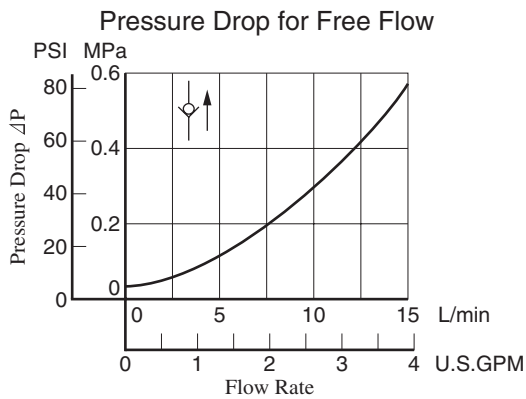
Graphic Symbol



MCP-005

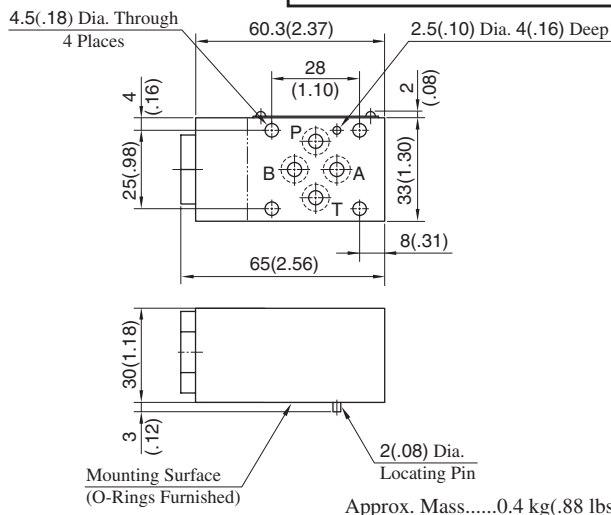
Typical Performance Characteristics

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



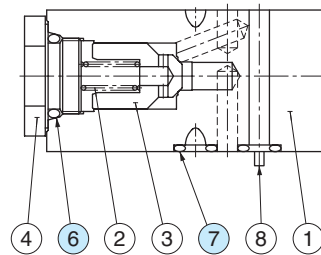
MCP-005-0-20

DIMENSIONS IN MILLIMETRES (INCHES)



Spare Parts List

MCP-005-0-20



List of Seals

Item	Name of Parts	Part Numbers	Qty.	Remarks
6	O-Ring	SO-NB-P14	2	Included in Seal Kit
7	O-Ring	SO-NB-P6	4	Kit No. : KS-MPA-005-20

End Plates

Blocking plates are used for auxiliary mounting surface or for closing unnecessary circuits.

Specifications

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

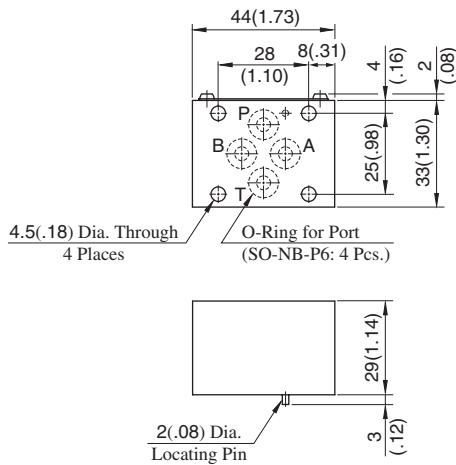


Model Number Designation

F-	MDC	-005	-A	-20	*
Special Seals	Series Number	Plate Size	Type of Plate	Design Number	Design Standard
F: Special Seals for Phosphate Ester Type Fluids (Omit if not required)	MDC: End Plate	005	A: Blocking Plate	20	Refer to ★

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

MDC-005-A-20



DIMENSIONS IN MILLIMETRES (INCHES)

Approx. Mass.....0.3 kg(.66 lbs.)

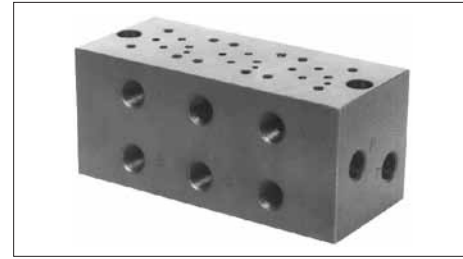
Graphic Symbol



Base Plates For Modular Valves

Specifications

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



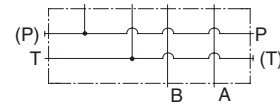
Model Number Designation

MMC	-005	-5	-20	*
Series Number	Plate Size	Number of Stations	Design Number	Design Standard
MMC: Base Plate	005	1 : 1 Station 2 : 2 Stations 3 : 3 Stations 4 : 4 Stations 5 : 5 Stations	20	None : Japanese Standard "JIS" 80 : European Design Standard 90 : N.American Design Standard

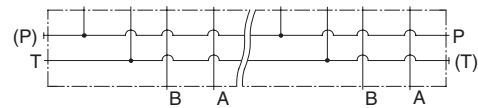
Instructions

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

Graphic Symbols

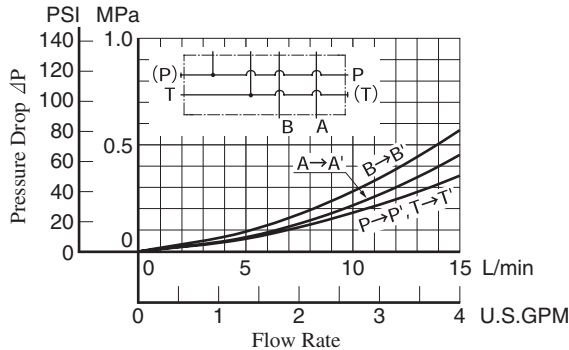


MMC-005-1



MMC-005-2-5

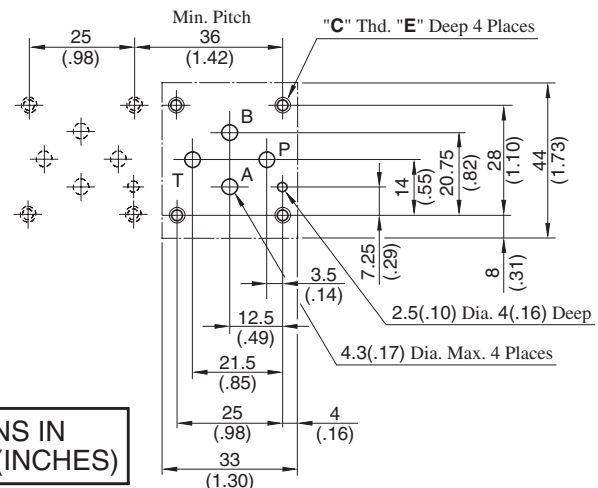
Pressure Drop



Mounting Surface Dimensions for 005 Series Modular Valve

When standard base plates (MMC-005) are not used, the mounting surface described on the right must be prepared. The mounting surface should have a good machined finish.

Design Std.	"C" Thd.	"E"
Japanese Std. "JIS" and European Design Std.	M4	7.5 (.30)
N. American Design Std.	No.8 - 32 UNC	10 (.39)

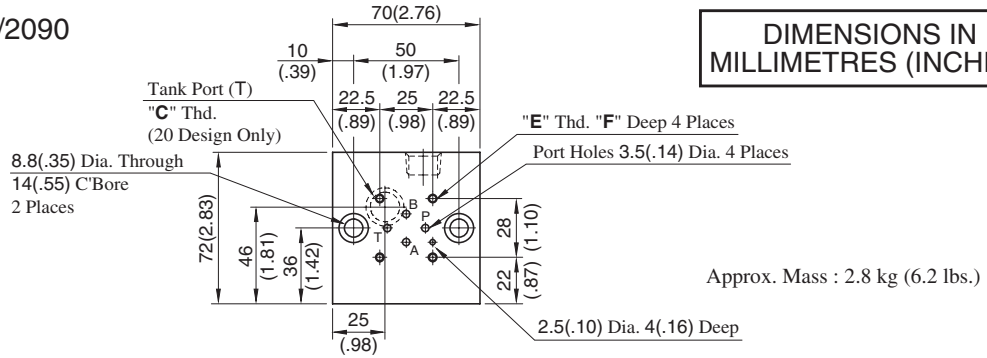


DIMENSIONS IN MILLIMETRES (INCHES)

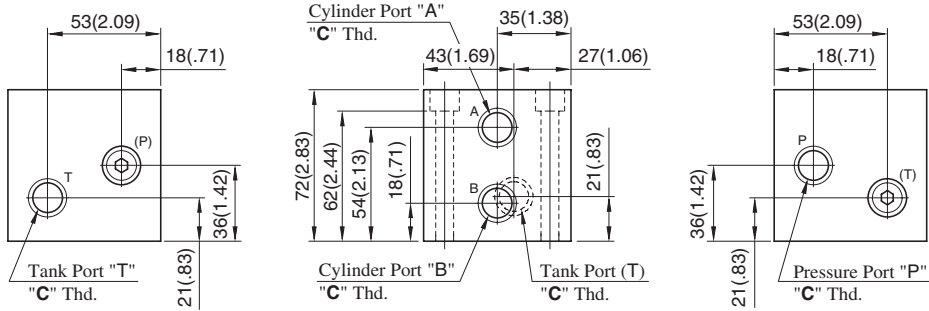
005 Series Modular Valves

MMC-005-1-20/2090

DIMENSIONS IN MILLIMETRES (INCHES)

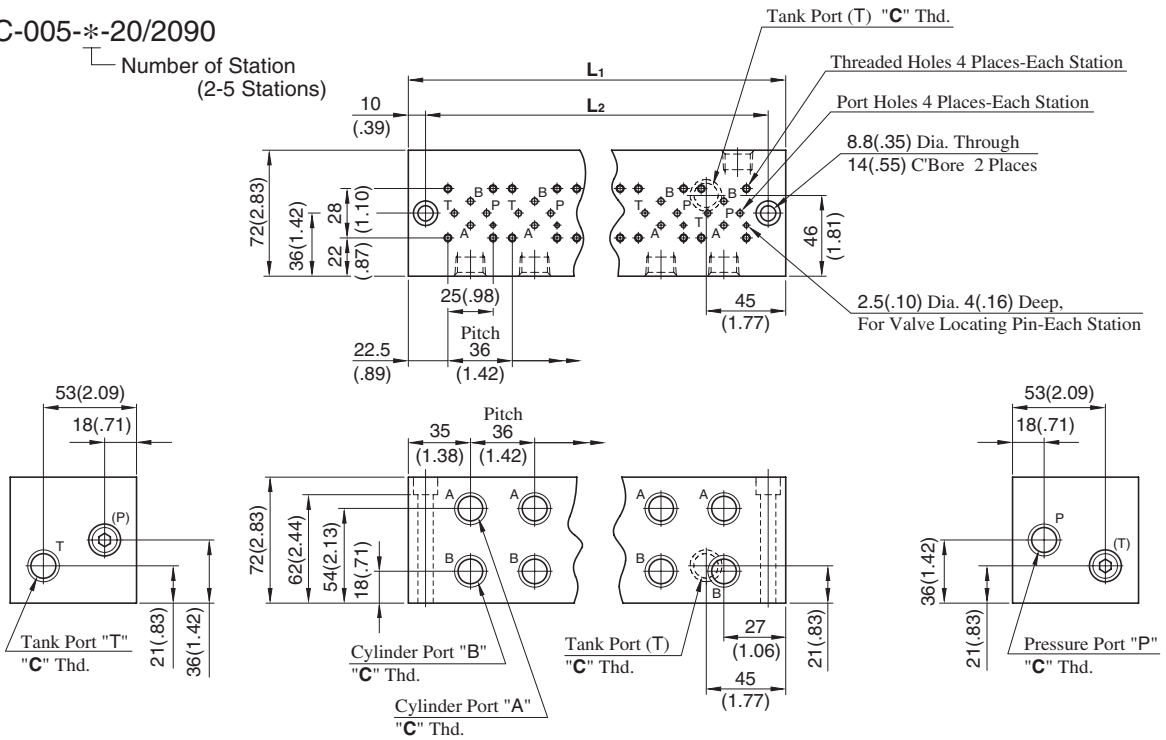


Approx. Mass : 2.8 kg (6.2 lbs.)



MMC-005-*-20/2090

Number of Station (2-5 Stations)



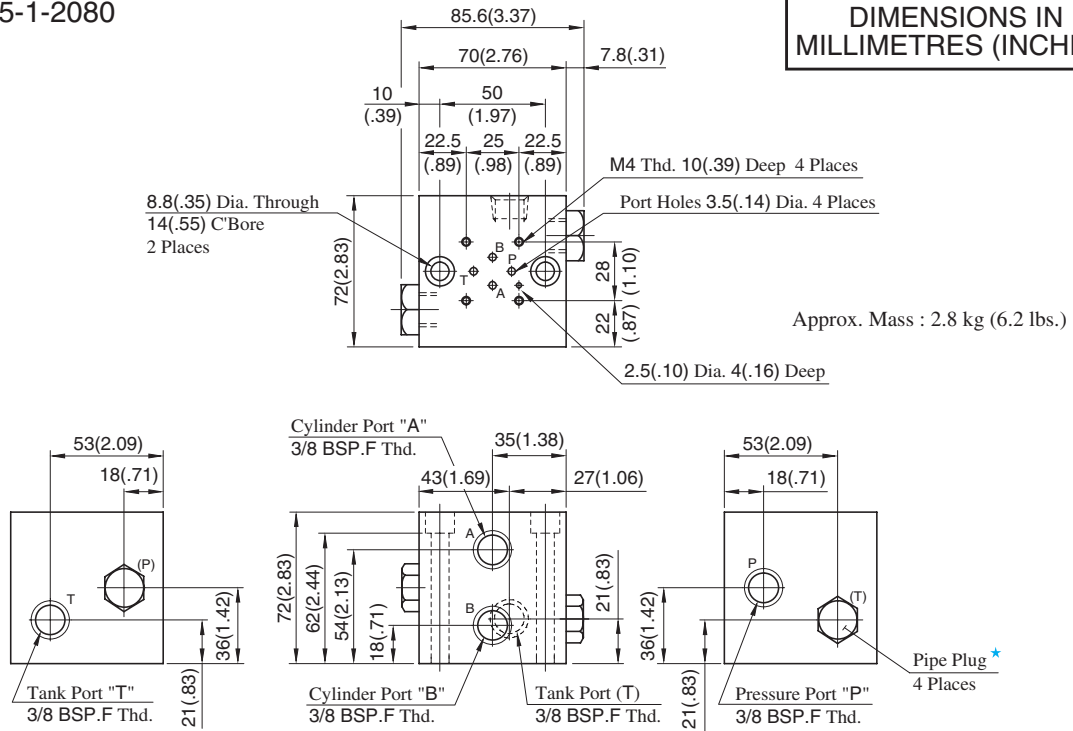
• For other dimensions, refer to the above Model MMC-005-1.

Model Numbers	Thread Size		Dimensions mm (Inches)
	"C" Thd.	"E" Thd.	F
MMC-005-*-20	Rc 3/8	M4	8 (.31)
MMC-005-*-2090	3/8 NPT	No. 8-32 UNC	10 (.39)

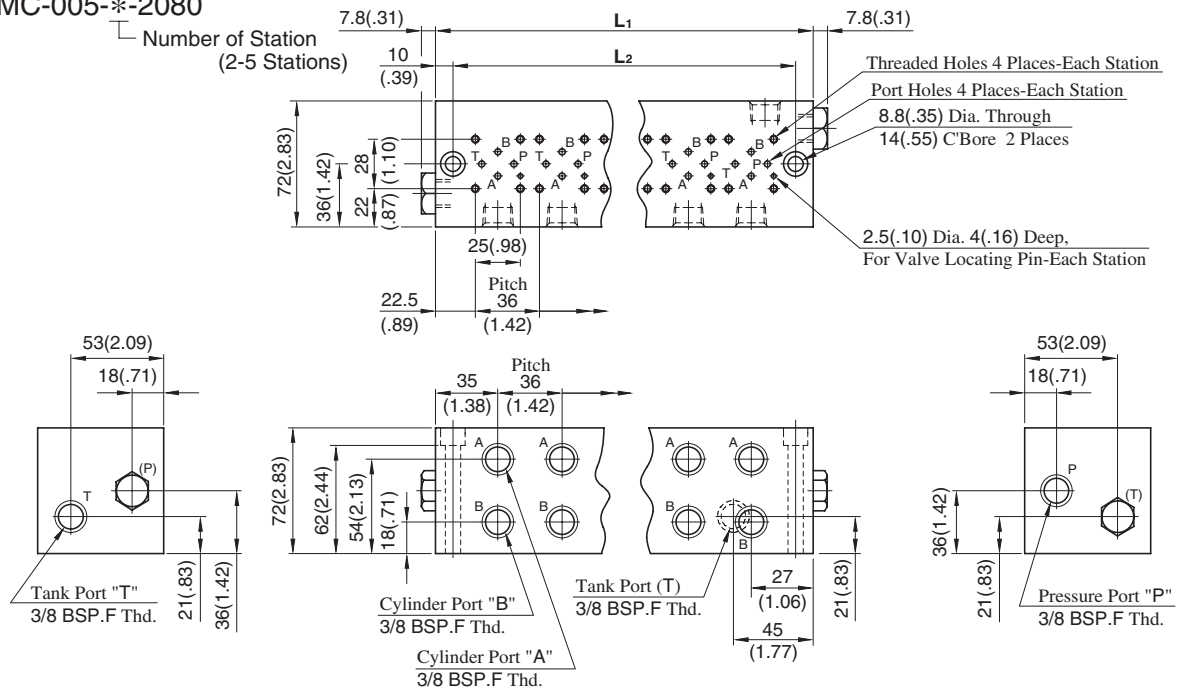
Model Numbers	Dimensions mm (Inches)		Approx. Mass kg (lbs.)
	L1	L2	
MMC-005-2	106 (4.17)	86 (3.39)	4.3 (9.5)
MMC-005-3	142 (5.59)	122 (4.80)	5.8 (12.8)
MMC-005-4	178 (7.01)	158 (6.22)	7.2 (15.9)
MMC-005-5	214 (8.43)	194 (7.64)	8.7 (19.2)

MMC-005-1-2080

DIMENSIONS IN MILLIMETRES (INCHES)



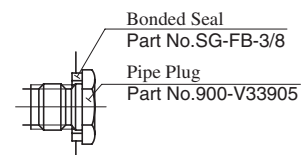
MMC-005-*-2080



• For other dimensions, refer to the above Model MMC-005-1.

Model Numbers	Dimensions mm (Inches)		Approx. Mass kg (lbs.)
	L ₁	L ₂	
MMC-005-2	106 (4.17)	86 (3.39)	4.3 (9.5)
MMC-005-3	142 (5.59)	122 (4.80)	5.8 (12.8)
MMC-005-4	178 (7.01)	158 (6.22)	7.2 (15.9)
MMC-005-5	214 (8.43)	194 (7.64)	8.7 (19.2)

★ Detail of Pipe Plug



005 Series Modular Valves

Mounting Bolt Kits

To mount the valves, four M4 bolts are used. The combination of valves varies with circuits. So, we have several mounting bolt kits suitable for different valve combinations. From the selection chart, choose a necessary bolt kit and specify it with model number when ordering.



Model Number Designation

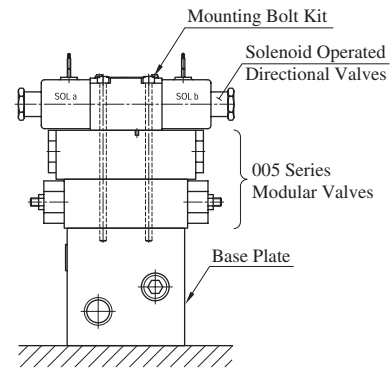
MBK	-005	-02	-20	*
Series Number	Size of Modular Valve	Bolt Number	Design Number	Design Standard
MBK: Bolt Kits for Modular Valves	005	01,02,03,05 (Refer to the following chart)	20	None: Japanese Standard "JIS" and European Design Standard 90: N.American Design Standard

Bolt Kits Selection Chart

Model Numbers	Quantity of valves to be stacked			Approx. Mass g (lbs.)
	Solenoid Operated Directional Valve (DSG-005)	Modular Valve (MDC-005)	Modular Valve (M**-005)	
MBK-005-01-20*	1	0	1	30(.07)
	0	1		
MBK-005-02-20*	1	0	2	40(.09)
	0	1		
MBK-005-03-20*	1	0	3	50(.11)
	0	1		
MBK-005-05-20*	1*	0	0	18(.04)
	0	1		

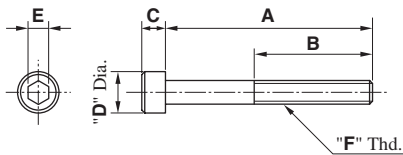
★ The solenoid operated directional valve comes with mounting bolts.

- **Bolts Kit Composition:**
Soc. Hd. Cap Screw.....4 Pcs.
- **Tightening Torque:**
2.5 - 3.5 Nm (22-31 in. lbs.)



Stacking Example

MBK-005-*-20/2090



Model Numbers	Dimensions mm (Inches)					"F" Thd.
	A	B	C	D	E	
MBK-005-01-20	65 (2.56)	20 (.79)	4 (.16)	7 (.28)	3 (.12)	M4
MBK-005-02-20	95 (3.74)					
MBK-005-03-20	125 (4.92)					
MBK-005-05-20	35 (1.38)					
MBK-005-01-2090	65.1 (2-9/16)	22.4 (.88)	4.17 (.164)	6.86 (.27)	3.6 (9/64)	No. 8-32 UNC
MBK-005-02-2090	95.2 (3-3/4)					
MBK-005-03-2090	125.4 (4-15/16)					
MBK-005-05-2090	34.9 (1-3/8)					