

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



Model **BEQ**
Double Acting Model



● Non-Leak Stop Valve (Manual Switching Valve)

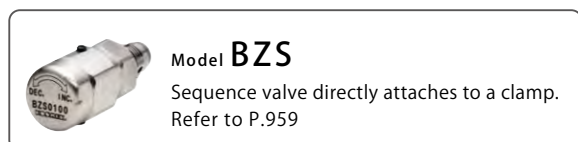
It is a manual switching valve that can hold pressure without power source.

Model **BT**



● Sequence Valve

In-line sequence valve for simple sequence control.



Model **BLS**
Piping Model/
Gasket Model



Model **BLG**
Compact
Gasket Model



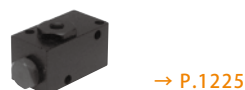
Model **BLV**
Vertical Mounting
Gasket Model



● 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**



● 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)



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



● 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**



● 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 Model/
Gasket Model



→ P.1243

Model BMG
Compact
Gasket Model



→ P.1243

Model BMV
Vertical Mounting
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

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/BLV

BLB

JSS/JS

JKA/JKB

BMA/BMG/BMV

AU/AU-M

BU

BP/JPB

BX

BEP/BSP

BH

BC

Air Hydraulic Unit

CV

CK

CP/CPB

CPC/CQC

CB

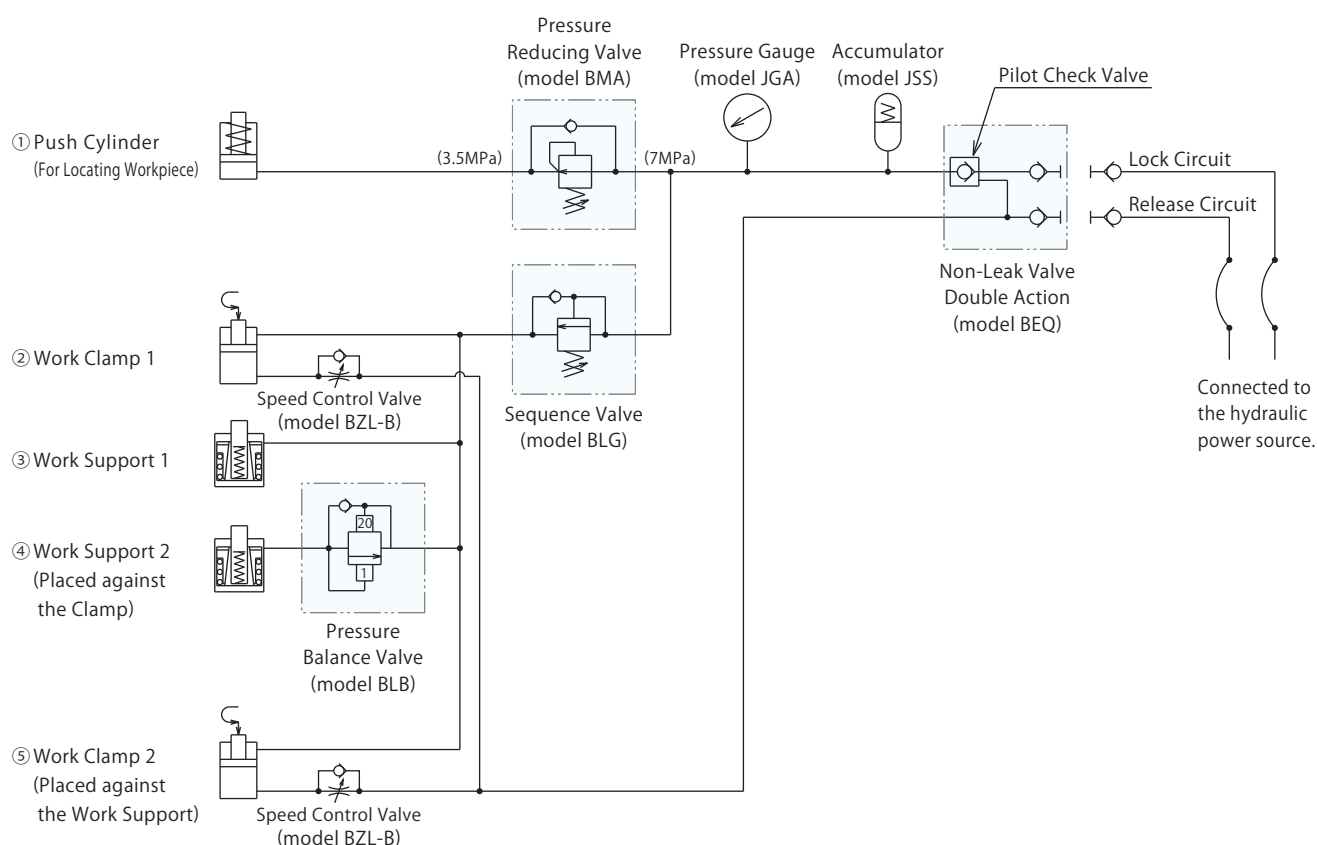
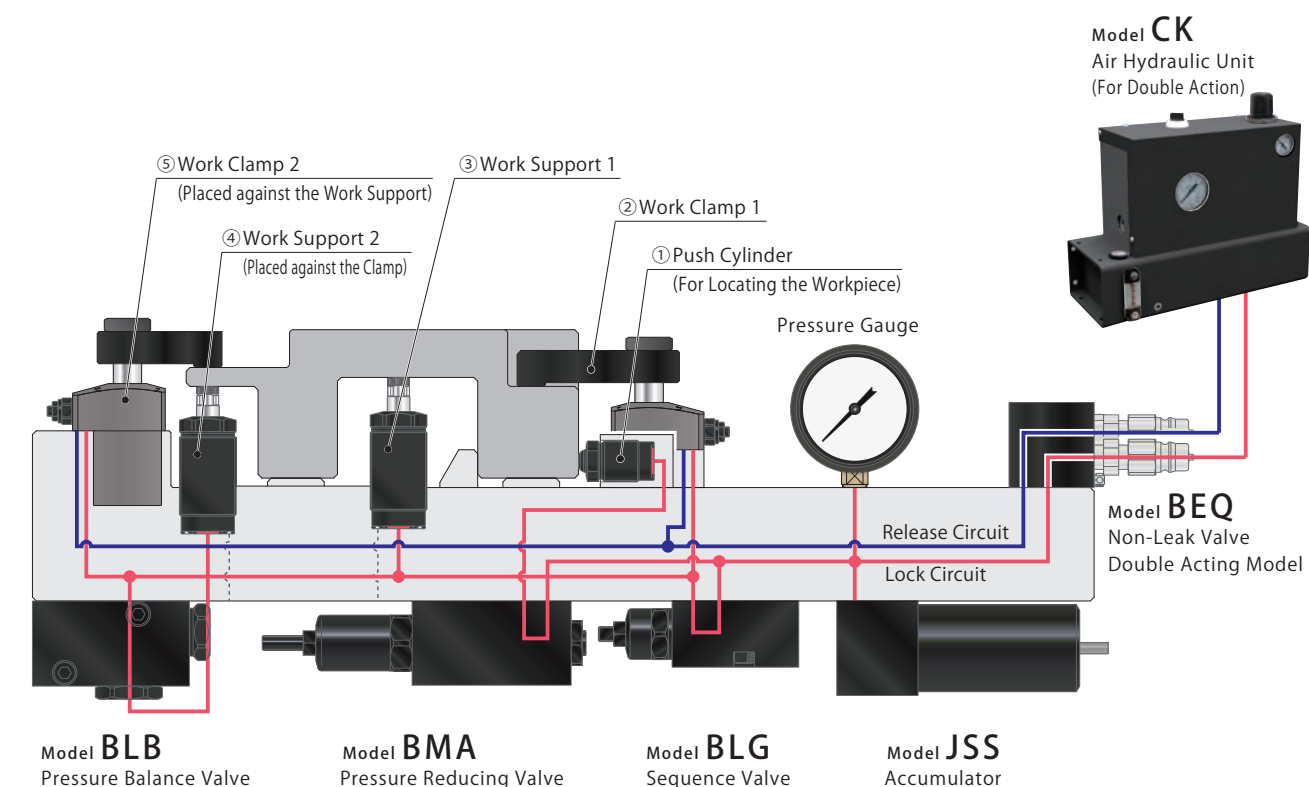
CC

AB/AB-V

AC/AC-V

Hydraulic Valve Double Acting Circuit Reference

Disconnected Fixture Example in Double Acting Circuit



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

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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

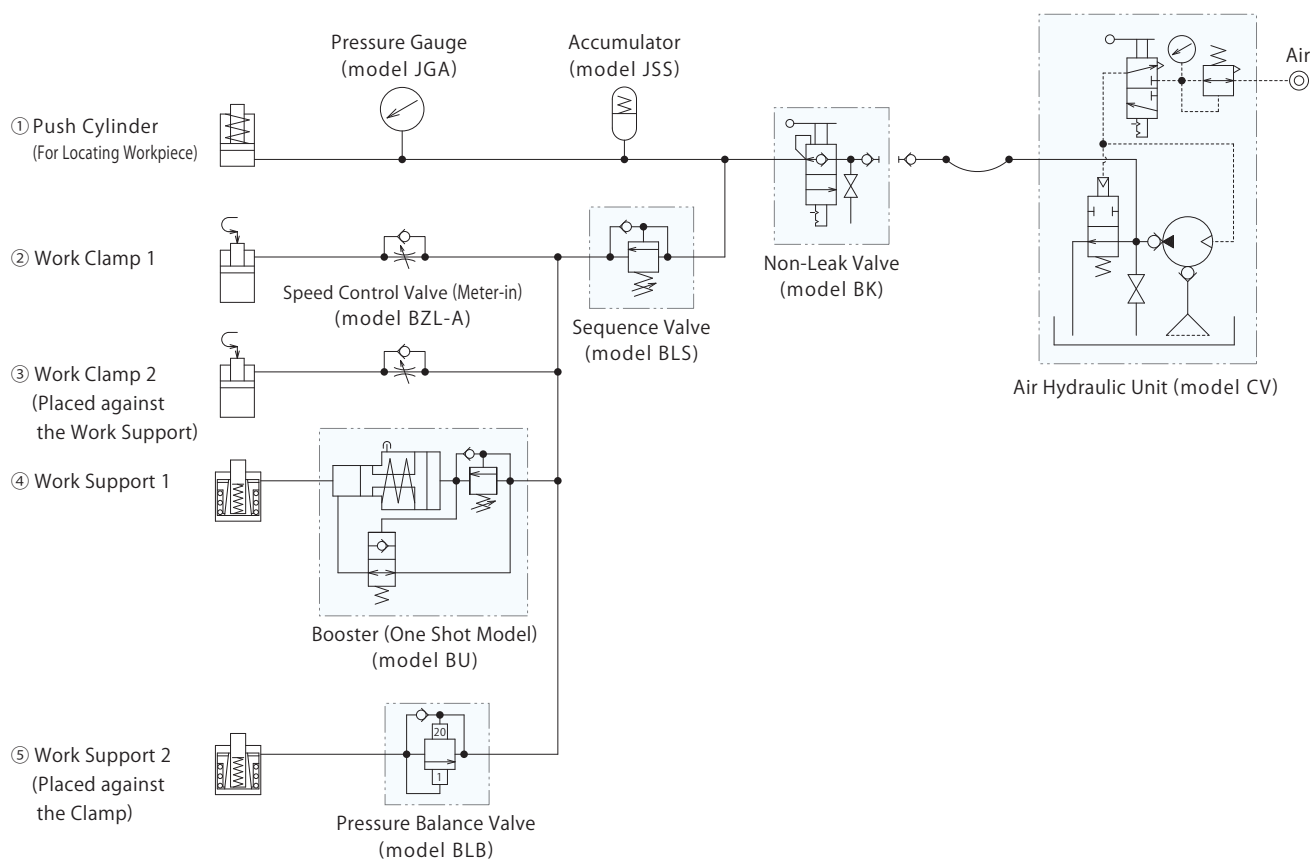
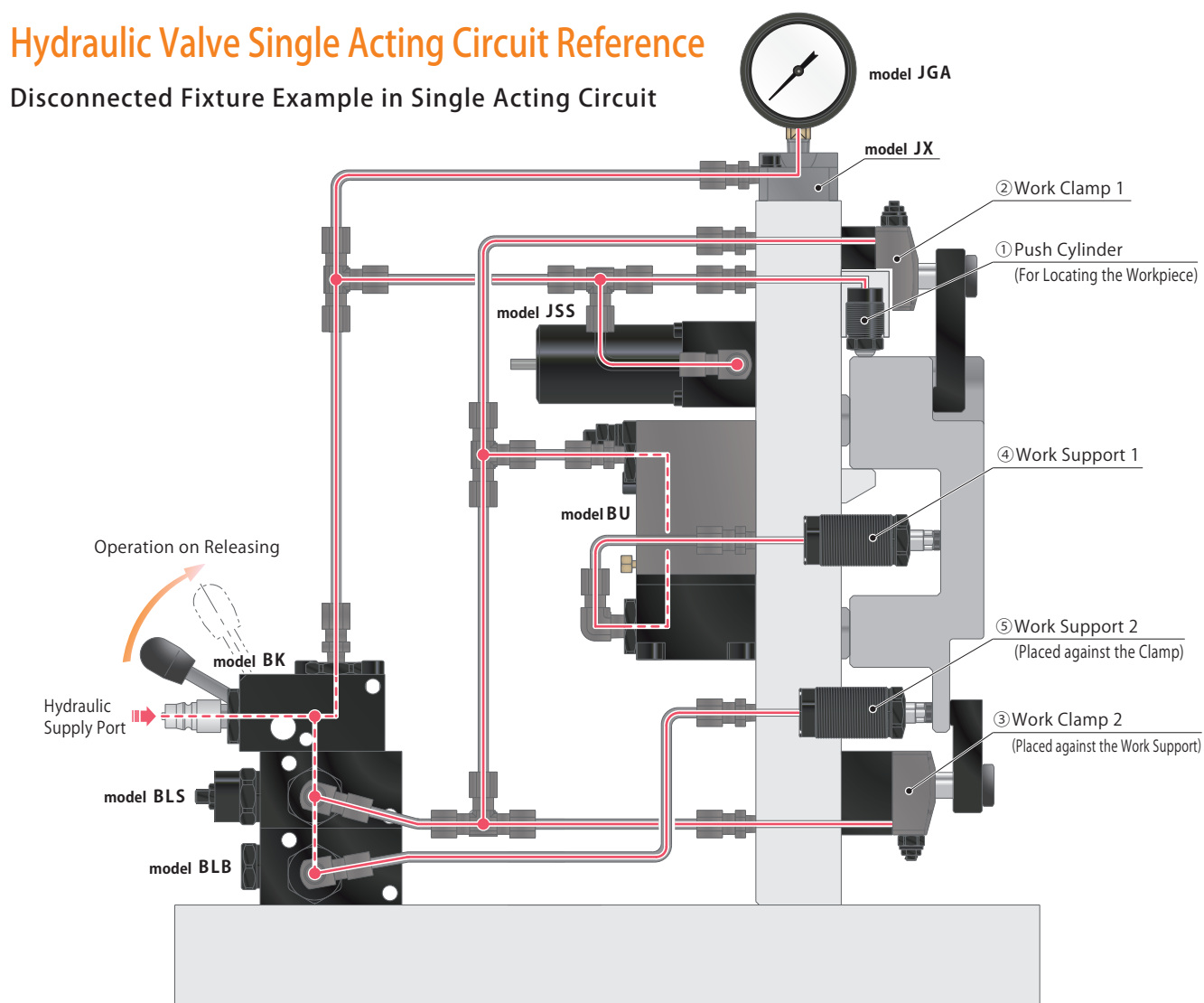
AC/AC-V

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.	
Releasing	Machining and/or Transferring	
	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



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

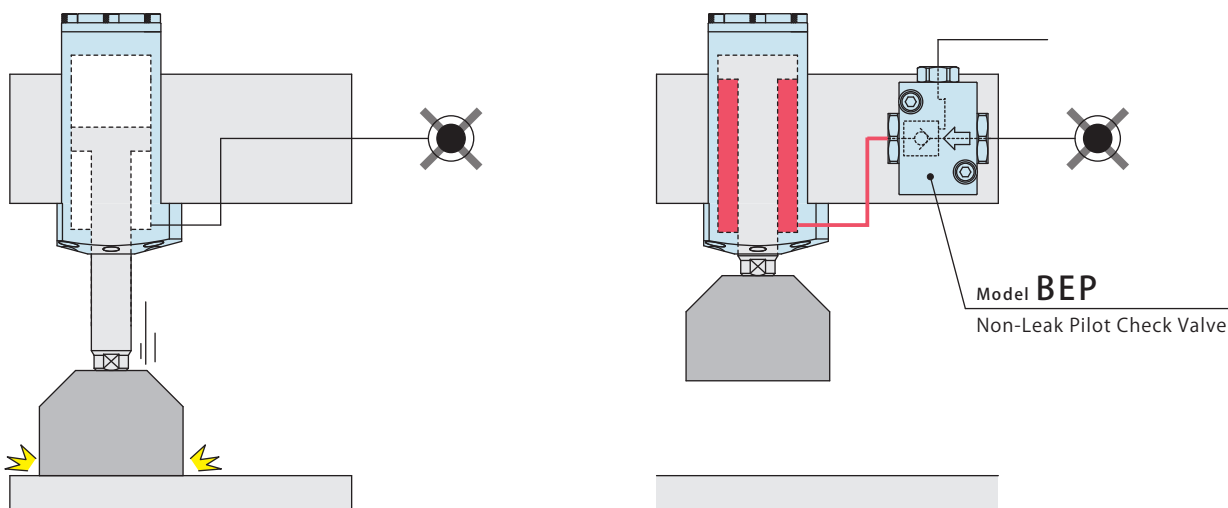
Action Description

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.	
Releasing	Machining, Transferring, etc.	
	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 valve and the non-leak pilot check valve can hold pressure even if power is lost, there is no reason for concern that the workpiece falls off.

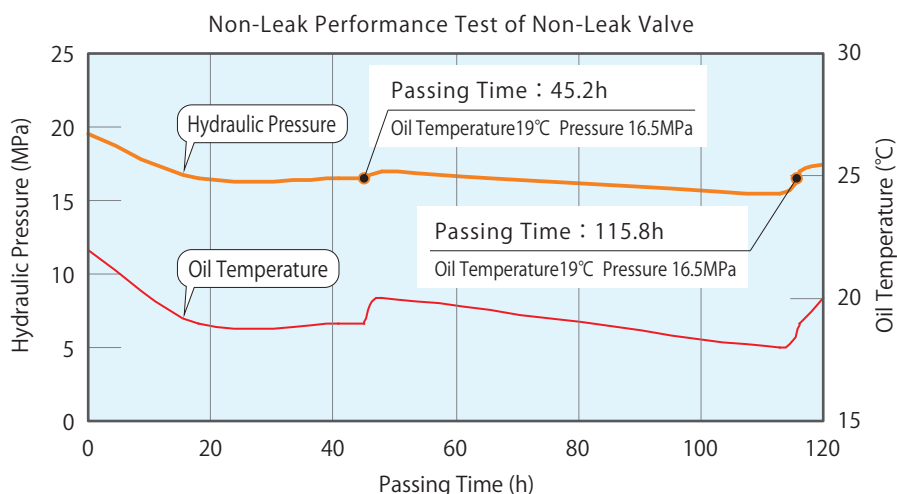


✗ The workpiece falls off when hydraulic power supply is cut off.

○ 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.

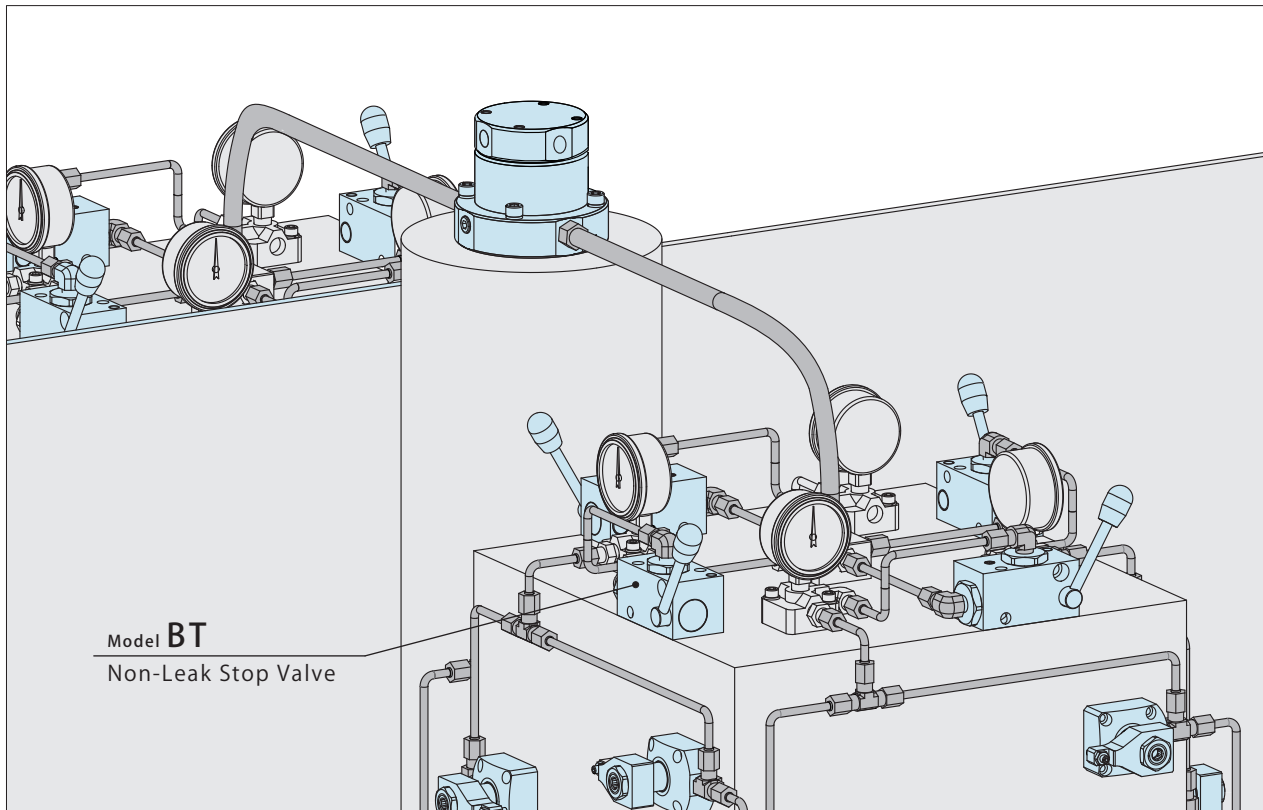
$$\frac{0.69\text{MPa}}{^{\circ}\text{C}}$$

(0.69MPa of Pressure Fluctuation
by 1°C Temperature Change)

One Touch Workpiece Set Up on 4-Surface Tombstone Fixture

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

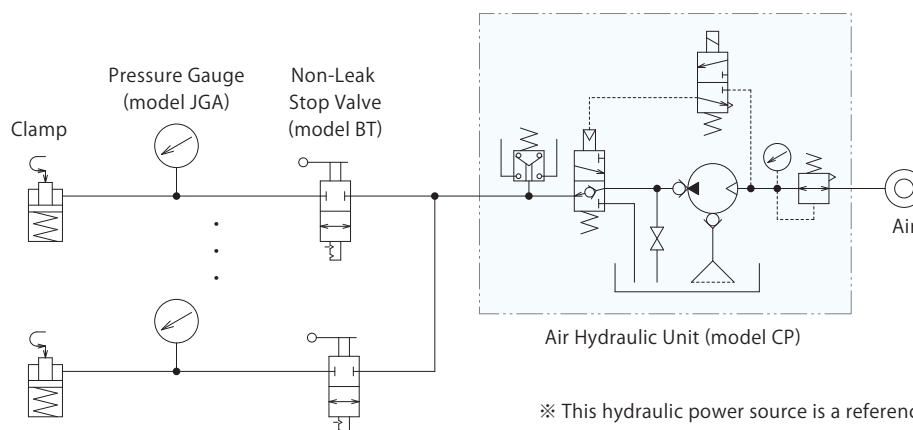
When changing a workpiece on 4-surface tombstone fixture : Installing the non-leak stop valve (Model : BT) on each surface enables to operate clamping/unclamping each surface and prevent a workpiece fall.



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.



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

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

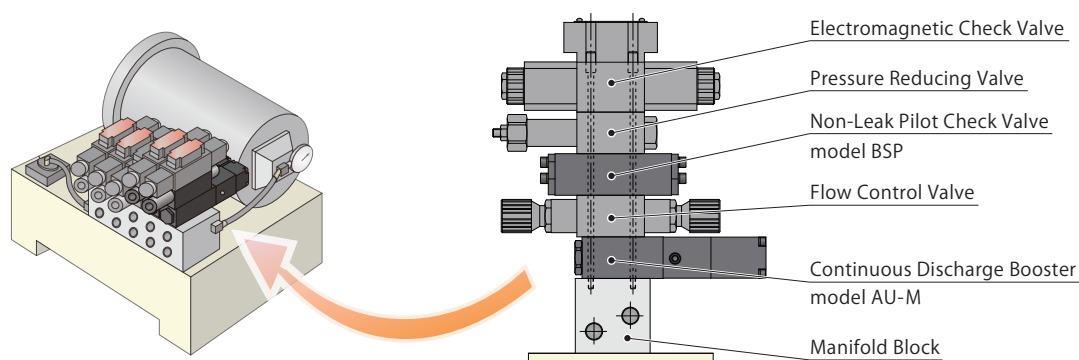
Partial Boosting (of Low-Pressure Hydraulic Power Source)

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

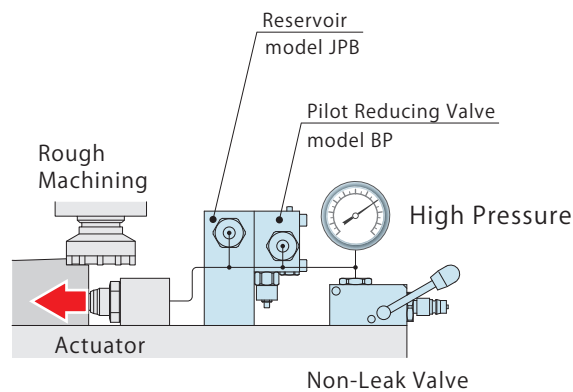
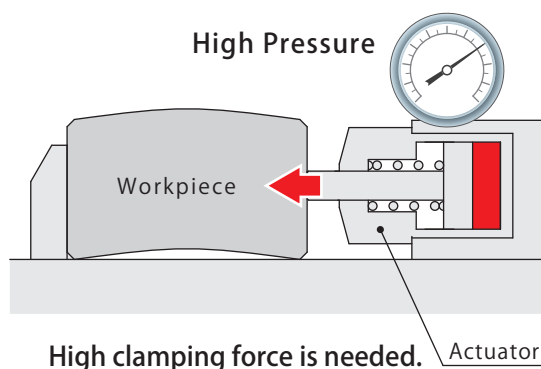


Integration of Rough Machining and Finish Machining

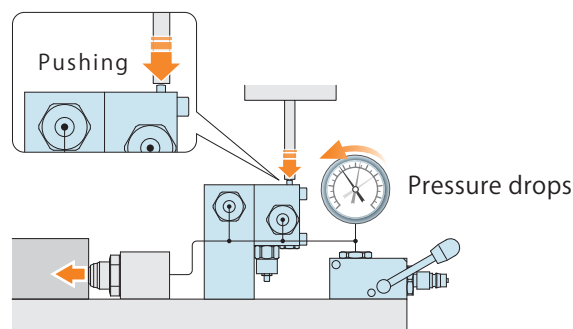
Controlling Clamping Force (Pressure) with Pilot Reducing Valve and Reservoir

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

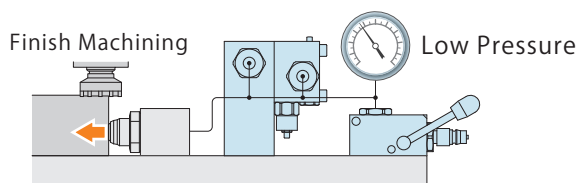
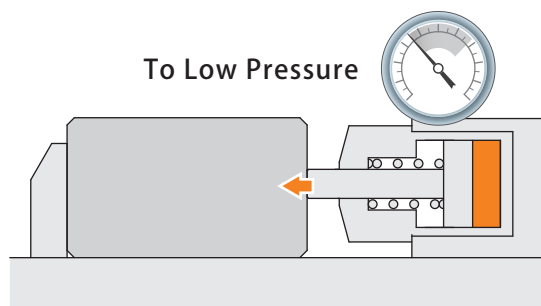


Before final machining, reduce the clamping force by reducing pressure.



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.

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

Air Sequence Valve

BWD

Hydraulic Non-Leak Coupler

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BGC/BGD
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BJP/BJS
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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

Non-Leak Valve

Single Acting Model

Model BK



Disconnects Fixture from Power Source and Securely Holds Outgoing Side Pressure

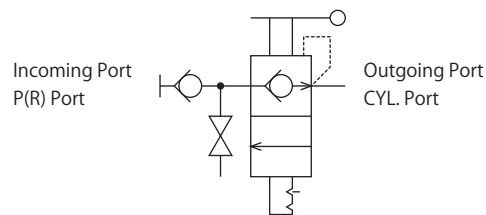
This valve reduces set up time and the number of circuits, and saves energy securely.

What is a Non-Leak Valve?

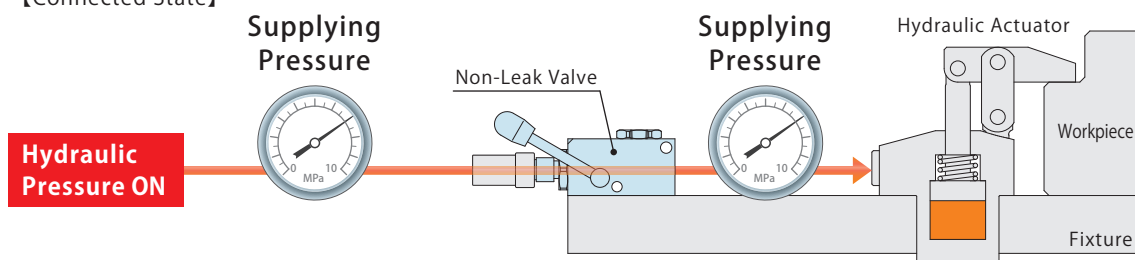
Non-leak valve maintains pressurized condition completely even when the fixture is detached from the power source.

It is able to disconnect from hydraulic pressure power source.

Circuit Symbol

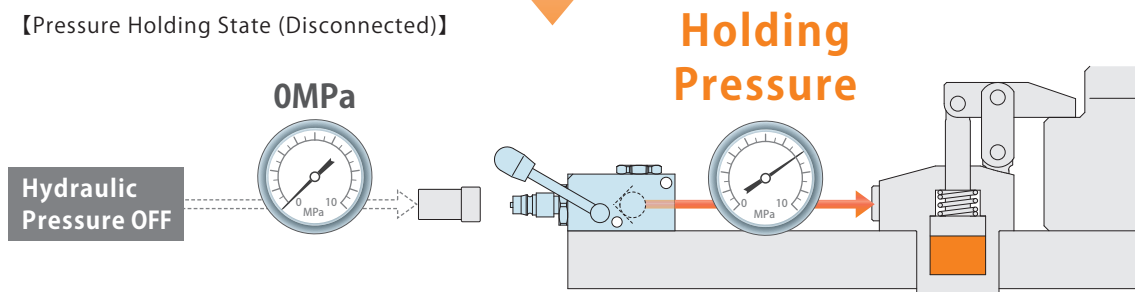


【Connected State】



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

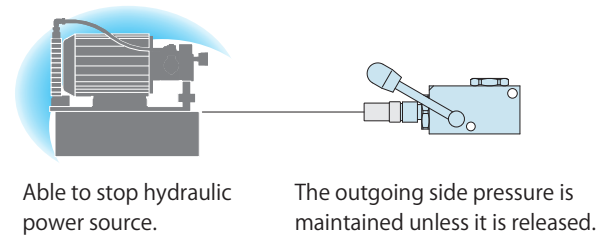
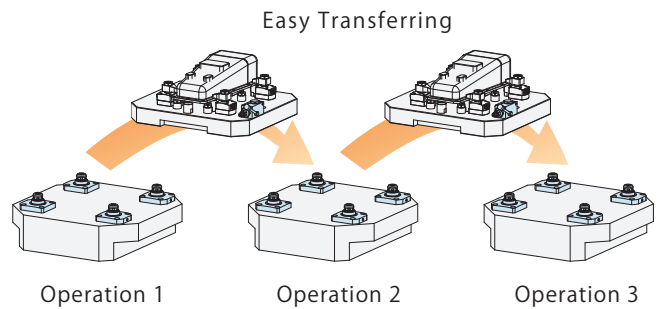
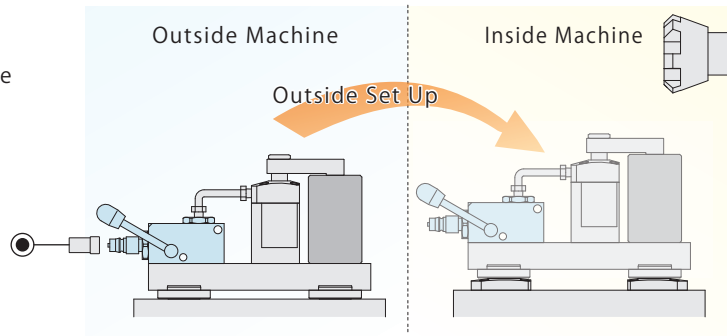
By holding the pressure, the number of circuits inside machine for fixture can be minimized.

● 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

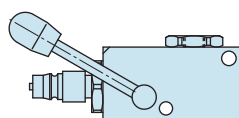
The outgoing side circuit hydraulic pressure is held unless the lever is moved. Even if you do not disconnect, you are saving energy by stopping the incoming hydraulic pressure. If a blackout occurs and the hydraulic pressure is shut off, the workpiece will not fall off due to the holding pressure.



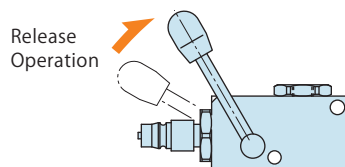
Action Description

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.	
Releasing	Machining and/or Transferring	
	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

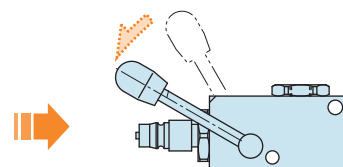


Before Release Operation
(Pressure Held Condition)



Release operation 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.

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
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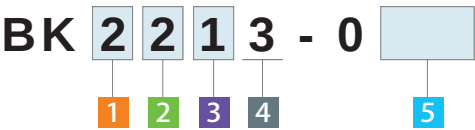
Auto Coupler
JTA/JTB
JTC/JTD
JVA/JVB
JVC/JVD
JVE/JVF
JNA/JNB
JNC/JND
JLP/JLS

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

Model No. Indication



1 Port Size

- 2 : Corresponding to Rc1/4
- 3 : Corresponding to Rc3/8 ※¹

4 Design No.

- 3 : Revision Number

2 Operating Pressure Range

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

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

- 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

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

- 1 : Right Hand Lever (Standard)
- 2 : Left Hand Lever ※¹

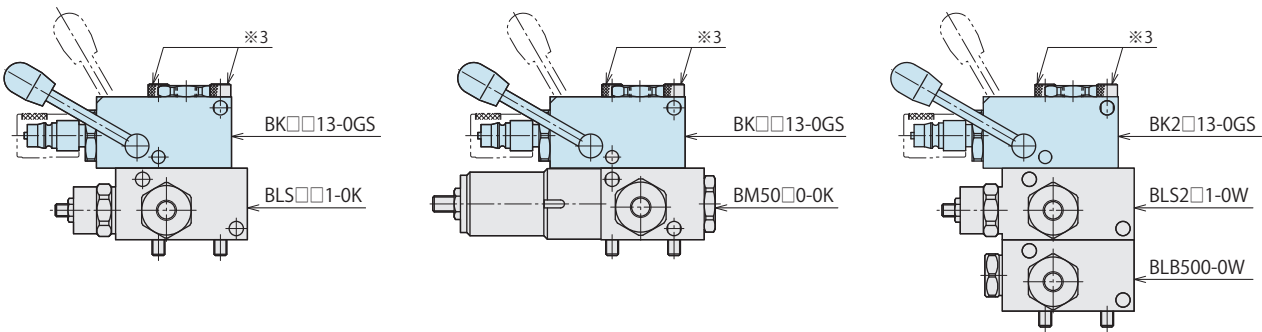
Note :
※¹. Build to order product. Feel free to ask us about delivery time when placing an order.

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 °C	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

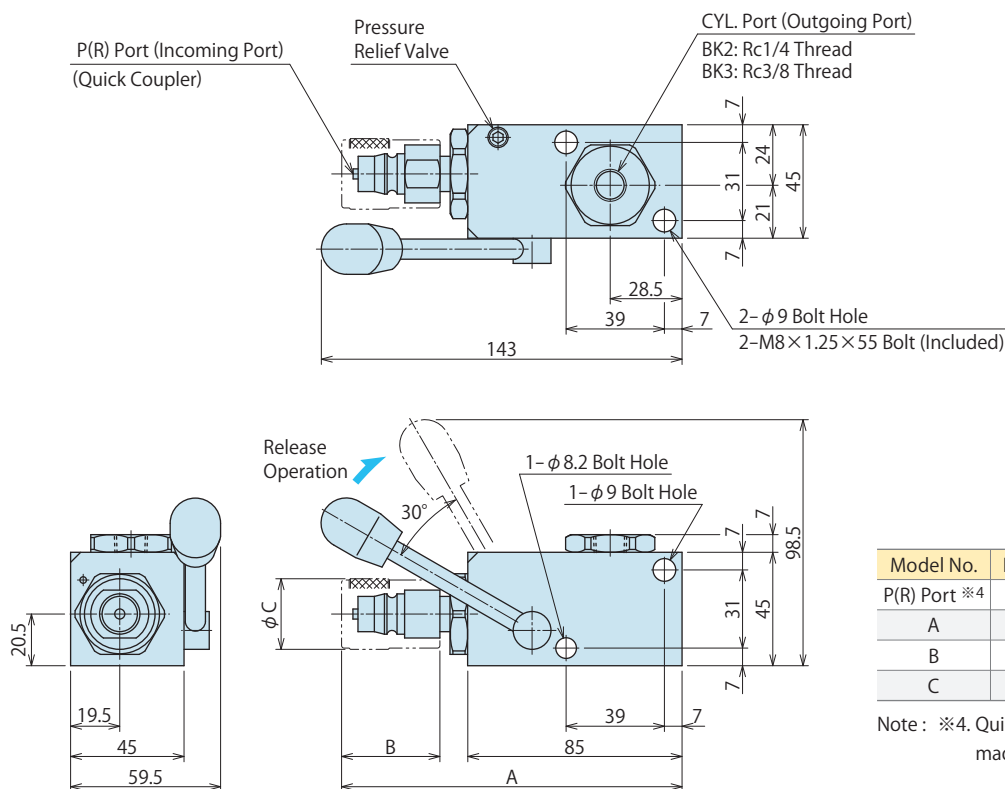


Note :
3. Bolts for combining valves are NOT included. Prepare them separately.

External Dimensions

BK□□13-0

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



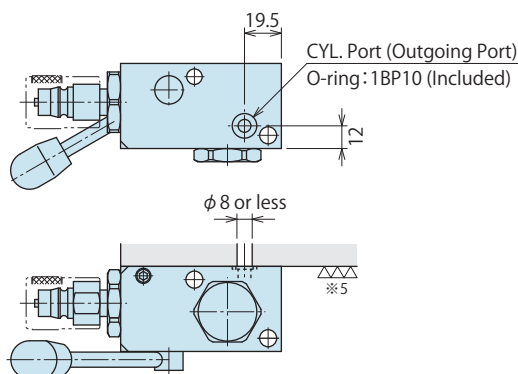
(mm)

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.

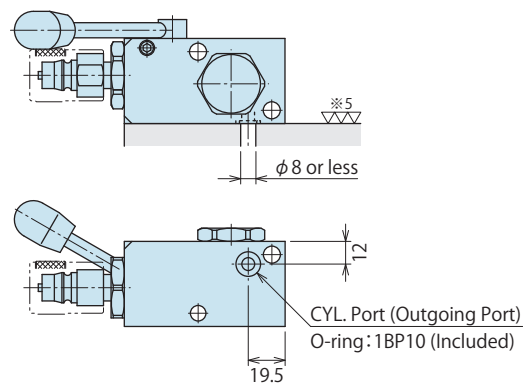
BK□□13-0GA

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



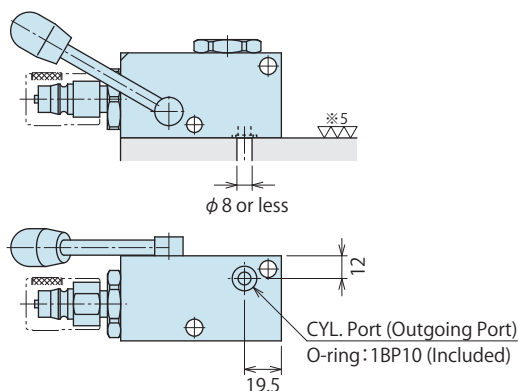
BK□□23-0GC

※ 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.

High-Power
Series

Pneumatic Series

Hydraulic Series

Valve / Coupler
Hydraulic UnitManual 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

Non-Leak Valve

Double Acting Model

Model BEQ



Pilot Check Method to Hold the Outgoing Side Pressure

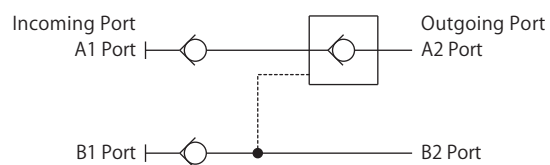
This valve reduces set up time and the number of circuits, and saves energy securely.

- 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.

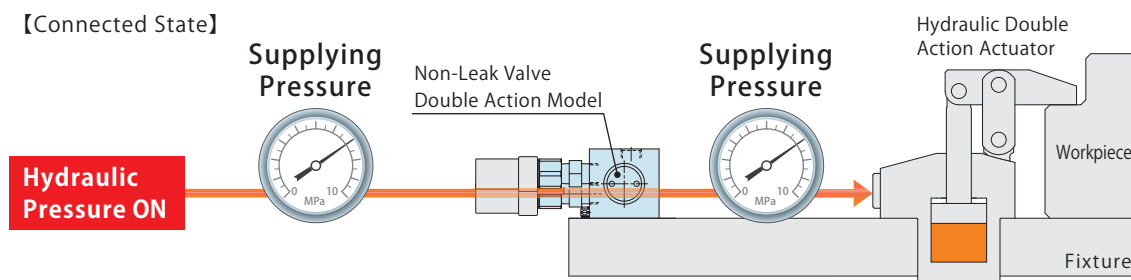
Fall prevention : In case of a blackout, it is possible to separate the hydraulic power source from fixture because the actuator holds pressure inside.

Circuit Symbol



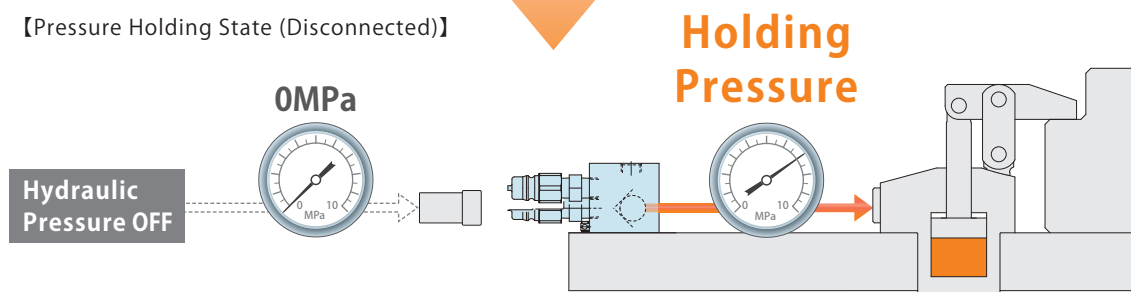
※ Filter is built in A1, A2.

【Connected State】



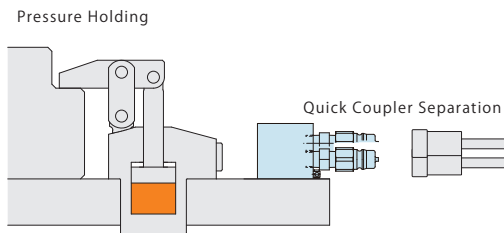
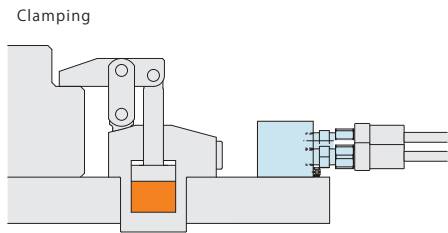
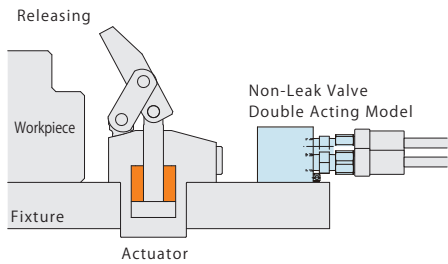
Holds the pressure even after coupler is disconnected.

【Pressure Holding State (Disconnected)】

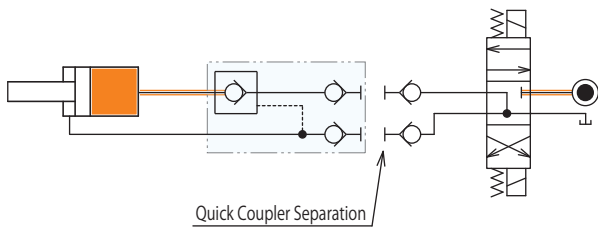
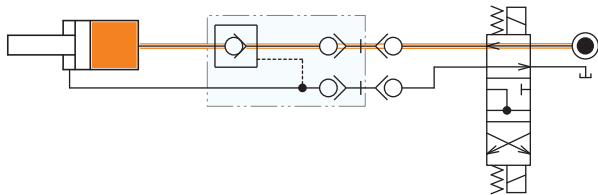
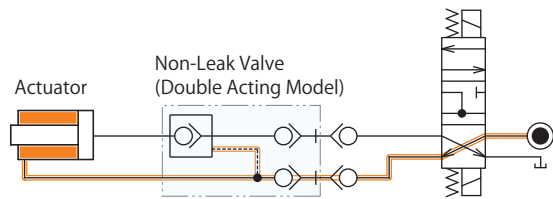


Action Description

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.

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

Model No. Indication

BEQ02 **2** **0** - 0

1
2
3

1 Operating Pressure Range

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

3 Piping Method ※CYL port position looking from A1 port

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

2 Design No.

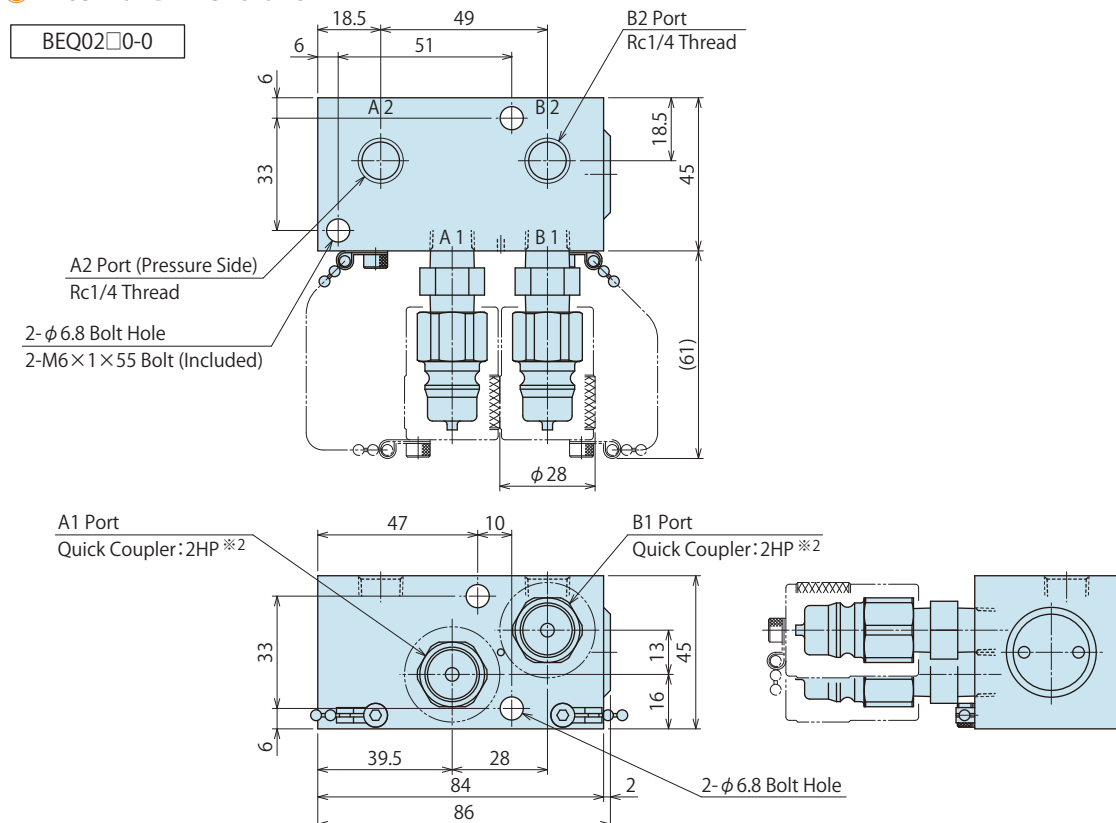
- 0 : Revision Number

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 °C	0 ~ 70	
Usable Fluid	General Hydraulic Oil Equivalent to ISO-VG-32	
Corresponding Coupler/Socket Form※1	2HS	
Weight kg	1.3	

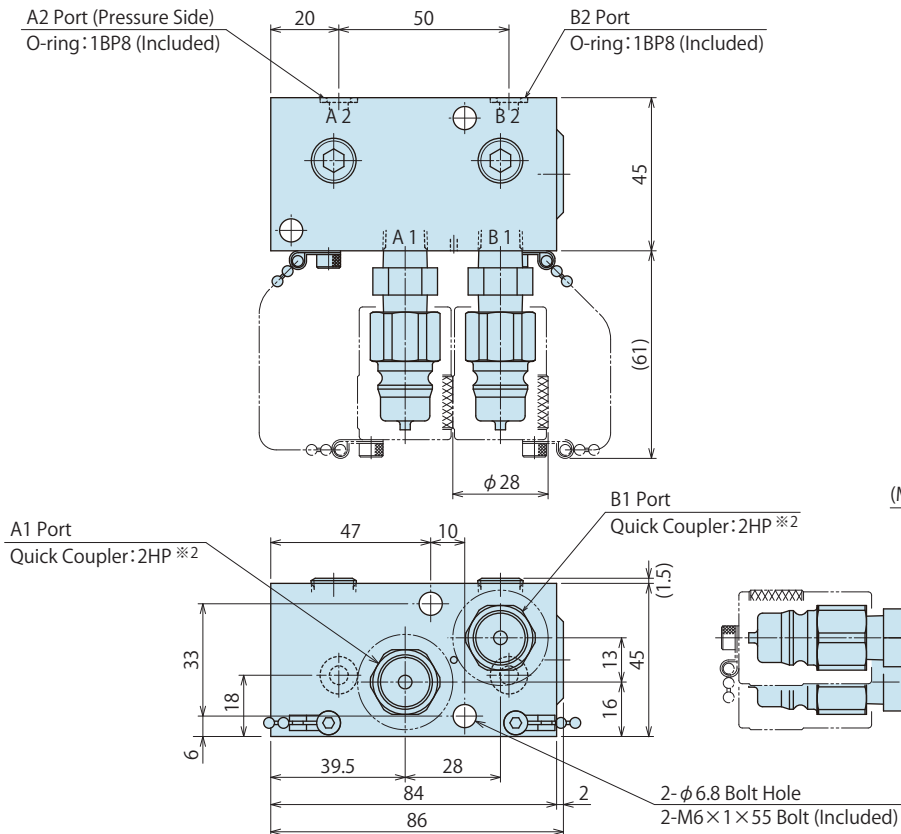
Note : ※1. Quick Coupler model number made by Nitto Koki.

External Dimensions

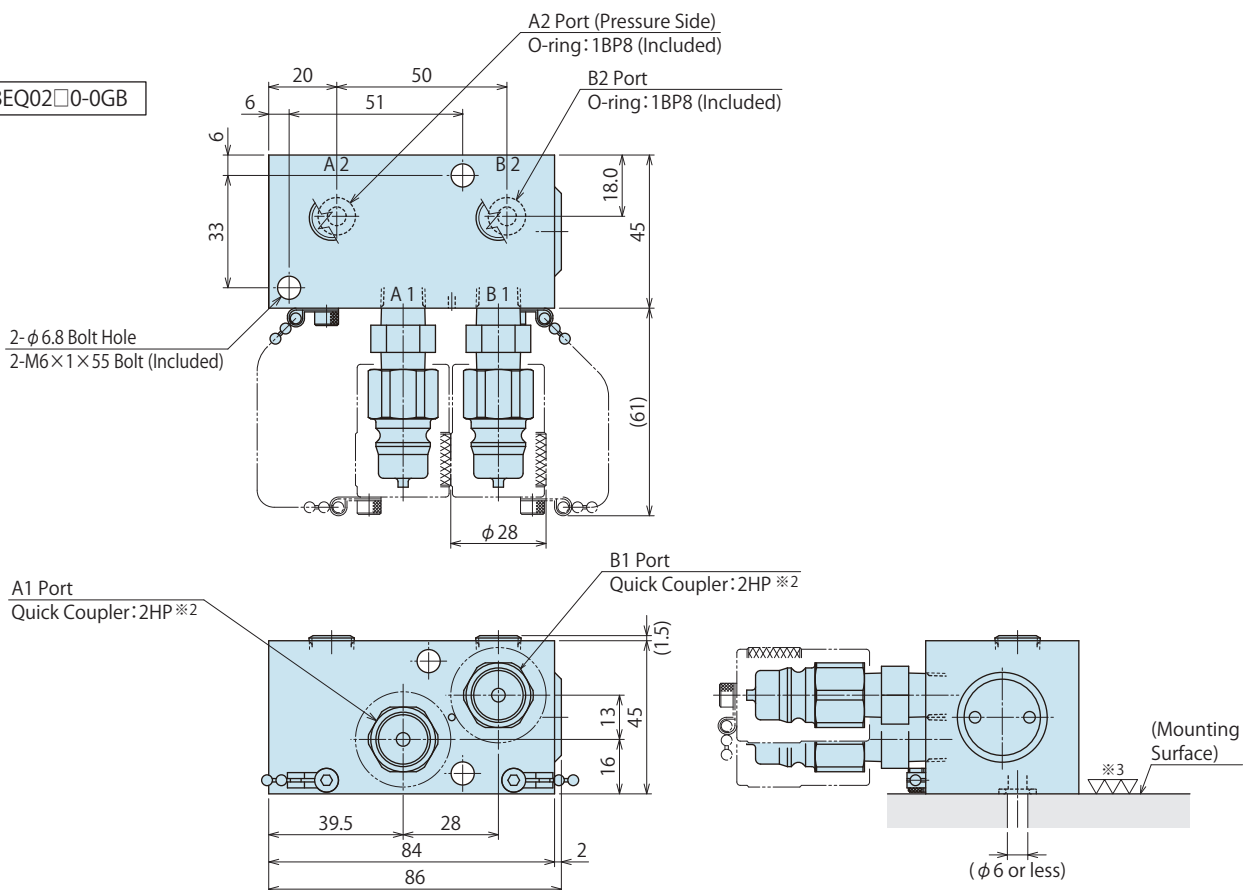


Note : ※2. Quick Coupler model number made by Nitto Koki.

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.

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/BS

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

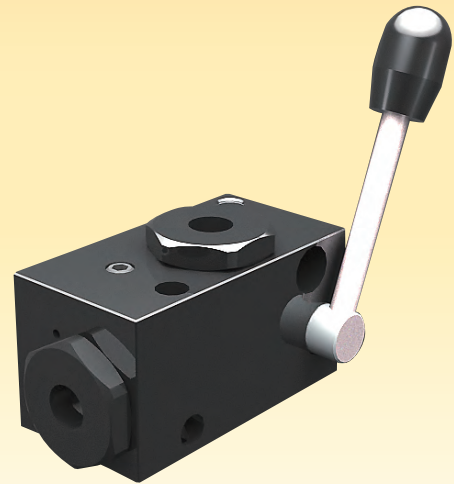
CC

AB/AB-V

AC/AC-V

Non-Leak Stop Valve (Manual Switching Valve)

Model BT



Manual Switching Valve to Maintain Pressure

Simple Operation

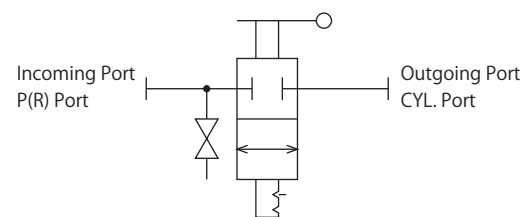
- What is a non-leak stop valve?

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.

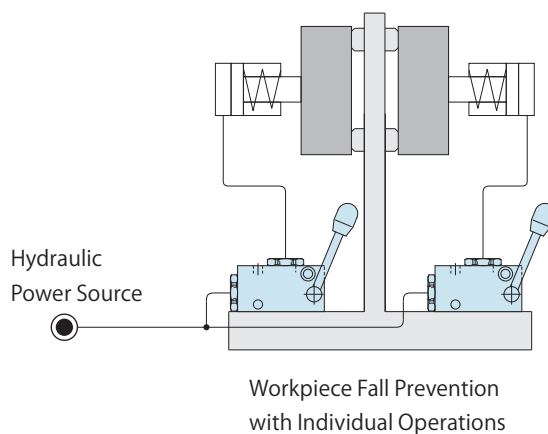
When the circuit is closed the outgoing side pressure is maintained to prevent a workpiece fall.

Circuit Symbol



Application Examples

Clamping operation is possible with each workpiece.



Model No. Indication

BT2 2 1 0 - 0

1 2

1 Operating Pressure Range

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

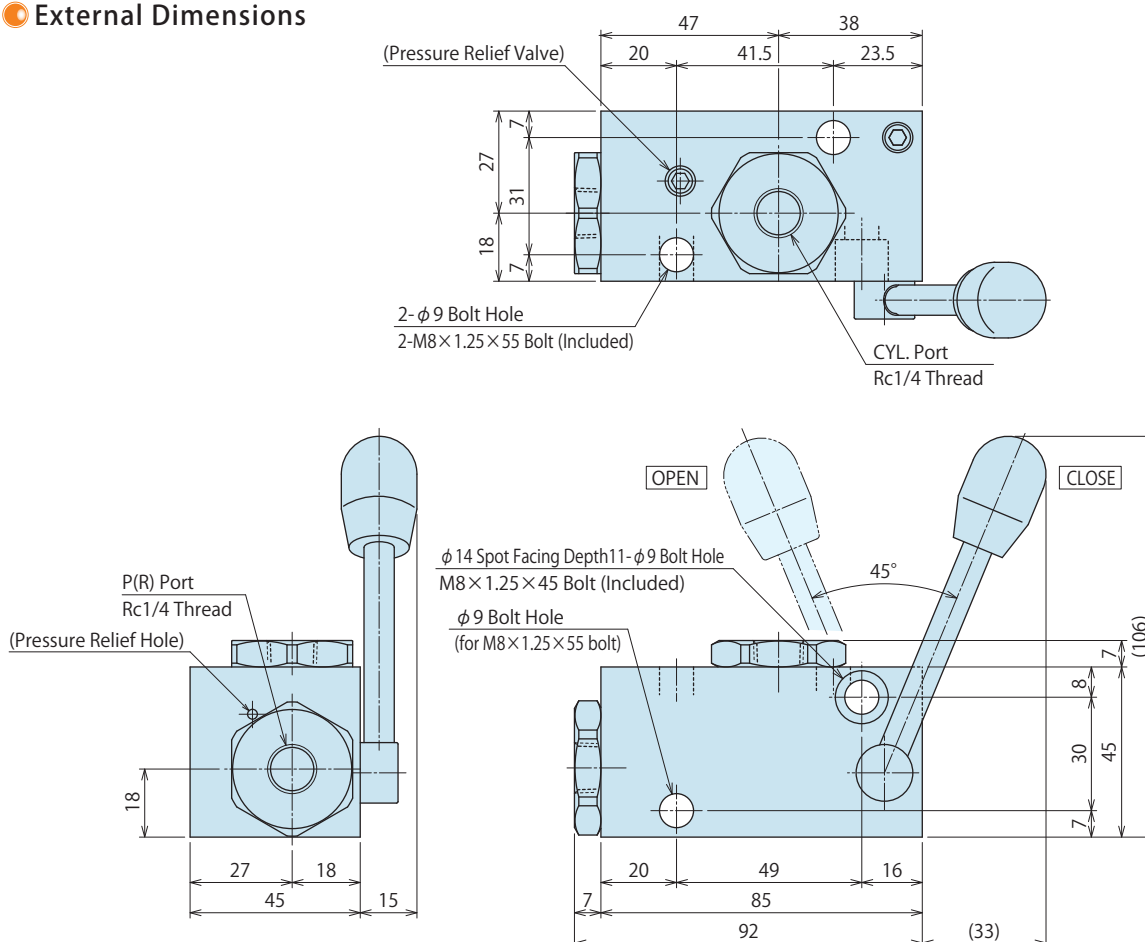
2 Design No.

- 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	°C	0 ~ 70	
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32	
Weight	kg	1.4	

External Dimensions



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

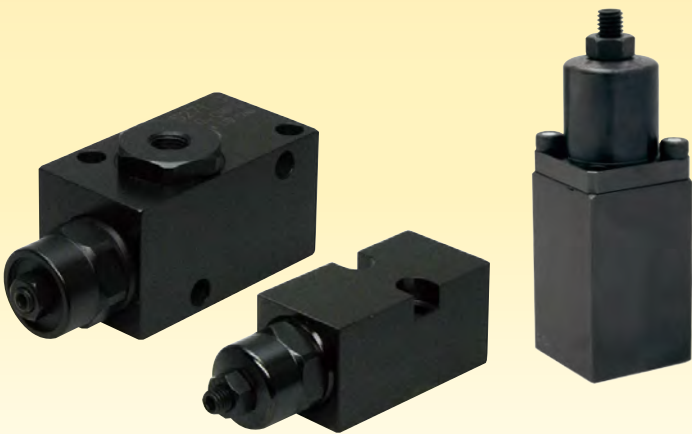
CC

AB/AB-V

AC/AC-V

Sequence Valve

Model **BLS**
 Model **BLG**
 Model **BLV**



NEW BLV newly added to the line-up

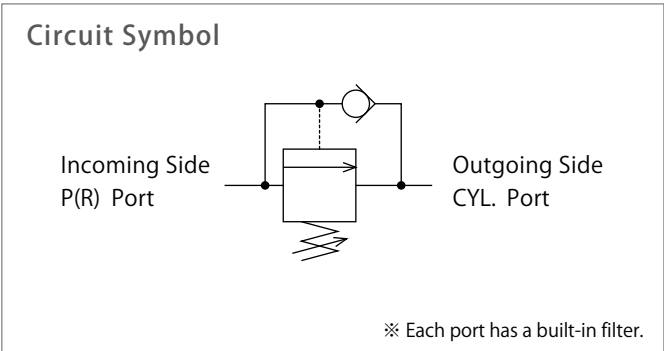
Activates multiple actuators in sequence,
 and reduces the number of ports required.

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.

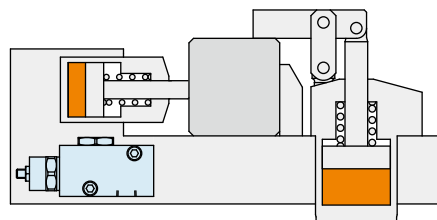
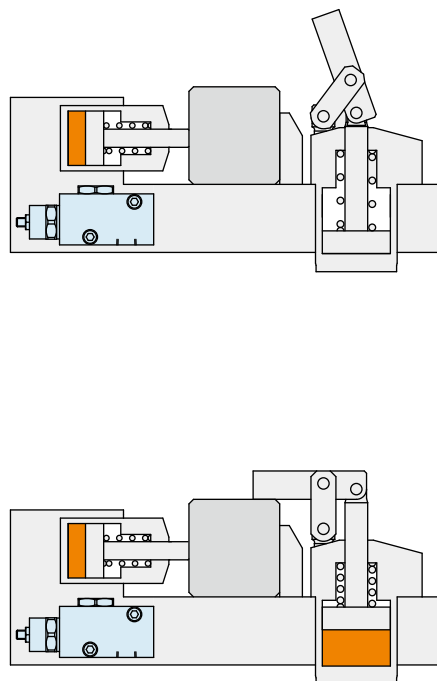
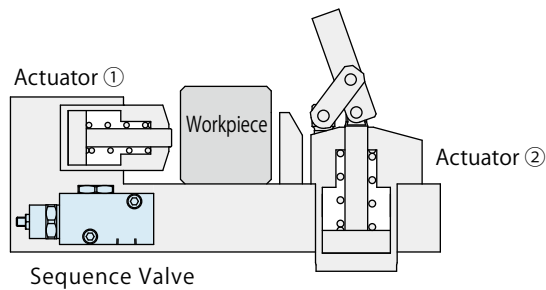
When incoming port pressure reaches the sequence setting pressure value, the pressure is supplied to outgoing port.



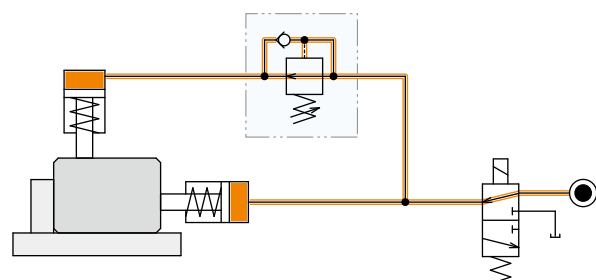
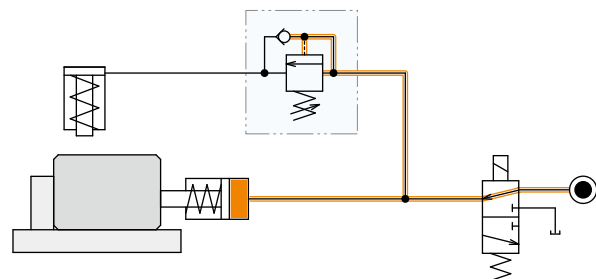
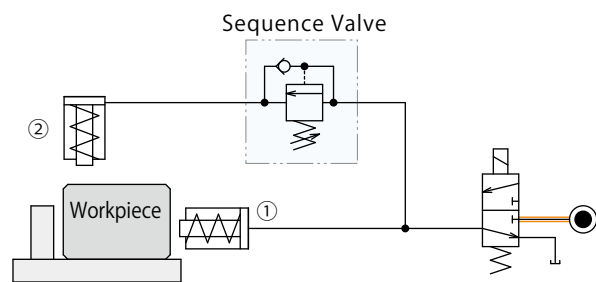
	 Model BLS → P.1221			 Model BLG → P.1223		 NEW Model BLV → P.1224	
Classification	Sequence Valve			Compact Sequence Valve		Vertical Mounting Compact Sequence Valve	
Sequence Operating Pressure Adjustable Range	1~4MPa	3~8MPa	8~20MPa	1~6MPa	5~18MPa	1~6MPa	5~18MPa
Operating Pressure Range	2~30MPa			2~35MPa	6~35MPa	2~35MPa	6~35MPa
Piping Method	Piping Option Manifold Option BK Connecting Option BK/BLB Connecting Option			Gasket Option		Gasket Option	

Action Description

Images



Circuit Example



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/BLV

BLB

JSS/JS

JKA/JKB

BMA/BMG/BMV

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

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.	
Releasing	Machining process, etc.	
	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

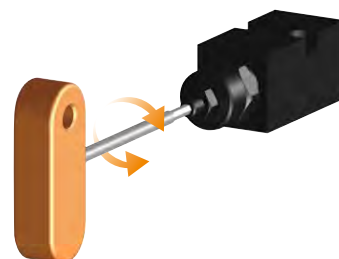
Set Pressure Change per Rotation

(MPa/Rev)

Model No.	BLS□31	BLS□51	BLS□71	BLG2830 BLV2830	BLG2860 BLV2860
Set Pressure Change per Rotation	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. Option W (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

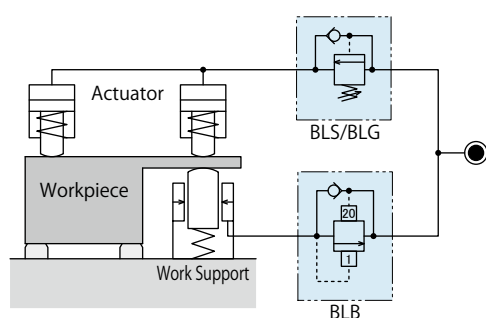
- ※ If set pressure is determined by customer, indicate it within "Blank".
- ※ When shipping, the pressure is set as the minimum pressure indicated in the specification "Actuating Pressure Range".
- ※ For pressure adjustment, please refer to "Sequence Valve Pressure Setting Procedure" included along 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	°C	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

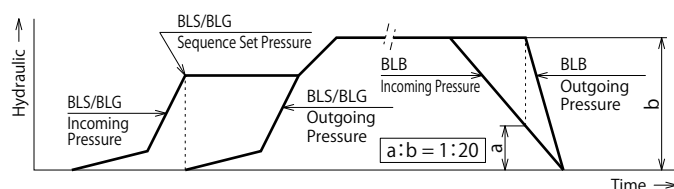


Operating Procedure (When clamping)

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.

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 option G (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.

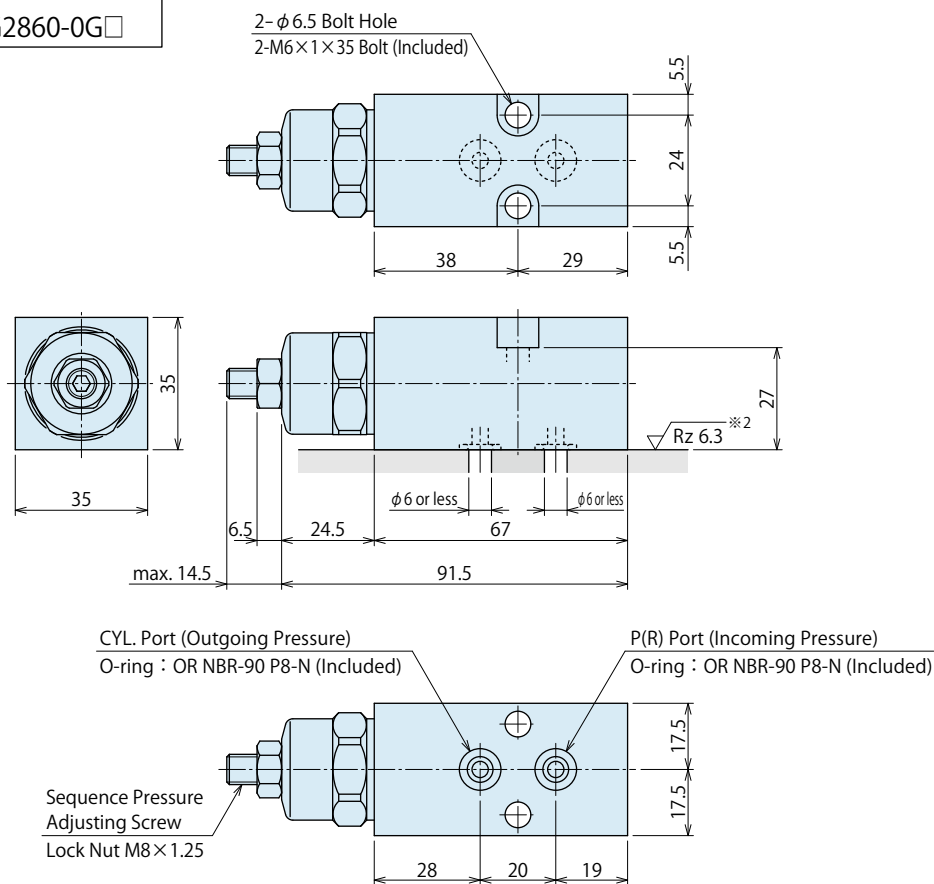
Specifications

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 supply flow rate on the incoming pressure side is excessively high, proper sequential operation may not be achieved.
 Install a flow control valve with a check valve just before the port on the incoming pressure side, or adjust the flow rate at the hydraulic power source.
 2. Please refer to BLS page for the example of a combination of BLG and BLB.

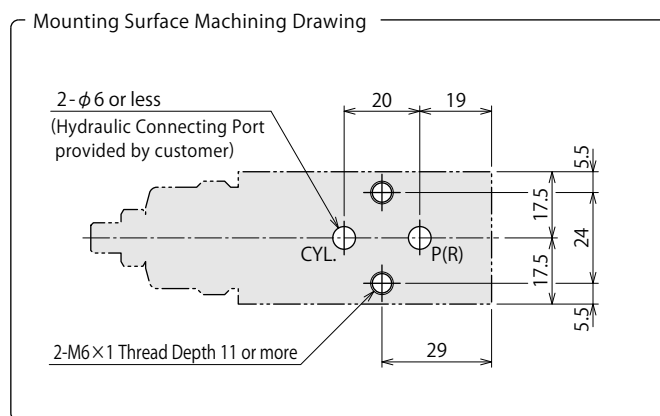
External Dimensions

BLG2830-0G□
BLG2860-0G□



Note :

※2. The mounting surface (O-ring sealing surface) should be flat with a maximum height roughness of Rz 6.3 or better.



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/BLV

BLB

JSS/JS

JKA/JKB

BMA/BMG/BMV

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

Model No. Indication

BLV 28 **6** **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 BLV 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)**

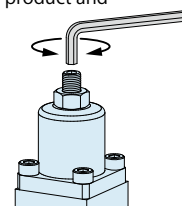
Blank : Pressure Setting Free Option

- ※ 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 the following "Adjustable Set Pressure".

Adjustable Set Pressure

(MPa/Rev)

Model No.	BLV2830	BLV2860
Set Pressure Change per Rotation	1.0	2.8



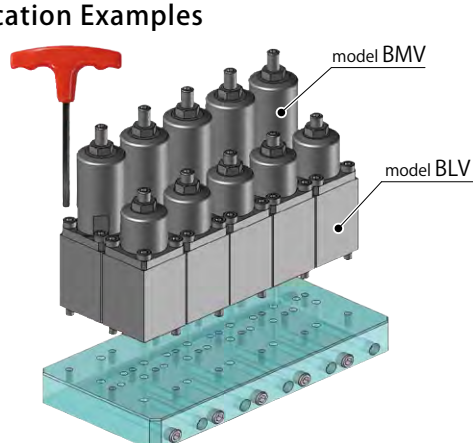
- Notes : 1. The set pressure value is set according to the model code.
 2. Pressure increases by turning clockwise and decreases by turning anti-clockwise.

Specifications

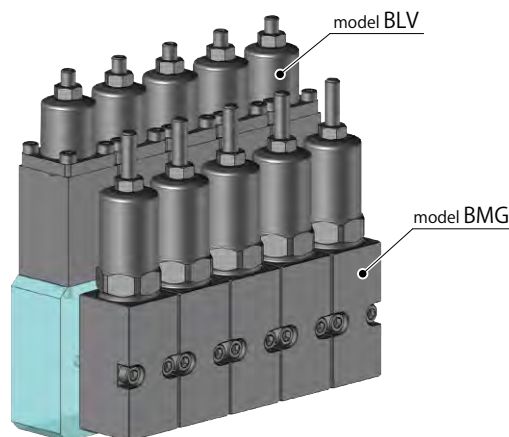
Model No.		BLV2830-0G□	BLV2860-0G□
Sequence Operating Pressure Adjustable Range	MPa	1.0 ~ 6.0	5.0 ~ 18.0
Operating Pressure Range	MPa	2.0 ~ 35.0	6.0 ~ 35.0
Cracking Pressure	MPa	0.01	
Min. Passage Area	mm ²	P(R) → CYL. : 8.7 CYL. → P(R) : 10.2	
Operating Temperature	°C	0 ~ 70	
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32	
Weight	kg	0.6	

Notes : 1. If the supply flow rate on the incoming pressure side is excessively high, proper sequential operation may not be achieved. Install a flow control valve with a check valve just before the port on the incoming pressure side, or adjust the flow rate at the hydraulic power source.

Application Examples



Manifold jig example using model BLV and model BMV.
 The valves are concentrated to slim down the entire jig.



Manifold jig example using model BLV and model BMG.
 This unit combines both horizontal and vertically mounted valves.

Pressure Balance Valve

Model BLB



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

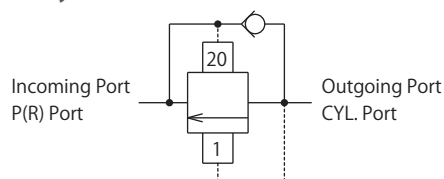
This valve prevents the deformation of workpiece when the work support releases.

• 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.

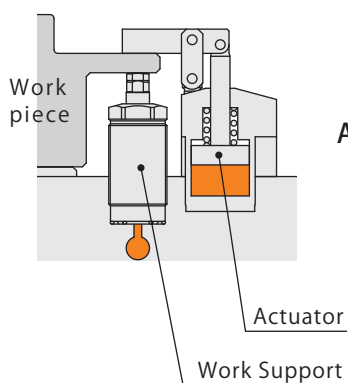
When releasing, the incoming side pressure reduces around 1/20 of outgoing side pressure. Then outgoing side pressure start to reduce.

Circuit Symbol

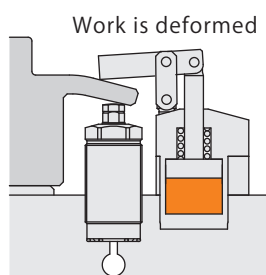


※ CYL. port comes with a built in filter.

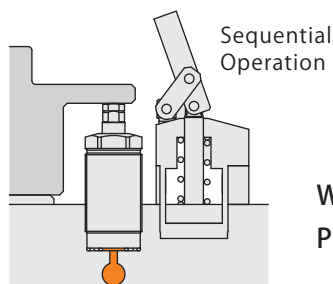
Since a filter is not built in the P(R) port, please sufficiently perform flushing of piping and fitting to prevent foreign substances such as cutting chips from entering the circuit.



At Releasing



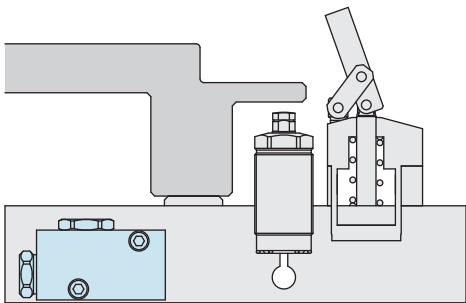
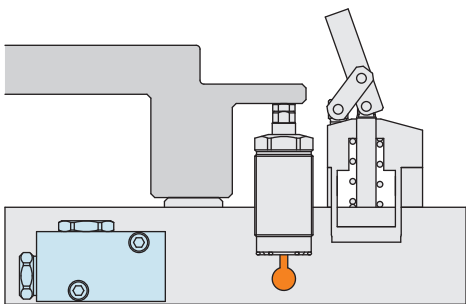
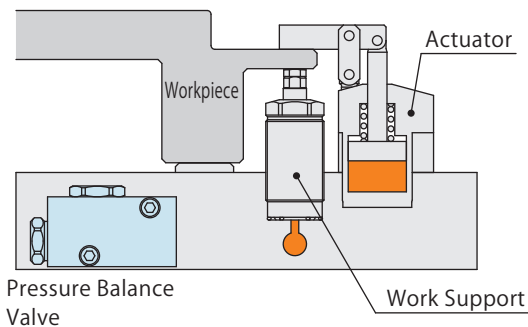
Without
Pressure Balance Valve



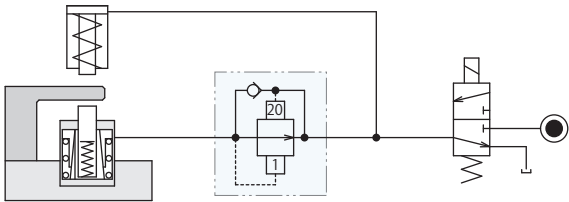
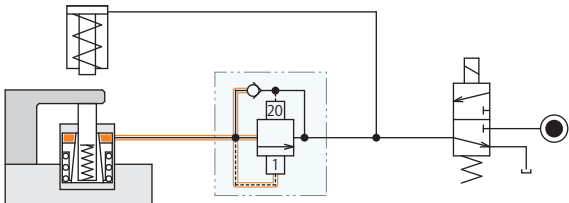
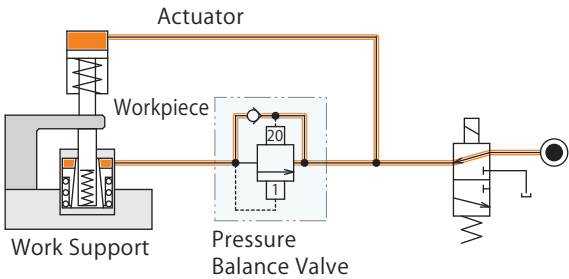
With
Pressure Balance Valve

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.	
Releasing	Machining process	
	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.	

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

Model No. Indication

BLB500 0 - 0

1 2

1 Design No.

0 : Revision Number

2 Piping Method

Blank : Piping Option (Rc Thread) (Standard)

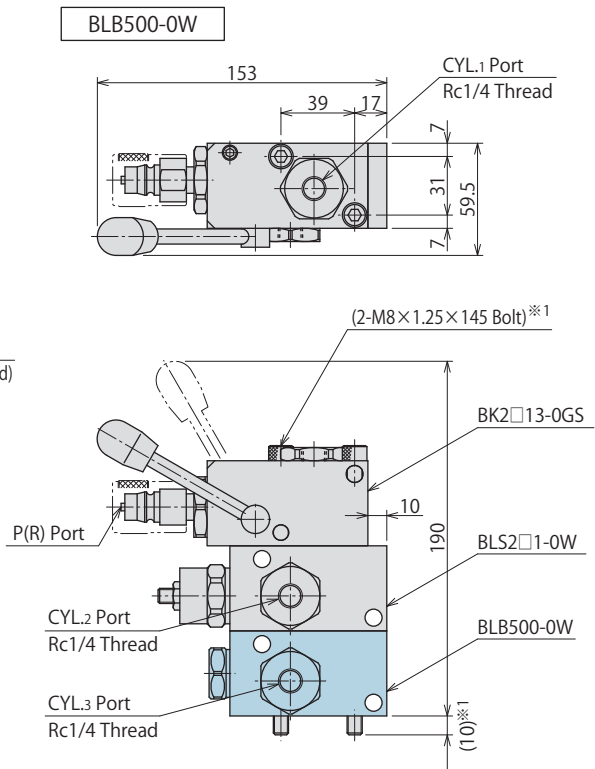
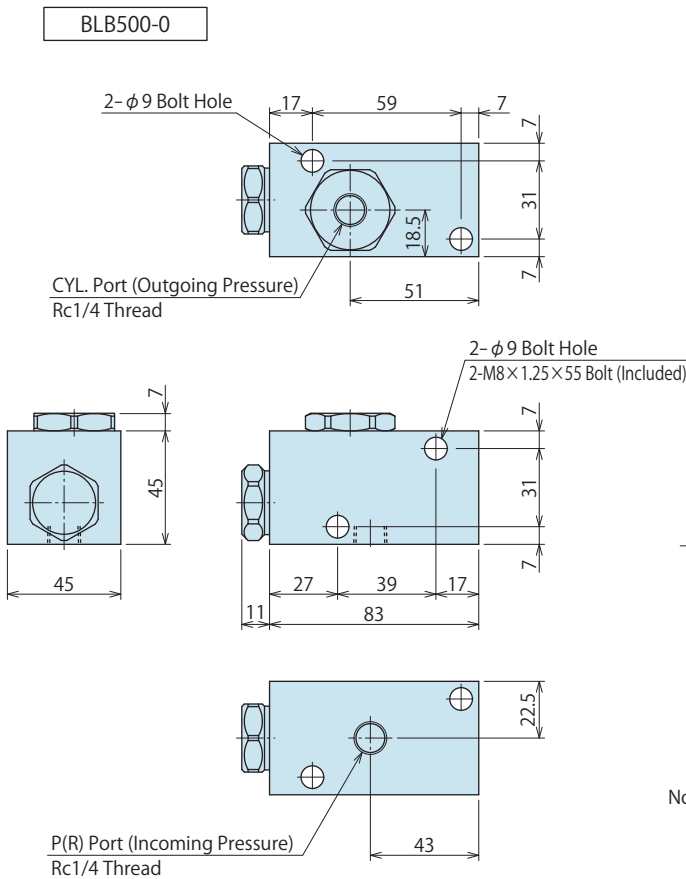
W : BK/BLS Connecting Option

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	°C	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



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
High-Power
Series

Pneumatic Series

Hydraulic Series

Valve / Coupler
Hydraulic UnitManual 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

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.

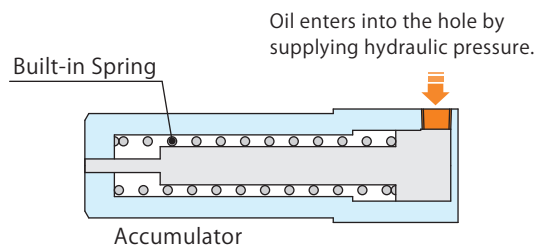
	 Model JSS → P.1231	 Model JS → P.1235
Classification	Spring Accumulator for Low Pressure	Spring Accumulator for High Pressure
Standard Operating Pressure	2/3/4/5/6/7 MPa	14/25 MPa

Action Description

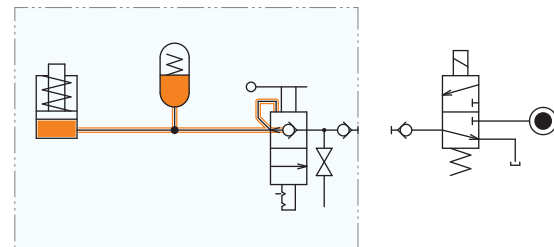
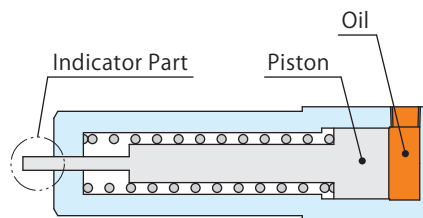
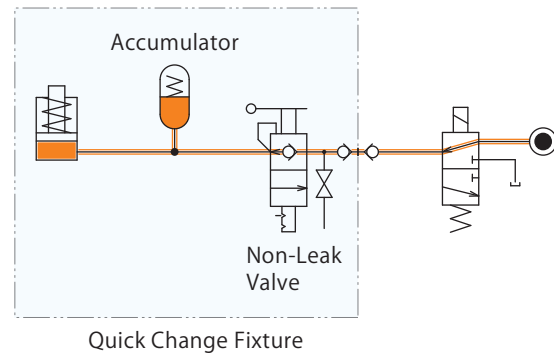
The Image of an Internal Accumulator

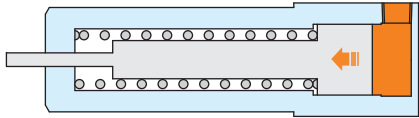
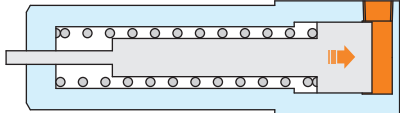
※ This is a simplified drawing.

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.

$$\frac{0.69\text{MPa}}{^{\circ}\text{C}} \quad \left(0.69\text{MPa of Pressure Fluctuation by } 1^{\circ}\text{C Temperature Change} \right)$$

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

Model No. Indication



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	: 2.5cm ³
05	: 5.0cm ³
10	: 10.0cm ³

3 Design No.

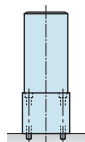
0	: Revision Number
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4 Mounting Direction

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

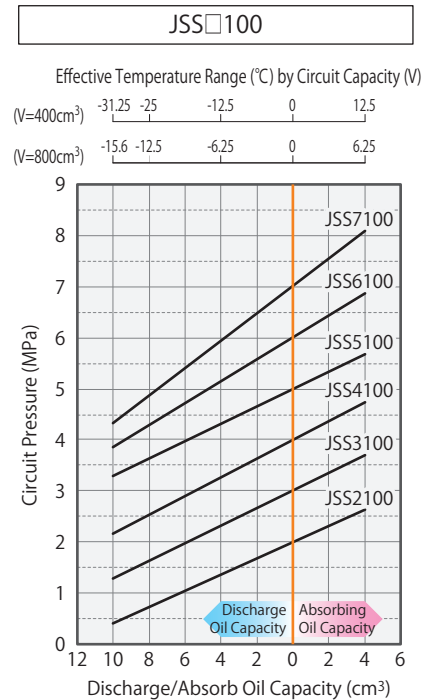
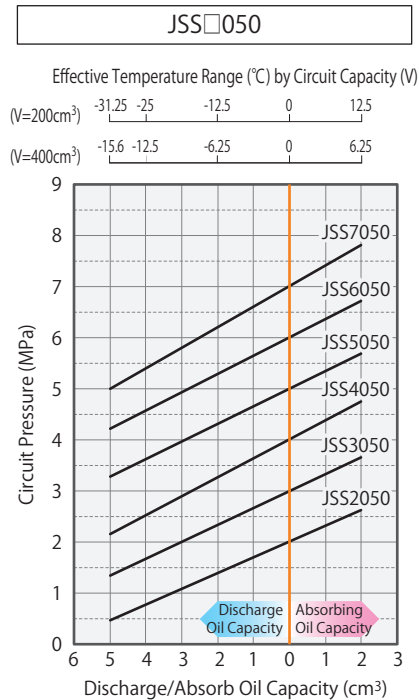
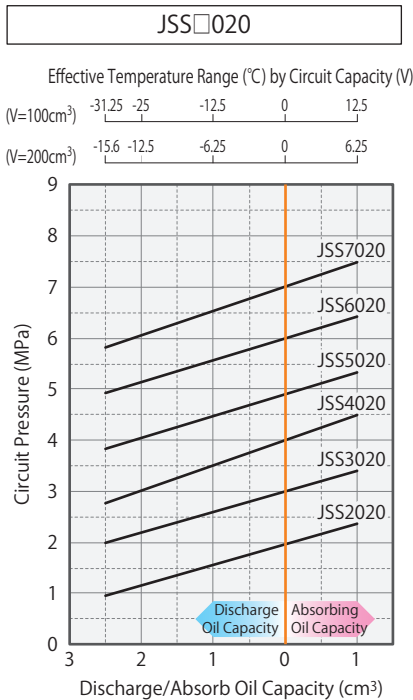
Specifications

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 cm ³	2.5	5.0	10.0	2.5	5.0	10.0	2.5	5.0	10.0
Absorbing Oil Capacity cm ³	1.0	2.0	4.0	1.0	2.0	4.0	1.0	2.0	4.0
Compression Factor (β) ^{*1} MPa/cm ³	0.40	0.31	0.16	0.40	0.33	0.17	0.49	0.37	0.18
Operating Temperature °C	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 cm ³	2.5	5.0	10.0	2.5	5.0	10.0	2.5	5.0	10.0
Absorbing Oil Capacity cm ³	1.0	2.0	4.0	1.0	2.0	4.0	1.0	2.0	4.0
Compression Factor (β) ^{*1} MPa/cm ³	0.43	0.34	0.17	0.43	0.36	0.21	0.48	0.40	0.27
Operating Temperature °C	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



How to read the Characteristic Diagram

Requirements (Reference)

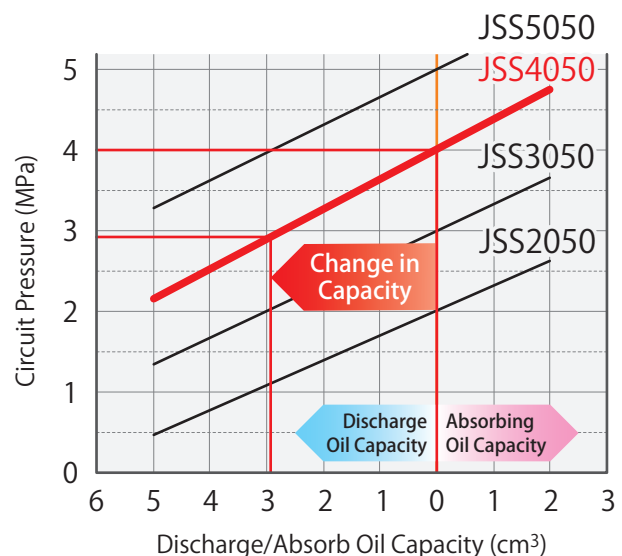
Clamp Used	LHA0650×4 units (Lock Cylinder Capacity for each : 26.7cm³)
Piping	Inner Diameter φ6×2m (Pipe Capacity per 1m : 28.3cm³)
Valve Capacity	20cm³
Temperature Change : ΔT	-20°C
Operating Pressure : P	4.0MPa
Thermal Expansion Coefficient : α	8×10 ⁻⁴

Selection Method

- Calculate Fixture Circuit Capacity (V)
Clamp Capacity + Pipe Capacity + Valve Capacity
 $V = (26.7 \times 4) + (28.3 \times 2) + 20 = 183.4 \text{ cm}^3$
- Calculate Change in Capacity (ΔV)
Fixture Circuit Capacity (V) x Thermal Expansion Coefficient (α)
x Amount of Temperature Change (ΔT)
 $\Delta V = 183.4 \times (8 \times 10^{-4}) \times (-20) = -2.93 \text{ cm}^3$
- 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].)
- Check the Accumulator Characteristics (Graph on the right)
Pressure after Temperature Change (-20°C) : 2.92MPa
Residual Oil Discharge Margin : 2.07cm³
- Select the mounting direction, piping method and piping direction.

Note :

- 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】



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/BS

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

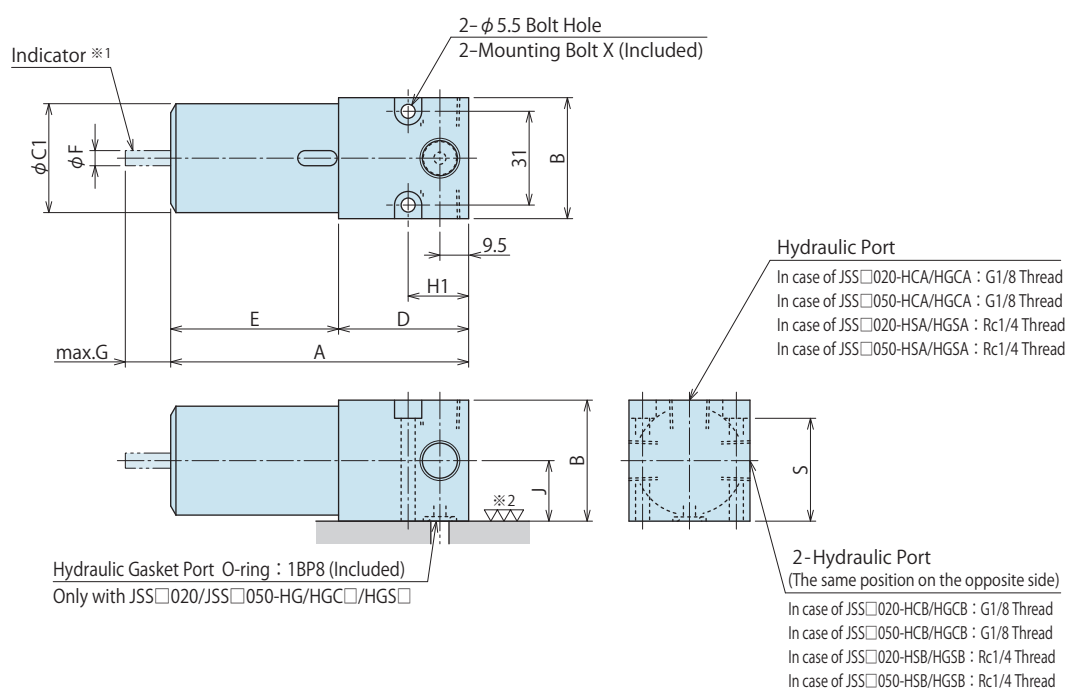
CC

AB/AB-V

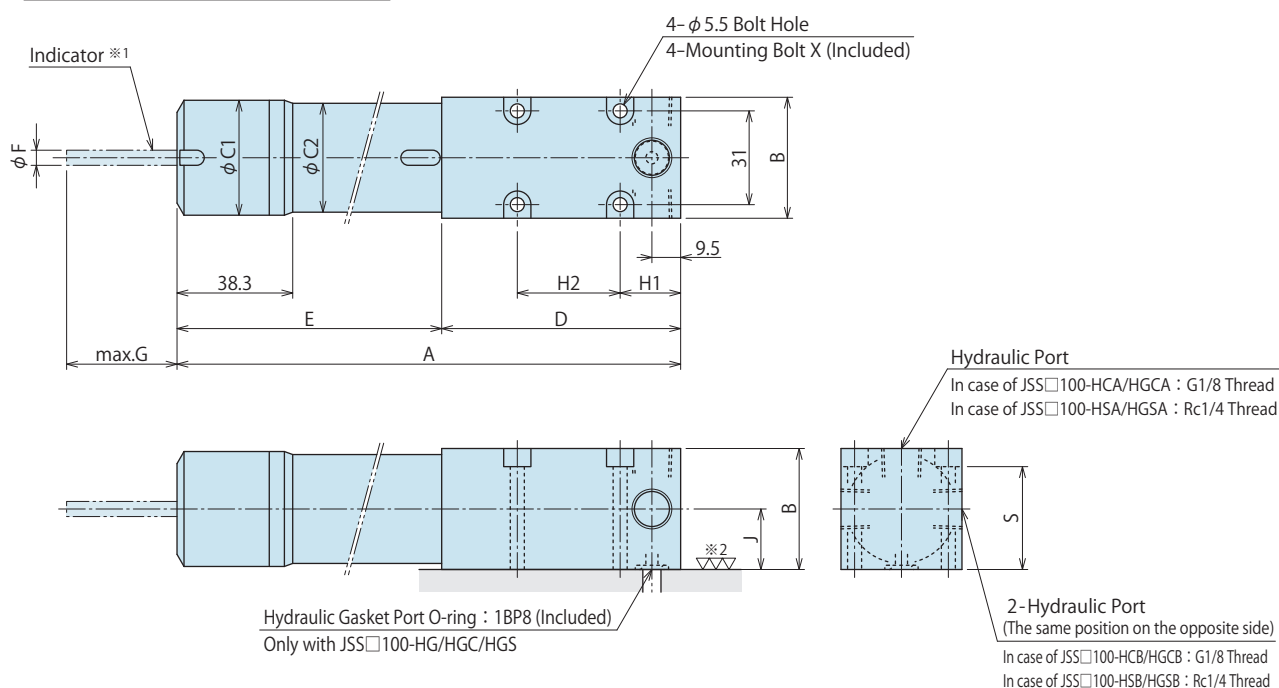
AC/AC-V

External Dimensions

JSS□020-H□□、JSS□050-H□□

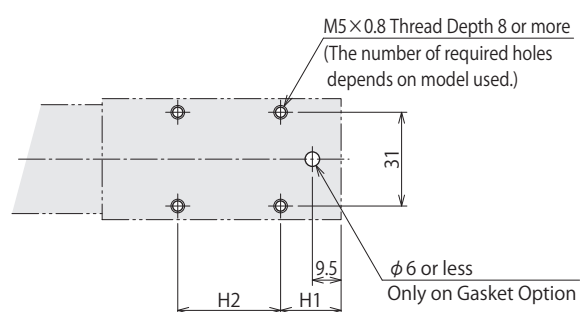


JSS□100-H□□

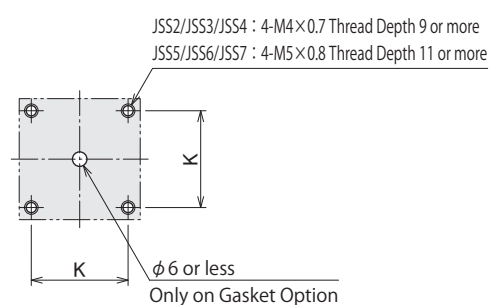


Machining Dimensions of Mounting Area

JSS□□0-H□□

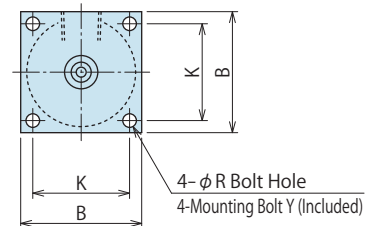
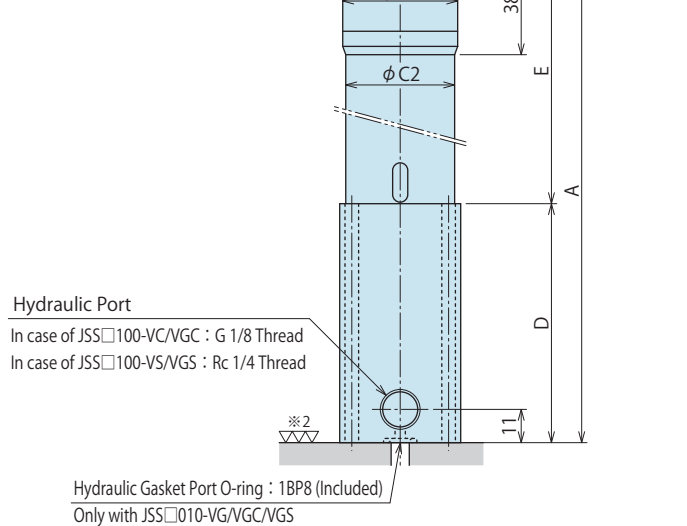
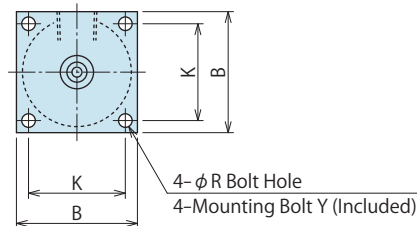
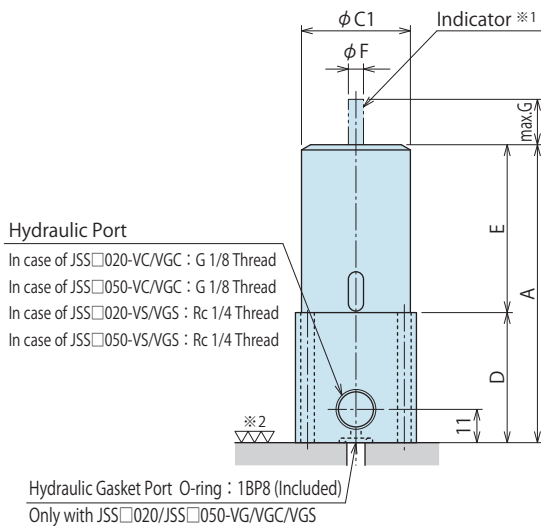


JSS□□0-V□



JSS□020-V□、JSS□050-V□

JSS□100-V□

High-Power
Series

Pneumatic Series

Hydraulic Series

Valve / Coupler
Hydraulic UnitManual Operation
Accessories

Cautions / Others

Air
Sequence Valve

BWD

Hydraulic
Non-Leak Coupler

BGA/BGB

BGC/BGD

BGP/BGS

BBP/BBS

BNP/BNS

BJP/BS

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 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.

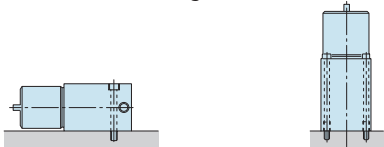
Model No. Indication

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

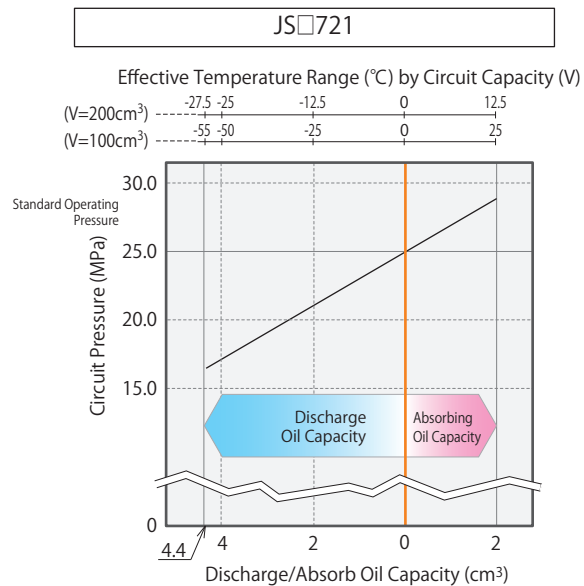
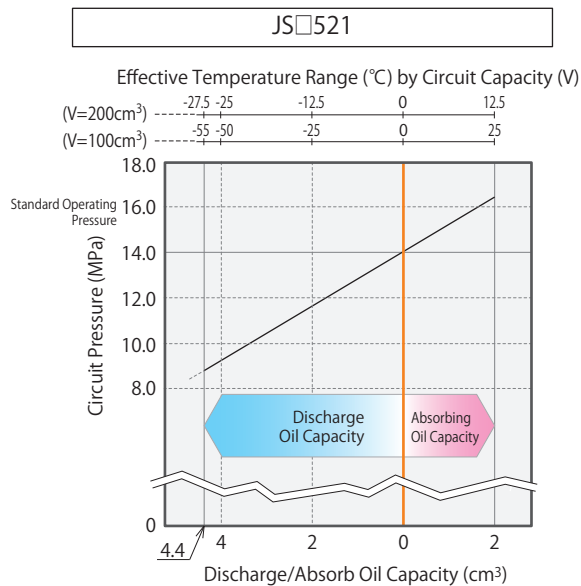
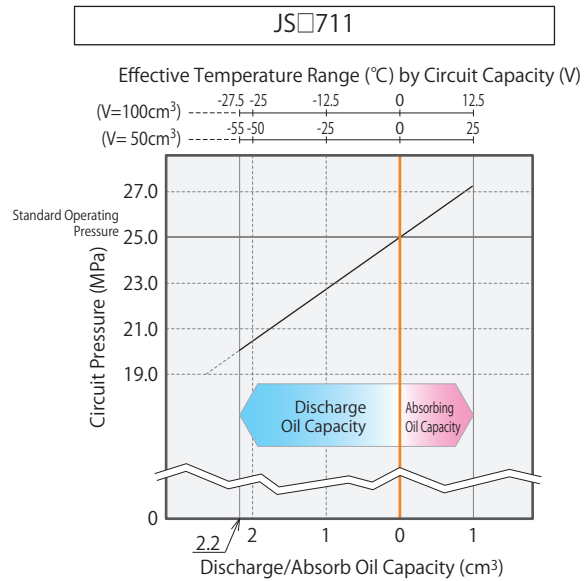
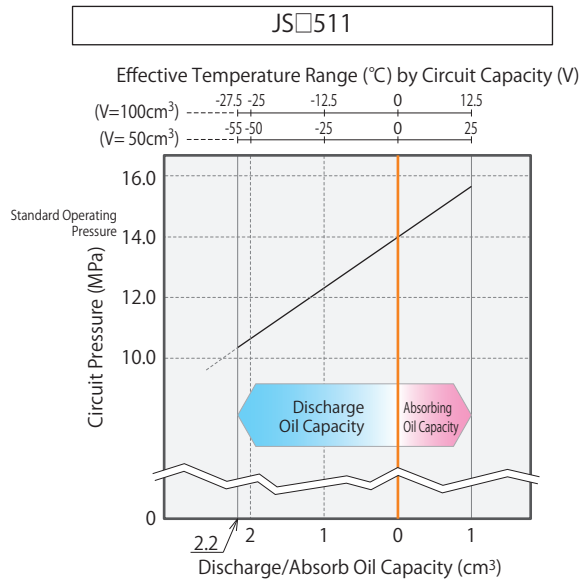
※1. When selecting Mounting Direction **B**:Vertical Mounting,
A:Front Side Piping Option and **B**:Top Surface Piping Option
cannot be selected.

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 cm ³	2.2	4.4	2.2	4.4
Absorbing Oil Capacity cm ³	1.0	2.0	1.0	2.0
Compression Factor (β)※1 MPa/cm ³	1.65	1.19	2.24	1.93
Operating Temperature °C	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



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

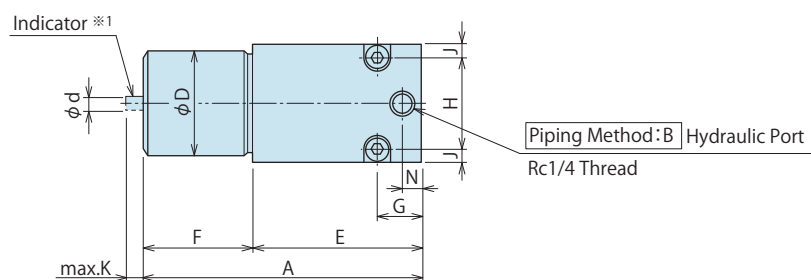
CC

AB/AB-V

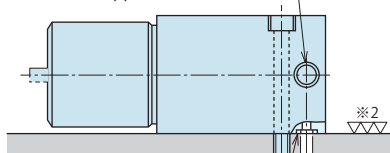
AC/AC-V

External Dimensions

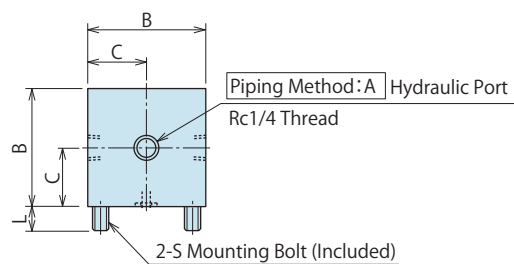
JSA□□1-0A/B/C/G



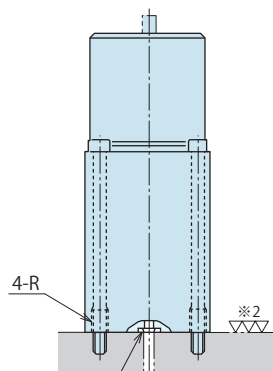
Piping Method:C Hydraulic Port
2-Rc1/4 Thread
(The same position on the opposite side)



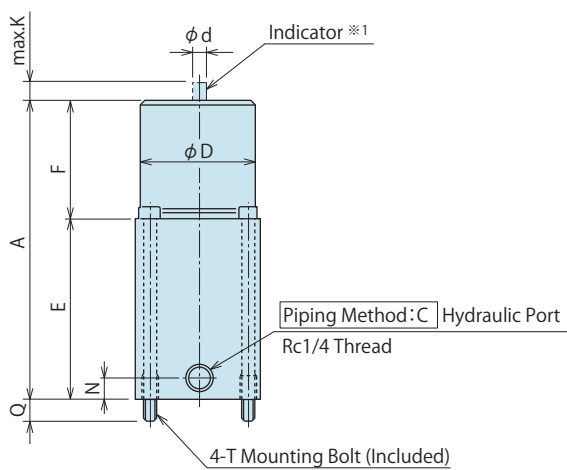
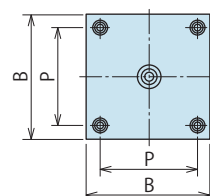
Piping Method:G Hydraulic Gasket Port
O-ring : 1BP8 (Included)



JSB□□1-0C/G



Piping Method:G Hydraulic Gasket Port
O-ring : 1BP8 (Included)



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.

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/BS

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

Pressure Indicator

Model JKA

Model JKB

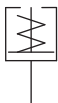


Detects circuit pressure of a fixture disconnected from the hydraulic pressure source

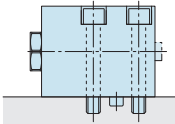
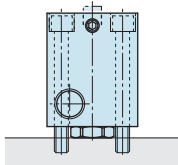
● What is a Pressure Indicator ?

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



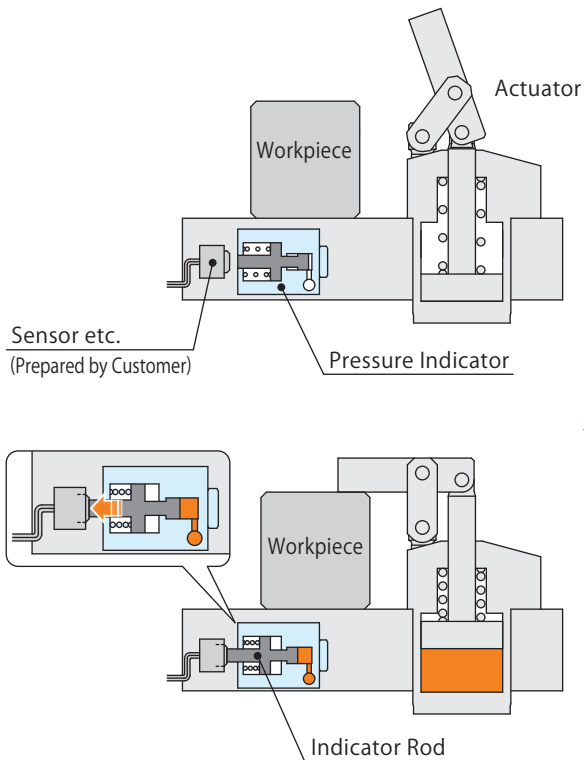
※ A filter is not built in each port. Please sufficiently perform flushing of piping and fitting to prevent contaminants such as cutting chips from entering the circuit.

	 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		

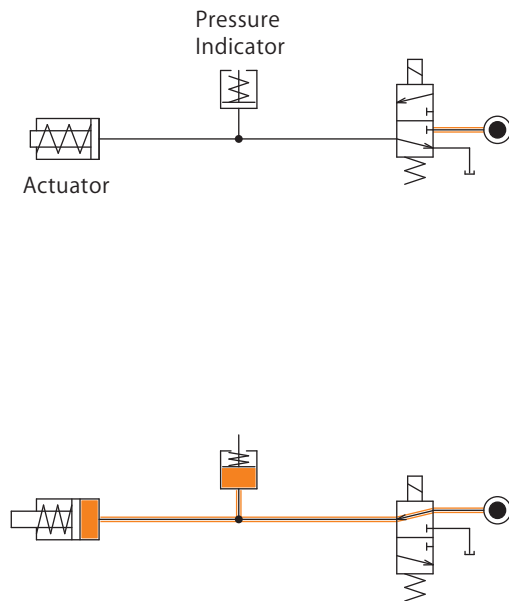
Action Description

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 ± 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.	

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

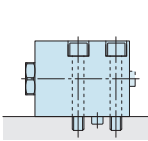
Model No. Indication

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

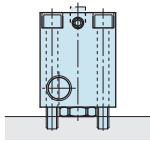
1 2 3 4 5

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 ($3\pm0.5\text{mm}$) when set pressure is reached.

Entry Example

at 5MPa	→	(5.0MPa)
at 20.5MPa	→	(20.5MPa)
at 700PSI	→	(700PSI)

Specifications

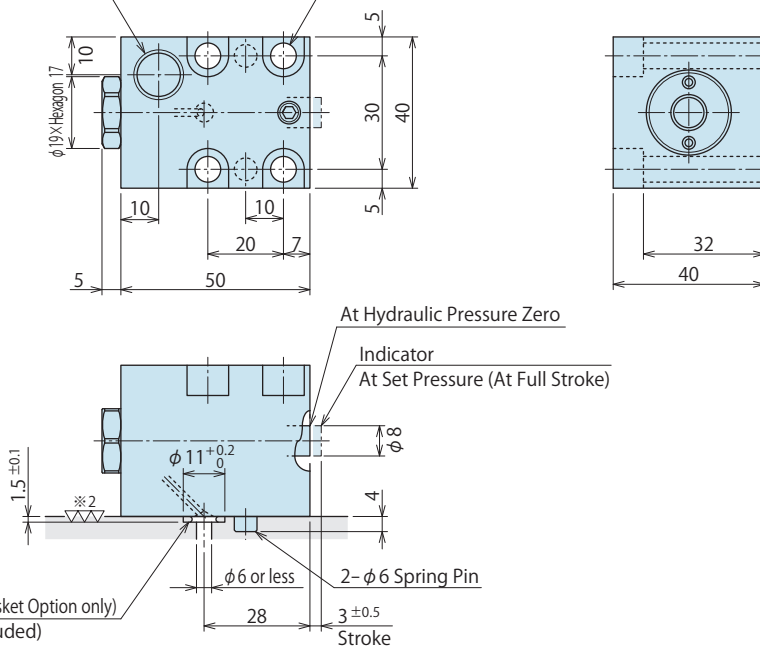
Model No.	JKA030	JKA050	JKA070
Set Pressure Range MPa	4.5 ~ 9.5	9.5 ~ 15.0	15.0 ~ 22.0
Max. Operating Pressure MPa	25.0		
Withstanding Pressure MPa	37.5		
Pressure Change ※1 MPa/mm	0.65	1.38	2.55
Operating Temperature °C	0 ~ 70		
Usable Fluid	General Hydraulic Oil Equivalent to ISO-VG-32		
Weight kg	0.5		

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

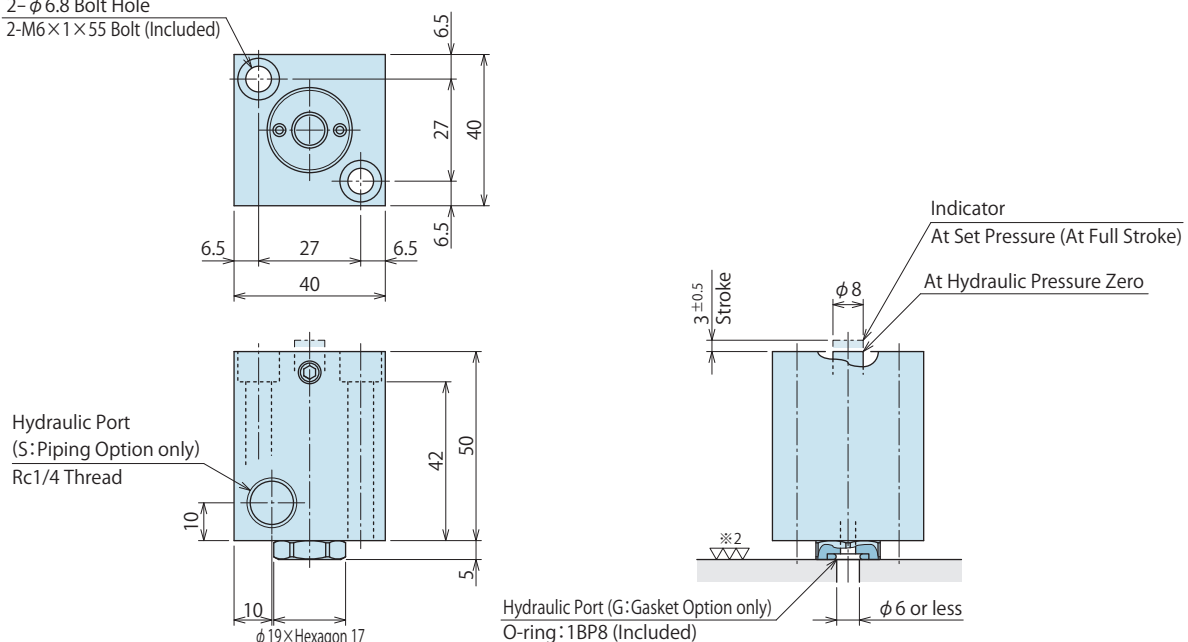
External Dimensions

JKA0□0-0□□

 Hydraulic Port (S: Piping Option only)
 Rc1/4 Thread

 4- ϕ 6.8 Bolt Hole
 4-M6 $\times$ 1 $\times$ 40 Bolt (Included)

 Hydraulic Port (G: Gasket Option only)
 O-ring: 1BP8 (Included)

JKB0□0-0□□

 2- ϕ 6.8 Bolt Hole
 2-M6 $\times$ 1 $\times$ 55 Bolt (Included)

 Hydraulic Port
 (S: Piping Option only)
 Rc1/4 Thread

 Hydraulic Port (G: Gasket Option only)
 O-ring: 1BP8 (Included)

Note :

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

High-Power
Series

Pneumatic Series

Hydraulic Series

Valve / Coupler
Hydraulic UnitManual 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

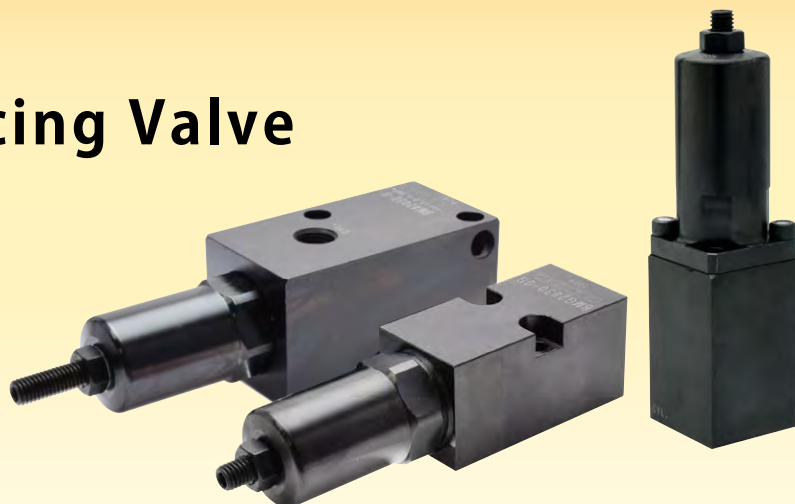
AC/AC-V

Non-Leak Reducing Valve

Model **BMA**

Model **BMG**

Model **BMV**



NEW BMV newly added to the line-up

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.**

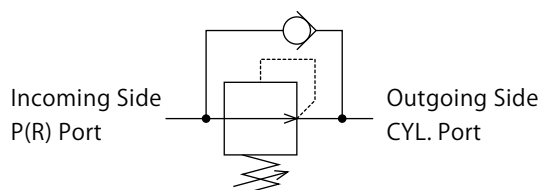
What is a Reducing Valve?

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

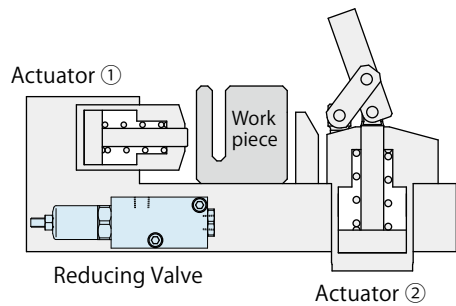


※ Each port has a built-in filter.

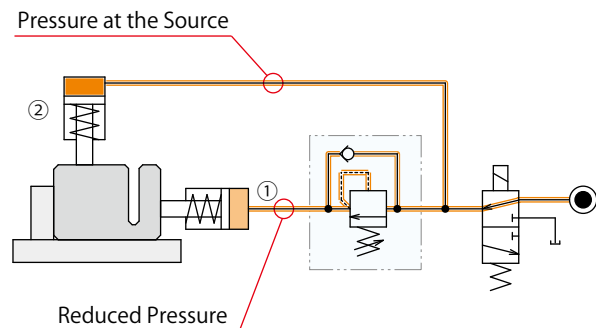
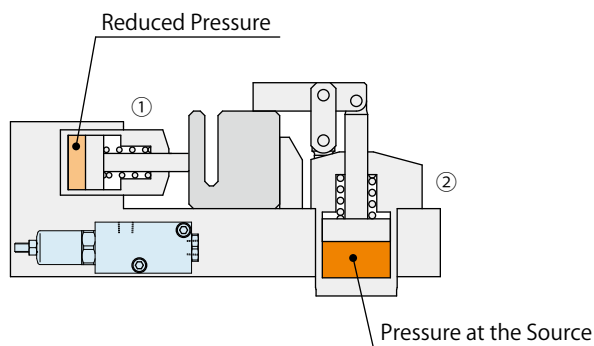
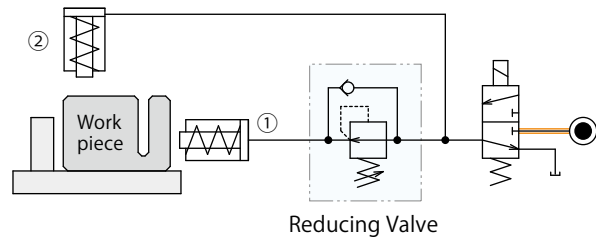
	 Model BMA → P.1245			 Model BMG → P.1247			 NEW Model BMV → P.1248		
Classification	Non-Leak Reducing Valve			Compact Non-Leak Reducing Valve			Vertical Mounting Compact Non-Leak Reducing Valve		
Incoming Supply Pressure	2 ~ 7MPa	6 ~ 30MPa	9 ~ 30MPa	2 ~ 7MPa	6 ~ 30MPa	9 ~ 30MPa	2 ~ 7MPa	6 ~ 35MPa	8 ~ 35MPa
Outgoing Set Pressure	1 ~ 6MPa	3 ~ 14MPa	6 ~ 27MPa	1 ~ 6MPa	3 ~ 14MPa	6 ~ 27MPa	1 ~ 6MPa	3 ~ 14MPa	5 ~ 27MPa
Piping Method	Piping Option Gasket Option BK Connecting Option			Gasket Option			Gasket Option		

Action Description

Images



Circuit Example

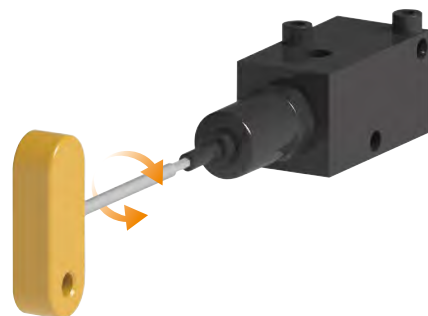


Operating Procedure		Remarks
Locking	Hydraulic pressure is ON.	
	Supply hydraulic pressure to actuator ① and ②.	
	Raise the pressure up to the outgoing side set pressure.	
	The valve of reducing valve closes and then supply the outgoing side set pressure to actuator ①.	There is differential pressure 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.	
Releasing	Machining process	
	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 Pressure Change per Rotation		(MPa/Rev)	
Model No.	BMA2030-0□ BMG2030-0G BMV2430-0G	BMA2050-0□ BMG2050-0G BMV2850-0G	BMA2070-0□ BMG2070-0G BMV2870-0G
Set Pressure Change per Rotation (Reference)	0.3	1.2	4

- 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.



High-Power Series

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Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others

Air Sequence Valve

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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/BLV

BLB

JSS/JS

JKA/JKB

BMA/BMG/BMV

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

Model No. Indication

BMA20 **5** **0** - **0** **G** **(5.0-25MPa)**

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.)

※ 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

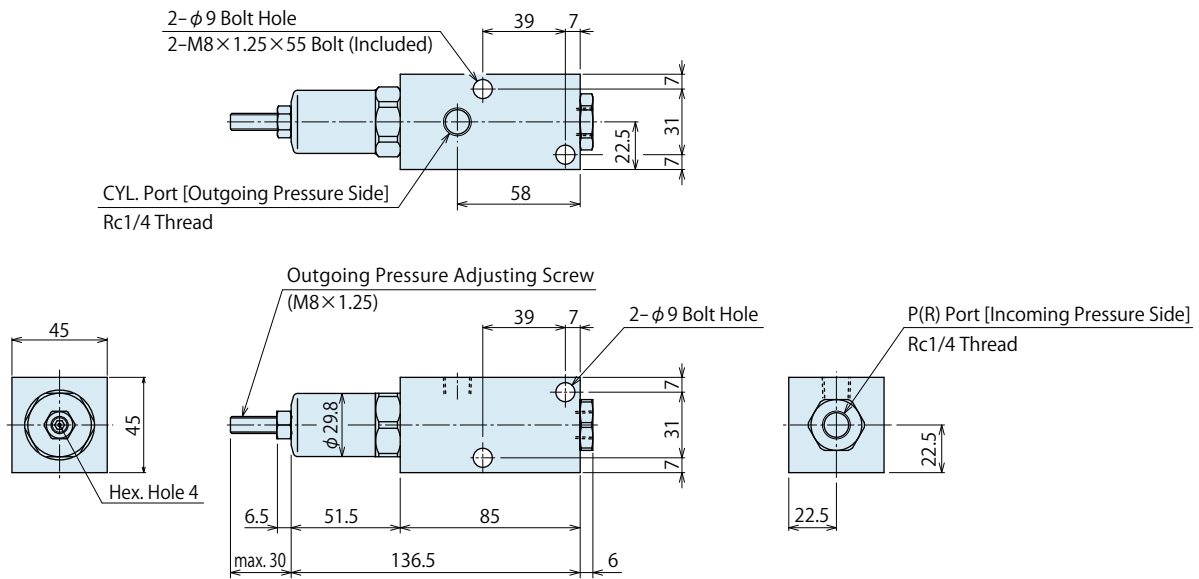
Model No.		BMA2030-0□□	BMA2050-0□□	BMA2070-0□□
Incoming Supply Pressure	MPa	2.0 ~ 7.0	6.0 ~ 30.0	9.0 ~ 30.0
Outgoing Set Pressure	MPa	1.0 ~ 6.0	3.0 ~ 14.0	6.0 ~ 27.0
Allowable Min. Pressure Difference ※2	MPa	1.0	3.0	3.0
Withstanding Pressure	MPa	10.5	37.5	37.5
Min. Passage Area	mm ²	23.3		
Operating Temperature	°C	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

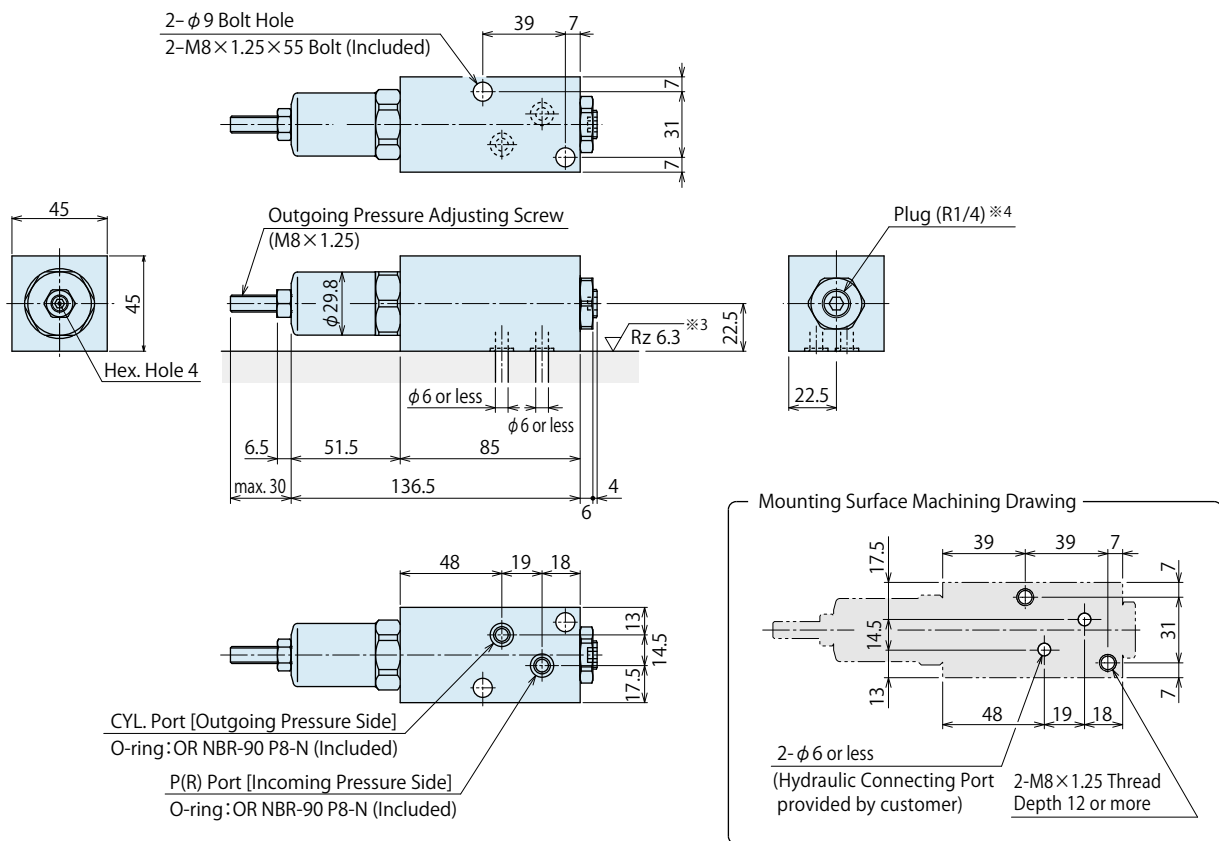
BMA20□0-0

※ This drawing shows piping method (Blank) : Piping Option.



BMA20□0-0G

※ This drawing shows piping method (G) : Gasket Option.



Notes :

※3. The mounting surface (O-ring sealing surface) should be flat with a maximum height roughness of Rz 6.3 or better.

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

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/BLV

BLB

JSS/JS

JKA/JKB

BMA/BMG/BMV

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

Model No. Indication

BMG20 **5** **0** - **0** **G** **(5.0-25MPa)**

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.)

※ 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)**

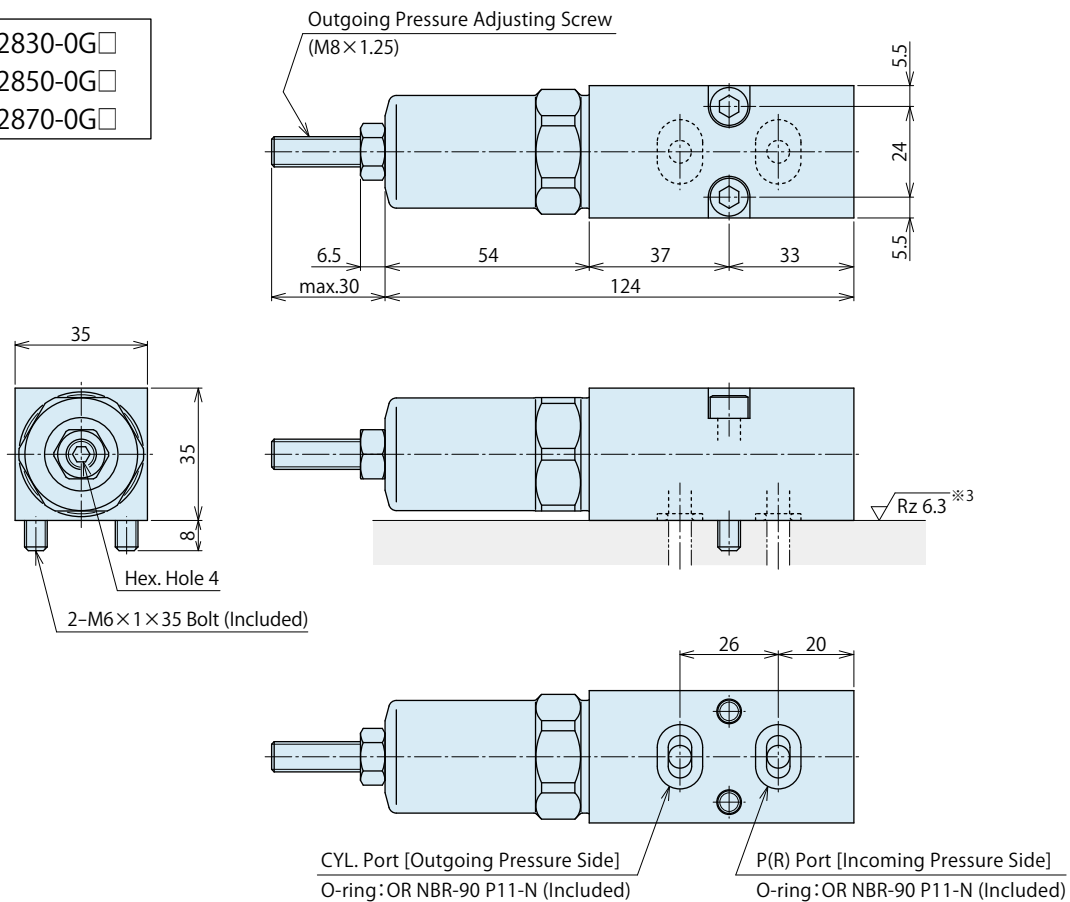
Specifications

Model No.		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	°C	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

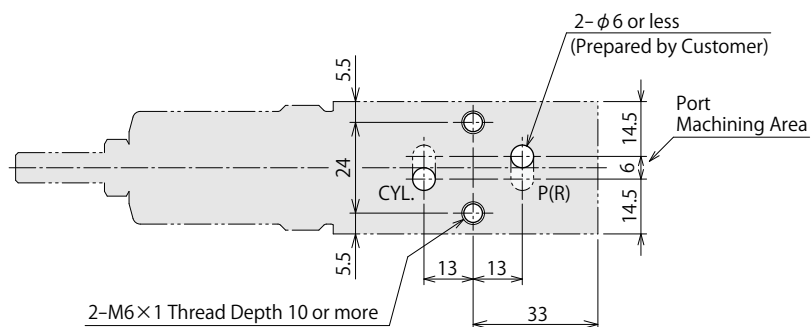
BMG2830-0G□
 BMG2850-0G□
 BMG2870-0G□



Note :

※3. The mounting surface (O-ring sealing surface) should be flat with a maximum height roughness of Rz 6.3 or better.

Mounting Part Machining Drawing



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/BLV

BLB

JSS/JS

JKA/JKB

BMA/BMG/BMV

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

Model No. Indication

BMV 2 **87** **0** - **0** **G** **(5.0-25MPa)**

1
2
3
4

1 Outgoing Side Set Pressure

43 : 1.0 ~ 6.0MPa

85 : 3.0 ~ 14.0MPa

87 : 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 BMV.
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.)

※ 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 → **(5.0-25MPa)**

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

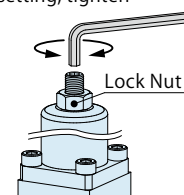
Blank : Pressure Setting Free Option

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

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

※ For pressure adjustment, please refer to "Set Pressure Change per Rotation" in the table below and adjust the pressure to the specified setting. After completing the setting, tighten the locknut and check the operation again.

Model No.	(MPa/Rev)		
	BMV2430	BMV2850	BMV2870
Set Pressure Change per Rotation	0.3	1.2	4



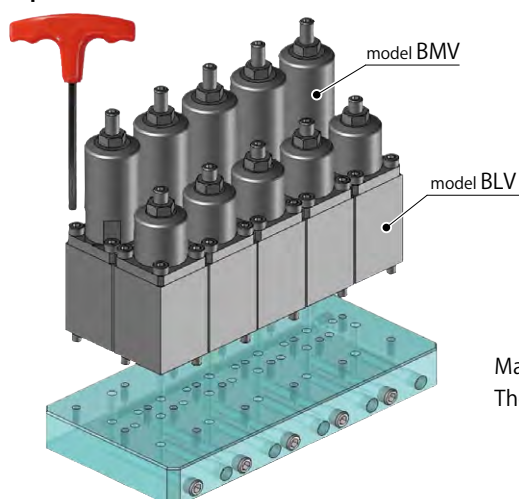
Notes : 1. The set pressure value is set according to the model code.
2. Pressure increases by turning clockwise and decreases by turning anti-clockwise.

Specifications

Model No.		BMV2430-0G	BMV2850-0G	BMV2870-0G
Incoming Supply Pressure	MPa	2.0 ~ 7.0	6.0 ~ 35.0	8.0 ~ 35.0
Outgoing Set Pressure	MPa	1.0 ~ 6.0	3.0 ~ 14.0	5.0 ~ 27.0
Allowable Min. Pressure Difference ^{※2}	MPa	1.0	3.0	3.0
Min. Passage Area	mm ²	12.6		
Operating Temperature	°C	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.

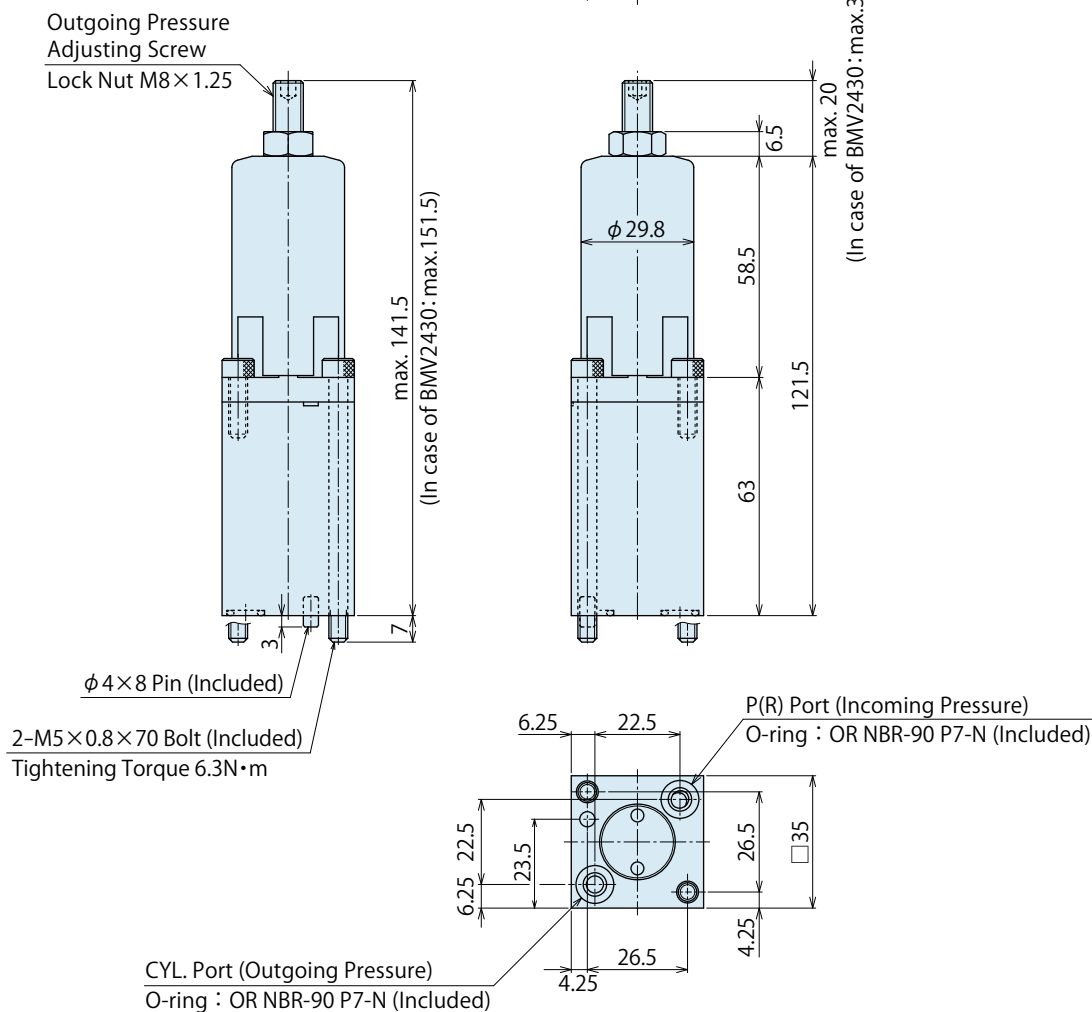
Application Example



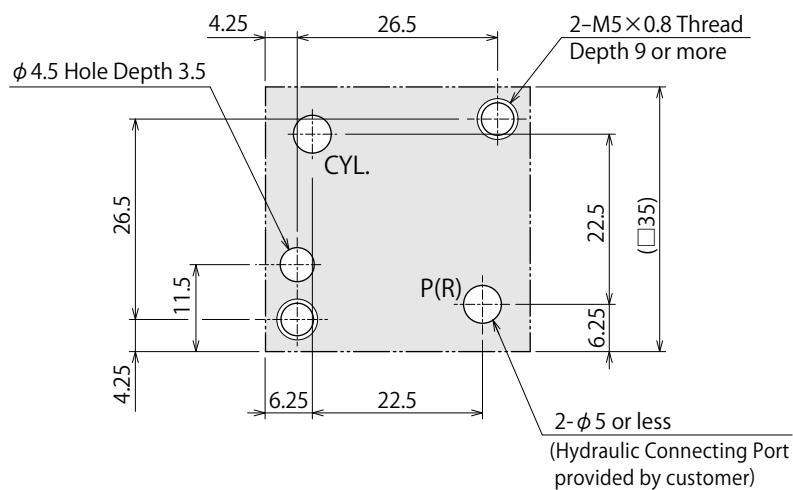
Manifold jig example using model BLV and model BMV.
The valves are concentrated to slim down the entire jig.

External Dimensions

BMV2430-0G□
 BMV2850-0G□
 BMV2870-0G□



Mounting Surface Machining Drawing



Note :

1. The mounting surface (O-ring sealing surface) should be flat with a maximum height roughness of Rz 6.3 or better.

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/BLV

BLB

JSS/JS

JKA/JKB

BMA/BMG/BMV

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

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.

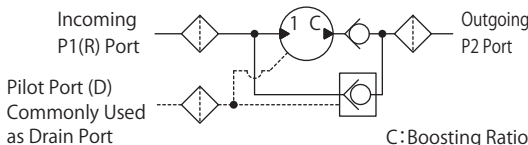
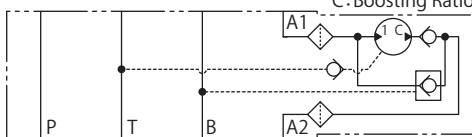
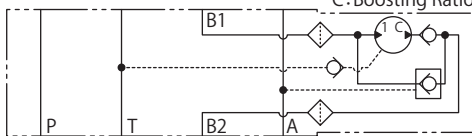
High pressure hydraulic power source is not needed by partial boosting pressure.

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.

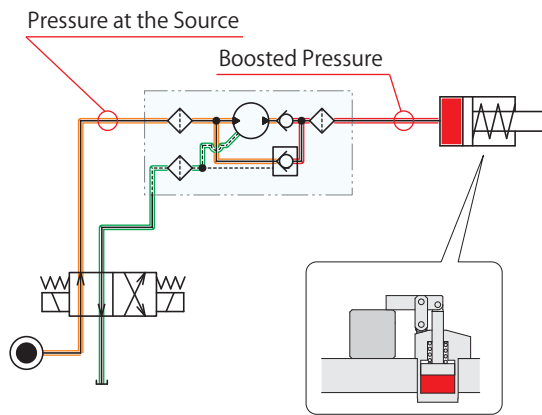
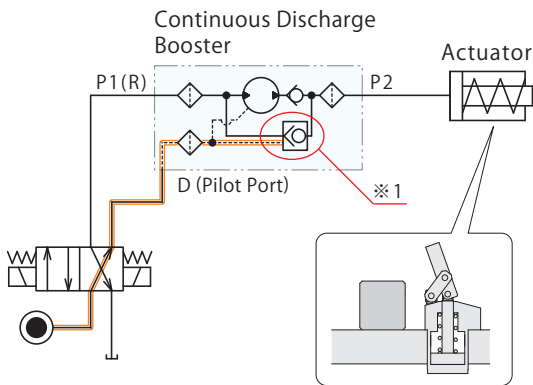
There is no limitation in the outgoing side circuit capacity because it continuously discharges the pressure so it is the best for multiple actuator or big circuit volume.

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

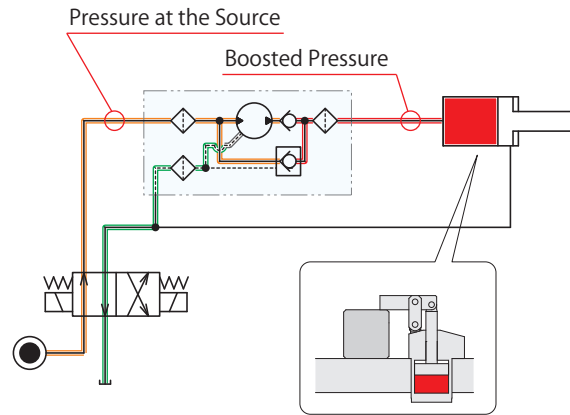
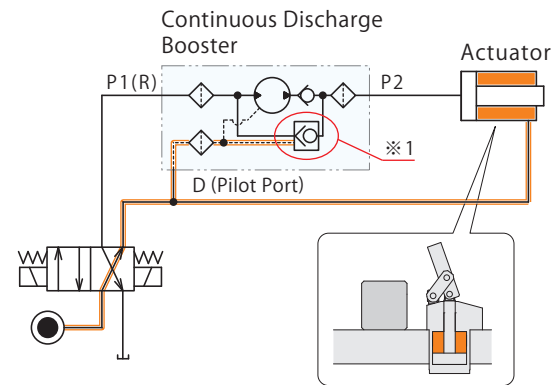
	 Model AU → P.1251	 Model AU-M → P.1251				
Classification	Piping Option			Modular Option		
Incoming Discharge Pressure	3 ~ 12.5MPa	2 ~ 8.4MPa	2 ~ 7MPa	3 ~ 12.5MPa	2 ~ 8.4MPa	2 ~ 5MPa
Outgoing Discharge Pressure	6 ~ 25MPa	6 ~ 25MPa	10 ~ 35MPa	6 ~ 25MPa	6 ~ 25MPa	10 ~ 25MPa
Boosting Ratio	2 times	3 times	5 times	2 times	3 times	5 times
Circuit Symbol	 Incoming P1(R) Port Pilot Port (D) Commonly Used as Drain Port C: Boosting Ratio ※ Each port has a built-in filter.			※ This drawing shows AU-MA.  C: Boosting Ratio ※ This drawing shows AU-MB.  C: Boosting Ratio		

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.	Get the drain connected to tank during boosting.
	Outgoing side circuit capacity has no limitation.	
	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).

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

Model No. Indication



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

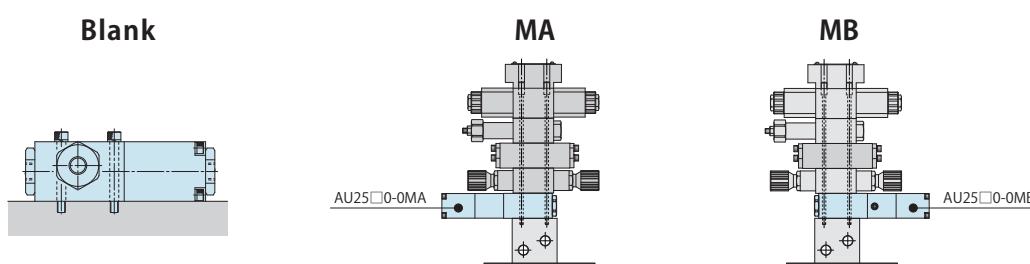
- 2 : 2 times
- 3 : 3 times
- 5 : 5 times

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.)



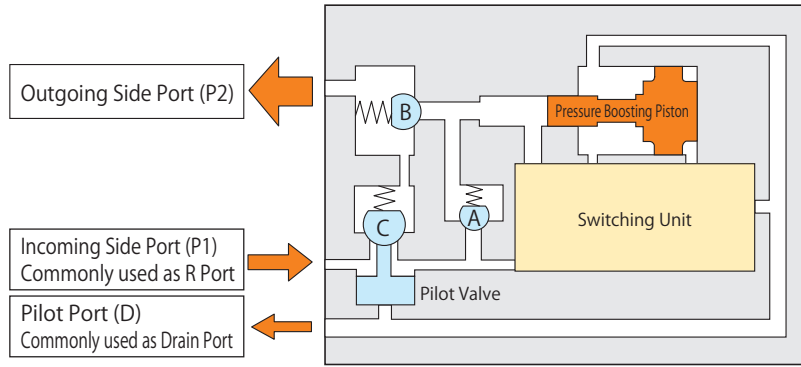
Note :

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)

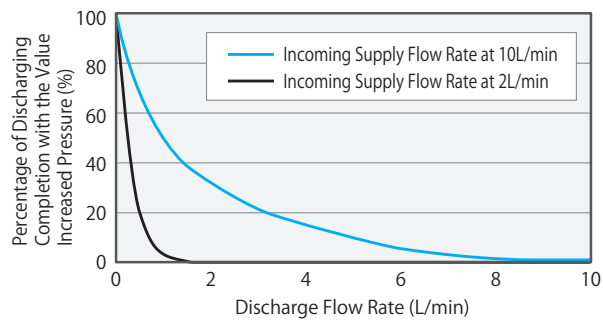
- Having hydraulic pressure supplied from the incoming side port oil passes through the built-in check valve C (A and B) to flow to the outgoing side port.
- As the outgoing pressure comes close to the incoming pressure, the check valve C (A and B) is shut to operate the built-in switching unit. The 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.
- The boosted pressure forces the check valve B to open so that oil having the boosted pressure flows to the outgoing side.
- 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.
- 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)

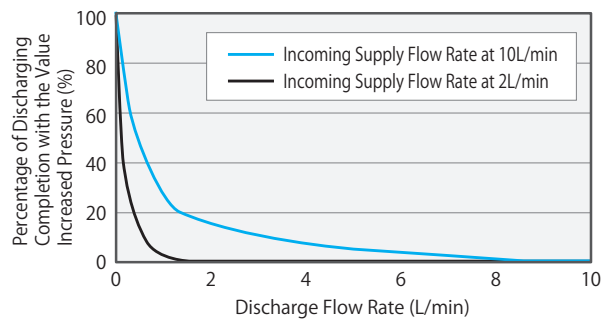
- The incoming pressure is supplied through the pilot port.
 - The pilot valve opens the check valve C to release the outgoing pressure.
- ※ Please refer to the pilot valve opening pressure on specification of the pressure that makes pilot valve activated.

● AU Continuous Discharge Booster Flow Characteristic Diagram

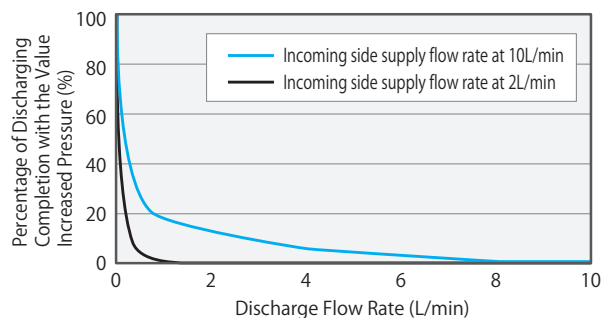
AU2521-0□/AU2520-0M□ Outgoing Discharge Flow Characteristic Diagram



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



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



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

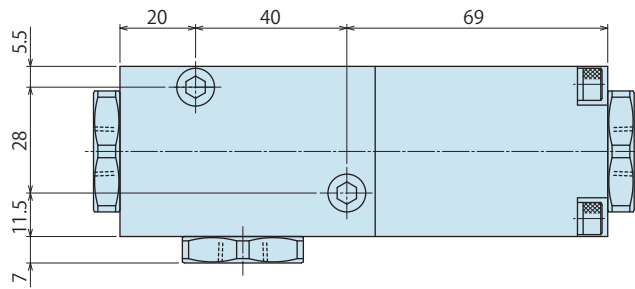
Rotary Joint
JR

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 (Piping Option)

AU2521-0 / AU2531-0 / AU2851-0

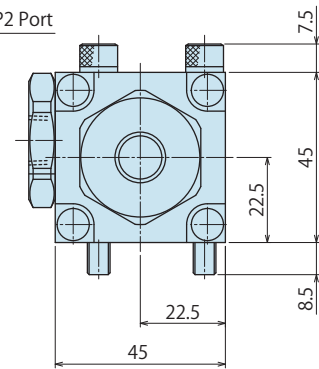
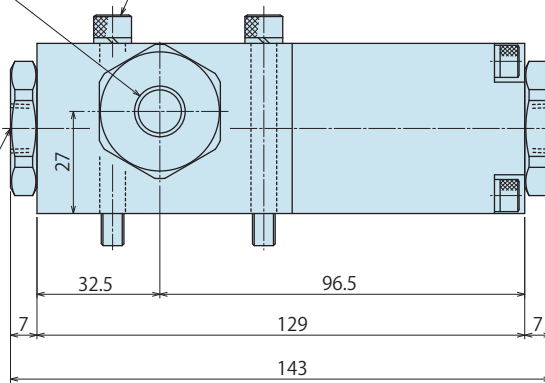


Pilot Port (D) commonly
used as Drain Port
Rc1/4

2-M6×1×55 Bolt (with Square Spring Washer) (Included)

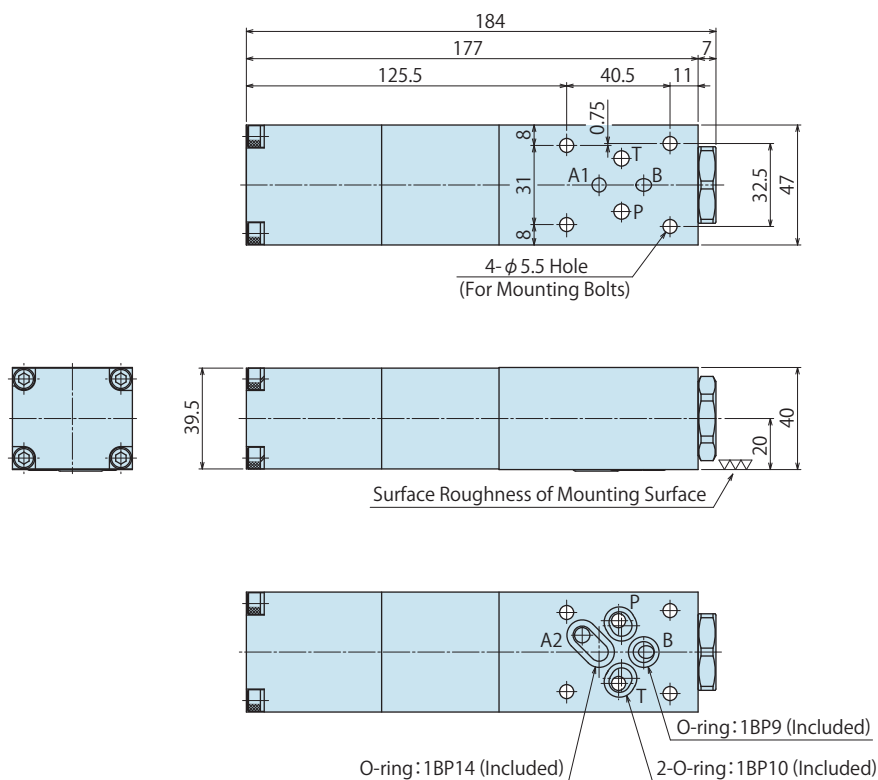
Incoming P1(R) Port
Rc1/4

Outgoing P2 Port
Rc1/4



External Dimensions (Modular Option)

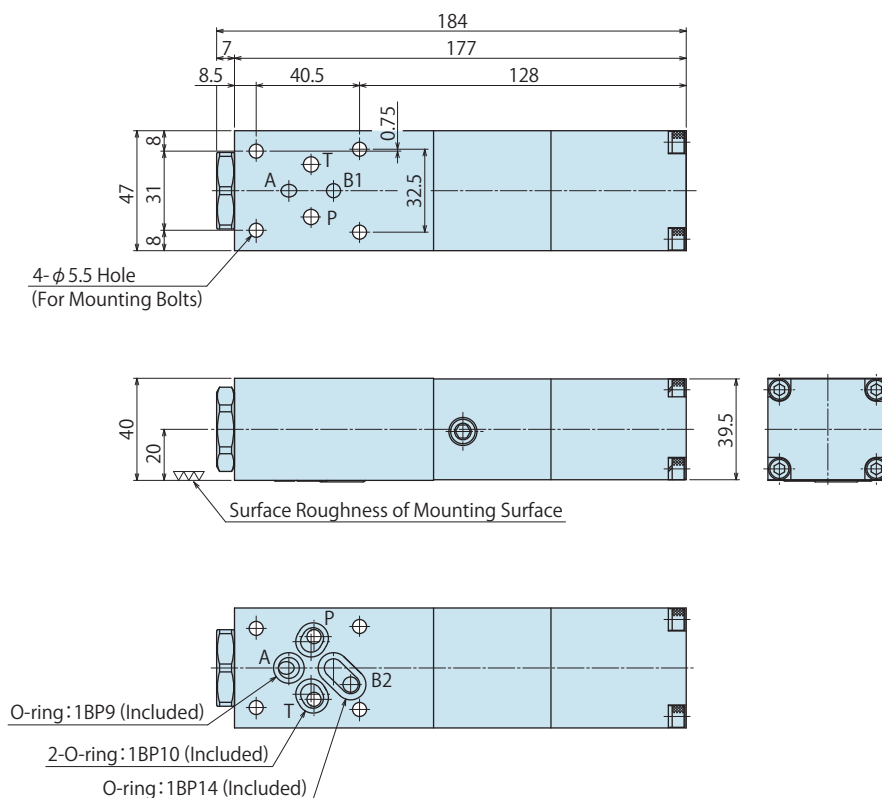
AU2520-0MA / AU2530-0MA / AU2550-0MA



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.

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

Cautions (AU)

< Cautions (Common) >

- 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.
- 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.)
- 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.
- Stop hydraulic supply before disconnecting from hydraulic power source with auto couplers, etc. (Refer to Reference Circuit.)
- 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.
- 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.

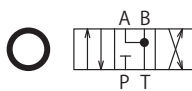
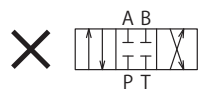
< Cautions for Piping Option >

- 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.
- 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

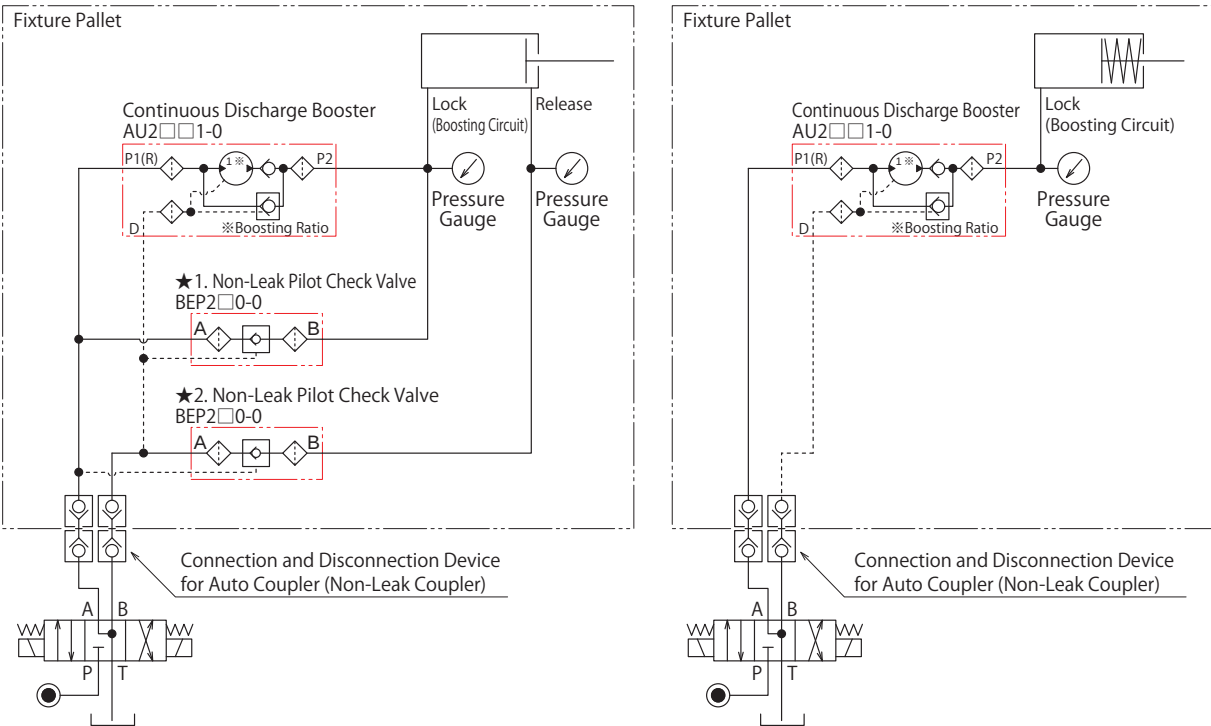
< Cautions for Modular Option >

- 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.
- 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.



- 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

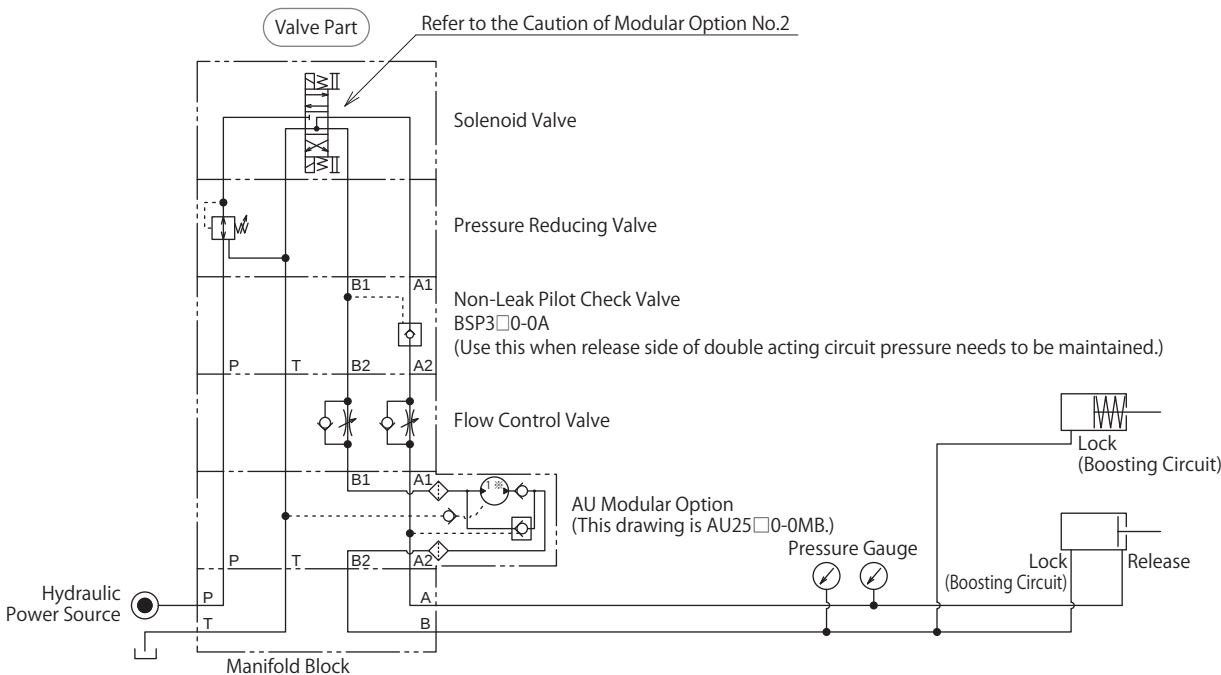
< In the case of separating hydraulic power source from fixture with auto coupler etc.>



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>



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/BS
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

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?

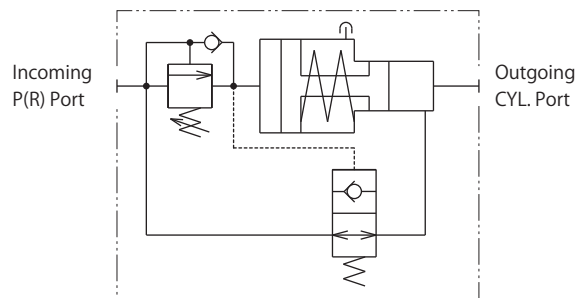
One-shot booster is placed in line circuit type and it is able to boost the hydraulic pressure of the circuit partially with non-leak function.

It has larger capacity of outgoing side circuit than general booster due to built-in sequence valve and check valve.

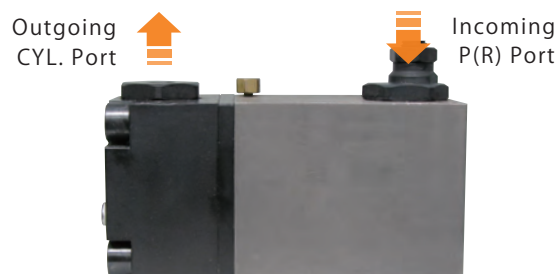
The check valve with non-leak function holds the outgoing side pressure with zero leakage.

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

Circuit Symbol



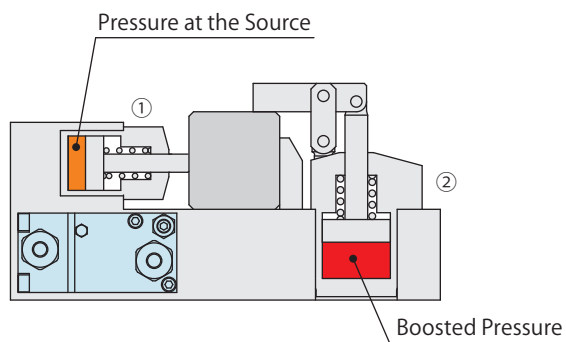
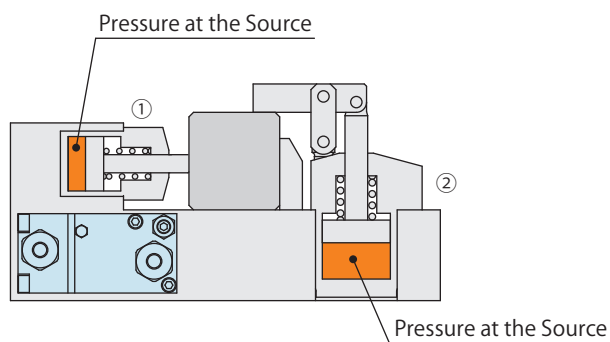
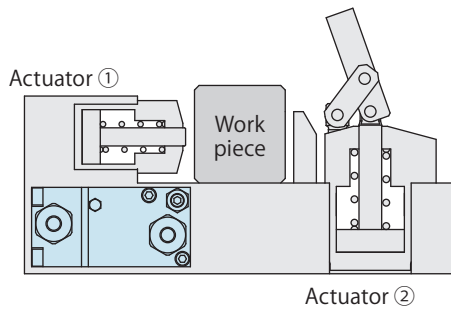
※ Each port has a built-in filter.



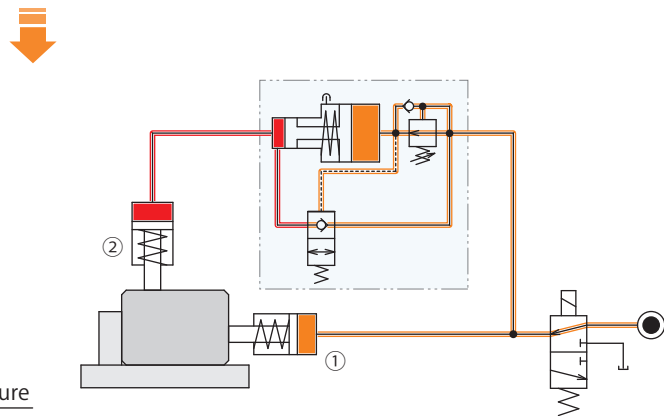
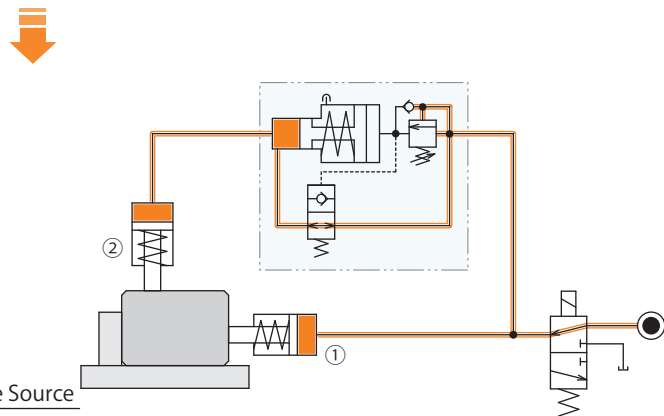
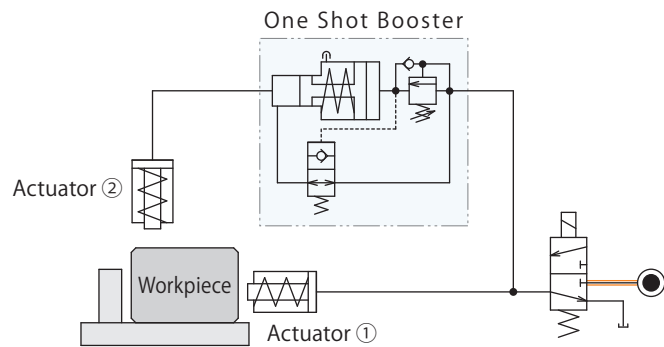
Boost the pressure just by connecting the incoming side and the outgoing side.

Action Description

Images



Circuit Example



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

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.	
Releasing	Machining process	
	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

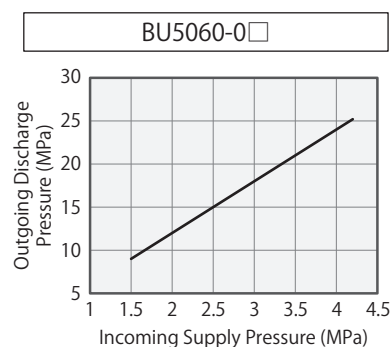
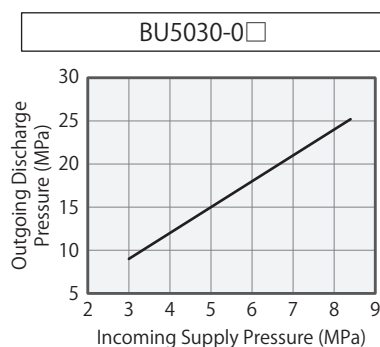
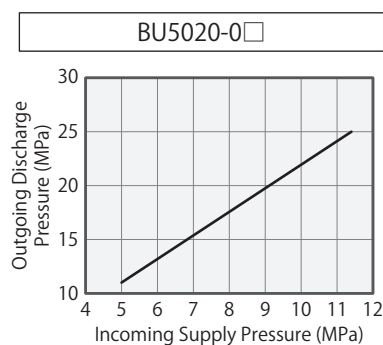
Model No.	BU5020-0□	BU5030-0□	BU5060-0□
Boosting Ratio ※1	2.2 times	3 times	6 times
Incoming Supply Pressure MPa	5.0 ~ 11.4	3.0 ~ 8.4	1.5 ~ 4.2
Sequence Set Pressure ※2 MPa	4.0 ~ 9.1	2.3 ~ 6.7	1.1 ~ 3.2
Outgoing Discharge Pressure MPa	11.0 ~ 25.0	9.0 ~ 25.2	9.0 ~ 25.2
Withstanding Pressure MPa	37.5		
Discharge Volume during Boosting Process ※3 cm ³	30	23	12
Min. Passage Area mm ²	14.1		
Operating Temperature °C	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.

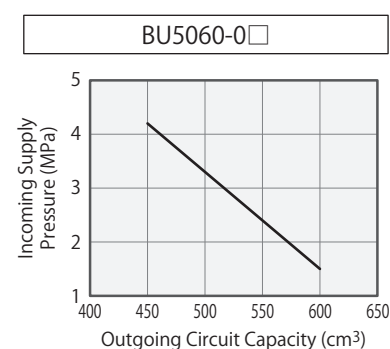
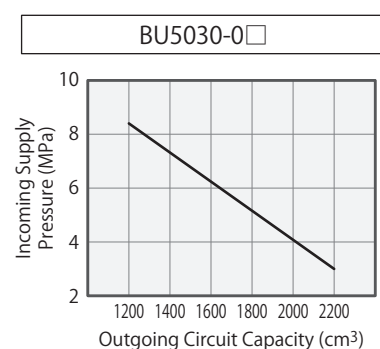
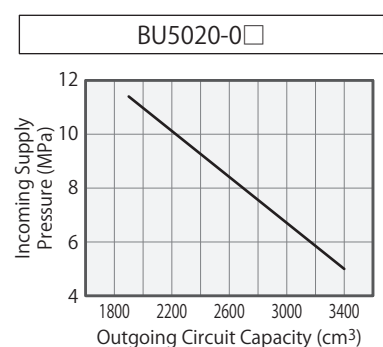
※3. Discharge volume during boosting process is the total oil discharge volume during boosting after exceeds sequence set pressure.

Performance Graph



Allowable Circuit Capacity Curve

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



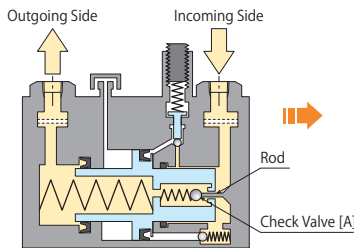
Note : 1. Performance graph curve is referencing.

(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

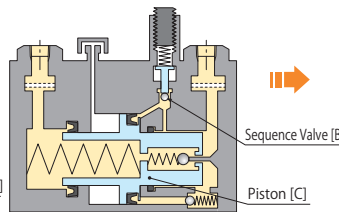
When supplied

<Charging Process>

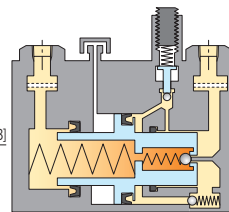


- ① Check valve [A] is always kept in "Open" position by the rod. Incoming pressure flows to outgoing side through check valve [A], then outgoing side actuators are activated completely.

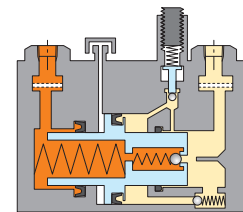
<Boosting Process>



- 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.

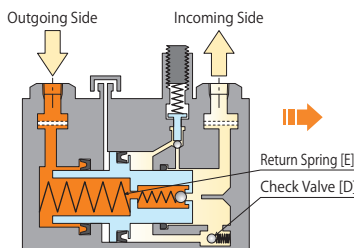


- ④ When piston [C] extends ahead a little, check valve [A] comes off from the rod, then it closes. Up to this time incoming and outgoing pressure are same pressure.
- ⑤ When check valve [A] closes, outgoing circuit becomes closed circuit, and pressure is boosted according to area ratio of piston [C].

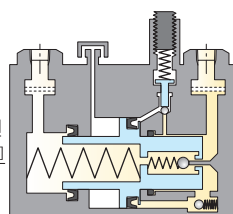


- ⑥ Piston [C] stops at the time the area and the pressure are balanced.
- ⑦ Pressure boosting is completed.

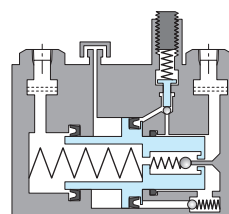
At discharged (Discharging Process)



- 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.

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

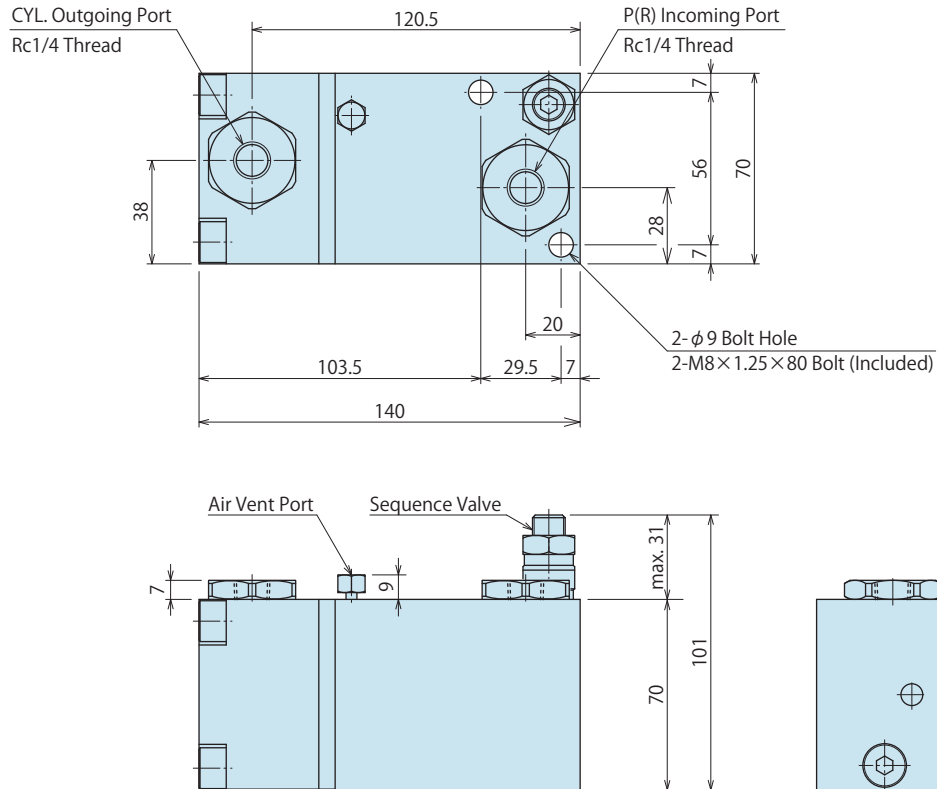
CB

CC

AB/AB-V

AC/AC-V

External Dimensions



Cautions

- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.

 MEMOHigh-Power
Series

Pneumatic Series

Hydraulic Series

Valve / Coupler
Hydraulic UnitManual 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

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.

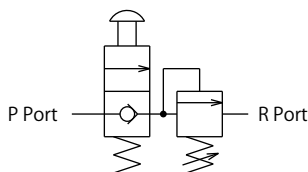
● What is a Pilot Reducing Valve?

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.

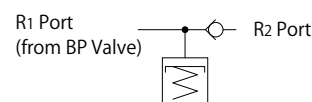
Circuit Symbol : Pilot Reducing Valve (BP)



※ A filter is built in P port.

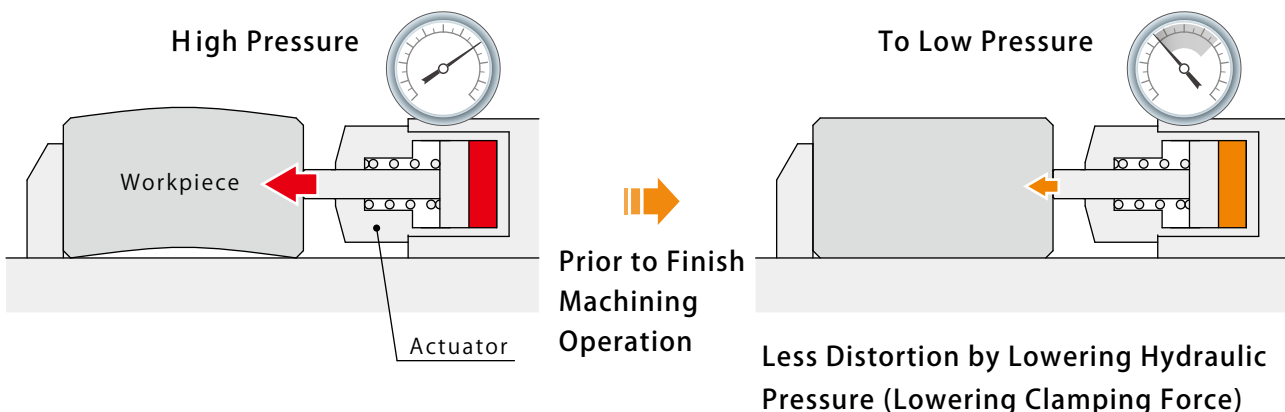
A filter is not built in the R port. Please sufficiently perform flushing of piping and fitting to prevent contaminants such as cutting chips from entering the circuit.

Circuit Symbol : Reservoir (JPB)



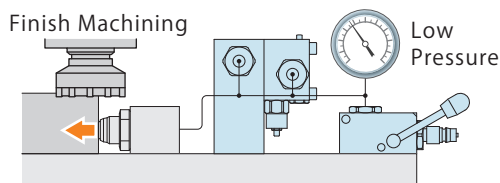
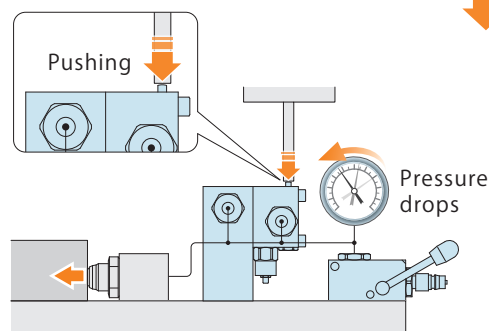
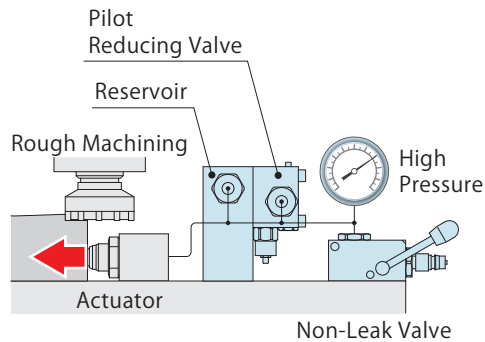
※ A filter is built in R2 port.

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.



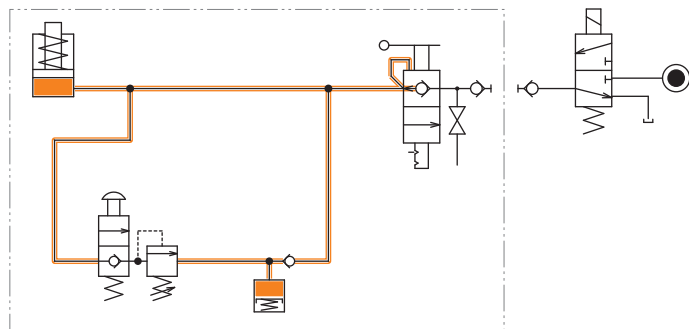
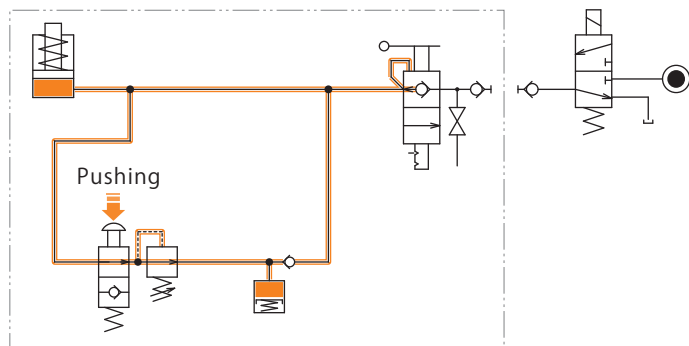
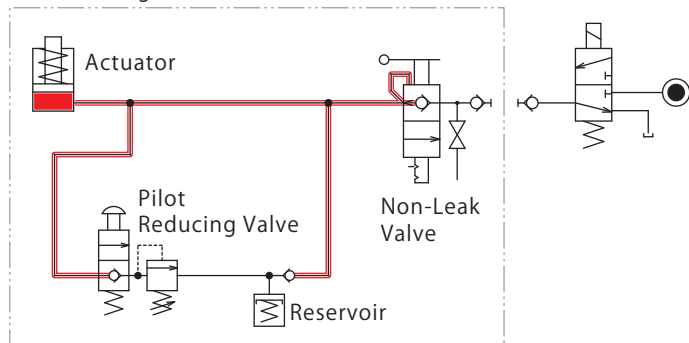
Action Description

Images



Circuit Example

Quick Change Fixture



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

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.	
Releasing	Start the final machining operation.	
	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	mm ²	9.1	
Operating Temperature	°C	0 ~ 70	
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32	
Weight	kg	1.4	

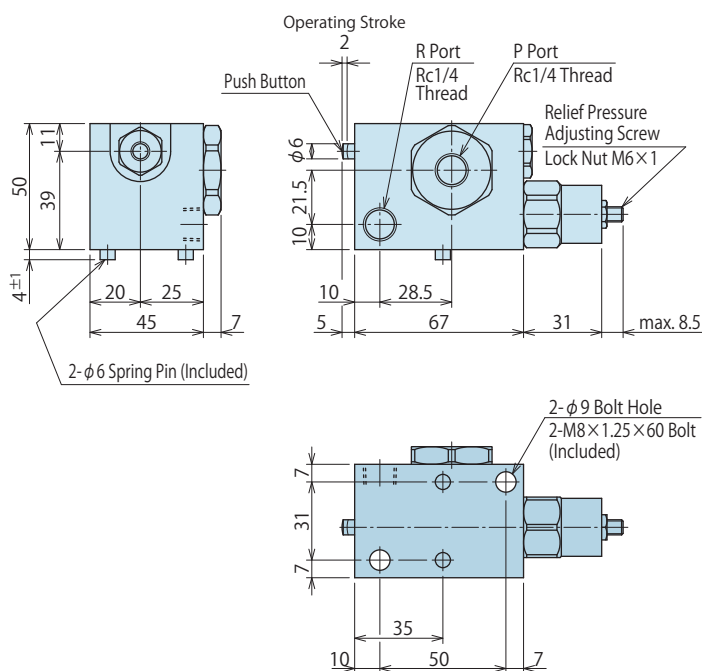
Notes : ※1. Operating pressure shows initial operating pressure.

※2. Relief pressure shows the relief set pressure after operating pilot.

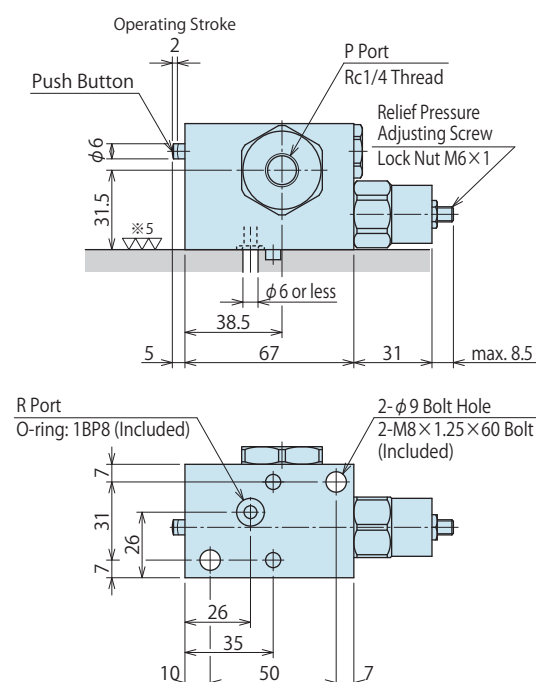
※3. Set the pilot operating force at more than minimum operating force (=More than operating pressure × 0.032) and less than 1.5kN.

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)

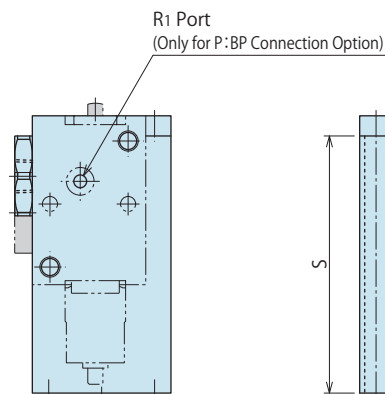
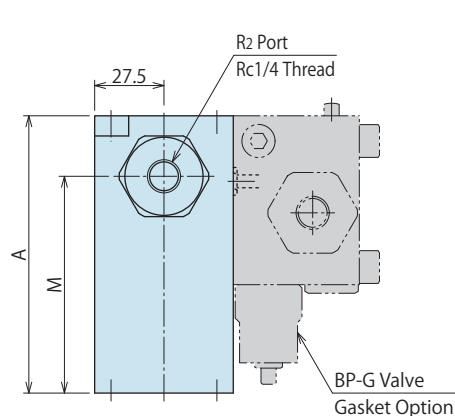
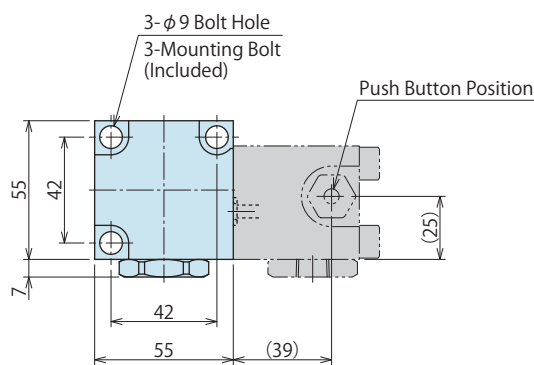
Specifications

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 cm ³	40.0	60.0	40.0	60.0
Circuit Capacity※6 cm ³	800 or less	800 ~ 1200	800 or less	800 ~ 1200
Operating Temperature °C	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.

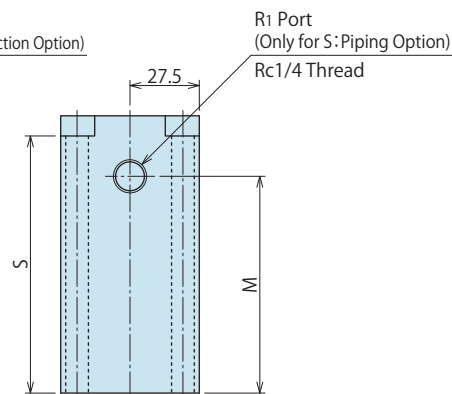
※7. Operating pressure and withstanding pressure are the pressure which is connected to R2 port. Please refer to Circuit Symbol.

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



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

Automatic Air Bleed Valve

Model BX

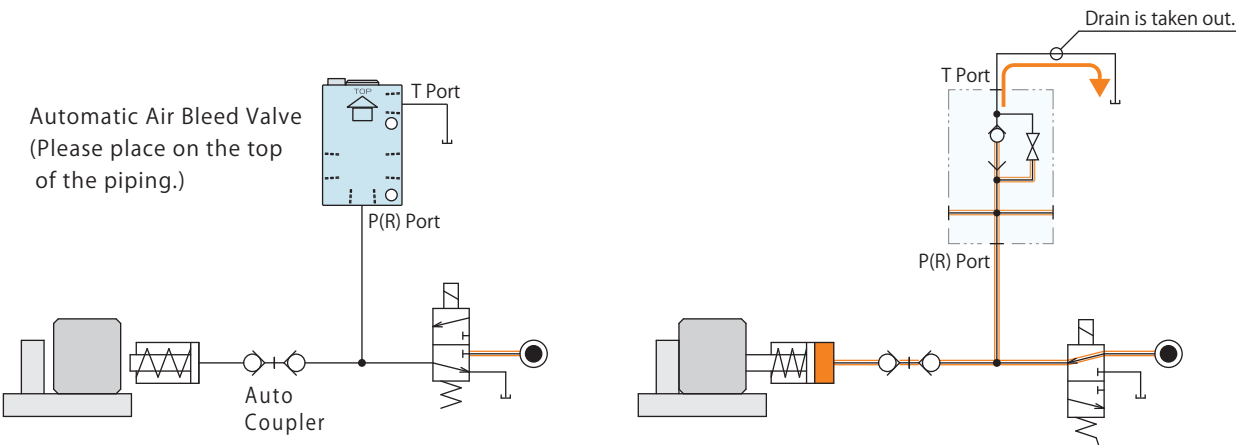
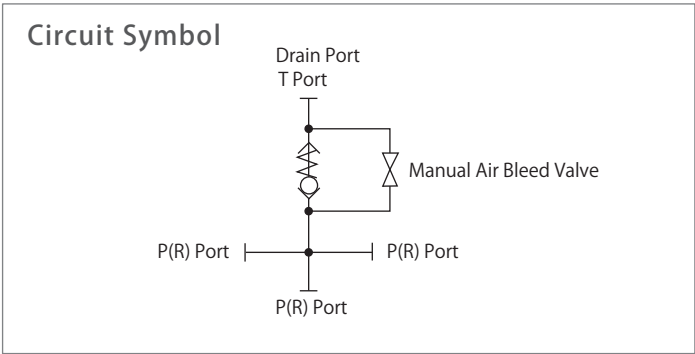


Drains air out automatically in the hydraulic circuit

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.



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 - 02

Port Size

2 : Rc1/4 Thread**3** : Rc3/8 ThreadDesign No.
(Revision Number)

Specifications

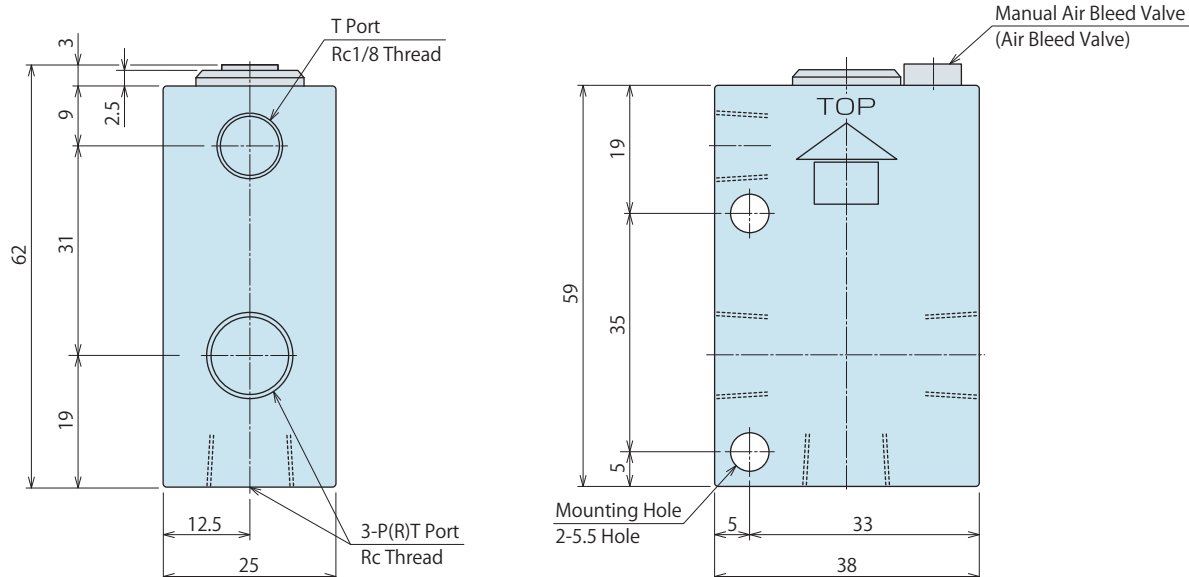
Model No.	BX0010-02	BX0010-03
Max. Operating Pressure	MPa	25
Cracking Pressure	MPa	0.04
Withstanding Pressure	MPa	37.5
Operating Temperature	°C	0 ~ 70
Usable Fluid	General Hydraulic Oil Equivalent to ISO-VG-32	
Drain ^{※1}	Air only	10cm ³ / Action
Volume	Oil only	0.6cm ³ / Action
Minimum Oil Flow Rate	50cm ³ /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

High-Power
Series

Pneumatic Series

Hydraulic Series

Valve / Coupler
Hydraulic UnitManual 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

Non-Leak Pilot Check Valve

Model **BEP**

Model **BSP**



Pressure is maintained even when pressure supply is stopped.

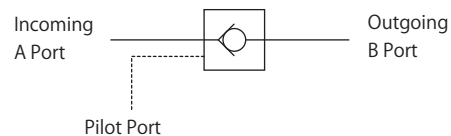
Maintains pressure until hydraulic pressure is supplied to pilot port.

● What is a Non-Leak Pilot Check Valve?

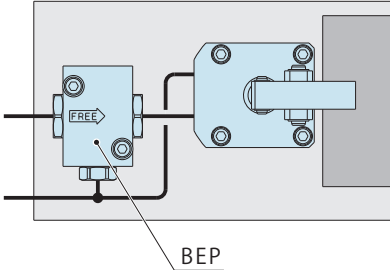
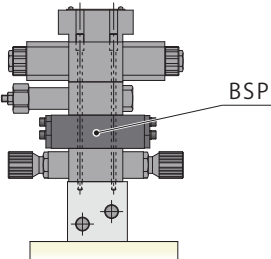
Even if pressure supply from the hydraulic power source is stopped, the outgoing side pressure is held until the pressure is supplied to pilot port.

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)

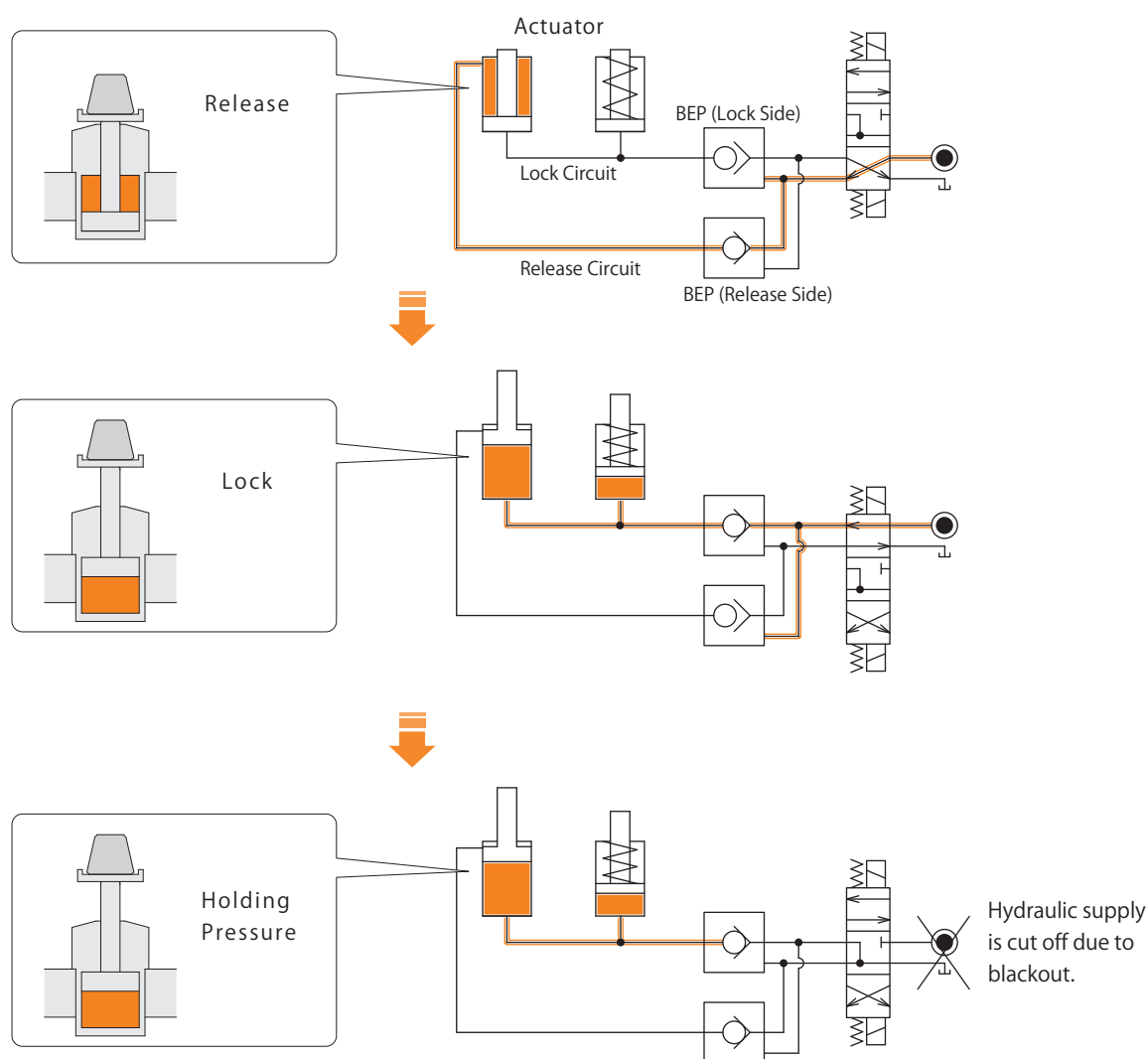


※ This drawing shows BEP. (Please refer to the BSP page for the BSP circuit symbol.)
A filter is built in each A port and B port.
A filter is not built in the pilot port. Please sufficiently perform flushing of piping and fitting to prevent contaminants such as cutting chips from entering the circuit.

	 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.	
	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.	

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

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.

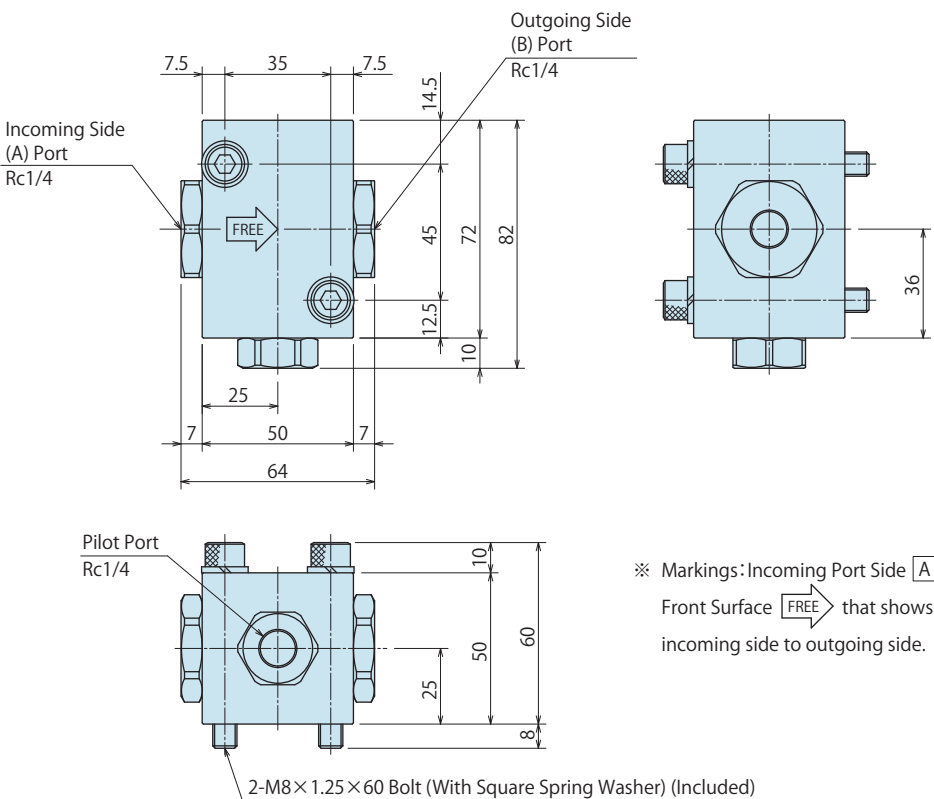
- 0** : Revision Number

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	mm ²	28.3	
Operating Temperature	°C	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



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.

High-Power
Series

Pneumatic Series

Hydraulic Series

Valve / Coupler
Hydraulic UnitManual 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

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⁺²₀ 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 mm ²	24			
Operating Temperature °C	0 ~ 70			
Usable Fluid	General Hydraulic Oil Equivalent to ISO-VG-32			
Weight kg	1.1	1.1	1.5	1.5

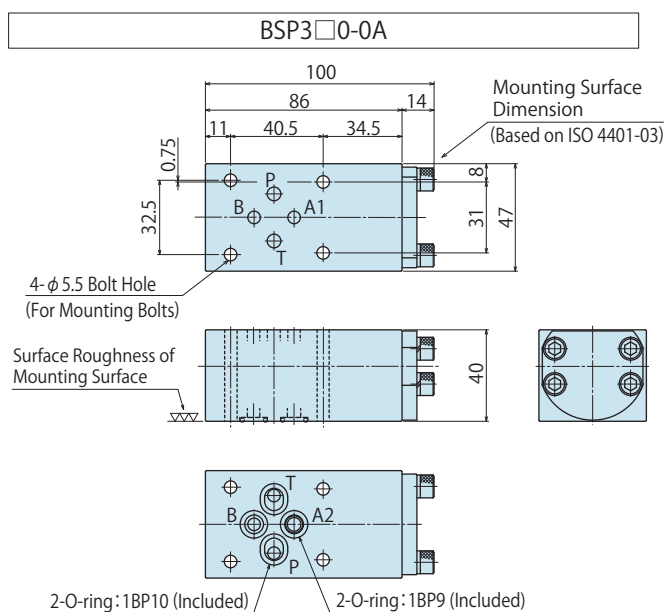
With Pressure Compensating Valve

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	mm ²	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)

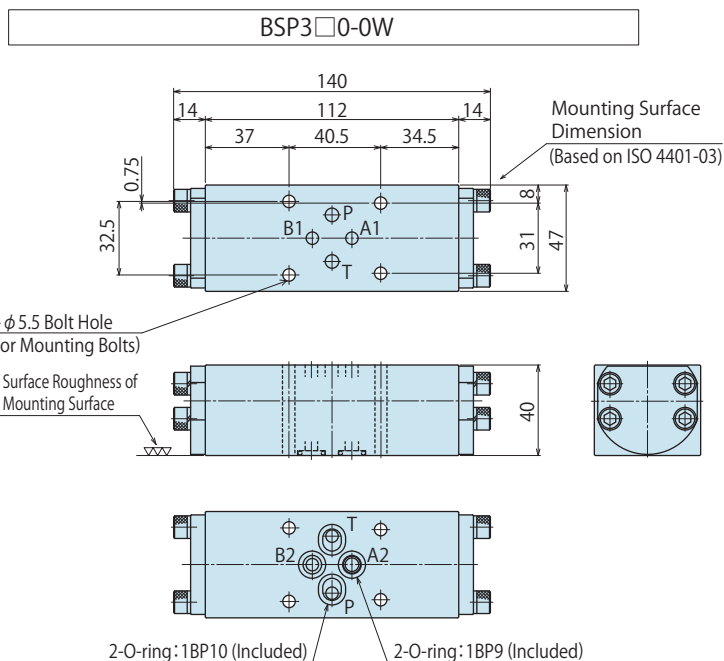
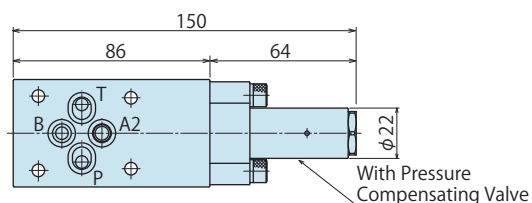
- Please note that pressure will be decreased by oil temperature drop when stopping pressure supply to A1(B1) port and maintaining pressure on A2(B2) port side.
- The pressure relief valve is used for relieving volume of hydraulic pressure which is increased by oil temperature rise. It cannot be used for reducing supply pressure that is out of relief set pressure range.
- 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



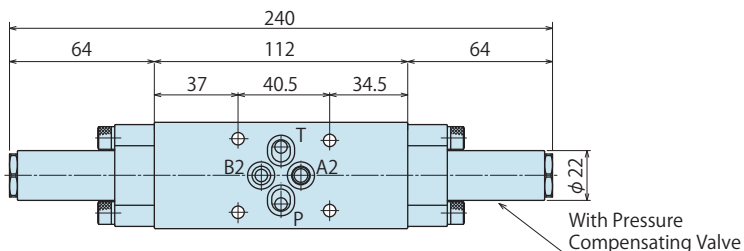
BSP320-0A4R□ / BSP350-0A6R□ / BSP350-0A7R□

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

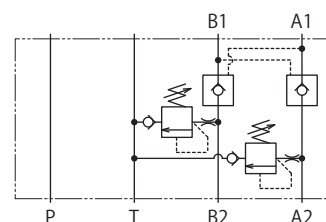
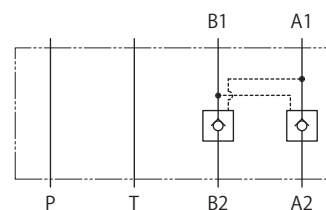
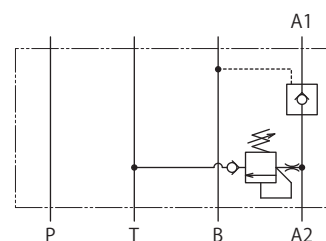
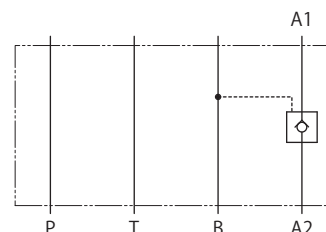


BSP320-0W4R□ / BSP350-0W6R□ / BSP350-0W7R□

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



Circuit Symbol



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

Non-Leak Valve Unit

Manual Operation Model

Model BH



Manual Direction Control Valve with Non-Leak Function

A Variety of Circuits and Combination Options

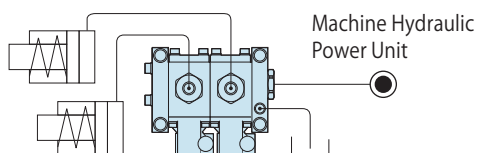
What is a manual operating non-leak valve unit ?

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

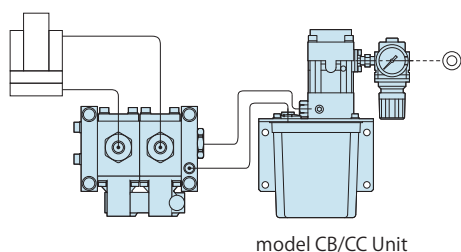
Even if the hydraulic power source is cut off due to energy saving (Stop hydraulic supply to incoming side) or blackout etc., it holds the pressure and prevents the workpiece drop off.

Application Examples

Activate the single acting actuator manually by AA circuit.



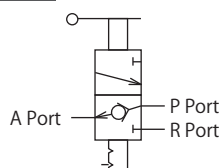
Activate the double acting actuator manually by NN circuit.



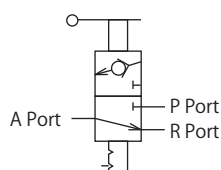
model CB/CC Unit

Circuit Symbol

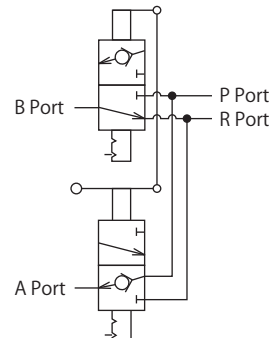
A Normal Open



B Normal Close

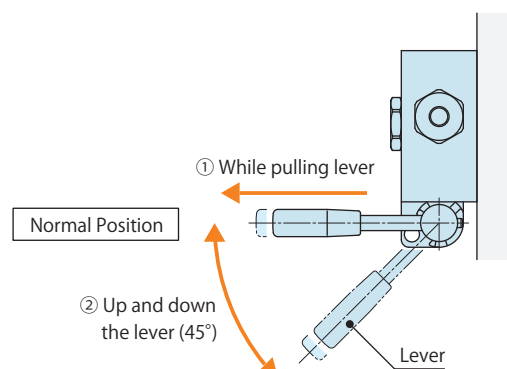


NN Exclusively used for Double Acting Circuit



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

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/cm²)

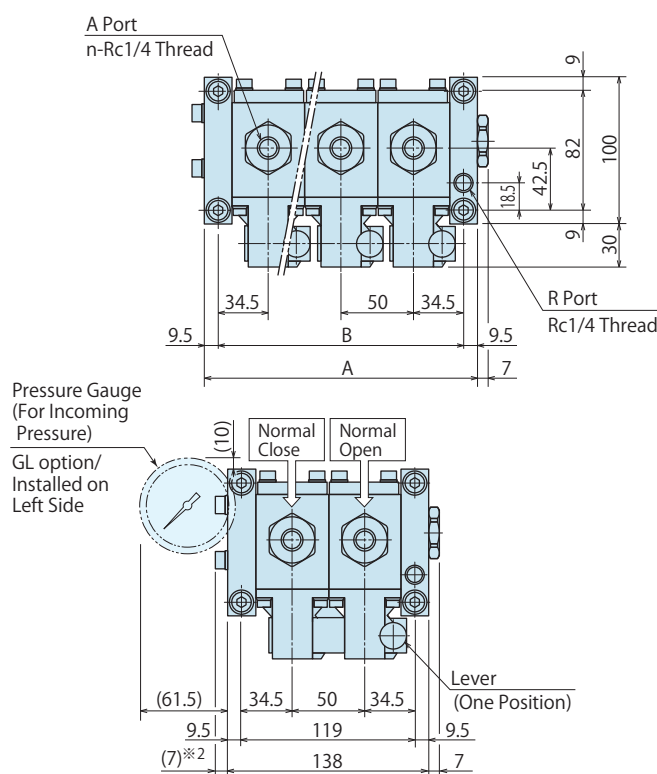
Specifications

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 °C	0 ~ 70	
Usable Fluid	General Hydraulic Oil Equivalent to ISO-VG-32	

Note :

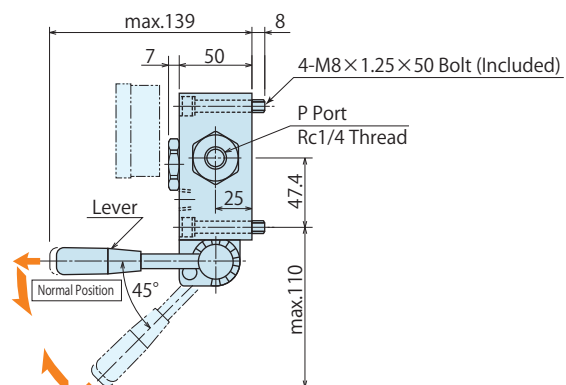
- ※1. It shows withstanding pressure without pressure gauge.

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.

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/BS

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

Non-Leak Valve Unit

Electrical Control Model

Model BC



Electrical direction control valve with non-leak valve

A variety of circuits and combination options.

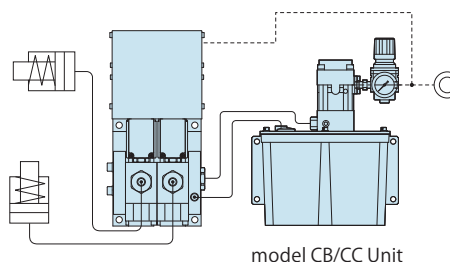
What is a non-leak valve unit (Electrical Control Model) ?

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.

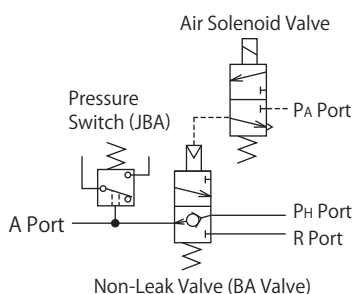
Application Examples

Control lock and release action of actuators electrically.

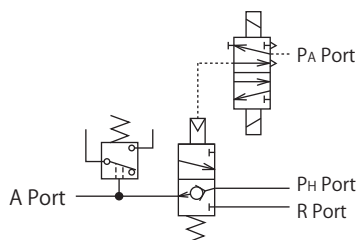


Circuit Symbol

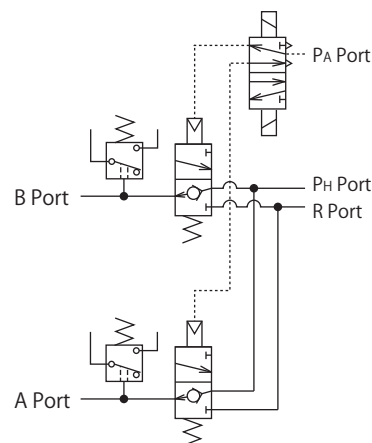
C Normal Open



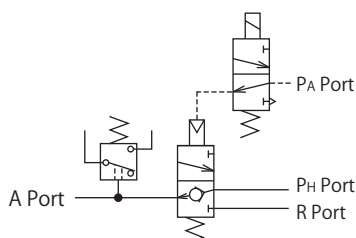
U Double Solenoid Valve Option



YY Exclusively used for Double Action Circuit



Z Normal Close



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

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 Pressure Code (Operating Pressure Range)

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

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, UUY

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

4 Control Voltage

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

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).

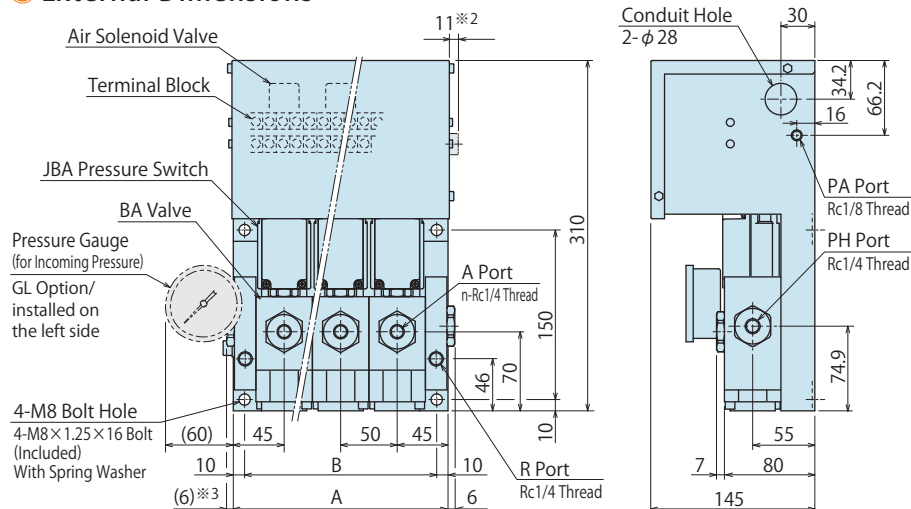
Specifications

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-OG-Z0020G	JBA0700-OG		JBA2700-OG	
Operating Temperature °C	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.

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

Air Sequence Valve

Hydraulic Non-Leak Coupler	BGA/BGB
	BGC/BGD
	BGP/BGS
	BBP/BBS
	BNP/BNS
	BJP/BJS
	BFP/BFS

Auto Coupler

JJC/JJD
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

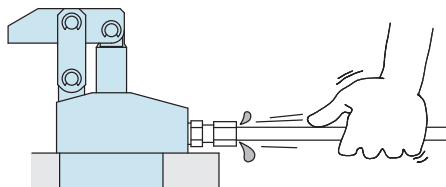
Air
Hydraulic Unit

CV
CK
CP/CPB
CPC/CQC
CB
CC
AB/AB-V
AC/AC-V

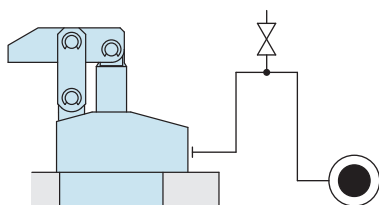
Cautions

● 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.

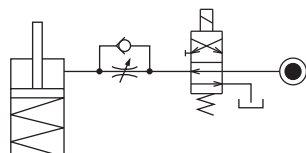
Notes on Hydraulic Cylinder Speed Control Unit



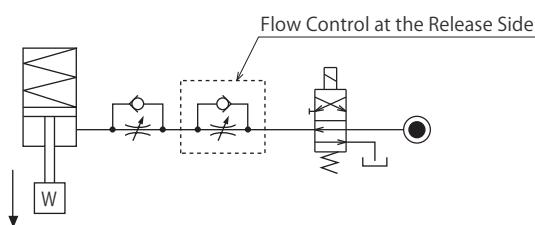
Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

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

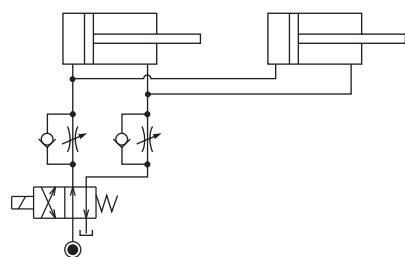
Flow control circuit for double acting cylinder should have meter-out circuits for both the lock and release sides. Meter-in control can have adverse effect by presence of air in the system.

However, in the case of controlling LKE, TMA, TLA, both lock side and release side should be meter-in circuit.

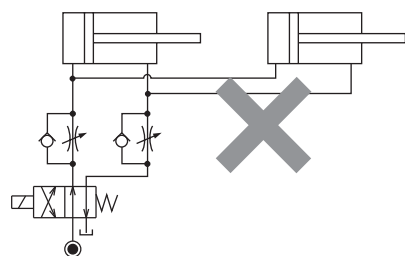
Refer to P.75 for speed adjustment of LKE.

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)

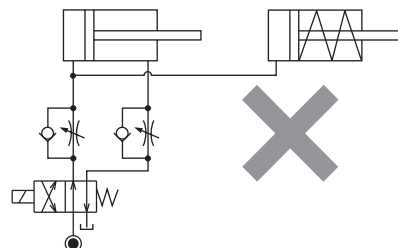


【Meter-in Circuit】 (LKE/TMA/TLA must be controlled with meter-in.)



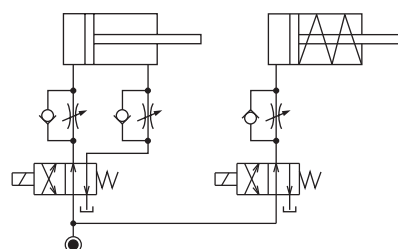
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

- 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.

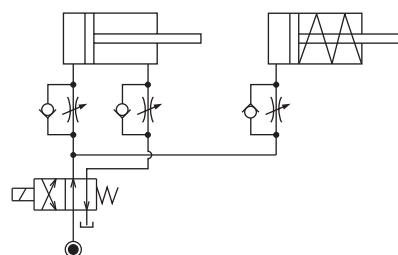


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

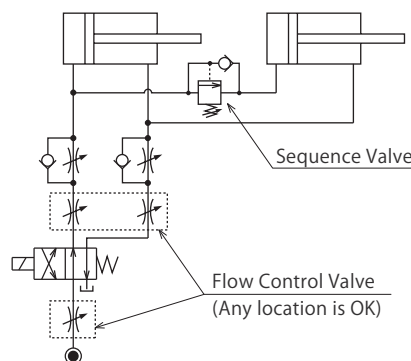
- Separate the control circuit.



- 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.



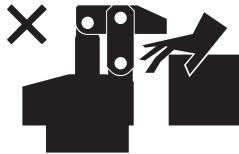
- ② In the case of meter-out circuit, the inner circuit pressure may increase during the cylinder action because of the fluid supply. The increase of the inner circuit pressure can be prevented by reducing the supplied fluid beforehand via the flow control valve. Especially when using sequence valve 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

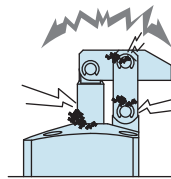
- 1) It should be operated by qualified personnel.
- The hydraulic machine and air compressor should be operated and maintained by qualified personnel.
- 2) Do not operate or remove the product unless the safety protocols are ensured.
 - ① The machine and equipment can only be inspected or prepared when 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.



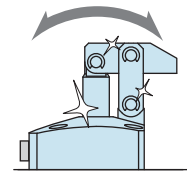
- 4) Do not disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

● 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.

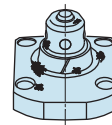


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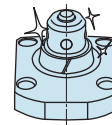


○

- 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.



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- 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.

Cautions[Installation Notes
\(For Hydraulic Series\)](#)[Hydraulic Fluid List](#)[Notes on Hydraulic Cylinder
Speed Control Circuit](#)[Notes on Handling](#)[Maintenance/
Inspection](#)[Warranty](#)**Company Profile**[Company Profile](#)[Our Products](#)[History](#)**Index**[Search by](#)[Alphabetical Order](#)**Sales Offices**

● 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

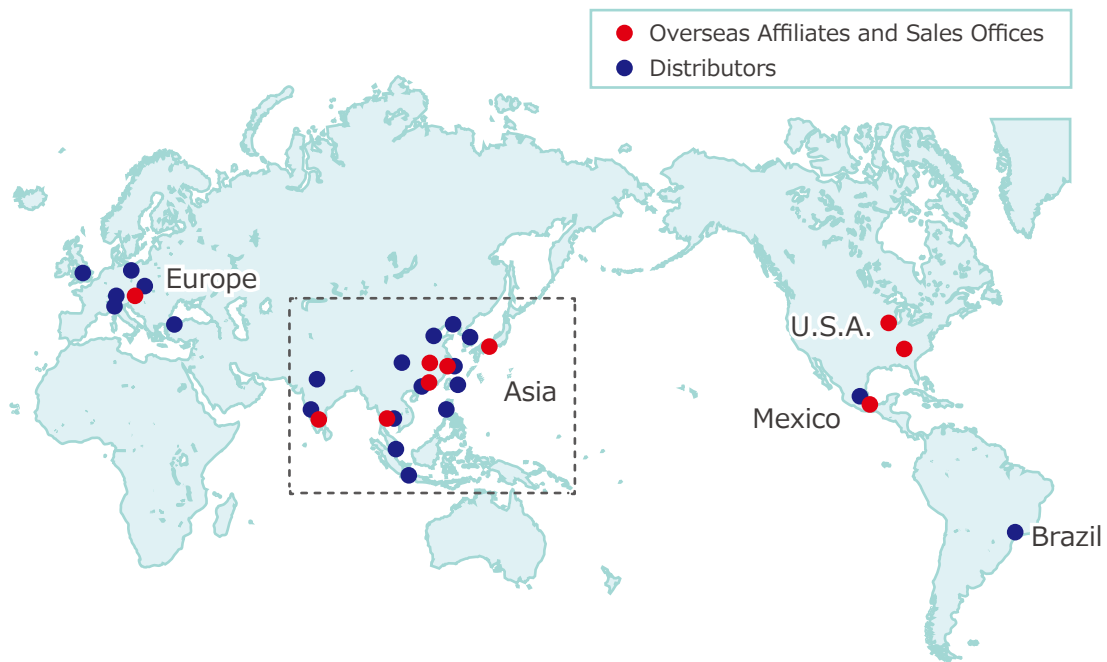
Sales Offices across the World

Japan	KOSMEK LTD. HEAD OFFICE	TEL. +81-78-991-5162 FAX. +81-78-991-8787 1-5, 2-chome, Murotani, Nishi-ku, Kobe-city, Hyogo, Japan 651-2241
USA	KOSMEK (USA) LTD. Overseas Subsidiary	TEL. +1-630-620-7650 FAX. +1-630-620-9015 650 Springer Drive, Lombard, IL 60148 USA
	KOSMEK USA ATLANTA BRANCH OFFICE	TEL. +1-630-620-7650 303 Perimeter Center North, Suite 300, Atlanta, GA 30346 USA
Mexico	KOSMEK USA MEXICO BRANCH OFFICE	TEL. +52-442-851-1377 Av. Loma Pinal de Amoles 320-piso PH oficina 504 interior 13, Vista Dorada, 76060 Santiago de Querétaro, Qro. Mexico
Europe	KOSMEK EUROPE GmbH Overseas Subsidiary	TEL. +43-463-287587 FAX. +43-463-287587-20 Schleppplatz 2 9020 Klagenfurt am Wörthersee Austria
China	KOSMEK (CHINA) LTD. Overseas Subsidiary	TEL.+86-21-54253000 FAX. +86-21-54253709 Room601, RIVERSIDE PYRAMID No.55, Lane21, Pusan Rd, Pudong Shanghai China
	KOSMEK (CHINA) LTD. Dongguan Office Overseas Subsidiary (Sales Office)	TEL.+86-769-85300880 Room 603, Xinchuang Power Building (No. 122-1 West Houjie Avenue), Houjie Town, Dongguan City, Guangdong Province, China
	KOSMEK (CHINA) LTD. Wuhan Office Overseas Subsidiary (Sales Office)	TEL.+86-15802172393 Room 309, Chuangu Technology Building, 266 Taizihu Rd, Zhuankou Subdistrict, Caidian District, Wuhan 430056, Hubei Province, China
India	KOSMEK LTD. - INDIA Branch	TEL. +91-9880561695 4A/Old No:649, Ground Floor, 4th D cross, MM Layout, Kavalbyrasandra, RT Nagar, Bangalore -560032 India
Thailand	KOSMEK Thailand Representative Office Representative Office	TEL. +66(0)2-059-2010 No.139, Blue Chips Building, 4th Floor, Room No.422, Soi Sukhumvit 63 (Thong Lor 10), Sukhumvit Road, Khlong Tan Nuea, Wattana, Bangkok 10110, Thailand
Taiwan	FULL LIFE TRADING CO., LTD. Distributor	TEL. +886-2-82261860 FAX. +886-2-82261890 16F-4, No.2, Jian Ba Rd., Zhonghe District, New Taipei City Taiwan 23511
Philippines	G.E.T. Inc, Phil. Distributor	TEL.+63-2-310-7286 FAX. +63-2-310-7286 Victoria Wave Special Economic Zone Mt. Apo Building, Brgy. 186, North Caloocan City, Metro Manila, Philippines 1427
Indonesia	PT. Yamata Machinery Sales Distributor	TEL. +62-21-29628607 FAX. +62-21-29628608 Delta Commercial Park I, Jl. Kenari Raya B-08, Desa Jayamukti Kec. Cikarang Pusat Kab. Bekasi 17530 Indonesia

Sales Offices in Japan

Head Office Osaka Sales Office Overseas Sales	TEL. 078-991-5162 FAX. 078-991-8787 1-5, 2-chome, Murotani, Nishi-ku, Kobe-city, Hyogo, 651-2241, Japan
Tokyo Sales Office	TEL. 048-652-8839 FAX. 048-652-8828 81, 4-chome, Onari-cho, Kita-ku, Saitama City, Saitama, 331-0815, Japan
Nagoya Sales Office	TEL. 0566-74-8778 FAX. 0566-74-8808 10-1, 2-chome, Misono-cho, Anjo City, Aichi, 446-0076, Japan
Fukuoka Sales Office	TEL. 092-433-0424 FAX. 092-433-0426 8-10-101, 1-chome, Kamimuta, Hakata-ku, Fukuoka City, Fukuoka, 812-0006, Japan

Global Network



Asia Detailed Map

