# Hydraulic Valve INDEX

**Kosmek valves are most appropriate for fixtures and setup devices.**

## Non-Leak Valve (Holding Pressure)

Kosmek valves with non-leak function maintain pressurized condition even when a fixture is detached from a hydraulic power source.

Model **BK**
Single Acting Model

→ P.1209

Model **BEQ**
Double Acting Model

→ P.1213

## Non-Leak Stop Valve (Manual Switching Valve)

It is a manual switching valve that can hold pressure without power source.

Model **BT**

→ P.1217

## Sequence Valve

In-line sequence valve for simple sequence control.

Model **BZS**
Sequence valve directly attaches to a clamp.
Refer to P.959

Model **BLS**
Piping/Gasket Model

→ P.1219

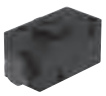
Model **BLG**
Compact Gasket Model

→ P.1219

## Pressure Balance Valve

This valve prevents deformation of a workpiece caused by release sequence operation in case a work support is arranged facing to an actuator.

Model **BLB**



→ P.1225

## Accumulator

Spring accumulator absorbs pressure fluctuation caused by temperature change in the fixture circuit when disconnected from the pressure source.

Model **JSS**
For Low Pressure
(Max.7MPa)

→ P.1229

Model **JS**
For High Pressure
(Max.25MPa)

→ P.1229

## Pressure Indicator (Pressure Switch)

Detects circuit pressure of the fixture disconnected from the hydraulic pressure source by using a limit switch together.

Model **JKA/JKB**

→ P.1239

## Pressure Reducing Valve

By using non-leak function, the in-line reducing valve does not require a drain port which partially reduces the circuit pressure.

**Model BMA**
Piping/Gasket Model

→ P.1243

**Model BMG**
Compact Gasket Model

→ P.1243

## Booster (Continuous Discharge Booster/One Shot Booster)

In-line type One Shot Booster (Model : BU), and Continuous Discharge Booster (Model : AU) that allows no restrictions on the outgoing side circuit capacity with continuous discharge.

**Model AU**
Continuous Discharge Booster

→ P.1249

**Model BU**
One Shot Booster

→ P.1257

## Pilot Reducing Valve/Reservoir

Pressure of a fixture circuit disconnected from the hydraulic power source, can be reduced to the set pressure only by pilot operation.

**Model BP**
Pilot Reducing Valve

→ P.1263

**Model JPB**
Reservoir

→ P.1263

## Automatic Air Bleed Valve

Placed on the top of the piping, this valve bleeds air automatically during repetition of the hydraulic pressure ON / OFF.

**Model BX**

→ P.1267

## Non-Leak Pilot Check Valve

It holds pressure even after the hydraulic supply is cut off. The mounting surface of modular model is based on ISO4401-03.

**Model BEP**
Piping Model

→ P.1269

**Model BSP**
Modular Model

→ P.1269

## Non-Leak Valve Unit (Holding Pressure)

Non-leak valve units which are operated manually or electrically.

**Model BH**
Manual Operation Model

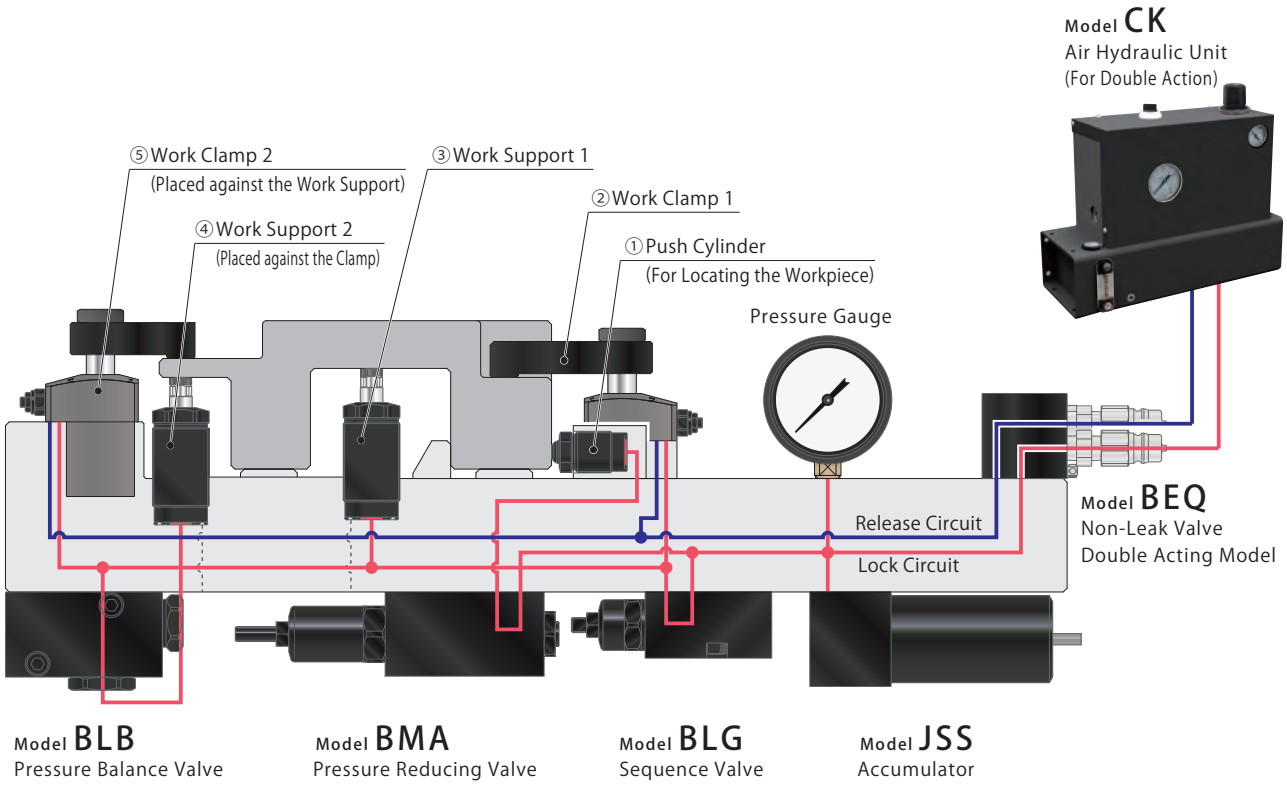
→ P.1275

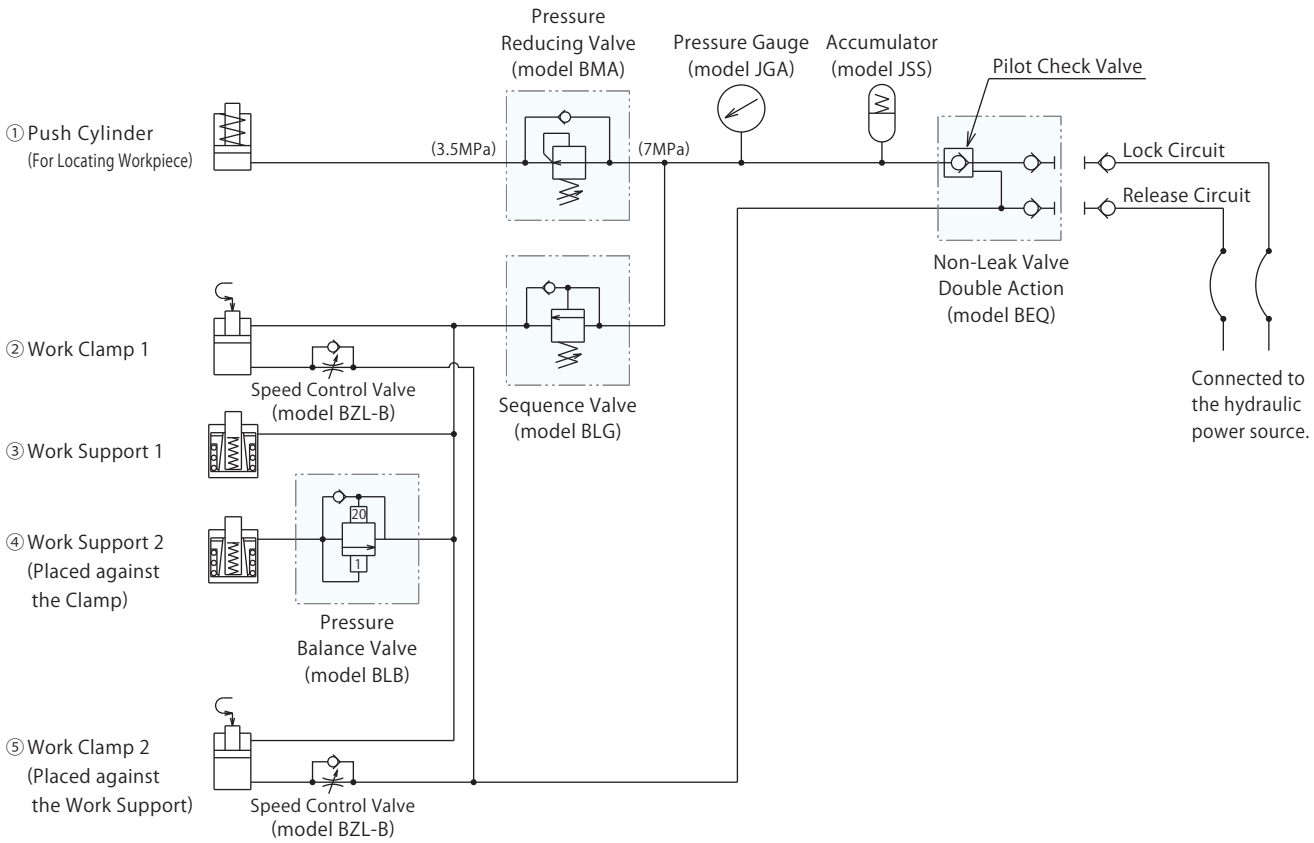
**Model BC**
Electrical Control Model

→ P.1277

# Hydraulic Valve Double Acting Circuit Reference

## Disconnected Fixture Example in Double Acting Circuit



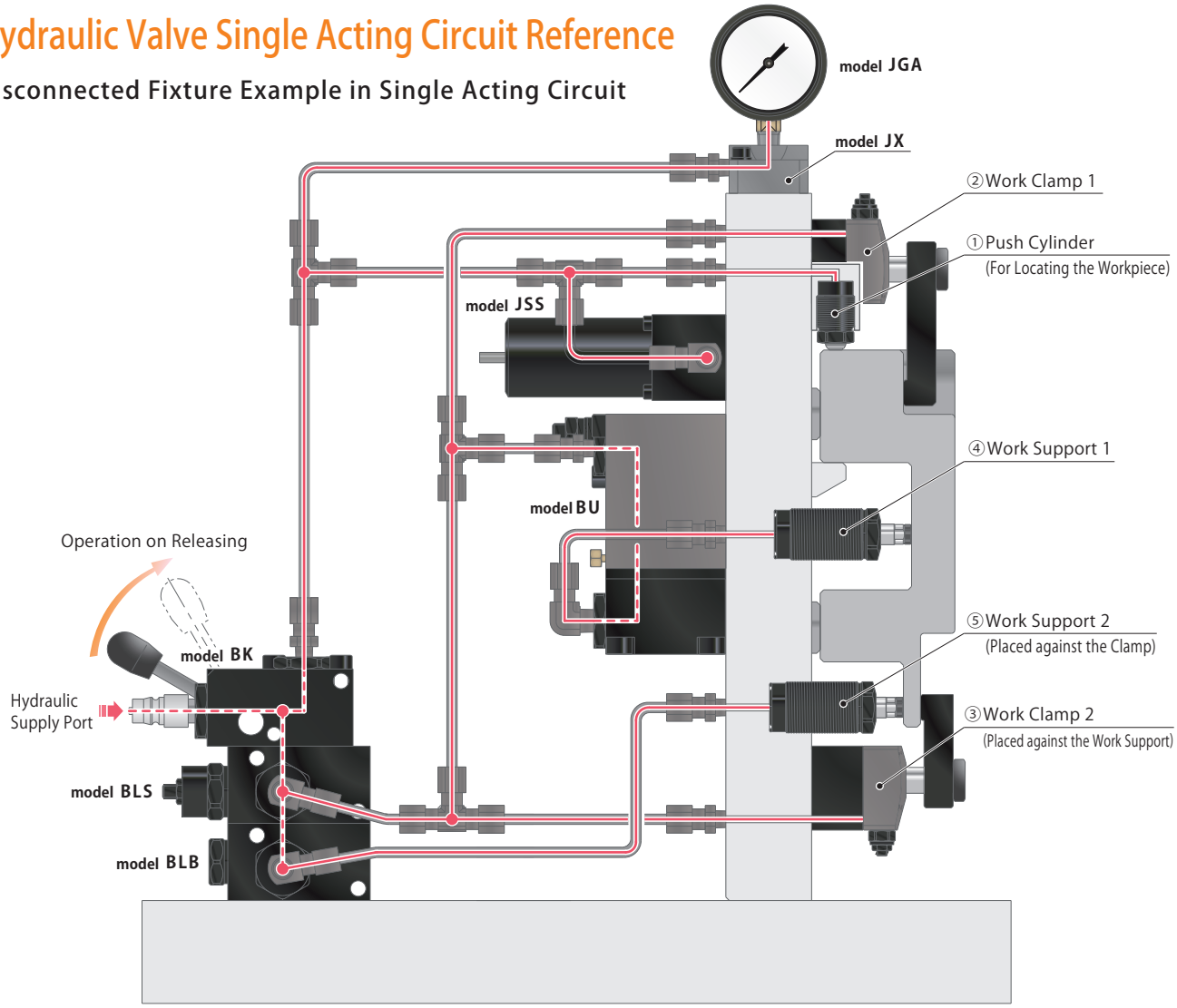



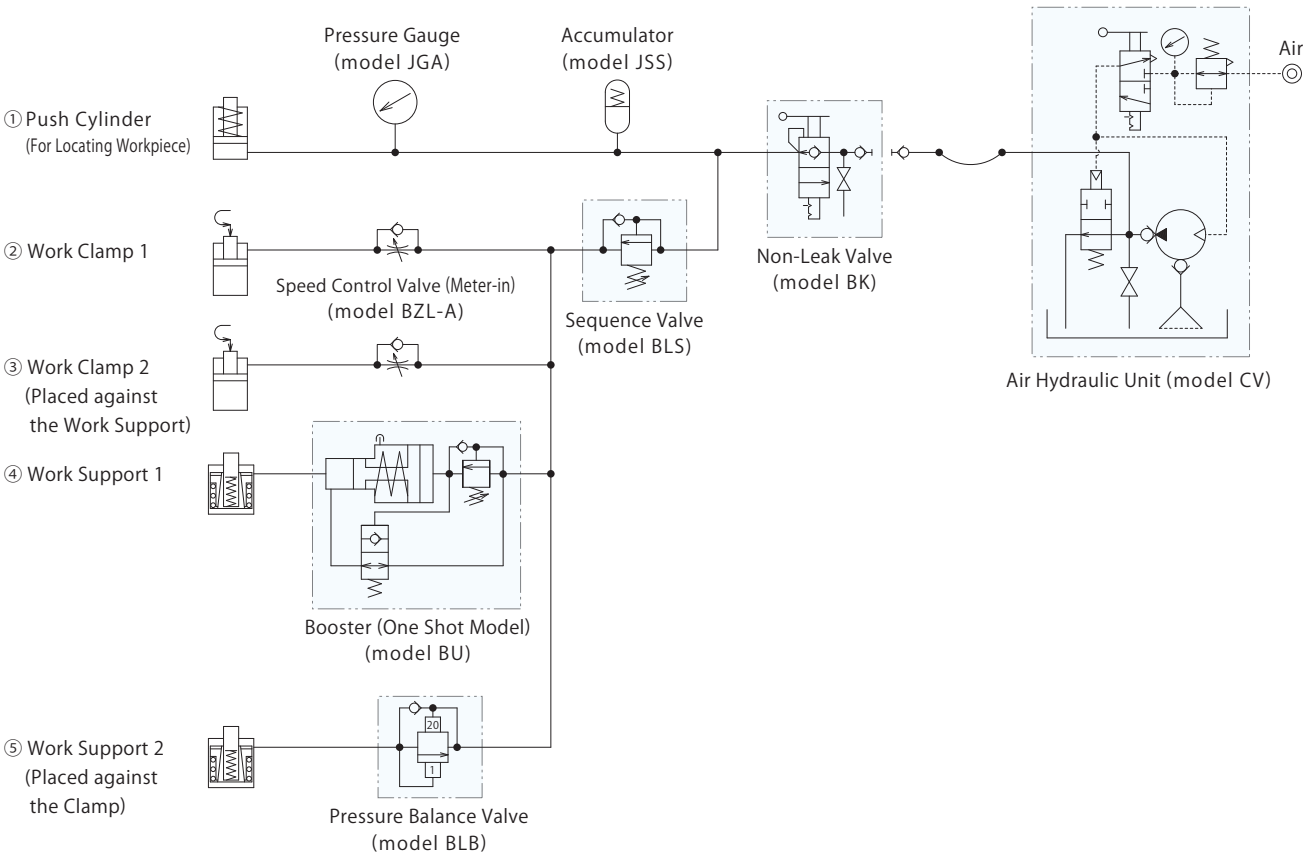
## Action Description

| | Operating Procedure | Note |
|---|---|---|
| Locking | Released State | Release hydraulic pressure is ON when the coupler is connected between the power unit and BEQ. |
| | Load a workpiece on the fixture. | |
| | Turn off release pressure, and turn on lock pressure. | |
| | Push Cylinder ① is activated to locate the workpiece. | The reduced pressure is supplied by reducing valve. |
| | Work Support ③ and ④ are activated. | It is activated after ① by sequence valve. |
| | Work Clamp ② and ⑤ are activated. | To prevent deformation of the workpiece, activate them after ③④ by flow control valve. |
| | Locking action is completed. | |
| | Hydraulic Pressure Source OFF | |
| | Non-leak valve is disconnected from hydraulic power source. | |
| | Machining and/or Transferring | |
| Releasing | Connect hydraulic power source to non-leak valve. | |
| | When release pressure is ON and lock pressure is OFF, the pilot check valve of non-leak valve opens. | |
| | Actuators ① ② ③ ⑤ are released. | |
| | Work Support ④ is released. | Work support is released after ①②③⑤ by pressure balance valve to prevent deformation of the workpiece. |
| | Releasing action is completed. | |

# Hydraulic Valve Single Acting Circuit Reference

## Disconnected Fixture Example in Single Acting Circuit



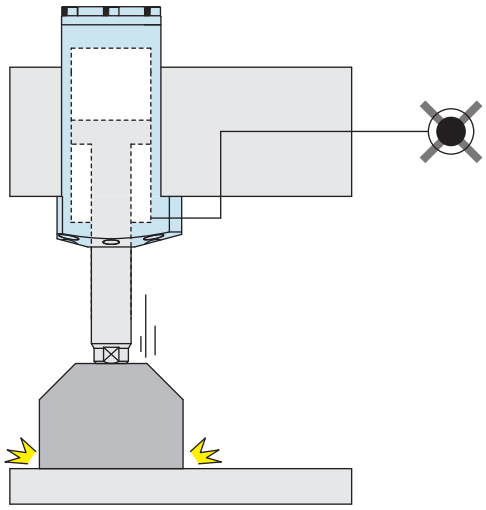
## Action Description

| | Operating Procedure | Note |
|---|---|---|
| Locking | Released State | Hydraulic pressure is OFF when the coupler is connected between the power unit and BK. |
| | Load a workpiece on the fixture. | |
| | Hydraulic Pressure ON | |
| | Push Cylinder ① is activated to locate the workpiece. | |
| | Actuators ②③④⑤ are activated. (Pressure boosted by BU is supplied to Work Support ④.) | It is activated after Push Cylinder ① by sequence valve. Work Clamp ③ is activated after Work Support ⑤ by flow control valve to prevent deformation of the workpiece. |
| | Locking action is completed. | |
| | Hydraulic Pressure OFF | |
| | BK valve is disconnected from hydraulic power source. | |
| | Machining, Transferring, etc. | |
| Releasing | Connect hydraulic power source to non-leak valve. | |
| | Operate BK valve lever to release. | By holding the lever at release position for about one second, outgoing side pressure will be released even if the operator removes his/her hand in the middle of release operation. |
| | Actuators ①②③④ are released. | |
| | Work Support ⑤ is released. | It is released after ①②③④ by pressure balance valve to prevent deformation of the workpiece. |
| | Release action is completed. | |

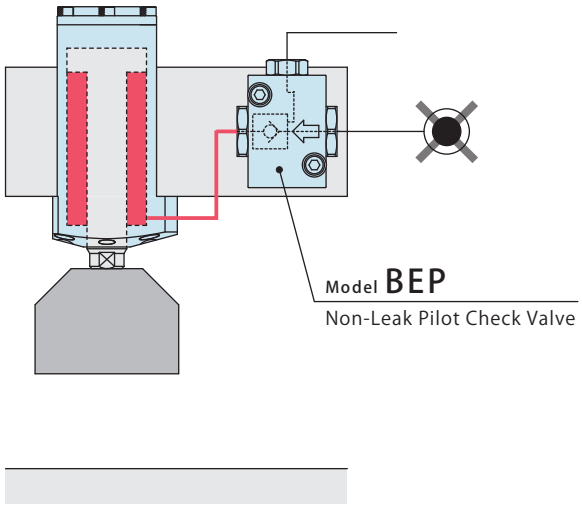
# Safety Circuit, Holding the Datum Point

**By using non-leak valve, non-leak pilot check valve, it allows to secure safety.**

Since the non-leak vale and the non-leak pilot check vale can hold pressure even if power is lost, there is no reason for concern that the workpiece falls off.



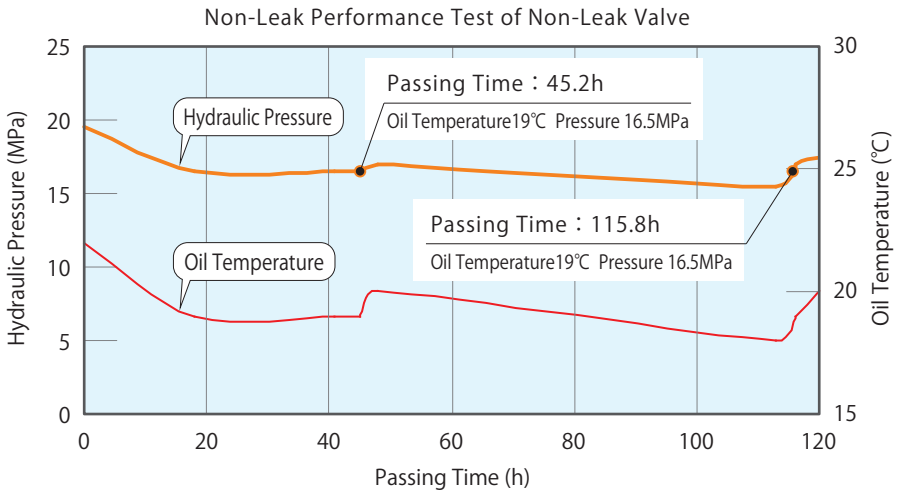
✕ The workpiece falls off when hydraulic power supply is cut off.




○ Hold the workpiece in position by maintaining hydraulic pressure.
(Non-leak function allows to hold the position for a long time without leakage.)

## The Reliability of Non-Leak Function

The following graph shows the data analysis of the oil temperature, the amount of time and the change in pressure while hydraulic pressure is disconnected from power source. Due to temperature change, maintained pressure changes but not due to leakage. You can set the hydraulic circuit more stable when combined with the accumulator.




## Influence of Temperature Change on Hydraulic Circuit

Hydraulic pressure of sealed circuit disconnected from hydraulic source by non-leak valve, etc. is significantly affected by ambient temperature change and supply oil temperature change. (Especially when using a motor pump, high temperature oil is supplied and the temperature rapidly decreases after sealing.)
Although it differs depending on the amount of air mixed, product, piping/hose expansion and temperature condition, etc., Kosmek standard is as shown on the right regardless of the amount of oil contained.

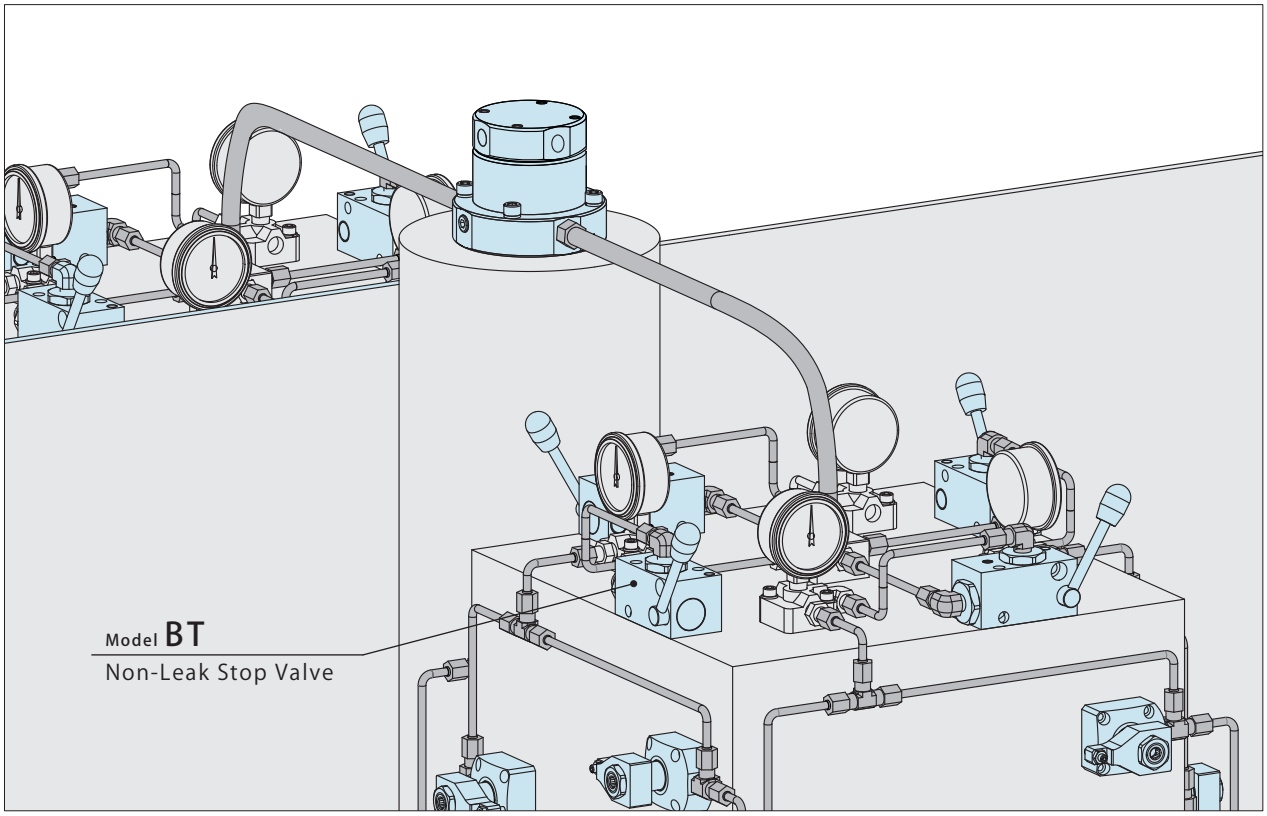
$$\frac{0.69\text{MPa}}{℃}$$

(0.69MPa of Pressure Fluctuation by 1℃ Temperature Change)

# One Touch Workpiece Set Up on 4-Surface Tombstone Fixture

## Example for Using Non-Leak Stop Valve on 4-Surface Tombstone Fixture

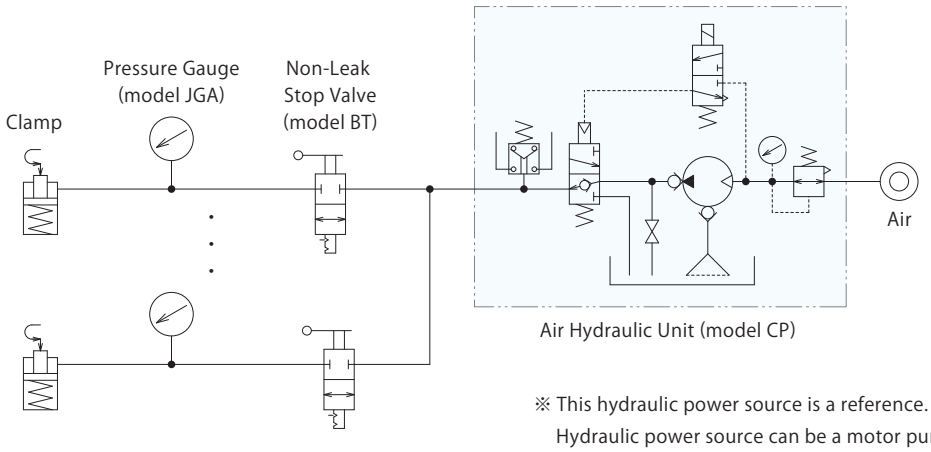
When changing a workpiece on 4-surface tombstone fixture : Installing the non-leak stop valve (Model : BT) on each surface enables to operate clamping/unclamping each surface and prevent a workpiece fall.




## Action Description

| | Operating Procedure |
|---|---|
| Locking | Hydraulic pressure is ON. |
| | Place the workpiece on. |
| | Operate BT lever (open the circuit) to clamp the workpiece. |
| | Operate BT lever (close the circuit) to hold the pressure. |
| | Repeat the setup of the workpiece for each surface. |
| | Locking action is completed. |

| | Operating Procedure |
|---|---|
| Releasing | Hydraulic pressure is OFF. |
| | Hold the workpiece not to fall, operate BT lever (open the circuit) and remove the workpiece. |
| | Operate BT lever (close the circuit). |
| | Repeat the removal of the workpiece for each surface. |
| | Releasing action is completed. |



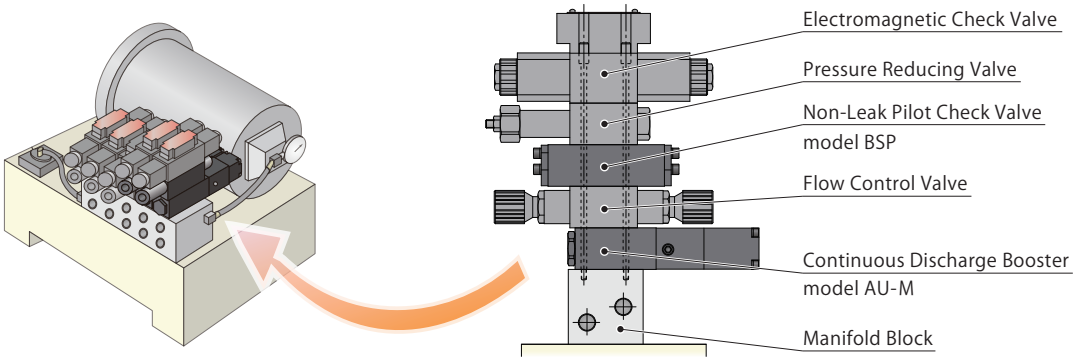

Air Hydraulic Unit (model CP)

※ This hydraulic power source is a reference.
Hydraulic power source can be a motor pump or Kosmek CV unit, etc.

# Partial Boosting (of Low-Pressure Hydraulic Power Source)

## Partial Boosting by Modular Model Valve

Allows to generate high pressure simply by using a continuous discharge booster.
It is not necessary to provide a high-pressure power source only for some high-pressure actuators.
The continuous discharge booster has no restrictions on the outgoing side circuit capacity. (Mounting is based on ISO4401-03.)




## Partial Boosting and Partial Reducing for the Fixture Side Pressure

We offer not only the modular model, but also the continuous discharge booster, the one shot booster and the reducing valve that can be installed to the fixture side.

**Boosting Pressure**

Model **AU**
Continuous Discharge Booster

Model **BU**
One Shot Booster

**Reducing Pressure**

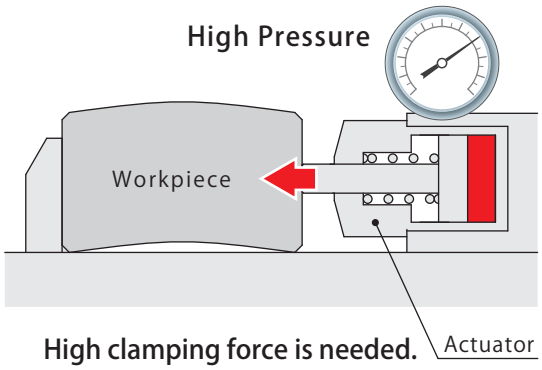
Model **BMA**
Pressure Reducing Valve

# Integration of Rough Machining and Finish Machining

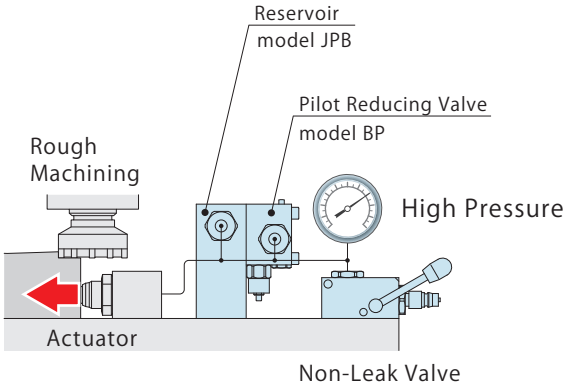
## Controlling Clamping Force (Pressure) with Pilot Reducing Valve and Reservoir

It is possible to control clamping force when fixture pressure is disconnected from power source. This valve is useful when it is necessary to have stronger clamping force at initial machining and weaker clamping force at finish machining.

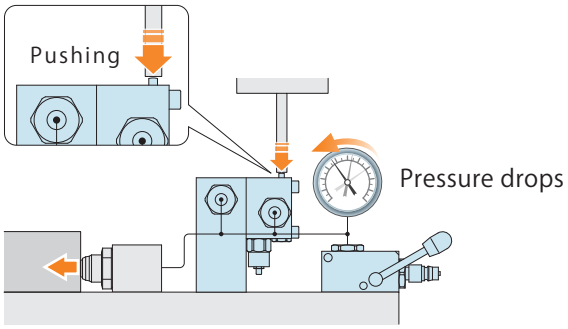
## In Initial Rough Machining




High clamping force is needed.

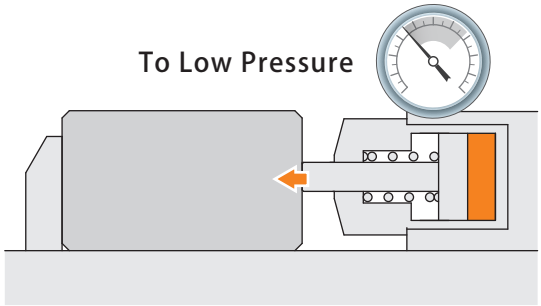


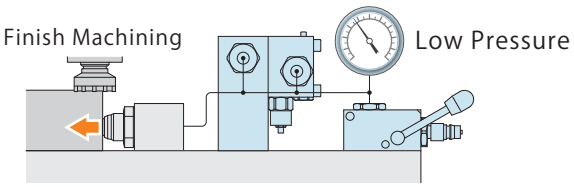

Before final machining, reduce the clamping force by reducing pressure.




Hydraulic pressure in the circuit goes to the reservoir by pressing the button of BP valve, and the pressure decreases to the set pressure.

## At Finish Machining




Workpiece deformation is avoided by reducing pressure and clamping force.

# Non-Leak Valve

## Single Acting Model

Model **BK**

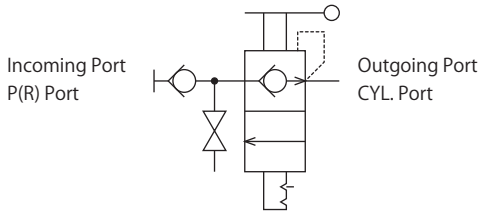
## Disconnects Fixture from Power Source and Securely Holds Outgoing Side Pressure

**This valve reduces set up time and the number of circuits, and saves energy securely.**

### What is a Non-Leak Valve?

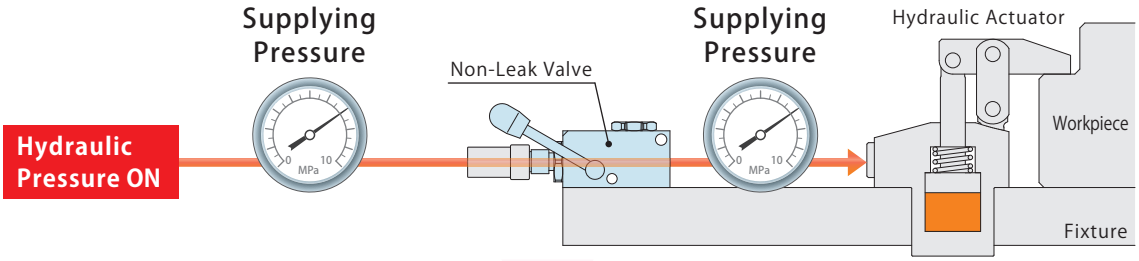
Non-leak valve maintains pressurized condition completely even when the fixture is detached from the power source.
It is able to disconnect from hydraulic pressure power source.

**Circuit Symbol**



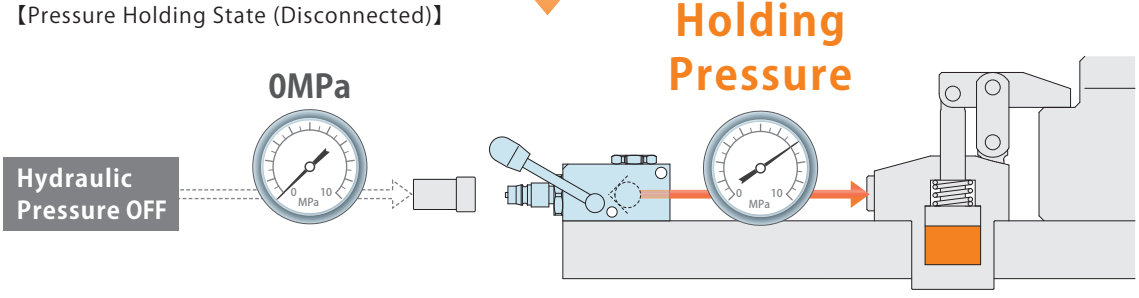

※ Each port has a built-in filter.

【Connected State】




**Holds the pressure even after coupler is disconnected.**

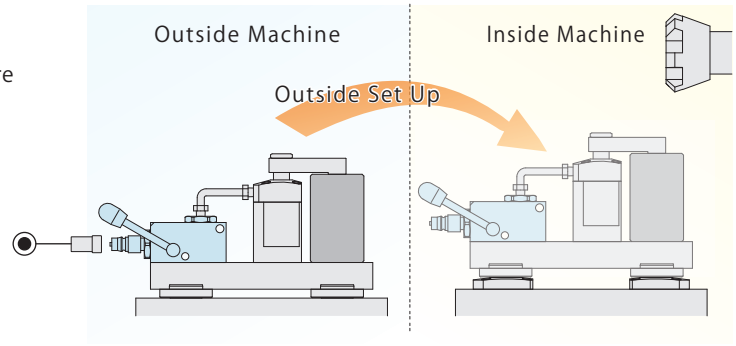
【Pressure Holding State (Disconnected)】



## Advantages

### Set Up Outside of Machine Improves Machine Operating Ratio

Non-leak function allows to disconnect a fixture from a hydraulic power source and to set up the fixture outside machine. This reduces machine down time and set up time.

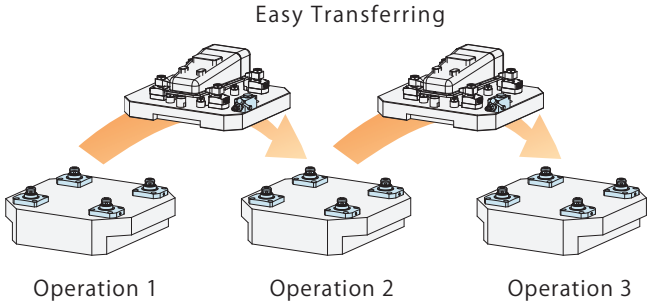



### Reduce the Number of Circuits in the Machine

By holding the pressure, the number of circuits inside machine for fixture can be minimized.

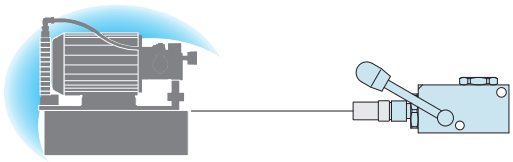
### Ideal for Transferring FMS Pallets

Because it is able to detach the fixture from the hydraulic pressure source, it allows to move the pallet freely without concerns on handling of hydraulic hoses, and it is suitable for FMS.




### Energy-Saving and Safety

The outgoing side circuit hydraulic pressure is held unless the lever is moved. Even if you do not disconnect, you are saving energy by stopping the incoming hydraulic pressure. If a blackout occurs and the hydraulic pressure is shut off, the workpiece will not fall off due to the holding pressure.



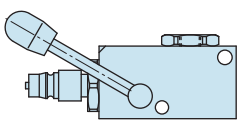
Able to stop hydraulic power source.

The outgoing side pressure is maintained unless it is released.

## Action Description

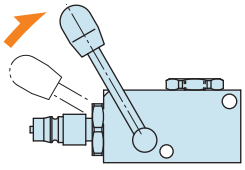
| | Operating Procedure | Note |
|---|---|---|
| Locking | Hydraulic pressure source is connected to the incoming side of non-leak valve. | |
| | Hydraulic Pressure ON | |
| | Hydraulic pressure is supplied to the outgoing side, and locking action is completed. | |
| | Hydraulic Pressure OFF. | Non-leak valve maintains the outgoing side pressure. |
| | Non-leak valve is disconnected from hydraulic power source. | |
| | Machining and/or Transferring | |
| Releasing | Hydraulic pressure source is connected to the incoming side of non-leak valve. | |
| | Release the lever on the non-leak valve. | After holding the lever at released state for about one second, the outgoing side pressure will be released even when the lever is released. |
| | Releasing action is completed. | |

About Release Operation



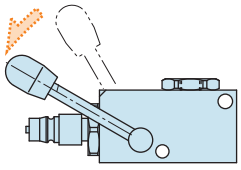
Before Release Operation (Pressure Held Condition)

Release Operation



Release operation by pulling up the lever.

※After holding the lever for about one second, the outgoing side pressure will be released even when the lever is released.



The lever is automatically lowered when the lever is released.

## Model No. Indication

BK 2 2 1 3 - 0 ☐

1 2 3 4 5

### 1 Port Size

**2** : Corresponding to Rc1/4

**3** : Corresponding to Rc3/8 ※1

### 2 Operating Pressure Range

**2** : 2.0 ~ 7.0 MPa

**5** : 7.0 ~ 30.0MPa

### 3 Lever Position ※Lever position looking from P(R) port

**1** : Right Hand Lever (Standard)

**2** : Left Hand Lever ※1

### 4 Design No.

**3** : Revision Number

### 5 Piping Method ※CYL port position looking from P(R)

**Blank** : Piping Option (Rc-Thread)

**GA** : Left Side Gasket Option (Only for Right Handle) ※1

**GB** : Bottom Gasket Option ※1

**GC** : Right Side Gasket Option (Only for Left Handle) ※1

**GS** : BLS, BLB and BM Valve Connecting Option ※1

Note :

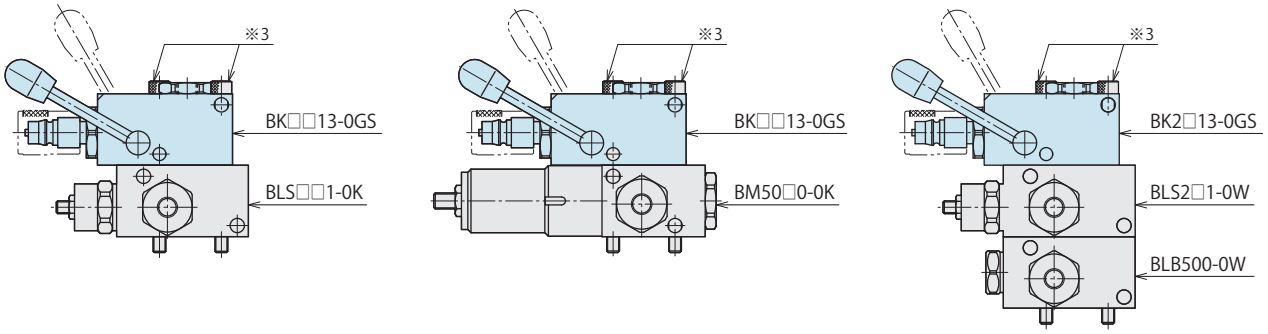
※1. Build to order product. Feel free to ask us about delivery time when placing an order.

## Specifications

| Model No. | | BK22☐3-0☐ | BK25☐3-0☐ | BK32☐3-0☐ |
|---|---|---|---|---|
| Operating Pressure Range | MPa | 2.0 ~ 7.0 | 7.0 ~ 30.0 | 2.0 ~ 7.0 |
| Withstanding Pressure | MPa | 10.5 | 37.5 | 10.5 |
| Min. Passage Area | $mm^2$ | 17.0 | 14.2 | 30.0 |
| Operating Temperature | ℃ | 0 ~ 70 | | |
| Usable Fluid | | General Hydraulic Oil Equivalent to ISO-VG-32 | | |
| Corresponding Coupler/Socket Form※2 | | 2HS | 2HS | 3HS |
| Weight | kg | 1.4 | | |

Note ※2. Shows the format of the quick coupler socket made by Nitto Kohki Co., Ltd..

## Combined Model on Valves

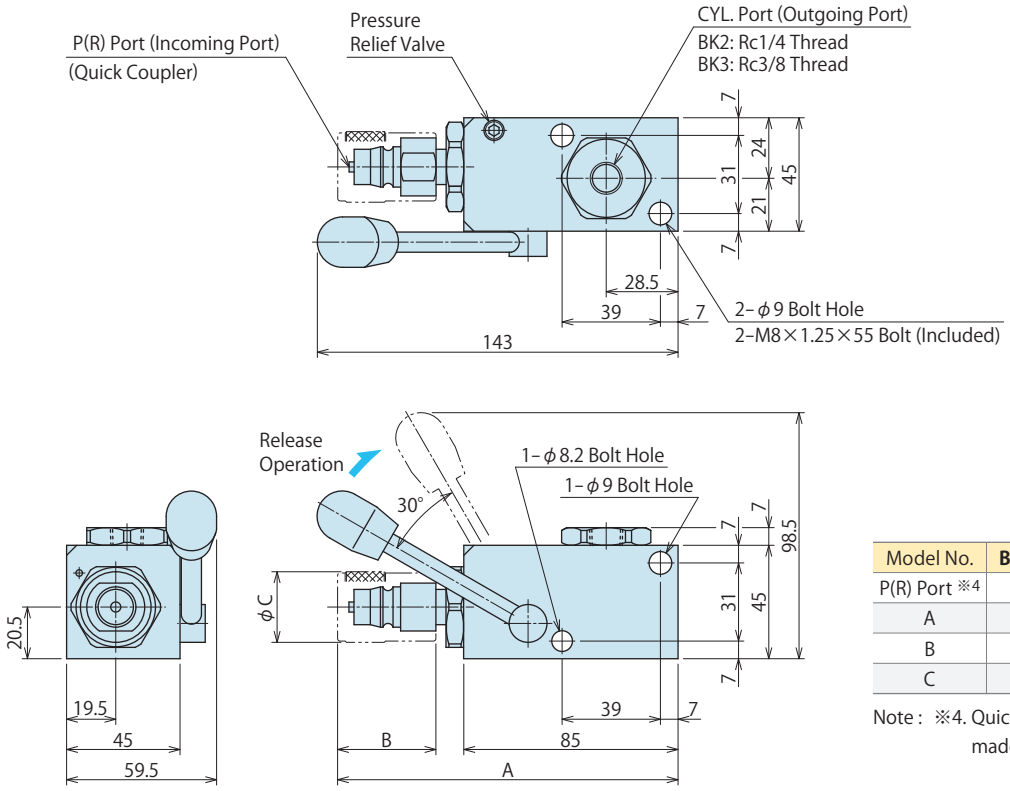



Note :

3. Bolts for combining valves are NOT included. Prepare them separately.

## External Dimensions

BK□□13-0 ※ BK□□23-0 is identical but handle is on left side.



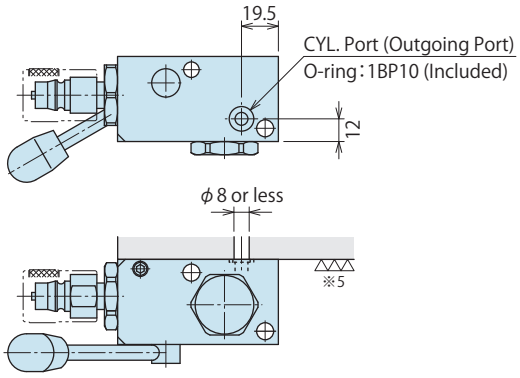

(mm)

| Model No. | BK2□13-0 | BK3213-0 |
|---|---|---|
| P(R) Port ※4 | 2HP | 3HP |
| A | 135 | 144 |
| B | 39 | 46 |
| C | 28 | 33 |

Note : ※4. Quick coupler model number made by Nitto Koki.

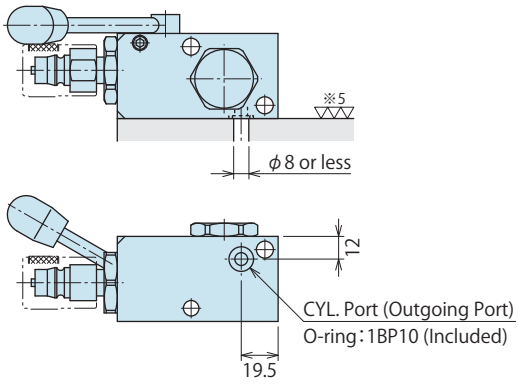
BK□□13-0GA

※ Please refer to BK□□13-0 for other dimensions.



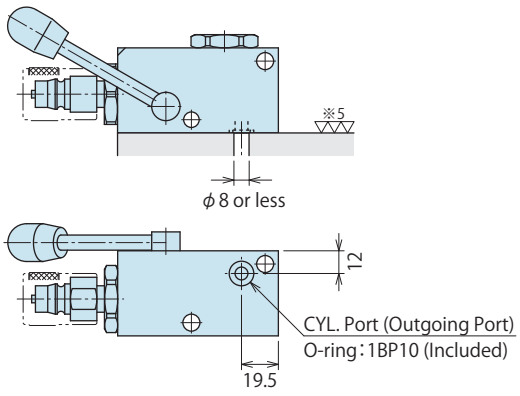

BK□□23-0GC

※ Please refer to BK□□13-0 for other dimensions.




BK□□13-0GB

※ Please refer to BK□□13-0 for other dimensions.




Note :
※5. Roughness of mounting surface (O-ring seal surface) should be 6.3S or less.

# Non-Leak Valve

## Double Acting Model

Model **BEQ**

## Pilot Check Method to Hold the Outgoing Side Pressure

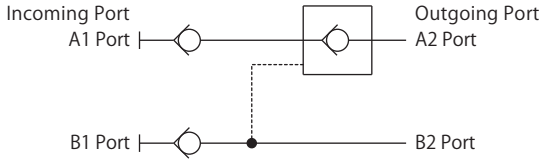
**This valve reduces set up time and the number of circuits, and saves energy securely.**

### ● Non-Leak Valve (Double Acting Model)

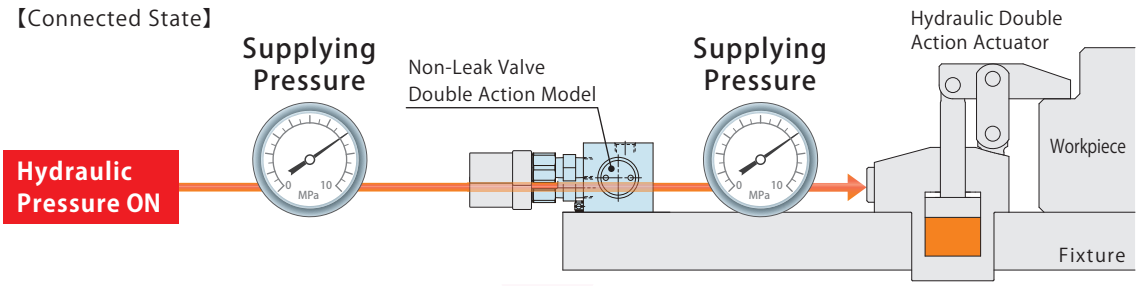
A non-leak valve (double acting model) is equipped with a non-leak function. Unless the hydraulic pressure is supplied to B1 port, the A2 port side pressure is held even if the hydraulic power source is cut off.

Fall prevention：In case of a blackout, it is possible to separate the hydraulic power source from fixture because the actuator holds pressure inside.

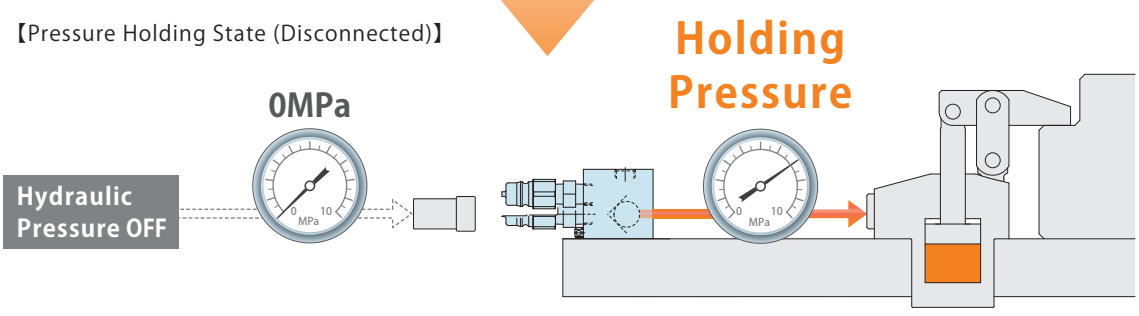
**Circuit Symbol**




※ Filter is built in A1, A2.

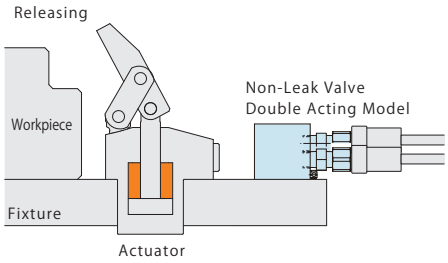


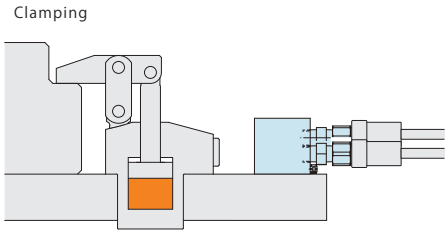

**Holds the pressure even after coupler is disconnected.**

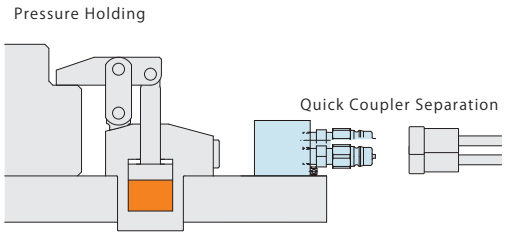


## Action Description

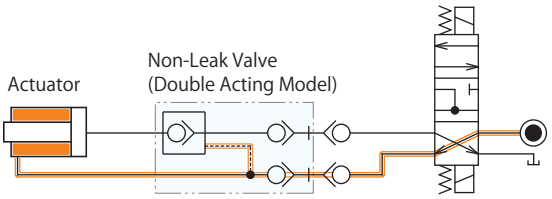
### Images

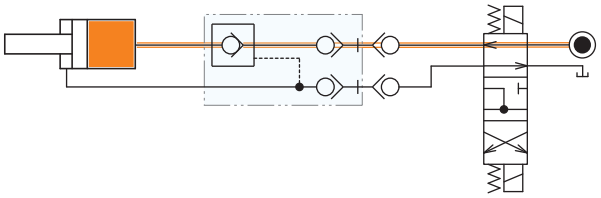


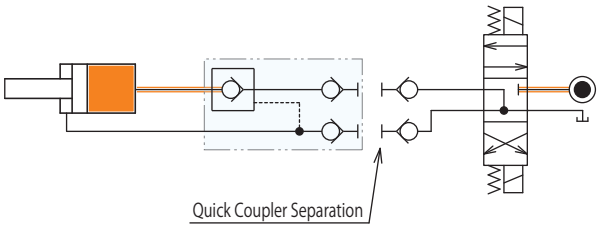




### Circuit Example






| Operating Procedure | | Note |
|---|---|---|
| Locking | Hydraulic pressure on the A1 port side is ON. (Hydraulic pressure on the B1 port side is OFF.) | |
| | The pressure is supplied to the locking side (A2 port) to lock the actuator. (The pressure is maintained even if the power source is turned OFF.) | |
| | Hydraulic poiwer source is OFF. | |
| | Separate the A1/B1 ports from the hydraulic power source. | |
| | Machining and/or Transferring | |
| Releasing | Connect the A1/B1 ports to the hydraulic power source. | |
| | When hydraulic pressure of the B1 port side is ON (A1 port side hydraulic pressure OFF), the pilot check valve is open and the oil from A2 port (lock side) goes back to the tank. | |
| | Releasing action is completed. | |
| In case of an emergency | Hydraulic power source is OFF due to a blackout. | |
| | With the pilot check valve, the locking side pressure (A2 port) will be maintained as it was before the blackout. | The B2 port side cannot hold the pressure because it has no check valve. |

## Model No. Indication

BEQ02 **2** **0** - 0 ☐

1 2 3

### 1 Operating Pressure Range

**2** : 2.0 ~ 7.0MPa
**5** : 7.0 ~ 30.0MPa

### 2 Design No.

**0** : Revision Number

### 3 Piping Method ※CYL port position looking from A1 port

**Blank** : Piping Option (Rc-Thread)
**GA** : Backside Gasket Option
**GB** : Bottom Gasket Option

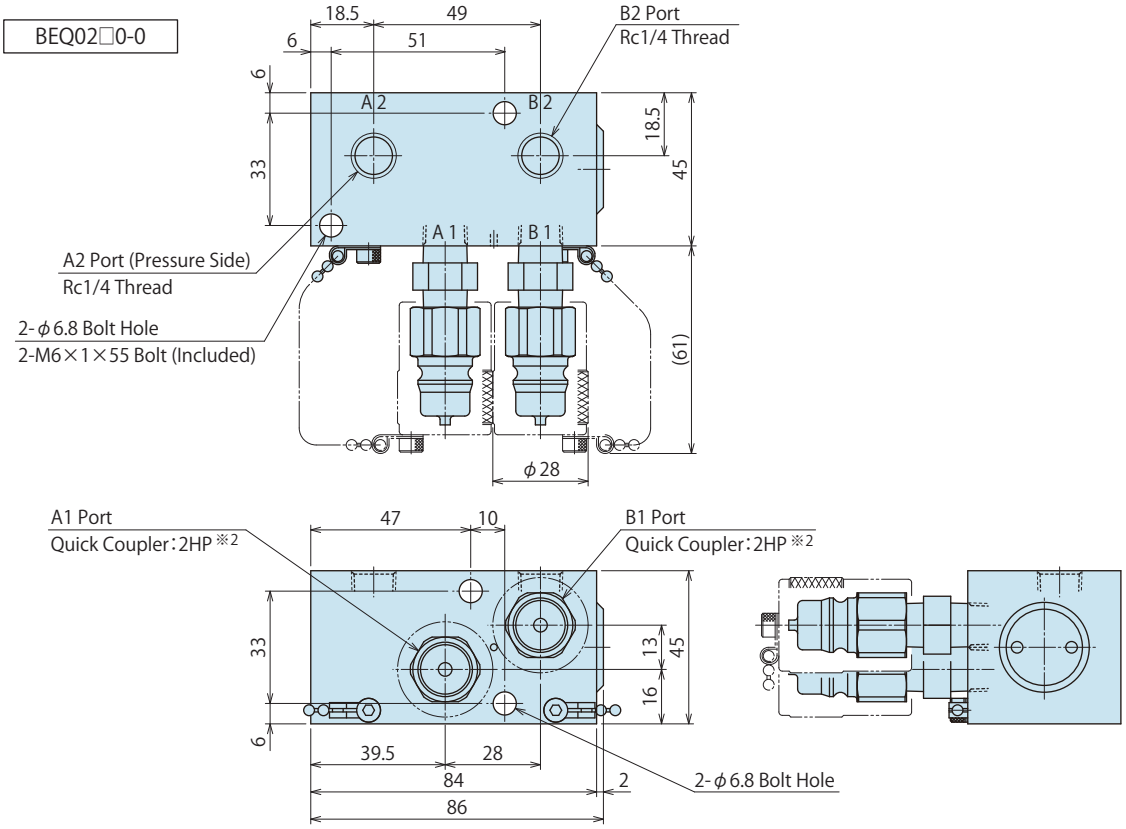
## Specifications

| Model No. | | BEQ0220-0☐ | BEQ0250-0☐ |
|---|---|---|---|
| Operating Pressure Range | MPa | 1.0 ~ 7.0 | 7.0 ~ 30.0 |
| Withstanding Pressure | MPa | 10.5 | 37.5 |
| Cracking Pressure | MPa | 0.07 | |
| Pilot Pressure | MPa | A2 Holding Pressure / 5.5 + 0.3 or more | |
| Min. Passage Area | $mm^2$ | 14.3 | |
| Operating Temperature | ℃ | 0 ~ 70 | |
| Usable Fluid | | General Hydraulic Oil Equivalent to ISO-VG-32 | |
| Corresponding Coupler/Socket Form※1 | | 2HS | |
| Weight | kg | 1.3 | |

Note : ※1. Quick Coupler model number made by Nitto Koki.

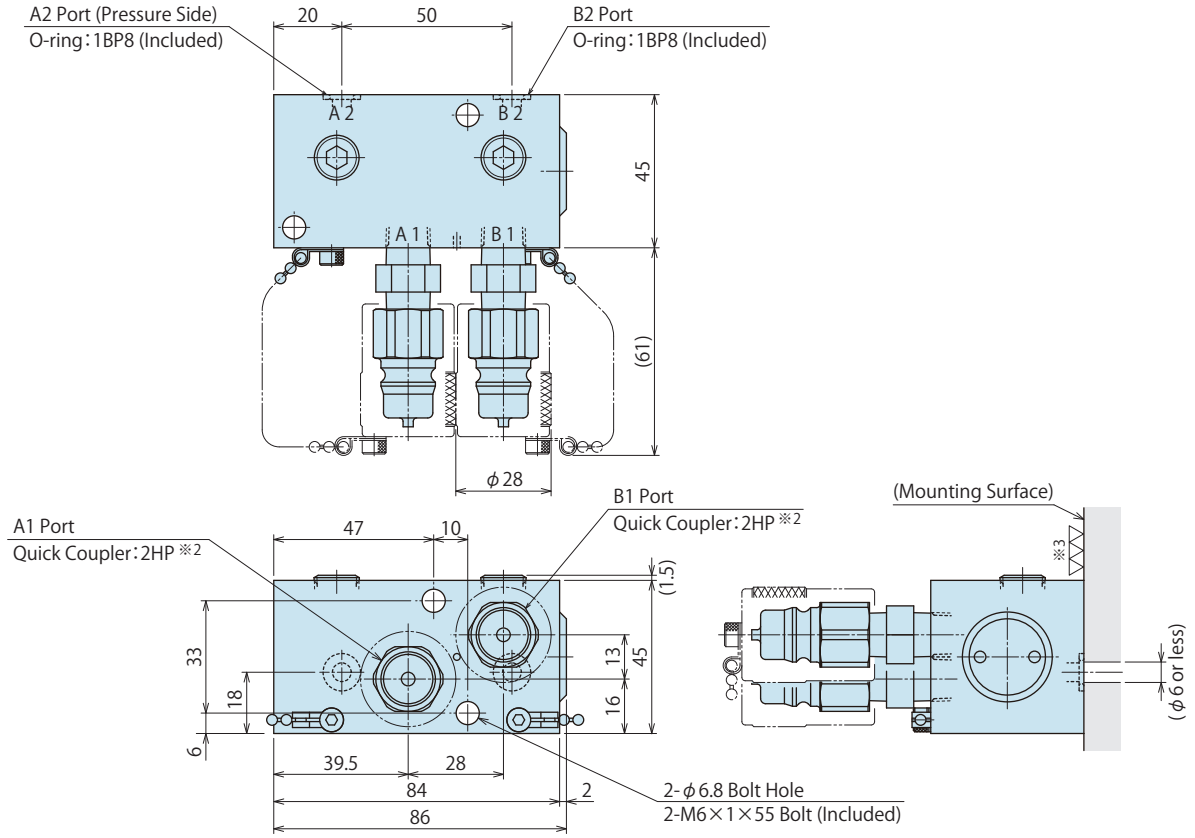
## External Dimensions

BEQ02☐0-0

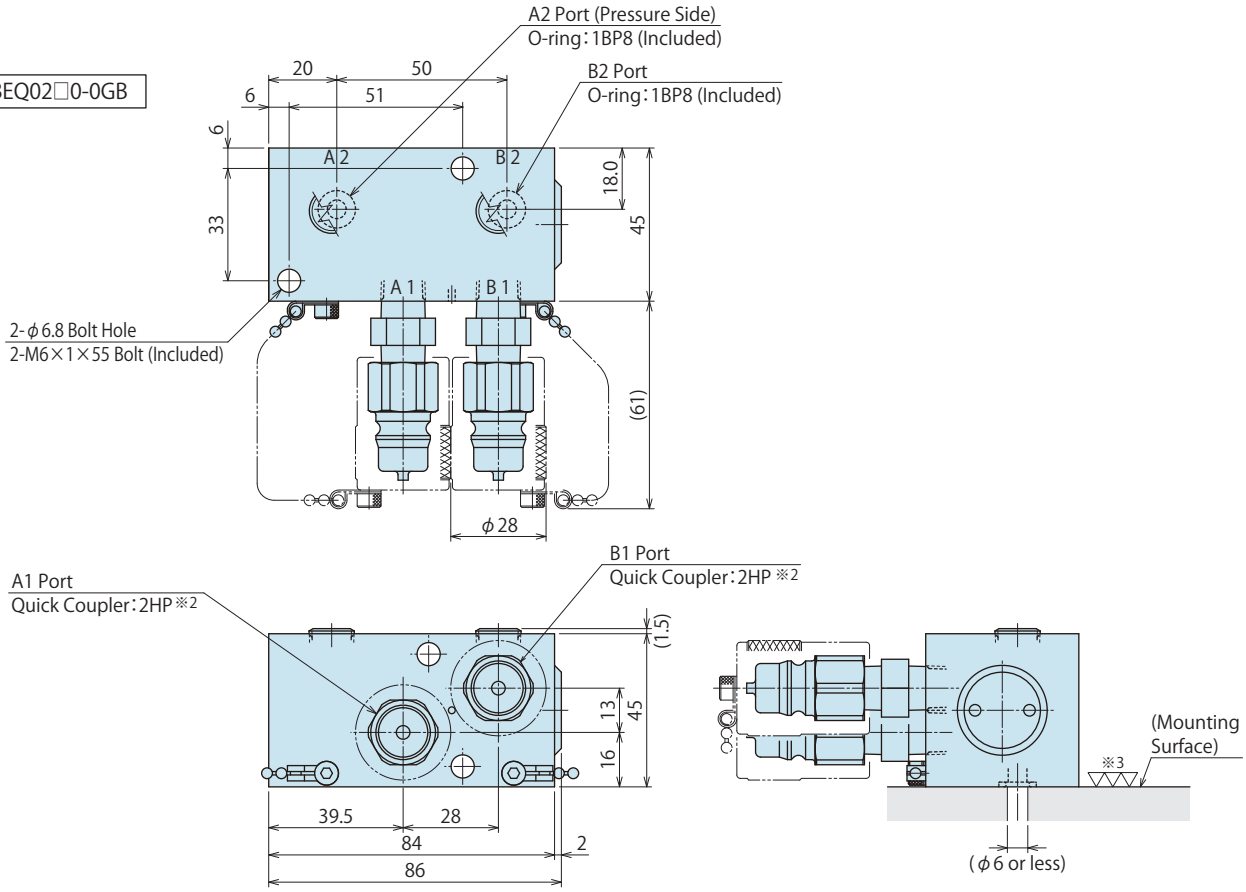



Note : ※2. Quick Coupler model number made by Nitto Koki.

BEQ02□0-0GA




BEQ02□0-0GB

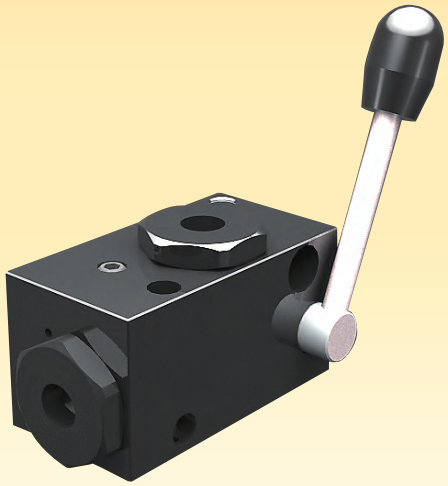



Notes : ※2. Quick Coupler model number made by Nitto Koki.
※3. Roughness of mounting surface (O-ring seal surface) should be 6.3S or less.

# Non-Leak Stop Valve

## (Manual Switching Valve)

Model **BT**



## Manual Switching Valve to Maintain Pressure

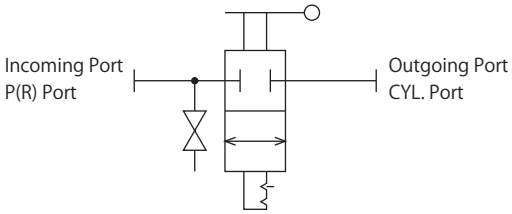
Simple Operation

### What is a non-leak stop valve?

The stop valve is operated by a manual operation lever.
When the circuit is closed or disconnected it maintains the outgoing side pressure.

In case of manual loading/unloading of multiple workpieces, it enables to clamp/unclamp each workpiece preventing a workpiece fall.
When the circuit is closed the outgoing side pressure is maintained to prevent a workpiece fall.

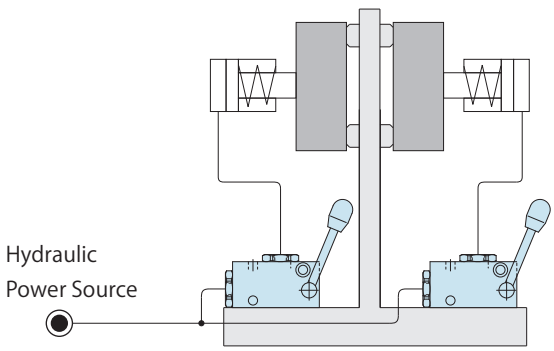
### Circuit Symbol




※ Each port has a built-in filter.

## Application Examples

Clamping operation is possible with each workpiece.




Workpiece Fall Prevention
with Individual Operations

## Model No. Indication

**BT2 2 1 0 - 0**

1 2

### 1 Operating Pressure Range

**2** : 2.0 ~ 7.0MPa
**5** : 7.0 ~ 30.0MPa

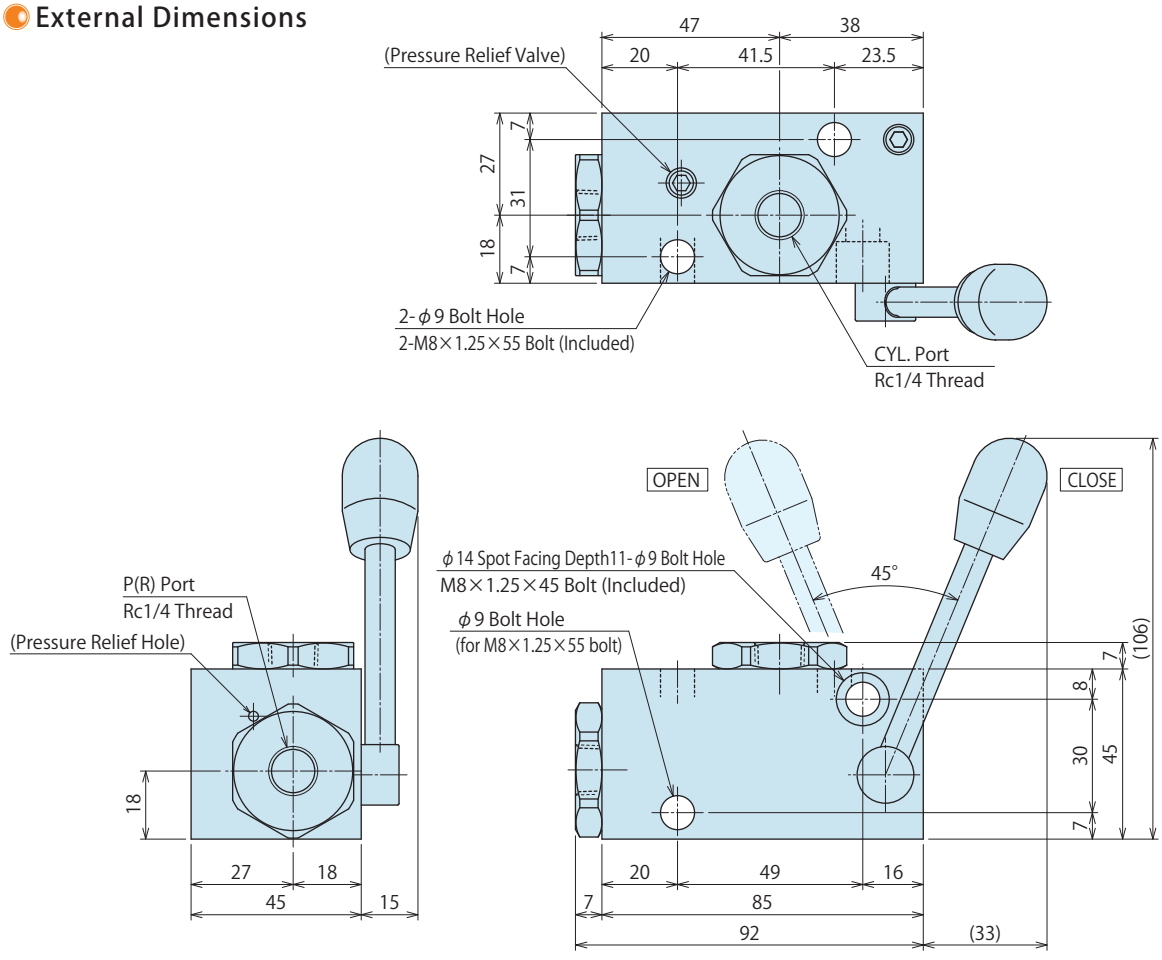
### 2 Design No.

**0** : Revision Number

## Specifications

| Model No. | | BT2210-0 | BT2510-0 |
|---|---|---|---|
| Operating Pressure Range | MPa | 2.0 ~ 7.0 | 7.0 ~ 30.0 |
| Withstanding Pressure | MPa | 10.5 | 37.5 |
| Min. Passage Area | $mm^2$ | 15.9 | |
| Operating Temperature | ℃ | 0 ~ 70 | |
| Usable Fluid | | General Hydraulic Oil Equivalent to ISO-VG-32 | |
| Weight | kg | 1.4 | |

## External Dimensions



# Sequence Valve

Model BLS
Model BLG

## Activates multiple actuators in sequence, and reduces the number of ports required.

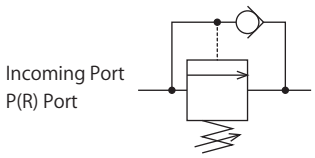
It is able to control locating and clamping workpiece in sequence in one system.

### What is a sequence valve?

This valve operates multiple actuators in sequence to perform positioning and clamping.

When incoming port pressure reaches the sequence setting pressure value, the pressure is supplied to outgoing port.

**Circuit Symbol**

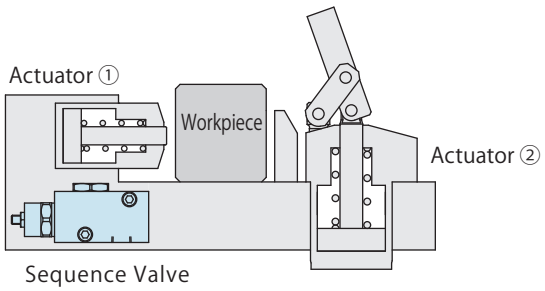



※ Each port has a built-in filter.

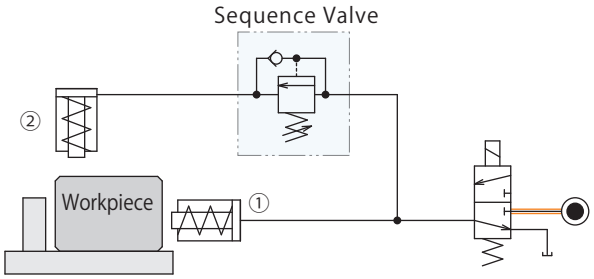
| |  Model BLS → P.1221 | | |  Model BLG → P.1223 | |
|---|---|---|---|---|---|
| Classification | Sequence Valve | | | Compact Sequence Valve | |
| Sequence Operating Pressure Adjustable Range | 1~4MPa | 3~8MPa | 8~20MPa | 1~6MPa | 5~18MPa |
| Operating Pressure Range | 2~30MPa | | | 2~35MPa | 6~35MPa |
| Piping Method | Piping Option<br>Manifold Option<br>BK Connecting Option<br>BK/BLB Connecting Option | | | Double Gasket Option | |

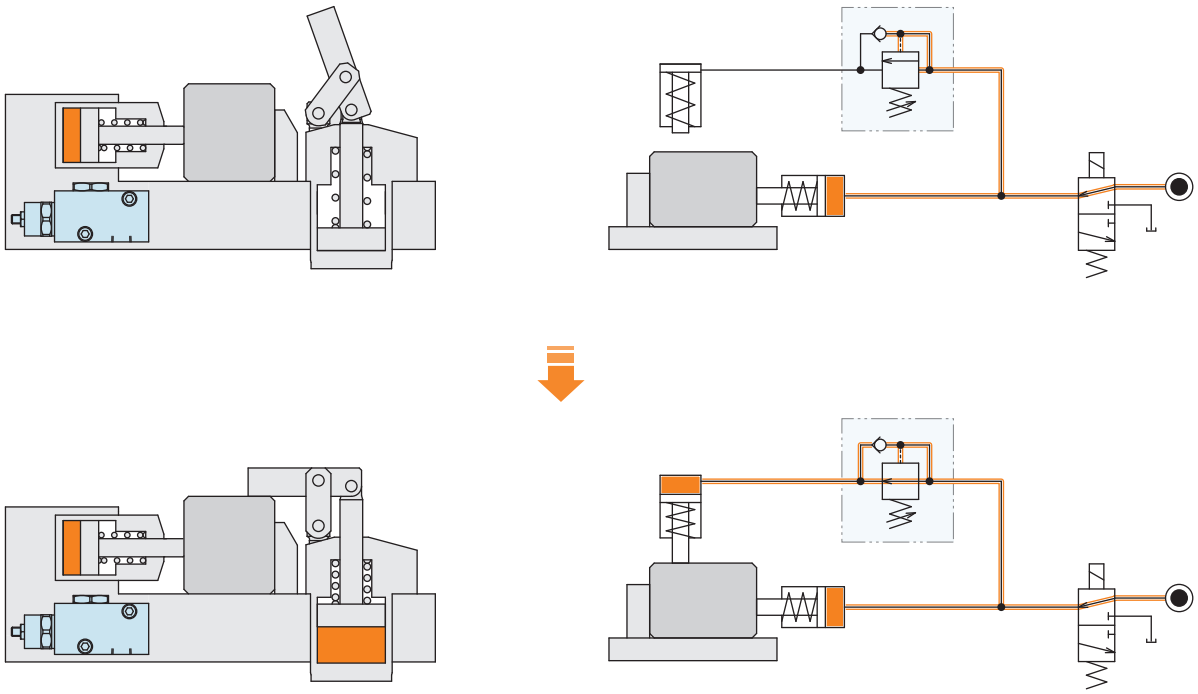
## Action Description

Images




Circuit Example



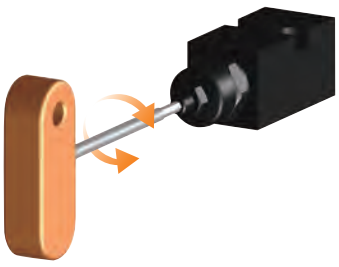
| Operating Procedure | | Note |
|---|---|---|
| Locking | Hydraulic pressure is ON. | |
| | Actuator ① is activated. | |
| | The pressure reaches to the set value for sequence operating pressure. | The difference between the operating pressure and the sequence operation set pressure should be 1MPa or more. |
| | Sequence valve port is open. | |
| | Actuator ② is activated. | |
| | Locking action is completed. | |
| | Machining process, etc. | |
| Releasing | Hydraulic pressure is OFF. | |
| | The actuators ①,② are released at the same time. | When incoming side pressure decreases, internal check valve opens. |
| | Releasing action is completed. | |

## Adjustable Set Pressure

Set Hydraulic Pressure Change per Rotation (MPa/Rev)

| Model No. | BLS□31 | BLS□51 | BLS□71 | BLG2830 | BLG2860 |
|---|---|---|---|---|---|
| Set Pressure Change per Rotation (Reference) | 0.7 | 1.0 | 2.6 | 1.0 | 2.8 |

Notes : 1. The set pressure value is set according to the model code.
2. Pressure increases by turning clockwise and decreases by turning anti-clockwise.



## Model No. Indication

BLS 2 5 1 - 0 ☐ (5.0MPa)

1 2 3 4 5

### 1 Port Size

**2** : Corresponding to Rc1/4

**3** : Corresponding to Rc3/8

### 2 Sequence Operating Pressure Adjustable Range

**3** : 1.0 ~ 4.0 MPa

**5** : 3.0 ~ 8.0 MPa

**7** : 8.0 ~ 20.0MPa

### 3 Design No.

**1** : Revision Number

Notes :

※1. Build to order product. Feel free to ask us about delivery time when placing an order.

※2. W option (BK/BLB connecting option) only available with 2 : Rc1/4 port.

### 4 Piping Method

**Blank** : Piping Option (Rc-Thread)

**G** : Gasket Option (O-ring Seal for P Port※1)

**K** : BK Connecting Option ※1

**W** : BK/BLB Connecting Option ※1 ※2

### 5 Set Pressure (Set Value for Sequence Operating Pressure)

**Please indicate the set pressure when ordering**
**(Please inform us with proper unit symbols.)**

※ Provide a difference of more than 1MPa between operating and setting pressure.

※ When using multiple BLS sequence valves in a parallel fashion, provide each set pressure with a pressure difference more than 1MPa.

Entry Example At 5MPa → **(5.0MPa)** At 3.5MPa → **(3.5MPa)**
At 700PSI → **(700PSI)**

**Blank : Pressure Setting Free Option**

※ If set pressure is determined by customer, indicate it within "Blank".

※ When shipping, the pressure is set as the minimum pressure indicated in the specification "Actuating Pressure Range".

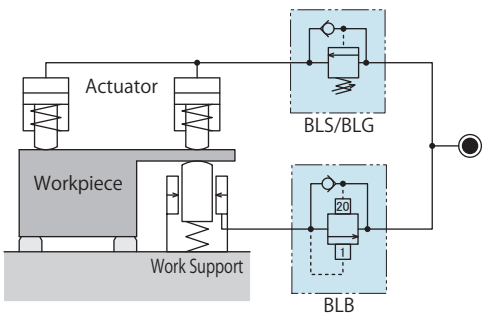
※ For pressure adjustment, please refer to "Sequence Valve Pressure Setting Procedure" included along with the product and "Adjustable Set Pressure" on P.1220.

## Specifications

| Model No. | | BLS☐31-0☐☐ | BLS☐51-0☐☐ | BLS☐71-0☐☐ |
|---|---|---|---|---|
| Sequence Operating Pressure Adjustable Range | MPa | 1.0 ~ 4.0 | 3.0 ~ 8.0 | 8.0 ~ 20.0 |
| Operating Pressure Range | MPa | 2.0 ~ 30.0 | | |
| Withstanding Pressure | MPa | 37.5 | | |
| Adjusting Screw Turn Ratio | MPa/Rev | 0.7 | 1.0 | 2.6 |
| Cracking Pressure | MPa | 0.01 | | |
| Min. Passage Area | $mm^2$ | P(R) → CYL. : 7 / CYL.→P(R) : 27 | | |
| Operating Temperature | ℃ | 0 ~ 70 | | |
| Usable Fluid | | General Hydraulic Oil Equivalent to ISO-VG-32 | | |
| Weight | kg | 1.2 | | |

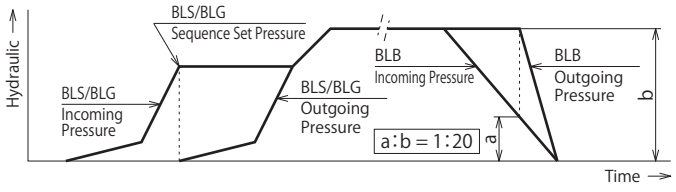
Note : 1. If the flow volume of the incoming pressure side is too much, there is a possibility that the proper sequential procedures would not work. In this instance, use a flow control valve to adjust flow volume from the pressure source.

## Example of a Combination of BLS and BLB




Operating Procedure (When clamping)
1. Supply hydraulic pressure.
2. The hydraulic pressure passing through the BLB, starts the support action of Work Support. At this time, hydraulic pressure does not reach the actuator side because of BLS.
3. When hydraulic pressure inside the system has exceeded the set pressure of BLS, the hydraulic pressure is supplied to the actuator to lock a workpiece.

Operating Procedure (When releasing)
1. Shut off hydraulic pressure supply.
2. Pressure reduction of BLS/BLG starts right after the hydraulic pressure supply is shut off and the actuator retracts to release the pressure.
3. BLB reduces hydraulic pressure inside Work Support in proportion to the pressure difference (1:20) between the incoming side (P port) pressure drop and the outgoing side (cylinder port) pressure. Therefore, workpiece and fixture damage due to the remaining pressure can be prevented because the workpiece is released after the actuator thrust becomes zero.

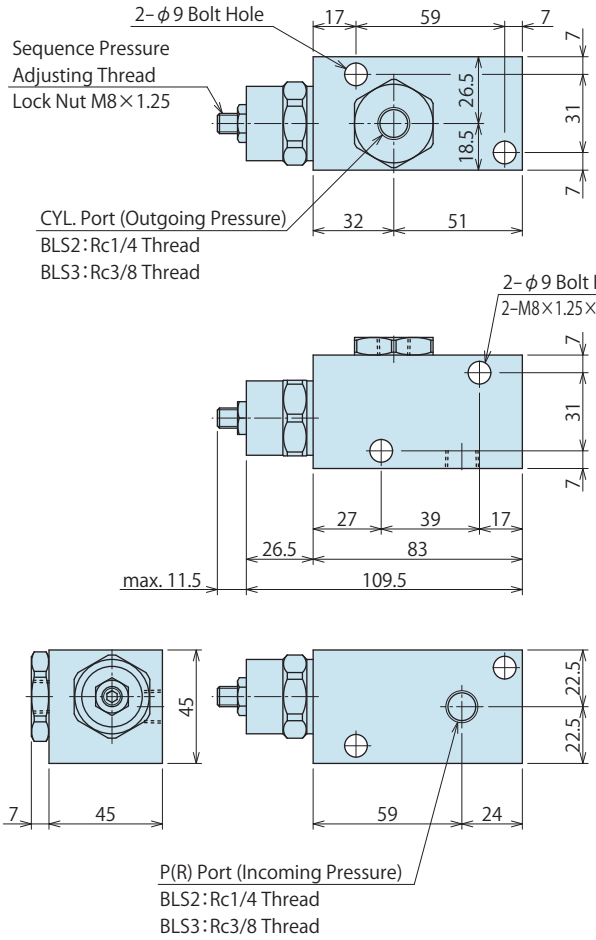



BLS/BLG
When the P port (incoming pressure) is pressurized to exceed the set up pressure of BLS/BLG, the valve is opened, and hydraulic pressure is supplied to the cylinder port (outgoing pressure).

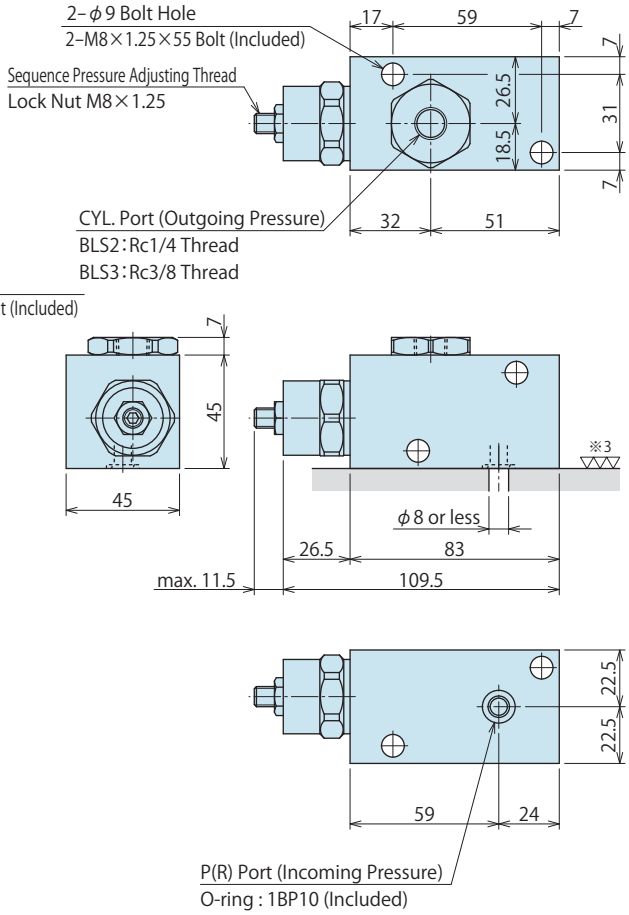
BLB
When the P port (incoming pressure) is reduced to approximately 1/20 times the cylinder port (outgoing pressure), reduction of the outgoing pressure starts and the outgoing pressure is reduced in proportion to the incoming pressure.

## External Dimensions

BLS□□1-0□



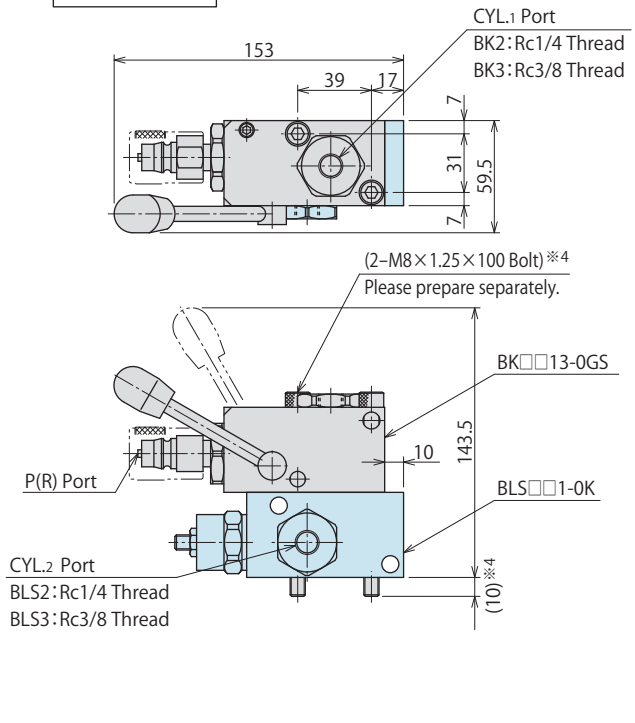

BLS□□1-0G□




Note :

※3. Roughness of mounting surface (O-ring seal surface) should be 6.3S or less.

BLS□□1-0K□

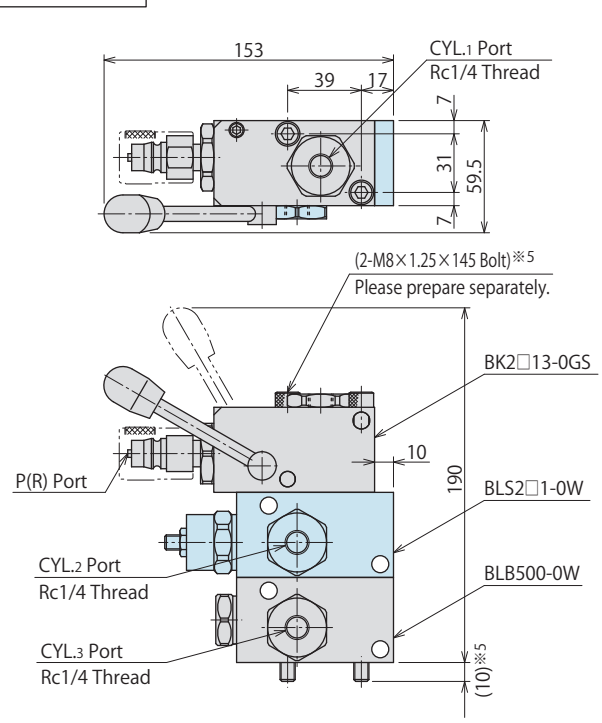



Notes :

※4. Mounting bolts are NOT included.
Prepare them by referring to ※4 shown above.

1. BK is NOT included. Prepare it separately.

BLS2□1-0W□




Notes :

※5. Mounting bolts are NOT included.
Prepare them by referring to ※5 shown above.

1. BK and BLB are NOT included. Prepare them separately.

## Model No. Indication

BLG28 **3** **0** - 0 **G** **(5.0MPa)**

1 2 3 4

### 1 Sequence Operating Pressure Adjustable Range

**3** : 1.0 ~ 6.0 MPa

**6** : 5.0 ~ 18.0 MPa

### 2 Design No.

**0** : Revision Number

### 3 Piping Method ※1

**G** : Gasket Option

Note :

※1. Hydraulic connecting method is only G option (gasket) . Select BLS if piping option is necessary.

### 4 Set Pressure (Set Value for Sequence Operating Pressure)

**Please indicate the set pressure when ordering**
**(Please inform us with proper unit symbols.)**

※ Provide a difference of more than 1MPa between operating and setting pressure.

※ When using multiple BLG sequence valves in a parallel fashion, provide each set pressure with a pressure difference more than 1MPa.

Entry Example At 5MPa → **(5.0MPa)** At 3.5MPa → **(3.5MPa)**
At 700PSI → **(700PSI)**

**Blank : Pressure Setting Free Option**

※ If set pressure is determined by customer, indicate it within "Blank".

※ When shipping, the pressure is set as the minimum pressure indicated in the specification "Actuating Pressure Range".

※ For pressure adjustment, please refer to "Sequence Valve Pressure Setting Procedure" included along with the product and "Adjustable Set Pressure" on P.1220.

## Specifications

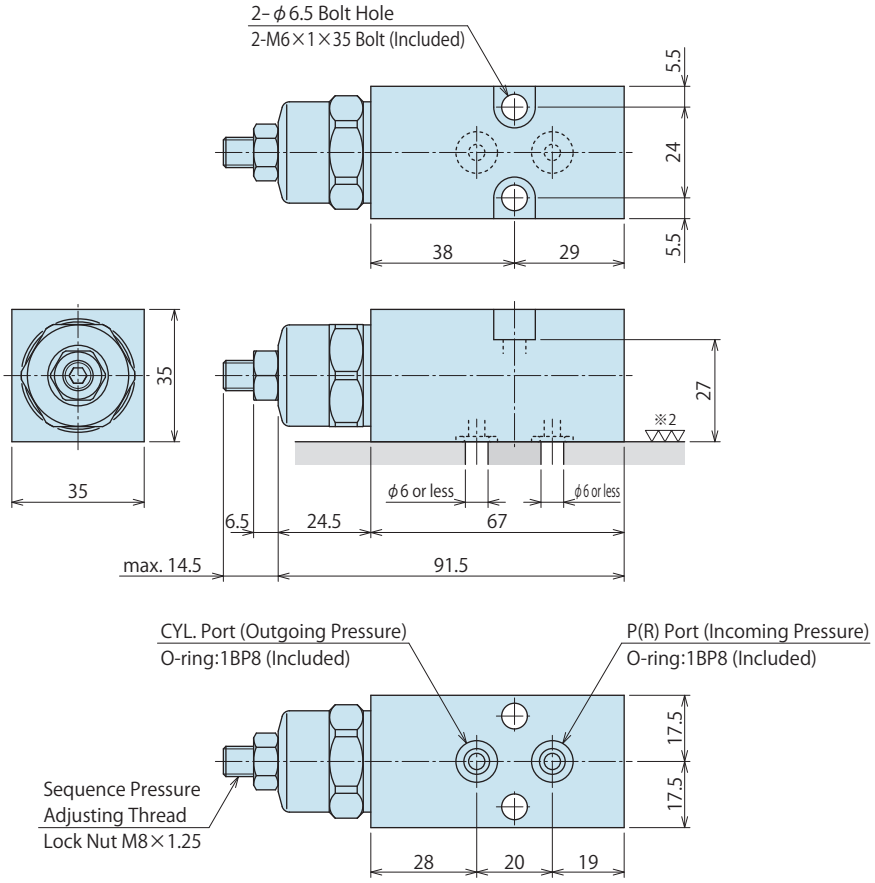
| Model No. | | BLG2830-0G□ | BLG2860-0G□ |
|---|---|---|---|
| Sequence Operating Pressure Adjustable Range | MPa | 1.0 ~ 6.0 | 5.0 ~ 18.0 |
| Operating Pressure Range | MPa | 2.0 ~ 35.0 | 6.0 ~ 35.0 |
| Adjusting Screw Turn Ratio | MPa/Rev | 1.0 | 2.8 |
| Cracking Pressure | MPa | 0.01 | |
| Min. Passage Area | $mm^2$ | P(R) → CYL. : 8.7 / CYL.→P(R) : 10.2 | |
| Operating Temperature | ℃ | 0 ~ 70 | |
| Usable Fluid | | General Hydraulic Oil Equivalent to ISO-VG-32 | |
| Weight | kg | 0.6 | |

Notes : 1. If the flow volume of the incoming pressure side is too much, there is a possibility that the proper sequential procedures would not work. In this instance, use a flow control valve to adjust flow volume from the pressure source.

2. Please refer to BLS page for the example of a combination of BLG and BLB.

## External Dimensions

BLG28□0-0G□



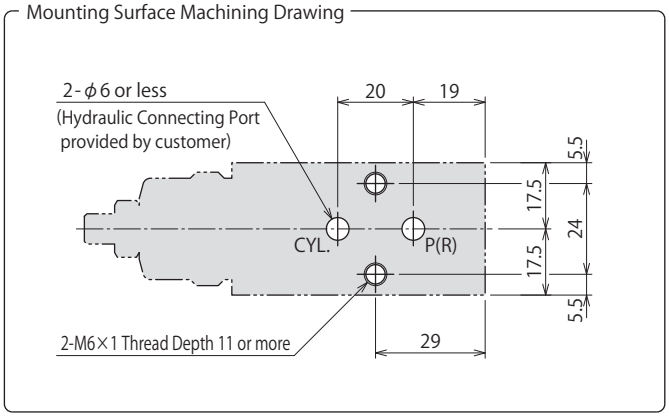




Note :

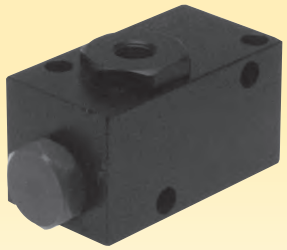
※2. Roughness of mounting surface (O-ring seal surface) should be 6.3S or less.

Mounting Surface Machining Drawing



# Pressure Balance Valve

Model **BLB**



## A pressure balance valve is actuated in sequence to prevent workpiece deformation

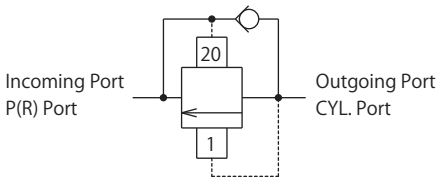
**This valve prevents the deformation of workpiece when the work support releases.**

### What is a pressure balance valve?

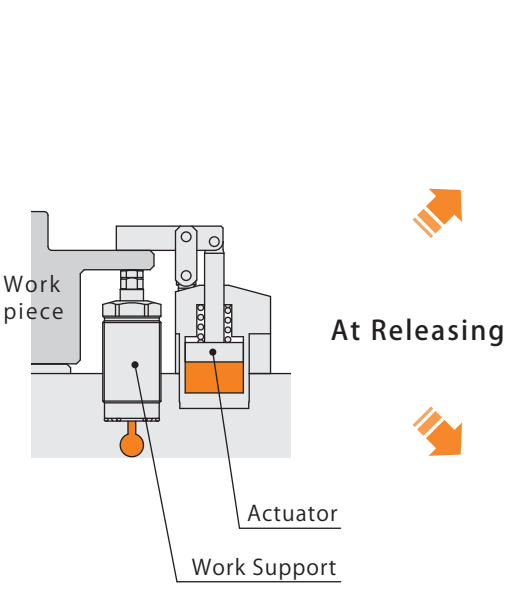
This valve prevents deformation of a workpiece during unclamping sequence. This will be useful when using work support and clamp actuator in opposite position.

When releasing, the incoming side pressure reduces around 1/20 of outgoing side pressure. Then outgoing side pressure start to reduce.

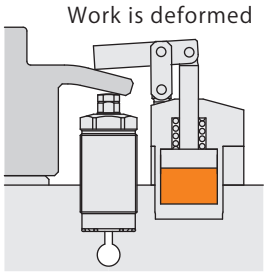
### Circuit Symbol



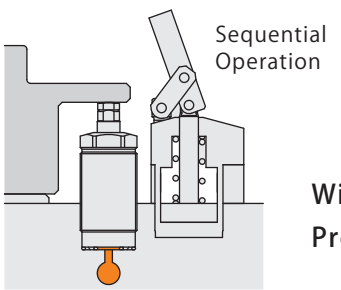

※ CYL. port comes with a built in filter.
Since a filter is not built in the P(R) port, please sufficiently perform flushing of piping and fitting to prevent foreign substances such as cutting chips from entering the circuit.




At Releasing



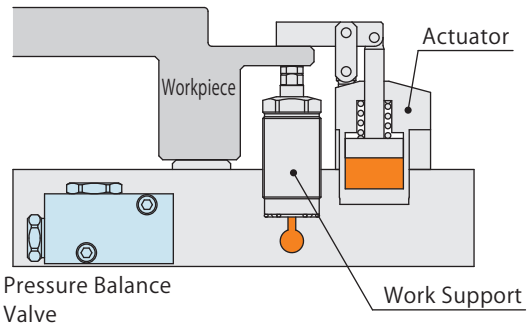

**Without Pressure Balance Valve**



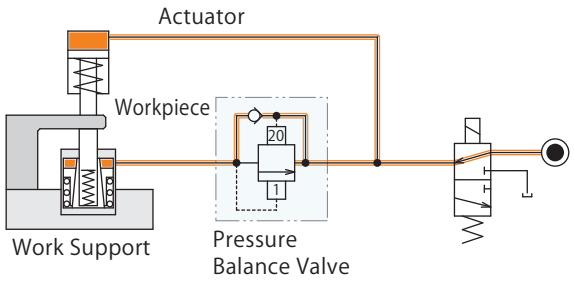

**With Pressure Balance Valve**

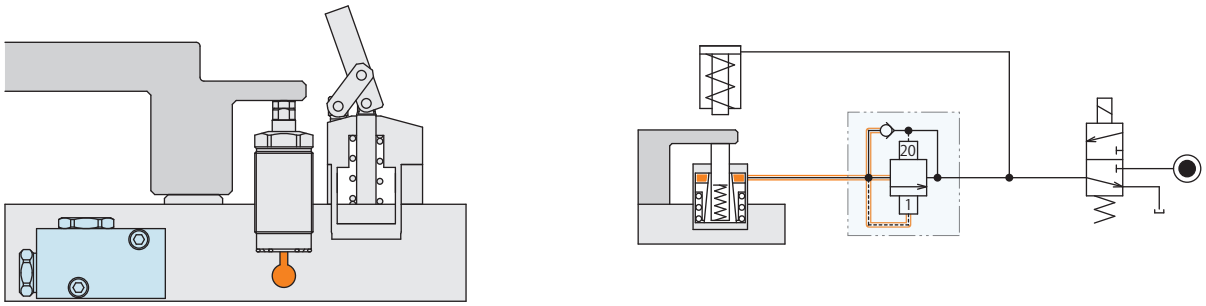
## Action Description

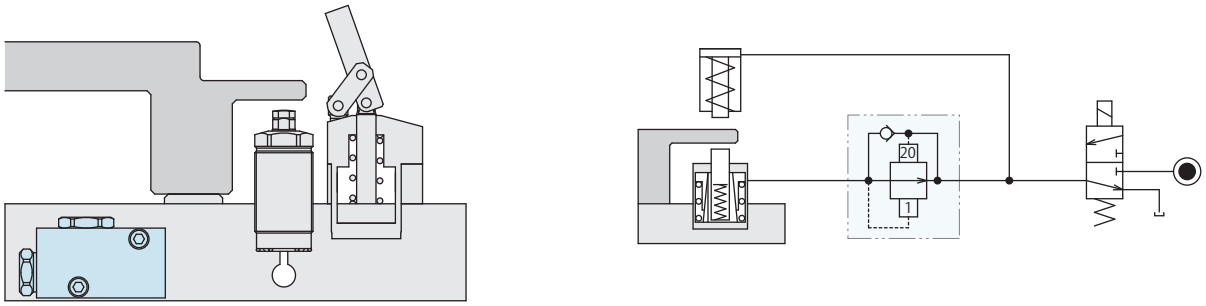
Images




Circuit Example





| Operating Procedure | | Note |
|---|---|---|
| Locking | Hydraulic pressure is ON. | |
| | The actuator and work support operates almost at the same time. | In the case that the workpiece is deformed due to the actuator operating earlier than work support, use the sequence valve (BLS/BLG) or flow control valve in order to operate in sequence. |
| | Locking action is completed. | |
| | Machining process | |
| Releasing | Hydraulic pressure is OFF. | |
| | Actuator is released. | |
| | The pressure balance valve circuit opens. | The circuit opens when the incoming side pressure reduces up to around 1/20 of the outgoing side pressure. |
| | Work Support is released. | |
| | Releasing action is completed. | |

## Model No. Indication

**BLB50 0 - 0 □**

1 2

### 1 Design No.

**0** : Revision Number

### 2 Piping Method

**Blank** : Piping Option (Rc Thread) (Standard)
**W** : BK/BLS Connecting Option

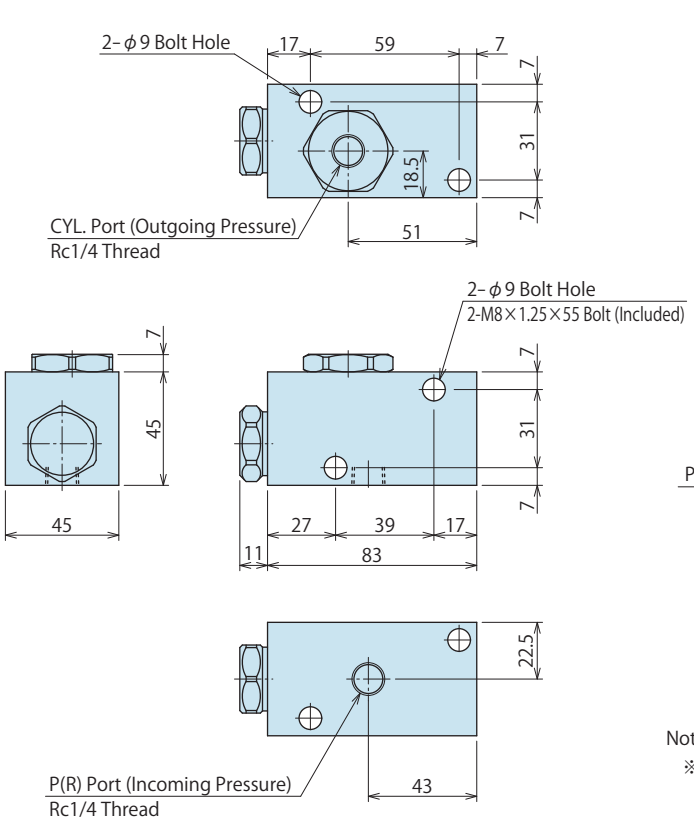
## Specifications

| Model No. | | BLB500-0□ |
|---|---|---|
| Operating Pressure Range | MPa | 2.0 ~ 30.0 |
| Withstanding Pressure | MPa | 37.5 |
| Min. Passage Area | $mm^2$ | 4.6 |
| Operating Temperature | ℃ | 0 ~ 70 |
| Usable Fluid | | General Hydraulic Oil Equivalent to ISO-VG-32 |
| Weight | kg | 1.2 |

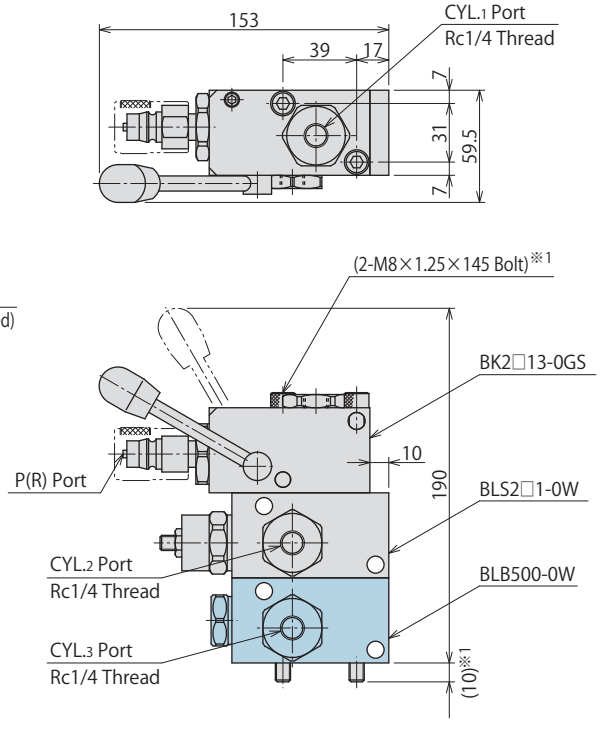
Note : 1. Please refer to BLS page for the example of a combination of BLS/BLG and BLB.

## External Dimensions

BLB500-0




BLB500-0W




Notes :
※1. Mounting bolts are NOT included.
Prepare them by referring to ※1 shown above.
1. BK and BLS are NOT included. Prepare them separately.

## MEMO

# Accumulator

Model JSS
Model JS

## Spring Accumulator to absorb pressure fluctuation of a fixture circuit disconnected from a pressure source

Maintenance-Free Spring Accumulator

### What is an accumulator?

When a fixture is disconnected from the hydraulic pressure source (closed circuit), with the change in volume of hydraulic fluid due to temperature changes, there will be pressure increase and/or decrease.

Accumulator avoids damage and deformation of a machine and workpiece caused by pressure increase, and falling of workpiece caused by pressure decrease.

### Circuit Symbol

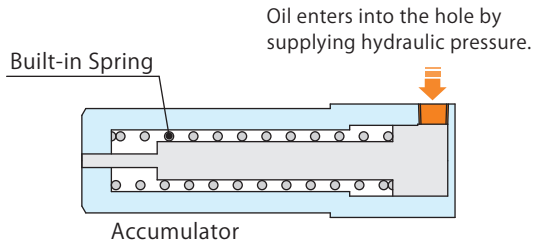
※ A filter is not built in each port. Please sufficiently perform flushing of piping and fitting to prevent contaminants such as cutting chips from entering the circuit.

| |  Model JSS → P.1231 |  Model JS → P.1235 |
|---|---|---|
| Classification | Spring Accumulator for Low Pressure | Spring Accumulator for High Pressure |
| Standard Operating Pressure | 2/3/4/5/6/7 MPa | 14/25 MPa |

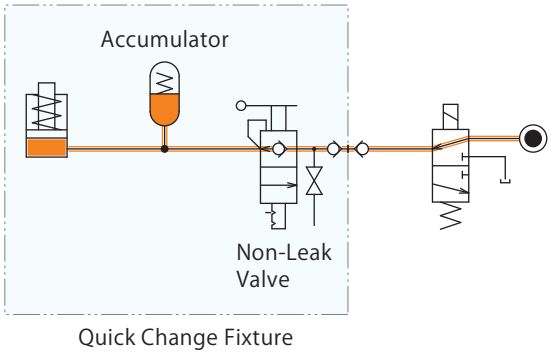
## Action Description

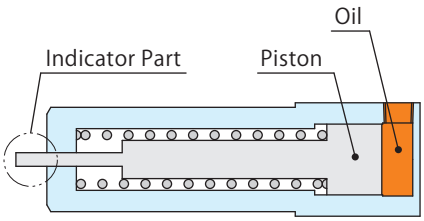
The Image of an Internal Accumulator

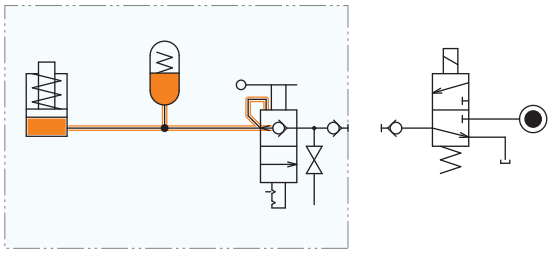
※ This is a simplified drawing.
The actual part components may be different.

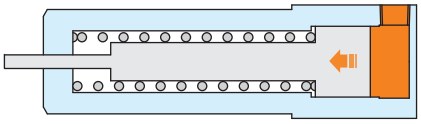
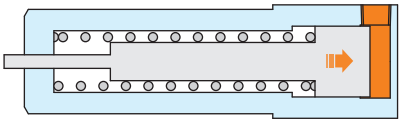



Circuit Example



| Temperature Change | With Accumulator | Without Accumulator |
|---|---|---|
| Increase in Oil Temperature | When hydraulic pressure increases as oil temperature rises, the piston will be pushed to absorb the pressure increase.  | Hydraulic pressure increases as oil temperature rises. Abnormal high pressure will damage a machine and/or deform a workpiece. |
| Decrease in Oil Temperature | When hydraulic pressure decreases as oil temperature drops, the piston will be pushed by spring to absorb the pressure decrease.  | Hydraulic pressure decreases as oil temperature drops. This will cause low machining quality and/or workpiece detachment. |

### Influence of Temperature Change on Hydraulic Circuit

Hydraulic pressure of sealed circuit disconnected from hydraulic source by non-leak valve, etc. is significantly affected by ambient temperature change and supply oil temperature change. (Especially when using a motor pump, high temperature oil is supplied and the temperature rapidly decreases after sealing.)
Although it differs depending on the amount of air mixed, product, piping/hose expansion and temperature condition, etc., Kosmek standard is as shown below regardless of the amount of oil contained.

$$\frac{0.69\text{MPa}}{℃}$$ ( 0.69MPa of Pressure Fluctuation by 1℃ Temperature Change )

## Model No. Indication

JSS 5 02 0 - □ □ □

1 2 3 4 5 6

### 1 Standard Operating Pressure

| | | | |
|---|---|---|---|
| **2** | : 2.0MPa | **5** | : 5.0MPa |
| **3** | : 3.0MPa | **6** | : 6.0MPa |
| **4** | : 4.0MPa | **7** | : 7.0MPa |

### 2 Amount of Discharge Oil

**02** : 2.5cm³

**05** : 5.0cm³

**10** : 10.0cm³

### 3 Design No.

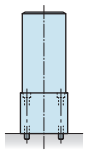
**0** : Revision Number

### 4 Mounting Direction

**H** : Horizontal Mounting

**V** : Vertical Mounting

**H** : Horizontal Mounting



**V** : Vertical Mounting

### 5 Piping Method

| | |
|---|---|
| **C** | : Piping Option (G Thread) |
| **S** | : Piping Option (Rc Thread) |
| **G** | : Gasket Option |
| **GC** | : Gasket + Piping Option (G Thread) |
| **GS** | : Gasket + Piping Option (Rc Thread) |

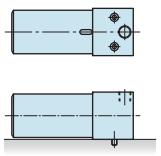
### 6 Piping Direction

(Applies only when selecting both Mounting Direction : **H** and Piping Method : **C/S/GC/GS**)

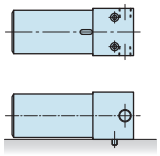
**A** : Top Piping

**B** : Side Piping

※ In case of **V**: Vertical Mounting, 6 Piping Direction is "**Blank**".
※ In case of **H**: Horizontal Mounting + Piping Method : **G**,
6 Piping Direction is "**Blank**".



**A** : Top Piping



**B** : Side Piping

## Specifications

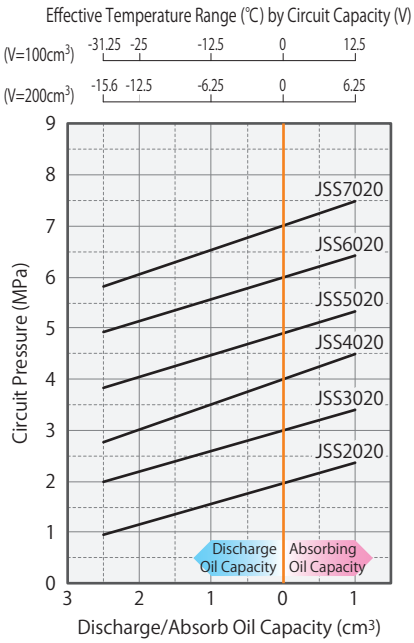
| Model No. | JSS2020 | JSS2050 | JSS2100 | JSS3020 | JSS3050 | JSS3100 | JSS4020 | JSS4050 | JSS4100 |
|---|---|---|---|---|---|---|---|---|---|
| Standard Operating Pressure MPa | 2.0 | | | 3.0 | | | 4.0 | | |
| Withstanding Pressure MPa | 14.0 | | | | | | | | |
| Discharge Oil Capacity cm³ | 2.5 | 5.0 | 10.0 | 2.5 | 5.0 | 10.0 | 2.5 | 5.0 | 10.0 |
| Absorbing Oil Capacity cm³ | 1.0 | 2.0 | 4.0 | 1.0 | 2.0 | 4.0 | 1.0 | 2.0 | 4.0 |
| Compression Factor (β)※1 MPa/cm³ | 0.40 | 0.31 | 0.16 | 0.40 | 0.33 | 0.17 | 0.49 | 0.37 | 0.18 |
| Operating Temperature ℃ | 0 ~ 70 | | | | | | | | |
| Usable Fluid | General Hydraulic Oil Equivalent to ISO-VG-32 | | | | | | | | |
| Weight kg | 0.8 | 1.0 | 1.7 | 0.8 | 1.1 | 1.7 | 0.8 | 1.1 | 2.0 |

| Model No. | JSS5020 | JSS5050 | JSS5100 | JSS6020 | JSS6050 | JSS6100 | JSS7020 | JSS7050 | JSS7100 |
|---|---|---|---|---|---|---|---|---|---|
| Standard Operating Pressure MPa | 5.0 | | | 6.0 | | | 7.0 | | |
| Withstanding Pressure MPa | 14.0 | | | | | | | | |
| Discharge Oil Capacity cm³ | 2.5 | 5.0 | 10.0 | 2.5 | 5.0 | 10.0 | 2.5 | 5.0 | 10.0 |
| Absorbing Oil Capacity cm³ | 1.0 | 2.0 | 4.0 | 1.0 | 2.0 | 4.0 | 1.0 | 2.0 | 4.0 |
| Compression Factor (β)※1 MPa/cm³ | 0.43 | 0.34 | 0.17 | 0.43 | 0.36 | 0.21 | 0.48 | 0.40 | 0.27 |
| Operating Temperature ℃ | 0 ~ 70 | | | | | | | | |
| Usable Fluid | General Hydraulic Oil Equivalent to ISO-VG-32 | | | | | | | | |
| Weight kg | 1.4 | 1.8 | 2.9 | 1.5 | 1.9 | 3.0 | 1.7 | 2.0 | 3.4 |

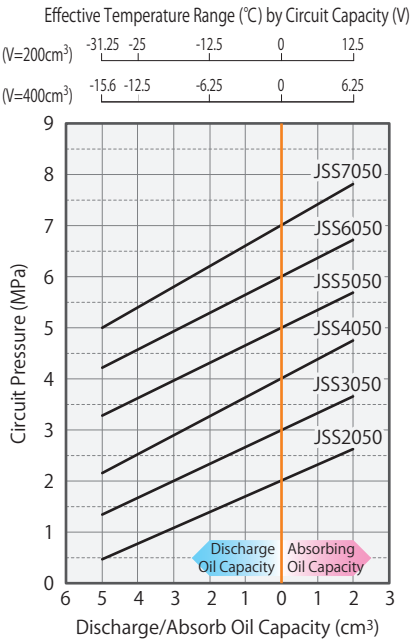
Note : ※1. Compression factor (β) means a pressure change (MPa) per 1cm³ change in oil volume.

## Performance Curve

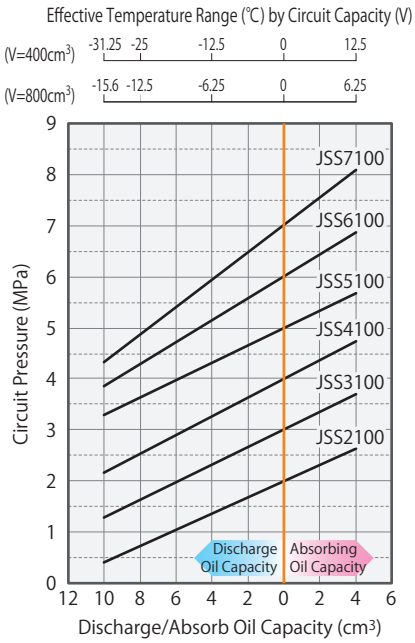
JSS□020




JSS□050




JSS□100




## How to read the Characteristic Diagram

### Requirements (Reference)

| | |
|---|---|
| Clamp Used | LHA0650×4 units (Lock Cylinder Capacity for each ：26.7cm³) |
| Piping | Inner Diameter φ6×2m (Pipe Capacity per 1m ：28.3cm³) |
| Valve Capacity | 20cm³ |
| Temperature Change ：ΔT | −20℃ |
| Operating Pressure ：P | 4.0MPa |
| Thermal Expansion Coefficient ：α | 8×10⁻⁴ |

### Selection Method

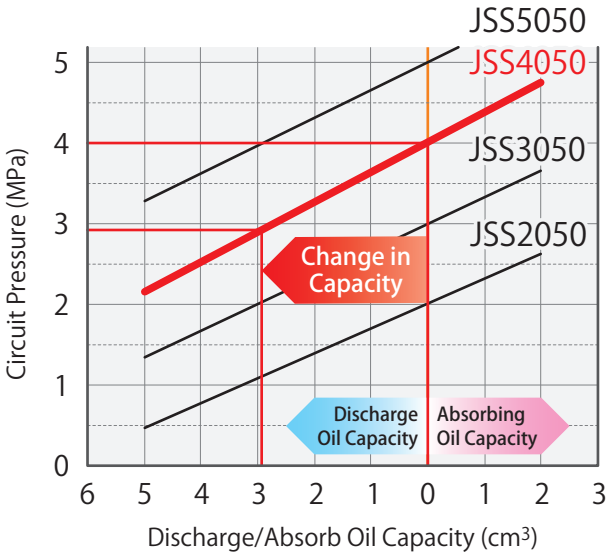
1. Calculate Fixture Circuit Capacity (V)
   Clamp Capacity + Pipe Capacity + Valve Capacity
   V = (26.7×4) + (28.3×2) + 20 = 183.4 cm³

2. Calculate Change in Capacity (ΔV)
   Fixture Circuit Capacity (V) x Thermal Expansion Coefficient (α)
   x Amount of Temperature Change (ΔT)
   ΔV = 183.4 × (8×10⁻⁴) × (-20) = -2.93 cm³

3. Select Accumulator Model
   Operating Pressure (P)= 4.0MPa select JSS4□□□
   Change in Capacity (ΔV)= -2.93cm³ select JSS4050.
   (If the required discharge capacity is greater than shown on the graph, select larger accumulator [e.g. JSS4100].)

4. Check the Accumulator Characteristics (Graph on the right)
   Pressure after Temperature Change (-20℃) ：2.92MPa
   Residual Oil Discharge Margin ：2.07cm³

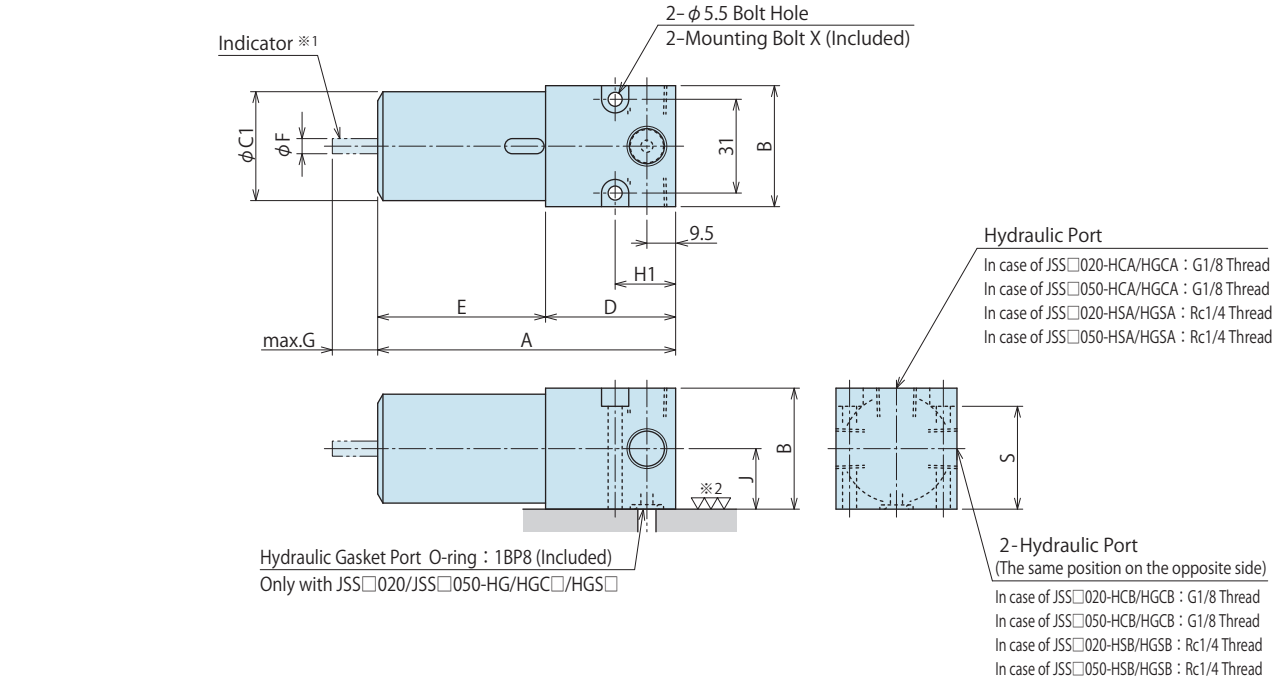
5. Select the mounting direction, piping method and piping direction.



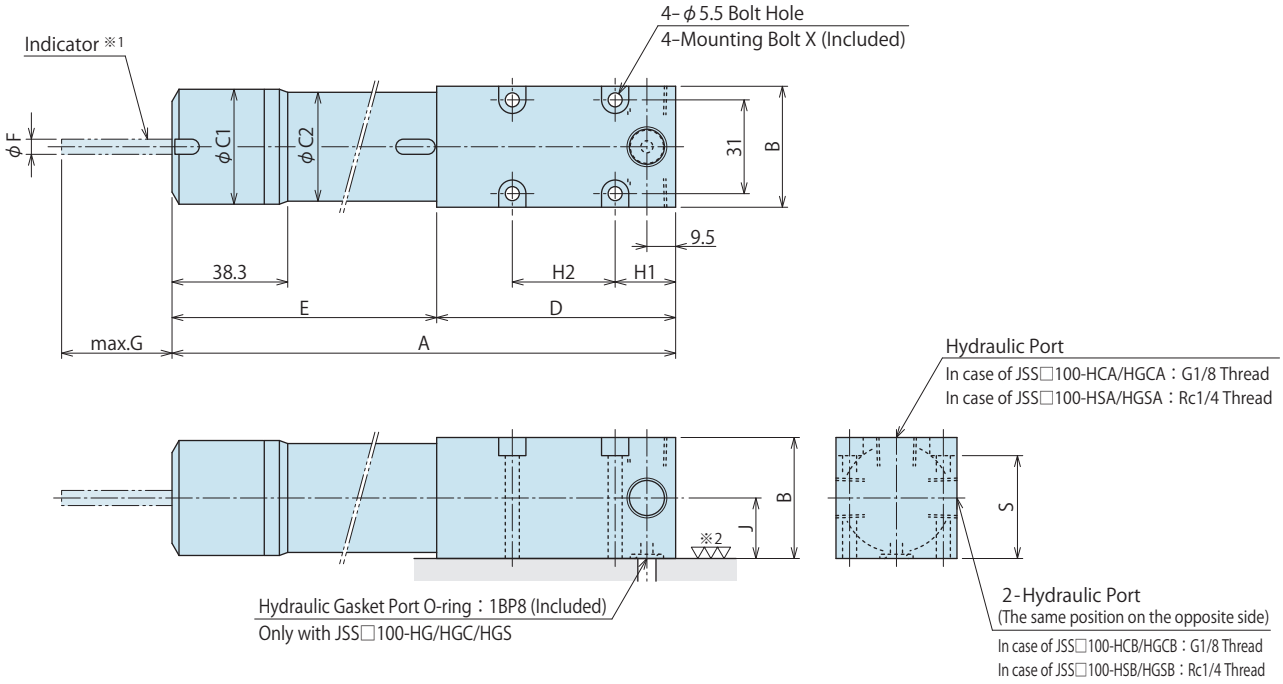

Note :
1. When making your selection, calculate tolerance for the oil capacity taking the spring force deviation into consideration.
【Approximate Amount of Spare Oil：JSS□020･･･0.5cm³, JSS□050･･･1.0cm³, JSS□100･･･1.5cm³】

## External Dimensions

JSS□020-H□□ 、JSS□050-H□□

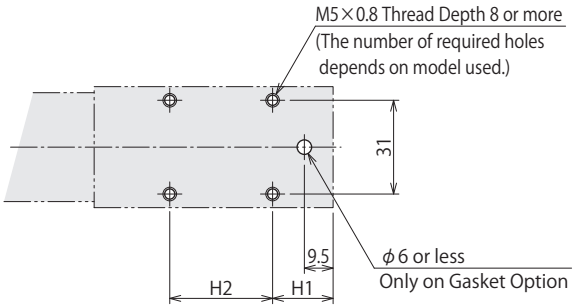



JSS□100-H□□

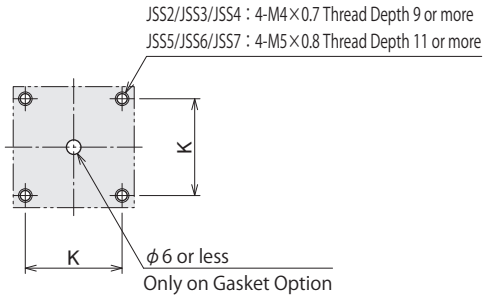



## Machining Dimensions of Mounting Area

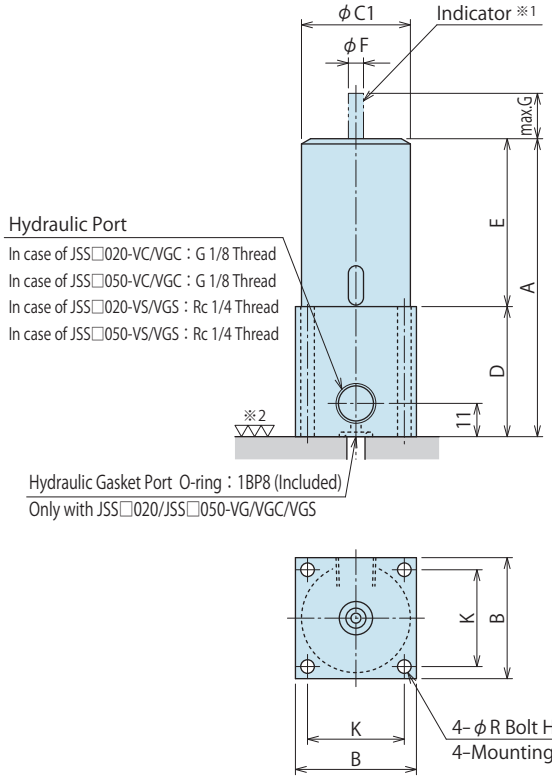
JSS□□0-H□□



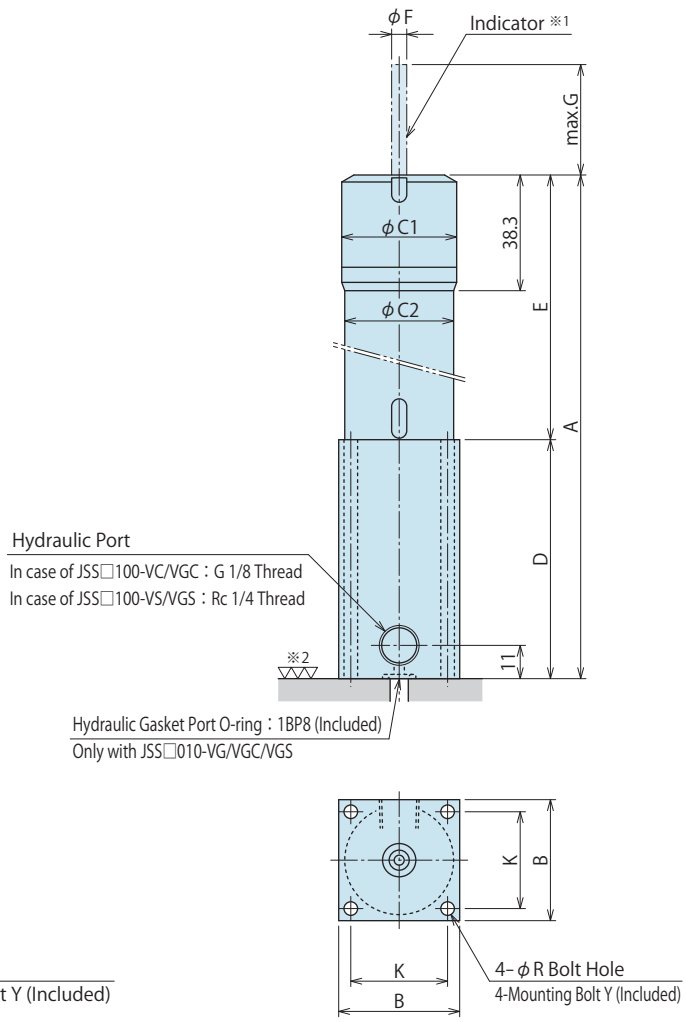

JSS□□0-V□



JSS□020-V□、JSS□050-V□




JSS□100-V□




## External Dimensions and Machining Dimensions for Mounting

(mm)

| Model No. | JSS2020 JSS3020 JSS4020 | JSS2050 JSS3050 JSS4050 | JSS2100 JSS3100 JSS4100 | JSS5020 JSS6020 JSS7020 | JSS5050 JSS6050 JSS7050 | JSS5100 JSS6100 JSS7100 |
|---|---|---|---|---|---|---|
| A | 98.5 | 136.5 | 241.5 | 128.5 | 164.5 | 275.5 |
| B | 40 | 40 | 40 | 50 | 50 | 50 |
| C1 | 36 | 36 | 38 | 46 | 46 | 48 |
| C2 | - | - | 36 | - | - | 46 |
| D | 43 | 55 | 79 | 43 | 55 | 79 |
| E | 55.5 | 81.5 | 162.5 | 85.5 | 109.5 | 196.5 |
| F | 5 | 5 | 5 | 6 | 6 | 6 |
| G ※1 | 15 | 27 | 49 | 15 | 27 | 49 |
| H1 | 20 | 20 | 20 | 20 | 20 | 20 |
| H2 | - | - | 34 | - | - | 34 |
| J | 20 | 20 | 20 | 25 | 25 | 25 |
| K | 32 | 32 | 32 | 40 | 40 | 40 |
| R | 4.5 | 4.5 | 4.5 | 5.5 | 5.5 | 5.5 |
| S | 34 | 34 | 34 | 44 | 44 | 44 |
| Mounting Bolt X | M5×0.8×40 | M5×0.8×40 | M5×0.8×40 | M5×0.8×50 | M5×0.8×50 | M5×0.8×50 |
| Mounting Bolt Y | M4×0.7×50 | M4×0.7×60 | M4×0.7×85 | M5×0.8×50 | M5×0.8×65 | M5×0.8×85 |

Notes :

※1. Indicator extends proportionally to pressure. Be aware not to interfere with other devices of max. extension dimension when designing.

※2. Roughness of mounting surface (O-ring seal surface) of G (Gasket option) should be 6.3S or better.

1. Do not disassemble. Components include pressured spring parts. It is dangerous to disassemble.

## Model No. Indication

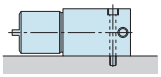
JS A 7 1 1 - 0 A

1 2 3 4 5

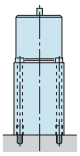
### 1 Mounting Direction

**A** : Horizontal Mounting

**B** : Vertical Mounting



**A**:Horizontal Mounting



**B**:Vertical Mounting

### 2 Standard Operating Pressure

**5**: 14.0MPa

**7**: 25.0MPa

### 3 Amount of Discharge Oil

**1**: 2.2cm³

**2**: 4.4cm³

### 4 Design No.

**1** : Revision Number

### 5 Piping Method

**A** : Front Side Piping Option (Rc1/4 Thread) ※1

**B** : Top Surface Piping Option (Rc1/4 Thread) ※1

**C** : Side Surface Piping Option (Rc1/4 Thread)

**G** : Gasket Option

※1. When selecting Mounting Direction **B**:Vertical Mounting, **A**:Front Side Piping Option and **B**:Top Surface Piping Option cannot be selected.

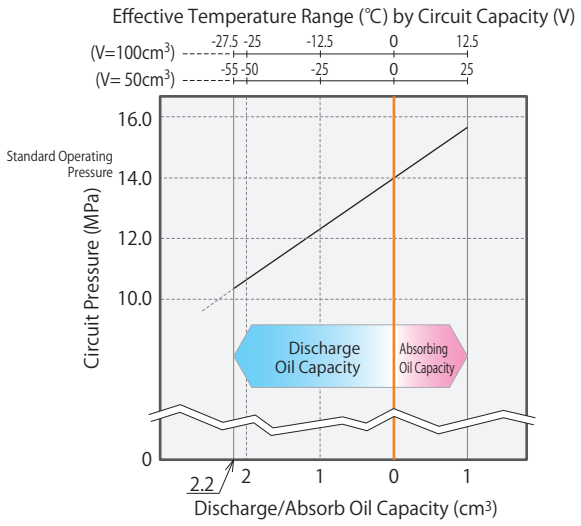
## Specifications

| Model No. | JS□511 | JS□521 | JS□711 | JS□721 |
|---|---|---|---|---|
| Standard Operating Pressure MPa | 14.0 | | 25.0 | |
| Withstanding Pressure MPa | 25.0 | | 37.5 | |
| Discharge Oil Capacity cm³ | 2.2 | 4.4 | 2.2 | 4.4 |
| Absorbing Oil Capacity cm³ | 1.0 | 2.0 | 1.0 | 2.0 |
| Compression Factor (β)※1 MPa/cm³ | 1.65 | 1.19 | 2.24 | 1.93 |
| Operating Temperature ℃ | 0 ~ 70 | | | |
| Usable Fluid | General Hydraulic Oil Equivalent to ISO-VG-32 | | | |
| Weight kg | 3.0 | 4.3 | 5.4 | 5.9 |

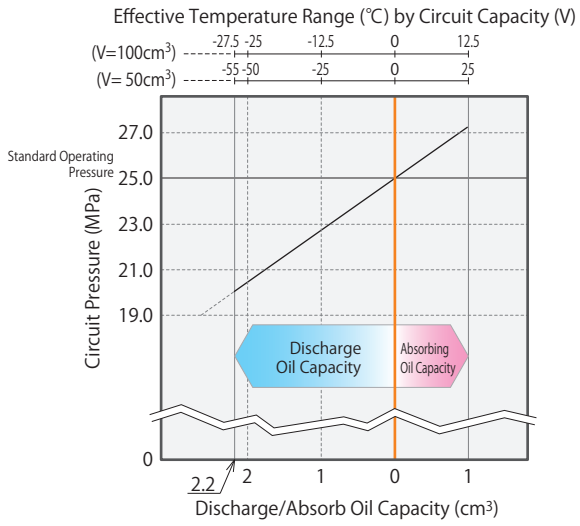
Note : ※1. Compression factor (β) means a pressure change (MPa) per 1cm³ charge in oil volume.

## Performance Curve

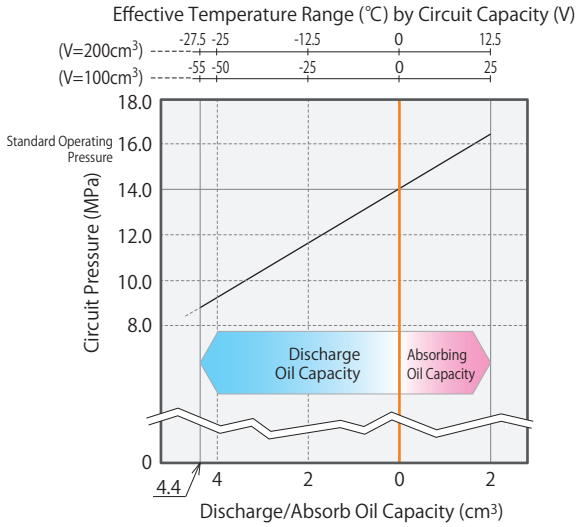
### JS□511



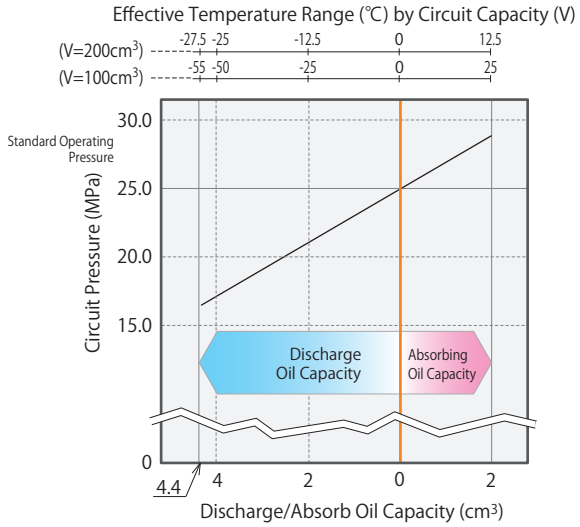

### JS□711




### JS□521




### JS□721




## How to read the Characteristic Diagram

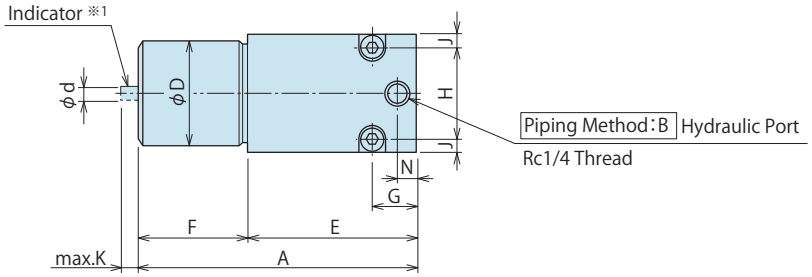
Please refer to “How to read the Characteristic Diagram” on JSS page.

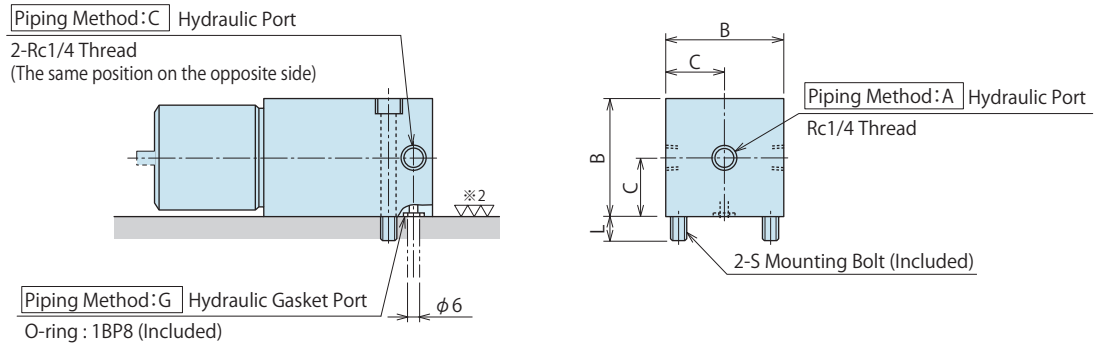
High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others

Air Sequence Valve
BWD
Hydraulic Non-Leak Coupler
BGA/BGB
BGC/BGD
BGP/BGS
BBP/BBS
BNP/BNS
BJP/BJS
BFP/BFS
Auto Coupler
JTA/JTB
JTC/JTD
JVA/JVB
JVC/JVD
JVE/JVF
JNA/JNB
JNC/JND
JLP/JLS
Rotary Joint
JR
Hydraulic Valve
BK
BEQ
BT
BLS/BLG
BLB
JSS/JS
JKA/JKB
BMA/BMG
AU/AU-M
BU
BP/JPB
BX
BEP/BSP
BH
BC
Air Hydraulic Unit
CV
CK
CP/CPB
CPC/CQC
CB
CC
AB/AB-V
AC/AC-V

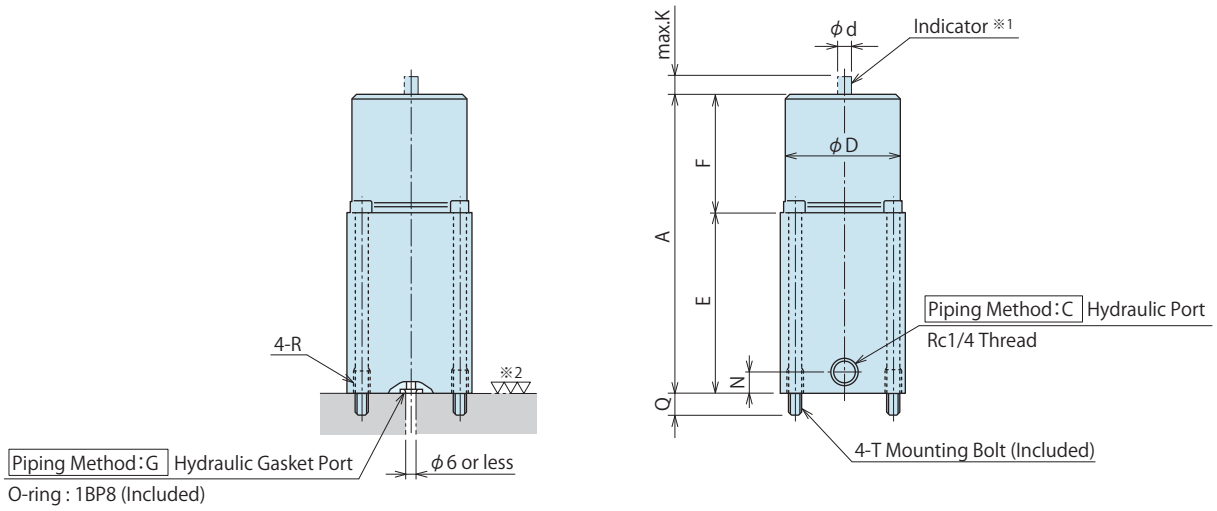
## External Dimensions

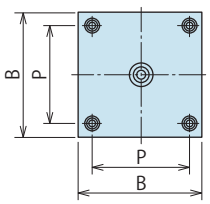
JSA□□1-0A/B/C/G




JSB□□1-0C/G



## External Dimensions

(mm)

| Model No. | JS□511 | JS□521 | JS□711 | JS□721 |
|---|---|---|---|---|
| A | 155.5 | 187.5 | 210.5 | 236 |
| B | 65 | | 70 | |
| C | 32.5 | | 35 | |
| D | 58.5 | | 68.5 | |
| d | 8 | | 8 | |
| E | 82 | | 84 | |
| F | 73.5 | 105.5 | 126.5 | 152 |
| G | 25 | | 25 | |
| H | 51 | | 56 | |
| J | 7 | | 7 | |
| K ※1 | 9 | 16.5 | 9.5 | 17.5 |
| L | 13 | | 13 | |
| N | 11 | | 11 | |
| P | 51 | | 56 | |
| Q | 8 | | 11 | |
| R (Nominal×Pitch×Depth) | M8×1.25×16 | | M8×1.25×16 | |
| Mounting Bolt S | M8×1.25×70 | | M8×1.25×75 | |
| Mounting Bolt T | M6×1×90 | | M6×1×95 | |

Notes :

※1. Indicator extends proportionally to pressure. Be aware not to interfere with other devices of max. extension dimension when designing.

※2. Roughness of mounting surface (O-ring seal surface) of G (Gasket option) should be 6.3S or better.

1. Do not disassemble. Components include pressured spring parts. It is dangerous to disassemble.

# Pressure Indicator

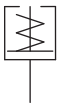
Model JKA
Model JKB

## Detects circuit pressure of a fixture disconnected from the hydraulic pressure source

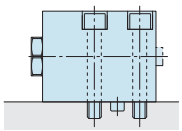
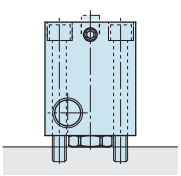
### What is a Pressure Indicator ?

The circuit pressure of a fixture that is disconnected from the hydraulic power source can be detected by using the pressure indicator with a sensor and/or a switch.
It enables to detect operations and errors of an automatic control system.

**Circuit Symbol**



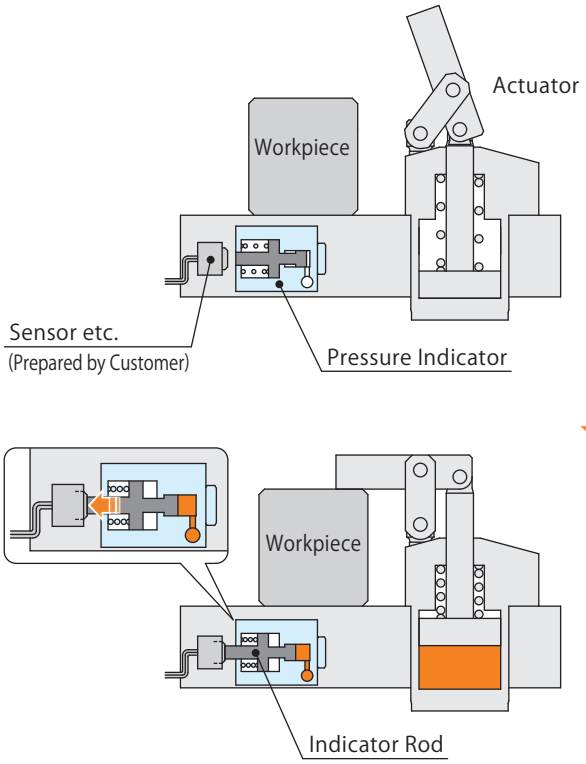
※ A filter is not built in each port. Please sufficiently perform flushing of piping and fitting to prevent contaminants such as cutting chips from entering the circuit.

| |  Model JKA → P.1241 |  Model JKB → P.1241 |
|---|---|---|
| Classification | Horizontal Mounting | Vertical Mounting |
| Set Pressure Range | 4.5～9.5MPa / 9.5～15MPa / 15～22 MPa | |
| Mounting Direction |  |  |

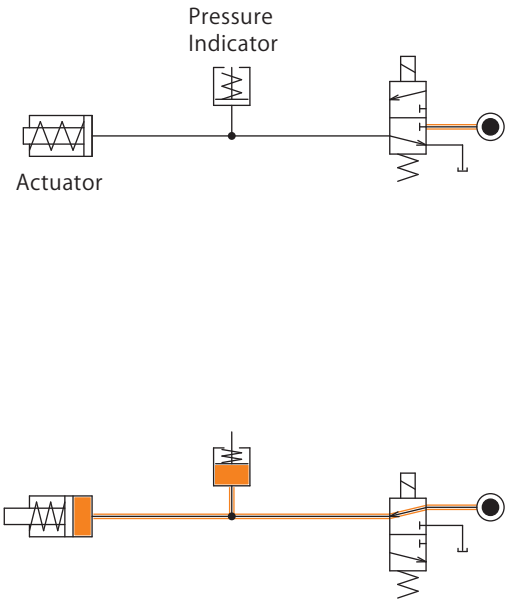
## Action Description

### Images

※ This is a simplified drawing.
The actual part components may be different.




### Circuit Example




| | Operating Procedure | Note |
|---|---|---|
| Locking | Hydraulic pressure is ON. | |
| | Supply hydraulic pressure to the actuator and the pressure indicator. | |
| | When the pressure reaches the set pressure of pressure indicator, the indicator rod is at full stroke ($3^{\pm 0.5}$mm stick out) and if using the sensor or switch, it can be detected. | The indicator rod extends gradually because of the balance between built-in spring force and pressure just before reaching the set pressure. |
| Releasing | Hydraulic pressure is OFF. | |
| | The pressure is released from the actuator and the pressure indicator. Then the indicator rod retracts back to the edge of the pressure indicator. | |

## Model No. Indication

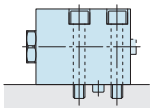
JK **A** 0 **3** **0** - 0 **S** **(5.5MPa)**

1 2 3 4 5

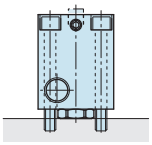
### 1 Mounting Direction

**A** : Horizontal Mounting

**B** : Vertical Mounting



**A** : Horizontal Mounting



**B** : Vertical Mounting

### 2 Set Pressure Code

**3**: 4.5 ~ 9.5MPa

**5**: 9.5 ~ 15.0MPa

**7**: 15.0 ~ 22.0MPa

### 3 Design No.

**0** : Revision Number

### 4 Piping Method

**G** : Gasket Option

**S** : Piping Option (Rc1/4 Thread)

### 5 Set Pressure (Set pressure when indicator rod is at full-stroke.)

**Please indicate the set pressure when ordering.**
**(Please inform us with proper unit symbols.)**

※ Indicator rod is at full stroke ($3^{\pm 0.5}$mm) when set pressure is reached.

Entry Example

at 5MPa → **(5.0MPa)**

at 20.5MPa → **(20.5MPa)**

at 700PSI → **(700PSI)**

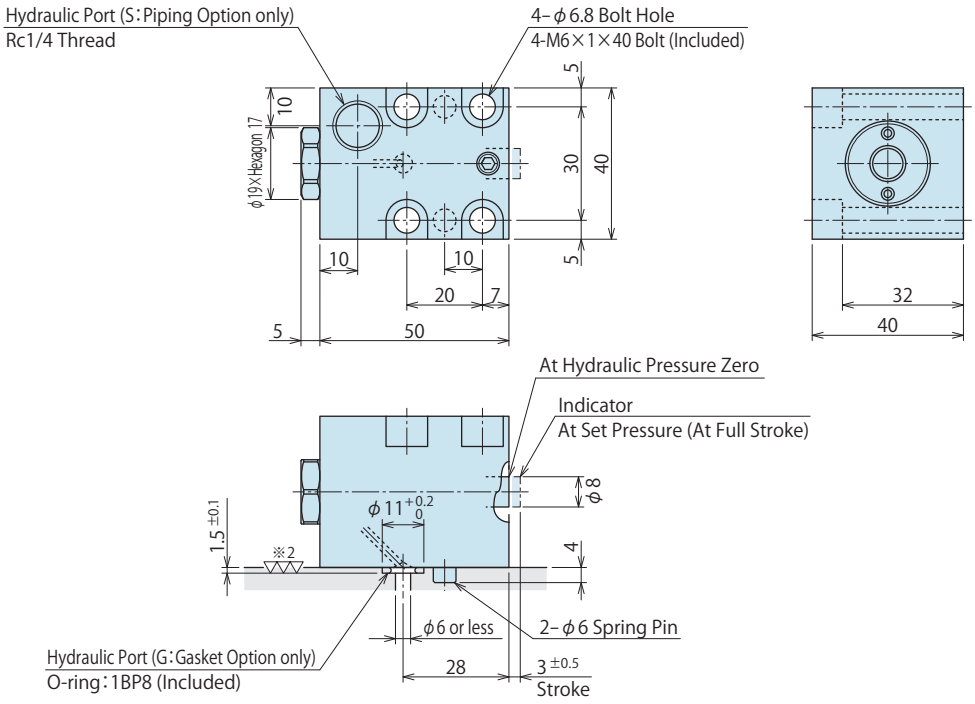
## Specifications

| Model No. | JK□030 | JK□050 | JK□070 |
|---|---|---|---|
| Set Pressure Range MPa | 4.5 ~ 9.5 | 9.5 ~ 15.0 | 15.0 ~ 22.0 |
| Max. Operating Pressure MPa | 25.0 | | |
| Withstanding Pressure MPa | 37.5 | | |
| Pressure Change ※1 MPa/mm | 0.65 | 1.38 | 2.55 |
| Operating Temperature ℃ | 0 ~ 70 | | |
| Usable Fluid | General Hydraulic Oil Equivalent to ISO-VG-32 | | |
| Weight kg | 0.5 | | |

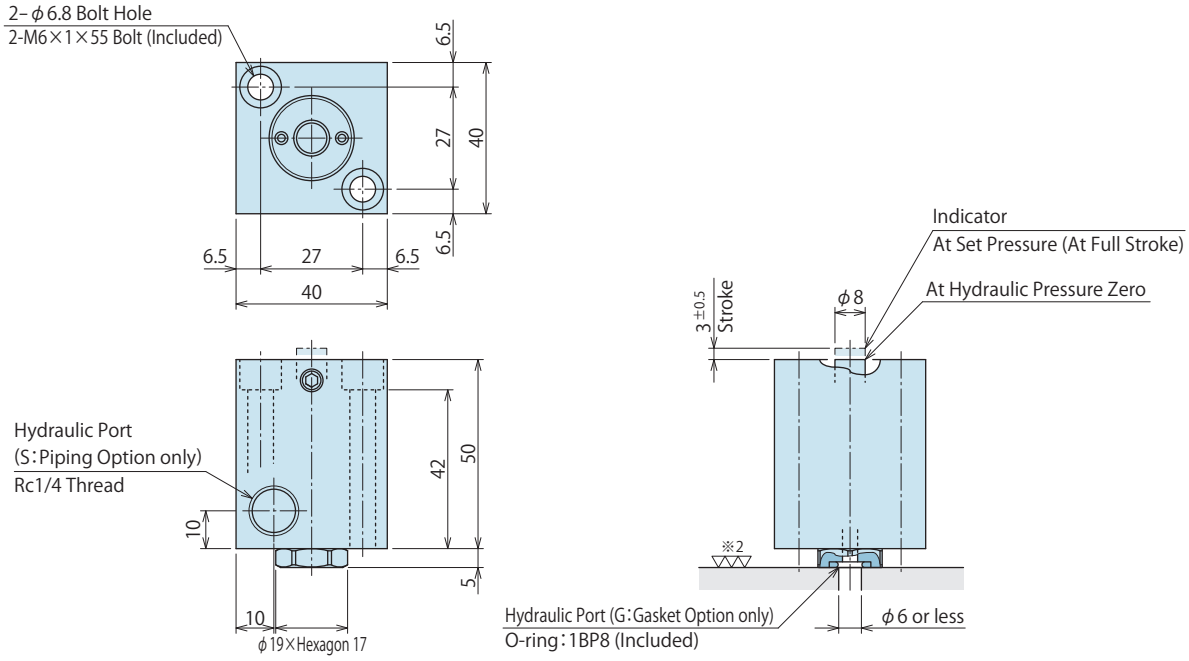
Note : ※1. It shows the pressure change by 1mm stroke of the indicator.

## External Dimensions

JKA0□0-0□□




JKB0□0-0□□

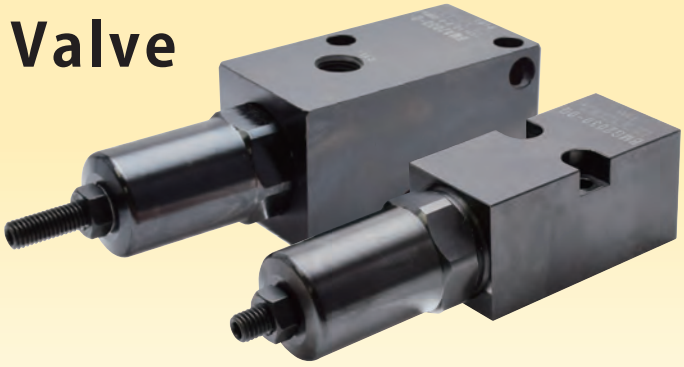



Note :

※2. Roughness of mounting surface (O-ring seal surface) should be 6.3S or less.

# Non-Leak Reducing Valve

Model BMA
Model BMG



## No Drain Port Required In-Line Type Reducing Valve

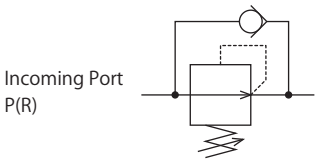
**Drain port for reducing pressure is not needed. This allows to reduce the number of circuits.** PAT.

### What is a Reducing Valve?

Non-leak reducing valves reduce hydraulic circuit pressure of a fixture.
Partial in-line circuit pressures can be reduced.
This allows for simple circuit designs and proper quick change fixtures as well as eliminating a need for an exterior drain port.


※ Gasket option is available.

### Circuit Symbol

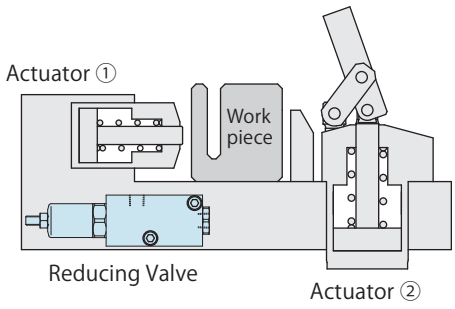



※ Each port has a built-in filter.

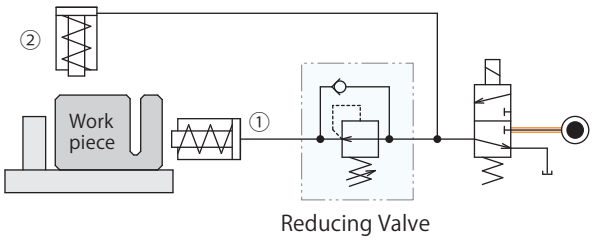
| |  Model BMA → P.1245 | | |  Model BMG → P.1247 | | |
|---|---|---|---|---|---|---|
| Classification | Non-Leak Reducing Valve | | | Compact Non-Leak Reducing Valve | | |
| Incoming Supply Pressure | 2~7MPa | 6~30MPa | 9~30MPa | 2~7MPa | 6~30MPa | 9~30MPa |
| Outgoing Set Pressure | 1~6MPa | 3~14MPa | 6~27MPa | 1~6MPa | 3~14MPa | 6~27MPa |
| Piping Method | Piping Option<br>Gasket Option<br>BK Connecting Option | | | Gasket Option | | |

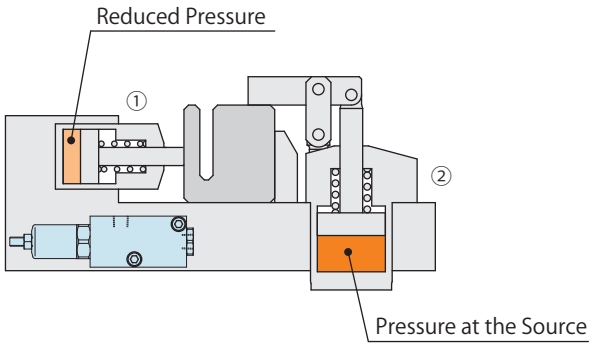
## Action Description

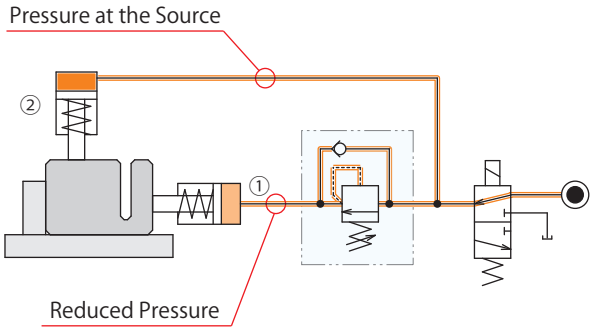
Images




Circuit Example



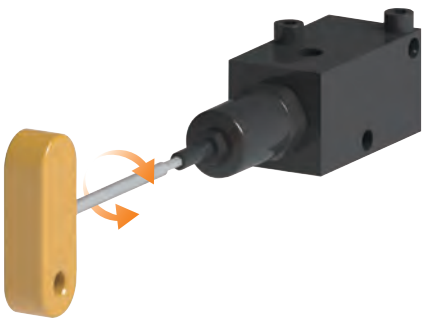

| | Operating Procedure | Remarks |
|---|---|---|
| Locking | Hydraulic pressure is ON. | |
| | Supply hydraulic pressure to actuator ① and ②. | |
| | Raise the pressure up to the outgoing side set pressure. | |
| | The valve of reducing valve closes and then supply the outgoing side set pressure to actuator ①. | There is differential pressure between outgoing side pressure and incoming side pressure (please refer to specification). |
| | The pressure going into actuator ② raise up to the original pressure and lock completes. | |
| | Machining process | |
| Releasing | Hydraulic pressure is OFF. | |
| | The actuators ①,② are released at the same time. | When incoming side pressure reduces, check valve of reducing valve opens. |
| | Releasing action is completed. | |

## Adjustable Set Pressure

Set Hydraulic Pressure Change per Rotation (MPa/Rev)

| Model No. | BMA2030-0□ BMG2030-0G | BMA2050-0□ BMG2050-0G | BMA2070-0□ BMG2070-0G |
|---|---|---|---|
| Set Pressure Change per Rotation (Reference) | 0.3 | 1.2 | 3.8 |

Notes :
1. The set pressure value is set according to the model code.
2. The value varies depending on the incoming port pressure.
3. Pressure increases by turning clockwise and decreases by turning counter-clockwise.



## Model No. Indication

**BMA20 5 0 - 0 G (5-25MPa)**

1 2 3 4

### 1 Outgoing Side Set Pressure

**3**: 1.0 ~ 6.0MPa

**5**: 3.0 ~ 14.0MPa

**7**: 6.0 ~ 27.0MPa

### 2 Design No.

**0** : Revision Number

### 3 Piping Method

**Blank** : Piping Option (Rc1/4 Thread)

**G** : Gasket Option

**K** : BK Valve Connecting Option (Rc1/4 Thread in Outgoing Port) ※1

Note : ※1. Please contact us separately for the detailed dimensions of K (BK Valve Connecting Option).

### 4 Set Pressure (Outgoing Set Pressure - Incoming Supply Pressure)

**Please indicate the set pressure when ordering.**
**(Please inform us with proper unit symbols.)**

※ Pressure difference of incoming supply pressure and outgoing set pressure should be more than the allowable minimum pressure difference.

Entry Example

Outgoing:5MPa Incoming:25MPa Setting → **(5.0-25.0MPa)**

Outgoing:725PSI Incoming:3625PSI Setting → **(725-3625PSI)**

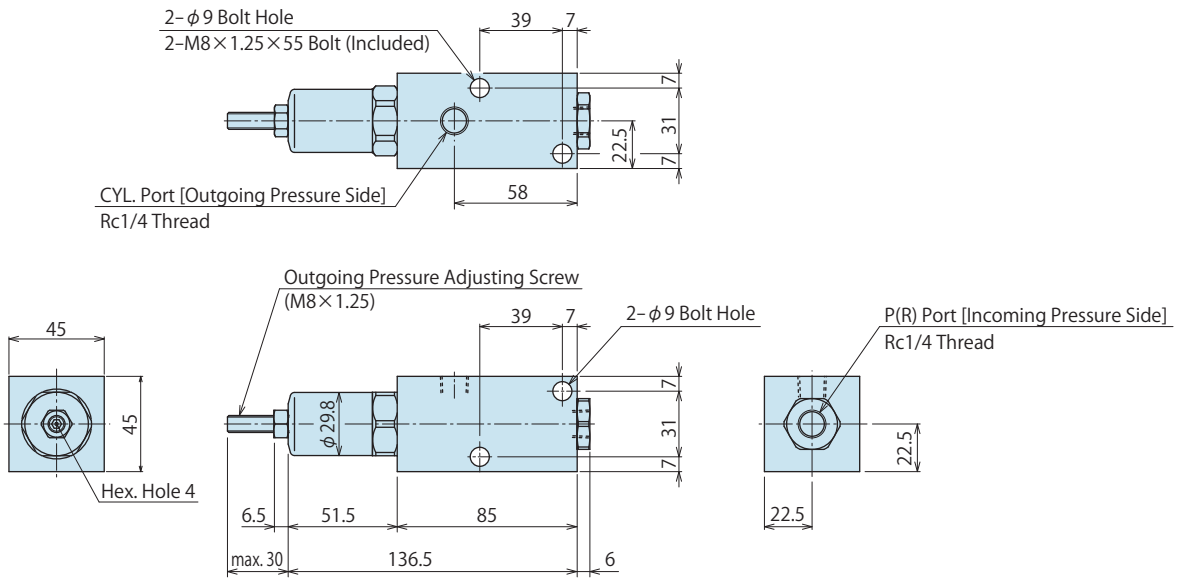
## Specifications

| Model No. | | BMA2030-0□ | BMA2050-0□ | BMA2070-0□ |
|---|---|---|---|---|
| Incoming Supply Pressure | MPa | 2.0 ~ 7.0 | 6.0 ~ 30.0 | 9.0 ~ 30.0 |
| Outgoing Set Pressure | MPa | 1.0 ~ 6.0 | 3.0 ~ 14.0 | 6.0 ~ 27.0 |
| Allowable Min. Pressure Difference ※2 | MPa | 1.0 | 3.0 | 3.0 |
| Withstanding Pressure | MPa | 10.5 | 37.5 | 37.5 |
| Min. Passage Area | $mm^2$ | 23.3 | | |
| Operating Temperature | ℃ | 0 ~ 70 | | |
| Usable Fluid | | General Hydraulic Oil Equivalent to ISO-VG-32 | | |
| Weight | kg | 1.5 | | |

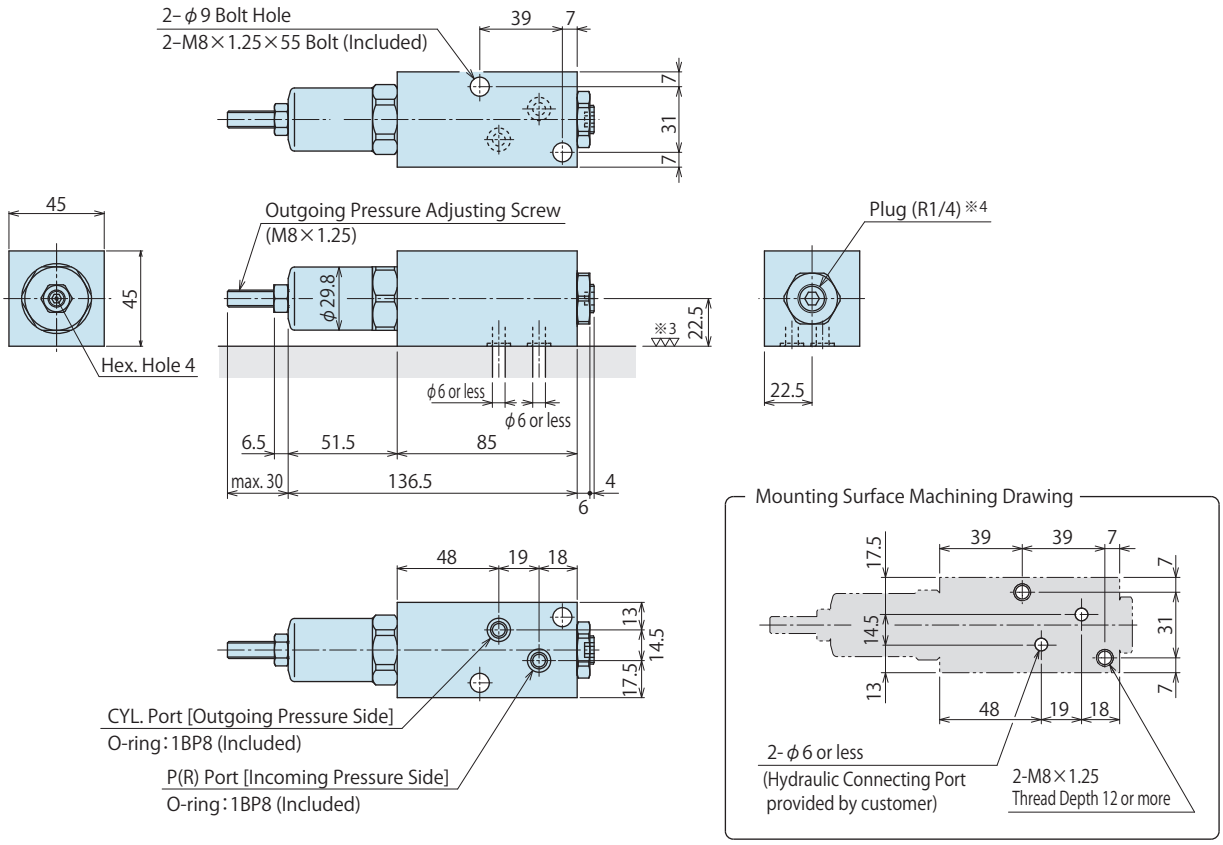
Note : ※2. Allowable minimum pressure difference between the incoming supply pressure and the outgoing set pressure.

## External Dimensions

BMA20□0-0 ※ This drawing shows piping method (Blank)：Piping Option.




BMA20□0-0G ※ This drawing shows piping method (G)：Gasket Option.




Notes :

※3. Roughness of mounting surface (O-ring seal surface) should be 6.3S or less.

※4. It can be used as P(R) port by removing the plug.

## Model No. Indication

**BMG20 5 0 - 0 G (5-25MPa)**

1 2 3 4

### 1 Outgoing Side Set Pressure

**3**: 1.0 ~ 6.0MPa

**5**: 3.0 ~ 14.0MPa

**7**: 6.0 ~ 27.0MPa

### 2 Design No.

**0** : Revision Number

### 3 Piping Method ※1

**G** : Gasket Option

Note : ※1. Only G (Gasket Option) is available for BMG.
Select BMA if connecting with couplers etc.

### 4 Set Pressure (Outgoing Set Pressure - Incoming Supply Pressure)

**Please indicate the set pressure when ordering.**
**(Please inform us with proper unit symbols.)**

※ Allowable minimum pressure difference shows the minimum difference between incoming and outgoing pressure.

Entry Example

Outgoing:5MPa Incoming:25MPa Setting → **(5.0-25.0MPa)**

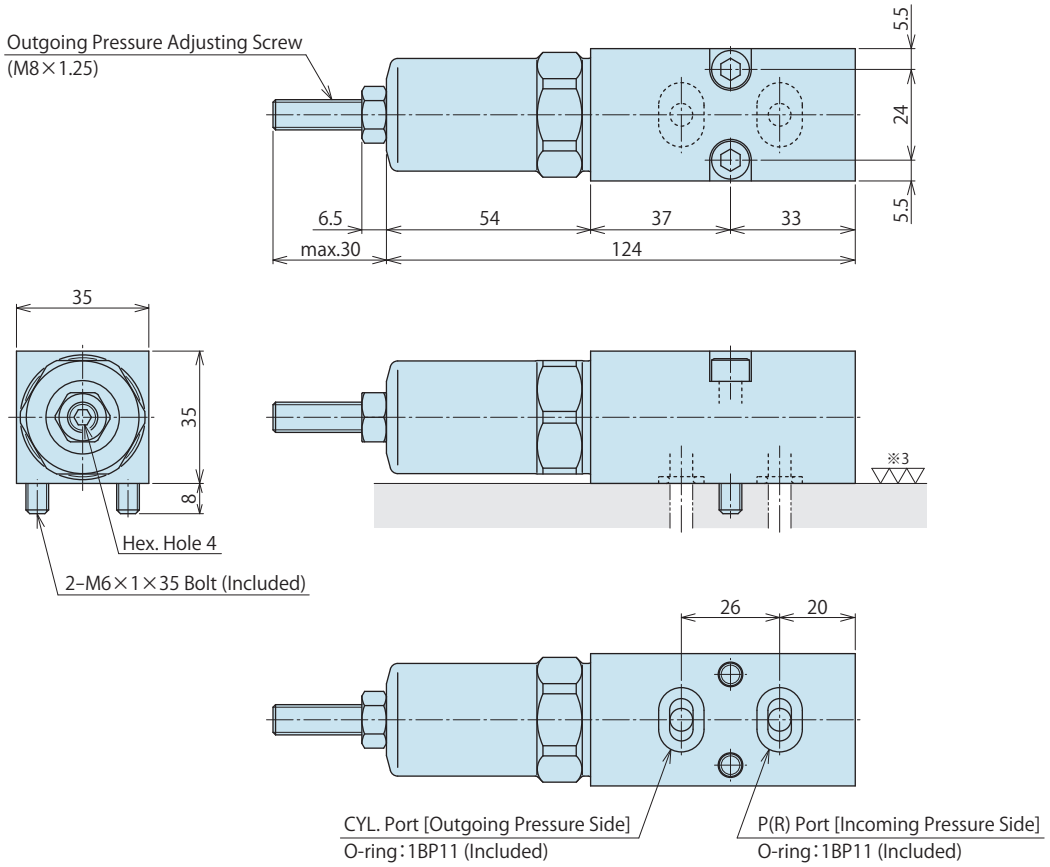
Outgoing:725PSI Incoming:3625PSI Setting → **(725-3625PSI)**

## Specifications

| Model No. | | BMG2030-0G | BMG2050-0G | BMG2070-0G |
|---|---|---|---|---|
| Incoming Supply Pressure | MPa | 2.0 ~ 7.0 | 6.0 ~ 30.0 | 9.0 ~ 30.0 |
| Outgoing Set Pressure | MPa | 1.0 ~ 6.0 | 3.0 ~ 14.0 | 6.0 ~ 27.0 |
| Allowable Min. Pressure Difference ※2 | MPa | 1.0 | 3.0 | 3.0 |
| Withstanding Pressure | MPa | 10.5 | 37.5 | 37.5 |
| Min. Passage Area | $mm^2$ | 23.3 | | |
| Operating Temperature | ℃ | 0 ~ 70 | | |
| Usable Fluid | | General Hydraulic Oil Equivalent to ISO-VG-32 | | |
| Weight | kg | 0.8 | | |

Note : ※2. Allowable minimum pressure difference between the incoming supply pressure and the outgoing set pressure.

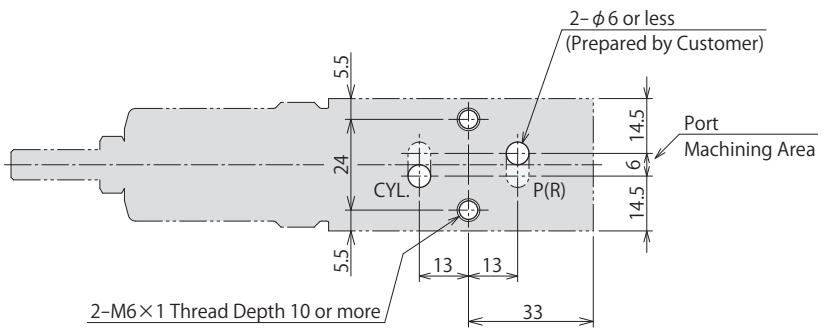
## External Dimensions




Note :

※3. Roughness of mounting surface (O-ring seal surface) should be 6.3S or less.

Mounting Part Machining Drawing



# Continuous Discharge Booster

Model AU
Model AU-M


## Continuous discharge booster that has no limitation for the outgoing side circuit capacity

**Actuator is made in a compact size by boosting pressure.**
**High pressure hydraulic power source is not needed by partial boosting pressure.**

### What is a Continuous Discharge Booster?

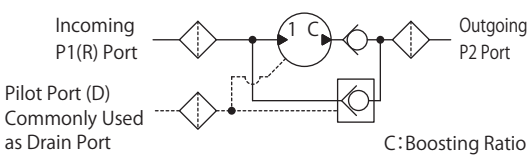
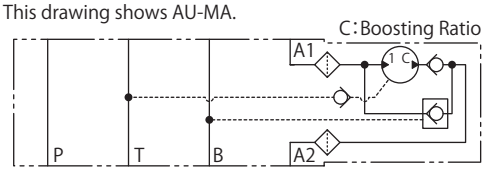
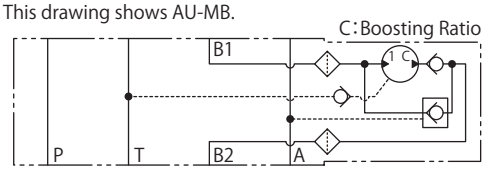
Boost incoming supply pressure by the back and forth action of piston and using bypass to get the boosted pressure to the outgoing side.

There is no limitation in the outgoing side circuit capacity because it continuously discharges the pressure so it is the best for multiple actuator or big circuit volume.

There are modular option and it can be attached to modular valve.

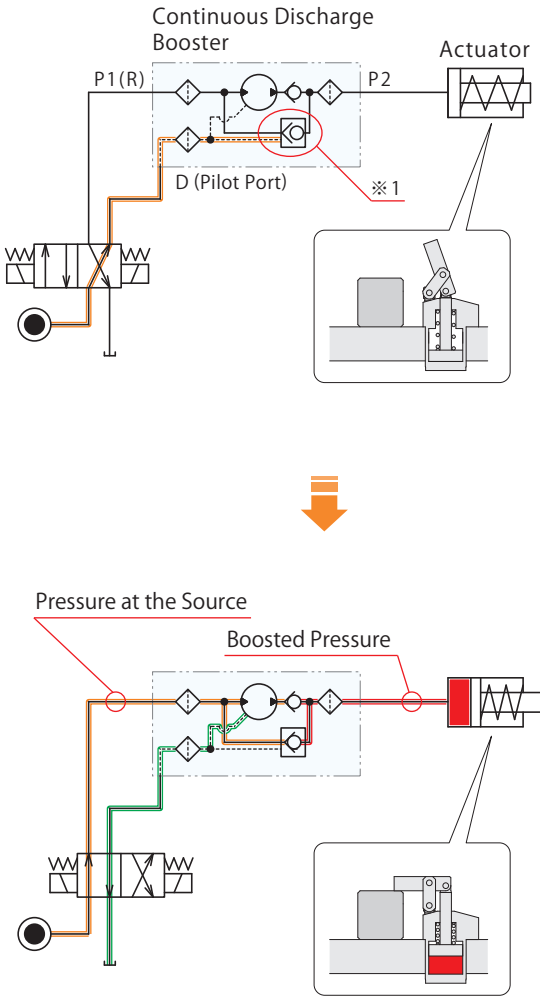
Model AU → P.1251

Model AU-M → P.1251

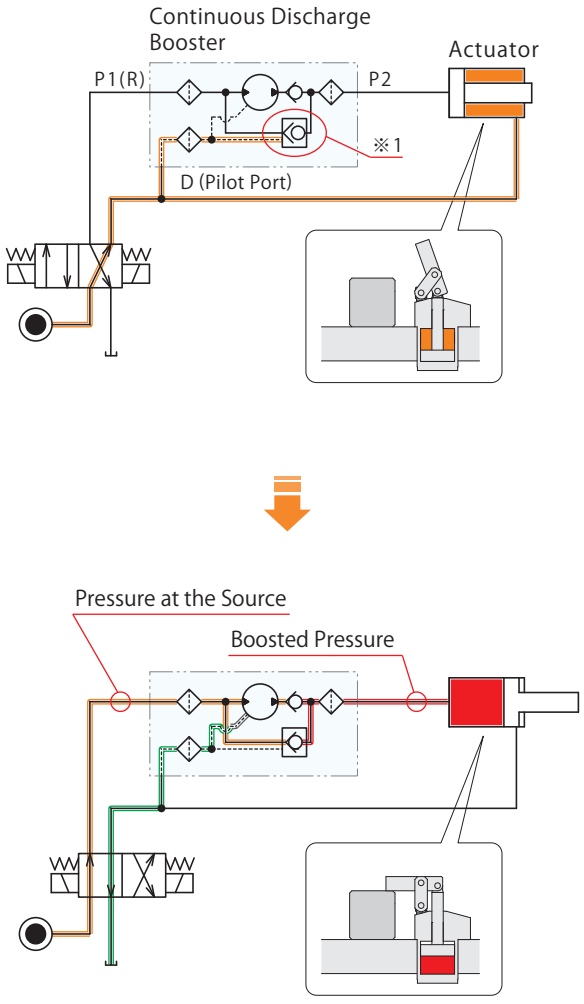
| | Piping Option | | | Modular Option | | |
|---|---|---|---|---|---|---|
| Classification | | | | | | |
| Incoming Discharge Pressure | 3～12.5MPa | 2～8.4MPa | 2～7MPa | 3～12.5MPa | 2～8.4MPa | 2～5MPa |
| Outgoing Discharge Pressure | 6～25MPa | 6～25MPa | 10～35MPa | 6～25MPa | 6～25MPa | 10～25MPa |
| Boosting Ratio | 2 times | 3 times | 5 times | 2 times | 3 times | 5 times |
| Circuit Symbol |  | | | ※ This drawing shows AU-MA.  ※ This drawing shows AU-MB.  | | |

## Action Description

Circuit Example：Single Action Circuit




Circuit Example：Double Action Circuit




| | Operation Sequence | Note |
|---|---|---|
| Locking | Supply hydraulic pressure to the continuous discharge booster. | |
| | Supply oil from outgoing port of the continuous discharge booster to the actuator. | |
| | Outgoing side oil is full and the pressure start to rise. | |
| | Boosting procedure starts inside the continuous discharge booster. Internal piston moves back and forth until the outgoing side pressure is boosted enough and then the pressure rises. Outgoing side circuit capacity has no limitation. | Get the drain connected to tank during boosting. |
| | Locking action is completed. | |
| | Machining process | |
| Releasing | Supply hydraulic pressure to the pilot port of the continuous discharge booster. | |
| | The pilot valve(※1) opens and lock-side hydraulic pressure goes back to the tank. | The pilot valve (※1) is operated by approximately 10% of outgoing side pressure. |
| | Actuator is released. | |
| | Releasing action is completed. | |

※ This drawing is the explanation of piping option (AU). Please refer to the detail page for modular option (AU-M).

## Model No. Indication

AU 2 5 2 1 - 0 ☐

1 2 3 4

### 1 Outgoing Side Discharge Pressure Code

**5** ：6 ~ 25MPa

**8** ：10 ~ 35MPa※1

※1. It is "8" only for AU2850-0. Modular model：only " 5" can be selected.

### 2 Boosting Ratio

**2** ：2 times

**3** ：3 times

**5** ：5 times

### 3 Design No. (Revision Number)

**0** ：4 **MA、MB** selected

**1** ：4 **Blank** selected

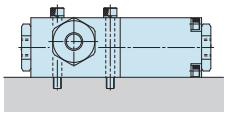
### 4 Piping Method

**Blank** ： Piping Option (Rc1/4 Thread)

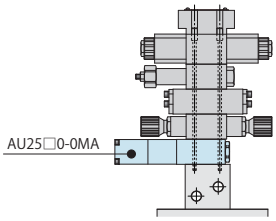
**MA** ：Modular Option (A port is boosted up.)

**MB** ：Modular Option (B port is boosted up.)

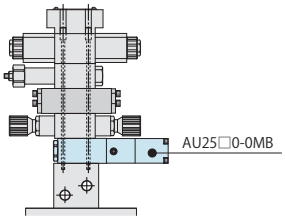
**Blank**



**MA**




**MB**




Note :

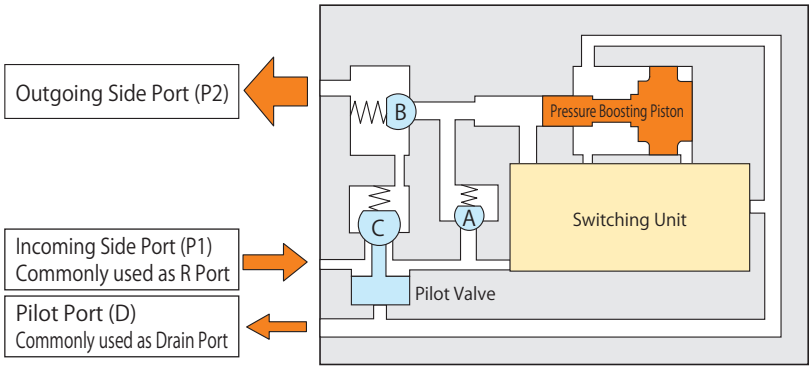
1. Please refer to the Circuit Symbol for the circuit drawing.

## Specifications

| Model No. | | AU2521-0 | AU2520-0MA AU2520-0MB | AU2531-0 | AU2530-0MA AU2530-0MB | AU2851-0 | AU2550-0MA AU2550-0MB |
|---|---|---|---|---|---|---|---|
| Boosting Ratio | | 2 times | | 3 times | | 5 times | |
| Incoming Supply Pressure | MPa | 3.0 ~ 12.5 | | 2.0 ~ 8.4 | | 2.0 ~ 7.0 | 2.0 ~ 5.0 |
| Outgoing Boosting Pressure | MPa | 6.0 ~ 25.0 | | 6.0 ~ 25.0 | | 10.0 ~ 35.0 | 10.0 ~ 25.0 |
| Min. Passage Area | $mm^2$ | 14.5 | 12.5 | 14.5 | 12.5 | 14.5 | 12.5 |
| Incoming Side Supply Rate | L/min | 2 ~ 10 | | 2 ~ 10 | | 2 ~ 10 | |
| Pilot Valve Opening Pressure | | Approx. 1/6 or more of the outgoing pressure | | | | | |
| Operating Temperature | ℃ | 0 ~ 70 | | | | | |
| Usable Fluid | | General Hydraulic Oil Equivalent to ISO-VG-32 | | | | | |
| Weight | kg | 1.1 | 2.3 | 1.1 | 2.3 | 1.1 | 2.3 |

## Action Description

※ This is referencing to the model drawing of AU2□□□-0.




### Pressure Boosting (Discharge)

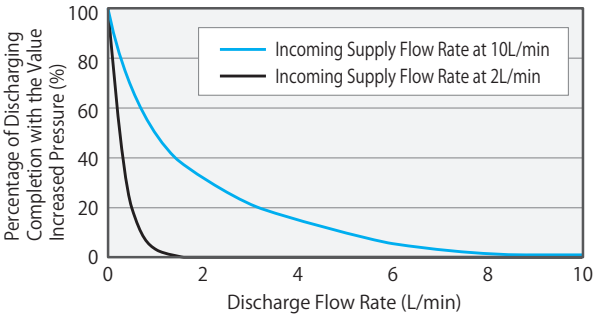
1. Having hydraulic pressure supplied from the incoming side port oil passes through the built-in check valve C (A and B) to flow to the outgoing side port.
2. As the outgoing pressure comes close to the incoming pressure, the check valve C (A and B) is shut to operate the built-in switching unit. The boosting piston boosts the incoming pressure remaining between the check valves A and B.
   The switching unit is operated and the boosting piston boosts the incoming pressure remaining between the check valves A and B.
3. The boosted pressure forces the check valve B to open so that oil having the boosted pressure flows to the outgoing side.
4. When the boosting piston reaches the stroke end, the check valve B is shut to operate the switching unit. So that oil having the incoming pressure flows through the check valve A to push the pressure boosting piston back.
5. When the pressure boosting piston reaches the back end, the check valve A is shut to operate the switching unit again to return to the step 2. These steps are repeated to allow the AU to discharge continuously.

### Reducing Pressure (Release)

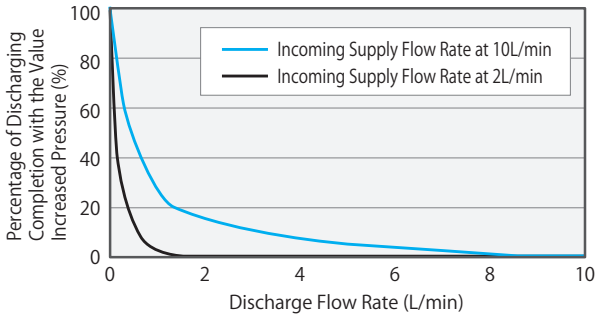
1. The incoming pressure is supplied through the pilot port.
2. The pilot valve opens the check valve C to release the outgoing pressure.
   ※Please refer to the pilot valve opening pressure on specification of the pressure that makes pilot valve activated.

## AU Continuous Discharge Booster Flow Characteristic Diagram

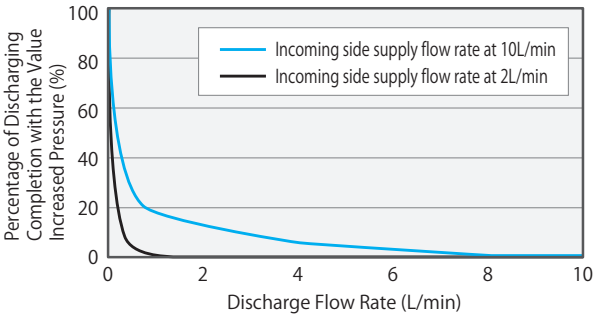
AU2521-0□/AU2520-0M□ Outgoing Discharge Flow Characteristic Diagram




AU2531-0□/AU2530-0M□ Outgoing Discharge Flow Characteristic Diagram

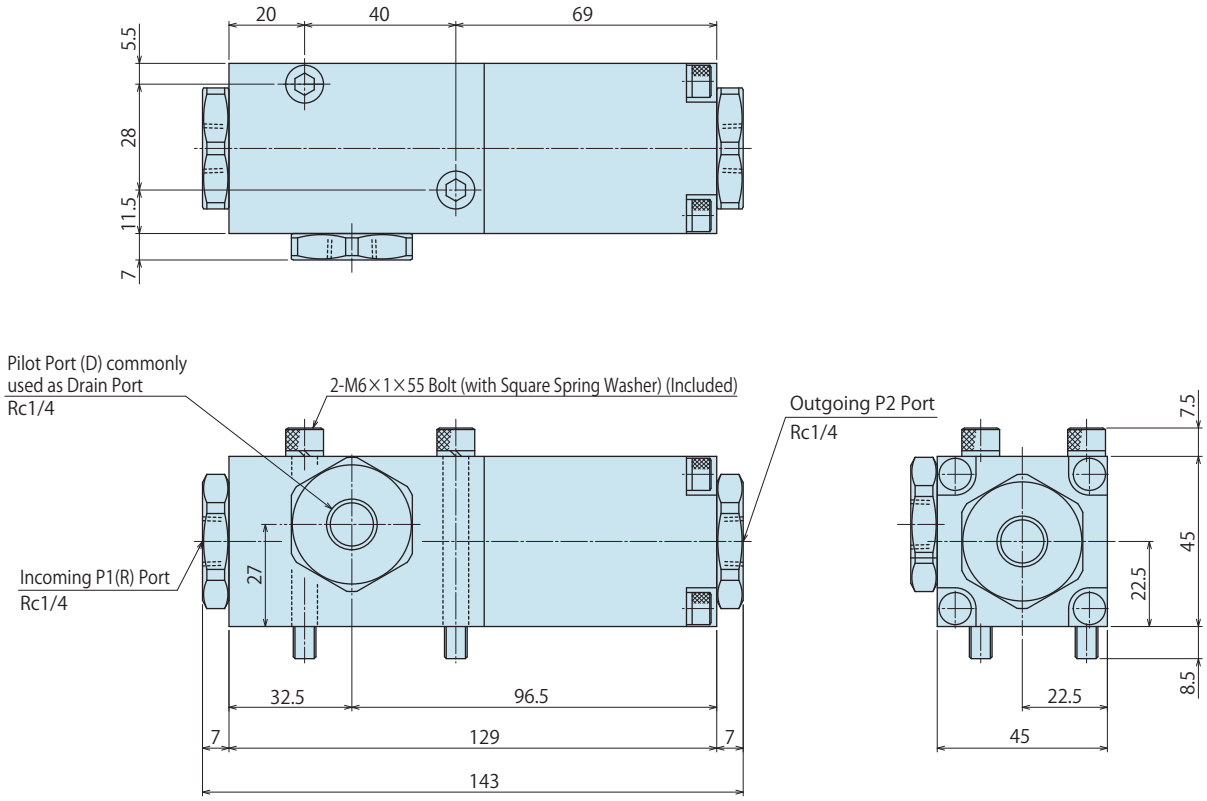



AU2851-0/AU2550-0M□ Outgoing Discharge Flow Characteristic Diagram



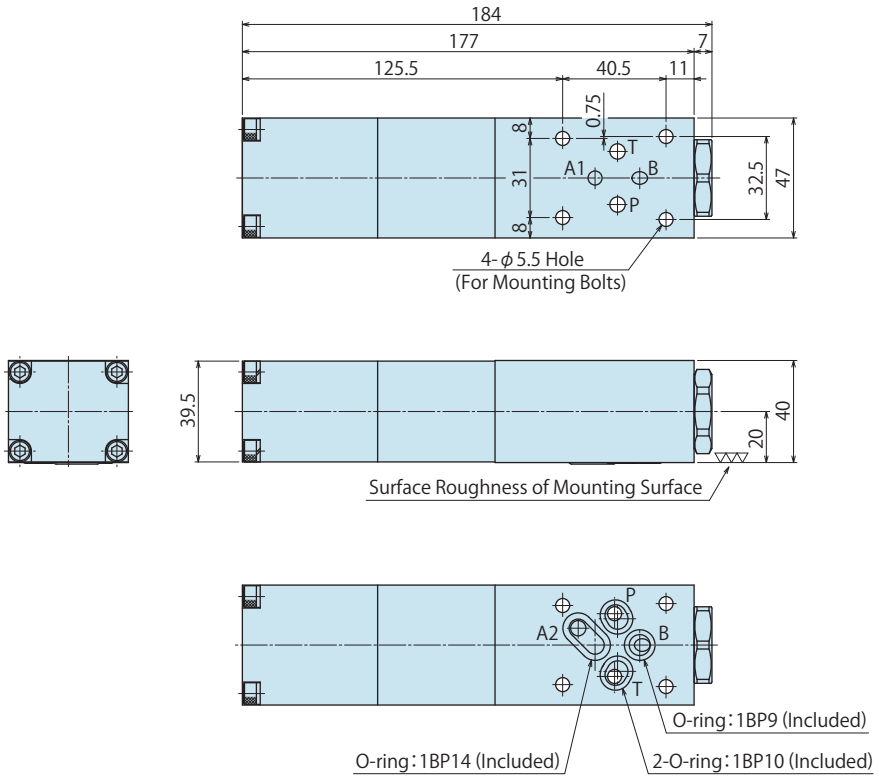
## External Dimensions (Piping Option)

AU2521-0 / AU2531-0 / AU2851-0



## External Dimensions (Modular Option)

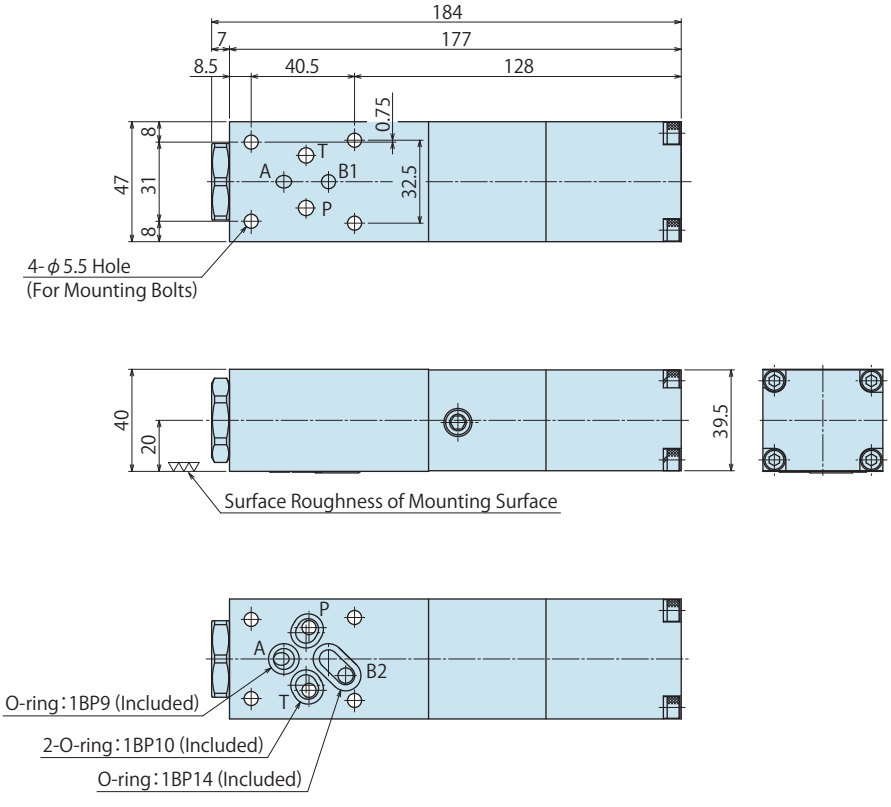
### AU2520-0MA / AU2530-0MA / AU2550-0MA




Note :

1. Mounting surface dimensions are based on ISO4401-03.

### AU2520-0MB / AU2530-0MB / AU2550-0MB




Note :

1. Mounting surface dimensions are based on ISO4401-03.

## Cautions (AU)

< Cautions (Common)>

1. Discharge flow decreases as pressure on outgoing side increases. (Refer to Flow Characteristic Graph.) Please keep in mind that if there is larger load when an actuator on outgoing side strokes, the stroke time will be longer due to the decrease of discharge flow.
2. It cannot be pressurized properly if using a device with leakage in outgoing side circuit.
   (Since a general modular solenoid valve has internal leakage, do not connect it to P2 port.)
3. Due to the mechanical structure, there is always internal leakage between the incoming port (P1) and the pilot port (D) (for modular model, between the pressurizing incoming port and T port). Please pay attention to the following notes.
   - When using a balance-stop pump (AA/AB/AC Pump manufactured by KOSMEK) as hydraulic power supply, the pump does not stop in balance due to the internal leakage of AU, leading to continuous operation and reduction in pump life.
   - When supply pressure decreases or stops temporarily, pressure in the circuit after the outgoing port (P2) (for modular model: pressurizing outgoing port) of AU will be maintained by non-leak function. However, pressure in the circuit before P1 port will not be maintained due to the internal leakage between P1 port and D port.
4. Stop hydraulic supply before disconnecting from hydraulic power source with auto couplers, etc. (Refer to Reference Circuit.)
5. Depending on incoming supply flow rate, circuit volume on outgoing side etc., surging may occur on incoming supply side. This may result by increasing too much set pressure on outgoing side.
   In that case, please prevent surging by installing accumulator or reducing incoming supply, etc.
6. If installing multiple numbers of AU to a low pressure hydraulic unit with high pressure supplied to a circuit, pressure fluctuation will be much larger, causing unstable pressure supply.

< Cautions for Piping Option>

1. Although each port is equipped with a filter, in order to maintain high pressure in the outgoing port (P2) at idle state of pressure supply to the incoming port (P1), the piping and fitting should be thoroughly cleaned before use.
2. Tightening with excessive torque leads to malfunction. (Maximum) tightening torque should be as shown below.

| Model No. | Bolt Size | Tightening Torque (N·m) |
|---|---|---|
| **AU2□□1-0** | M6×1 | MAX. 10 |

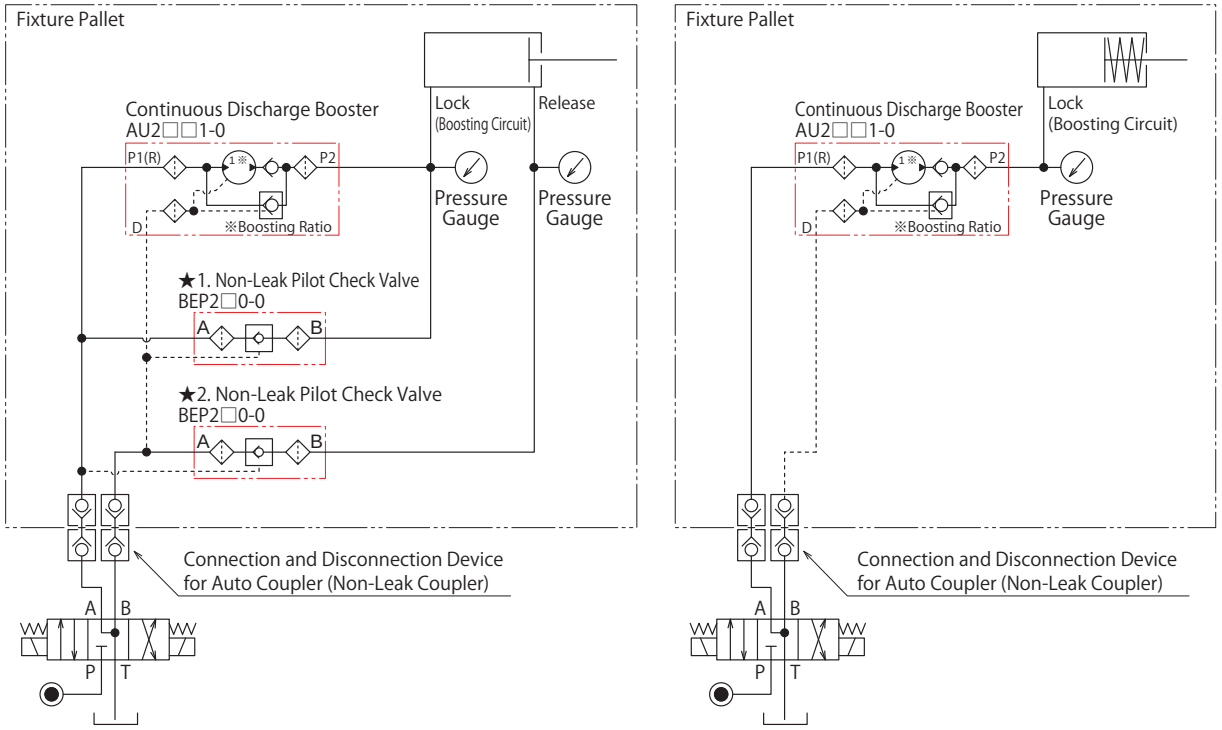
< Cautions for Modular Option>

1. Although the boosting ports (A1/A2 port for AU25□0-0MA, B1/B2 port for AU2□0-0MB) are equipped with a filter, the piping and fitting should be thoroughly cleaned before use.
2. When using Three-position solenoid valve, select ABT connection as the neutral position port model.
   Pressure in outgoing side will be released when using a model (closed center, etc.) that supplied pressure in P port flows into A or B port due to internal leakage when shifting to neutral position at outgoing pressure maintained state.


3. Make sure that hydraulic pressure is supplied to the boosting port (A1 or B1) after the actuator on the outgoing side is completely released.
   If pressure is supplied during release when there is still pressure (back pressure) remained in the boosting port, boosting time will be longer.

## Circuit Reference

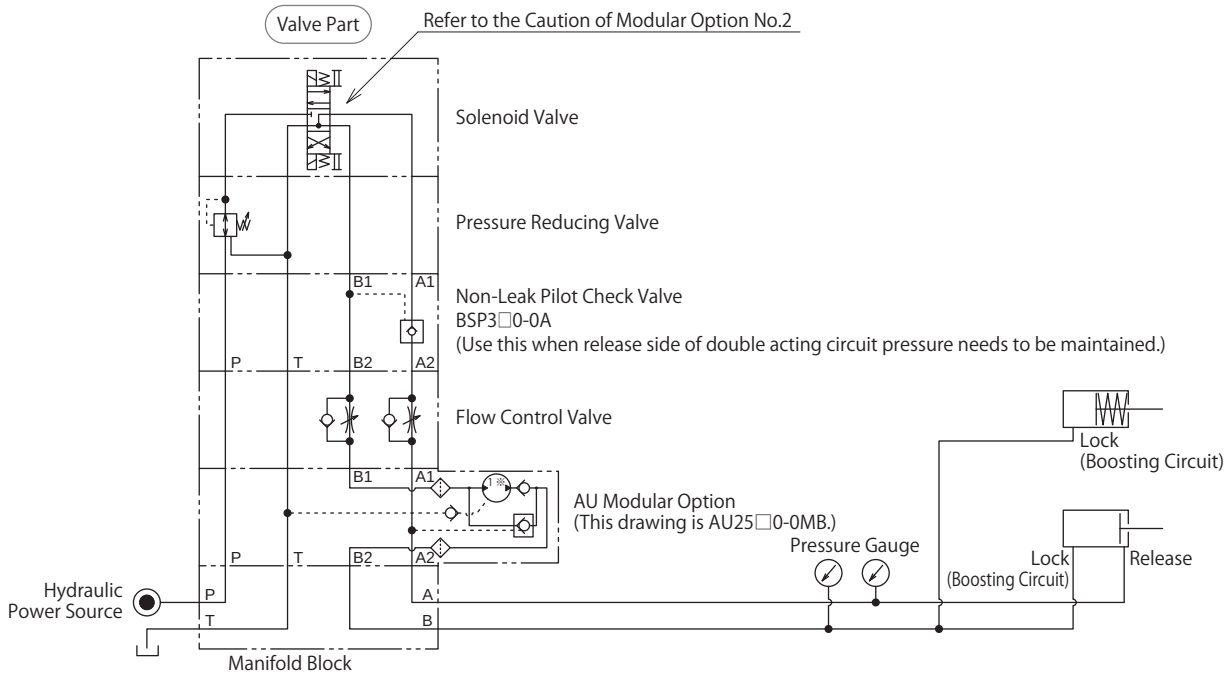
< In the case of separating hydraulic power source from fixture with auto coupler etc.>




■ Points

1. AU makes it easier to boost pressure on outgoing side. (Release action is controlled with low pressure.)
2. Use the three-position solenoid valve for control (with neutral position ABT (ABR) connection), and stop hydraulic pressure supply with neutral position before operating connection/disconnection device. Even in this case, the pressure in the circuit after the outgoing port (P2) will be maintained by internal check valve of AU.
3. ★1 BEP Non-Leak Pilot Check Valve is a bypass circuit of AU. When the action speed of a cylinder is insufficient due to AU passage area, it can be accelerated by providing the bypass circuit which increases the amount of oil pass on both lock and release sides.
4. ★2 BEP Non-Leak Pilot Check Valve is an example when maintaining hydraulic pressure at released state.
5. Non-leak circuit will not work when connecting an actuator, which is not to be boosted, to P1(R) port since there is internal leakage between P1(R) port and D port. Please design another circuit. (Refer to Common Cautions No.3.)

< In the Case of Modular Option in Use>



# One Shot Booster

Model **BU**

## BU booster valve is placed in line circuit, compact, the best for boosting pressure partially in fixture

**It matches our product AB/AC pump (balance stop pump) and is the best for quick change fixture.**

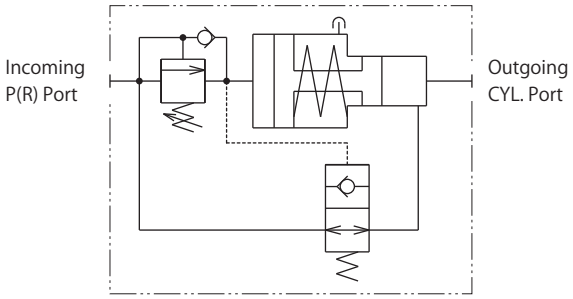
### What is a One Shot Booster?

One-shot booster is placed in line circuit type and it is able to boost the hydraulic pressure of the circuit partially with non-leak function.

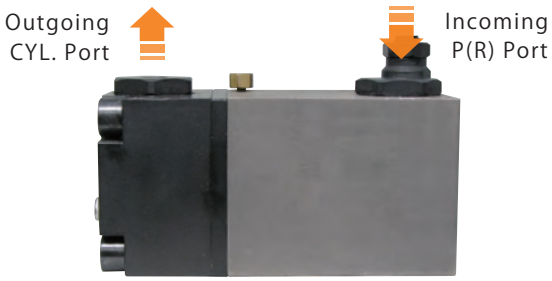
It has larger capacity of outgoing side circuit than general booster due to built-in sequence valve and check valve.
The check valve with non-leak function holds the outgoing side pressure with zero leakage.

It is possible to design simple circuit and it is appropriate for quick change fixture.

**Circuit Symbol**



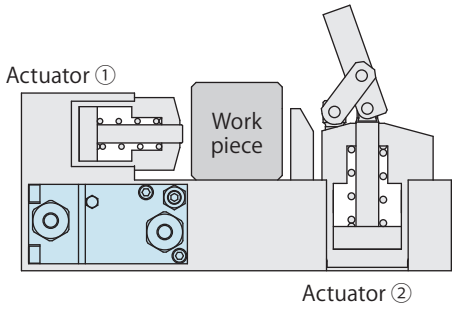

※ Each port has a built-in filter.



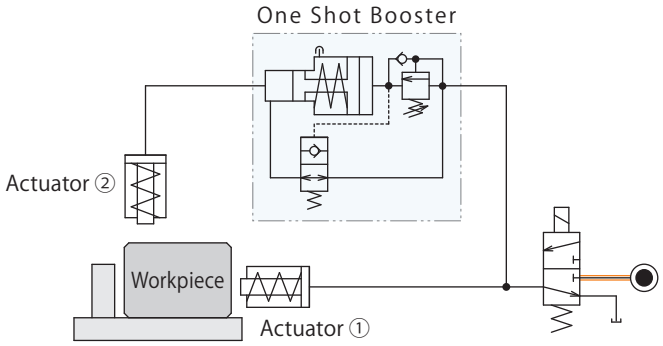

**Boost the pressure just by connecting the incoming side and the outgoing side.**

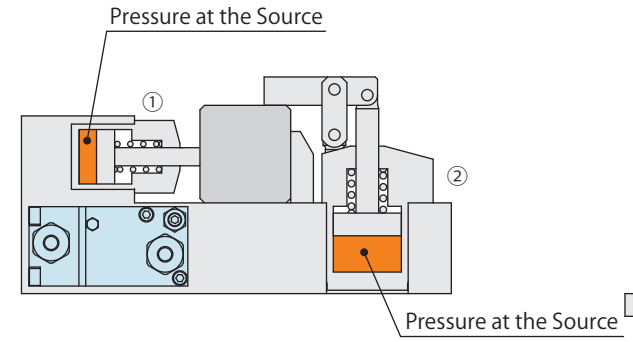
## Action Description

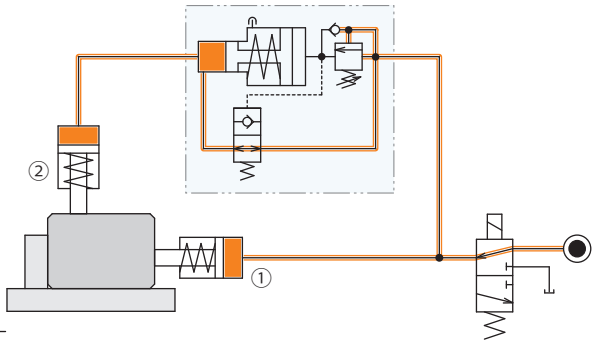
Images

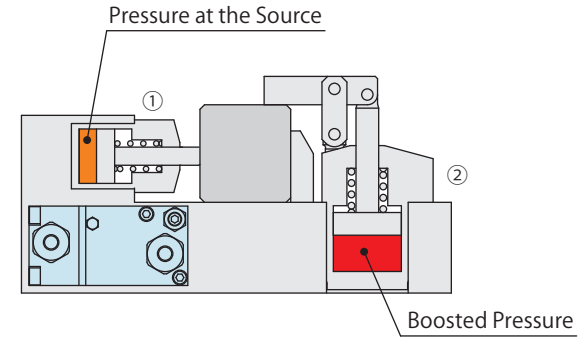


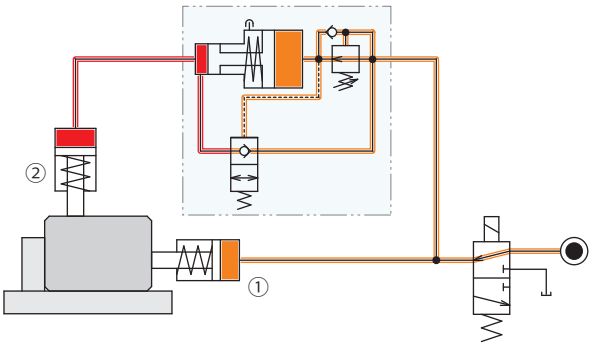

Circuit Example




| | Operating Procedure | Note |
|---|---|---|
| Locking | Hydraulic pressure is ON. | |
| | Both actuator ① and ② are activated. | |
| | When the pressure reaches up to the built-in sequence set pressure, built-in non-leak check valve is closed. | |
| | Boosting pressure process starts inside the booster and the internal piston is pushed, then the outgoing side pressure is boosted. | The outgoing side circuit capacity is limited because it is one shot model. |
| | The pressure of actuator ② is boosted. | |
| | Locking action is completed. | |
| | Machining process | |
| Releasing | Hydraulic pressure is OFF. | |
| | The actuator ① and ② are released at the same time. | |
| | Releasing action is completed. | |

## Model No. Indication

**BU50 2 0 - 0 (10.5MPa)**

1 2 3

### 1 Boosting Ratio

**2**: 2.2 times

**3**: 3.0 times

**6**: 6.0 times

### 2 Design No.

**0** : Revision Number

### 3 Incoming Supply Pressure

**Please inform us of the incoming supply pressure.**
**(Please inform us with proper unit symbols.)**

Entry Example

Incoming Supply Pressure : 5MPa → **(5.0MPa)**

Incoming Supply Pressure : 700PSI → **(700PSI)**

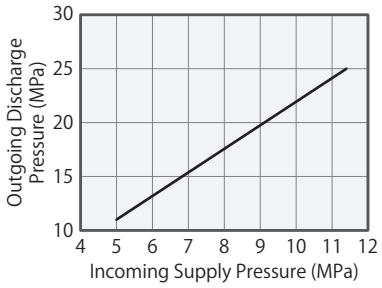
## Specifications

| Model No. | | BU5020-0□ | BU5030-0□ | BU5060-0□ |
|---|---|---|---|---|
| Boosting Ratio ※1 | | 2.2 times | 3 times | 6 times |
| Incoming Supply Pressure | MPa | 5.0 ~ 11.4 | 3.0 ~ 8.4 | 1.5 ~ 4.2 |
| Sequence Set Pressure ※2 | MPa | 4.0 ~ 9.1 | 2.3 ~ 6.7 | 1.1 ~ 3.2 |
| Outgoing Discharge Pressure | MPa | 11.0 ~ 25.0 | 9.0 ~ 25.2 | 9.0 ~ 25.2 |
| Withstanding Pressure | MPa | 37.5 | | |
| Discharge Volume during Boosting Process ※3 | $cm^3$ | 30 | 23 | 12 |
| Min. Passage Area | $mm^2$ | 14.1 | | |
| Operating Temperature | ℃ | 0 ~ 70 | | |
| Usable Fluid | | General Hydraulic Oil Equivalent to ISO-VG-32 | | |
| Weight | kg | 4.4 | | |

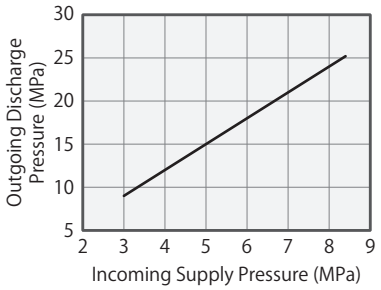
Notes : ※1. Boosting ratio is slightly different depending on packing seal resistance and spring force.
※2. Sequence set pressure should be 70 ~ 80% of incoming supply pressure.
※3. Discharge volume during boosting process is the total oil discharge volume during boosting after exceeds sequence set pressure.

## Performance Graph

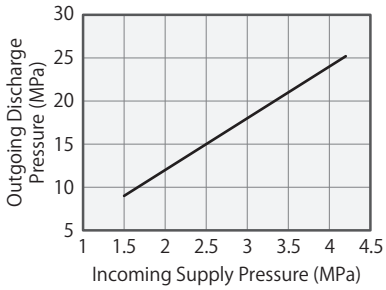
BU5020-0□




BU5030-0□



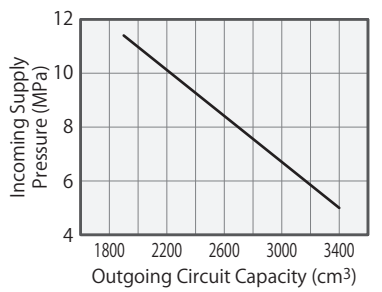

BU5060-0□



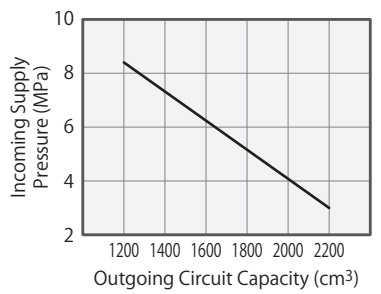

## Allowable Circuit Capacity Curve

※ Since BU is one shot booster, it has a limitation in the volume of outgoing circuit.

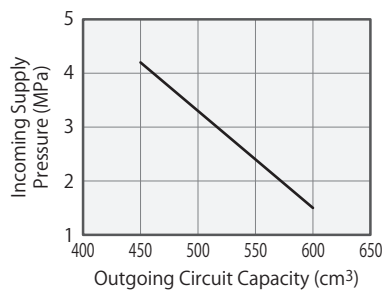
BU5020-0□




BU5030-0□




BU5060-0□



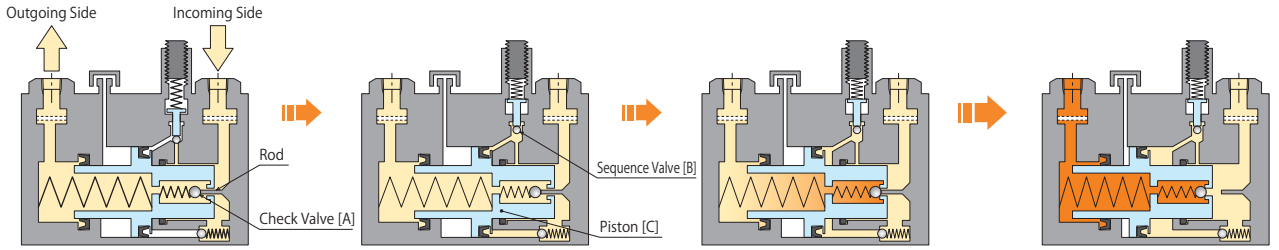

Note : 1. Performance graph curve is referencing.
(Referencing condition : All piping material shall be steel. Air in the circuit shall be completely flushed, and workpiece and attachment (lever) shall be securely fastened.)

# Internal Action Description

## When supplied

<Charging Process>

<Boosting Process>



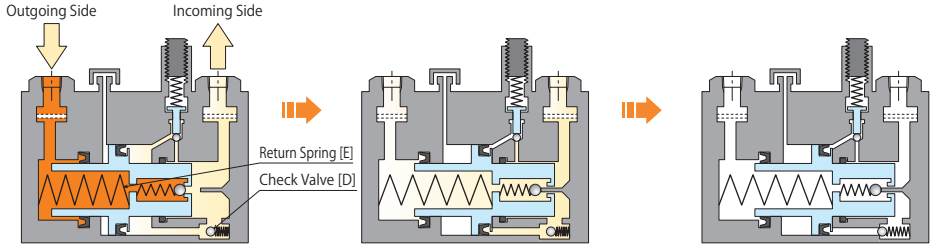

① Check valve [A] is always kept in "Open" position by the rod. Incoming pressure flows to outgoing side through check valve [A], then outgoing side actuators are activated completely.

② When the pressure reaches the sequence set pressure, sequence valve [B] opens.
③ The incoming pressure having passed through sequence valve [B] extends piston [C] ahead.

④ When piston [C] extends ahead a little, check valve [A] comes off from the rod, then it closes. Up to this time incoming and outgoing pressure are same pressure.
⑤ When check valve [A] closes, outgoing circuit becomes closed circuit, and pressure is boosted according to area ratio of piston [C].

⑥ Piston [C] stops at the time the area and the pressure are balanced.
⑦ Pressure boosting is completed.

## At discharged (Discharging Process)

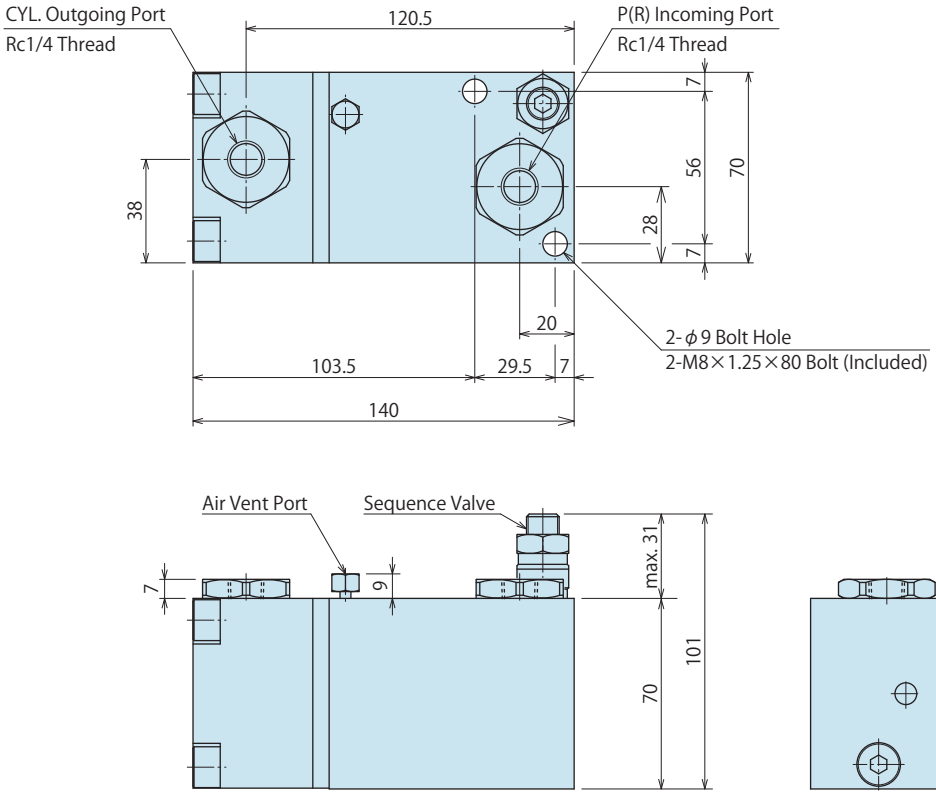



① When incoming pressure is released, check valve [D] opens. Sequence valve [B] closes almost simultaneously.
② Piston [C] is pushed back by outgoing pressure and return spring [E], and outgoing pressure drops.

③ Check valve [A] is opened and pushed by the rod at the time just before piston [C] finishing moving back. Release of the discharge oil from outgoing side actuator is released through the check valve [A].

④ When the outgoing pressure is completely released and the piston [C] fully retracts back, check valve [D] closes.
⑤ Discharge is finished.

## External Dimensions




## Cautions

1. Excessive amount of supply oil in the incoming side leads to malfunction of BU Booster.
   Provide a flow control valve with check valve just before the incoming side port, or adjust the flow rate on hydraulic pressure source side.
2. A large amount of air mixed in the outgoing circuit leads to boosting failure. If it does not work properly, release air from the circuit.
3. A large volume of oil capacity in outgoing circuit leads to boosting failure.
   Refer to the outgoing circuit capacity shown in Allowable Circuit Capacity Curve.
4. Using hydraulic hoses in outgoing circuit may result in insufficient boosting because the volume changes during boosting.
   Please use steel pipes as much as possible referring to the discharge rate of boosting process shown in specification.
5. Installing an accumulator in outgoing circuit may result in boosting failure by the similar reason. In case of using an accumulator,
   please select a proper one referring to the outgoing circuit capacity shown in Allowable Circuit Capacity Curve.
6. It is recommended to install a pressure gauge. It is easy to check the boosting condition by installing a pressure gauge on the outgoing circuit.
7. Do not install a flow control valve to an actuator on outgoing side. It may be boosted before the actuator completes operation leading to
   boosting failure.

## MEMO

# Pilot Reducing Valve Reservoir

Model BP
Model JPB

## Reducing internal circuit hydraulic pressure while it is disconnected from pressure power source

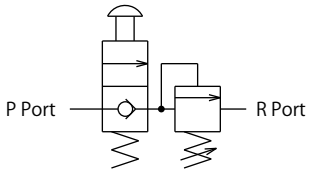
Reduce pressure easily by pilot operation.

### What is a Pilot Reducing Valve?

It is possible to reduce internal circuit pressure of disconnected fixture from hydraulic power source by pilot operation.

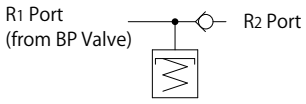
Kosmek reservoir can hold the oil discharged from pilot reducing valve temporarily.
The reservoir also has a non-leak check valve in it.

#### Circuit Symbol：Pilot Reducing Valve (BP)

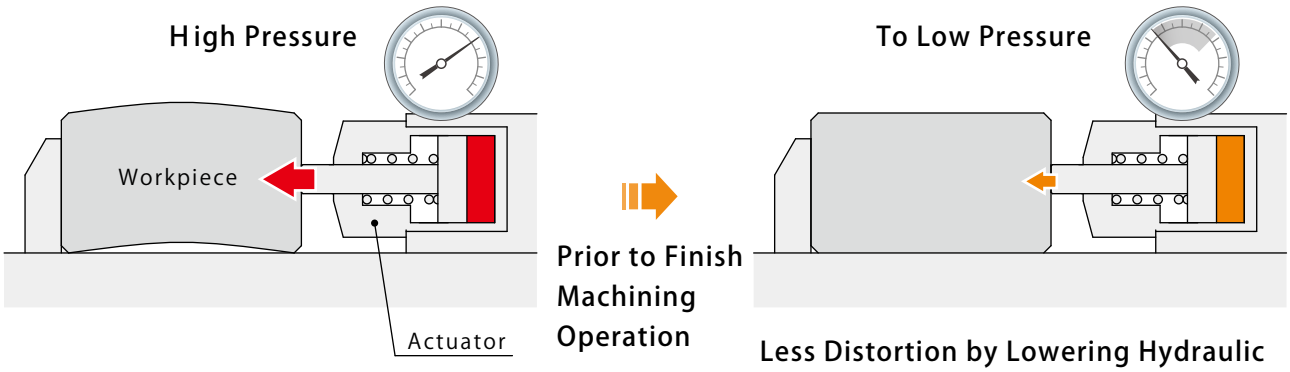



※ A filter is built in P port.
A filter is not built in the R port. Please sufficiently perform flushing of piping and fitting to prevent contaminants such as cutting chips from entering the circuit.

#### Circuit Symbol：Reservoir (JPB)



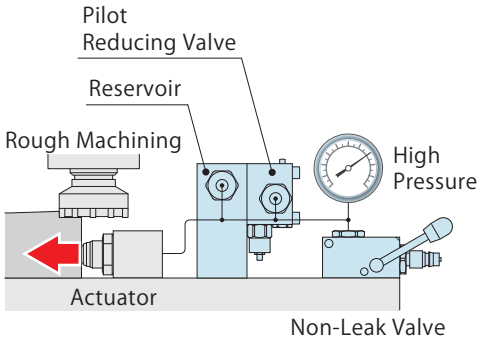

※ A filter is built in R2 port.
A filter is not built in the R1 port. Please sufficiently perform flushing of piping and fitting to prevent contaminants such as cutting chips from entering the circuit.

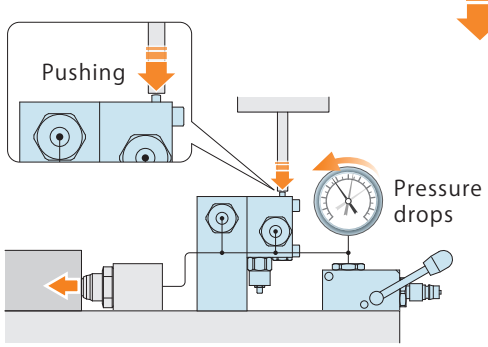


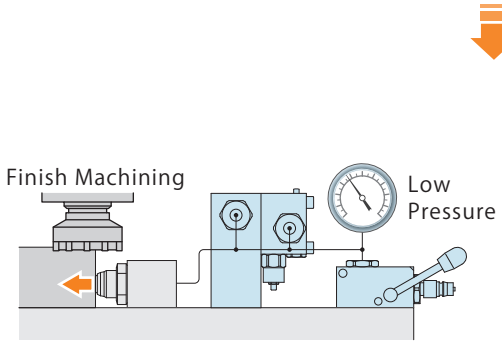

Less Distortion by Lowering Hydraulic Pressure (Lowering Clamping Force)

## Action Description

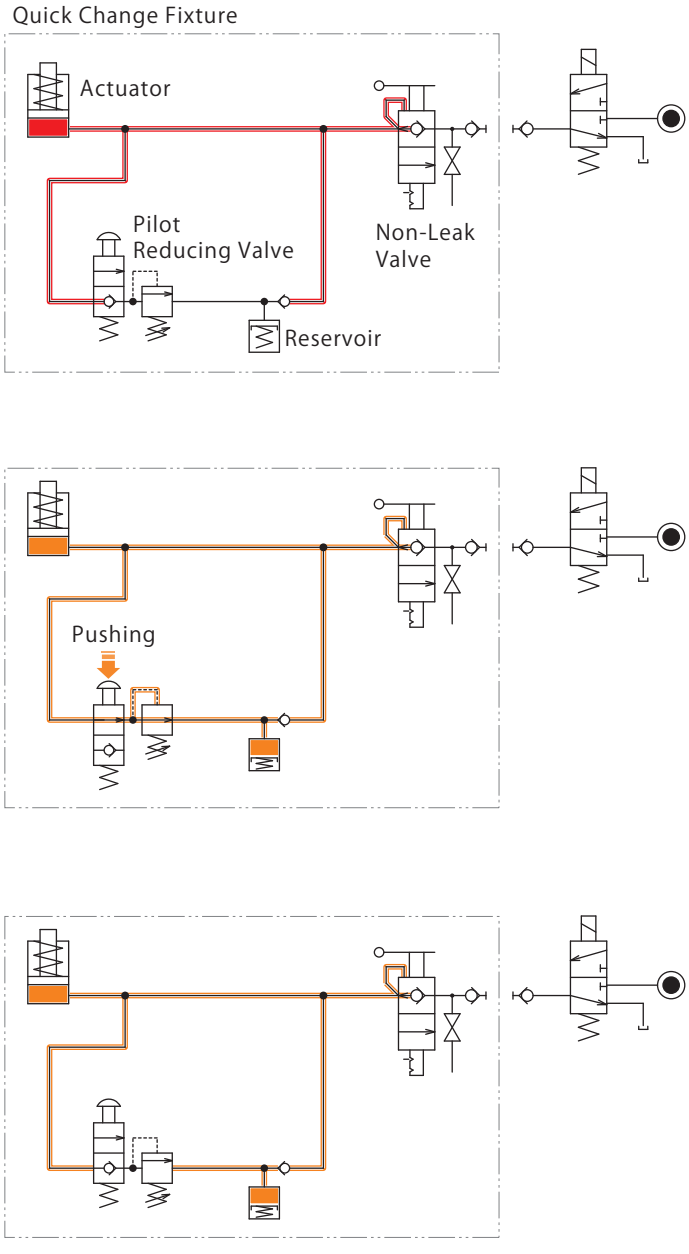
Images




Circuit Example




| Operating Procedure | | Note |
|---|---|---|
| | Disconnection is completed when it is locked. | |
| | Rough machining (Large thrust machining). | |
| Pressure reducing | When the push button of pilot reducing valve is pushed by main spindle or manually, the circuit is connected to the reservoir and reduces the pressure to the relief set pressure. | Lowering clamping force prior to finish machining operation, it allows to prevent or minimize distortion of workpiece. |
| | Release the push button. | |
| | Start the final machining operation. | |
| Releasing | When the hydraulic power source is OFF, connect the fixture and then release the non-leak valve. | |
| | When the circuit pressure becomes lower than the pressure held in reservoir tank, check valve opens and hydraulic oil returns to tank. | |

## Model No. Indication

**BP 203 0 - 0 G (2.5MPa)**

1 2 3 4

### 1 Pressure Code

**203** : Operating Pressure 2.0 ~ 7.0MPa
Relief Pressure 1.5 ~ 5.0MPa

**507** : Operating Pressure 7.0 ~ 30.0MPa
Relief Pressure 5.0 ~ 15.0MPa

### 2 Design No.

**0** : Revision Number

### 3 Piping Method

**Blank** : Piping Option (Rc1/4 Thread)

**G** : Gasket Option
(Select G : Gasket option for connecting JPB.)

### 4 Set Pressure (Relief Set Pressure)

**Please let us know the relief set pressure.**
**(Please inform us with proper unit symbols.)**

Entry Example
Relief Pressure: 4MPa → **(4.0MPa)**
Relief Pressure: 1200PSI → **(1200PSI)**

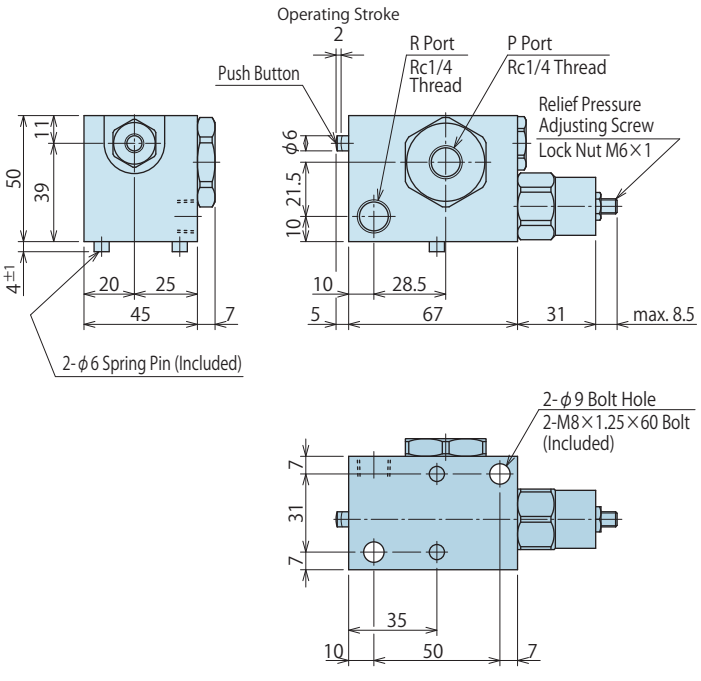
## Specifications

| Model No. | | BP2030-0□□ | BP5070-0□□ |
|---|---|---|---|
| Operating Pressure※1 | MPa | 2.0 ~ 7.0 | 7.0 ~ 30.0 |
| Relief Pressure※2 | MPa | 1.5 ~ 5.0 | 5.0 ~ 15.0 |
| Withstanding Pressure | MPa | 10.5 | 37.5 |
| Pilot Operating Force※3 | kN | 0.06 ~ 0.22 | 0.22 ~ 1.00 |
| Min. Passage Area | mm2 | 9.1 | |
| Operating Temperature | ℃ | 0 ~ 70 | |
| Usable Fluid | | General Hydraulic Oil Equivalent to ISO-VG-32 | |
| Weight | kg | 1.4 | |

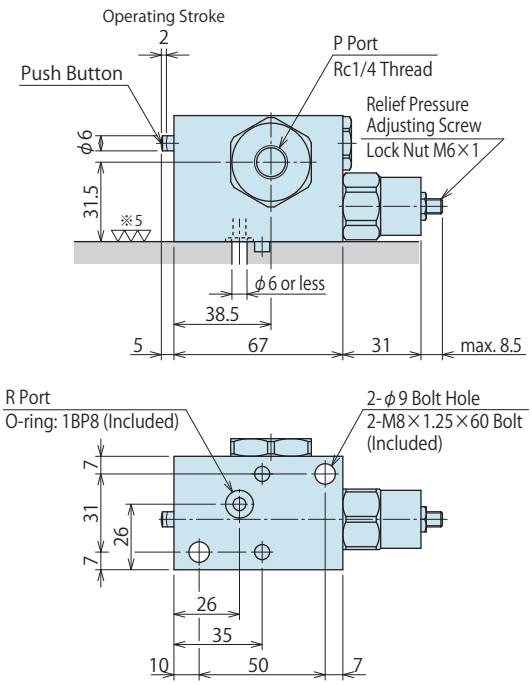
Notes : ※1. Operating pressure shows initial operating pressure.
※2. Relief pressure shows the relief set pressure after operating pilot.
※3. Set the pilot operating force at more than minimum operating force (=More than operating pressure ×0.032) and less than 1.5kN.

## External Dimensions

BP□0-0□ : Piping Option




BP□0-0G□ : Gasket Option ※4




Notes : ※4. The dimensions that are not shown in BP□0-0G□ (gasket option) area, please refer to BP□0-0□ (piping option). They are the same.
※5. Roughness of mounting surface (O-ring seal surface) should be 6.3S or better.

## Model No. Indication

JPB 5 4 0 - 0 P
1 2 3 4

### 1 Pressure Code

**2** : Operating Pressure Range 2.0 ~ 7.0MPa

**5** : Operating Pressure Range 5.0 ~ 30.0MPa

### 2 Tank Capacity

**4** : 40cm³

**6** : 60cm³

### 3 Design No.

**0** : Revision Number

### 4 Piping Method

**P** : BP Connection Option

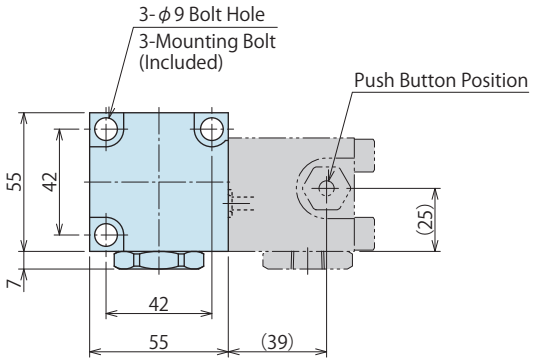
**S** : Piping Option (Rc Thread)

## Specifications

| Model No. | | JPB240-0□ | JPB260-0□ | JPB540-0□ | JPB560-0□ |
|---|---|---|---|---|---|
| Operating Pressure Range※7 | MPa | 2.0 ~ 7.0 | | 5.0 ~ 30.0 | |
| Withstanding Pressure※7 | MPa | 10.5 | | 37.5 | |
| Tank Capacity※6 | cm³ | 40.0 | 60.0 | 40.0 | 60.0 |
| Circuit Capacity※6 | cm³ | 800 or less | 800 ~ 1200 | 800 or less | 800 ~ 1200 |
| Operating Temperature | ℃ | 0 ~ 70 | | | |
| Usable Fluid | | General Hydraulic Oil Equivalent to ISO-VG-32 | | | |
| Weight | kg | 2.1 | 2.2 | 2.1 | 2.2 |

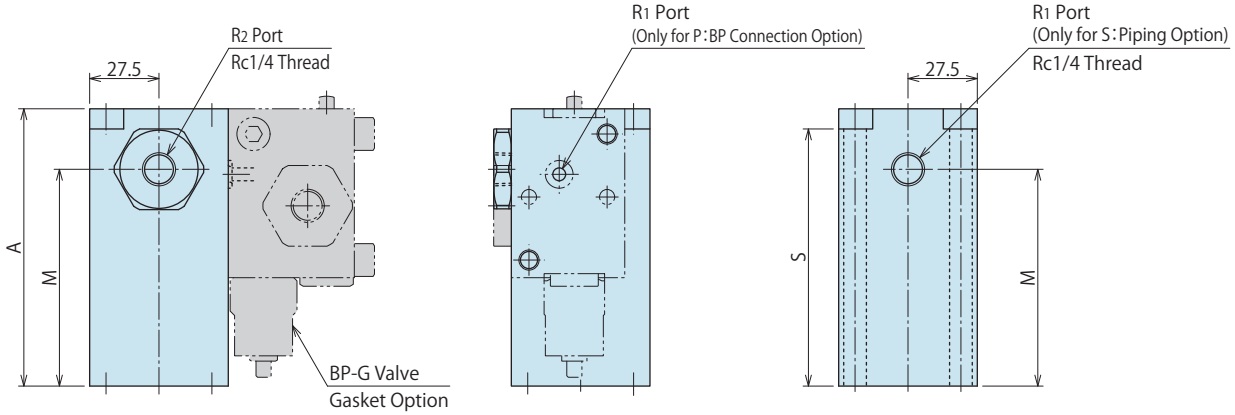
Notes : ※6. Select the tank capacity based on the circuit capacity to be used.
※7. Operating pressure and withstanding pressure are the pressure which is connected to R2 port. Please refer to Circuit Symbol.

## External Dimensions




(mm)

| Model No. | JPB□40-0□ | JPB□60-0□ |
|---|---|---|
| A | 110 | 126 |
| M | 86 | 102 |
| S | 102 | 118 |
| Mounting Bolt | M8×1.25×115 | M8×1.25×130 |



# Automatic Air Bleed Valve

Model **BX**

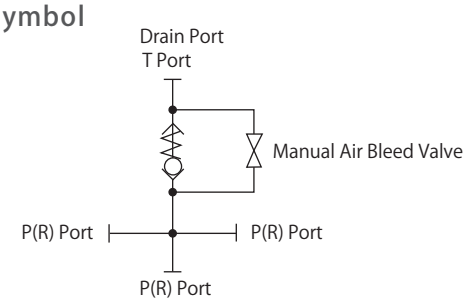

## Drains air out automatically in the hydraulic circuit

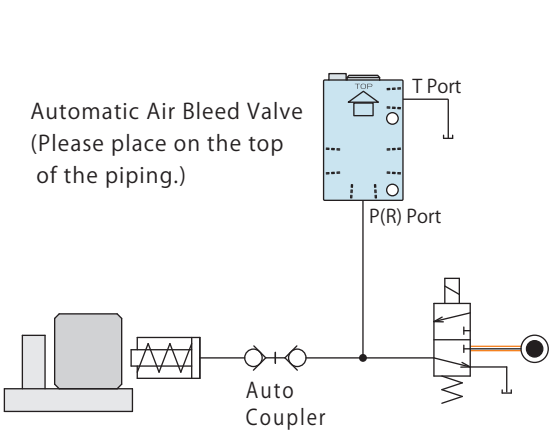
**With Manual Air Bleed Valve**

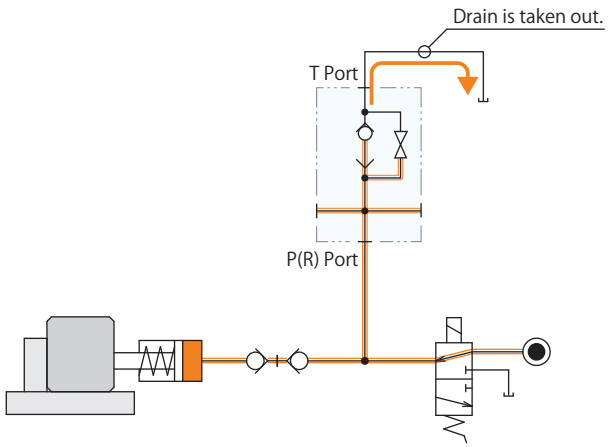
### What is an Automatic Air Bleed Valve?

Placed on the top of the piping, this valve bleeds air automatically during repetition of the hydraulic pressure ON and OFF.

**Circuit Symbol**




| Operating Procedure | Note |
|---|---|
| Hydraulic pressure is OFF | |
| Hydraulic pressure is ON | |
| The air and oil is drained out from drain port of auto air bleed valve. | Drains air or oil out each time of hydraulic pressure is switched. (Please refer to the specification for the drain volume.) |
| The check valve of auto air bleed valve is closed and drain-out is stopped. | There is no oil leakage from check valve after drain-out. |

## Model No. Indication

**BX 001 0 - 0 2**

- Port Size
  - **2** : Rc1/4 Thread
  - **3** : Rc3/8 Thread
- Design No. (Revision Number)

## Specifications

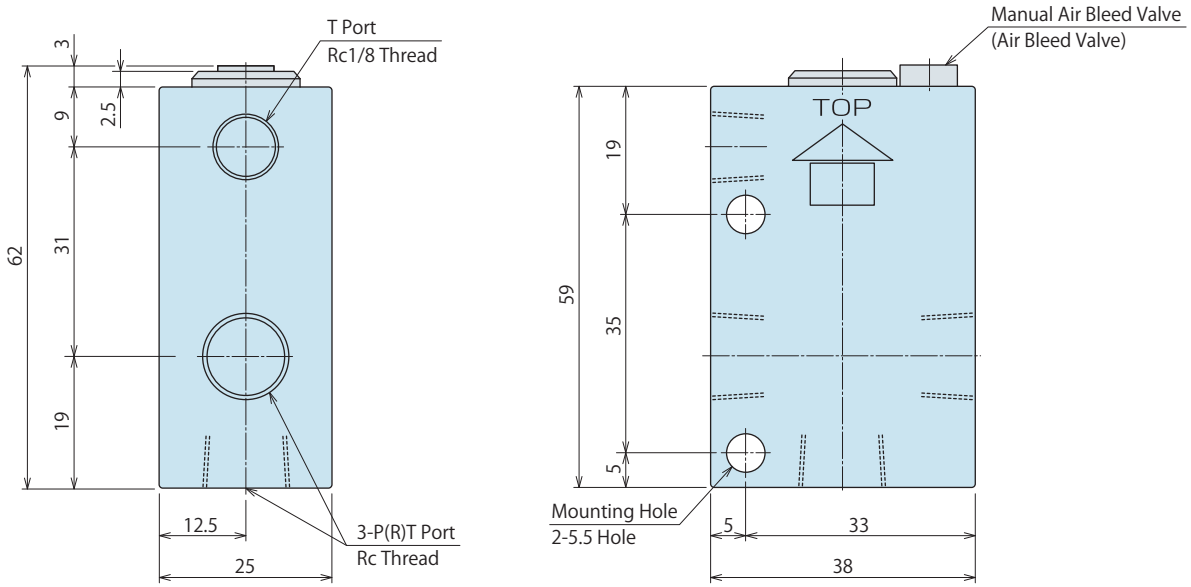
| Model No. | | BX0010-02 | BX0010-03 |
|---|---|---|---|
| Max. Operating Pressure | MPa | 25 | |
| Cracking Pressure | MPa | 0.04 | |
| Withstanding Pressure | MPa | 37.5 | |
| Operating Temperature | ℃ | 0 ~ 70 | |
| Usable Fluid | | General Hydraulic Oil Equivalent to ISO-VG-32 | |
| Drain ※1 | Air only | 10cm³ / Action | |
| Volume | Oil only | 0.6cm³ / Action | |
| Minimum Oil Flow Rate | | 50cm³/min. | |
| Mounting Position | | Vertical Upward (See Outline Drawing) | |
| Weight | kg | 0.4 | |
| 3-P(R) Port | | Rc1/4 Thread | Rc3/8 Thread |

Notes :

※1. It shows the drain volume returning from valve to tank at the moment when the circuit pressure switches from zero to normal operating pressure.

1. Please place on the top of the piping in the hydraulic circuit.
2. Air and oil are exhausted from T port. Please make sure to connect drain piping to tank.
3. Please make sure to mount this as shown in the drawing. In case of an incorrect position, air cannot be bled out.

## External Dimensions



# Non-Leak Pilot Check Valve

Model BEP
Model BSP


## Pressure is maintained even when pressure supply is stopped.

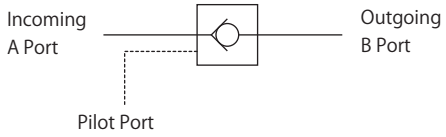
**Maintains pressure until hydraulic pressure is supplied to pilot port.**

### What is a Non-Leak Pilot Check Valve?

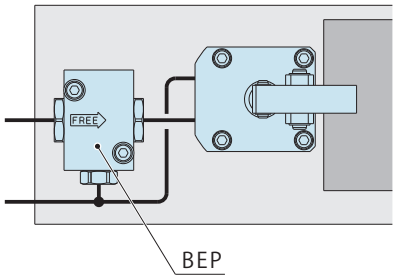
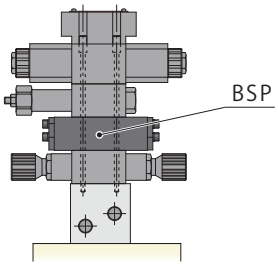
Even if pressure supply from the hydraulic power source is stopped, the outgoing side pressure is held until the pressure is supplied to pilot port.

Even if the hydraulic power source is cut off due to energy saving (Stop hydraulic supply to incoming side) or blackout etc., it holds the pressure and prevents the workpiece drop off.

### Circuit Symbol (BEP)

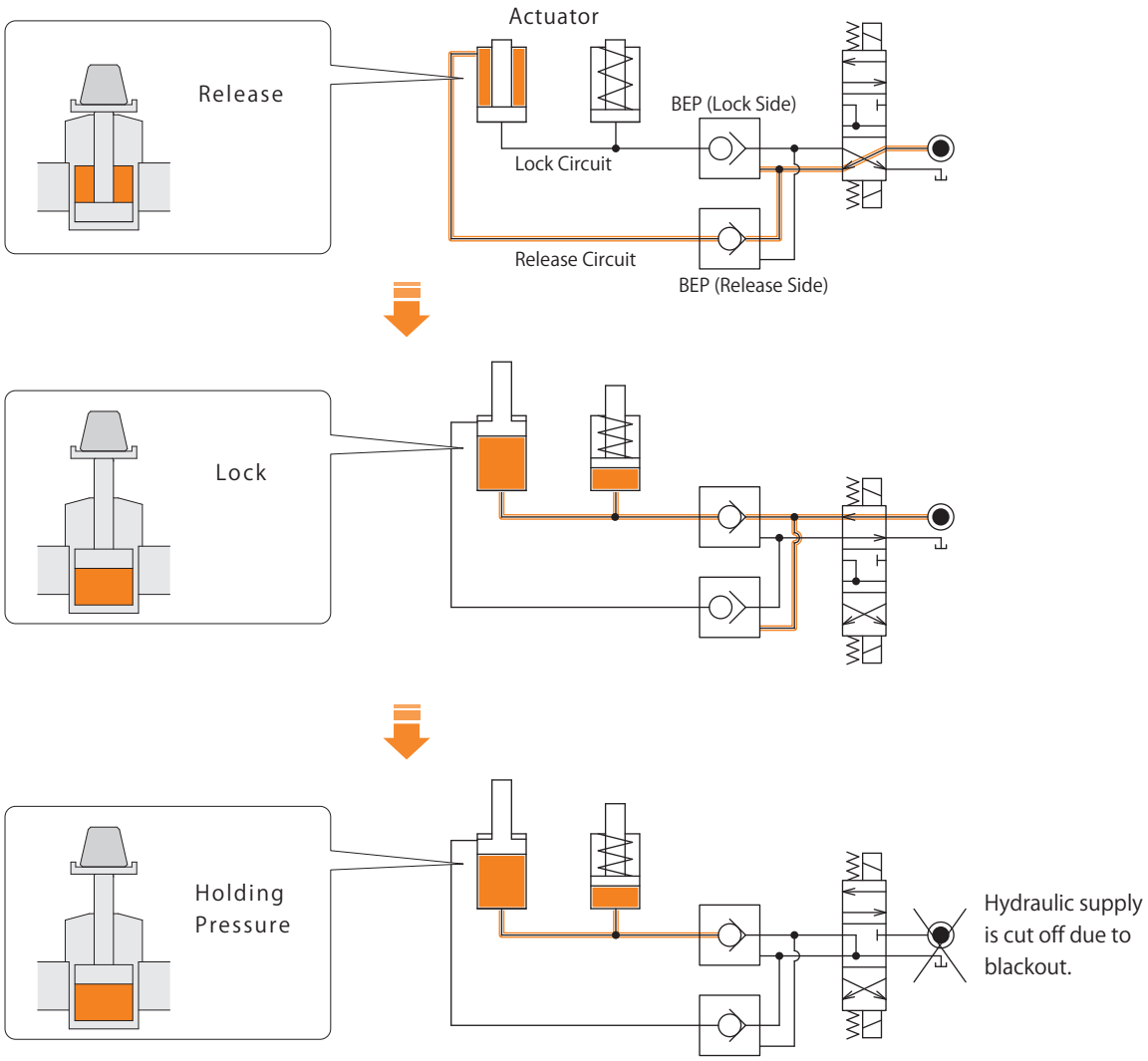



※ This drawing shows BEP. (Please refer to the BSP page for the BSP circuit symbol.)
A filter is built in each A port and B port.
A filter is not built in the pilot port. Please sufficiently perform flushing of piping and fitting to prevent contaminants such as cutting chips from entering the circuit.

| |  Model BEP → P.1271 |  Model BSP → P.1273 |
|---|---|---|
| Classification | Piping Model | Modular Model |
| Operating Pressure | 1.0～7.0MPa / 7.0～30.0MPa | 2.5～7.0MPa / 7.0～25.0MPa |
| Application Examples |   |   |

## Action Description

Circuit Reference ※ Two numbers of Non-Leak Pilot Check Valve BEP are used in this reference.




| Operating Procedure | | Note |
|---|---|---|
| Locking | Lock hydraulic pressure is ON. (Release hydraulic pressure is OFF.) | |
| | BEP pilot check valve (release side) opens.<br>The release side circuit pressure returns to the tank. | |
| | Actuator is locked by supplying hydraulic pressure to the lock side. | |
| | (The locking pressure is maintained even after hydraulic power source is OFF.) | |
| | Machining Process, etc. | |
| Releasing | Release side hydraulic pressure is ON. (Lock side pressure is OFF.) | |
| | BEP pilot check valve (lock side) opens and the lock side circuit pressure returns to the tank. | |
| | Actuator is released by supplying the hydraulic pressure to the release side. | |
| | (The releasing pressure is maintained even after hydraulic power source is OFF.) | |
| In case of an emergency | Hydraulic power source is OFF due to a blackout. | |
| | The actuator will remain in the same state as it was before blackout by non-leak pilot check valve. | |

## Model No. Indication

**BEP2 2 0 - 0**

1 2

### 1 Pressure Code

**2** : Operating Pressure Range 1.0 ~ 7.0MPa

**5** : Operating Pressure Range 7.0 ~ 30.0MPa

### 2 Design No.

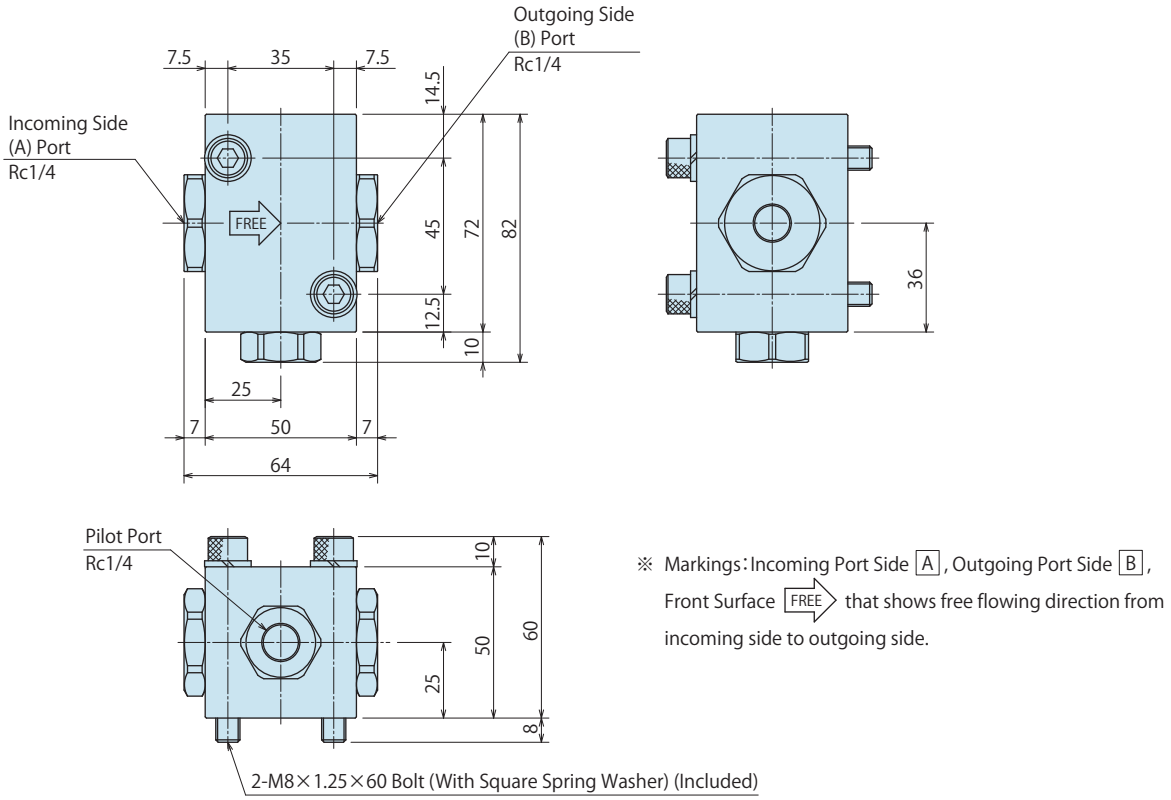
**0** : Revision Number

## Specifications

| Model No. | | BEP220-0 | BEP250-0 |
|---|---|---|---|
| Operating Pressure Range MPa | | 1.0 ~ 7.0 | 7.0 ~ 30.0 |
| Withstanding Pressure MPa | | 10.5 | 37.5 |
| Cracking Pressure MPa | | 0.24 | |
| Min. Passage Area mm² | | 28.3 | |
| Operating Temperature ℃ | | 0 ~ 70 | |
| Usable Fluid | | General Hydraulic Oil Equivalent to ISO-VG-32 | |
| Pilot Hydraulic Pressure | Operating Pressure at 25MPa | - | 6.8MPa or more |
| | Operating Pressure at 14MPa | - | 3.8MPa or more |
| | Operating Pressure at 7MPa | 2.0MPa or more | - |
| Weight kg | | 1.4 | 1.4 |

## External Dimensions

BEP220-0 / BEP250-0




※ Markings : Incoming Port Side [A], Outgoing Port Side [B], Front Surface [FREE] that shows free flowing direction from incoming side to outgoing side.

## Cautions (BEP)

1. Do not place any devices that occurs oil leakage between outgoing side (B) port and actuators.
2. Non-leak function does not work properly if there is an oil leakage inside actuators.
3. Connecting the hydraulic source to outgoing (B) port and controlling hydraulic supply of A port with pilot port will lead to sealing malfunction. We offer other compatible products. Please contact us.

## Model No. Indication

**BSP3 5 0 - 0 W 6R (8.0MPa)**

1 2 3 4 5

### 1 Pressure Code

**2** : Operating Pressure Range 2.5 ~ 7.0MPa

**5** : Operating Pressure Range 7.0 ~ 25.0MPa
(Please refer to the specification for pressure compensating valve.)

### 2 Design No.

**0** : Revision Number

### 3 Circuit Symbol

**A** : A Port Check

**W** : A/B Port Check

### 4 Pressure Compensating Valve / Relief Set Pressure Range

**Blank** : Without Pressure Compensating Valve

**4R** : With Pressure Compensating Valve, Relief Set Pressure Range 3.5~8.0 $^{+1.5}_{0}$ MPa

**6R** : With Pressure Compensating Valve, Relief Set Pressure Range 8.5~17.0 $^{+2}_{0}$ MPa

**7R** : With Pressure Compensating Valve, Relief Set Pressure Range 17.5~27.0 $^{+2.5}_{0}$ MPa

### 5 Operating Pressure (Only with Pressure Compensating Valve)

**Please inform us of operating pressure (Supply pressure to P-port).**
**(Please inform us with proper unit symbols.)**

※Please refer to the specification for relief set pressure.

Entry Example

**Blank** : Without Pressure Compensating Valve

With Pressure Compensating Valve, Operating Pressure (P Port Supply Pressure) : 4MPa → **(4.0MPa)**

With Pressure Compensating Valve, Operating Pressure (P Port Supply Pressure) : 1200PSI → **(1200PSI)**

## Specifications

Without Pressure Compensating Valve

| Model No. | | BSP320-0A | BSP350-0A | BSP320-0W | BSP350-0W |
|---|---|---|---|---|---|
| Operating Pressure Range | MPa | 2.5 ~ 7.0 | 7.0 ~ 25.0 | 2.5 ~ 7.0 | 7.0 ~ 25.0 |
| Cracking Pressure | MPa | 0.05 | | | |
| Pilot Hydraulic Pressure | MPa | More than one third of A2 port holding pressure | | More than one third of A2 (B2) port holding pressure | |
| Min. Passage Area | mm² | 24 | | | |
| Operating Temperature | ℃ | 0 ~ 70 | | | |
| Usable Fluid | | General Hydraulic Oil Equivalent to ISO-VG-32 | | | |
| Weight | kg | 1.1 | 1.1 | 1.5 | 1.5 |

With Pressure Compensating Valve

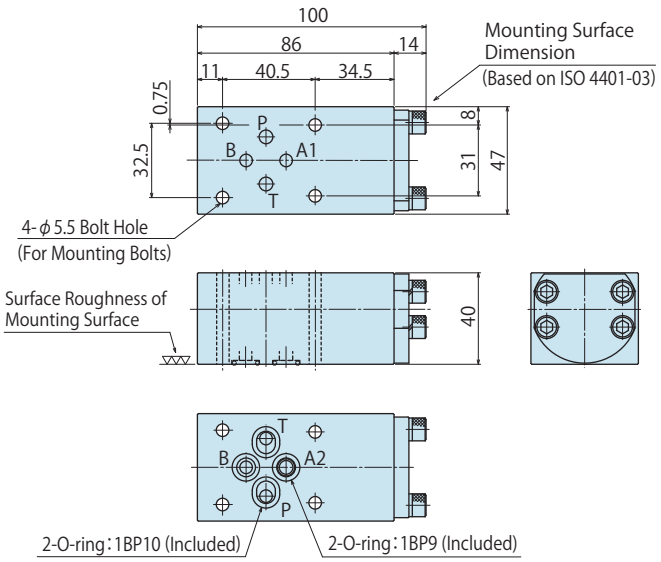
| Model No. | | BSP320-0A4R□ | BSP350-0A6R□ | BSP350-0A7R□ | BSP320-0W4R□ | BSP350-0W6R□ | BSP350-0W7R□ |
|---|---|---|---|---|---|---|---|
| Operating Pressure Range | MPa | 2.5 ~ 7.0 | 7.0 ~ 15.5 | 15.5 ~ 25.0 | 2.5 ~ 7.0 | 7.0 ~ 15.5 | 15.5 ~ 25.0 |
| Relief Set Pressure Range | MPa | 3.5 ~ 8.0 $^{+1.5}_{0}$ | 8.5 ~ 17.0 $^{+2}_{0}$ | 17.5 ~ 27.0 $^{+2.5}_{0}$ | 3.5 ~ 8.0 $^{+1.5}_{0}$ | 8.5 ~ 17.0 $^{+2}_{0}$ | 17.5 ~ 27.0 $^{+2.5}_{0}$ |
| Relief Set Pressure | MPa | Operating Pressure + 1 $^{+1.5}_{0}$ | Operating Pressure + 1.5 $^{+2}_{0}$ | Operating Pressure + 2 $^{+2.5}_{0}$ | Operating Pressure + 1 $^{+1.5}_{0}$ | Operating Pressure + 1.5 $^{+2}_{0}$ | Operating Pressure + 2 $^{+2.5}_{0}$ |
| Cracking Pressure | MPa | 0.05 | | | | | |
| Pilot Hydraulic Pressure | MPa | More than one third of A2 port holding pressure | | | More than one third of A2 (B2) port holding pressure | | |
| Min. Passage Area | mm² | 24 | | | | | |
| Operating Temperature | ℃ | 0 ~ 70 | | | | | |
| Usable Fluid | | General Hydraulic Oil Equivalent to ISO-VG-32 | | | | | |
| Weight | kg | 1.1 | 1.1 | 1.1 | 1.5 | 1.5 | 1.5 |

## Cautions (BSP)

1. Please note that pressure will be decreased by oil temperature drop when stopping pressure supply to A1(B1) port and maintaining pressure on A2(B2) port side.
2. The pressure relief valve is used for relieving volume of hydraulic pressure which is increased by oil temperature rise. It cannot be used for reducing supply pressure that is out of relief set pressure range.
3. When using with pressure compensating valve, if there is back pressure generated in T port, it cannot be relieved properly. Please contact us for further information.

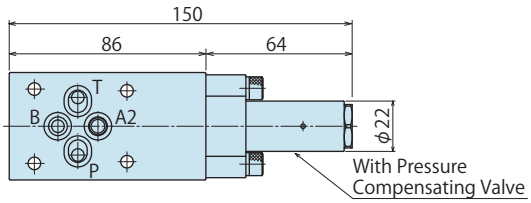
## External Dimensions

### BSP3□0-0A

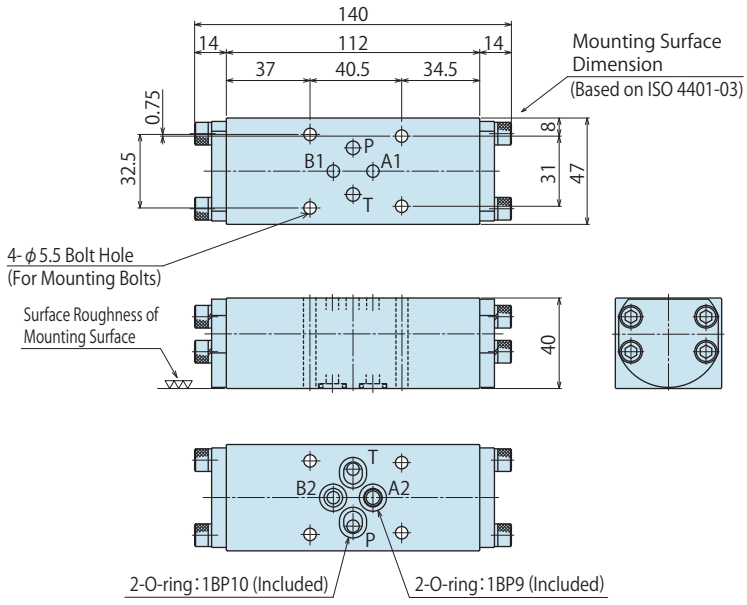



### BSP320-0A4R□ / BSP350-0A6R□ / BSP350-0A7R□

※Please refer to BSP3□0-0A for any dimensions that are not shown.

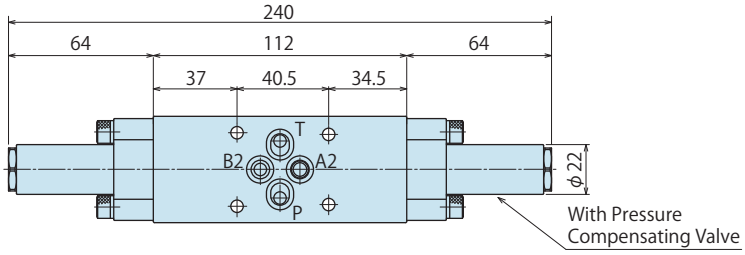



### BSP3□0-0W

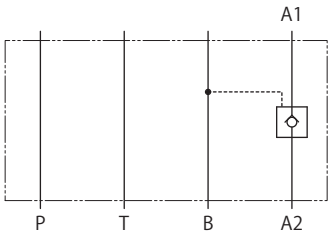


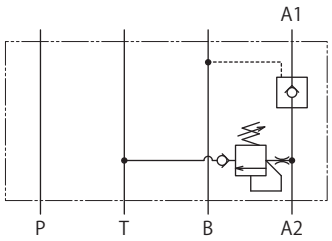

### BSP320-0W4R□ / BSP350-0W6R□ / BSP350-0W7R□

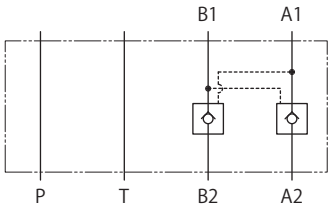
※Please refer to BSP3□0-0W for any dimensions that are not shown.

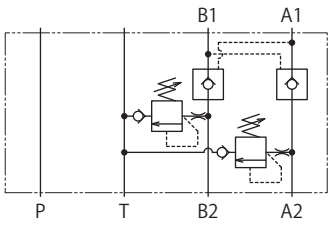



## Circuit Symbol



# Non-Leak Valve Unit

## Manual Operation Model

Model **BH**


## Manual Direction Control Valve with Non-Leak Function

### A Variety of Circuits and Combination Options

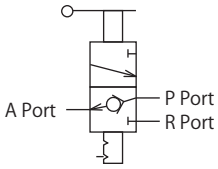
- **What is a manual operating non-leak valve unit ?**

It is a manual operated direction control valve. It holds outgoing side hydraulic pressure even after the pressure power supply is cut off.

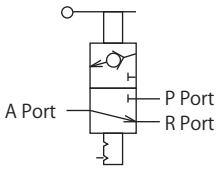
Even if the hydraulic power source is cut off due to energy saving (Stop hydraulic supply to incoming side) or blackout etc., it holds the pressure and prevents the workpiece drop off.

### Circuit Symbol

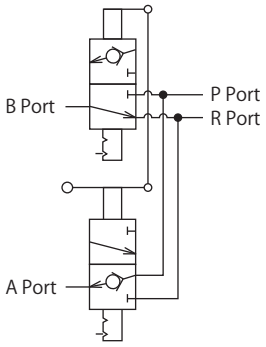
**A** Normal Open




**B** Normal Close



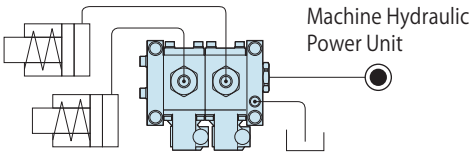

**NN** Exclusively used for Double Acting Circuit



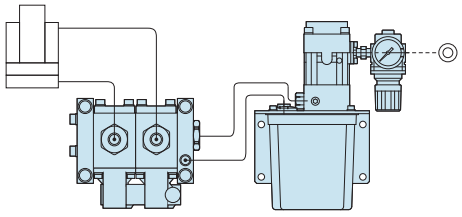

※A filter is built in each port other than R ports.

### Application Examples

Activate the single acting actuator manually by AA circuit.

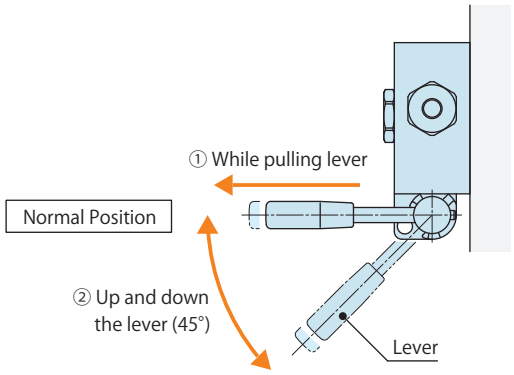



Activate the double acting actuator manually by NN circuit.



model CB/CC Unit

### Operating Procedure




| Operating Procedure |
| --- |
| While pulling lever (to prevent wrong operation) |
| Operate the lever up and down. |

## Model No. Indication

**BH00 4 1 - NN - 0 - ( ) ( ) (7.0MPa)**

1 2 3 4 5 6 7

### 1 Pressure Code

**4** : Operating Pressure Range 2.5~7.0MPa
**7** : Operating Pressure Range 6.0~30.0MPa

※ Pressure code is the same as BC unit if it is with pressure switch option or with 5 pressure gauge option.

### 2 Design No.

**1** : Revision Number

### 3 Circuit Symbol

**A** : Normal Open
**B** : Normal Close
**NN** : Exclusively used for Double Action Circuit
(Example) A, AA, AB, ANN, NNNN

### 4 Usable Fluid

**0** : General Hydraulic Oil
(Please refer to Hydraulic Fluid List)
**S** : Silicon Oil
**G** : Water-Glycol

### 5 Option

**Blank** : None (Standard : Piping Block is only on the right side.)
**GR** : With Pressure Gauge installed on the right side. (Piping Block is on both sides.)
**GL** : With Pressure Gauge installed on the left side. (Piping Block is on both sides.)
**H** : With Piping Block installed on the left side. ($P_H$ Port)

### 6 Unit of Pressure Gauge

**Blank** : MPa (Standard)
**P** : PSI / Rc Thread Fitting

### 7 Operating Pressure

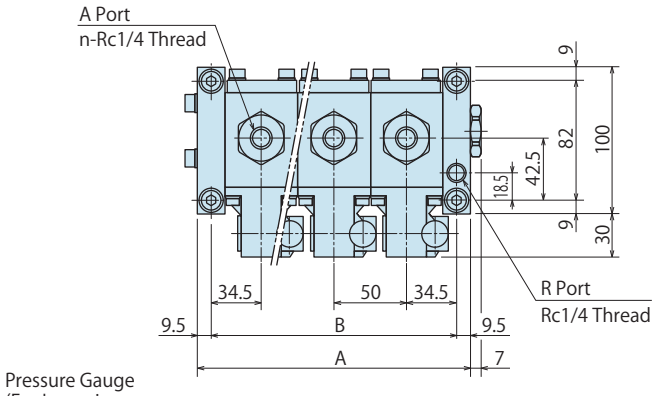
Specify the operating pressure.
(Please indicate the pressure with a proper unit symbol.)
(Example) (7.0MPa) (20.0MPa) (2000PSI) (200kg/cm$^2$)

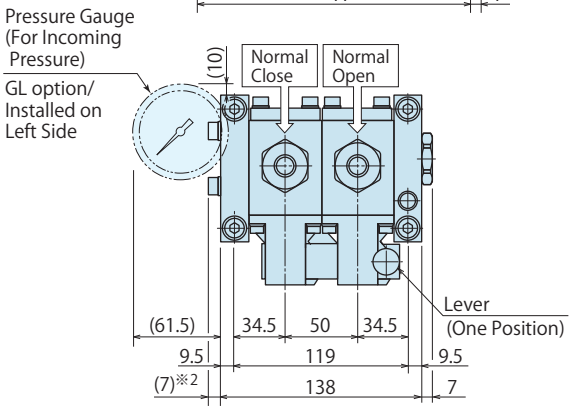
## Specifications

| Model No. | | BH0041 | BH0071 |
|---|---|---|---|
| Operating Pressure Range | MPa | 2.5 ~ 7.0 | 6.0 ~ 30.0 |
| Withstanding Pressure ※1 | MPa | 10.5 | 37.5 |
| Operating Temperature | ℃ | 0 ~ 70 | |
| Usable Fluid | | General Hydraulic Oil Equivalent to ISO-VG-32 | |

Note :
※1. It shows withstanding pressure without pressure gauge.

## External Dimensions

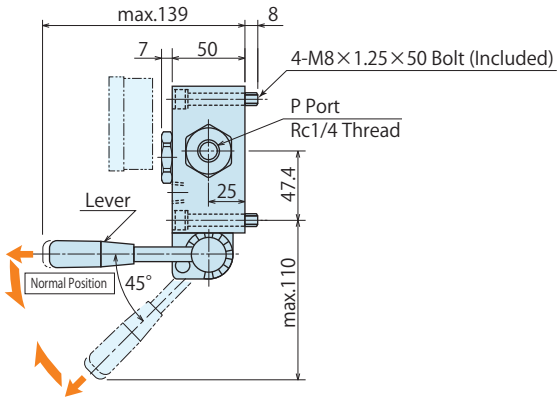



NN Circuit / Exclusively used for Double Action Circuit

(mm)

| The Number of Valves (n) | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| A | 88 | 138 | 188 | 238 |
| B | 69 | 119 | 169 | 219 |
| Weight kg | 3.9 | 6.3 | 8.7 | 10.4 |




Note : ※2. It shows the outline dimensions of valve unit with left hand side piping block option.

# Non-Leak Valve Unit

## Electrical Control Model

Model **BC**

## Electrical direction control valve with non-leak valve

A variety of circuits and combination options.

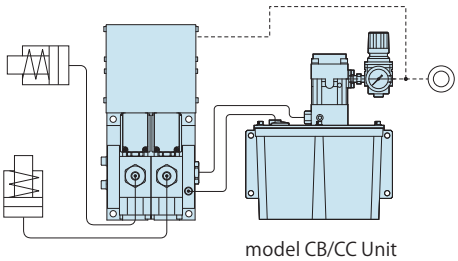
### What is a non-leak valve unit (Electrical Control Model) ?

It is an electrical directional control valve. It operates built-in non-leak valves by switching air solenoid valve electrically. Even if the pressure supply is cut off from the hydraulic power source, it maintains the pressure in outgoing side circuit.

Even if the hydraulic power source is cut off due to energy saving (Stop hydraulic supply to incoming side) or blackout etc., it holds the pressure and prevents a workpiece fall.

### Application Examples

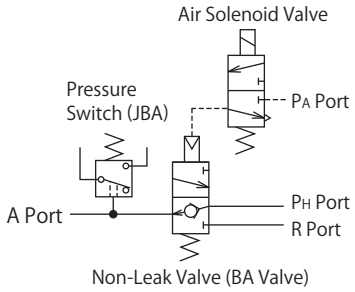
Control lock and release action of actuators electrically.



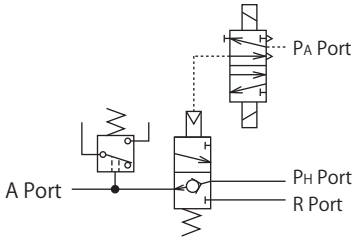
model CB/CC Unit

### Circuit Symbol

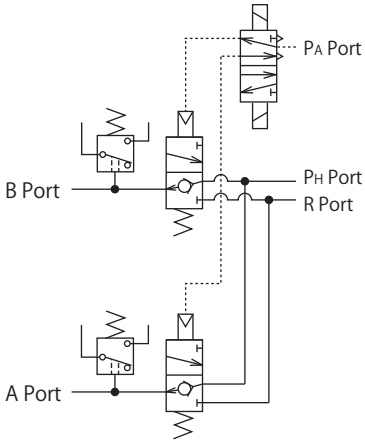
**C** Normal Open



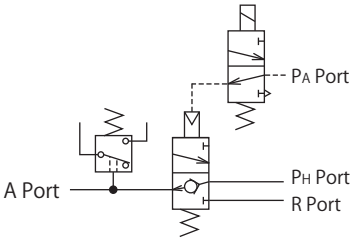

**U** Double Solenoid Valve Option




**YY** Exclusively used for Double Action Circuit




**Z** Normal Close




※ Filter is built in other than PA port and R port.

## Model No. Indication

【Notice of Change in Model No. Indication】: 5 Common option has been added.
When reordering a hydraulic unit including DC24V double solenoid valve, please place the order with the new model no.

**BC00 [4] [1] - [CC] - [1] [ ] [0] - [ ] [ ] (7.0MPa)**

1 2 3 4 5 6 7 8 9

### 1 Pressure Code (Operating Pressure Range)

**3** : 2.5~4.5MPa
**4** : 4.0~7.0MPa
**5** : 6.0~11.0MPa
**6** : 10.0~17.5MPa
**7** : 15.5~30.0MPa

### 2 Design No.

**1** : Revision Number

### 3 Circuit Symbol

**C** : Normal Open Single Solenoid Valve Control
**Z** : Normal Close Single Solenoid Valve Control
**U** : Double Solenoid Valve Control for Single Acting Circuit
**YY** : Double Solenoid Valve Control for Double Acting Circuit
(Example) C, CZ, UU, UUYY

※ Please contact us if a different circuit is needed other than those listed above.

### 4 Control Voltage

**1** : AC100V (50/60Hz)
**2** : AC200V (50/60Hz)
**3** : AC110V (50/60Hz)
**4** : AC220V (50/60Hz)
**5** : DC24V

### 5 Common

Please specify only when selecting both 3 Double Solenoid Valve and 4 5:DC24V. Specifications other than the above will be indicated with **Blank** .

**B** : (−) Minus Common
**A** : (+) Plus Common

※Products before the change of the Model No. Indication which is without this symbol are equivalent to **B** : Minus Common.
Ex.: BC0041-YY-50-(7.0MPa) is equivalent to BC0041-YY-5B0-(7.0MPa).

### 6 Fluid Code

**0** : General Hydraulic Oil (See Hydraulic Fluid List on P.1355)
**S** : Silicon Oil
**G** : Water・Glycol (Iron Tank)

※ Contact us for fluids other than those described above.

### 7 Option

**Blank** : None (Standard: piping block is only on the right side.)
**GR** : With Pressure Gauge installed on right side. (Piping Block is on both sides.)
**GL** : With Pressure Gauge installed on left side. (Piping Block is on both sides.)
**H** : With Piping Block installed on the left side. ($P_H$ Port)

### 8 Unit of Pressure Gauge

**Blank** : MPa (Standard)
**P** : PSI / Rc Thread Fitting

### 9 Operating Pressure

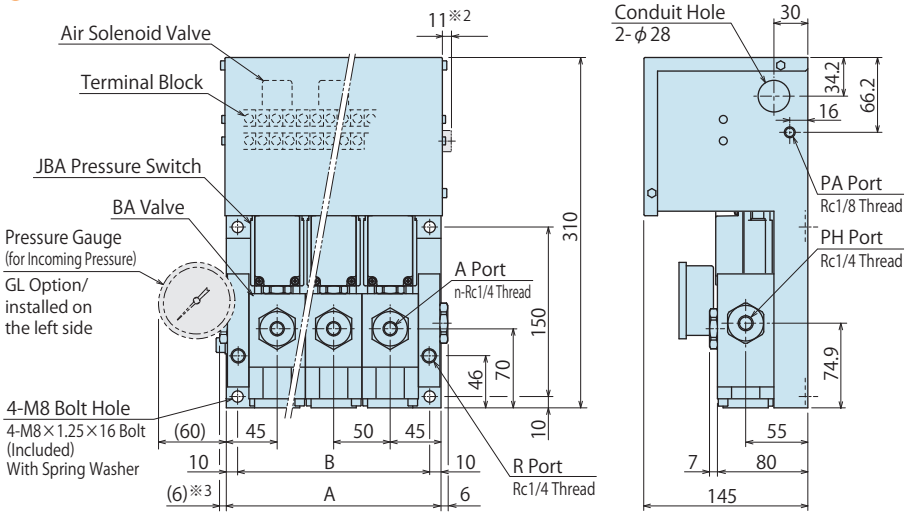
Specify the operating pressure.
(Please indicate the pressure with a proper unit symbol.)
(Example) (7.0MPa) (20.0MPa) (2000PSI) (200kg/cm²)

## Specifications

| Model No. | | BC0031 | BC0041 | BC0051 | BC0061 | BC0071 |
|---|---|---|---|---|---|---|
| Operating Pressure Range | MPa | 2.5 ~ 4.5 | 4.0 ~ 7.0 | 6.0 ~ 11.0 | 10.0 ~ 17.5 | 15.5 ~ 30.0 |
| Withstanding Pressure ※1 | MPa | 10.5 | | 37.5 | | |
| Non-Leak Valve Part Number | | BA2011-0 | | BA5011-0 | | |
| Pressure Switch Part Number | | JBA0700-0G-Z0020G | JBA0700-0G | | JBA2700-0G | |
| Operating Temperature | ℃ | 0 ~ 70 | | | | |
| Usable Fluid | | General Hydraulic Oil Equivalent to ISO-VG-32 (It depends on fluid code.) | | | | |

Notes : ※1. It shows withstanding pressure without pressure gauge.
1. INC. (Pressure Increase Detection) of Pressure Switch (JBA) is set to 70% of operating pressure. Contact us for other set pressure.
2. For pressure gauge (for incoming pressure) option, piping ports are provided on both sides.

## External Dimensions




(mm)

| The Number of Valves (n) | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| A | 90 | 140 | 190 | 240 |
| B | 70 | 120 | 170 | 220 |
| Weight kg | 6 | 8.8 | 11 | 14 |

Notes :
※2. When circuit symbol is U and YY.
※3. Dimension of valve unit with left side piping block option.

## Cautions

### Installation Notes (For Hydraulic Series)

1) Check the Usable Fluid

- Please use the appropriate fluid by referring to the Hydraulic Fluid List.

2) Procedure before Piping

- The pipeline, piping connector and fixture circuits should be cleaned by thorough flushing.
- The dust and cutting chips in the circuit may lead to fluid leakage and malfunction.
- There is no filter provided with Kosmek's product except for a part of valves which prevents foreign materials and contaminants from getting into the circuit.

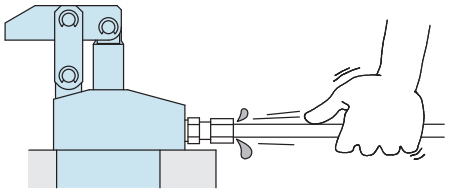
3) Applying Sealing Tape

- Wrap with tape 1 to 2 times following the screw direction.
- Pieces of the sealing tape can lead to oil leakage and malfunction.
- Please implement piping construction in a clear environment to prevent anything getting in products.

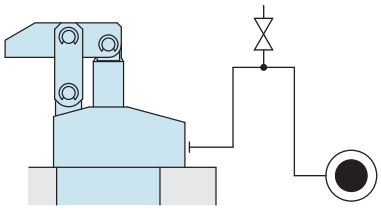
4) Air Bleeding of the Hydraulic Circuit

- If the hydraulic circuit has excessive air, the action time may become very long. If air enters the circuit after connecting the hydraulic port or under the condition of no air in the oil tank, please perform the following steps.

① Reduce hydraulic pressure to less than 2MPa.
② Loosen the cap nut of pipe fitting closest to the clamp by one full turn.
③ Shake the pipeline to loosen the outlet of pipe fitting.
Hydraulic fluid mixed with air comes out.



④ Tighten the cap nut after bleeding.
⑤ It is more effective to release air at the highest point inside the circuit or at the end of the circuit.
(Set an air bleeding valve at the highest point inside the circuit.)



5) Checking Looseness and Retightening

- At the beginning of the machine installation, the bolt and nut may be tightened lightly. Check the looseness and re-tighten as required.

### Hydraulic Fluid List

ISO Viscosity Grade ISO-VG-32

| Maker | Anti-Wear Hydraulic Oil | Multi-Purpose Hydraulic Oil |
|---|---|---|
| Showa Shell Sekiyu | Tellus S2 M 32 | Morlina S2 B 32 |
| Idemitsu Kosan | Daphne Hydraulic Fluid 32 | Daphne Super Multi Oil 32 |
| JX Nippon Oil & Energy | Super Hyrando 32 | Super Mulpus DX 32 |
| Cosmo Oil | Cosmo Hydro AW32 | Cosmo New Mighty Super 32 |
| ExxonMobil | Mobil DTE 24 | Mobil DTE 24 Light |
| Matsumura Oil | Hydol AW-32 | |
| Castrol | Hyspin AWS 32 | |

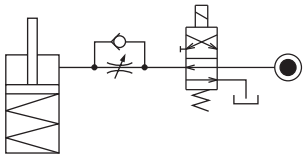
Note : Please contact manufacturers when customers require products in the list above.

## Notes on Hydraulic Cylinder Speed Control Unit

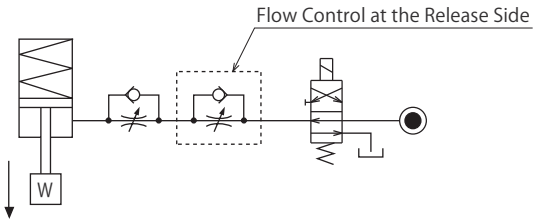
Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

### Flow Control Circuit for Single Acting Cylinder

For spring return single acting cylinders, restricting flow during release can extremely slow down or disrupt release action. The preferred method is to control the flow during the lock action using a valve that has free-flow in the release direction. It is also preferred to provide a flow control valve at each actuator.



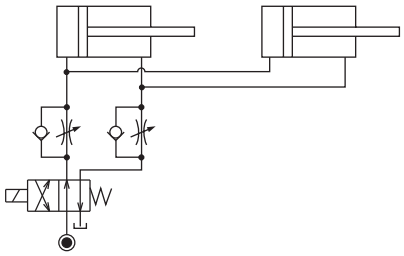
Accelerated clamping speed by excessive hydraulic flow to the cylinder may sustain damage. In this case add flow control to regulate flow. (Please add flow control to release flow if the lever weight is put on at the time of release action when using swing clamps.)



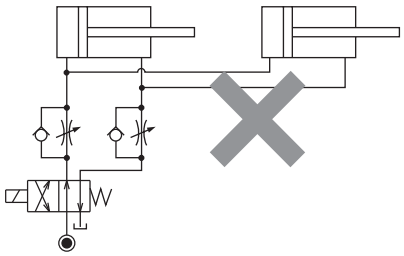

### Flow Control Circuit for Double Acting Cylinder

Flow control circuit for double acting cylinder should have meter-out circuits for both the lock and release sides. Meter-in control can have adverse effect by presence of air in the system.
However, in the case of controlling LKE, TMA, TLA, both lock side and release side should be meter-in circuit.
Refer to P.75 for speed adjustment of LKE.
For TMA and TLA, if meter-out circuit is used, abnormal high pressure is created, which causes oil leakage and damage.

【Meter-out Circuit】(Except LKE/TMA/TLA)

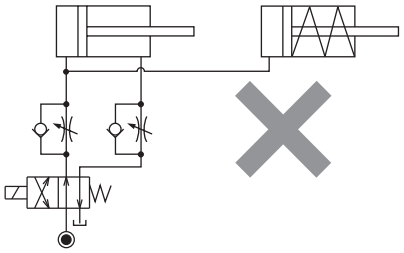


【Meter-in Circuit】(LKE/TMA/TLA must be controlled with meter-in.)



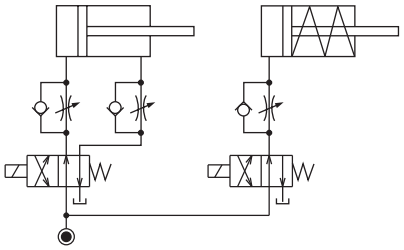
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

① Single acting components should not be used in the same flow control circuit as the double acting components.
The release action of the single acting cylinders may become erratic or very slow.

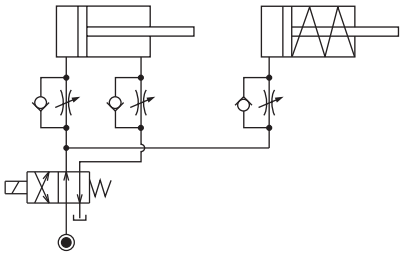


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

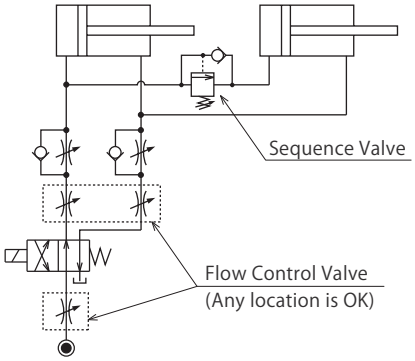
○ Separate the control circuit.



○ Reduce the influence of double acting cylinder control unit.
However, due to the back pressure in tank line, single action cylinder is activated after double action cylinder works.



② In the case of meter-out circuit, the inner circuit pressure may increase during the cylinder action because of the fluid supply. The increase of the inner circuit pressure can be prevented by reducing the supplied fluid beforehand via the flow control valve. Especially when using sequence valve or pressure switches for clamping detection. If the back pressure is more than the set pressure then the system will not work as it is designed to.



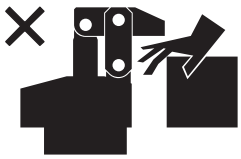
## Cautions

### Notes on Handling

1) It should be operated by qualified personnel.
- The hydraulic machine and air compressor should be operated and maintained by qualified personnel.

2) Do not operate or remove the product unless the safety protocols are ensured.
① The machine and equipment can only be inspected or prepared when it is confirmed that the safety devices are in place.
② Before the product is removed, make sure that the above-mentioned safety devices are in place. Shut off the pressure and power source, and make sure no pressure exists in the air and hydraulic circuits.
③ After stopping the product, do not remove until the temperature drops.
④ Make sure there is no abnormality in the bolts and respective parts before restarting the machine or equipment.

3) Do not touch a clamp (cylinder) while it is working.
Otherwise, your hands may be injured due to clinching.

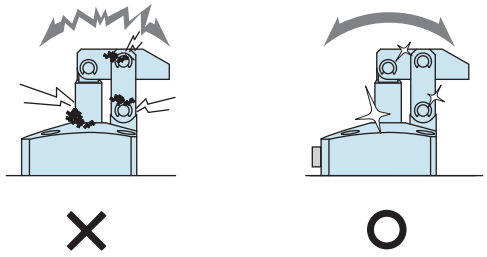


4) Do not disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

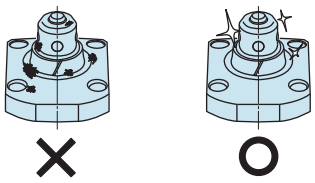
### Maintenance and Inspection

1) Removal of the Machine and Shut-off of Pressure Source
- Before the machine is removed, make sure that safety devices and preventive devices are in place. Shut off the pressure and power source, and make sure no pressure exists in the air and hydraulic circuits.
- Make sure there is no abnormality in the bolts and respective parts before restarting.

2) Regularly clean the area around the piston rod and plunger.
- If it is used when the surface is contaminated with dirt, it may lead to packing seal damage, malfunctioning and fluid leakage.



3) Please clean out the reference surfaces on a regular basis (taper reference surface and seating surface) of the locating products. (VS/VT/VFL/VFM/VFJ/VFK/WVS/VWM/VWK/VX/VXE/VXF)
- The locating products, except VX/VXE/VXF model, can remove contaminants with cleaning functions. However, hardened cutting chips, adhesive coolant and others may not be removed. Make sure there are no contaminants before installing a workpiece/pallet.
- Continuous use with contaminant on components will lead to locating accuracy failure, malfunction and fluid leakage.



4) If disconnecting by couplers, air bleeding should be carried out on a regular basis to avoid air mixed in the circuit.

5) Regularly tighten nut, bolt, pin, cylinder, pipe line and others to ensure proper use.

6) Make sure the hydraulic fluid has not deteriorated.

7) Make sure there is a smooth action without an irregular noise.
- Especially when it is restarted after left unused for a long period, make sure it can be operated correctly.

8) The products should be stored in the cool and dark place without direct sunshine or moisture.

9) Please contact us for overhaul and repair.

## Warranty

1) Warranty Period

- The product warranty period is 18 months from shipment from our factory or 12 months from initial use, whichever is earlier.

2) Warranty Scope

- If the product is damaged or malfunctions during the warranty period due to faulty design, materials or workmanship, we will replace or repair the defective part at our expense.
  Defects or failures caused by the following are not covered.

① If the stipulated maintenance and inspection are not carried out.
② If the product is used while it is not suitable for use based on the operator's judgment, resulting in defect.
③ If it is used or operated in an inappropriate way by the operator. (Including damage caused by the misconduct of the third party.)
④ If the defect is caused by reasons other than our responsibility.
⑤ If repair or modifications are carried out by anyone other than Kosmek, or without our approval and confirmation, it will void warranty.
⑥ Other caused by natural disasters or calamities not attributable to our company.
⑦ Parts or replacement expenses due to parts consumption and deterioration.
(Such as rubber, plastic, seal material and some electric components.)

Damages excluding from direct result of a product defect shall be excluded from the warranty.

# Sales Offices

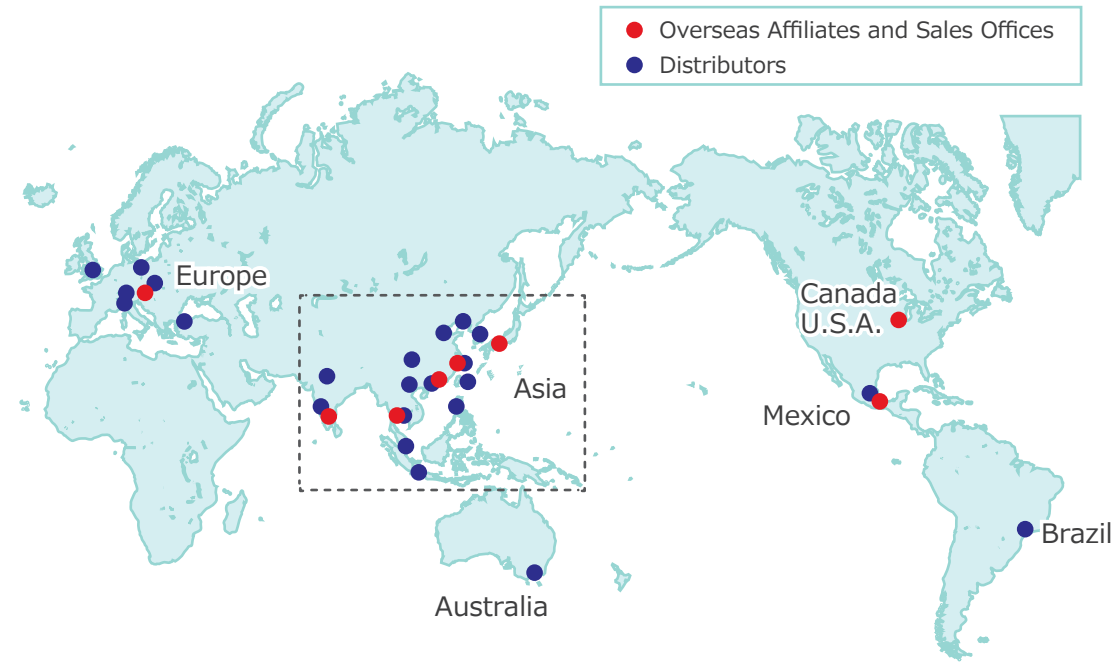
## Sales Offices across the World

| | | |
|---|---|---|
| JAPAN<br>HEAD OFFICE<br>Overseas Sales | **TEL. +81-78-991-5162** | FAX. +81-78-991-8787<br>KOSMEK LTD. 1-5, 2-chome, Murotani, Nishi-ku, Kobe-city, Hyogo, Japan 651-2241<br>〒651-2241　兵庫県神戸市西区室谷2丁目1番5号 |
| United States of America<br>SUBSIDIARY<br>KOSMEK (USA) LTD. | **TEL. +1-630-620-7650** | FAX. +1-630-620-9015<br>650 Springer Drive, Lombard, IL 60148 USA |
| MEXICO<br>REPRESENTATIVE OFFICE<br>KOSMEK USA Mexico Office | **TEL. +52-442-161-2347** | Av. Santa Fe #103 int 59 Col. Santa Fe Juriquilla C.P. 76230 Queretaro, Qro Mexico |
| EUROPE<br>SUBSIDIARY<br>KOSMEK EUROPE GmbH | **TEL. +43-463-287587** | FAX. +43-463-287587-20<br>Schleppeplatz 2 9020 Klagenfurt am Wörthersee Austria |
| CHINA<br>KOSMEK (CHINA) LTD.<br>考世美(上海)貿易有限公司 | **TEL. +86-21-54253000** | FAX. +86-21-54253709<br>Room601, RIVERSIDE PYRAMID No.55, Lane21, Pusan Rd, Pudong Shanghai 200125, China<br>中国上海市浦东新区浦三路21弄55号银亿滨江中心601室 200125 |
| INDIA<br>BRANCH OFFICE<br>KOSMEK LTD - INDIA | **TEL. +91-9880561695** | F 203, Level-2, First Floor, Prestige Center Point, Cunningham Road, Bangalore -560052 India |
| THAILAND<br>REPRESENTATIVE OFFICE<br>KOSMEK Thailand Representation Office | **TEL. +66-2-300-5132** | FAX. +66-2-300-5133<br>67 Soi 58, RAMA 9 Rd., Suanluang, Suanluang, Bangkok 10250, Thailand |
| TAIWAN<br>(Taiwan Exclusive Distributor)<br>Full Life Trading Co., Ltd.<br>盈生貿易有限公司 | **TEL. +886-2-82261860** | FAX. +886-2-82261890<br>16F-4, No.2, Jian Ba Rd., Zhonghe District, New Taipei City Taiwan 23511<br>台湾新北市中和區建八路2號 16F－4（遠東世紀廣場） |
| PHILIPPINES<br>(Philippines Exclusive Distributor)<br>G.E.T. Inc, Phil. | **TEL. +63-2-310-7286** | FAX. +63-2-310-7286<br>Victoria Wave Special Economic Zone Mt. Apo Building, Brgy. 186, North Caloocan City, Metro Manila, Philippines 1427 |
| INDONESIA<br>(Indonesia Exclusive Distributor)<br>PT. Yamata Machinery | **TEL. +62-21-29628607** | FAX. +62-21-29628608<br>Delta Commercial Park I, Jl. Kenari Raya B-08, Desa Jayamukti, Kec. Cikarang Pusat Kab. Bekasi 17530 Indonesia |

## Sales Offices in Japan

| | | |
|---|---|---|
| Head Office<br>Osaka Sales Office<br>Overseas Sales | **TEL. 078-991-5162** | FAX. 078-991-8787<br>〒651-2241　兵庫県神戸市西区室谷2丁目1番5号 |
| Tokyo Sales Office | **TEL. 048-652-8839** | FAX. 048-652-8828<br>〒331-0815　埼玉県さいたま市北区大成町4丁目81番地 |
| Nagoya Sales Office | **TEL. 0566-74-8778** | FAX. 0566-74-8808<br>〒446-0076　愛知県安城市美園町2丁目10番地1 |
| Fukuoka Sales Office | **TEL. 092-433-0424** | FAX. 092-433-0426<br>〒812-0006　福岡県福岡市博多区上牟田1丁目8-10-101 |

# Global Network




Asia Detailed Map


KOSMEK
Harmony in Innovation

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