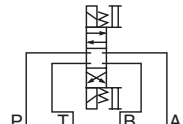

















# 005 Series Modular Valves

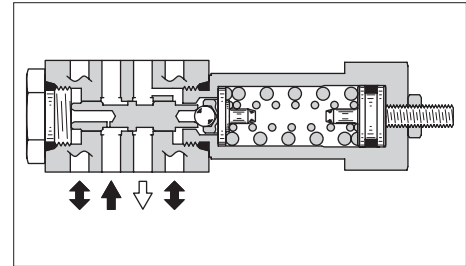
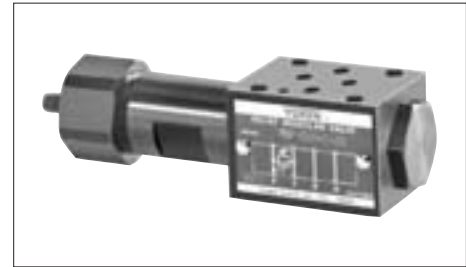
## Type of Modular Valve

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

## Relief Modular Valves

### Specifications

| Model Numbers | Max. Operating Pressure<br>MPa (PSI) | Max. Flow<br>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<br>MPa (PSI)   | Design Number | Design Standard        |
| <b>F:</b><br>Special Seals for<br>Phosphate Ester<br>Type Fluids (Omit<br>if not required) | <b>MBP:</b> Relief Valve for P-Line | <b>005</b> | <b>C:</b> *-16 <sup>★1</sup><br>(*-2320)<br><b>H:</b> 7-25<br>(1020-3630) | <b>20</b>     | Refer to <sup>★2</sup> |

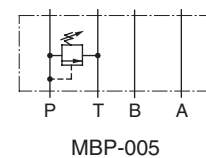
★1. See the "Minimum Adjustment Pressure" of the next page for the item marked \*.

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

### Instructions

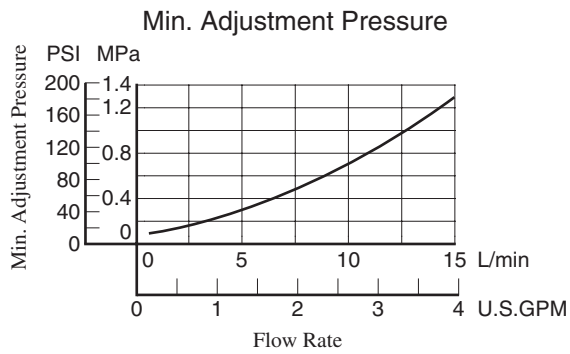
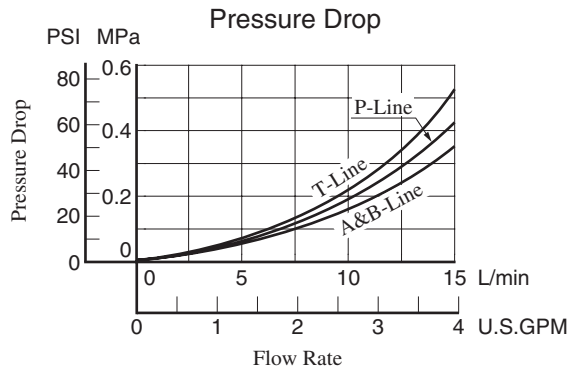
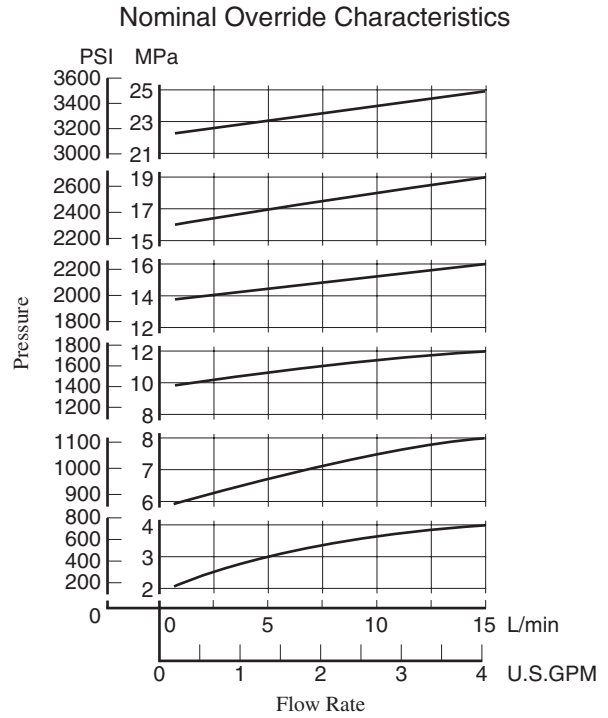
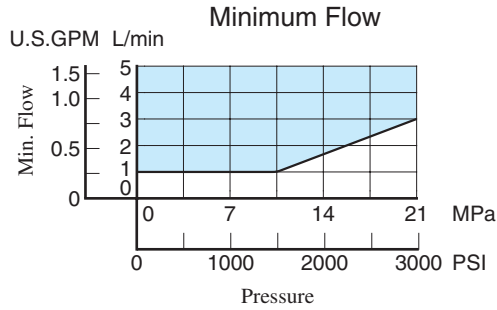
- The minimum adjustment pressure equals the value obtained from the minimum adjustment pressure characteristics plus the tank line back pressure of the next page. This back pressure should include the value of the T-line pressure drop characteristics of the valves stacked to the base plate side of the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



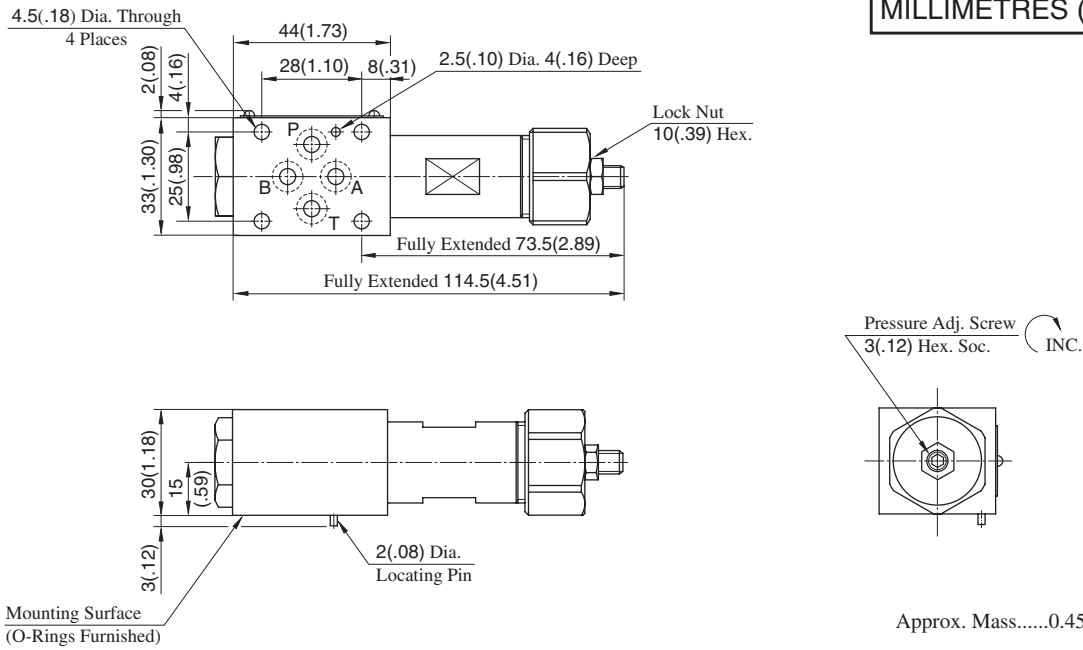
## Typical Performance Characteristics

Hydraulic Fluid: Viscosity 35 mm<sup>2</sup>/s (164 SSU), Specific Gravity 0.850



**MBP-005-\*-20**

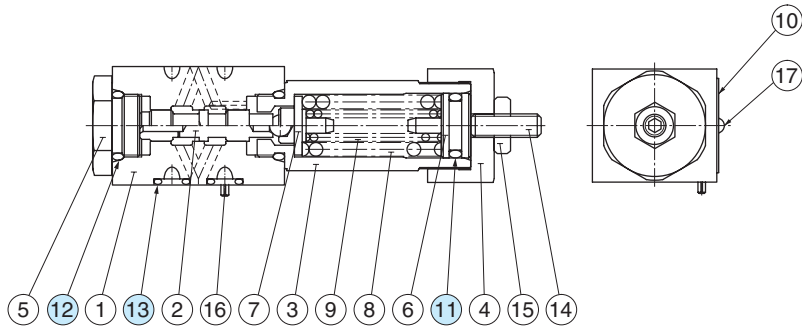
**DIMENSIONS IN MILLIMETRES (INCHES)**



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

**Spare Parts List**

**MBP-005-\*-20**



**List of Seals**

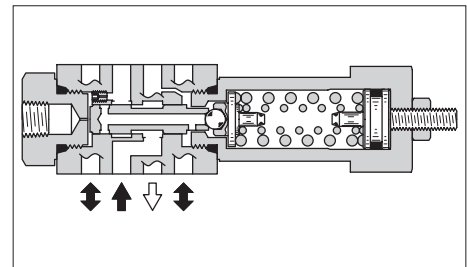
| Item | Name of Parts | Part Numbers | Qty. | Remarks   |
|------|---------------|--------------|------|---|
| 11   | O-Ring        | SO-NA-P12.5  | 1    | Included in Seal Kit<br>Kit No. : KS-MBP-005-20 |
| 12   | O-Ring        | SO-NB-P14    | 2    |   |
| 13   | O-Ring        | SO-NB-P6     | 4 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

## Reducing Modular Valves

### Specifications

| Model Numbers     | Max. Operating Pressure<br>MPa (PSI) | Max. Flow<br>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<br>MPa (PSI)   | Design Number | Design Standard |
| <b>F:</b><br>Special Seals for Phosphate Ester Type Fluids (Omit if not required) | <b>MRP:</b> Reducing Valve for P-Line | <b>005</b> | <b>B:</b> *-7 (*-1020) ★<br><b>C:</b> 3.5-16 (510-2320)<br><b>H:</b> 7-24.5 (1020-3550) | <b>20</b>     | Refer to ★2     |

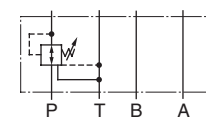
★ 1. See the "Minimum Adjustment Pressure vs. Maximum Flow" of the next page for the item marked \*.

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

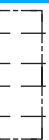
### Instructions

- 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

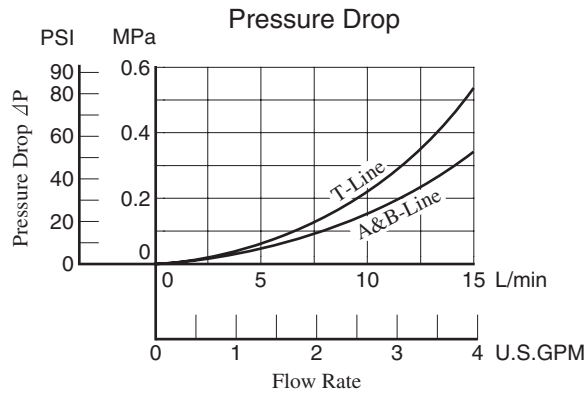


MRP-005

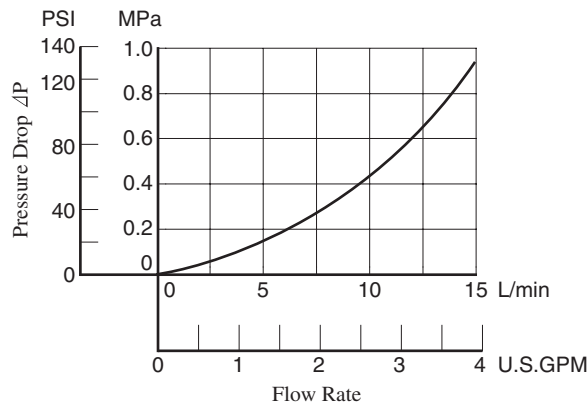


■ Typical Performance Characteristics

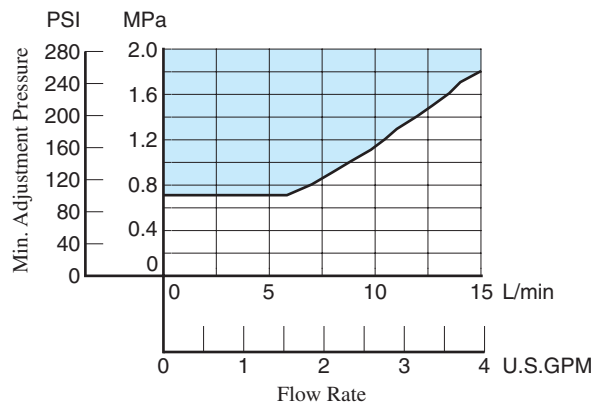
Hydraulic Fluid: Viscosity 35 mm<sup>2</sup>/s (164 SSU), Specific Gravity 0.850



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

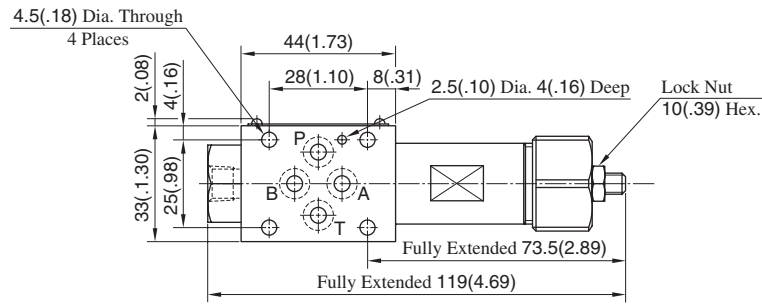


Min. Adjustment Pressure vs. Max. Flow



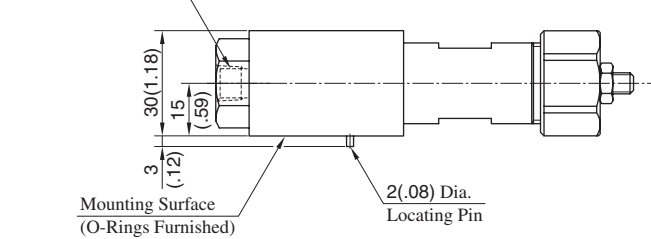
## MRP-005-\*-20/2090

**DIMENSIONS IN MILLIMETRES (INCHES)**

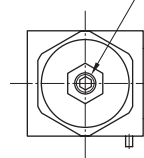


| Model Numbers  | Thread Size "C" Thd. |
|----------------|----------------------|
| MR*-005-*-20   | Rc 1/8 = 1/8 BSP.Tr  |
| MR*-005-*-2090 | 1/8 NPT              |

Pressure Gauge Connection "C" Thd.



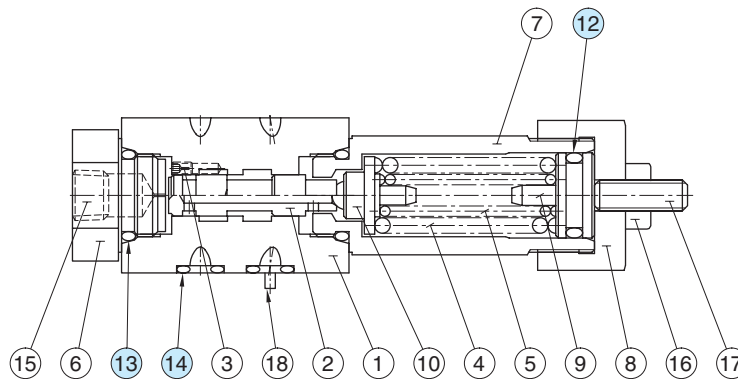
Pressure Adj. Screw 3(.12) Hex. Soc. INC.



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

### Spare Parts List

## MRP-005-\*-20/2090



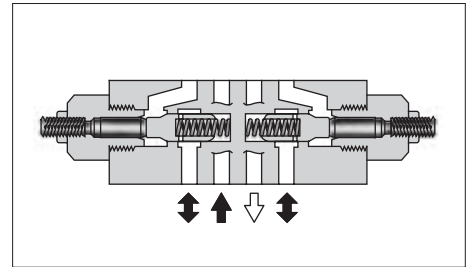
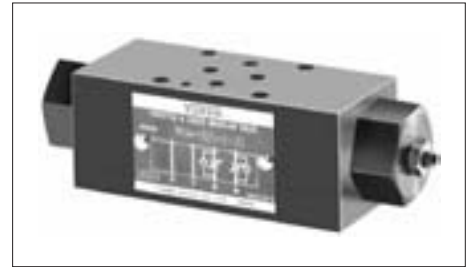
### List of Seals

| Item | Name of Parts | Part Numbers | Qty. | Remarks   |
|------|---------------|--------------|------|---|
| 12   | O-Ring        | SO-NA-P12.5  | 1    | Included in Seal Kit<br>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<br>MPa (PSI) | Max. Flow<br>L/min (U.S.GPM) |
|--|--------------------------------------|------------------------------|
| MSW-005-*-20<br>MSA-005-*-20<br>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 |
| <b>F:</b><br>Special Seals for<br>Phosphate Ester<br>Type Fluids (Omit<br>if not required) | <b>MSA:</b> Throttle and Check Valve<br>for A-Line    | <b>005</b> | <b>X:</b> Metre-out<br><b>Y:</b> Metre-in | <b>20</b>     | Refer to ★      |
|  | <b>MSB:</b> Throttle and Check Valve<br>for B-Line    |            |   |               |                 |
|  | <b>MSW:</b> Throttle and Check Valve<br>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.

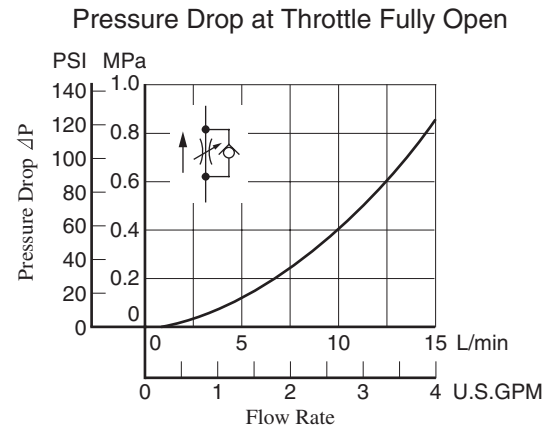
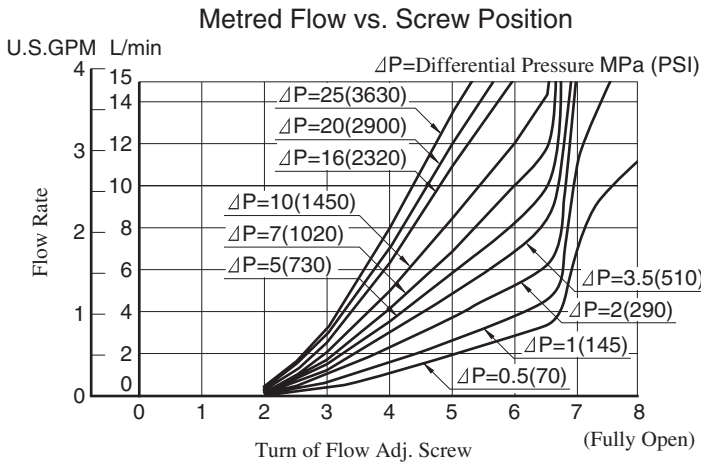
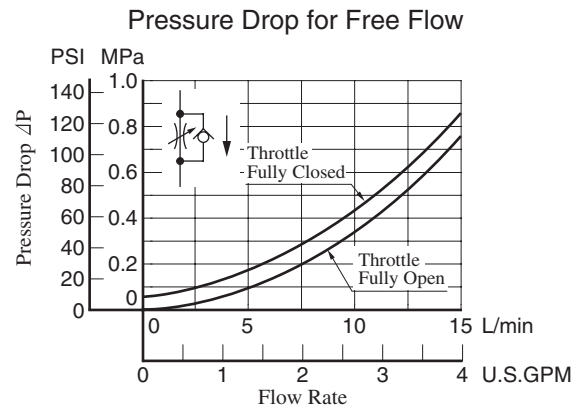
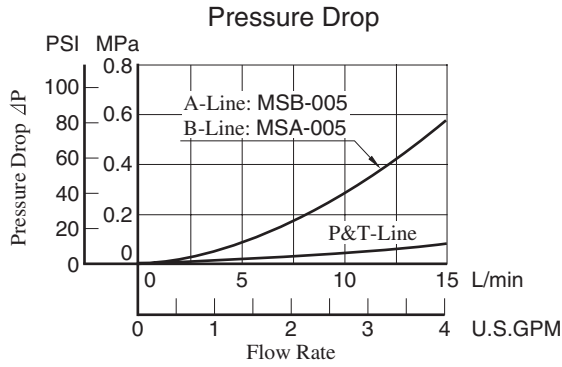
### Graphic Symbols

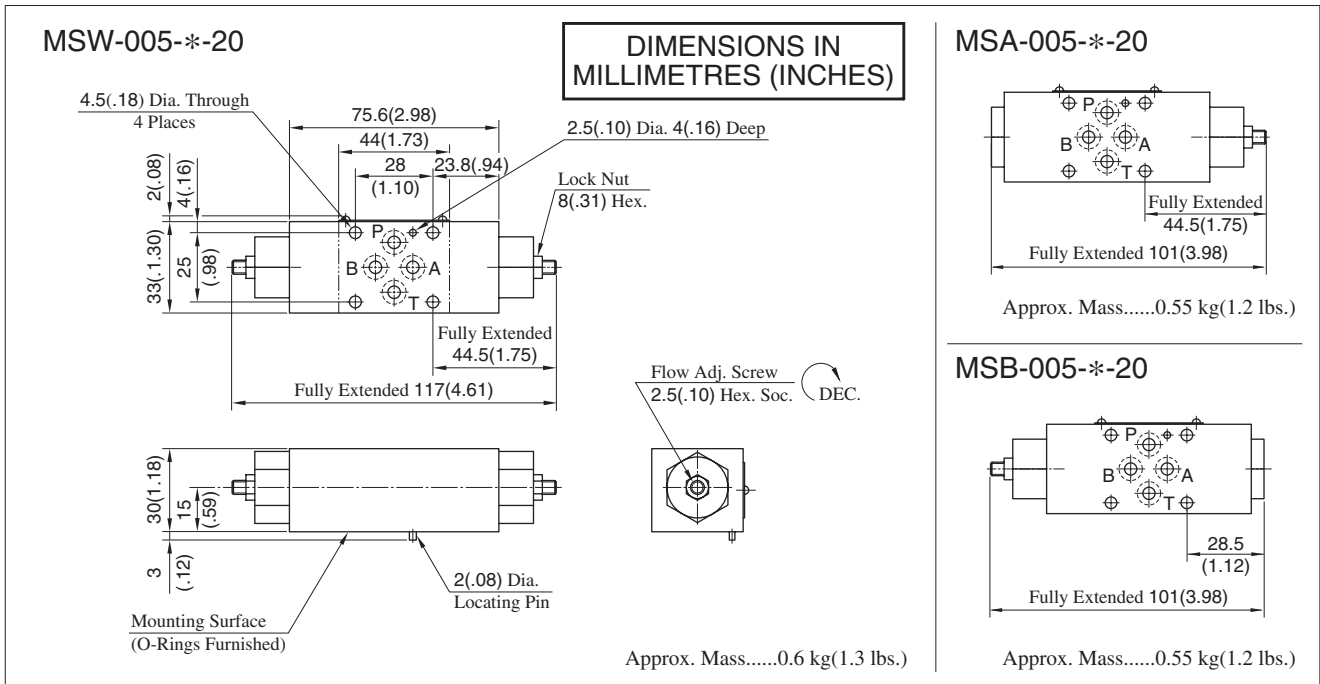
| Metre-out        | Metre-in         |
|------------------|------------------|
| <p>MSA-005-X</p> | <p>MSA-005-Y</p> |
| <p>MSB-005-X</p> | <p>MSB-005-Y</p> |
| <p>MSW-005-X</p> | <p>MSW-005-Y</p> |



## Typical Performance Characteristics

Hydraulic Fluid: Viscosity 35 mm<sup>2</sup>/s (164 SSU), Specific Gravity 0.850





**■ Spare Parts List**

### MSA-005-X<sub>Y</sub>-20

### MSB-005-X<sub>Y</sub>-20

### MSW-005-X<sub>Y</sub>-20

#### ● List of Seals

| Item | Name of Parts | Part Numbers | Qty.       |     |
|------|---------------|--------------|------------|-----|
|      |               |              | MSA<br>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

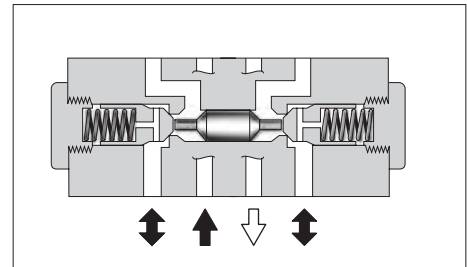
### Specifications

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

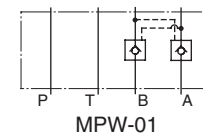
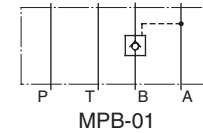
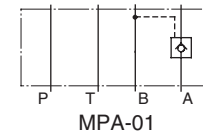
### Model Number Designation

| F-   | MPW  | -005       | -2                             | -20           | *               |
|--|--|------------|--------------------------------|---------------|-----------------|
| Special Seals  | Series Number  | Valve Size | Cracking Pressure<br>MPa (PSI) | Design Number | Design Standard |
| <b>F:</b><br>Special Seals<br>for Phosphate<br>Ester Type<br>Fluids<br>(Omit if not<br>required) | <b>MPA:</b> Pilot Operated<br>Check Valve<br>for A-Line<br><br><b>MPB:</b> Pilot Operated<br>Check Valve<br>for B-Line<br><br><b>MPW:</b> Pilot Operated<br>Check Valve<br>for A&B-Lines | <b>005</b> | <b>2:</b> 0.2 (29)             | <b>20</b>     | Refer to ★      |

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

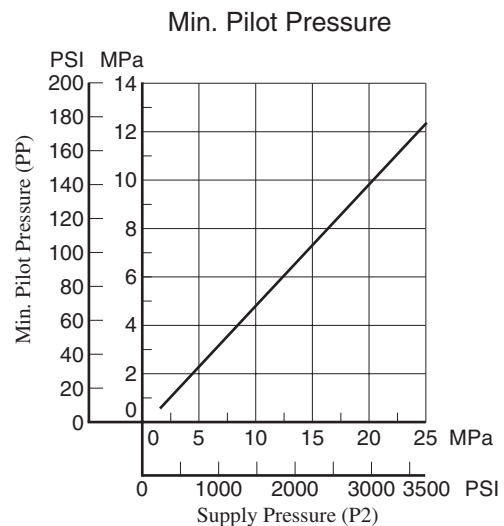
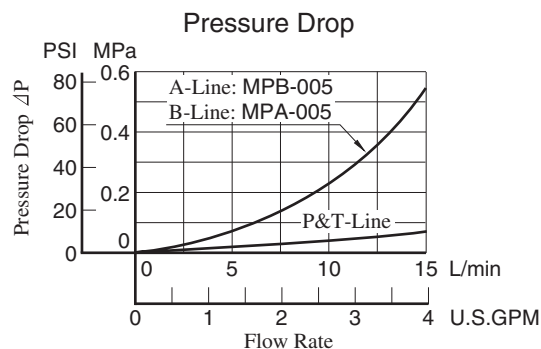
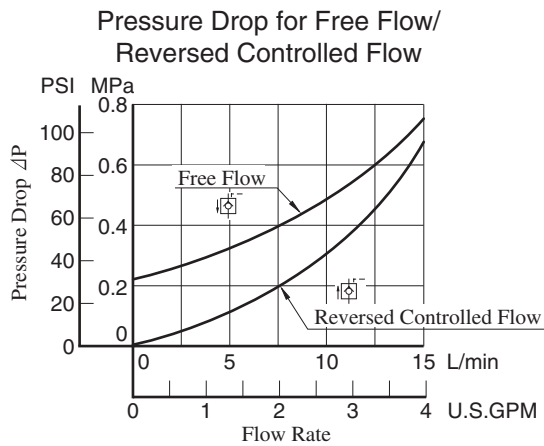


### Graphic Symbols



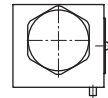
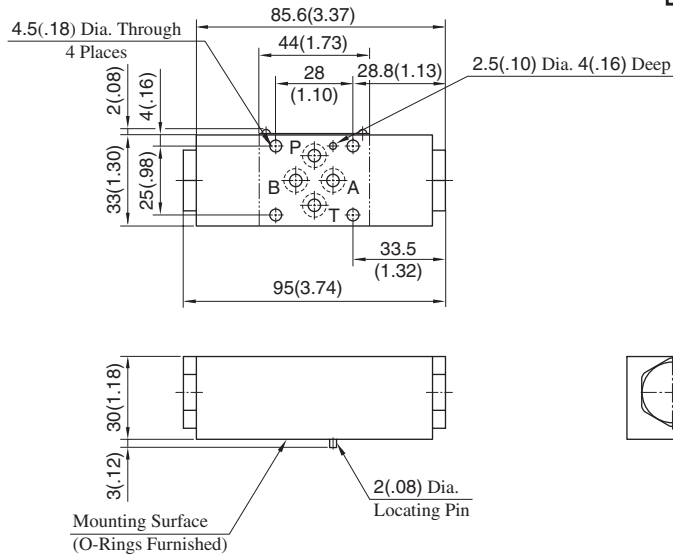
### Typical Performance Characteristics

Hydraulic Fluid: Viscosity 35 mm<sup>2</sup>/s (164 SSU), Specific Gravity 0.850



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

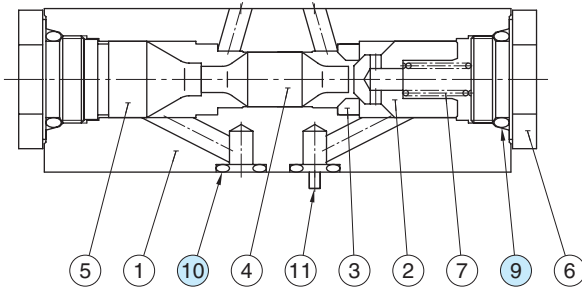
**DIMENSIONS IN  
 MILLIMETRES (INCHES)**



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

**Spare Parts List**

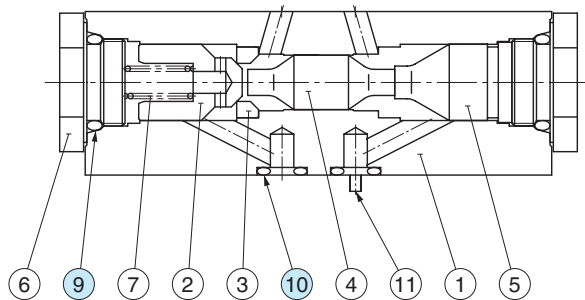
MPA-005-2-20



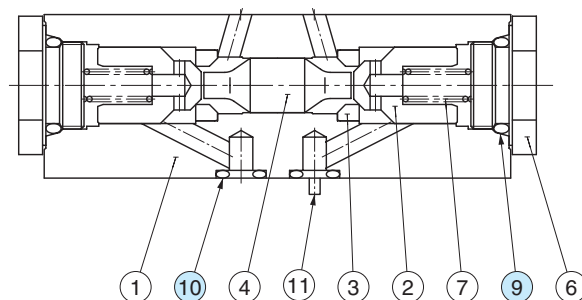
**List of Seals**

| 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

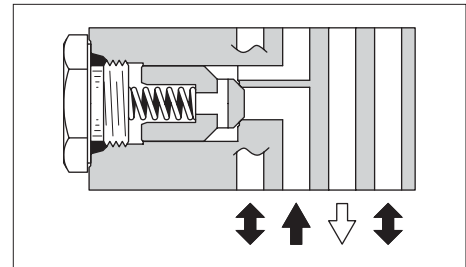
### Specifications

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

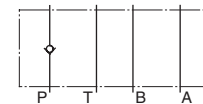
### Model Number Designation

| F-  | MCP                                | -005       | -0                             | -20           | *               |
|---|------------------------------------|------------|--------------------------------|---------------|-----------------|
| Special Seals   | Series Number                      | Valve Size | Cracking Pressure<br>MPa (PSI) | Design Number | Design Standard |
| <b>F:</b><br>Special Seals for Phosphate Ester Type Fluids (Omit if not required) | <b>MCP:</b> Check Valve for P-Line | <b>005</b> | <b>0:</b> 0.035(5)             | <b>20</b>     | Refer to ★      |

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



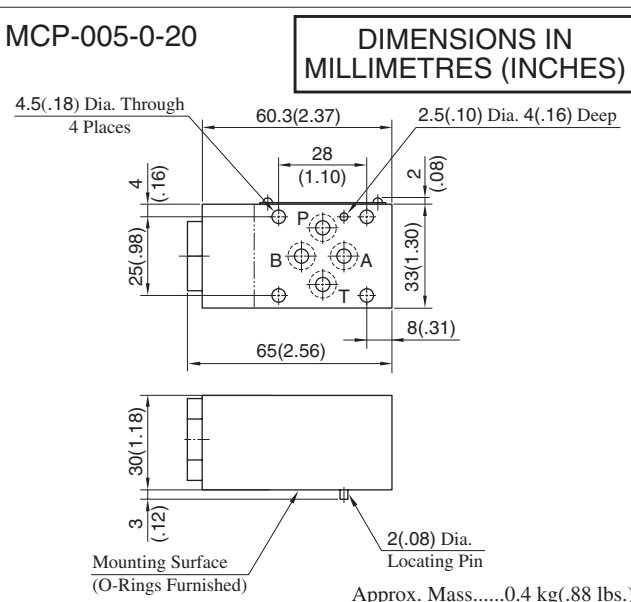
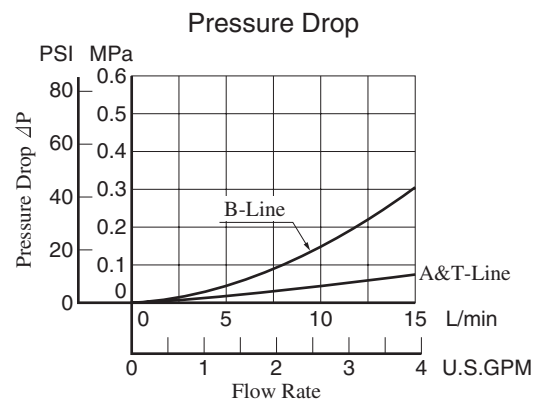
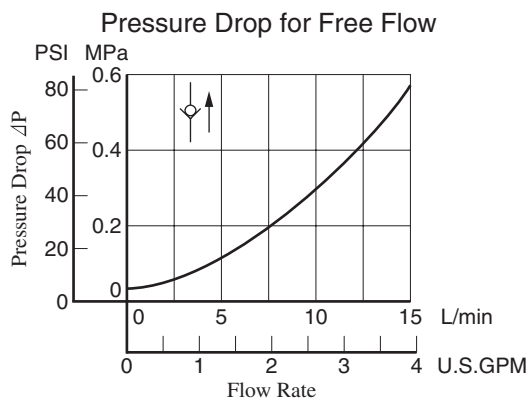
Graphic Symbol



MCP-005

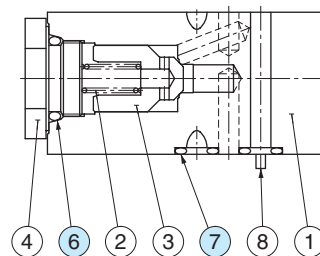
### Typical Performance Characteristics

Hydraulic Fluid: Viscosity 35 mm<sup>2</sup>/s (164 SSU), Specific Gravity 0.850



### 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)

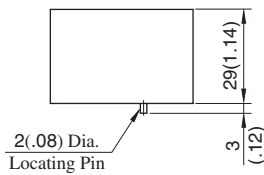
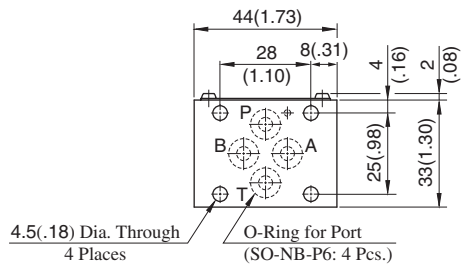


### Model Number Designation

| F-  | MDC                   | -005       | -A                       | -20           | *               |
|---|-----------------------|------------|--------------------------|---------------|-----------------|
| Special Seals   | Series Number         | Plate Size | Type of Plate            | Design Number | Design Standard |
| <b>F:</b><br>Special Seals for Phosphate Ester Type Fluids (Omit if not required) | <b>MDC:</b> End Plate | <b>005</b> | <b>A:</b> Blocking Plate | <b>20</b>     | 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



MDC-005-A

## Base Plates For Modular Valves

### Specifications

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



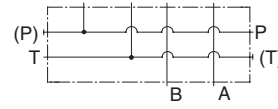
### Model Number Designation

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

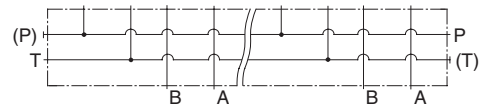
### Instructions

- 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

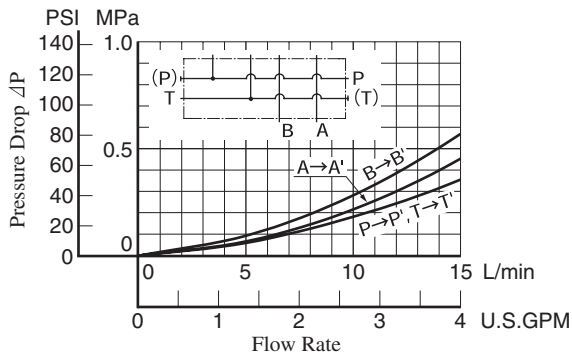


MMC-005-1



MMC-005-2-5

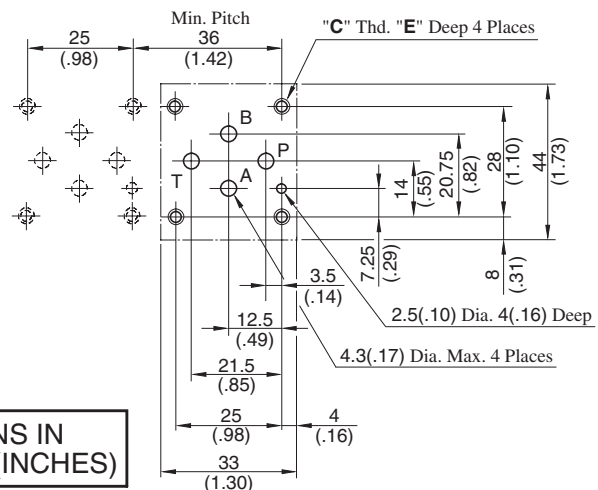
### Pressure Drop



### 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)  |

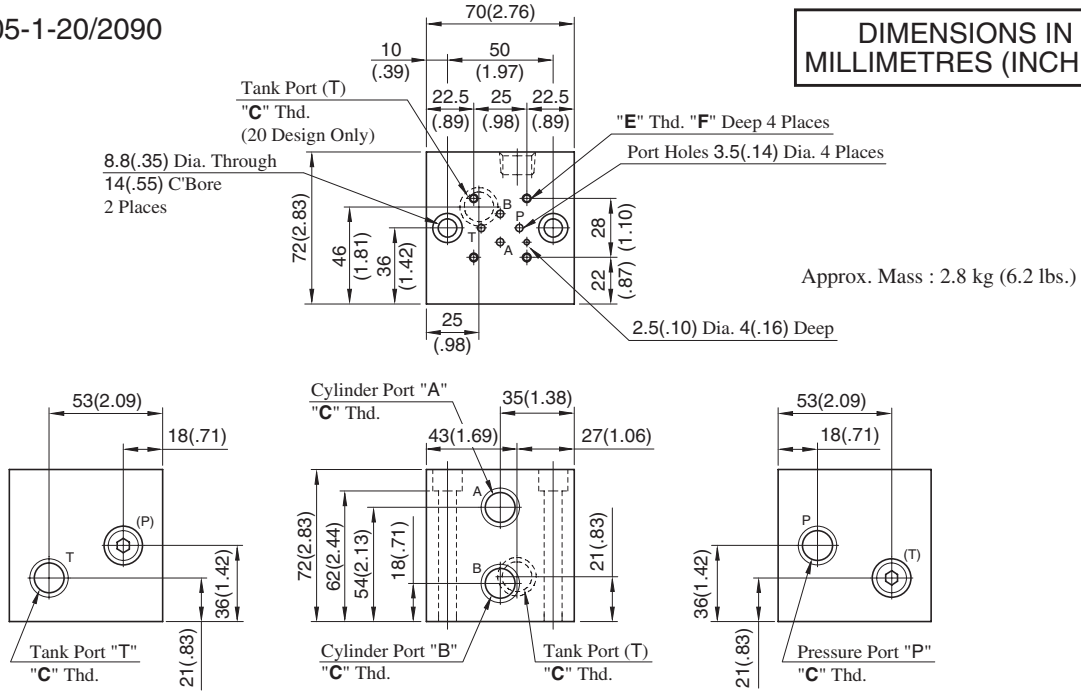


DIMENSIONS IN MILLIMETRES (INCHES)

005 Series Modular Valves

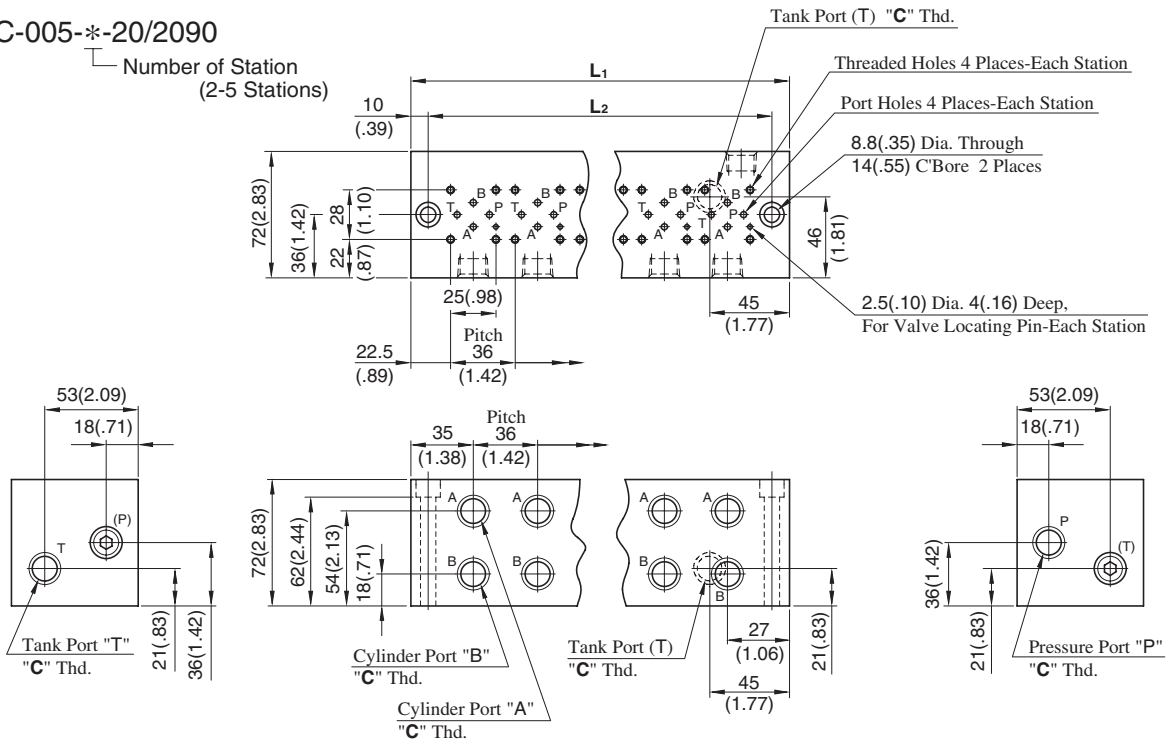
MMC-005-1-20/2090

**DIMENSIONS IN MILLIMETRES (INCHES)**



MMC-005-\*-20/2090

Number of Station  
(2-5 Stations)



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

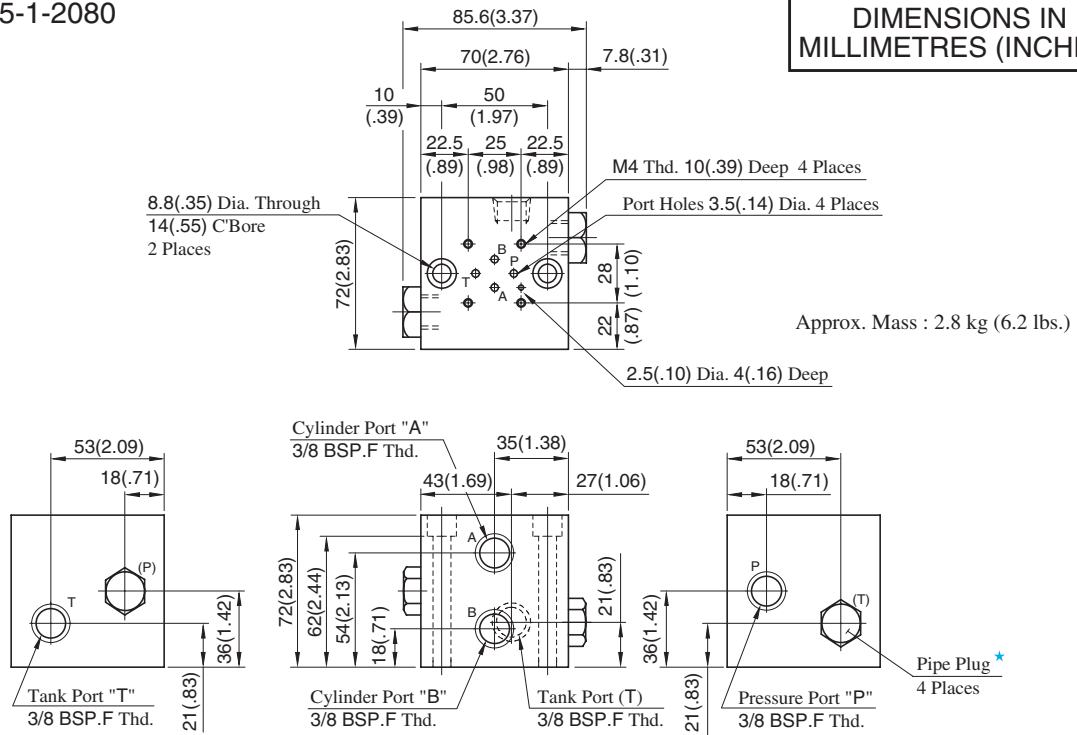
| Model Numbers  | Thread Size |              | Dimensions mm (Inches) |
|----------------|-------------|--------------|------------------------|
|                | "C" Thd.    | "E" Thd.     | F                      |
| MMC-005-*-20   | Rc 3/8      | M4           | 8 (.31)                |
| MMC-005-*-2090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

| Model Numbers | Dimensions mm (Inches) |                | Approx. Mass<br>kg (lbs.) |
|---------------|------------------------|----------------|---------------------------|
|               | L <sub>1</sub>         | L <sub>2</sub> |                           |
| 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)                |

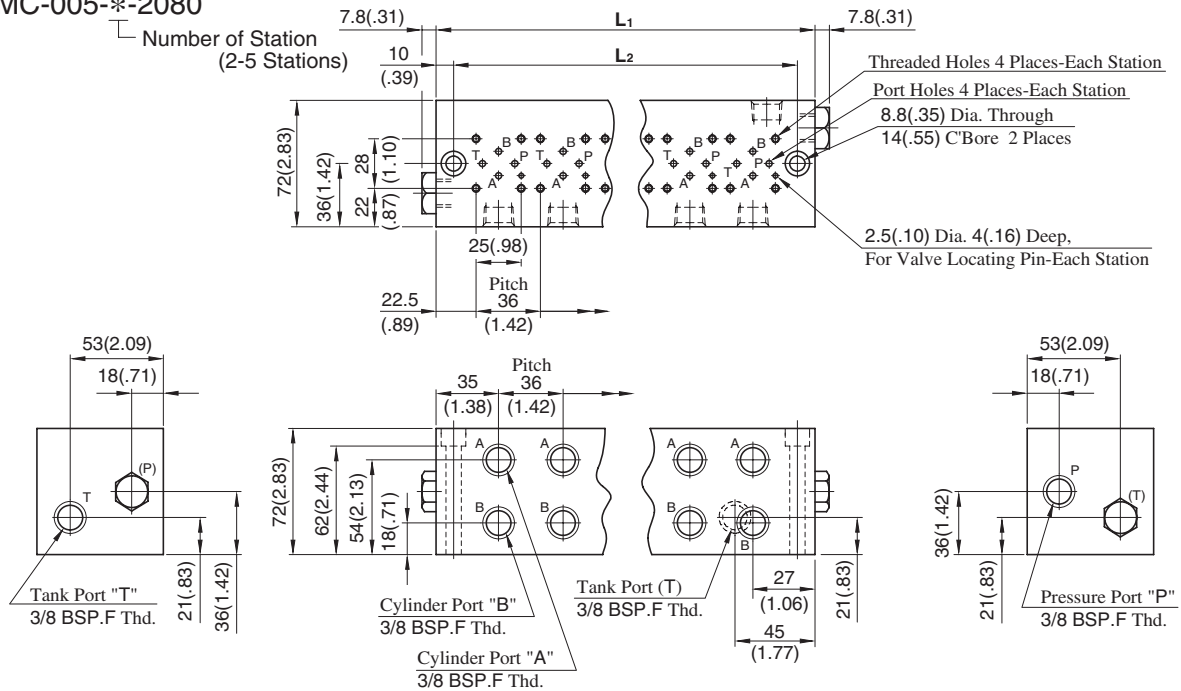


MMC-005-1-2080

**DIMENSIONS IN MILLIMETRES (INCHES)**



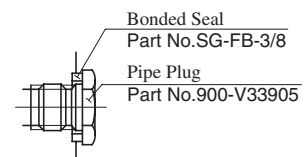
MMC-005-\*2080



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

| Model Numbers | Dimensions mm (Inches) |                | Approx. Mass<br>kg (lbs.) |
|---------------|------------------------|----------------|---------------------------|
|               | L <sub>1</sub>         | L <sub>2</sub> |                           |
| 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

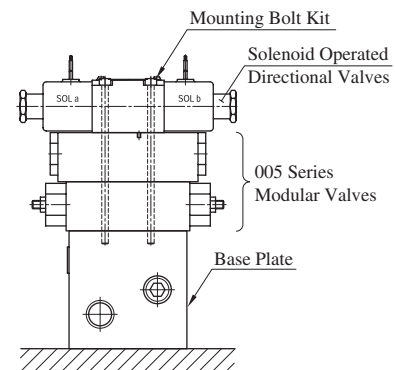
| MBK                                      | -005                  | -02  | -20           | *  |
|--|-----------------------|--|---------------|--|
| Series Number                            | Size of Modular Valve | Bolt Number  | Design Number | Design Standard  |
| <b>MBK:</b> Bolt Kits for Modular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

### Bolt Kits Selection Chart

| Model Numbers  | Quantity of valves to be stacked              |                         |                         | Approx. Mass<br>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                       |                         |                          |

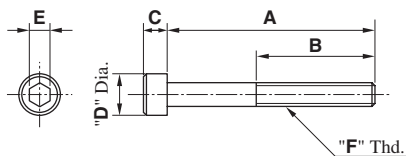
★ The solenoid operated directional valve comes with mounting bolts.

- **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<br>(2.56)           | 20<br>(.79)   | 4<br>(.16)     | 7<br>(.28)    | 3<br>(.12)    | M4           |
| MBK-005-02-20   | 95<br>(3.74)           |               |                |               |               |              |
| MBK-005-03-20   | 125<br>(4.92)          |               |                |               |               |              |
| MBK-005-05-20   | 35<br>(1.38)           |               |                |               |               |              |
| MBK-005-01-2090 | 65.1<br>(2-9/16)       | 22.4<br>(.88) | 4.17<br>(.164) | 6.86<br>(.27) | 3.6<br>(9/64) | No. 8-32 UNC |
| MBK-005-02-2090 | 95.2<br>(3-3/4)        |               |                |               |               |              |
| MBK-005-03-2090 | 125.4<br>(4-15/16)     |               |                |               |               |              |
| MBK-005-05-2090 | 34.9<br>(1-3/8)        |               |                |               |               |              |