

Sequence Valve

Model BLS
Model BLG



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

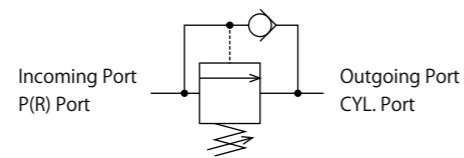
It is able to control locating and clamping workpiece in sequence in one system.

What is a sequence valve?

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

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

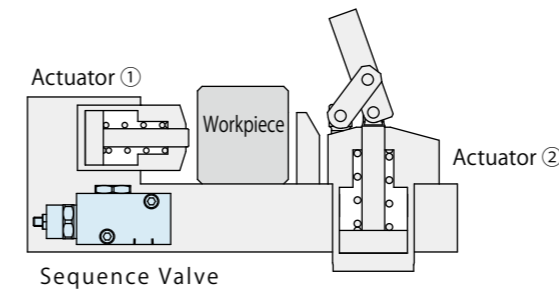
Circuit Symbol



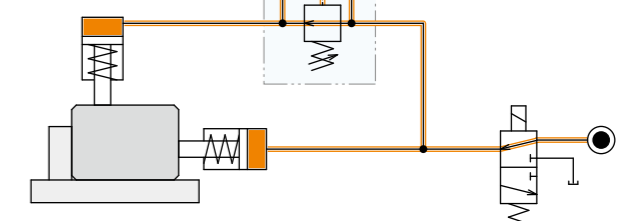
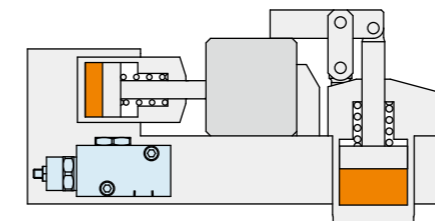
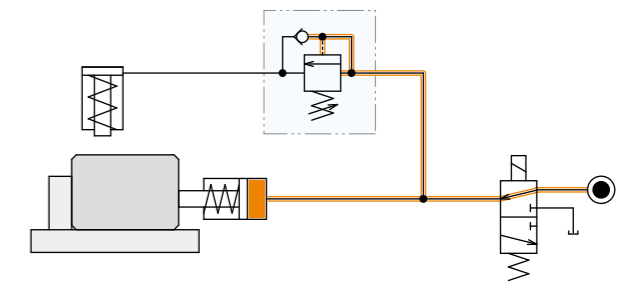
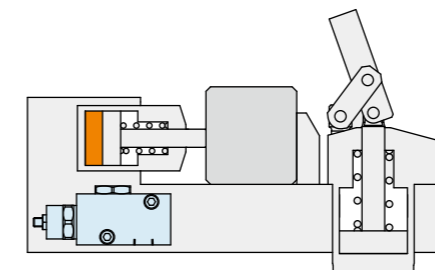
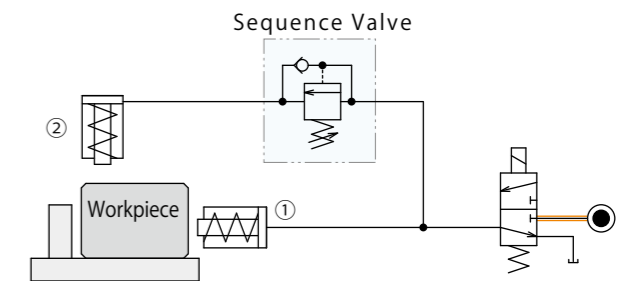
※ Each port has a built-in filter.

Action Description

Images



Circuit Example

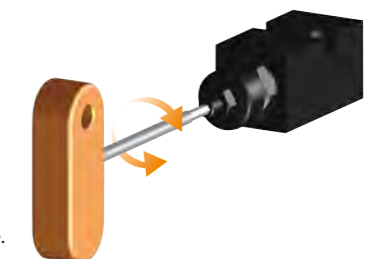


Operation Sequence		Remarks
When locking	Hydraulic pressure is ON.	
	Actuator ① works.	
	The pressure reaches to the set value for sequence operating pressure.	Provide a difference of more than 1MPa between operating and setting pressure.
	Sequence valve port is open.	
	Actuator ② works.	
	Locking action completed.	
machining process		
When releasing	Hydraulic pressure is OFF.	
	The actuators ①,② are released at the same time.	When incoming side pressure decreases, internal check valve opens.
	Release action completed.	

Adjustable Set Pressure

Model No.	BLS□31	BLS□51	BLS□71	BLG2830	BLG2860
Set Hydraulic Pressure Change per Rotation (MPa/Rev)	0.7	1.0	2.6	1.0	2.8

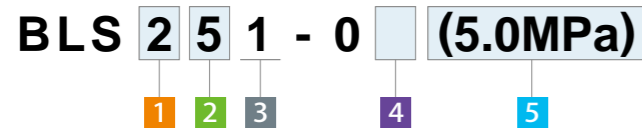
Notes: 1. The set pressure value is set according to the model code.
2. Pressure increases by turning clockwise and decreases by turning anti-clockwise.



	Model BLS → P.1111	Model BLG → P.1113
Classification	Sequence Valve	Compact Sequence Valve
Actuating Pressure Range	1~4MPa 3~8MPa 8~20MPa	1~6MPa 5~18MPa
Operating Pressure Range	2~30MPa 2~35MPa 6~35MPa	
Piping Method	Piping Option Manifold Option BK Connecting Option BK/BLB Connecting Option	Double Gasket 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/BJS
 - BFP/BFS
- Auto Coupler
 - 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

2 Operating Pressure Range

- 3 : 1.0~4.0 MPa
- 5 : 3.0~8.0 MPa
- 7 : 8.0~20.0MPa

3 Design No.

- 1 : Revision Number

Notes:

- ※1. Build to order product. Feel free to ask us about delivery time when placing an order.
- ※2. W option 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.)

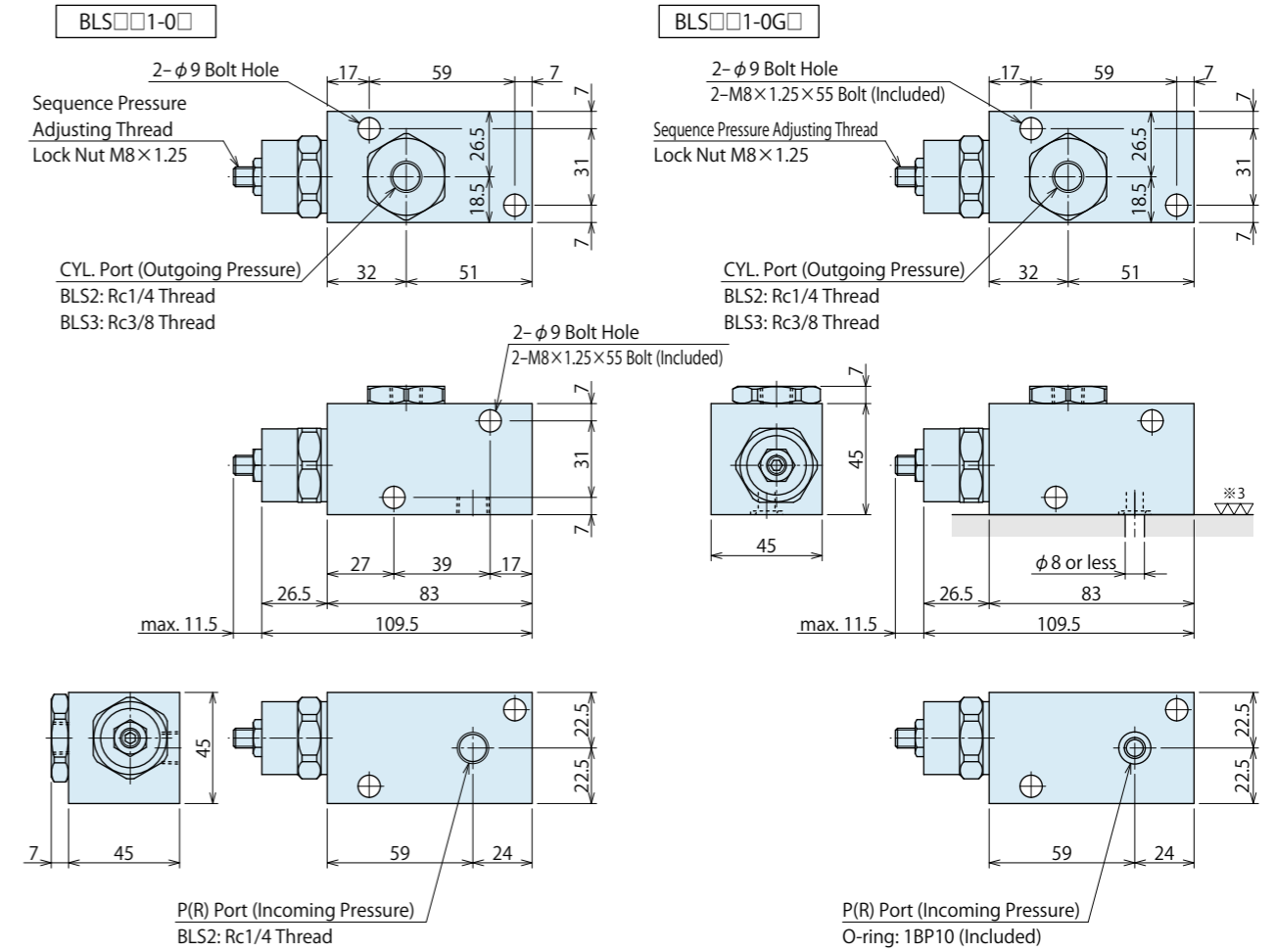
- ※ Provide a difference of more than 1MPa between operating and setting pressure.
- ※ When using multiple BLS sequence valves in a parallel fashion, provide each set pressure with a pressure difference more than 1MPa.

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.1110.

External Dimensions



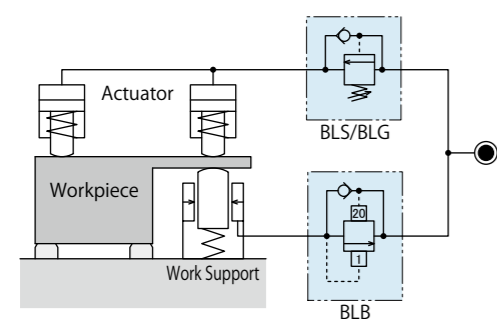
- Note : ※3. Roughness of mounting surface (O-ring seal surface) should be 6.3S or less.

Specifications

Model No.	BLS□31-0□□	BLS□51-0□□	BLS□71-0□□	
Actuating Pressure 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		
Mass	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

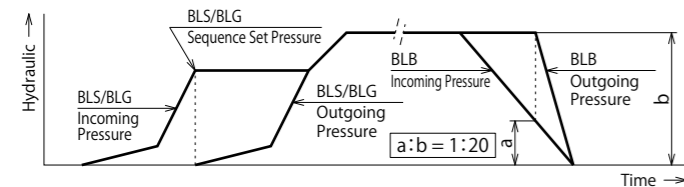


Operation Sequence (When clamping)

- Supply hydraulic pressure.
- 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.
- 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.

Operation Sequence (When releasing)

- Shut off hydraulic pressure supply.
- Pressure reduction of BLS/BLG starts right after the hydraulic pressure supply is shut off and the actuator retracts to release the pressure.
- 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.



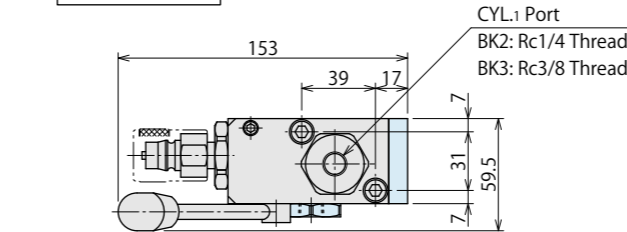
BLS/BLG

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).

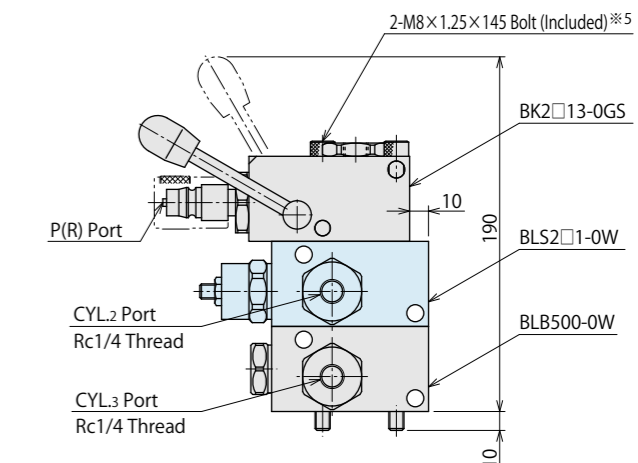
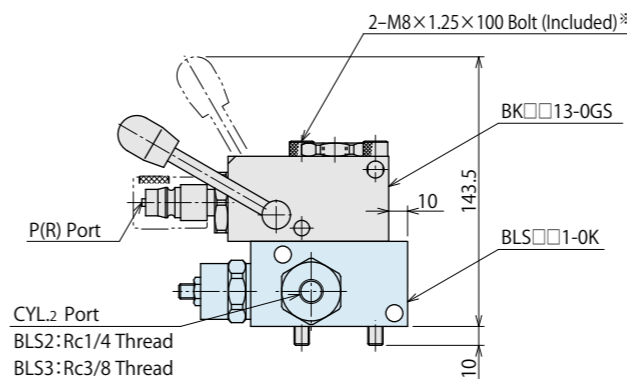
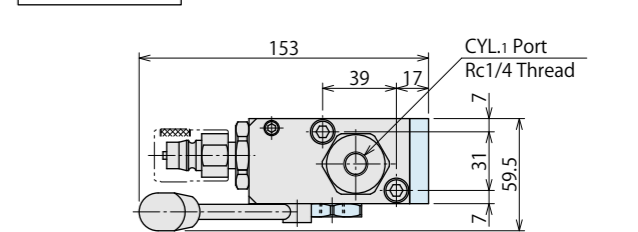
BLB

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.

BLS□□1-0K□



BLS2□1-0W□



Notes :

- ※4. The BK combination option uses M8×1.25×100 bolts (provided). But without M8×1.25×55 bolts and M8×1.25×145 bolts.
- 1. BK is sold separately. Prepare it separately.

Notes :

- ※5. The BK and BLB combination option uses M8×1.25×145 bolts (provided). But without M8×1.25×55 bolts and M8×1.25×100 bolts.
- 1. BK/BLB are sold separately. Prepare them separately.

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

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

BLG28 3 0 - 0 G (5.0MPa)



1 Set Value for Sequence Operating Pressure

- 3 : 1.0~6.0 MPa
- 6 : 5.0~18.0 MPa

2 Design No.

0 : Revision Number

3 Piping Method ^{※1}

G : Gasket Option

Note :

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

4 Set Pressure (Set Value for Sequence Operating Pressure)

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

- ※ Provide a difference of more than 1MPa between operating and setting pressure.
- ※ When using multiple BLG sequence valves in a parallel fashion, provide each set pressure with a pressure difference more than 1MPa.

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

Blank : Pressure Setting Free Option

- ※ If set pressure is determined by customer, indicate it within "Blank".
- ※ When shipping, the pressure is set as the minimum pressure indicated in the specification "Actuating Pressure Range".
- ※ For pressure adjustment, please refer to "Sequence Valve Pressure Setting Procedure" included along with the product and "Adjustable Set Pressure" on P.1110.

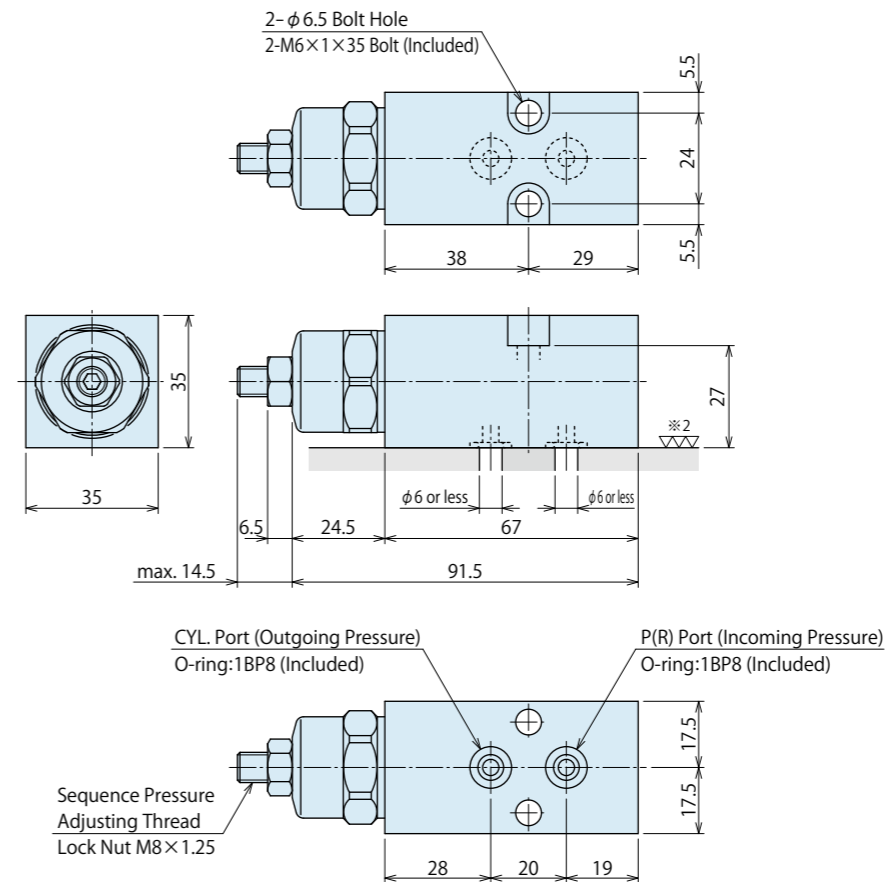
Specifications

Model No.		BLG2830-0G□	BLG2860-0G□
Actuating Pressure 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	°C	0 ~ 70	
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32	
Mass	kg	0.6	

- Notes :
1. If the flow volume of the incoming pressure side is too much, there is a possibility that the proper sequential procedures would not work. In this instance, use a flow control valve to adjust flow volume from the pressure source.
 2. Please refer to BLS page for the example of a combination of BLG and BLB.

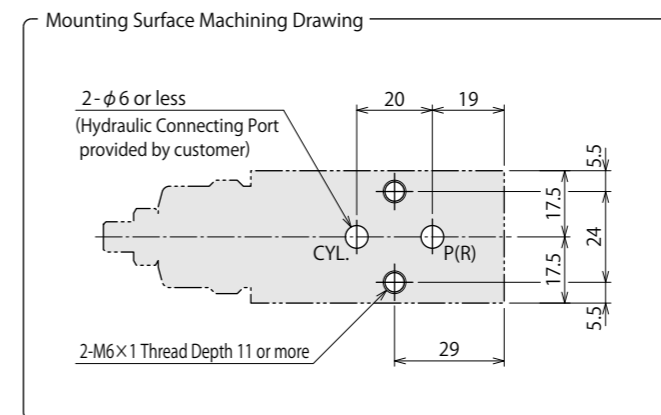
External Dimensions

BLG28□0-0G□



Note :

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



- 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

- 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

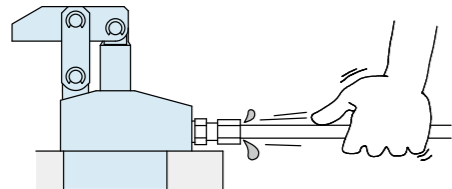
Air Hydraulic Unit

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

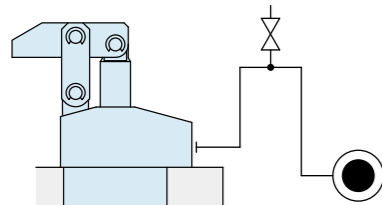
● Cautions

● 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.
 - In order to prevent a foreign substance from going into the product during the piping work, it should be carefully cleaned before working.
- 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 Wiggle 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 bleed 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

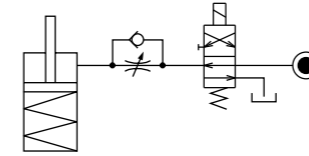
Maker	ISO Viscosity Grade ISO-VG-32	
	Anti-Wear Hydraulic Oil	Multi-Purpose Hydraulic Oil
Showa Shell Sekiyu	Tellus S2 M 32	Morlina S2 B 32
Idemitsu Kosan	Daphne Hydraulic Fluid 32	Daphne Super Multi Oil 32
JX Nippon Oil & Energy	Super Hyrando 32	Super Mulpus DX 32
Cosmo Oil	Cosmo Hydro AW32	Cosmo New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

Note As it may be difficult to purchase the products as shown in the table from overseas, please contact the respective manufacturer.

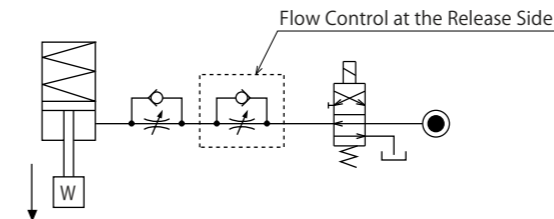
● Notes on Hydraulic Cylinder Speed Control Unit

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.

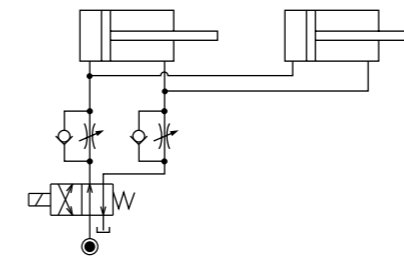


Accelerated clamping speed by excessive hydraulic flow to the cylinder may sustain damage. In this case add flow control to regulate flow. (Please add flow control to release flow if the lever weight is put on at the time of release action when using swing clamps.)

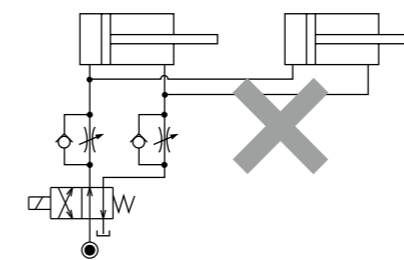


- Flow Control Circuit for Double Acting Cylinder
Flow control circuit for double acting cylinder should have meter-out circuits for both the lock and release sides. Meter-in control can have adverse effect by presence of air in the system. **However, in the case of controlling LKE, TMA, TLA, both lock 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.**

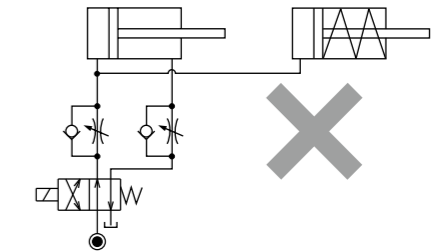
【Meter-out Circuit】 (Except LKE/TMA/TLA)



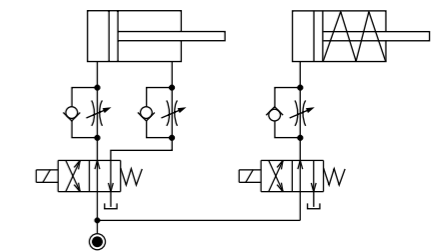
【Meter-in Circuit】 (LKE/TMA/TLA must be controlled with meter-in.)



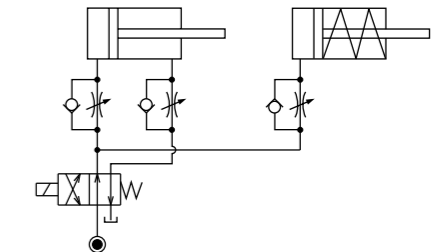
- ① Single acting components should not be used in the same flow control circuit as the double acting components. The release action of the single acting cylinders may become erratic or very slow.



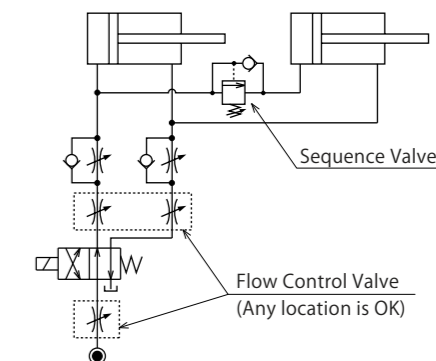
Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.
○ Separate the control circuit.



- 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.



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

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

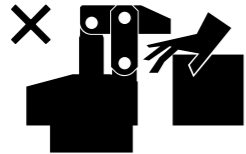
Index
Search by Alphabetical Order

Sales Offices

Cautions

● Notes on Handling

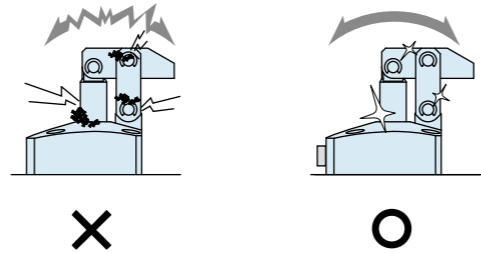
- 1) It should be handled by qualified personnel.
 - The hydraulic machine and air compressor should be handled and maintained by qualified personnel.
- 2) Do not handle or remove the machine unless the safety protocols are ensured.
 - ① The machine and equipment can only be inspected or prepared when it is confirmed that the preventive devices are in place.
 - ② Before the machine is removed, make sure that the above-mentioned safety measures are in place. Shut off the air of hydraulic source and make sure no pressure exists in the hydraulic and air circuit.
 - ③ After stopping the machine, do not remove until the temperature cools down.
 - ④ Make sure there is no abnormality in the bolts and respective parts before restarting the machine or equipment.
- 3) Do not touch clamp (cylinder) while clamp (cylinder) is working. Otherwise, your hands may be injured due to clinching.



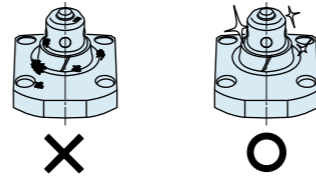
- 4) Do not disassemble or modify.
 - If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

● Maintenance and Inspection

- 1) Removal of the Machine and Shut-off of Pressure Source
 - Before the machine is removed, make sure that the above-mentioned safety measures are in place. Shut off the air of hydraulic source and make sure no pressure exists in the hydraulic and air circuit.
 - 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, fluid leakage and air leaks.



- 3) Please clean out the reference surface regularly (taper reference surface and seating surface) of locating machine. (VS/VT/VFL/VFM/VFJ/VFK/WVS/VWM/VWK/VX/VXF)
 - Location products, except VX/VXF model, can remove contaminants with cleaning functions. When installing pallets make sure there is no thick sludge like substances on pallets.
 - Continuous use with dirt on components will lead to locating functions not work properly, leaking and malfunction.



- 4) If disconnecting by couplers on a regular basis, air bleeding should be carried out daily to avoid air mixed in the circuit.
- 5) Regularly tighten nuts, bolts, pins, cylinders and pipe line to ensure proper use.
- 6) Make sure the hydraulic fluid has not deteriorated.
- 7) Make sure there is smooth action and no abnormal noise.
 - Especially when it is restarted after left unused for a long period, make sure it can be operated correctly.
- 8) The products should be stored in the cool and dark place without direct sunshine or moisture.
- 9) Please contact us for overhaul and repair.

● Warranty

- 1) Warranty Period
 - The product warranty period is 18 months from shipment from our factory or 12 months from initial use, whichever is earlier.
- 2) Warranty Scope
 - If the product is damaged or malfunctions during the warranty period due to faulty design, materials or workmanship, we will replace or repair the defective part at our expense. Defects or failures caused by the following are not covered.
 - ① If the stipulated maintenance and inspection are not carried out.
 - ② If the product is used while it is not suitable for use based on the operator's judgment, resulting in defect.
 - ③ If it is used or handled in 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.

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

- 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



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