

## Type of Modular Valve

| Class                   | Model Numbers   | Graphic Symbols | Page | Class                      | Model Numbers  | Graphic Symbols               | Page |     |
|-------------------------|---|-----------------|------|----------------------------|--|-------------------------------|------|-----|
|                         | Solenoid Controlled Pilot Operated Directional Valve<br>(S-)DSHG-10-***-*-43/4390 |                 | 381  |                            | Pilot Operated Check Valves<br>(for "A-Line", Internal Pilot-)<br>Internal Drain Type<br>MPA-10-*-30/3090    |                               | 640  |     |
| Pressure Control Valves | Reducing Valves<br>(for "P-Line")<br>MRP-10-*-30/3090                             |                 | 634  |                            | Pilot Operated Check Valves<br>(for "A-Line", External Pilot-)<br>External Drain Type<br>MPA-10-*-X-30/3090  |                               | 640  |     |
|                         | Reducing Valves<br>(for "A-Line")<br>MRA-10-*-30/3090                             |                 | 634  |                            | Pilot Operated Check Valves<br>(for "A-Line", External Pilot-)<br>Internal Drain Type<br>MPA-10-*-Y-30/3090  |                               | 640  |     |
|                         | Reducing Valves<br>(for "B-Line")<br>MRB-10-*-30/3090                             |                 | 634  | Directional Control Valves | Pilot Operated Check Valves<br>(for "B-Line", Internal Pilot-)<br>Internal Drain Type<br>MPB-10-*-30/3090    |                               | 640  |     |
|                         | Throttle and Check Valves<br>(for "A-Line", Metre-out)<br>MSA-10-X-30/3090        |                 | 637  |                            | Pilot Operated Check Valves<br>(for "B-Line", External Pilot-)<br>External Drain Type<br>MPB-10-*-X-30/3090  |                               | 640  |     |
|                         | Throttle and Check Valves<br>(for "A-Line", Metre-in)<br>MSA-10-Y-30/3090         |                 | 637  |                            | Pilot Operated Check Valves<br>(for "B-Line", External Pilot-)<br>Internal Drain Type<br>MPB-10-*-Y-30/3090  |                               | 640  |     |
| Flow Control Valves     | Throttle and Check Valves<br>(for "B-Line", Metre-out)<br>MSB-10-X-30/3090        |                 | 637  |                            | Pilot Operated Check Valves<br>(for "A&B-Lines", Internal Pilot-)<br>Internal Drain Type<br>MPW-10-*-30/3090 |                               | 640  |     |
|                         | Throttle and Check Valves<br>(for "B-Line", Metre-in)<br>MSB-10-Y-30/3090         |                 | 637  |                            | Mounting Bolts   | Bolt Kits<br>MBK-10-*-10/1090 |      | 644 |
|                         | Throttle and Check Valves<br>(for "A&B-Lines", Metre-out)<br>MSW-10-X-30/3090     |                 | 637  |                            |  |                               |      |     |
|                         | Throttle and Check Valves<br>(for "A&B-Lines", Metre-in)<br>MSW-10-Y-30/3090      |                 | 637  |                            |  |                               |      |     |

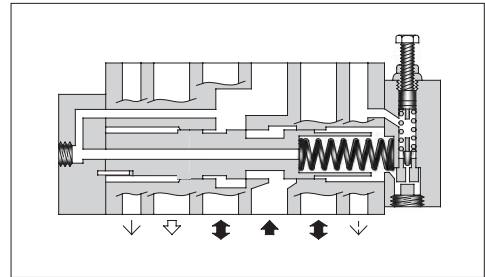
★ Because drain ports "V" and "W" are not provided for solenoid controlled pilot operated directional valves of Pressure Centred Type (3H\*) and models with Pilot Piston (P\*), those valves cannot be used in combination with modular valves.

## Reducing Modular Valves

### Specifications

| Model Numbers         | Max. Operating Pressure<br>MPa(PSI) | Max. Flow*<br>L/min (U.S.GPM) |
|-----------------------|-------------------------------------|-------------------------------|
| MR*-10-A-30/3090      | 25 (3630)                           | 250 (66)                      |
| MR*-10-B-30/3090      |                                     | 800 (211)                     |
| MR*-10-C-30/3090<br>H |                                     |                               |

★ In the pressure adjustment ranges "A" and "B", maximum flow rates are limited by the pressure setting on the secondary side. Referring to the secondary pressure vs. maximum flow characteristics on the following page, use the valve at the maximum flow rate within a zone highlighted with .



### Model Number Designation

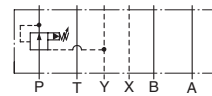
| F-  | MRP   | -10        | -B  | -30           | *               |
|---|---|------------|---|---------------|-----------------|
| Special Seals   | Series Number   | Valve Size | Pres. Adj. Range<br>MPa (PSI)   | Design Number | Design Standard |
| <b>F:</b><br>Special Seals for Phosphate Ester Type Fluids (Omit if not required) | <b>MRP:</b> Reducing Valve for P-Line<br><b>MRA:</b> Reducing Valve for A-Line<br><b>MRB:</b> Reducing Valve for B-Line | <b>10</b>  | <b>A:</b> 0.7-7 (100-1020)<br><b>B:</b> 1.5-7 (220-1020)<br><b>C:</b> 3.5-14 (510-2030)<br><b>H:</b> 7-21 (1020-3050) | <b>30</b>     | Refer to ★      |

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

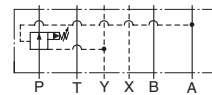
### Instructions

- Connect **Drain Line (Y port)** to oil tank independently so as to obtain stable pressure setting. At the same time, the solenoid controlled pilot operated directional valve to be used in combination with this valve must be of internal drain type (with T).
- 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.

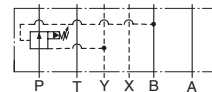
### Graphic Symbols



MRP-10



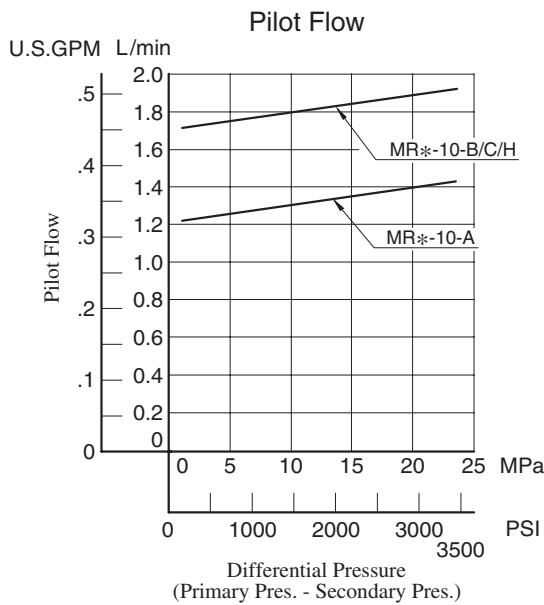
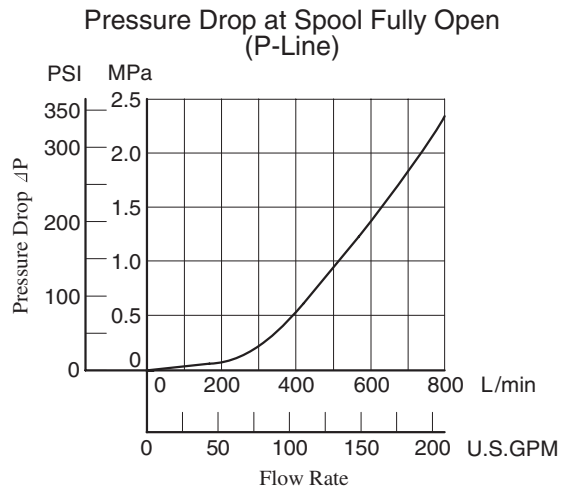
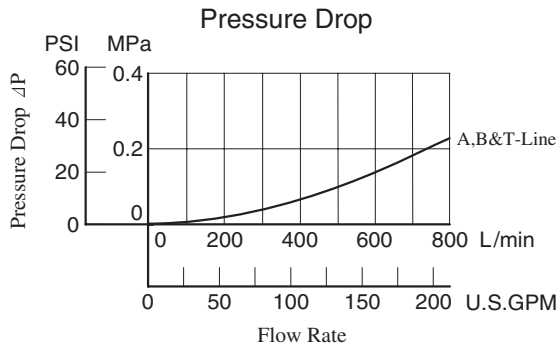
MRA-10



MRB-10

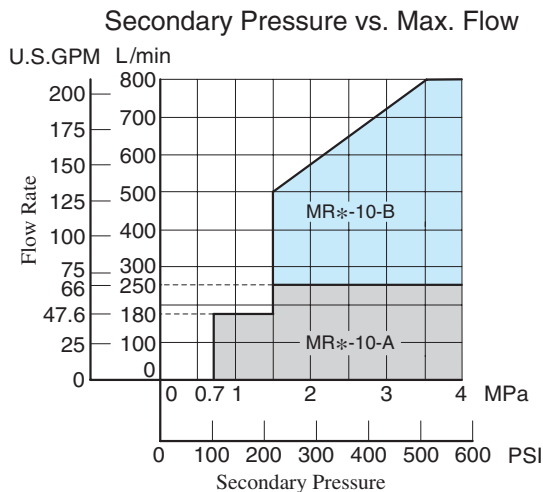
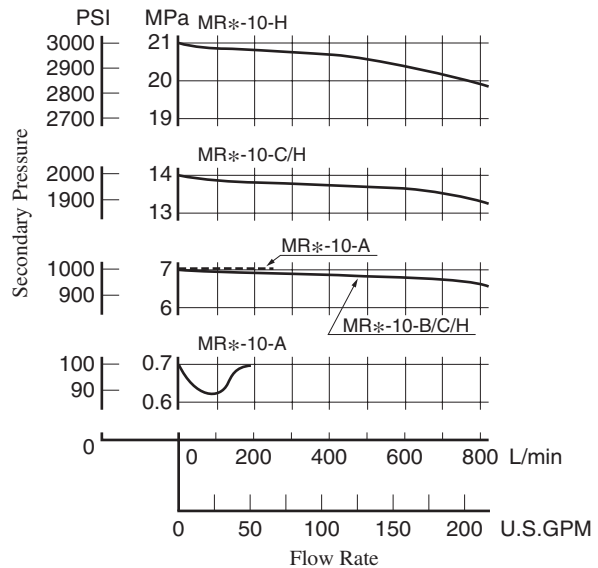
## Typical Performance Characteristics

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



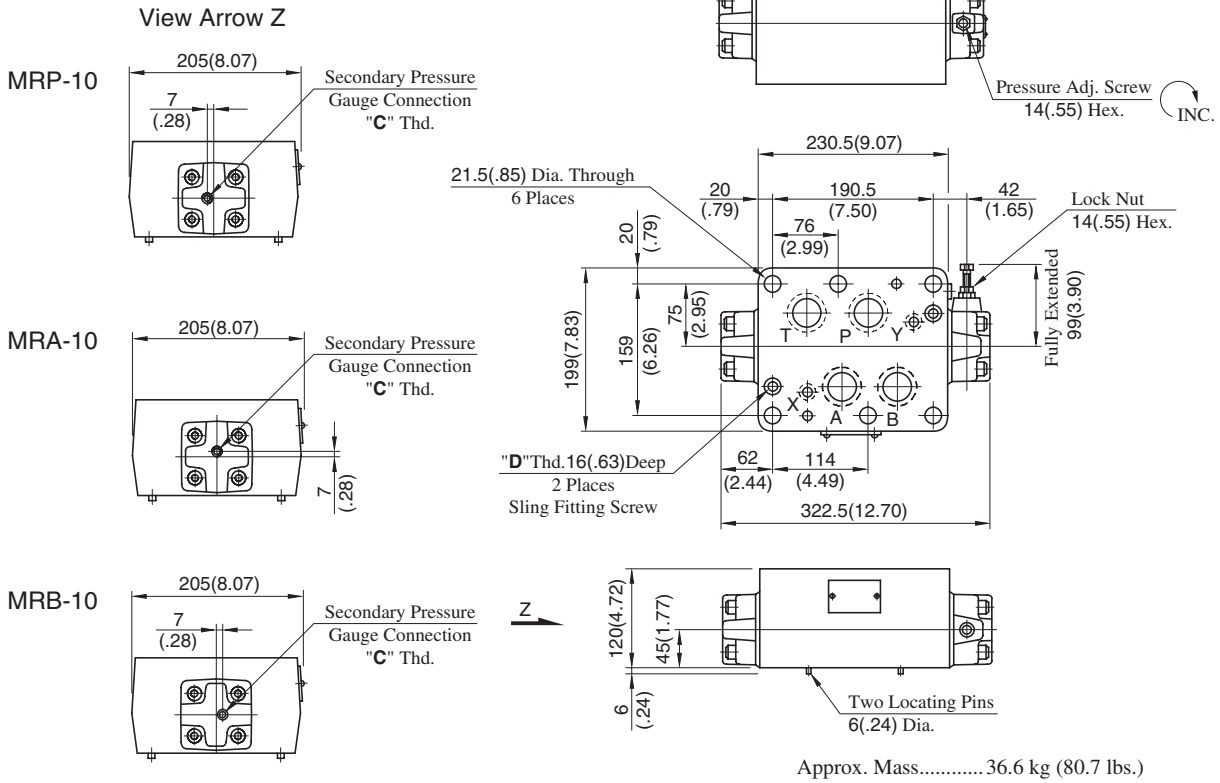
### Nominal Override Characteristics

Primary Pressure 25 MPa (3630 PSI)



MRP-10-\*-30/3090  
 MRA-10-\*-30/3090  
 MRB-10-\*-30/3090

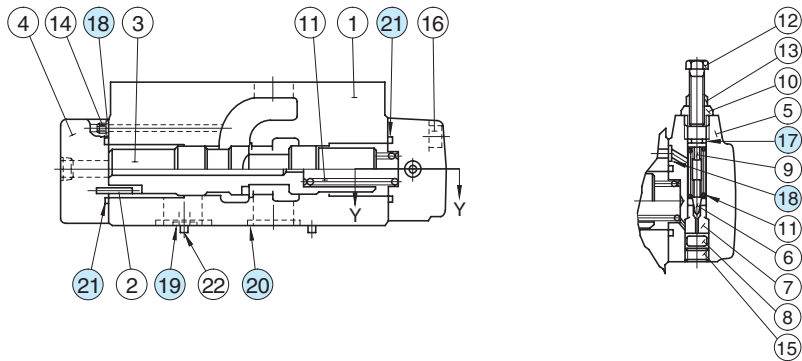
**DIMENSIONS IN  
 MILLIMETRES (INCHES)**



| Model Numbers | Thread Size         |             |
|---------------|---------------------|-------------|
|               | "C" Thd.            | "D" Thd.    |
| MR*-10-*-30   | Rc 1/4 = 1/4 BSP.Tr | M8          |
| MR*-10-*-3090 | 1/4 NPT             | 5/16-18 UNC |

**■ Spare Parts List**

MRP-10-\*-30/3090  
 MRA-10-\*-30/3090  
 MRB-10-\*-30/3090



**● List of Seals**

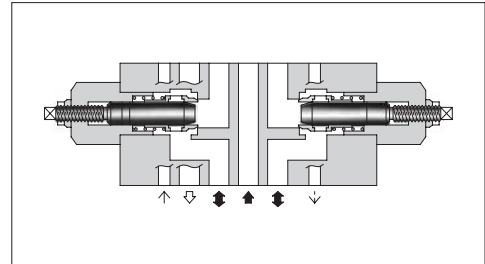
| Item | Name of Parts | Part Numbers | Qty. | Remarks                                       |
|------|---------------|--------------|------|---|
| 17   | O-Ring        | SO-NA-P9     | 1    | Included in Seal Kit<br>Kit No.: KS-MRP-10-10 |
| 18   | O-Ring        | SO-NB-P9     | 4    |   |
| 19   | O-Ring        | SO-NB-P16    | 2    |   |
| 20   | O-Ring        | SO-NB-P40    | 4    |   |
| 21   | O-Ring        | SO-NB-P44    | 2    |   |

Section Y-Y

## Throttle and Check Modular Valves

### Specifications

| Model Numbers  | Max. Operating Pressure<br>MPa (PSI) | Max. Flow<br>L/min (U.S.GPM) |
|--|--------------------------------------|------------------------------|
| MSA-10-*-30/3090<br>MSB-10-*-30/3090<br>MSW-10-*-30/3090 | 25 (3630)                            | 800 (211)                    |



### Model Number Designation

| F-  | MSW  | -10        | -X  | -30           | *               |
|---|--|------------|---|---------------|-----------------|
| Special Seals   | Series Number  | Valve Size | Direction of Flow                           | Design Number | Design Standard |
| <b>F:</b><br>Special Seals for Phosphate Ester Type Fluids (Omit if not required) | <b>MSA :</b> Throttle and Check Valves for A-Line<br><b>MSB :</b> Throttle and Check Valves for B-Line<br><b>MSW :</b> Throttle and Check Valves for A&B-Lines | <b>10</b>  | <b>X :</b> Metre-out<br><b>Y :</b> Metre-in | <b>30</b>     | Refer to ★      |

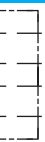
★ Design Standards: None ..... Japanese Standard "JIS" and European Design Standard 90 ..... N. American Design Standard

### Instructions

- 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.

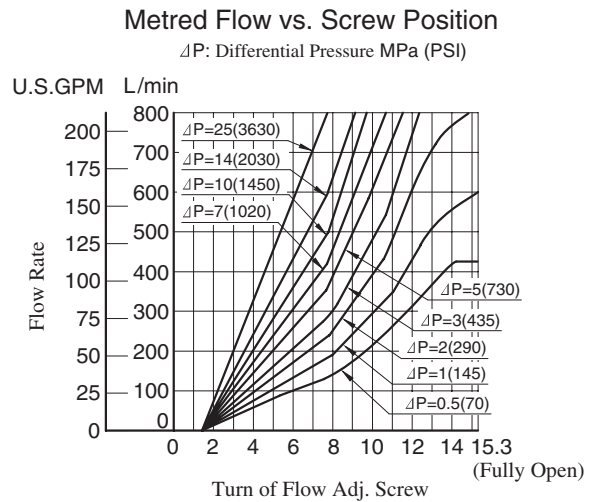
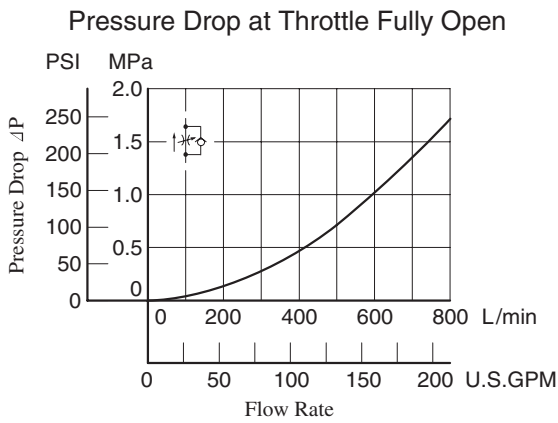
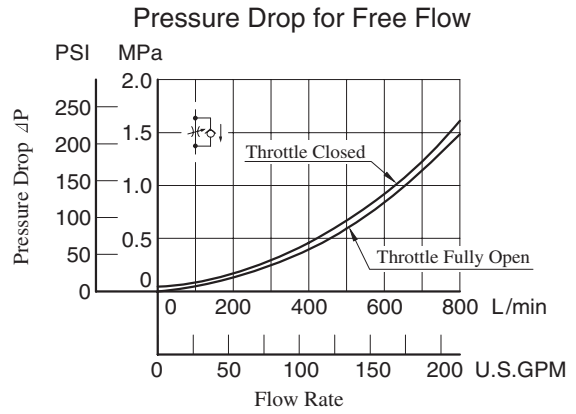
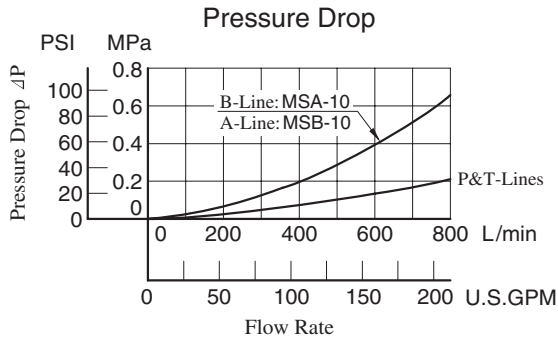
### Graphic Symbols

| Metre-out       | Metre-in        |
|-----------------|-----------------|
| <p>MSA-10-X</p> | <p>MSA-10-Y</p> |
| <p>MSB-10-X</p> | <p>MSB-10-Y</p> |
| <p>MSW-10-X</p> | <p>MSW-10-Y</p> |



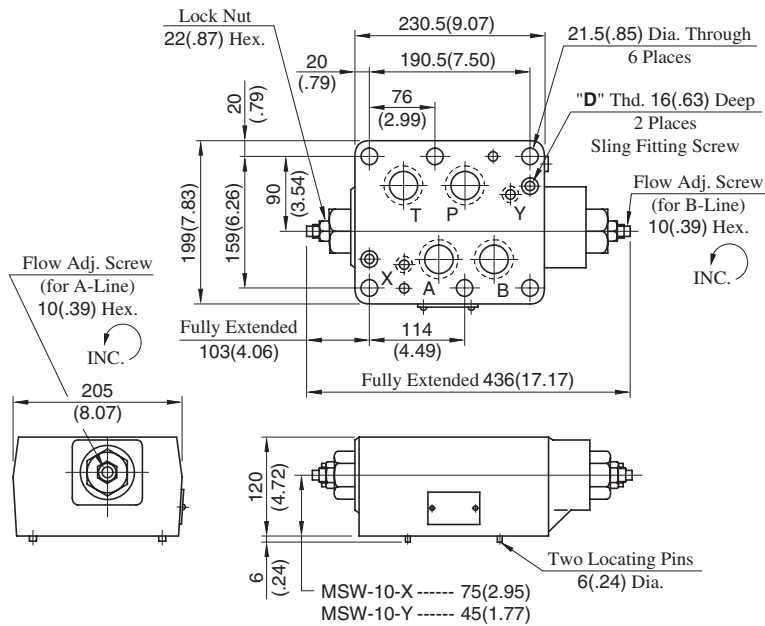
■ Typical Performance Characteristics

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



## MSW-10-X-Y-30/3090

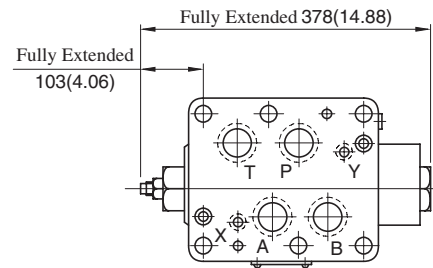
### DIMENSIONS IN MILLIMETRES (INCHES)



| Model Numbers | "D" Thd.    |
|---------------|-------------|
| MS*-10-*-30   | M8          |
| MS*-10-*-3090 | 5/16-18 UNC |

Approx. Mass..... 35.7 kg (78.7 lbs.)

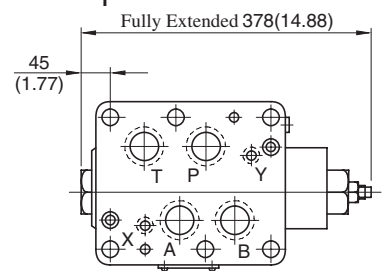
## MSA-10-X-Y-30/3090



Approx. Mass..... 35 kg (77.2 lbs.)

• For other dimensions, refer to "MSW-10" drawing left.

## MSB-10-X-Y-30/3090

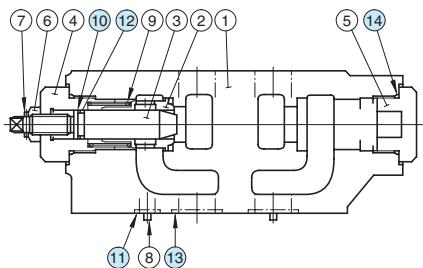


Approx. Mass..... 35 kg (77.2 lbs.)

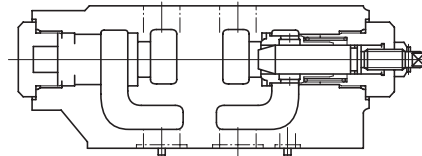
• For other dimensions, refer to "MSW-10" drawing left.

### Spare Parts List

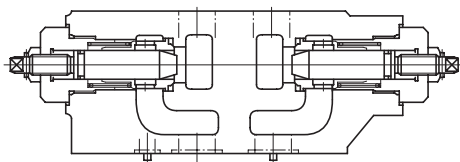
#### MSA-10-\*-30/3090



#### MSB-10-\*-30/3090



#### MSW-10-\*-30/3090



#### List of Seals

| Item | Name of Parts | Part Numbers | Quantity |        |        |
|------|---------------|--------------|----------|--------|--------|
|      |               |              | MSA-10   | MSB-10 | MSW-10 |
| 10   | Back Up Ring  | SO-BB-P20    | 1        | 1      | 2      |
| 11   | O-Ring        | SO-NB-P16    | 2        | 2      | 2      |
| 12   | O-Ring        | SO-NA-P20    | 1        | 1      | 2      |
| 13   | O-Ring        | SO-NB-P40    | 4        | 4      | 4      |
| 14   | O-Ring        | SO-NB-P44    | 2        | 2      | 2      |

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

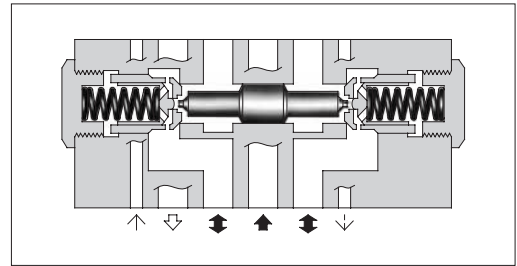
#### List of Seal Kits

| Valve Model Numbers | Seal Kit Numbers |
|---------------------|------------------|
| MSA-10              | KS-MSA-10-10     |
| MSB-10              |                  |
| MSW-10              | KS-MSW-10-10     |

## Pilot Operated Check Modular Valves

### Specifications

| Model Numbers  | Max. Operating Pressure<br>MPa (PSI) | Max. Flow<br>L/min (U.S.GPM) |
|--|--------------------------------------|------------------------------|
| MPA-10*-**-30/3090<br>MPB-10*-**-30/3090<br>MPW-10*-**-30/3090 | 25 (3630)                            | 800 (211)                    |



### Model Number Designation

| F-  | MPA   | -10        | S  | -2   | -X   | -30           | *                      |
|---|---|------------|--|--|--|---------------|------------------------|
| Special Seals   | Series Number   | Valve Size | Port Tapping Feature of Pilot-Drain Port <sup>★1</sup>   | Cracking Pressure MPa (PSI)                | Pilot-Drain <sup>★2</sup> Connection   | Design Number | Design Standard        |
| <b>F:</b><br>Special Seals for Phosphate Ester Type Fluids (Omit if not required) | <b>MPA :</b> Pilot Operated Check Valve for A-Line<br><b>MPB :</b> Pilot Operated Check Valve for B-Line<br><b>MPW :</b> Pilot Operated Check Valve for A&B-Lines | <b>10</b>  | <b>None :</b> Taper Thread<br><b>S :</b> Straight Thread (Applicable only for Japanese Std. "JIS") | <b>2 :</b> 0.2 (29)<br><b>4 :</b> 0.4 (58) | <b>None:</b> Internal Pilot-Internal Drain<br><b>X :</b> External Pilot-External Drain<br><b>Y :</b> External Pilot-Internal Drain | <b>30</b>     | Refer to <sup>★3</sup> |

- ★1. This item applies only to External Pilot or External Drain Type.
- ★2. Only "None: Internal Pilot-Internal Drain Type" is available for MPW (for "A&B-Lines").
- ★3. Design Standards: None ..... Japanese Standard "JIS" and European Design Standard 90 ..... N. American Design Standard

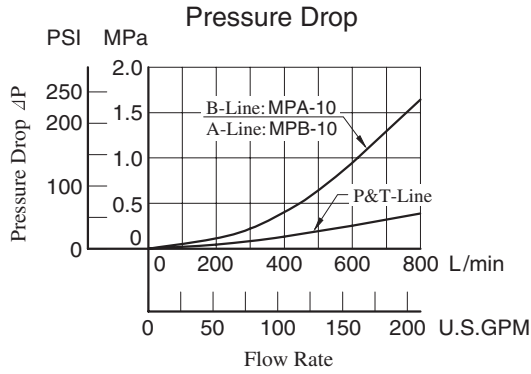
### Graphic Symbols

| Pilot-Drain type<br>Model No. | Internal Pilot-Internal Drain Type | External Pilot-External Drain Type | External Pilot-Internal Drain Type |
|-------------------------------|------------------------------------|------------------------------------|------------------------------------|
| MPA-10                        | <br>MPA-10-*                       | <br>MPA-10*-*-X                    | <br>MPA-10*-*-Y                    |
| MPB-10                        | <br>MPB-10-*                       | <br>MPB-10*-*-X                    | <br>MPB-10*-*-Y                    |
| MPW-10                        | <br>MPW-10-*                       | —                                  | —                                  |

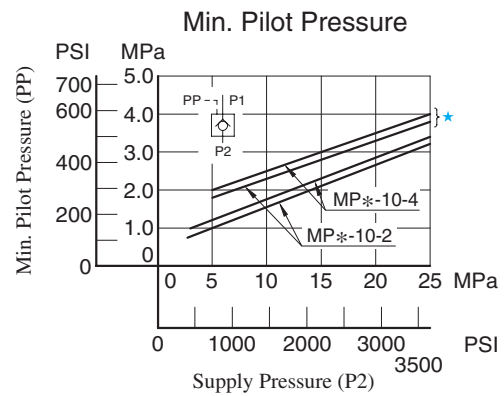
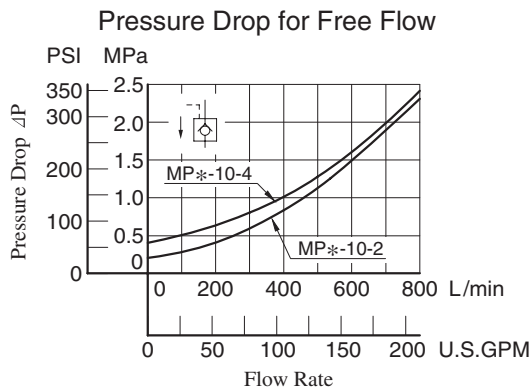
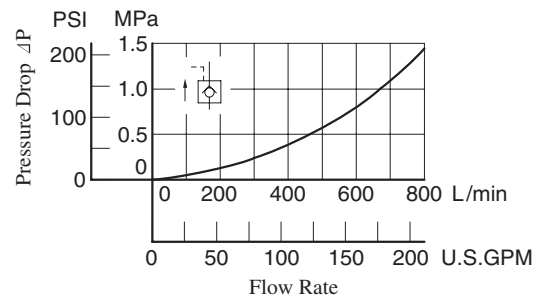


## Typical Performance Characteristics

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



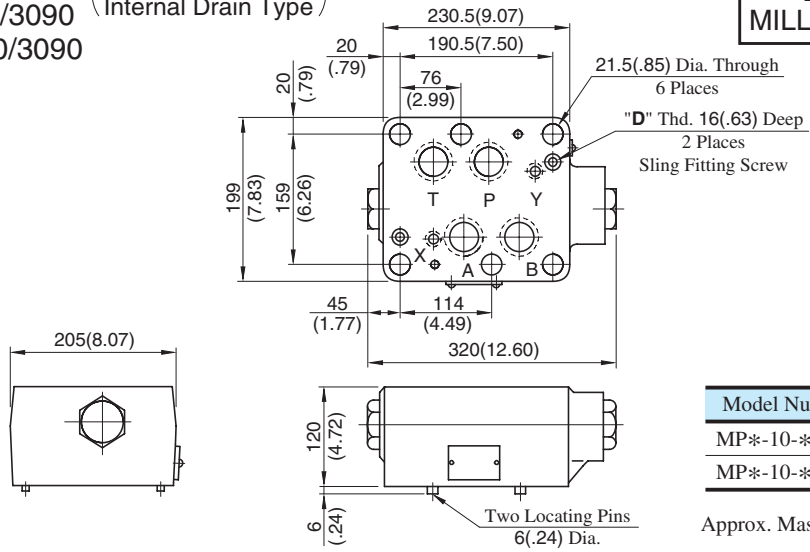
### Pressure Drop for Reversed Controlled Flow



★ In case of 500 L/min (132 U.S.GPM) or more.

MPA-10-\*-30/3090 (Internal Pilot-  
MPB-10-\*-30/3090 Internal Drain Type)  
MPW-10-\*-30/3090

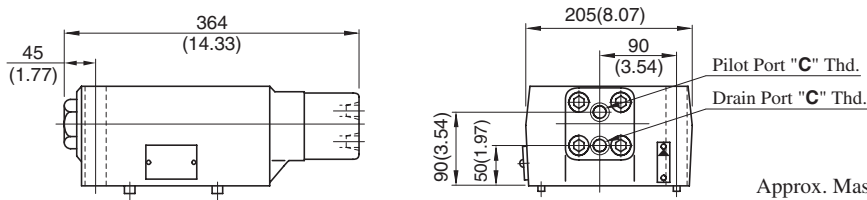
**DIMENSIONS IN  
MILLIMETRES (INCHES)**



| Model Numbers | "D" Thd.    |
|---------------|-------------|
| MP*-10-*-30   | M8          |
| MP*-10-*-3090 | 5/16-18 UNC |

Approx. Mass.....36.5 kg (80.5 lbs.)

MPA-10-\*-X-30/3090 (External Pilot-  
External Drain Type)

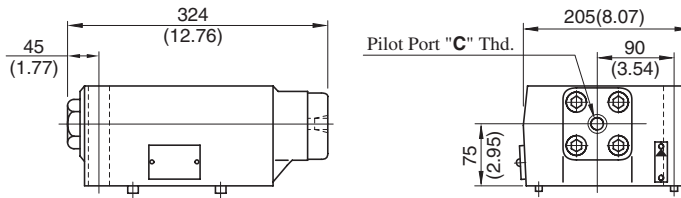


Approx. Mass.....38 kg (83.8 lbs.)

| Model Numbers   | Thread Size<br>"C" Thd. |
|-----------------|-------------------------|
| MPA-10-*-X-30   | Rc 3/8 = 3/8 BSP. Tr    |
| MPA-10-*-X-3090 | 3/8 NPT                 |
| MPA-10S-*-X-30  | G 3/8                   |

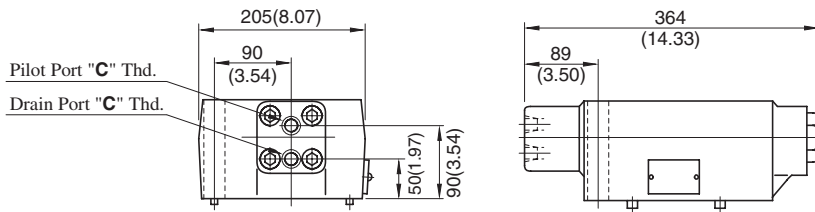
Approx. Mass.....36.5 kg (80.5 lbs.)

MPA-10-\*-Y-30/3090 (External Pilot-  
Internal Drain Type)



• For other dimensions, refer to "Internal pilot-Internal drain type" drawing above.

MPB-10-\*-X-30/3090 (External Pilot-  
External Drain Type)

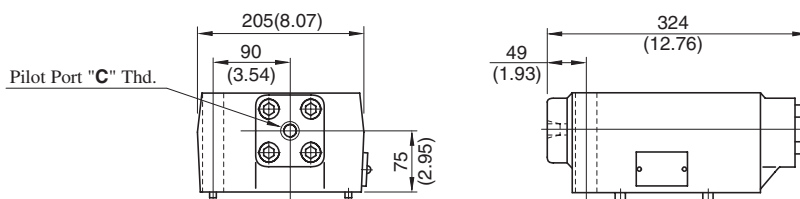


Approx. Mass.....38 kg (83.8 lbs.)

| Model Numbers   | Thread Size<br>"C" Thd. |
|-----------------|-------------------------|
| MPB-10-*-X-30   | Rc 3/8 = 3/8 BSP. Tr    |
| MPB-10-*-X-3090 | 3/8 NPT                 |
| MPB-10S-*-X-30  | G 3/8                   |

Approx. Mass.....36.5 kg (80.5 lbs.)

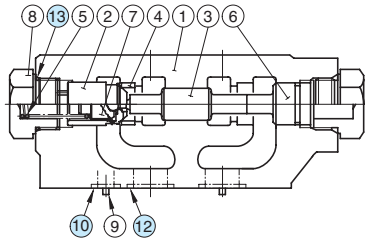
MPB-10-\*-Y-30/3090 (External Pilot-  
Internal Drain Type)



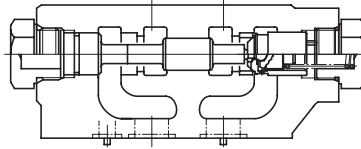
• For other dimensions, refer to "Internal pilot-Internal drain type" drawing above.

## ■ Spare Parts List

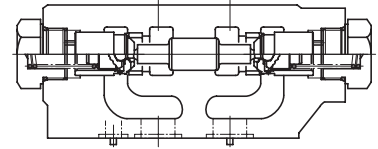
### Internal Pilot- Internal Drain Type



MPA-10\*-30/3090

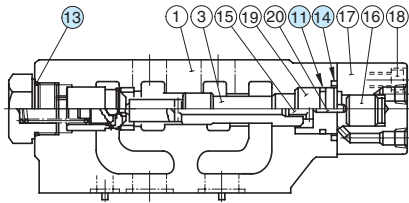


MPB-10\*-30/3090

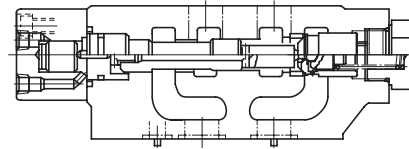


MPW-10\*-30/3090

### External Pilot- External Drain Type

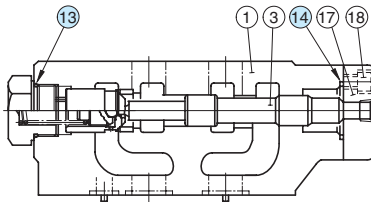


MPA-10\*-X-30/3090

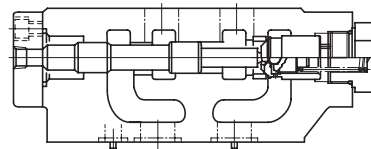


MPB-10\*-X-30/3090

### External Pilot- Internal Drain Type



MPA-10\*-Y-30/3090



MPB-10\*-Y-30/3090

### ● List of Seals

| Item | Name of Parts | Part Numbers | Quantity                          |                                   |                                   |
|------|---------------|--------------|-----------------------------------|-----------------------------------|-----------------------------------|
|      |               |              | Internal Pilot-<br>Internal Drain | External Pilot-<br>External Drain | External Pilot-<br>Internal Drain |
| 10   | O-Ring        | SO-NB-P16    | 2                                 | 2                                 | 2                                 |
| 11   | O-Ring        | SO-NB-P34    | —                                 | 1                                 | —                                 |
| 12   | O-Ring        | SO-NB-P40    | 4                                 | 4                                 | 4                                 |
| 13   | O-Ring        | SO-NB-P44    | 2                                 | 1                                 | 1                                 |
| 14   | O-Ring        | SO-NB-P46    | —                                 | 1                                 | 1                                 |

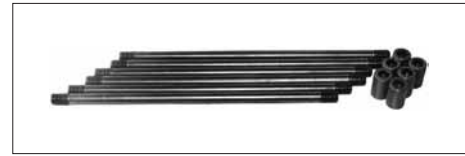
Note: When ordering seals, please specify the seal kit number from the table right.

### ● List of Seal Kits

| Valve Model Numbers | Seal Kit Numbers |
|---------------------|------------------|
| MPA-10-*            | KS-MPA-10-10     |
| MPB-10-*            |                  |
| MPW-10-*            |                  |
| MPA-10*-X           | KS-MPA-10-X-10   |
| MPB-10*-X           |                  |
| MPA-10*-Y           | KS-MPA-10-Y-10   |
| MPB-10*-Y           |                  |

## ■ Mounting Bolt Kits For Modular Valves

Valves are mounted with six stud bolts. Valve combination varies according to the circuit type. Hence, the mounting bolt kits are available on a combination type basis. When ordering the mounting bolt kit, be sure to give the bolt kit model number from the table below.



### ■ Model Number Designation

| <b>MBK</b>  | <b>-10</b>            | <b>-04</b>            | <b>-10</b>    | <b>*</b>   |
|---|-----------------------|-----------------------|---------------|--|
| Series Number                                     | Size of Modular Valve | Bolt Number           | Design Number | Design Standard  |
| <b>MBK:</b> Mounting Bolt Kits for Modular Valves | <b>10</b>             | <b>01, 02, 03, 04</b> | <b>10</b>     | <b>None:</b> Japanese Standard "JIS" and European Design Standard<br><b>90:</b> N.American Design Standard |

### ■ Bolt Kits Selection Chart

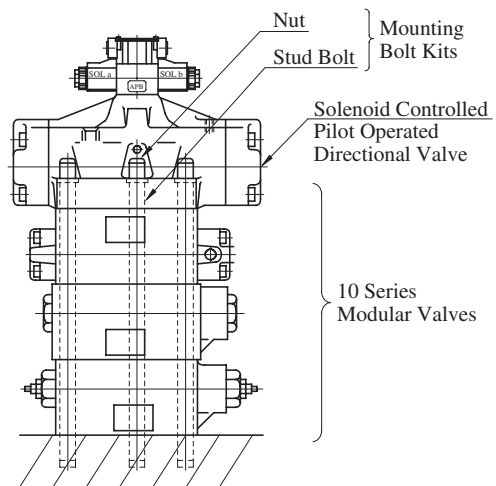
| Model Numbers | Quantity of Valves to be Stacked                         |               | Approx. Mass<br>kg (lbs.) |
|---------------|--|---------------|---------------------------|
|               | Sol. Cont. Pilot Operated Directional Valves (*-DSHG-10) | Modular Valve |                           |
| MBK-10-01-10* | 1  | 1             | 3.9 (8.6)                 |
| MBK-10-02-10* | 1  | 2             | 5.7 (12.6)                |
| MBK-10-03-10* | 1  | 3             | 7.4 (16.3)                |
| MBK-10-04-10* | 1  | 4             | 9.2 (20.3)                |

#### ● Bolt Kit Composition

Stud Bolt ----- 6 Pcs. } 1 set  
 Nut ----- 6 Pcs. }

#### ● Tightening Torque:

150-170 Nm (1330-1505 in. lbs.)

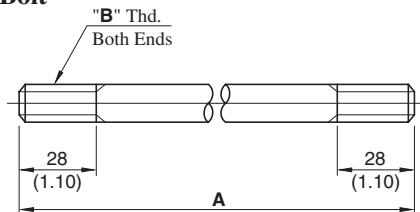


Stacking Example

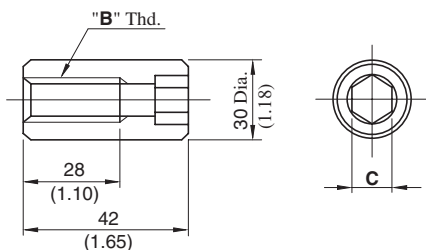
### MBK-10-\*-10/1090

**DIMENSIONS IN MILLIMETRES (INCHES)**

#### ● Stud Bolt



#### ● Nut



| Bolt Numbers | A mm (in.)  |
|--------------|-------------|
| MBK-10-01    | 217 ( 8.54) |
| MBK-10-02    | 337 (13.27) |
| MBK-10-03    | 457 (17.99) |
| MBK-10-04    | 577 (22.72) |

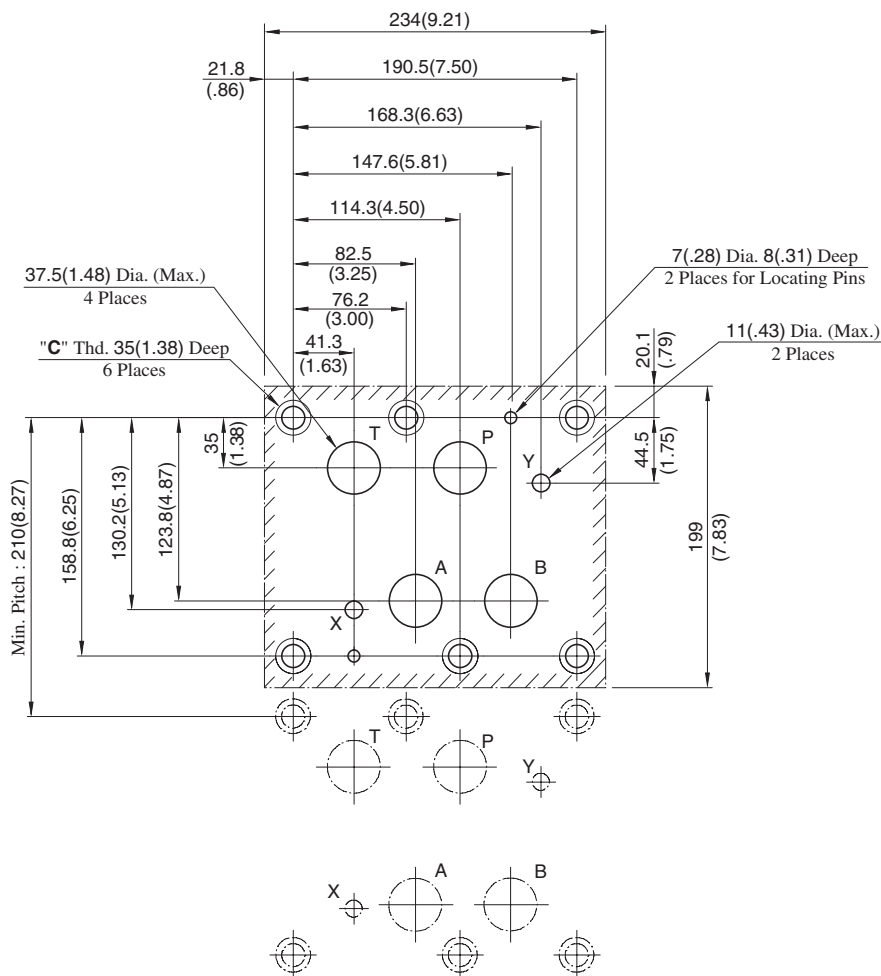
| Model Numbers | "B" Thd.   | C          |
|---------------|------------|------------|
| MBK-10-*-10   | M20        | 17 (.67)   |
| MBK-10-*-1090 | 3/4-10 UNC | 15.9 (5/8) |

## ■ Mounting Surface Dimensions for 1-1/4 Modular Valve

When mounting 10 series modular valve, be sure to use a sub-plate for 1-1/4 solenoid controlled pilot operated directional valves.

| Name  | Sub-plate Model Number | Page |
|---|------------------------|------|
| Sub-plate for 1-1/4 Solenoid Controlled Pilot Operated Directional Valves | DHGM-10*-40/4080/4090  | 403  |

When no sub-plates are used, be sure to use the following mounting surface.



| Design Std.                                  | "C" Thd.   |
|--|------------|
| Japanese Std. "JIS" and European Design Std. | M20        |
| N. American Design Std.                      | 3/4-10 UNC |