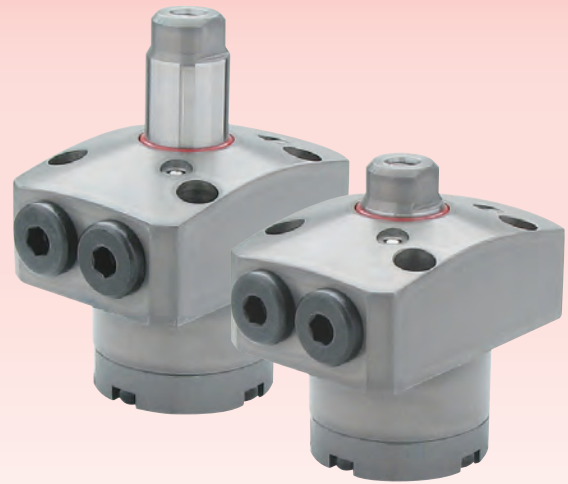


Air Sensing Lift Cylinder

Hydraulic Double Action

Model LLW

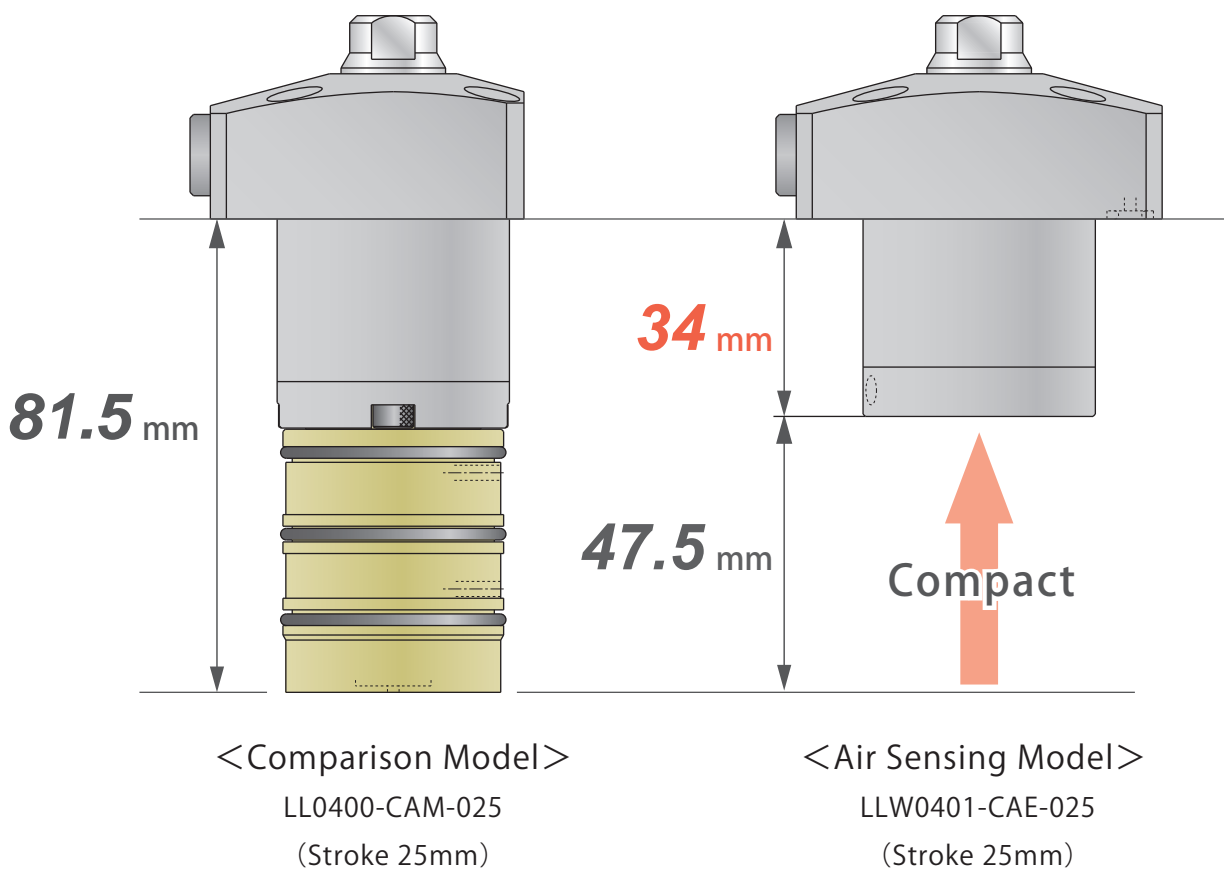


Compact and Space-Saving Lift Cylinder

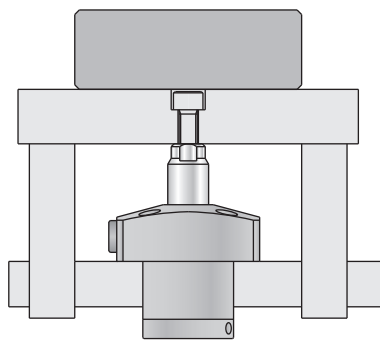
With built-in action confirmation valve LLW is ideal for automated equipment.
The stroke can be set from every 5 mm.

PAT. P.

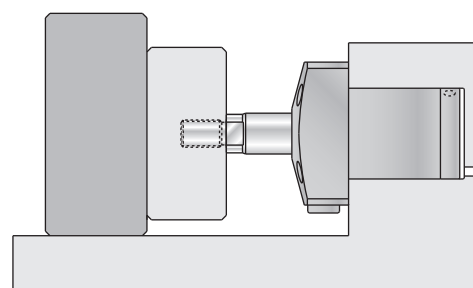
LLW is much more compact than the conventional model LL.



Application Examples

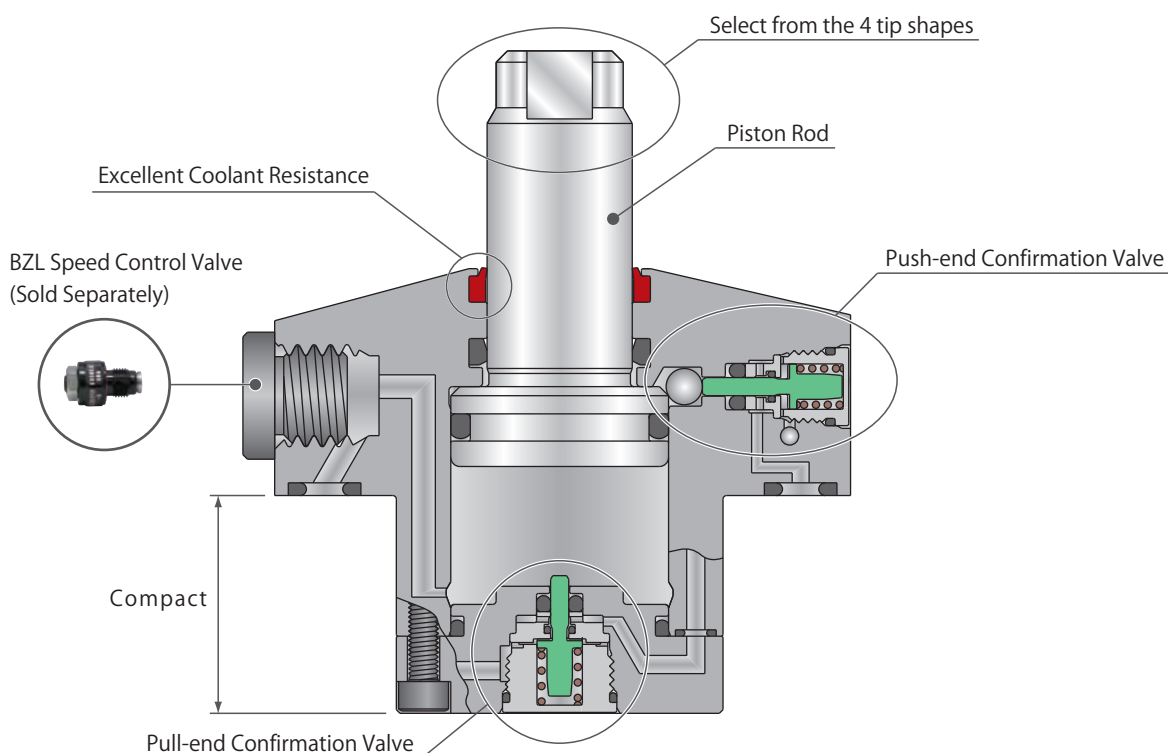


For lifting

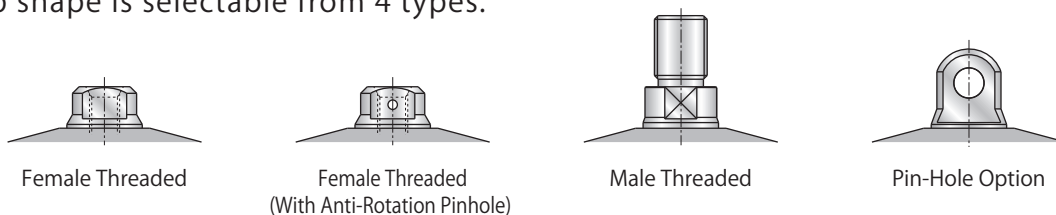


For shifting

Cross Section



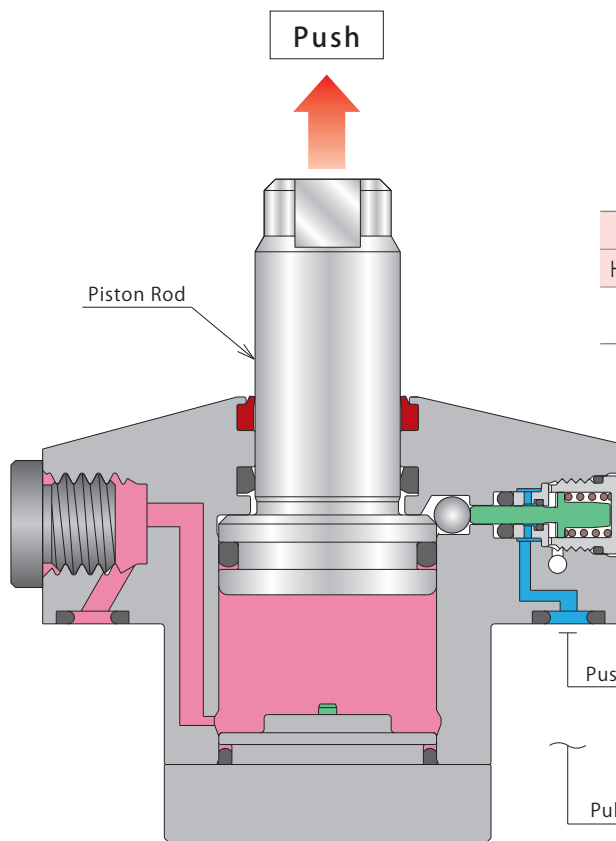
- 3 body sizes which are most suitable to space-saving.
- Built-in sensing valve enables to design an extremely small height fixtures. Zero air leakage when the valve is closed. Air sensor with limited flow rate is available.
- The stroke can be set from every 5mm in the range of 10 ~ 50mm(75mm)^{※1}
^{※1}. LLW0361/LLW0401: up to 50mm, LLW0481: up to 75mm
- Tip shape is selectable from 4 types.



- Able to attach speed control valve directly

It is available for directly mounting the speed control valve with air venting function (speed control valve is sold separately.)

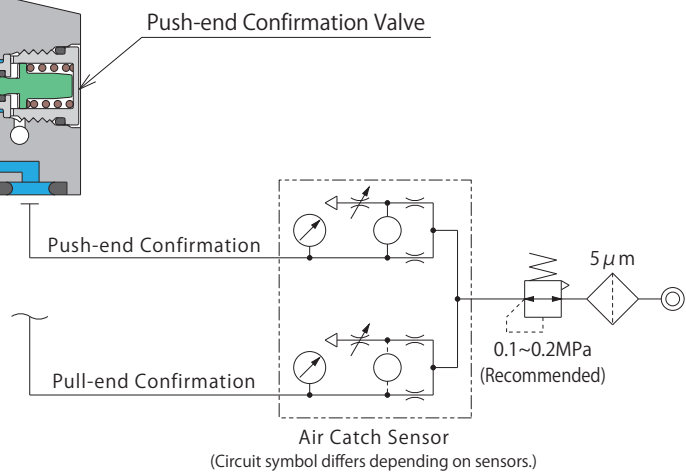
● Action Description



■ Push (Supplying hydraulic pressure to push side)

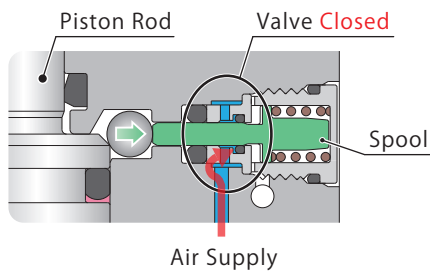
The piston rod ascends.

| Hydraulic Pressure | | Air Catch Sensor | |
|-----------------------|-----------------------|-----------------------|-----------------------|
| Hyd. Port : Push Side | Hyd. Port : Pull Side | Push-end Confirmation | Pull-end Confirmation |
| ON | OFF | ON | OFF |



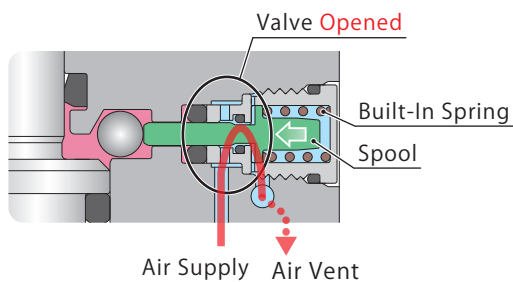
Push-end Confirmation Valve

Supplying Hyd. Pressure to Push Side Air Catch Sensor **ON**



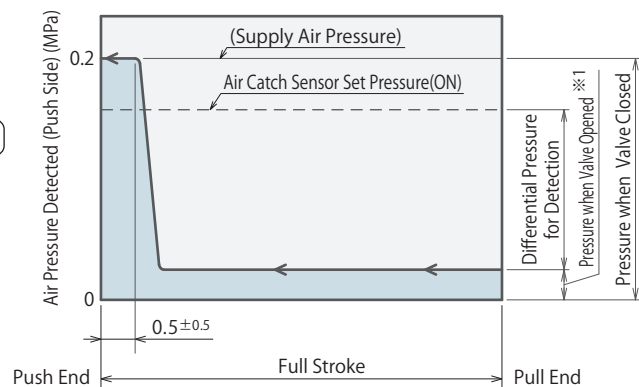
The spool is pushed back by the piston rod, and the valve is closed.

Supplying Hyd. Pressure to Pull Side Air Catch Sensor **OFF**

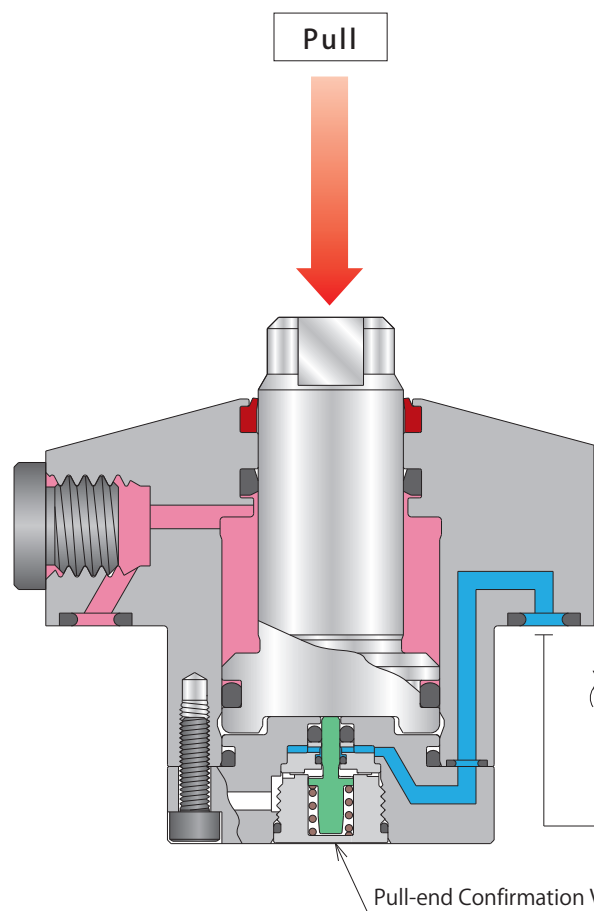


The spool is pushed forward by the built-in spring, and the valve is opened.

Push Side: Sensing Chart



※1. The sensor pressure for opening the valve depends on the sensor. With air sensor with large air flow, the sensor pressure for opening the valve is higher and the differential pressure for detection is lower.

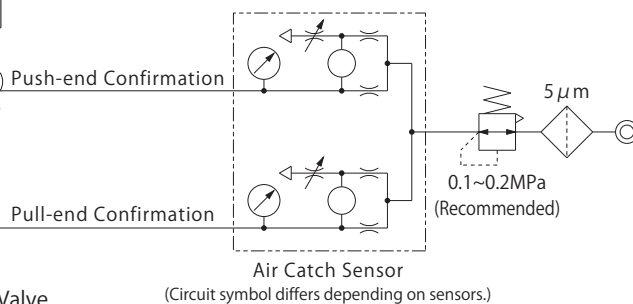


■ Pull (Supplying hydraulic pressure to pull side)

The piston rod descends.

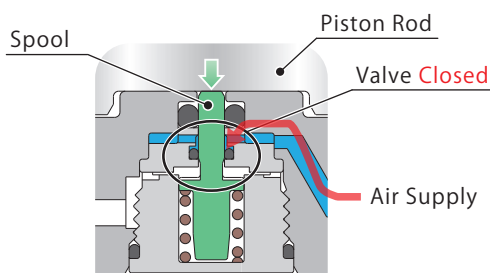
※ If releasing the pull side pressure at this state, the piston rod may move with the built-in spring force.

| Hydraulic Pressure | | Air Catch Sensor | |
|-----------------------|-----------------------|-----------------------|-----------------------|
| Hyd. Port : Push Side | Hyd. Port : Pull Side | Push-end Confirmation | Pull-end Confirmation |
| OFF | ON | OFF | ON |



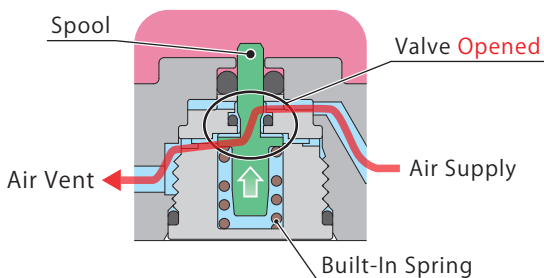
Pull-end Confirmation Valve

Supplying Hyd. Pressure to Pull Side Air Catch Sensor **ON**



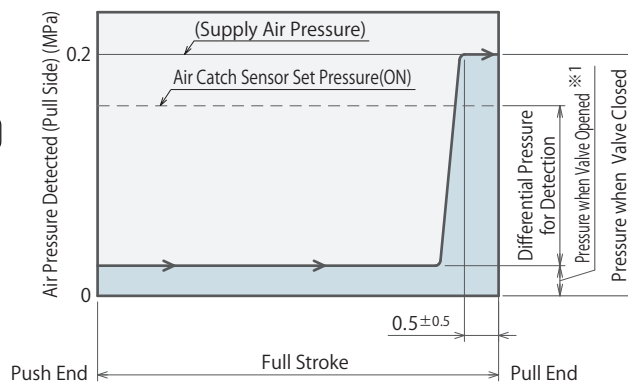
The spool is pushed back by the piston rod, and the valve is closed.

Supplying Hyd. Pressure to Push Side Air Catch Sensor **OFF**



The spool is pushed forward by the built-in spring, and the valve is opened.

Pull Side: Sensing Chart



※1. The sensor pressure for opening the valve depends on the sensor. With air sensor with large air flow, the sensor pressure for opening the valve is higher and the differential pressure for detection is lower.

● Action Description (Explanation about Sensing and Air Sensing Chart)

Action confirmation can be conducted by detecting differential pressure with the air catch sensor connected to the push-end detecting port and pull-end detecting port.

Model No. Indication

LLW 048 1 - C

A
B
T
P

E
H
J

- 5 Sensing Valve
 E : On Both Sides
 H : On Push Side
 J : On Pull Side

Air Catch Sensor

- Air catch sensor is required in order to conduct the action confirmation.

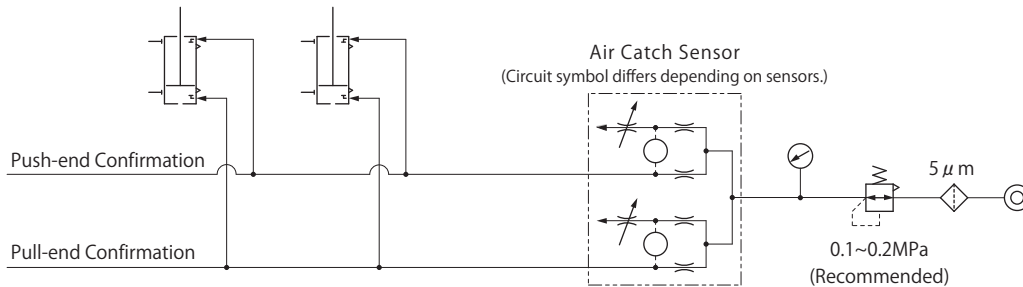
Sensing can be done by the air catch sensor with small air flow (recommended models are in the chart below).

Recommended operating air pressure : 0.1~0.2MPa

Recommended air catch sensor

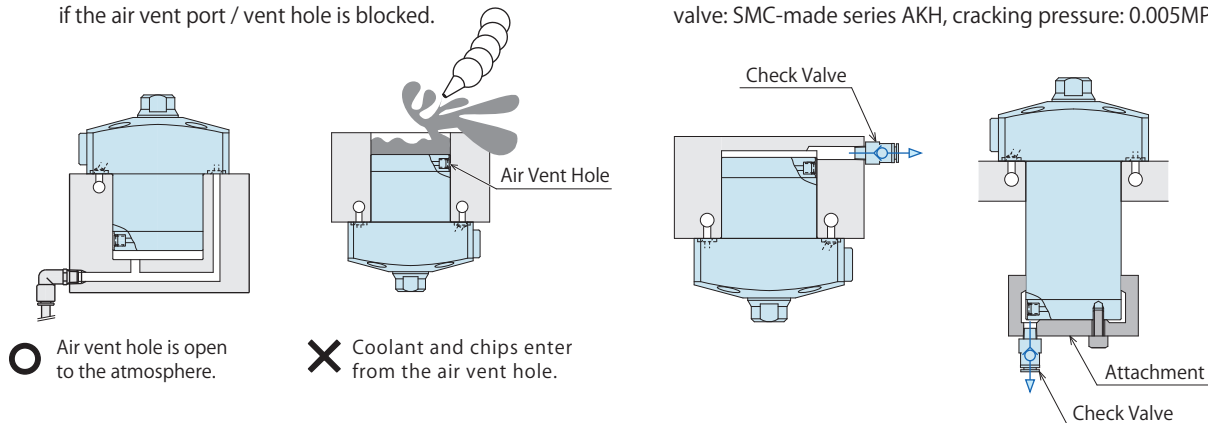
| Maker | SMC | CKD |
|-----------|------------------------|------------|
| Name | Air Catch Sensor | Gap Switch |
| Model No. | ISA3-F, ISA3-G, ISA2-G | GPS2-05-15 |

- Please refer to maker's catalog etc. for the detail of the air catch sensor.
- The air pressure to the air catch sensor should be 0.1~0.2MPa.
- Continuously supply air pressure to the cylinder when in use.
- Refer to the drawing below for the pneumatic circuit construction.



Notes for Design and Installation

- Air vent port / vent hole must be open to the atmosphere, and prevent coolant and chips from entering the air vent port / vent hole. The air catch sensor can malfunction if the air vent port / vent hole is blocked.
- Prevention of Foreign Substance to the Air Vent Port / Vent Hole
Coolant and chips can be prevented by setting a check valve with low cracking pressure. (Recommended check valve: SMC-made series AKH, cracking pressure: 0.005MPa)



- Continuously supply air pressure to the air port when in use.

Air Sensing Chart

Hydraulic Series

Accessories

Cautions

Air Sensing
Swing Clamp

LHW

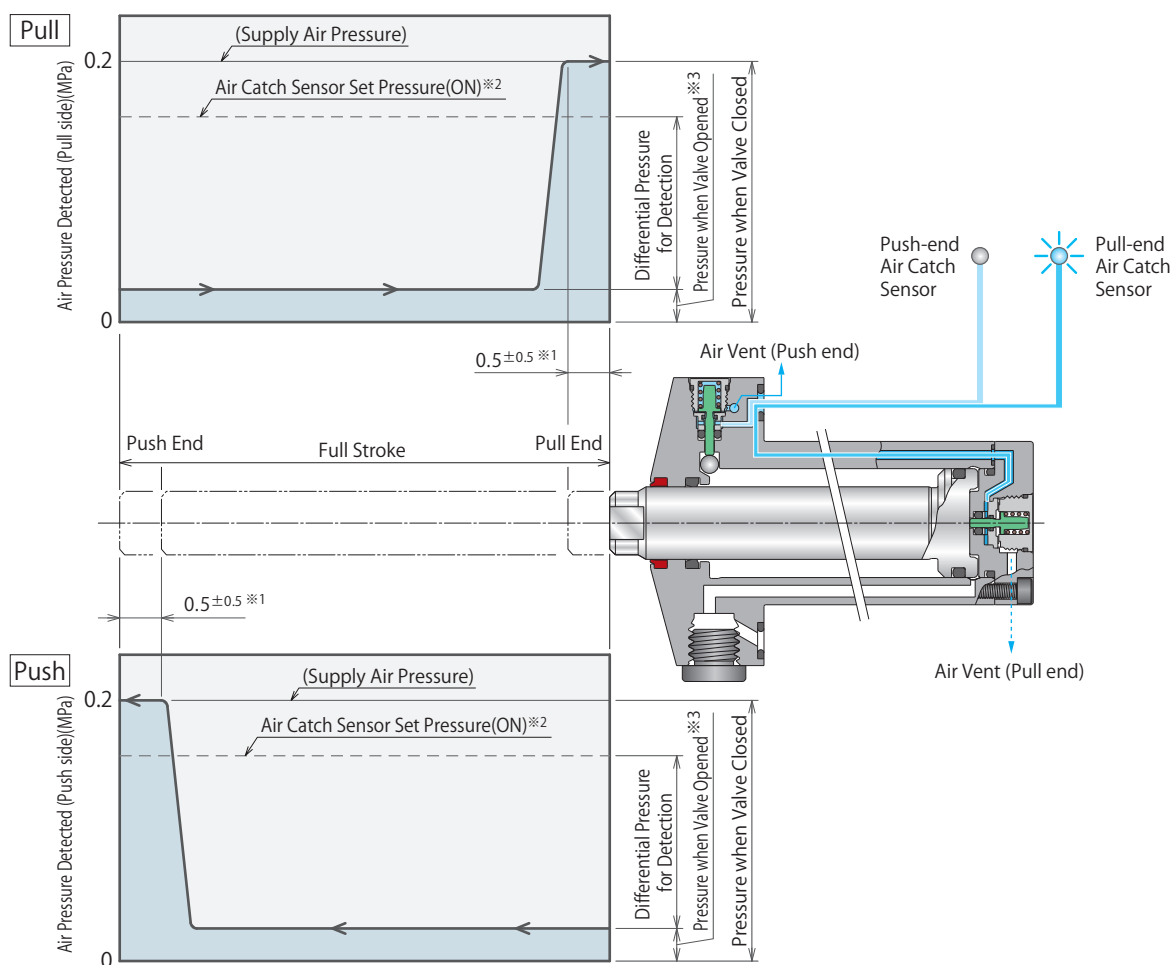
Air Sensing
Link Clamp

LKW

Air Sensing
Lift Cylinder

LLW

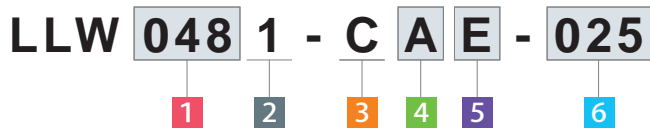
Number Directly Connected to Clamp: 1, Air Catch Sensor ISA3-F, Supply Air Pressure 0.2MPa



Notes:

- Sensing chart shown is the relationship between the stroke and detection circuit air pressure.
 - The specifications may vary depending on the air circuit. The hose length should be as short as possible. (Less than 5m)
 - There is only push-end confirmation for sensing valve symbol **H**, and only pull-end confirmation for sensing valve symbol **J**.
- ※1. There is a certain tolerance with regard to the position where the pressure for closing the valve is reached depending on the sensor structure. (Refer to the sensing chart.)
- ※2. The position where the air catch sensor has ON signal output varies depending on the sensor setting.
- ※3. The sensor pressure for opening the valve depends on the sensor.
- With air sensor with large air flow, the sensor pressure for opening the valve is higher and the differential pressure for detection is lower.

Model No. Indication



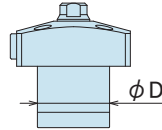
1 Body Size

036 : $\phi D=36\text{mm}$

040 : $\phi D=40\text{mm}$

048 : $\phi D=48\text{mm}$

※ Outer diameter (ϕD) of the cylinder.

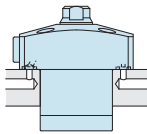


2 Design No.

1 : Revision Number

3 Piping Method

C : Gasket Option (With G Thread Plug)



With G Thread Plug
Able to attach speed control valve

※ Speed control valve (BZL) is sold separately. Please refer to P.59.

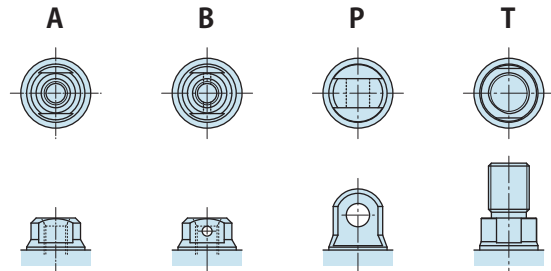
4 Shape of Piston Tip

A : Female Threaded

B : Female Threaded (With Anti-Rotation Pinhole)

P : Pin-Hole

T : Male Threaded

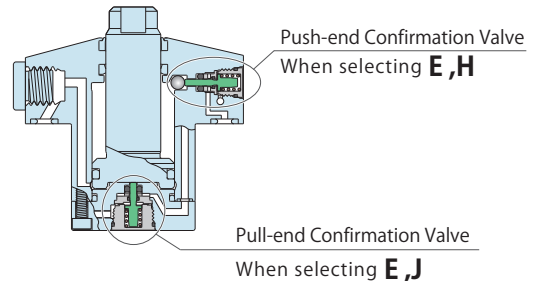


5 Sensing Valve

E : Sensing Valves on Both Sides

H : Sensing Valve on Push Side

J : Sensing Valve on Pull Side



6 Stroke

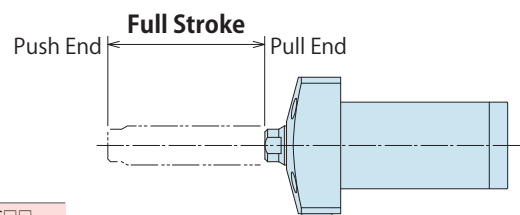
Stroke Value : Full Stroke

※ Full stroke is set by every 5mm

Example : Full Stroke 15mm : 015

Full Stroke 50mm : 050

Full Stroke 75mm : 075



| Model No. | LLW0361-C□□ | LLW0401-C□□ | LLW0481-C□□ |
|----------------|------------------|------------------|------------------|
| Full Stroke mm | 10~50(every 5mm) | 10~50(every 5mm) | 10~75(every 5mm) |

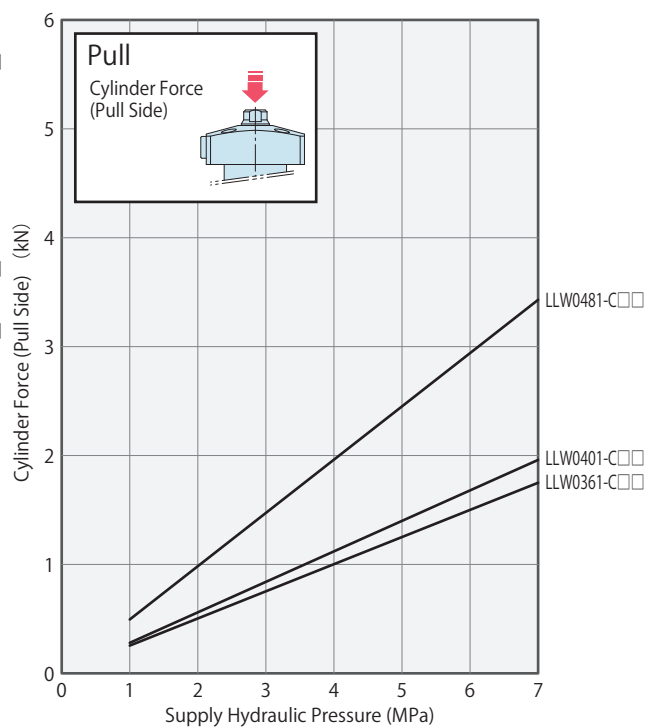
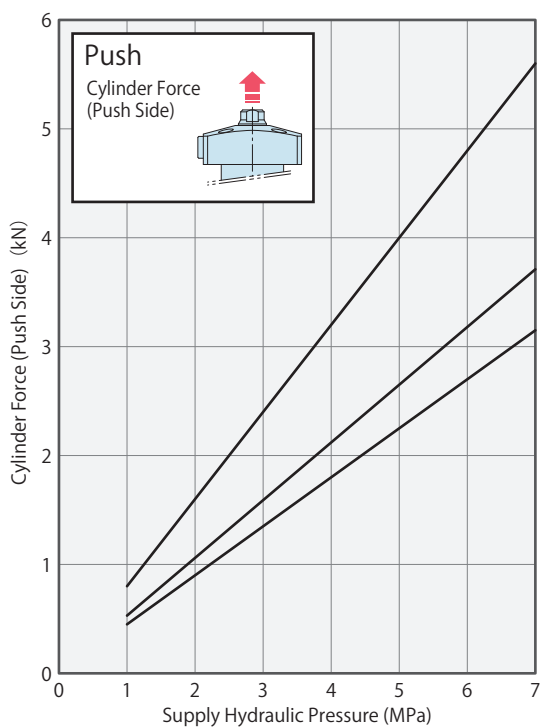
Specifications

| Model No. | LLW0361-C□□ | LLW0401-C□□ | LLW0481-C□□ | |
|---|-------------------------|---|-------------------|-------------------|
| Full Stroke Y | mm | 10~50 (every 5mm) | 10~50 (every 5mm) | 10~75 (every 5mm) |
| Cylinder Area | cm ² | | | |
| | Push Side | 4.5 | 5.3 | 8.0 |
| | Pull Side | 2.5 | 2.8 | 4.9 |
| Cylinder Force ※1 (Calculation Formula) | kN | | | |
| | Push Side | $P \times 0.45$ | $P \times 0.53$ | $P \times 0.80$ |
| | Pull Side | $P \times 0.25$ | $P \times 0.28$ | $P \times 0.49$ |
| Cylinder Capacity ※1 (Calculation Formula) | cm ³ | | | |
| | Push Side | $Y \times 0.45$ | $Y \times 0.53$ | $Y \times 0.80$ |
| | Pull Side | $Y \times 0.25$ | $Y \times 0.28$ | $Y \times 0.49$ |
| Cylinder Inside Diameter | mm | φ24 | φ26 | φ32 |
| Rod Diameter | mm | φ16 | φ18 | φ20 |
| Hydraulic Pressure | MPa | | 7.0 | |
| | Min. Operating Pressure | MPa | 1.0 | |
| | Withstanding Pressure | MPa | 10.5 | |
| Recommended Operating Air Pressure | MPa | 0.1~0.2 | | |
| Recommended Air Catch Sensor | | ISA3-F, ISA3-G, ISA2-G (SMC) / GPS2-05-15 (CKD) | | |
| Operating Temperature | °C | 0~70 | | |
| Mass | kg | 0.6~0.8 | 0.7~0.9 | 1.0~1.6 |

Note: ※1. P: Supply Hydraulic Pressure (MPa) Y: Full Stroke (mm)

Performance Curve

| Model No. | Cylinder Force (Push Side) (kN) | | | | | | | Cylinder Force (Pull Side) (kN) | | | | | | |
|-------------|---------------------------------|------|------|------|------|------|------|---------------------------------|------|------|------|------|------|------|
| | 1MPa | 2MPa | 3MPa | 4MPa | 5MPa | 6MPa | 7MPa | 1MPa | 2MPa | 3MPa | 4MPa | 5MPa | 6MPa | 7MPa |
| LLW0361-C□□ | 0.4 | 0.9 | 1.3 | 1.8 | 2.2 | 2.7 | 3.1 | 0.2 | 0.5 | 0.7 | 1.0 | 1.2 | 1.5 | 1.7 |
| LLW0401-C□□ | 0.5 | 1.0 | 1.5 | 2.1 | 2.6 | 3.1 | 3.7 | 0.2 | 0.5 | 0.8 | 1.1 | 1.4 | 1.6 | 1.9 |
| LLW0481-C□□ | 0.8 | 1.6 | 2.4 | 3.2 | 4.0 | 4.8 | 5.6 | 0.4 | 0.9 | 1.4 | 1.9 | 2.4 | 2.9 | 3.4 |



Notes:

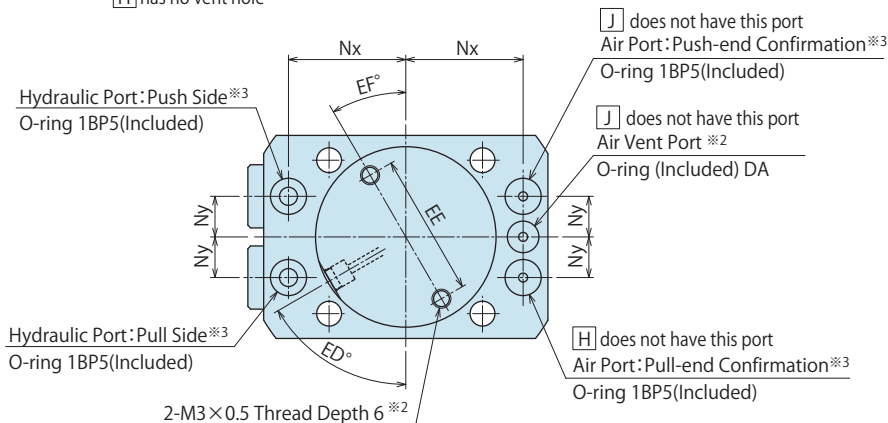
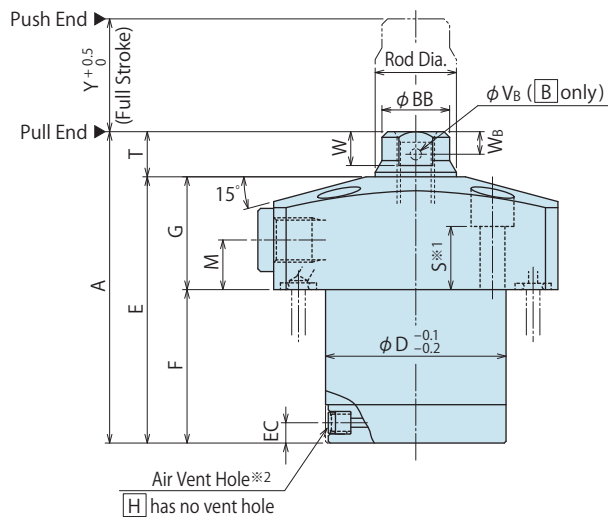
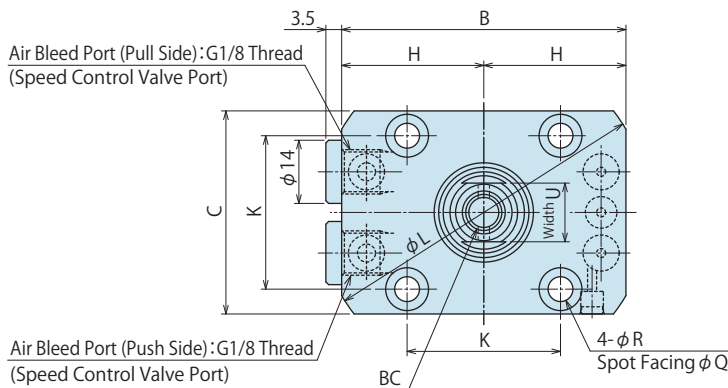
1. The chart and graph show the relationship between the cylinder force and supply hydraulic pressure.
2. Cylinder force (kN) is the theoretical value. Actual force may decrease because of friction and pressure loss.

External Dimensions

Tip Shape :

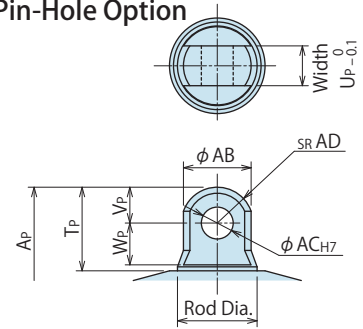
A : Female Threaded **B** : Female Threaded (With Anti-Rotation Pinhole)

※ The drawings show LLW-CAE / LLW-CBE.

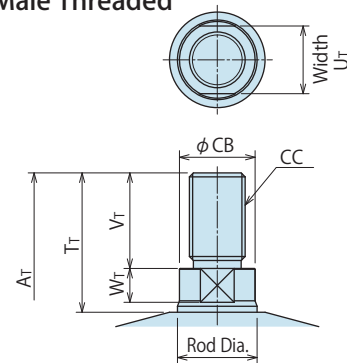


Tip Shape Refer **A** pinhole option dimension for not mentioned size below.

P : Pin-Hole Option



T : Male Threaded



Notes:

※1. Mounting bolts are not provided. Please prepare based on dimension S.

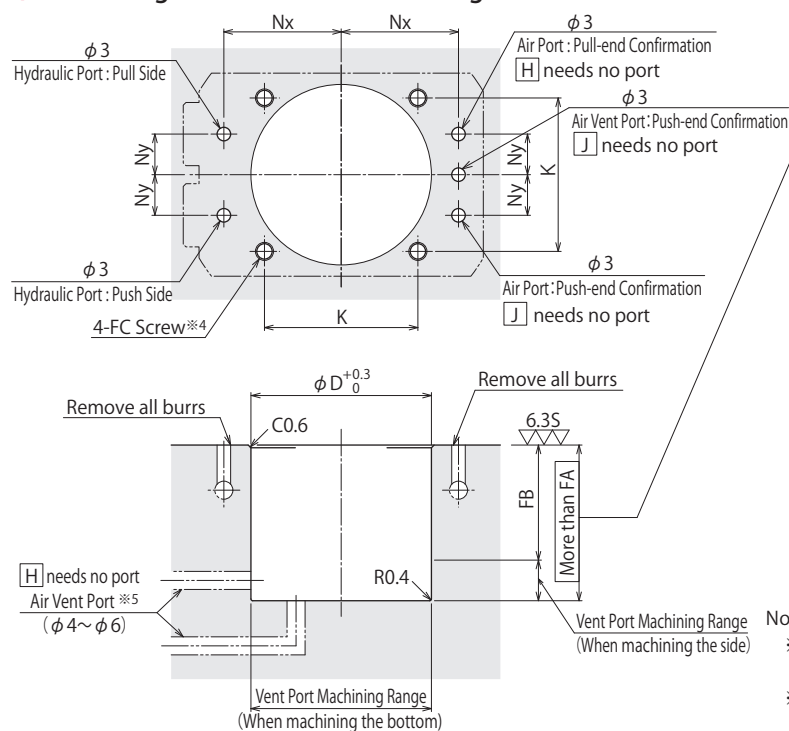
※2. Air vent hole must be open to the atmosphere, and prevent coolant and chips from entering the air vent hole. If exposed to coolant, install an attachment on M3 screw to prevent coolant and chips, but do not block the air vent hole.

※3. The port name is marked on the body surface.

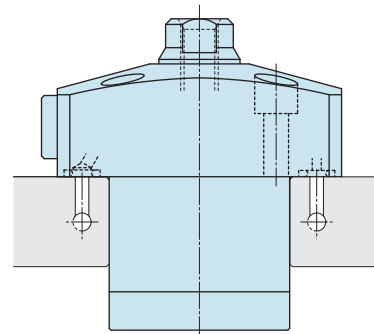
(PUSH HYD.: Hydraulic port on push side, PULL HYD.: Hydraulic port on pull side, PUSH CHECK: Air port on push side, PULL CHECK: Air port on pull side)

VENT: Air Vent Port)

Machining Dimensions for Mounting Area



When the mounting hole is a through hole, there is no need to follow dimension FA. Determine FA according to the plate thickness.



Notes:

- ※ 4. The FC depth of the mounting bolts should be decided from dimension S.
- ※ 5. No need of air vent port if the mounting hole is a through hole.

External Dimensions and Machining Dimensions for Mounting

[A] : Female Threaded [B] : Female Threaded (With Anti-Rotation Pinhole) (mm)

| Model No. | LLW0361-CA□ | LLW0401-CA□ | LLW0481-CA□ |
|--------------------------|--------------------------------|--------------------------------|--------------------------------|
| Full Stroke Y | 10, 15 20~50 (every 5mm) | 10, 15 20~50 (every 5mm) | 10, 15 20~75 (every 5mm) |
| A | 58 | Y+43 | 59 |
| B | 58 | 63 | 71 |
| C | 40 | 45 | 51 |
| D | 36 | 40 | 48 |
| E | 49 | Y+34 | 49 |
| F | 24 | Y+9 | 24 |
| G | 25 | 25 | 28 |
| H | 29 | 31.5 | 35.5 |
| K | 31.4 | 34 | 40 |
| L | 66 | 73 | 83 |
| M | 11 | 11 | 12 |
| Nx | 23.5 | 26 | 30 |
| Ny | 8 | 9 | 11 |
| Q | 7.5 | 9.5 | 9.5 |
| R | 4.5 | 5.5 | 5.5 |
| S | 16 | 14 | 15.5 |
| T | 9 | 10 | 11 |
| U | 12 | 13 | 14 |
| W | 7.5 | 7.5 | 8.5 |
| BB | 14 | 15 | 17 |
| BC (Nominal×Pitch×Depth) | M6×1×12 | M8×1.25×16 | M8×1.25×16 |
| Vb [B] only | 2 | 2.5 | 2.5 |
| Wb [B] only | 5.5 | 5 | 6 |
| EC | 4.5 | 4.5 | 4.5 |
| ED | 45° | 60° | 60° |
| EE | 30 | 31.6 | 39 |
| EF | 30° | 0° | 0° |
| FA | 24.5 | Y+9.5 | 24.5 |
| FB | 15.5 | Y+0.5 | 15.5 |
| FC (Nominal×Pitch) | M4×0.7 | M5×0.8 | M5×0.8 |
| O-Ring | DA AS568-006(90°) | AS568-007(90°) | 1BP5 |

(ex.) LLW0361-CA□-010 [Y=10, A=58, E=49, F=24]
 LLW0361-CA□-030 [Y=30, A=73, E=64, F=39]

[P] : Pin-Hole Option Refer to A option dimension for not mentioned size below (mm)

| Model No. | LLW0361-CP□ | LLW0401-CP□ | LLW0481-CP□ |
|---------------|----------------------------------|----------------------------------|----------------------------------|
| Full Stroke Y | 10, 15 20~50 (every 5mm) | 10, 15 20~50 (every 5mm) | 10, 15 20~75 (every 5mm) |
| Ap | 64 | Y+49 | 68 |
| AB | 12 | 15 | 17 |
| AC | 6 ^{+0.012} ₀ | 8 ^{+0.015} ₀ | 8 ^{+0.015} ₀ |
| AD | 6 | 8 | 9 |
| Tp | 15 | 19 | 21 |
| Up | 6 | 8 | 10 |
| Vp | 6 | 8 | 9 |
| Wp | 7.5 | 9.5 | 10.5 |

[T] : Male Threaded Refer to A option dimension for not mentioned size below (mm)

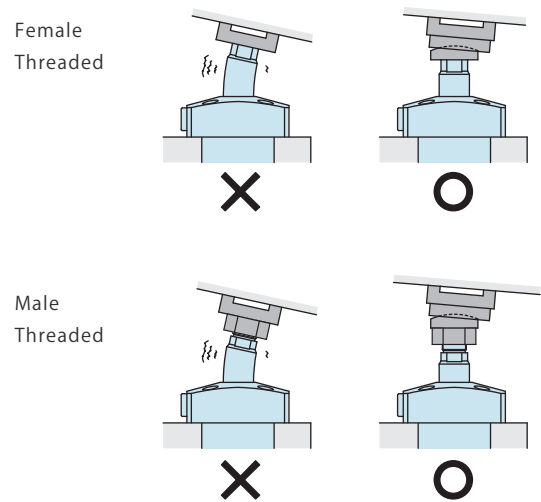
| Model No. | LLW0361-CT□ | LLW0401-CT□ | LLW0481-CT□ |
|--------------------|--------------------------------|--------------------------------|--------------------------------|
| Full Stroke Y | 10, 15 20~50 (every 5mm) | 10, 15 20~50 (every 5mm) | 10, 15 20~75 (every 5mm) |
| At | 74 | Y+59 | 79 |
| Tt | 25 | 30 | 35 |
| Ut | 12 | 14 | 17 |
| Vt | 16 | 20 | 24 |
| Wt | 7.5 | 7.5 | 8.5 |
| Cb | 14 | 17 | 19 |
| CC (Nominal×Pitch) | M10×1.25 | M12×1.25 | M14×1.5 |

Cautions

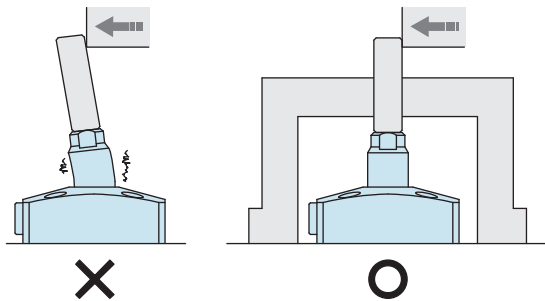
● Notes for Design

- 1) Check Specifications
 - Please use each product according to the specifications.
- 2) Notes for Circuit Design
 - Please read "Notes on Hydraulic Cylinder Speed Control Circuit" on P. 64 to assist with proper hydraulic circuit designing. Improper circuit design will lead to applications malfunction and damages.
 - Ensure there is no possibility of supplying hydraulic pressure to the push side and pull side simultaneously.
- 3) Notes for Pipe Design
 - It is recommended to select as large diameter pipes as possible. The back pressure is proportional to the pipe size, so if the pipes are small the release and lock times will be longer.
- 4) When using on a welding fixture, the exposed area of piston rod should be protected.
 - If spatter gets onto the sliding surface it could lead to malfunction and fluid leakage.
- 5) The Load Direction Given to the Piston Rod
 - Make sure no force is applied to the piston rod outside the axial direction. Usage like the one shown in the figure below will apply a large bending stress to the piston rod and must be avoided.

- 6) When clamping on a sloped surface on the workpiece
 - When clamping an inclined surface, make sure that the clamp area is level when looking from the clamp side. The clamp surface and cylinder mounting surface should be parallel. Workpieces may move and piston rods may slip when clamps are used on inclined surfaces. (When the workpiece is a casting, it is recommended that spiked attachments be used for clamps on draft angles.)

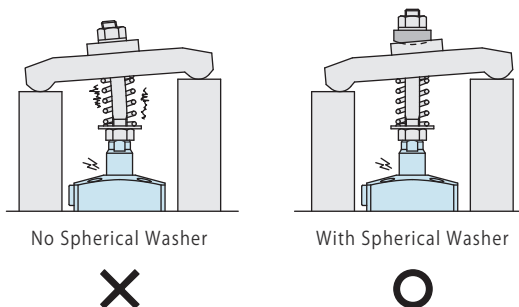


In case that force is loaded except from the axial direction

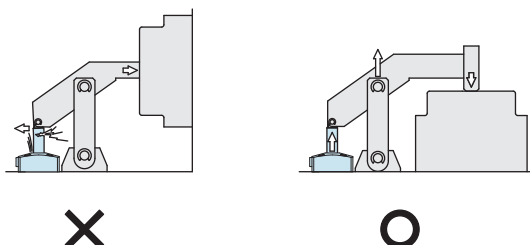


- 7) Notes on Sensing Valve
 - Please refer to the notes for design, installation and use on P. 51.

When clamping workpieces of different heights



A Combination with Link Mechanism



● Installation Notes

1) Check the Usable Fluid

- Please use the appropriate fluid by referring to the Hydraulic Fluid List (P.63).

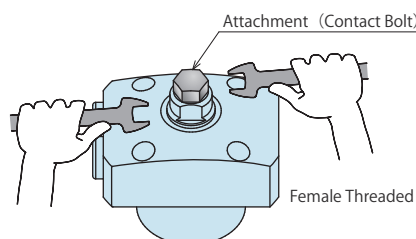
2) Mounting the cylinder

- When mounting the cylinder, use four hexagon socket bolts (with tensile strength of 12.9) and tighten them with the torque shown in the chart below. Tightening with greater torque than recommended can depress the seating surface or break the bolt.

| Model No. | Thread Size | Tightening Torque(N·m) |
|-----------|-------------|------------------------|
| LLW0361 | M4×0.7 | 3.2 |
| LLW0401 | M5×0.8 | 6.3 |
| LLW0481 | M5×0.8 | 6.3 |

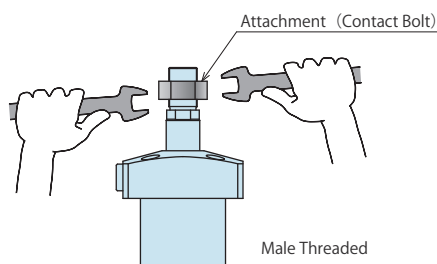
3) Mounting / removing the attachments

- When mounting or removing the attachment, stop the piston rod with a spanner at its front end and tighten it with torque as shown in the table below.



LLW□-CA□ / LLW□-CB□ : Female Threaded

| Model No. | Thread Size | Tightening Torque(N·m) |
|---------------|-------------|------------------------|
| LLW0361-CA/B□ | M6×1 | 10 |
| LLW0401-CA/B□ | M8×1.25 | 16 |
| LLW0481-CA/B□ | M8×1.25 | 16 |



LLW□-CT□ : Male Threaded

| Model No. | Thread Size | Tightening Torque(N·m) |
|-------------|-------------|------------------------|
| LLW0361-CT□ | M10×1.25 | 40 |
| LLW0401-CT□ | M12×1.25 | 63 |
| LLW0481-CT□ | M14×1.5 | 80 |

4) Speed Adjustment

- Adjust the rod operating speed less than 100mm/sec both the push and pull operation.
Excessive cylinder speed will accelerate wear and lead to component damage.
- Only adjust the speed after releasing the air from the circuit.
If air is mixed in the circuit it is not able to adjust the speed accurately.
- Turn the speed control valve gradually from the low-speed side (small flow) to the high-speed side (large flow) to adjust the speed.

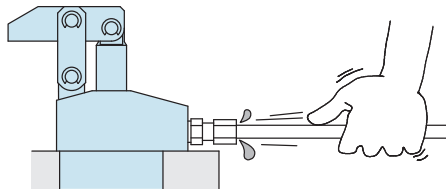
※ Please refer to P.63 for common cautions.

• Installation Notes • Hydraulic Fluid List • Notes on Hydraulic Cylinder Speed Control Circuit
• Notes on Handling • Maintenance/Inspection • Warranty

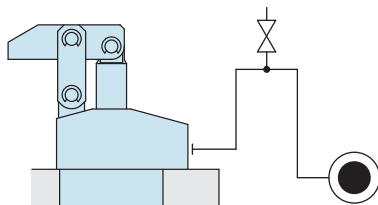
● Cautions

● 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 product 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.

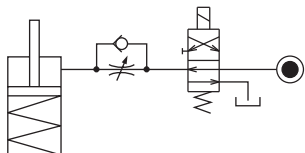
● Notes on Hydraulic Cylinder Speed Control Unit



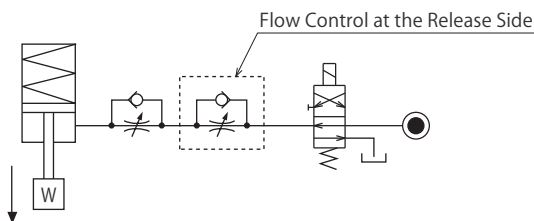
Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

● 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.



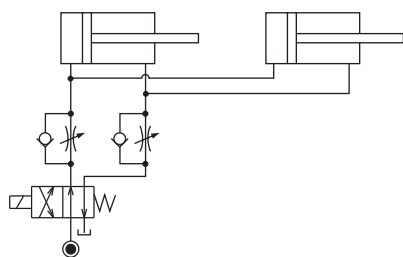
Accelerated clamping speed by excessive hydraulic flow to the cylinder may sustain damage. In this case add flow control to regulate flow. (Please add flow control to release flow if the lever weight is put on at the time of release action when using swing clamps.)



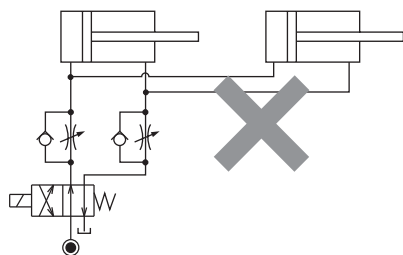
● Flow Control Circuit for Double Acting Cylinder

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.

【Meter-out Circuit】

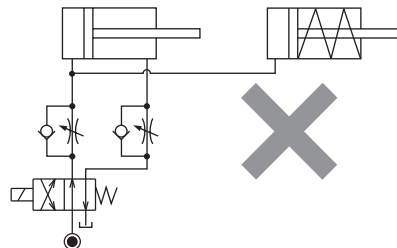


【Meter-in Circuit】



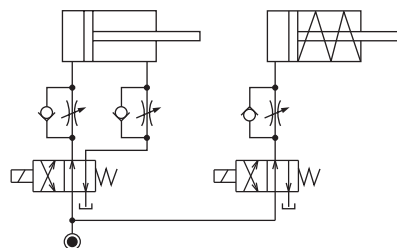
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

- 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.

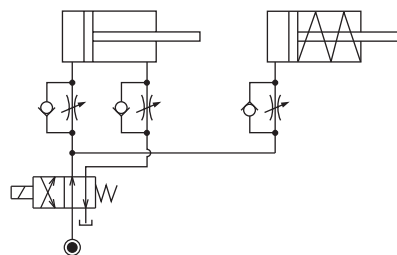


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

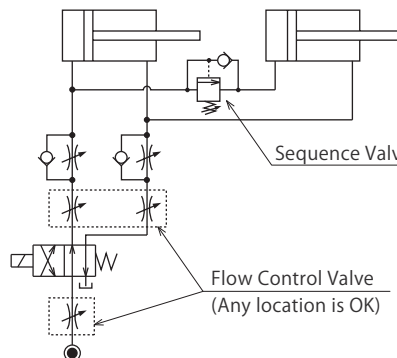
- Separate the control circuit.



- 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.



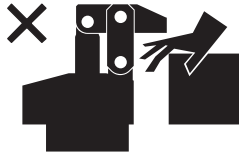
- ② In the case of meter-out circuit, the inner circuit pressure may increase during the cylinder action because of the fluid supply. The increase of the inner circuit pressure can be prevented by reducing the supplied fluid beforehand via the flow control valve. Especially when using sequence valve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

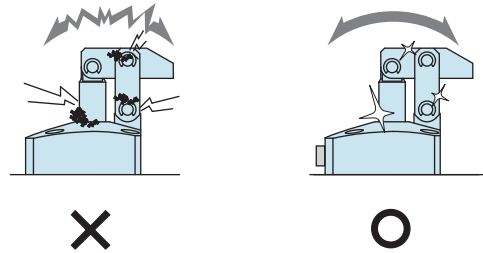
- 1) It should be handled by qualified personnel.
 - The hydraulic machine and air compressor should be handled and maintained by qualified personnel.
- 2) Do not handle or remove the machine unless the safety protocols are ensured.
 - ① The machine and equipment can only be inspected or prepared when 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 clamps (cylinder) while clamps (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 Product and Shut-off of Pressure Source
 - Before the product 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) If disconnecting by couplers on a regular basis, air bleeding should be carried out daily to avoid air mixed in the circuit.
- 4) Regularly tighten nuts, bolts, pins, cylinders and pipe line to ensure proper use.
- 5) Make sure the hydraulic fluid has not deteriorated.
- 6) 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.
- 7) The products should be stored in the cool and dark place without direct sunshine or moisture.
- 8) 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.

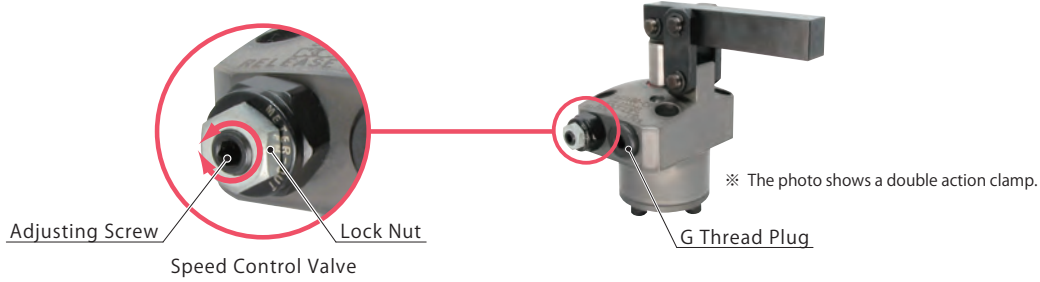
- ① If the stipulated maintenance and inspection are not carried out.
- ② If the product is used while it is not suitable for use based on the operator's judgment, resulting in defect.
- ③ If it is used or handled in inappropriate way by the operator.
(Including damage caused by the misconduct of the 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.

Speed Control Valve for Low Pressure PAT.

Directly Mounted to Clamps

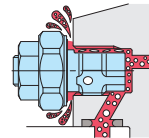
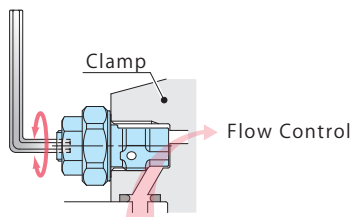
Flow control valve (model BZL) can be directly mounted to hydraulic clamps/work supports with G-thread (-C option).



Action Description

Adjust the flow by wrench.
It can adjust the clamping action speed individually.

Air bleeding in the circuit is possible
by loosening flow control valve.



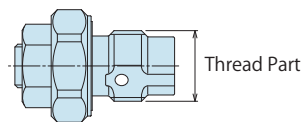
Model No. Indication (Speed Control Valve for Low Pressure)

BZL 0 10 0 - B

1
2
3

1 G Thread Size

- 10 : Thread Part G1/8A Thread
- 20 : Thread Part G1/4A Thread

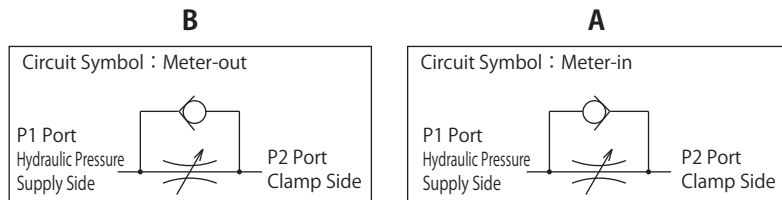


2 Design No.

- 0 : Revision Number

3 Control Method

- B** : Meter-out (Recommended^{※1})
- A** : Meter-in



※1. Flow control circuit for double action cylinder both should have meter-out circuits for the lock side and release side except model LKE/TLA/TMA.
Meter-in controls can be adversely affected by any air in the system.

Specifications

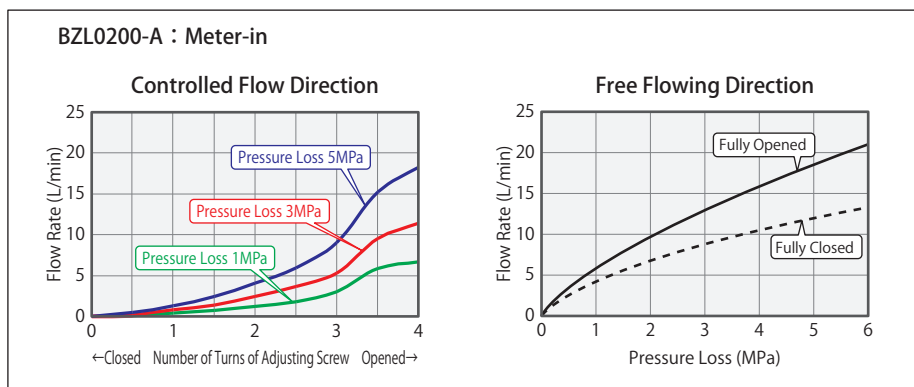
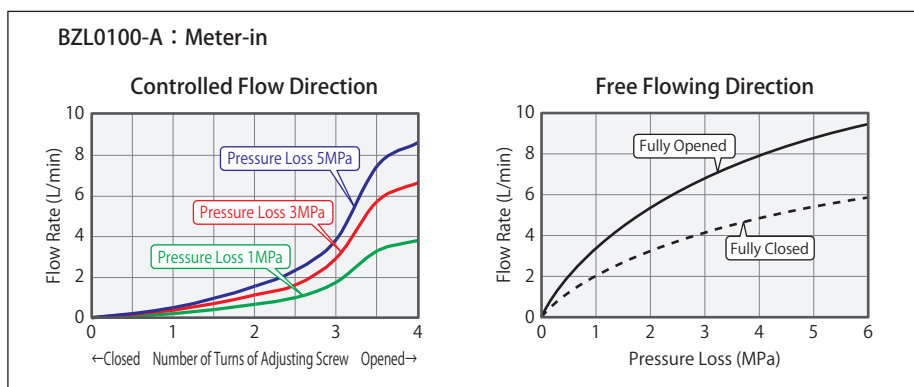
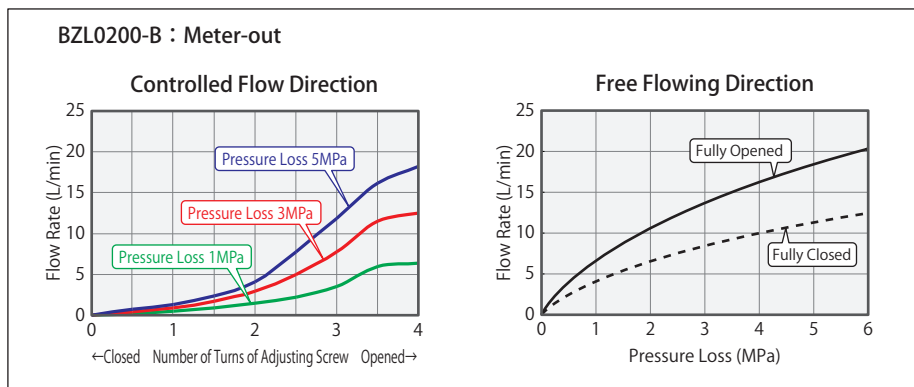
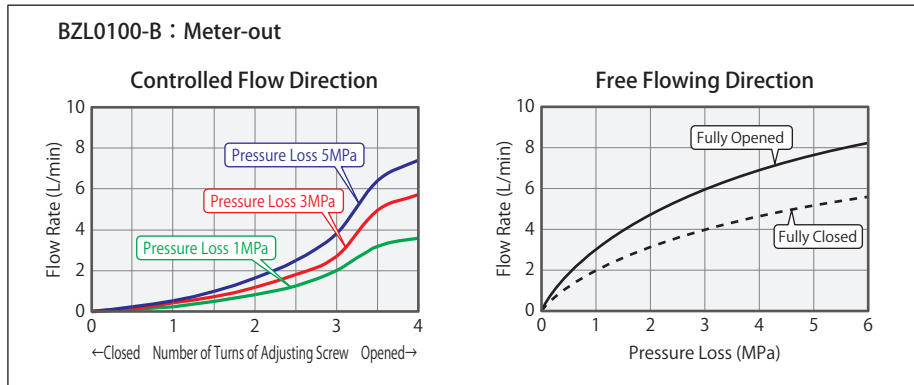
| Model No. | BZL0100-B | BZL0200-B | BZL0100-A | BZL0200-A | |
|---------------------------------|---|-----------|-----------|-----------|-----|
| Max. Operating Pressure | MPa | 7 | | | |
| Withstanding Pressure | MPa | 10.5 | | | |
| Control Method | Meter-out | | Meter-in | | |
| G Thread Size | G1/8A | G1/4A | G1/8A | G1/4A | |
| Cracking Pressure | MPa | 0.12 | | 0.04 | |
| Max. Passage Area | mm ² | 2.6 | 5.0 | 2.6 | 5.0 |
| Usable Fluid | General Hydraulic Oil Equivalent to ISO-VG-32 | | | | |
| Operating Temperature | °C | 0 ~ 70 | | | |
| Tightening Torque for Main Body | N·m | 10 | 25 | 10 | 25 |

- Notes:
1. Minimum passage area when fully opened is the same as the maximum passage area in the table above.
 2. It must be mounted with recommended torque. Because of the structure of the metal seal, if mounting torque is insufficient, the flow control valve may not be able to adjust the flow rate.
 3. Don't use used BZL to other clamps.
Flow control will not be made because the bottom depth difference of G thread makes metal seal insufficient.

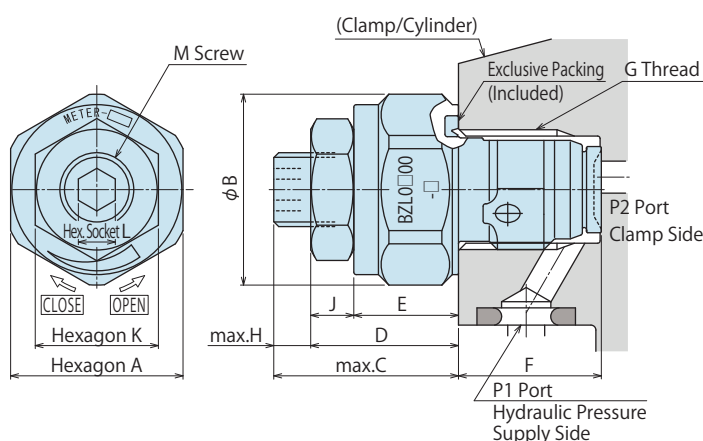
Applicable Products

| Model No. | LHW (Double Action) | LKW (Double Action) | LLW (Double Action) |
|-----------|---------------------|---------------------|---------------------|
| | Swing Clamp | Link Clamp | Lift Cylinder |
| BZL0100-B | LHW0401-C□□-□ | LKW0401-C□□-□ | LLW0361-C□□-□ |
| | LHW0481-C□□-□ | LKW0481-C□□-□ | LLW0401-C□□-□ |
| | LHW0551-C□□-□ | LKW0551-C□□-□ | LLW0481-C□□-□ |
| BZL0100-A | (LHW0401-C□□-□) | (LKW0401-C□□-□) | (LLW0361-C□□-□) |
| | (LHW0481-C□□-□) | (LKW0481-C□□-□) | (LLW0401-C□□-□) |
| | (LHW0551-C□□-□) | (LKW0551-C□□-□) | (LLW0481-C□□-□) |
| BZL0200-B | LHW0651-C□□-□ | LKW0651-C□□-□ | |
| | LHW0751-C□□-□ | LKW0751-C□□-□ | |
| BZL0200-A | (LHW0651-C□□-□) | (LKW0651-C□□-□) | |
| | (LHW0751-C□□-□) | (LKW0751-C□□-□) | |

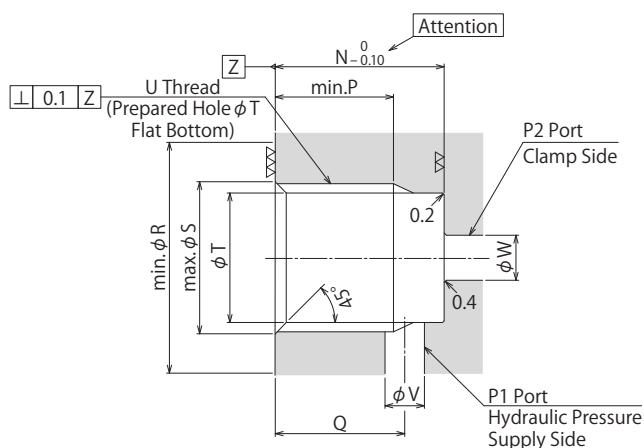
Flow Rate Graph < Hydraulic Fluids ISO-VG32 (25~35°C) >



External Dimensions



Machining Dimensions of Mounting Area



| Model No. | BZL0100-□ | BZL0200-□ |
|-----------------------|-----------|-----------|
| A | 14 | 18 |
| B | 15.5 | 20 |
| C | 15 | 16 |
| D | 12 | 13 |
| E | 8.5 | 9.5 |
| F | (11.6) | (15.1) |
| G | G1/8 | G1/4 |
| H | 3 | 3 |
| J | 3.5 | 3.5 |
| K | 10 | 10 |
| L | 3 | 3 |
| M | M6×0.75 | M6×0.75 |
| N | 11.5 | 15 |
| P | 8.5 | 11※1 |
| Q | 9 | 11.5 |
| R (Flat Surface Area) | 16 | 20.5 |
| S | 10 | 13.5 |
| T | 8.7 | 11.5 |
| U | G1/8 | G1/4 |
| V | 2 ~ 3 | 3 ~ 4 |
| W | 2.5 ~ 5 | 3.5 ~ 7 |

Notes:

1. Since the $\nabla\nabla$ area is sealing part, be careful not to damage it.
2. Since the ∇ area is the metal sealing part of BZL, be careful not to damage it. (Especially when deburring)
3. No cutting chips or burr should be at the tolerance part of machining hole.
4. As shown in the drawing, P1 port is used as the hydraulic supply and P2 port as the clamp side.
5. If mounting plugs or fittings with G thread specification available in the market, the dimension '※1' should be 12.5.

Notes

1. Please read "Notes on Hydraulic Cylinder Speed Control Circuit" to assist with proper hydraulic circuit design.
If there is something wrong with the circuit design, it leads to the applications malfunction and damage. (Refer to P.64)
2. It is dangerous to air bleed during operation under high pressure. It must be done under lower pressure.
(For reference: the minimum operating range of the product within the circuit.)
3. Flow control circuit for double action cylinder both should have meter-out circuits for the lock side and release side except model LKE/TLA/TMA. Meter-in controls can be adversely affected by any air in the system.

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Global Network



Asia Detailed Map



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