New

Auto Coupler with Pilot Check Valve

Model BGE/BGF

KOSMEK
Harmony in Innovation

Auto Coupler with Pilot Check Valve Mainly for APC

model **BGE/BGF**

Suitable for connecting the machine side and the fixture side of APC.

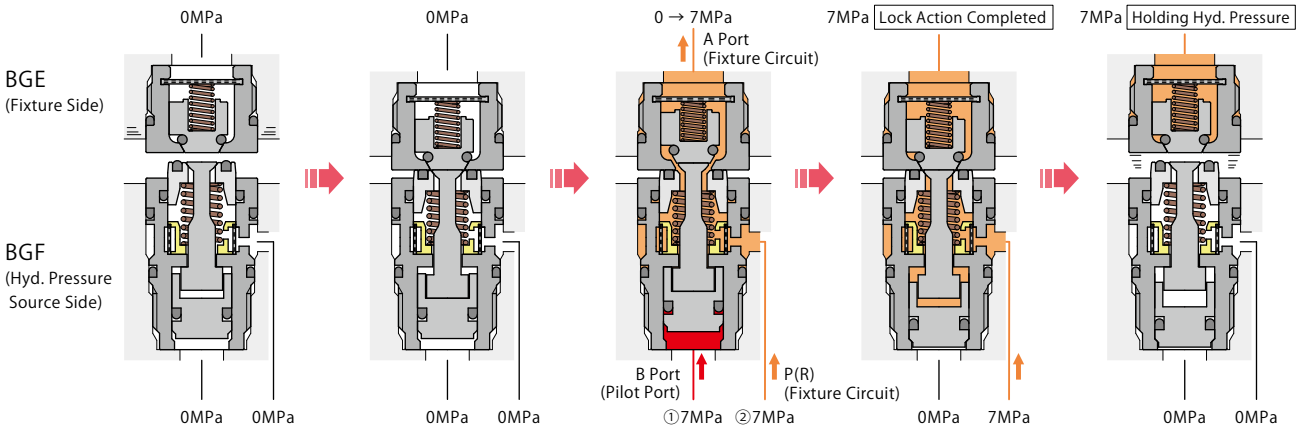
Enables temporary pressure holding during APC exchange.

Feature

Pilot check valve makes a smooth connection and disconnection of coupler with no reaction force.
It holds the fixture-side pressure even when the supply of pressure is stopped while connected.

Action Description (at 7MPa)

Lock Operation



Stop the hydraulic supply when connecting each port on the BGF side.

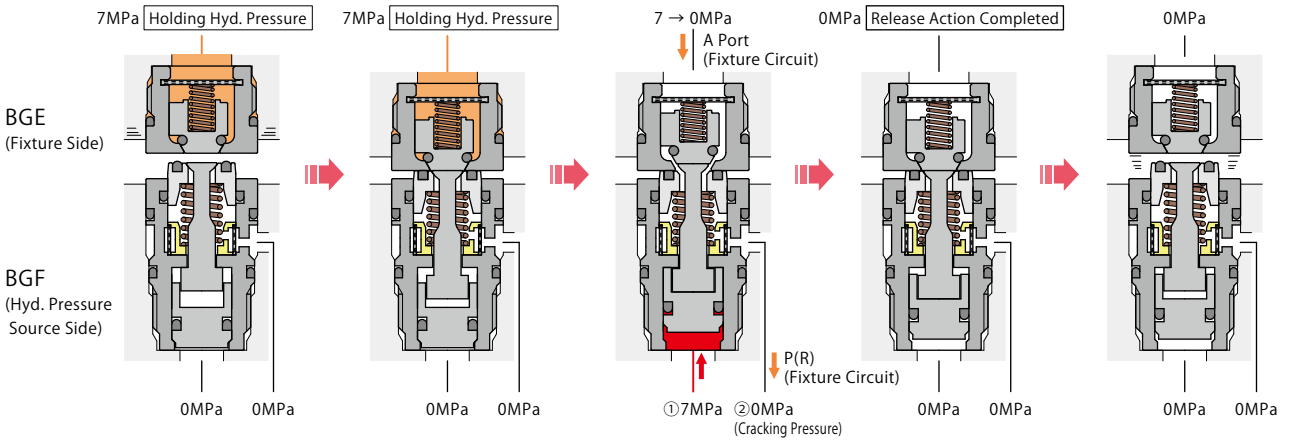
Connection Completed

① Supply hydraulic pressure to the pilot port B to open the check valve of BGE.
② After that, supply hydraulic pressure to the fixture circuit P (R).

After locking (pressurizing) of the fixture circuit is completed, stop the hydraulic supply to the pilot port B.

Disconnect the coupler after stopping the hydraulic supply to the fixture circuit P (R).

Release Operation



Stop the hydraulic supply when connecting each port on the BGF side.

Connection Completed

Supply hydraulic pressure to the pilot port B to open the check valve of BGE.

After releasing the pressure of the fixture circuit is completed, stop the hydraulic supply to the pilot port B.

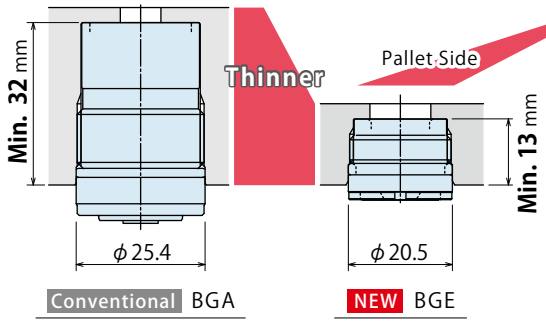
Notes :

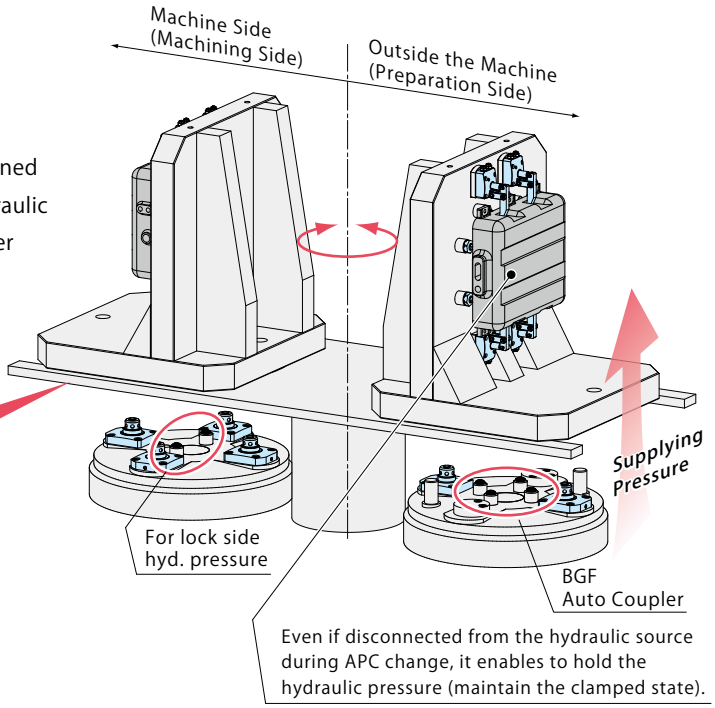
1. The drawings are simplified and different from the actual components.
2. Conditions of internal parts may be different from this drawing depending on connecting status, etc.
3. The pressures shown in the drawings are for example.

Best Suitable for APC

The coupler outgoing side pressure can be maintained only while temporarily disconnected from the hydraulic pressure source during APC replacement. (A coupler to supply the internal lock pressure is required.)

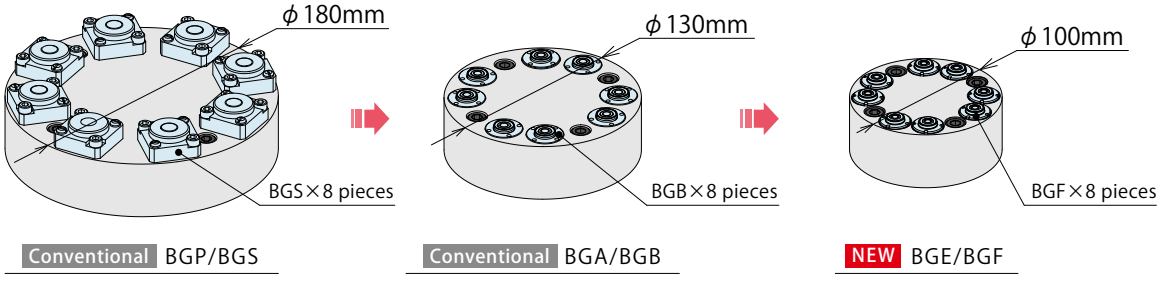
Pallet can be much thinner.





BGE/BGF is more compact than our conventional models for smaller footprint fixtures.

Examples of setting 8 pcs. of couplers on the hydraulic pressure source side.



Model No. Indication

BG E 022 0 - 0M

1 2

1 Style

E : Fixture Side (Outgoing Side)

F : Hydraulic Pressure Side (Incoming Side)

2 Design No.

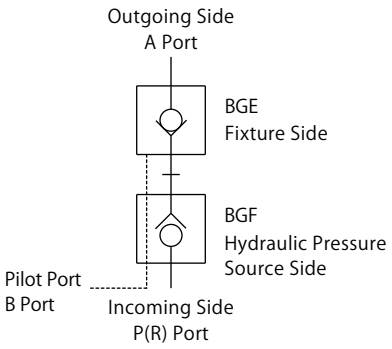
0 : Revision Number

Specifications

Model No.	Fixture Side		**BGE0220-0M**
	Pressure Source Side		**BGF0220-0M**
Operating Pressure		MPa	1.0 ~ 7.0
Withstanding Pressure		MPa	10.5
Min. Passage Area		mm^2	10.8
Offset Distance (Tolerance)		mm	±0.5
Angular Deviation (Tolerance)		DEG.	0.3
Operating Temperature		℃	0 ~ 70
Usable Fluid			General Hyd. Oil Equivalent to ISO-VG-32
Pilot Pressure ※1		MPa	Holding Pressure P / 1.3 + 0.5 or more
Spring Force when Connecting		kN	0.03
Reaction Force under Pressure	Operating Pressure	at 7 MPa	0.89
kN		at P MPa	0.123 × P + 0.03
Weight		g BGE	26
		BGF	51

Note : ※1. P : Holding Pressure (MPa).

Circuit Symbol



※ A filter is set to the A port side of the BGE check valve only. Contaminants entering from the connecting side lead to sealing failure. Do not connect when cutting chips are adhered on each end surface.

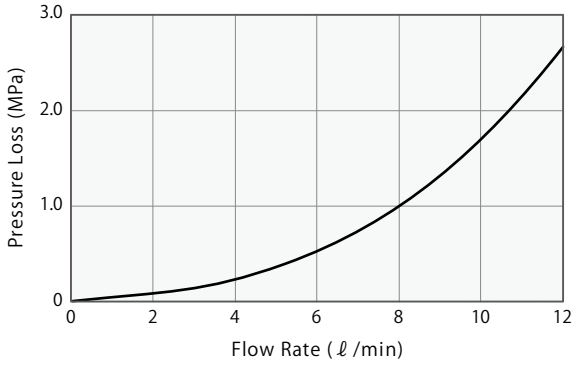
※ Pipes and oil passages should be cleaned and flushed thoroughly in order to prevent contaminants entering to the BGE side from the P (R) port of the BGF side.

※ Since the check valve of BGF is a metal seal, there will be slight leakage when pressurized while disconnected.

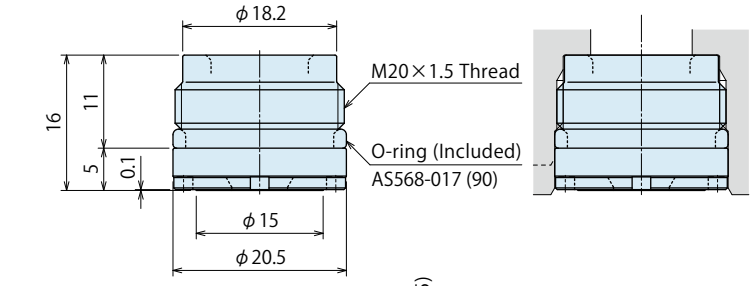
Flow Rate—Pressure Loss Characteristic Graph

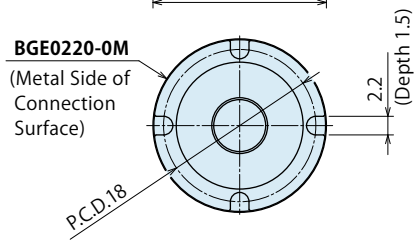
The fluid used on this data is general hydraulic oil equivalent to ISO-VG-32 (30 ~ 40℃).

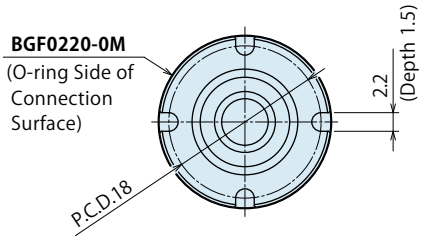
Pressure Loss (MPa)	Flow Rate (ℓ/min)
0	0
0.5	6.0
1.0	8.2
1.5	9.2
2.5	11.6

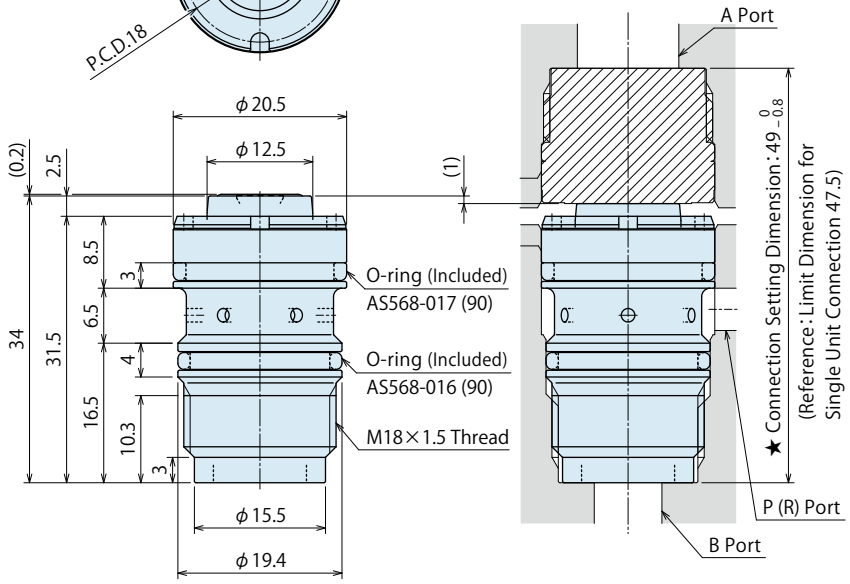


External Dimensions

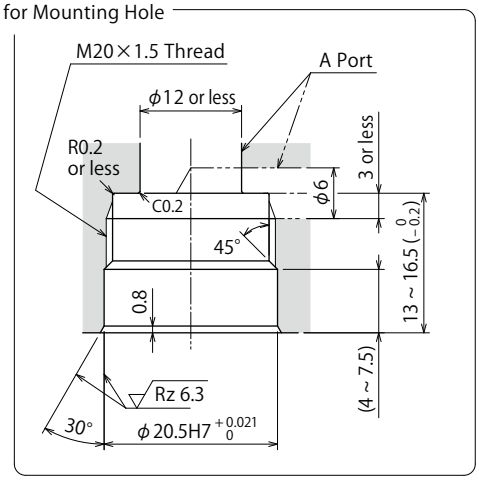




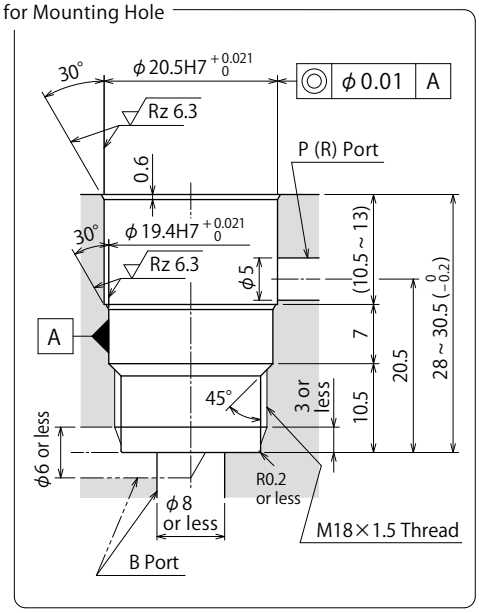




BGE Machining Dimensions for Mounting Hole



BGF Machining Dimensions for Mounting Hole



Model No.	Thread Size	Tightening Torque (N·m)
BGE0220-0M	M20×1.5	16
BGF0220-0M	M18×1.5	

Notes :

1. When using a stopper, make the ★ connection setting dimension as shown in the drawing.
2. Mounting Jig (Model ZZJ0020) or equivalent is required to install and remove BGE0220/BGF0220.
   Mounting Jig (Model ZZJ0060) is not included with BGE0220/BGF0220. Please order separately.

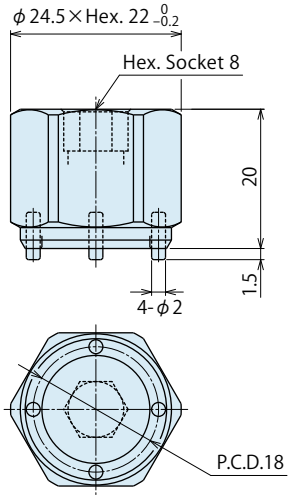
Accessary : Mounting Jig

This jig is used to mount and remove the BGE0220/BGF0220.
Tightening Torque : 16 N·m

Model No. Indication

ZZJ0020

Design No.
(Revision Number)

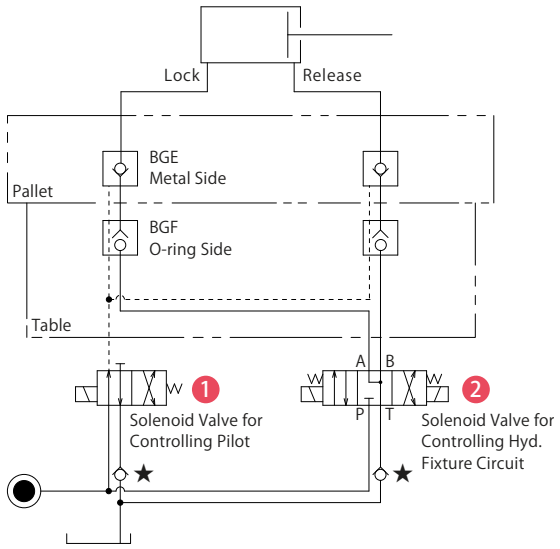


Note :

1. This mounting jig (Model ZZJ0020) or equivalent is required to install and remove BGE0220/BGF0220.
   Please determine the required number of jigs when ordering.

System Circuit Diagram (Example)

Double-Acting Circuit



Controlling Double-Acting Circuit

Apply a 3-position (center position, ABT connection) solenoid valve for controlling the hydraulic fixture circuit. When connecting or disconnecting BGE/BGF, use the center position to shut off the hydraulic pressure supply. This minimizes the reaction force at BGE/BGF part. In addition, when there is a possibility that back pressure is generated at the T port due to the system, install a check valve for preventing back flow having a cracking pressure of 0.04 MPa or less in the position with ★.
(Otherwise, oil leakage from the tip of BGF or malfunction of the pilot may occur.)

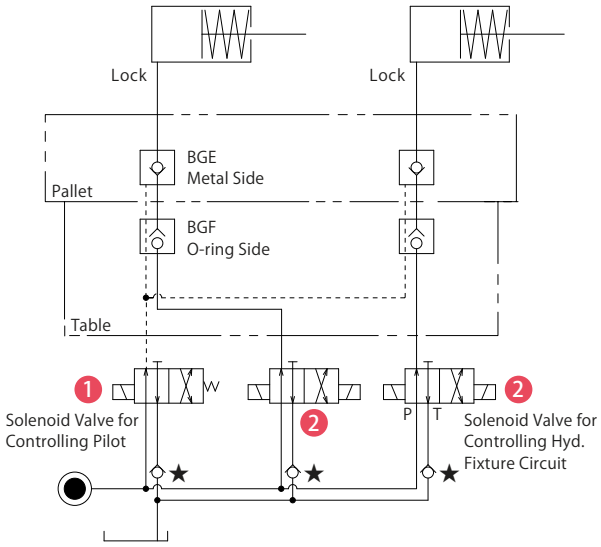
Lock Operation Procedure

1. In the connected condition, provide hydraulic pressure to the pilot circuit to open the check valve of BGE. (Operate the valve 1.)
2. Provide hydraulic pressure to the lock side circuit of the hydraulic fixture actuator. (Operate the valve 2.)
3. After pressurized, stop the hydraulic pressure supply to the pilot circuit. (Operate the valve 1.)
4. After stopping the hydraulic supply to all actuators, disconnect BGE/BGF. (Operate the valve 2 : Center Position.)

Release Operation Procedure

1. In the connected condition, provide hydraulic pressure to the pilot circuit to open the check valve of BGE (Operate the valve 1.)
2. Provide hydraulic pressure to the release side circuit of the hydraulic fixture actuator. (Operate the valve 2.)

Single-Acting Circuit



Controlling Single-Acting Circuit

When connecting or disconnecting BGE/BGF, stop the hydraulic pressure supply to the hydraulic fixture circuit. This minimizes the reaction force at BGE/BGF part. In addition, when there is a possibility that back pressure is generated at the T port due to the system, install a check valve ※1 for preventing back flow having a cracking pressure of 0.04 MPa or less in the position with ★.
(Otherwise, oil leakage from the tip of BGF or malfunction of the pilot may occur.)
※1. Select a device that can normally release at pressure less than the cracking pressure.

Lock Operation Procedure

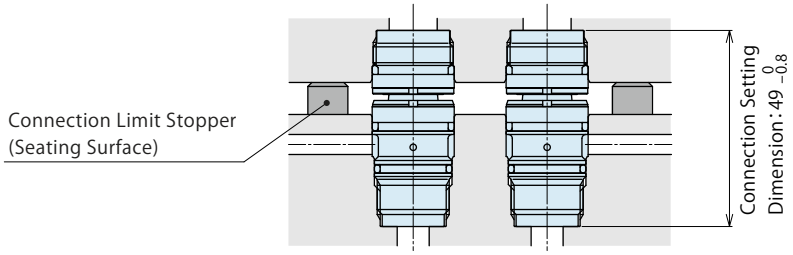
1. In the connected condition, provide hydraulic pressure to the pilot circuit to open the check valve of BGE. (Operate the valve 1.)
2. Provide hydraulic pressure to each actuator circuit of the hydraulic fixture. (Operate the valve 2.)
3. After pressurized, stop the hydraulic supply to the pilot circuit. (Operate the valve 1.)
4. After stopping the hydraulic supply to all actuators, disconnect BGE/BGF. (Operate the valve 2.)

Release Operation Procedure

1. The release operation can be performed just by providing the pilot circuit with hydraulic pressure after connection.
(Individual release can be performed by providing each actuator with hydraulic pressure in advance after the connection.)

Notes for Usage (BGE/BGF)

1. Please do not connect or disconnect while pressurizing each port of BGF. (Do not use a pilot check modular valve in the control circuit.
   After stopping pressure supply, pressure will be remained between the pilot check modular valve and BGF.)
2. Take precautionary measures not to produce back pressure in ports B and P(R) of BGF side when pressure supply is stopped.
3. Release the air in the circuit before use. (Air in the circuit may affect the oil dripping amount.)
4. A filter is set to the A port side of the BGE check valve only. Contaminants entering from the connecting side lead to sealing failure.
   Do not connect when cutting chips are adhered on each end surface.
   (Install a cover or remove all contaminants with air blow in order to prevent cutting chips.)
5. Pipes and oil passages should be cleaned and flushed thoroughly in order to prevent contaminants entering to the BGE side from the P (R) port of the BGF side.
6. Since the check valve of BGF is a metal seal, there will be slight leakage when pressurized while disconnected.
7. Please note that exceeding the allowable offset distance will damage the internal parts.
8. Remove burrs at the tolerance part of each hydraulic port after machining.
9. If using connection limit stoppers, make sure it becomes connection setting dimension when connected.



10. When pressing to the connection limit, the force should be higher than reaction force and lower than 2.0kN.

Cautions

Installation Notes (for Hydraulic Series)

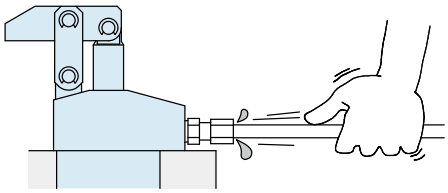
1) Check the Usable Fluid
- Please use the appropriate fluid by referring to the Hydraulic Fluid List.

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.

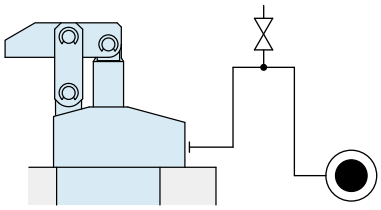
3) Applying Sealing Tape
- Wrap with tape 1 to 2 times following the screw direction.
- Pieces of the sealing tape can lead to oil leakage and malfunction.
- Please implement piping construction in a clear environment to prevent anything getting in products.

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, cylinder, work support, etc. 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 air bleeding.
⑤ It is more effective to release air at the highest point inside the circuit or at the end of the circuit. (For the gasket option, set an air bleeding valve at the highest point inside the circuit.)



5) Checking Looseness and Retightening
- At the beginning of the product 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

Manufacturer	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	

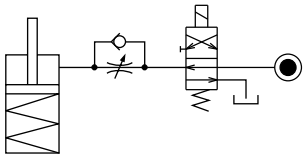
Note : Please contact manufacturers when customers require products in the list above.

Notes on Hydraulic Cylinder Speed Control Unit

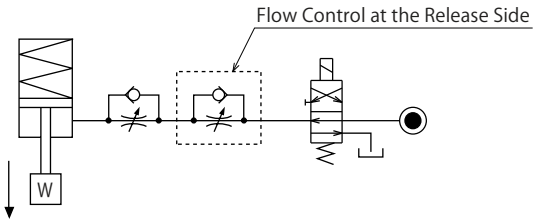
Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

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 only using a flow control valve with a check valve.
It is also preferred to provide a flow control valve at each actuator.



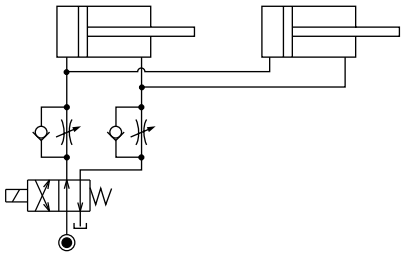
If a load is applied in the direction of release action during release, which may damage the cylinder, use a flow control valve with a check valve to control the flow rate on the release side as well. (This also applies to swing clamps where the lever weight is applied during release.)



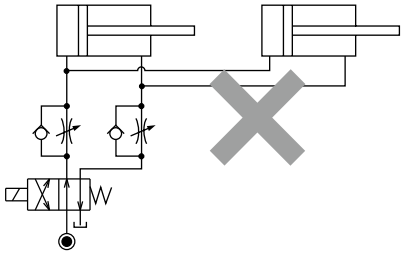
Flow Control Circuit for Double Acting Cylinder

Flow control circuit for double acting cylinder (except LKE/TLA/TMA/TLV/TMV/TTA) 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, TLA, TMA, TLV, TMV, TTA, both lock side and release side should be meter-in circuit.
For TLA, TMA, TLV, TMV and TTA, if meter-out circuit is used, abnormal high pressure is created, which causes oil leakage and damage.

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

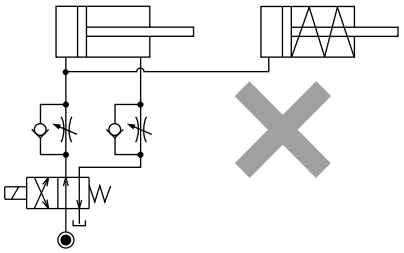


【Meter-in Circuit】(LKE, TLA, TMA, TLV, TMV and TTA must be controlled with meter-in.)



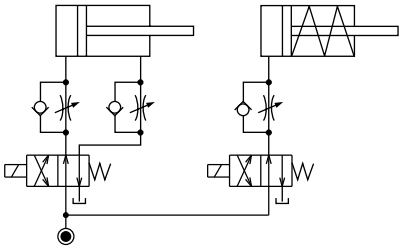
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

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.

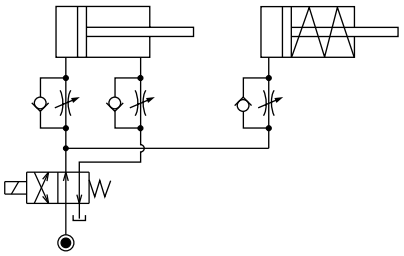


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

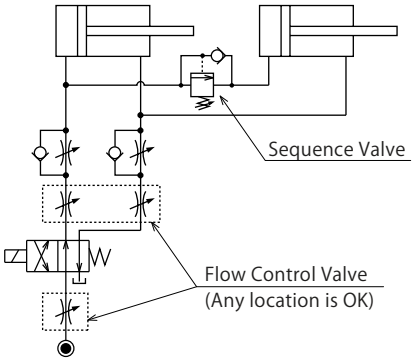
○ Separate the control circuit.



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



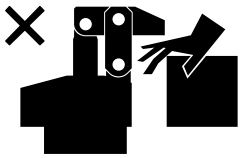
Cautions

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 Product and Shut-off of Pressure Source
- Before the product 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 hydraulic and air circuit.
- Make sure there is no trouble/issue in the bolts and respective parts before restarting.

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

3) Regularly tighten pipes, mounting bolts, nuts, snap rings and others to ensureproper use.

4) Make sure the hydraulic fluid has not deteriorated.

5) 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.

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

7) Please contact us for overhaul and repair.

Warranty

1) Warranty Period

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

2) Warranty Scope

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

① If the stipulated maintenance and inspection are not carried out.
② If the product is used while it is not suitable for use based on the operator's judgment, resulting in defect.
③ If it is used or operated in an inappropriate way by the operator. (Including damage caused by the misconduct of the third party.)
④ If the defect is caused by reasons other than our responsibility.
⑤ If repair or modifications are carried out by anyone other than Kosmek, or without our approval and confirmation, it will void warranty.
⑥ Others 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.

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- For Further Information on Unlisted Specifications and Sizes, Please call us.
- Specifications in this Leaflet are Subject to Change without Notice.

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