

Low Pressure

New

Hydraulic Single Action Clamps & Work Support

Kosmek Work Clamping Systems Additional Catalog



New Compact Models



Hydraulic Swing Clamp

model LT0301-C□



Hydraulic Work Support Flange Series

model LC0262-C□
model LC0302-C□
model LC0362-C□



Hydraulic Link Clamp

model LM0300-C□

Hydraulic Work Support

Threaded Series



Short Model
model LD0222-□-S

NEW MODELS

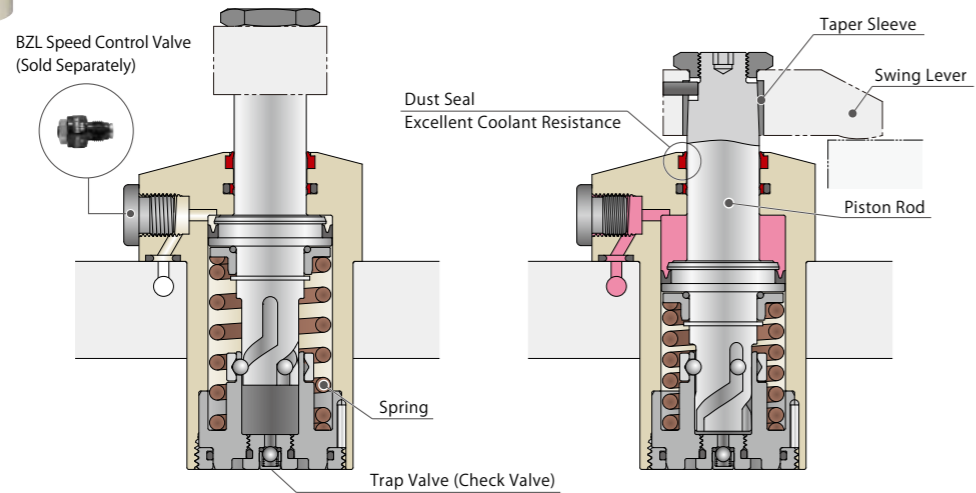
Kosmek Work Clamping Systems
Additional Product Catalog



**Hydraulic Single Action
Swing Clamp**

Model **LT** ▶ P.3

Compact Model LT0301 with Cylinder Outer Diameter $\phi 30$



When Releasing
Cut off hydraulic supply,
release action is done by spring.

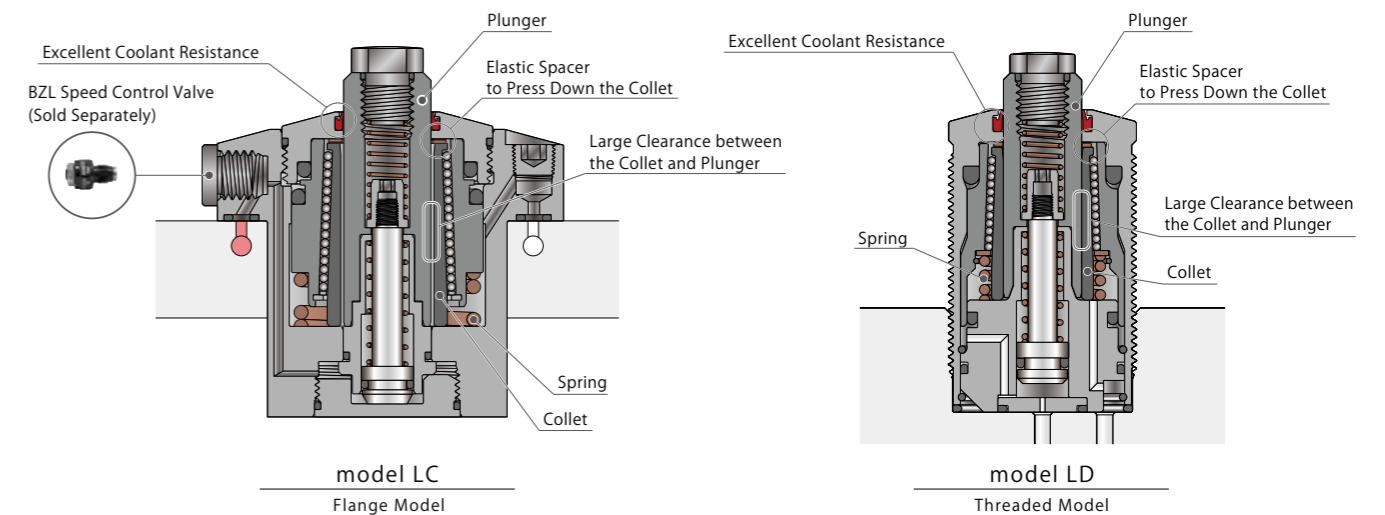
When Locking
Locking action is done by
hydraulic pressure.



Hydraulic Work Support Model **LC/LD** ▶ P.15

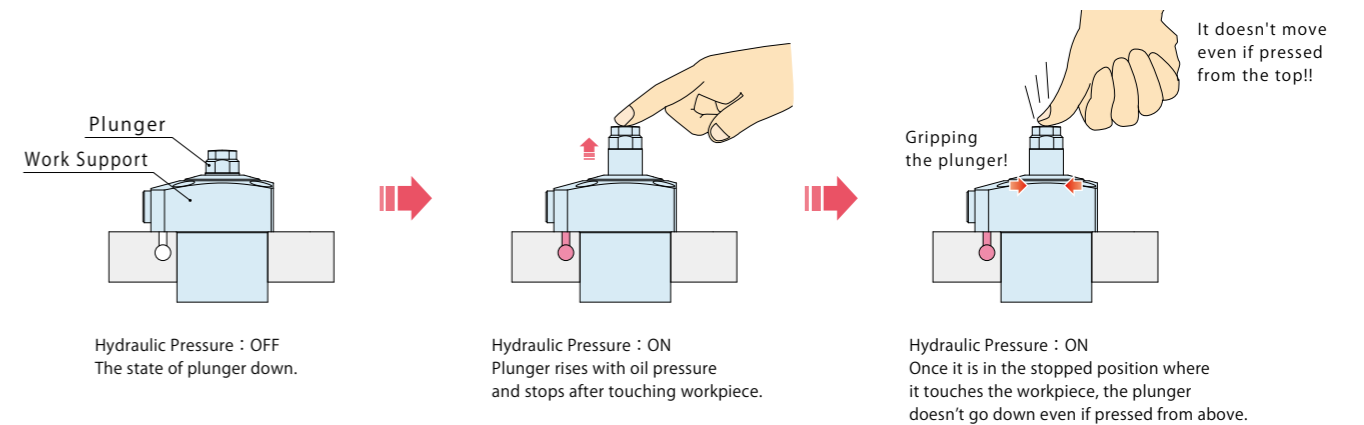
LC : Cylinder Outer Diameter $\phi 26, \phi 30, \phi 36$ Models are Added to the Flange Series.

LD : Outer Thread M22 Short Body Model is Added to the Threaded Series.



model LC
Flange Model

model LD
Threaded Model



※Please refer to the complete catalog (KWCS2014-02-GB) or our website for the detailed action descriptions.



Accessories

▶ P.23

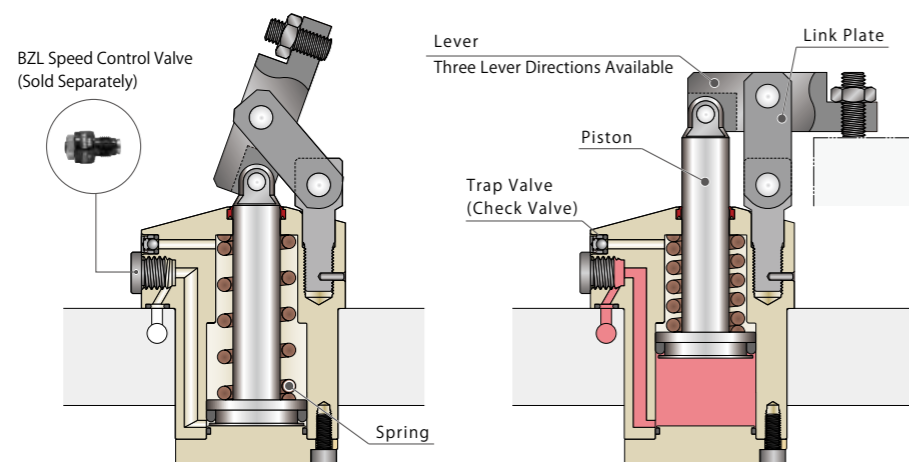
Speed Control Valves and Manifold Blocks
for the New Models (LT/LM/LC/LD)



**Hydraulic Single Action
Link Clamp**

Model **LM** ▶ P.9

Compact Model LM0300 with Cylinder Outer Diameter $\phi 30$

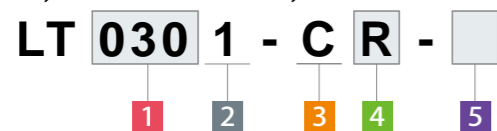


When Releasing
Cut off hydraulic supply,
release action is done by spring.

When Locking
Locking action is done by
hydraulic pressure.

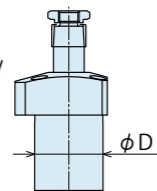
Model No. Indication

Body Material: Aluminum Alloy



1 Body Size

030 : φD=30mm
Body Material: Aluminum Alloy



※ Cylinder Outer Diameter (φD)

Refer to the complete catalog (KWCS2014-02-GB) for current models.

- 036 : φD=36mm 055 : φD=55mm
- 040 : φD=40mm 065 : φD=65mm
- 048 : φD=48mm 075 : φD=75mm

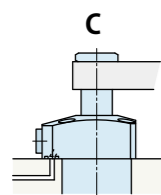
2 Design No.

1 : Revision Number

3 Piping Method

C : Gasket Option (With G Thread Plug)

※ Speed control valve (BZL) is sold separately. Refer to P.23.



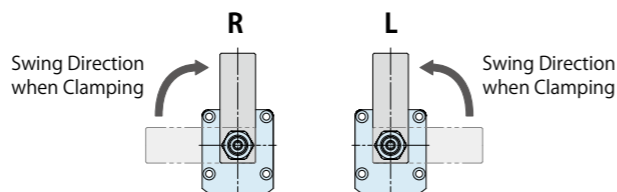
Gasket Option
With G Thread Plug
Possible to Attach
Speed Control Valve

Specifications

Model No.	LT0301-C□	
Cylinder Area for Locking	cm ²	2.67
Clamping Force (Calculation Formula) ^{※1}	kN	$F = \frac{P - 1.01}{3.75 + 0.018 \times L}$
	mm	10.5
Full Stroke	mm	10.5
	mm	4.5
Swing Stroke (90°)	mm	4.5
	mm	6
Lock Stroke	mm	6
	mm	6
Swing Angle Accuracy	°	90° ± 3°
Swing Completion Position Repeatability	°	± 1°
Return Spring Force	kN	0.21 ~ 0.29
Maximum Operating Pressure	MPa	7
Minimum Operating Pressure ^{※2}	MPa	2.5
Withstanding Pressure	MPa	10.5
Operating Temperature	°C	0 ~ 70
Usable Fluid		ISO-VG-32 or Equivalent General Oil

4 Swing Direction when Clamping

R : Clockwise
L : Counter-Clockwise



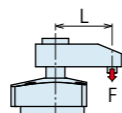
5 Option

Blank : None (Standard: Taper Lock Lever Option)

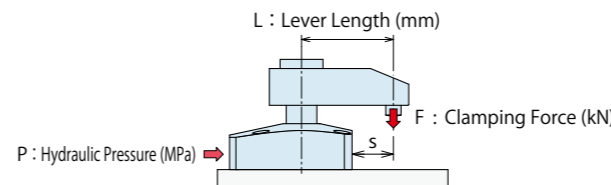
Please contact us separately for other options.

- F : Quick Change Lever Option
- P : Balance Lever Option
- Y□ : Swing Angle Selectable Option (Y30 : 30° / Y45 : 45° / Y60 : 60°)

Notes ※1. F : Clamping Force (kN), P : Supply Hydraulic Pressure (MPa), L : Distance between the Piston Center and the Clamping Point (mm)
※2. Minimum Pressure to Operate the Clamp with No Load
1. Refer to the external dimensions for cylinder capacity and mass.



Clamping Force Curve

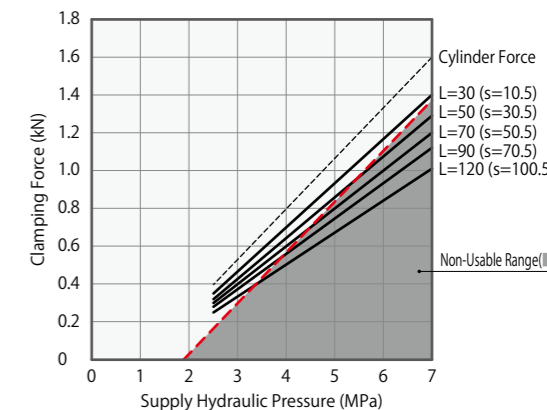


Applicable Model No.

LT0301 - C □

(Example) Supply Hydraulic Pressure 5.0 MPa, Lever Length L=50 mm
Clamping force is about 0.9 kN.

Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) / Non-Usable Range (mm)								Max. Lever Length L (mm)
		L=30	L=40	L=50	L=60	L=70	L=80	L=100	L=120	
7	1.6	1.4								35
6.5	1.5	1.3								38
6	1.3	1.2	1.1							43
5.5	1.2	1.1	1.0							49
5	1.1	0.9	0.9	0.9						57
4.5	0.9	0.8	0.8	0.8	0.7					68
4	0.8	0.7	0.7	0.6	0.6	0.6	0.6			83
3.5	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.4		109
3	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	120
2.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	120
Max. Operating Pressure (MPa)	7.0	6.3	5.4	4.8	4.4	4.1	3.6	3.4		



Notes

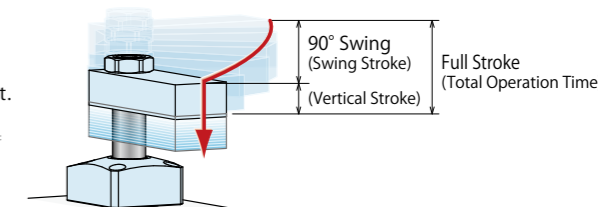
- Tables and graphs shown are the relationships between the clamping force (kN) and supply hydraulic pressure (MPa).
 - Cylinder output (when L=0) cannot be calculated from the calculation formula of clamping force.
 - There may be no lever swing action with large inertia depending on supply hydraulic pressure or lever mounting position.
 - The clamping force is shown with lever in the locked position.
 - The clamping force varies as per the lever length. Use the hydraulic supply pressure suitable to the lever length.
 - Operation in the non-usable range can damage the clamp and lead to fluid leakage.
 - The tables and graphs are only for reference. The exact results should be calculated based on the formula in the specification column.
- ※3. F : Clamping Force (kN), P : Supply Hydraulic Pressure (MPa), L : Lever Length (mm).

Allowable Swing Time Graph

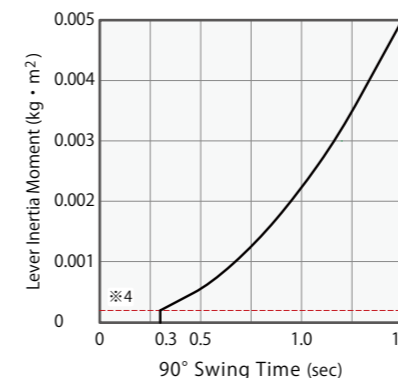
Adjustment of Swing Time

The graph shows allowable swing time against lever inertia moment. Please make sure that an operation time is more than the operation time shown in the graph.

Excessive action speed can reduce stopping accuracy and damage internal parts.



LTO301



Notes

- It shows the inertia moment with material lever (LZ0300-LE2).
- For any lever inertia moment, minimum 90° swing time should be 0.3 sec or more.
- The graph shows the action time tolerance in regard to the lever inertia moment when the clamp piston is operating at constant speed.
- There may be no lever swing action with large inertia depending on supply hydraulic pressure, oil flow and lever mounting position.
- Depending on clamp mounting position, the lever may be accelerated by its own weight (when clamps are mounted horizontally). In this case, use meter-out flow control valve for speed adjustment.
- Excessive swing speed can reduce stopping accuracy and damage the internal parts.
- Please contact us if operational conditions differ from those shown on the graphs.

How to Calculate Inertia Moment (Estimated)

I : Inertia Moment (kg·m²) L₁, L₂, K, b : Length (m) m₁, m₂, m₃ : Mass (kg)

① For a rectangular plate (cuboid), the rotating shaft is vertically on one side of the plate.

$$I = m_1 \frac{4L^2 + b^2}{12} + m_2 \frac{4L_1^2 + b^2}{12}$$

② For a rectangular plate (cuboid), the rotating shaft is vertically on the gravity center of the plate.

$$I = m \frac{L^2 + b^2}{12}$$

③ Load is applied on the lever front end.

$$I = m_1 \frac{4L^2 + b^2}{12} + m_2 \frac{4L_1^2 + b^2}{12} + m_3 K^2 + m_3 \frac{L_2^2 + b^2}{12}$$

Calculation Formula of Total Operation Time

$$\text{Total Operation Time (sec)} = 90^\circ \text{ Swing Time (sec)} \times \frac{\text{Full Stroke (mm)}}{\text{Swing Stroke (mm)}}$$

Hydraulic Series

Cautions

Swing Clamp

LT

Link Clamp

LM

Work Support

LC

LD

Control Valve

BZL

Manifold Block

LZ-MS

LZ-MP

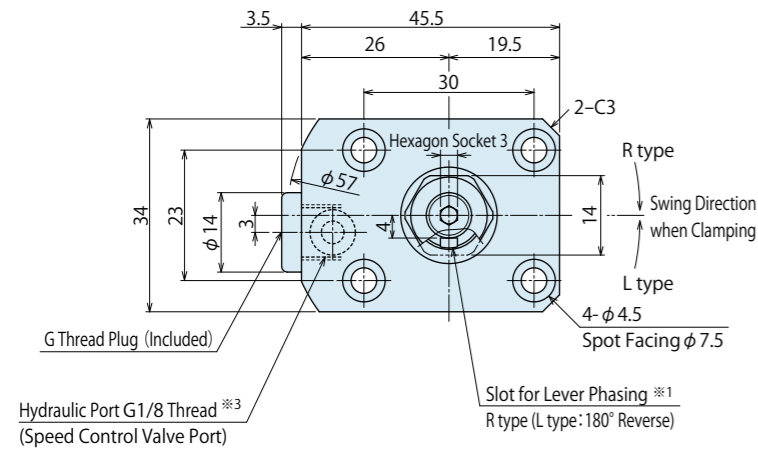
LZ-S

DZ-R

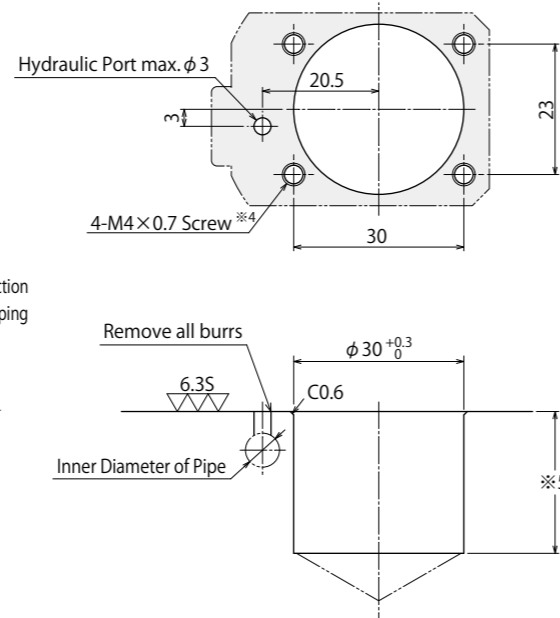
DZ-C

External Dimensions

C : Gasket Option (With G Thread Plug)
 ※ The drawing shows the released state of LT0301-CR.



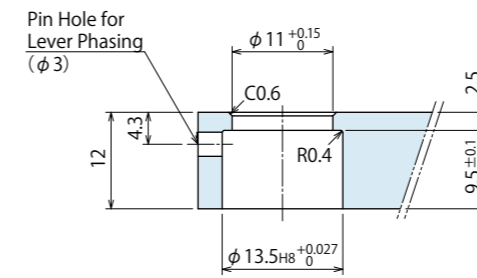
Machining Dimensions of Mounting Area



- Notes
- ※4. 4-M4×0.7 tapping depth for mounting bolt should be calculated according to mounting height referring to dimension '※2'.
 - ※5. The body mounting hole $\phi 30^{+0.3}$ should be decided according to mounting height referring to dimension '※6'.

Taper Lock Lever Design Dimensions

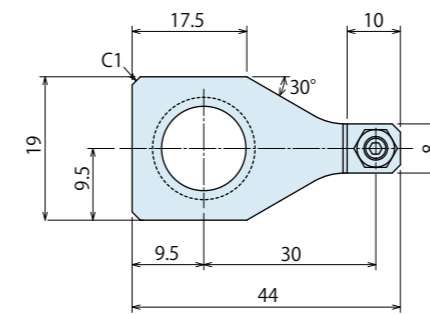
※ Reference for designing taper lock swing lever of LT0301-C□ (Standard : Taper Lock Lever Option)



- Notes
1. Swing lever should be designed with its length according to performance graph shown on P.4.
 2. If the swing lever is not in accordance with the dimension shown left, performance may be degraded and damage can occur.

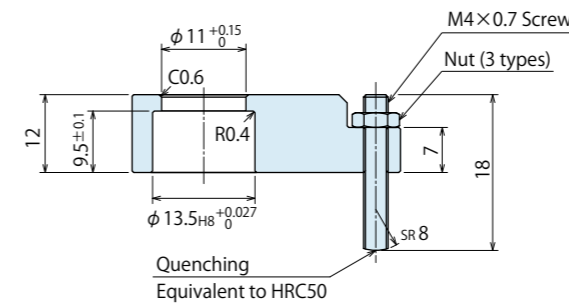
Accessories : Swing Lever for Taper Lock Option Made-to-Order

Model No. Indication
LZ 030 0 - LE1
 Size Design No. (Revision Number)



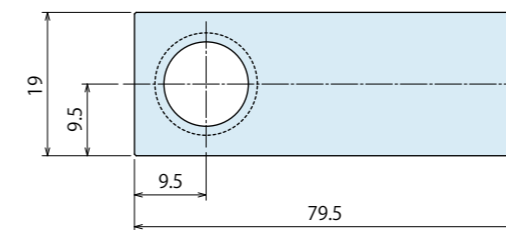
Model No.	LZ0300-LE1
Corresponding Model No.	LT0301-C□

- Notes
1. Material : S45C
 2. When you perform a phase determination, please additionally process after referring to a swing lever design dimensions.



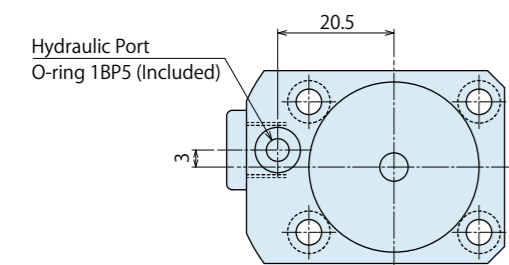
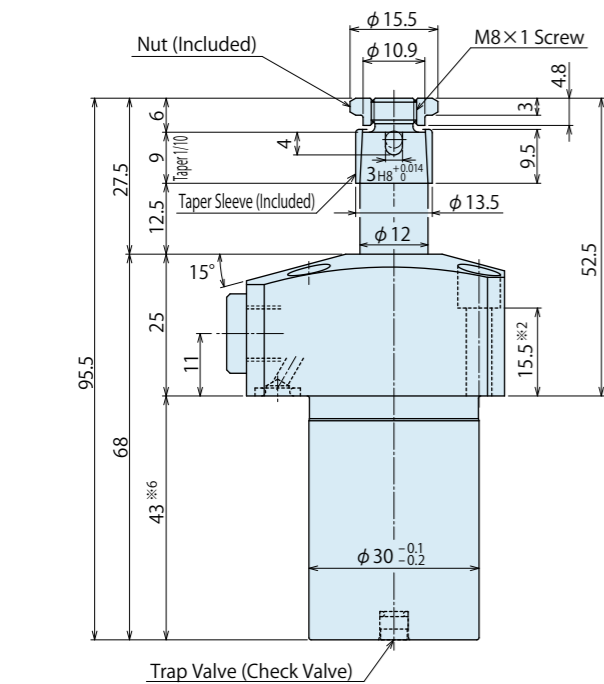
Accessories : Material Swing Lever for Taper Lock Option

Model No. Indication
LZ 030 0 - LE2
 Size Design No. (Revision Number)



Model No.	LZ0300-LE2
Corresponding Model No.	LT0301-C□

- Notes
1. Material : S45C
 2. If necessary, the front end should be additionally processed.
 3. When you perform a phase determination, please additionally process after referring to a swing lever design size.



- Notes
- ※1. The slot for determining the lever phase faces the port side if locked.
 - ※2. Mounting bolts are not provided. Customer should prepare based on dimension '※2'.
 - ※3. Speed control valve is sold separately. Please prepare using reference to P.23.

External Dimensions and Machining Dimensions for Mounting

Model No.	LT0301-C□
Full Stroke	mm 10.5
Swing Stroke (90°)	mm 4.5
Vertical Stroke	mm 6
Inner Diameter of Pipe ※7	mm φ6
Lock Cylinder Capacity	cm ³ 2.8
Mass ※8	kg 0.25

- Notes
- ※7. The inner diameter of pipe is reference. Make appropriate changes according to the number of clamps used and the distance from the piping.
 - ※8. Mass of single swing clamp including taper sleeve and nut.

Hydraulic Series

Cautions

Swing Clamp

LT

Link Clamp

LM

Work Support

LC

LD

Control Valve

BZL

Manifold Block

LZ-MS

LZ-MP

LZ-S

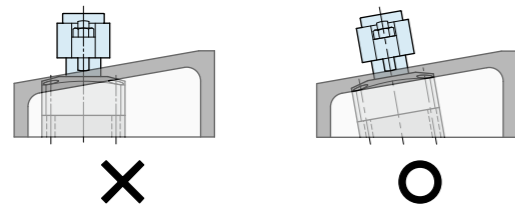
DZ-R

DZ-C

Cautions Cautions for Swing Clamp LT0301-C□ (Refer to P.27~P.30 for common 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. 28 to assist with proper hydraulic circuit designing.
 - Ensure there is no possibility of supplying hydraulic pressure to the lock and release ports simultaneously.
- 3) Swing lever should be designed so that the inertia moment is small.
 - Large moment of inertia will degrade the lever's stopping accuracy and cause undue wear to the clamp. Additionally, the clamp may not function, depending on supplied hydraulic pressure and lever mounting position.
 - Please set the allowable operating time after the inertia moment is calculated. Please make sure that let the clamps work within allowable operating time referring to the allowable operating time graph.
- 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) When clamping on a sloped surface of the workpiece
 - Make sure the clamp surface and mounting surface of the clamp are parallel.



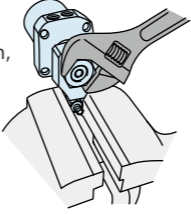
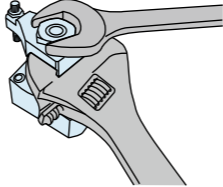
● Installation Notes

- 1) Check the Usable Fluid
 - Please use the appropriate fluid by referring to the Hydraulic Fluid List (P.27).
- 2) Mounting the clamp
 - When mounting the clamp, use hexagon socket bolts as multiple bolt holes for mounting (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.

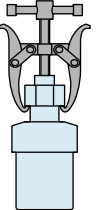
Model No.	Thread Size	Tightening Torque (N·m)
LT0301-C□	M4×0.7	3.2
- 3) Mounting and removing the swing lever.
 - Oil or debris on the mating surfaces of the lever, taper sleeve or piston rod can cause the rod to loosen. Clean carefully before assembly.
 - Lever arm mounting bolt torques are shown below.

Model No.	Thread Size	Tightening Torque (N·m)
LT0301-C□	M8×1	8 ~ 10
- If the piston rod is subjected to excessive torque or shock, the rod or the internal mechanism may be damaged. Observe the following points to prevent such shock.

During mounting

- ① When the clamp is positioned with fixture, determine the lever position, and temporarily tighten the nut for fixing the lever. 
- ② Remove the clamp from a fixture, fix the lever by machine vise etc., and tighten the nut. 
- ③ If clamp can't be removed from fixture for final tightening, secure the lever while tightening the nut. It is best to bring the lever to the middle of the swing stroke before tightening the nut.

During removal

- ① While the clamp is in the fixture or vise, use a hex wrench to bring the arm to the middle of the swing stroke and then loosen the nut. 
- ② Loosen the taper sleeve nut two or three turns then remove the lever with puller. Do not put any rotating torque on the piston rod.

4) Swinging Speed Adjustment

- Adjust the speed following "Allowable Swing Time Graph". If the clamp operates too fast the parts will wear out leading to premature damage and ultimately complete equipment failure.
- Please make sure to release air from the circuit before adjusting speed. It will be difficult to adjust the speed accurately with air mixed in the circuit.
- Turn the speed control valve gradually from the low-speed side (small flow) to the high-speed side (large flow) to adjust the speed.

5) Checking looseness and retightening

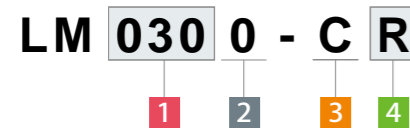
- At the beginning of the machine installation, the bolt and nut may be tightened lightly. Check the looseness and re-tighten as required.

※ Please refer to P.27 for common cautions.

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

Model No. Indication

Body Material: Aluminum Alloy

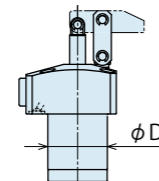


1 Body Size

030 : φD=30mm
Body Material: Aluminum Alloy

Refer to the complete catalog (KWCS2014-02-GB) for current models.

- | | |
|---------------|---------------|
| 036 : φD=36mm | 055 : φD=55mm |
| 040 : φD=40mm | 065 : φD=65mm |
| 048 : φD=48mm | 075 : φD=75mm |



※ Cylinder Outer Diameter (φD)

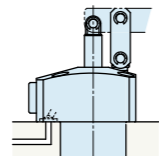
2 Design No.

0 : Revision Number

3 Piping Method

C : Gasket Option (With G Thread Plug)

※ Speed control valve (BZL) is sold separately. Refer to P.23.



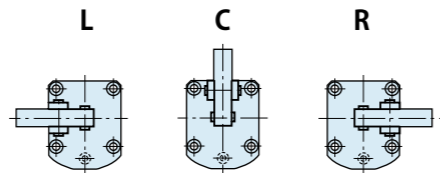
C Gasket Option

With G Thread Plug Possible to Attach Speed Control Valve

4 Lever Direction

- L : Left
- C : Center
- R : Right

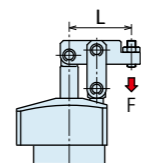
※ This images show the lever direction when the piping port is placed in front of you.



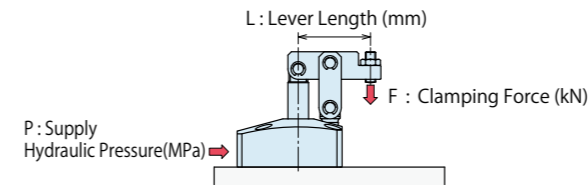
Specifications

Model No.	LM0300-C□
Cylinder Area for Locking	cm ² 2.55
Clamping Force (Calculation Formula) ^{※1}	kN $F = \frac{2.86 \times P - 0.97}{L - 12.5}$
Full Stroke	mm 16
Lock Stroke	mm 14
Extra Stroke	mm 2
Cylinder Capacity	cm ³ 4.1
Return Spring Force	kN 0.06 ~ 0.09
Max. Operating Pressure	MPa 7
Min. Operating Pressure	MPa 2.5
Withstanding Pressure	MPa 10.5
Operating Temperature	°C 0 ~ 70
Usable Fluid	ISO-VG-32 or Equivalent General Oil
Mass ^{※2}	kg 0.2

Notes ※1. F : Clamping Force (kN), P : Supply Hydraulic Pressure (MPa), L : Distance between the Piston Center and the Clamping Point (mm)
※2. Mass of single clamp without the link lever.



Clamping Force Curve

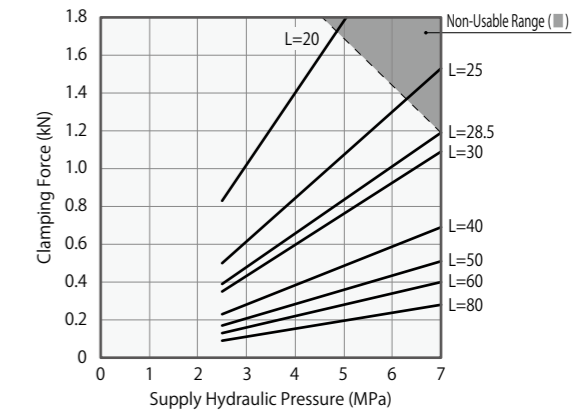


Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm)								Non-Usable Range (■)	Min. Lever Length L (mm)
		Clamping Force Calculation Formula ^{※3} (kN) $F = (2.86 \times P - 0.97) / (L - 12.5)$									
		L=20	L=25	L=28.5	L=30	L=40	L=50	L=60	L=80		
7	1.7			1.2	1.1	0.7	0.5	0.4	0.3	28.5	
6.5	1.6			1.1	1.0	0.6	0.5	0.4	0.3	26	
6	1.4		1.3	1.0	0.9	0.6	0.4	0.3	0.2	24	
5.5	1.3		1.2	0.9	0.8	0.5	0.4	0.3	0.2	22	
5	1.2		1.1	0.8	0.8	0.5	0.4	0.3	0.2	21	
4.5	1.1	1.6	1.0	0.8	0.7	0.4	0.3	0.3	0.2	19	
4	0.9	1.4	0.8	0.7	0.6	0.4	0.3	0.2	0.2	18	
3.5	0.8	1.2	0.7	0.6	0.5	0.3	0.2	0.2	0.1	17	
3	0.7	1.0	0.6	0.5	0.4	0.3	0.2	0.2	0.1	17	
2.5	0.5	0.8	0.5	0.4	0.4	0.2	0.2	0.1	0.1	17	
Max. Operating Pressure (MPa)		4.8	6.3	7.0	7.0	7.0	7.0	7.0	7.0		

Applicable Model

LM0300 - C L
C
R

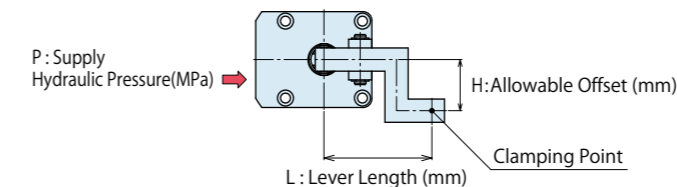
(Example) Supply Hydraulic Pressure 5.0 MPa, Lever Length L=30 mm
Clamping force is about 0.76 kN.



Notes

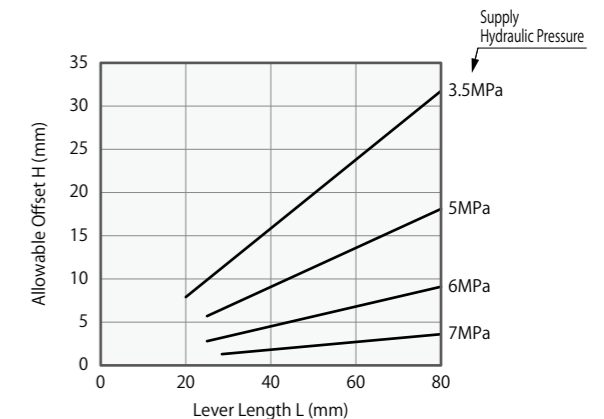
- Tables and graphs shown are the relationships between the clamping force (kN) and supply hydraulic pressure (MPa).
 - Cylinder output (when L=0) cannot be calculated from the calculation formula of clamping force.
 - Using in the non-usable range may damage the clamp and lead to fluid leakage.
- ※3. F: Clamping Force (kN), P: Supply Hydraulic Pressure (MPa), L: Lever Length (mm)

Allowable Offset Graph



(Example) Supply Hydraulic Pressure 5.0 MPa, Lever Length L=30 mm
Allowable offset is about 7 mm.

Hydraulic Pressure (MPa)	Allowable Offset H (mm) Non-Usable Range (■)							
	Lever Length L (mm)							
	L=20	L=25	L=28.5	L=30	L=40	L=50	L=60	L=80
7			1	1	2	2	3	4
6		3	3	3	5	6	7	9
5		6	6	7	9	11	14	18
3.5	8	10	11	12	16	20	24	32



Notes

- Tables and graphs shown are the relationships between the lever length (mm) for supply hydraulic pressure (MPa) and the allowable offset (mm).
- Using the lever beyond allowable offset may cause deformation, galling and fluid leakage etc.
- The tables and graphs are only for reference. The design should be carried out with allowance fully taken into consideration.

Hydraulic Series

Cautions

Swing Clamp
LT

Link Clamp
LM

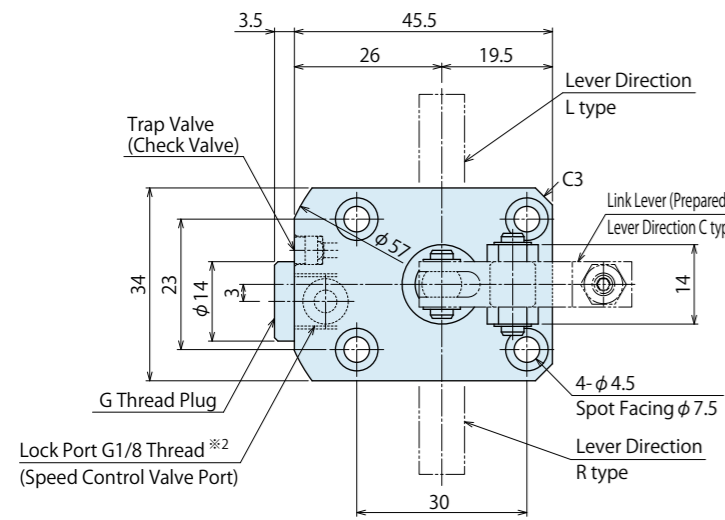
Work Support
LC
LD

Control Valve
BZL

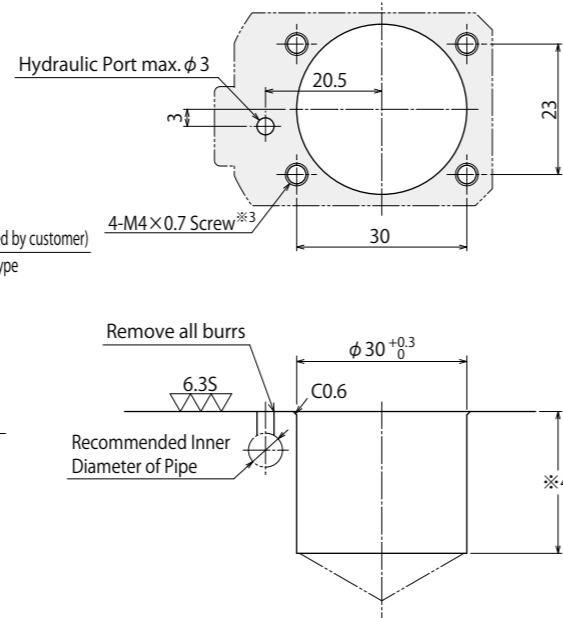
Manifold Block
LZ-MS
LZ-MP
LZ-S
DZ-R
DZ-C

External Dimensions

C : Gasket Option (With G Thread Plug)
 ※The drawing shows the locked state of LM0300-CC.



Machining Dimensions of Mounting Area

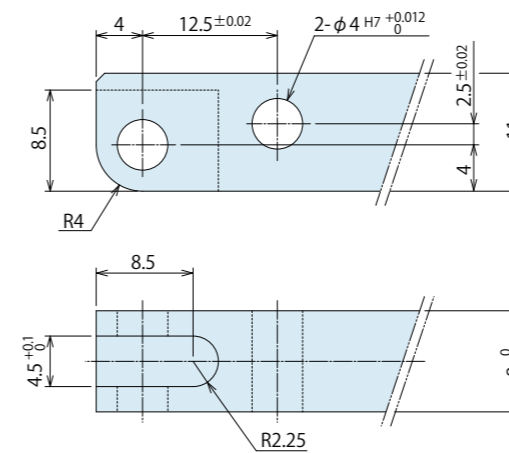


Notes

- ※3. 4-M4×0.7 tapping depth for mounting bolt should be calculated according to mounting height referring to dimension '※1'.
- ※4. The body mounting hole $\phi 30^{+0.3}$ should be decided according to mounting height referring to dimension '※5'.

Link Lever Design Dimensions

※ Reference for designing link lever of LM0300-C□.



Notes

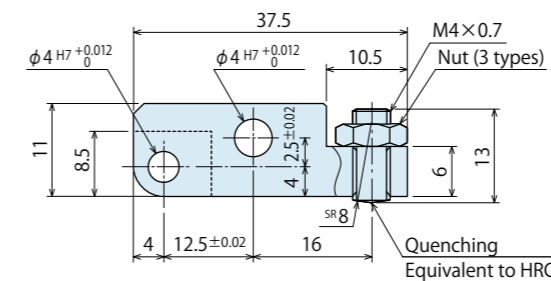
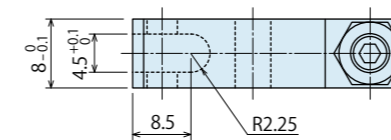
- Link lever should be designed with its length according to performance graph.
- If the link lever is not in accordance with the dimension shown left, performance may be degraded and damage can occur.
- Please use the provided pin (Equivalent to $\phi 4f6$, HRC60) as mounting pin for lever.

Accessories : Link Lever (LZ-LJ1) Made-to-Order

Model No. Indication

LZ 030 0 - LJ1

Size Design No. (Revision Number)



Model No.	LZ0300-LJ1
Corresponding Model No.	LM0300-C□

Notes

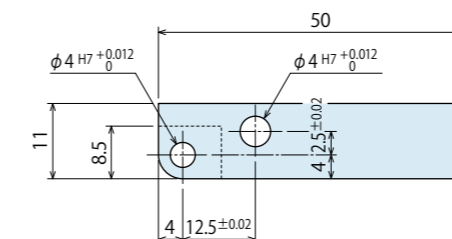
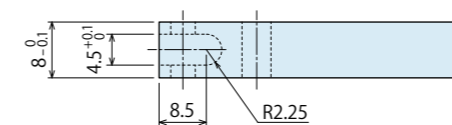
- Material : S45C
- Please use the provided pin (Equivalent to $\phi 4f6$, HRC60) as mounting pin for lever.

Accessories : Material Link Lever (LZ-LJ2)

Model No. Indication

LZ 030 0 - LJ2

Size Design No. (Revision Number)



Model No.	LZ0300-LJ2
Corresponding Model No.	LM0300-C□

Notes

- Material : S45C
- If necessary, the front end should be additionally processed.
- Please use the provided pin (Equivalent to $\phi 4f6$, HRC60) as mounting pin for lever.

External Dimensions and Machining Dimensions for Mounting

Model No.	LM0300-C□
Full Stroke	mm 16
Lock Stroke	mm 14
Extra Stroke	mm 2
Inner Diameter of Pipe ※6	mm $\phi 6$

Notes

- ※6. The recommended inner pipe diameter is reference. Make appropriate changes according to the number of clamps used and the distance from the piping.

Notes

- ※1. Mounting bolts are not provided. Customer should prepare based on dimension '※1'.
- ※2. Speed control valve is sold separately. Please prepare using reference to P.23.
- 1. Please use the provided pin (equivalent to $\phi 4f6$, HRC60) as mounting pin for lever.

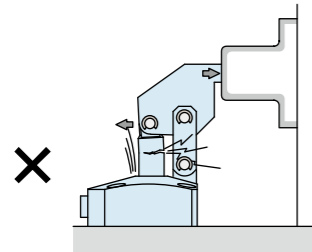
Cautions Cautions for Link Clamp LM0300-C□ (Refer to P.27~P.30 for common cautions.)

● 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.28 to assist with proper hydraulic circuit designing.
 - Ensure there is no possibility of supplying hydraulic pressure to the lock and release ports simultaneously.

3) Notes for Link Lever Design

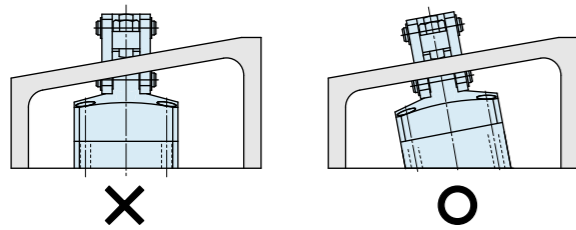
- Make sure no force is applied to the piston rod except the axial direction. (Make sure the clamp surface and the mounting surface on the workpiece are parallel.) The usage like the one shown in the drawing below will apply a large bending stress to the piston rod and must be avoided.



- If offset load is applied on the link part, use it within the allowable range of "Allowable Offset Graph".

- 4) When using on a welding fixture, the exposed area of piston rod and link plate should be protected.
 - If spatter gets onto the sliding surface it may lead to malfunction and fluid leakage.

- 5) When clamping on a sloped surface on the workpiece.
 - Make sure the clamp surface and the mounting surface on the workpiece are parallel.



- 6) When using in a dry environment.
 - The link pin can dry out. Grease it periodically or use a special pin. Contact us for the specifications for special pins.

● Notes on Installation

- 1) Check the fluid to use.
 - Please use the appropriate fluid by referring to the Hydraulic Fluid List (P.27).

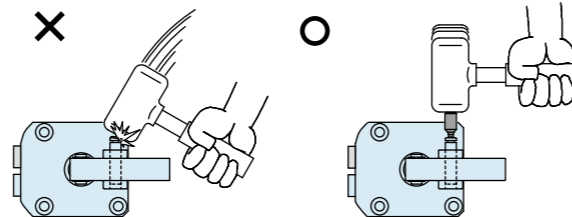
2) Mounting / Removing clamp.

- When mounting the clamp, use hexagon socket bolts as multiple bolt holes for mounting (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)
LM0300-C□	M4×0.7	3.2

3) Installation / Removal of the Link Lever

- When inserting the link pin, do not hit the pin directly with a hammer. When using a hammer to insert the pin, always use a cover plate with a smaller diameter than the snap ring groove on the pin.

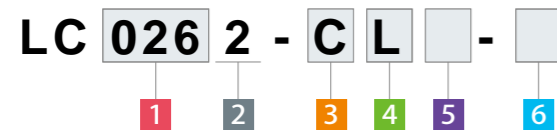


4) Speed Adjustment

- Adjust the speed so that the total operating time is one second or more. If the clamp operates too fast the parts will wear out leading to premature damage and ultimately complete equipment failure.
- Please make sure to release air from the circuit before adjusting speed. It will be difficult to adjust the speed accurately with air mixed in the circuit.
- Turn the speed control valve gradually from the low-speed side (small flow) to the high-speed side (large flow) to adjust the speed.

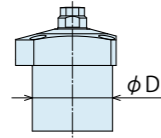
※ Please refer to P.27 for common cautions. • Installation Notes • Hydraulic Fluid List • Notes on Hydraulic Cylinder Speed Control Circuit • Notes on Handling • Maintenance/Inspection • Warranty

Model No. Indication



1 Body Size

- 026 : $\phi D=26\text{mm}$
- 030 : $\phi D=30\text{mm}$
- 036 : $\phi D=36\text{mm}$



※ Outer diameter (ϕD) of the cylinder.

Refer to the complete catalog (KWCS2014-02-GB) for current models.

- 040 : $\phi D=40\text{mm}$ 065 : $\phi D=65\text{mm}$
- 048 : $\phi D=48\text{mm}$ 075 : $\phi D=75\text{mm}$
- 055 : $\phi D=55\text{mm}$ 090 : $\phi D=90\text{mm}$

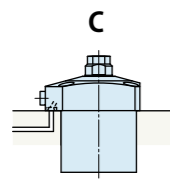
2 Design No.

- 2 : Revision Number

3 Piping Method

- C : Gasket Option (With G Thread Plug • Air Venting Function)

※ Speed control valve (BZL) is sold separately. Refer to P. 23.



Gasket Option
With G Thread Plug
Able to Attach
Speed Control Valve

Specifications

Model No.		LC0262-C□	LC0302-C□	LC0362-C□
Support Force at 7MPa	kN	2	3	4
Support Force (Calculation Formula) ^{※1}	kN	$0.38 \times P - 0.69$	$0.53 \times P - 0.68$	$0.70 \times P - 0.91$
Plunger Stroke	mm	6.5	6.5	8
Cylinder Capacity	cm ³	0.4	0.6	0.8
Plunger Spring Force ^{※2}	L: Low Spring Force	2.2 ~ 3.0	2.8 ~ 3.8	3.6 ~ 5.6
	N: High Spring Force	3.0 ~ 4.4	3.7 ~ 5.5	4.7 ~ 7.8
Maximum Operating Pressure	MPa	7.0		
Minimum Operating Pressure	MPa	2.5		
Withstanding Pressure	MPa	10.5		
Operating Temperature	°C	0 ~ 70		
Mass	kg	0.3	0.4	0.5

Notes ※1. P in the formula for support force indicates the hydraulic pressure (MPa).

※2. The plunger spring force figure indicates the spring design force.

It may vary due to moving resistance of the plunger and spring. Please use it as reference for the workpiece contacting force.

4 Plunger Spring Force

- L : Low Spring Force
- H : High Spring Force

5 Plunger Action Confirmation

- Blank : None (Standard)
- M : Air Sensing Option (Contact us separately.)

6 Options

Blank : Hydraulic Advance Model (Standard)

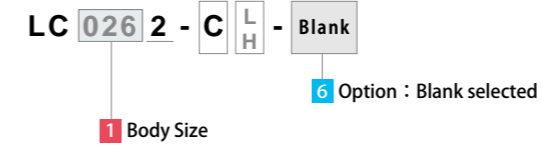
Please contact us separately for other options.

- Q : Hydraulic Advance Long Stroke Model
- E : Spring Advance Model
- EQ : Spring Advance Long Stroke Model
- D : Rodless Hollow Model (The rod is prepared by the customer)

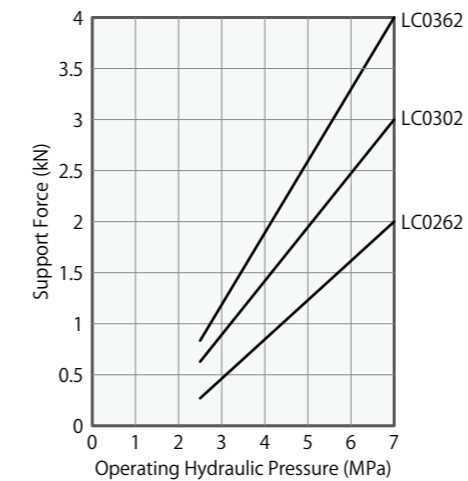


Performance Curve

Applicable Model



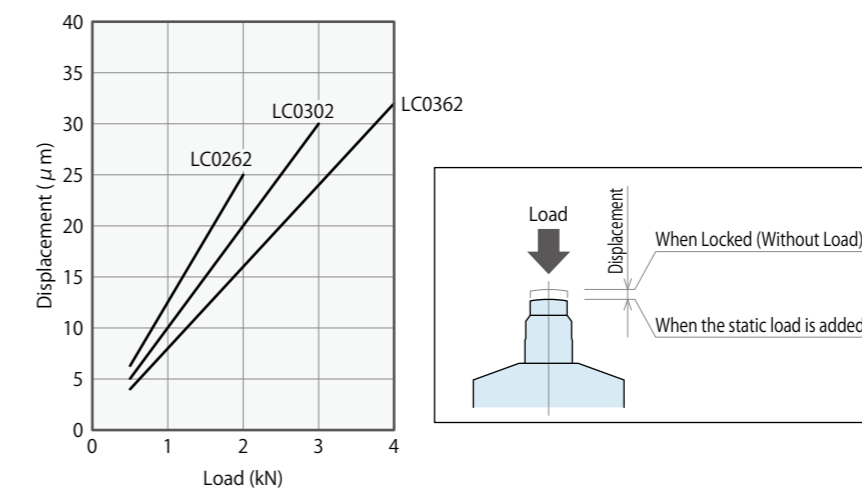
Support Force Graph ※ This graph shows the support force under static load condition.



Model No.	Support Force (kN)		
	LC0262-C□	LC0302-C□	LC0362-C□
Hydraulic Pressure (MPa)			
7	2.0	3.0	4.0
6.5	1.8	2.8	3.6
6	1.6	2.5	3.3
5.5	1.4	2.2	2.9
5	1.2	2.0	2.6
4.5	1.0	1.7	2.2
4	0.8	1.4	1.9
3.5	0.6	1.2	1.5
3	0.5	0.9	1.2
2.5	0.3	0.6	0.8
Support Force Formula ^{※3} kN	$0.38 \times P - 0.69$	$0.53 \times P - 0.68$	$0.70 \times P - 0.91$

Note ※3. P : Operating hydraulic pressure (MPa)

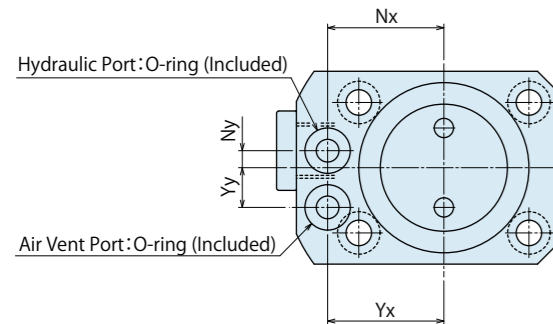
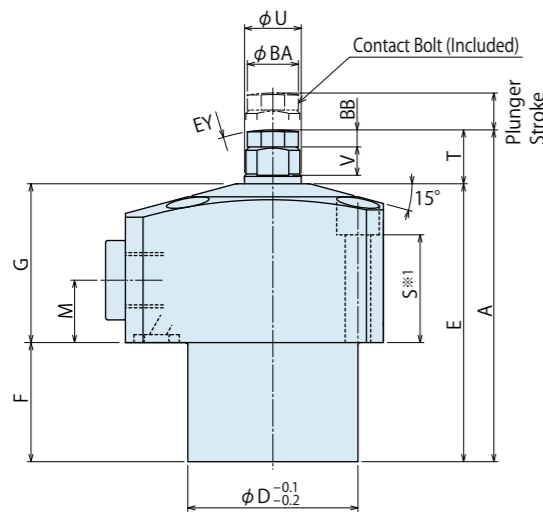
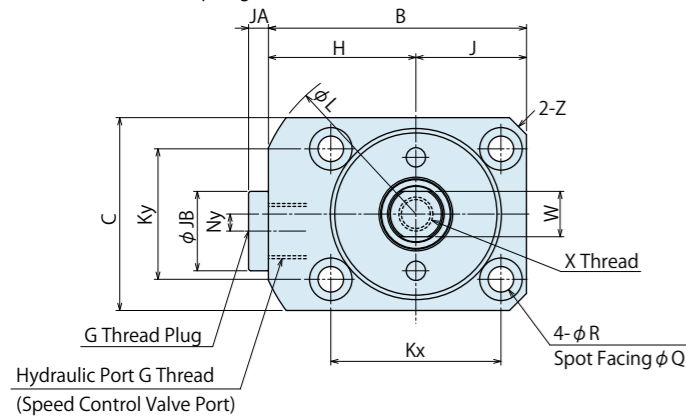
Load / Displacement Graph ※ This graph shows the static load displacement at 7 MPa hydraulic pressure.



External Dimensions

C: Gasket Option (with G Thread Plug)

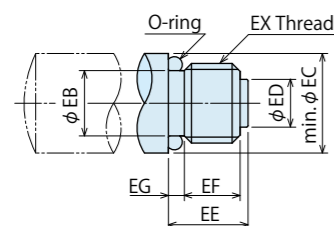
※ This drawing shows the released state of LC-C□ (before the plunger is lifted).



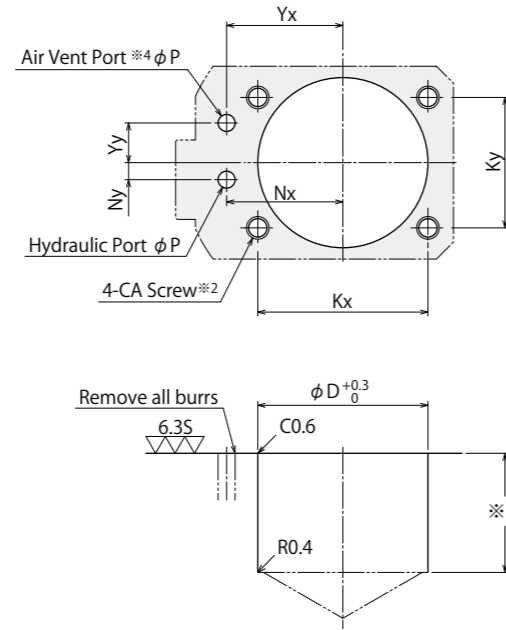
Note

※ 1. Mounting bolts are not provided. Customer should prepare based on dimension 'S'.

Contact Bolt Design Dimensions



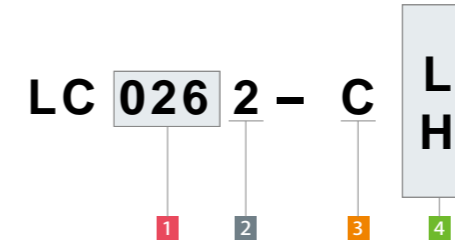
Machining Dimensions of Mounting Area



Notes

- ※ 2. CA tapping depth should be calculated so that mounting bolts engage fixture by at least 1.5 x bolt diameter.
- ※ 3. The φD depth of the body mounting hole should be decided from dimension F.
- ※ 4. The vent port needs to be processed in an open air environment without the presence of coolant, dust, etc. to avoid any internal contamination. Refer to P.21 : Appropriate Position of Vent Port for reference.

Model No. Indication



(Format Example : LC0302-CL、LC0362-CH)

- 1 Body Size
- 2 Design No.
- 3 Piping Method
- 4 Plunger Spring Force
- 5 Plunger Action Confirmation (Blank)
- 6 Options (Blank)

External Dimensions and Machining Dimensions for Mounting (mm)

Model No.	LC0262-C□	LC0302-C□	LC0362-C□
Plunger Stroke	6.5	6.5	8
A	56.5	58.5	64
B	40.5	45.5	49
C	29	34	40
D	26	30	36
E	49	49	52.5
F	21	21	27.5
G	28	28	25
H	24	26	29
J	16.5	19.5	20
Kx	25	30	31.4
Ky	21	23	31.4
L	53	57	63
M	11	11	11
Nx	18.5	20.5	23.5
Ny	3	3	5
P	3	3	3
Q	6	7.5	7.5
R	3.4	4.5	4.5
S	21	19	16
T	7.5	9.5	11.5
U	7	10	12
V	3.5	5	6
W	5.5	8	10
X (Nominal×Pitch×Depth)	M4×0.7×7	M6×1×9	M8×1.25×12
Yx	18.5	20.5	23.5
Yy	7	7	8
Z (Chamfer)	C2	C3	C2
BA	6.5	9	11.5
BB	2.5	3	4
BC	5.5	8	10
CA	M3×0.5	M4×0.7	M4×0.7
EY	SR20	SR30	SR30
JA	3.5	3.5	3.5
JB	14	14	14
Hydraulic Port G Thread	G1/8	G1/8	G1/8
Hydraulic Port: O-Ring	1BP5	1BP5	1BP5
Air Vent Port: O-Ring	1BP5	1BP5	1BP5

Contact Bolt Design Dimensions

※Reference when contact bolts (attachment) other than the attached contact bolt are designed and manufactured by the customer.

Corresponding Item Model Number	LC0262-C□	LC0302-C□	LC0362-C□
EB	3	4.5	6
EC	6	8.5	10.5
ED	2	3.5	5
EE	6	8	10
EF	4.5	6	7
EG	1	1.5	2
EX	M4×0.7	M6×1	M8×1.25
O-ring	SS3 (Made by NOK)	S5 (Made by NOK)	S6 (Made by NOK)

Hydraulic Series

Cautions

Swing Clamp

LT

Link Clamp

LM

Work Support

LC

LD

Control Valve

BZL

Manifold Block

LZ-MS

LZ-MP

LZ-S

DZ-R

DZ-C

Model No. Indication

LD 022 2 - L - S

1 2 3 4

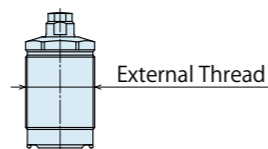
1 Body Size

022 : External Thread M22×1.5

Refer to the complete catalog (KWCS2014-02-GB) for current models.

026 : External Thread M26×1.5 036 : External Thread M36×1.5

030 : External Thread M30×1.5 045 : External Thread M45×1.5



2 Design No.

2 : Revision Number

3 Plunger Spring Force

L : Low Spring Force

H : High Spring Force

4 Options

Blank : Hydraulic Advance Model (Standard)

S : Hydraulic Advance Short Model

Please contact us separately for other options.

Q : Hydraulic Advance Long Stroke Model ES : Spring Advance Short Model

E : Spring Advance Model EQ : Spring Advance Long Stroke Model

Specifications

Model No.	Hydraulic Advance Model (Standard)		Hydraulic Advance Short Model	
	LD0222-□		LD0222-□-S	
Support Force at 7MPa	kN	2.0	0.6	
Support Force (Calculation Formula) ※1	kN	0.38×P-0.69	0.12×P-0.24	
Plunger Stroke	mm	6.5	5	
Cylinder Capacity	cm ³	0.4	0.2	
Plunger Spring Force ※2	L: Low Spring Force	2.1 ~ 3.1	1.8 ~ 3.1	
	H: High Spring Force	3.0 ~ 4.4	2.1 ~ 4.3	
Maximum Operating Pressure	MPa	7.0		
Minimum Operating Pressure	MPa	2.5		
Withstanding Pressure	MPa	10.5		
Operating Temperature	°C	0 ~ 70		
Mass	kg	0.1	0.1	

Notes ※1. P in the formula for support force indicates the hydraulic pressure (MPa).

※2. The plunger spring force figure indicates the spring design force.

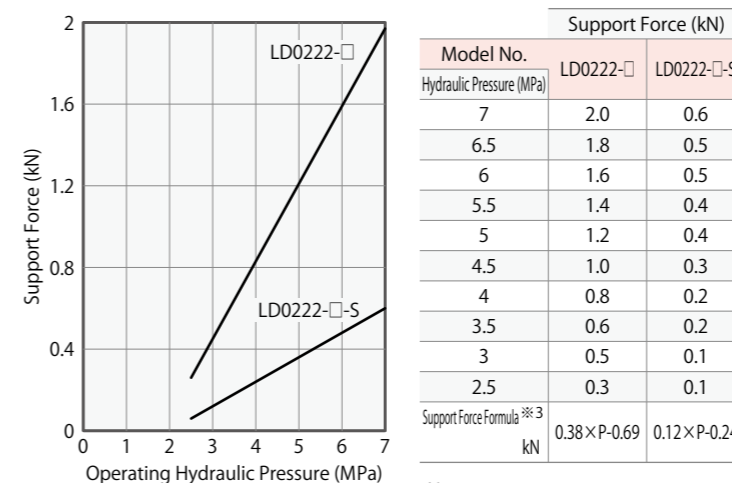
It may vary due to moving resistance of the plunger and spring. Please use it as reference for the workpiece contacting force.

Performance Curve

Applicable Model **LD 022 2 - L - S**

Support Force Graph

※ This graph shows the support force under static load condition.

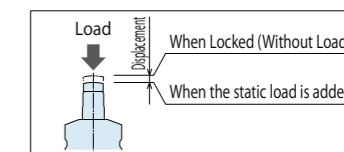
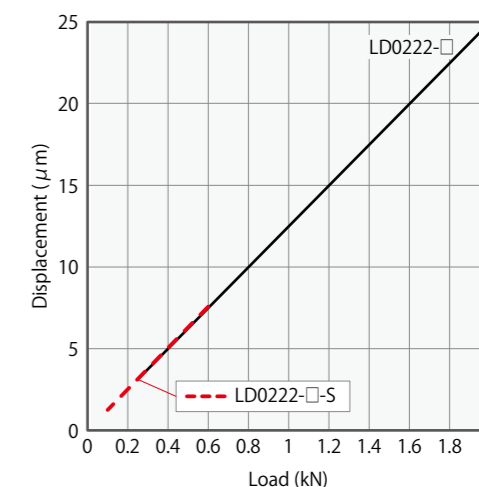


Note

※ 3. P: Operating Hydraulic Pressure (MPa)

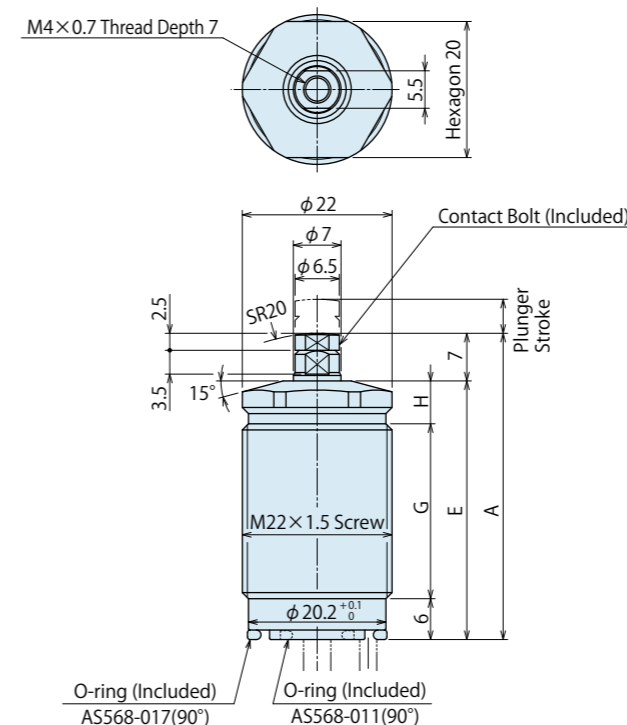
Load / Displacement Graph

※ This graph shows the static load displacement at 7 MPa hydraulic pressure.



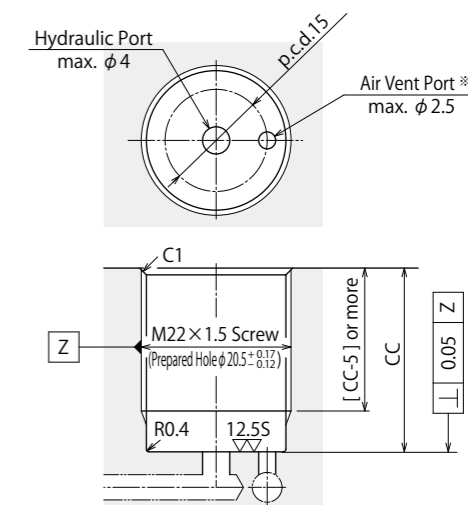
External Dimensions

※ This drawing shows the released state of LD0222-□-□ (before the plunger is lifted).



(mm)		
Model No.	LD0222-□	LD0222-□-S
Plunger Stroke	6.5	5
A	59.5	45
E	52.5	38
G	37.7	25.7
H	8.8	6.3
CC	14~43	14~31

Machining Dimensions of Mounting Area

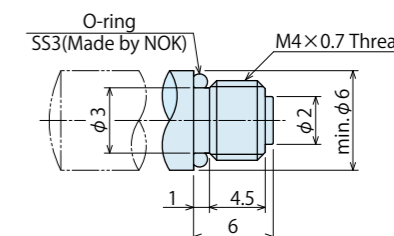


Note

※4. The vent port needs to be machined in an open air environment without the presence of coolant, dust, etc. to avoid any internal contamination. (Refer to P.21: Appropriate Position of Vent Port for reference.)

Contact Bolt Design Dimensions

※ Reference when contact bolts (attachment) other than the attached contact bolt are designed and manufactured by the customer.

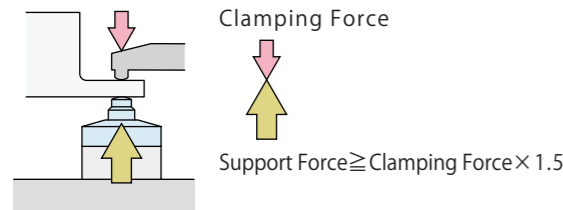


Cautions Cautions for Work Support LC□-C□ / LD0222-□-□ (Refer to P.27~P.30 for common cautions.)

Notes for Design

1) Check Specifications

- Please use each product according to the specifications.
- When using a work support opposite to the clamp, set the support force at more than 1.5 times the clamping force.



2) Notes for Circuit Design

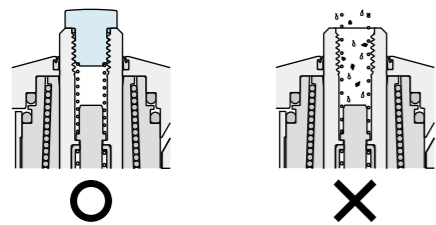
- Please read "Notes on Hydraulic Cylinder Speed Control Circuit" on P.28 to assist with proper hydraulic circuit designing.

3) Install temporary stopper for workpiece if necessary.

- When multiple work supports are used for a light workpiece, the plunger spring force may be higher than the weight of the workpiece causing it to lift the workpiece.

4) Contact bolt or attachment required for the plunger.

- Always use contact bolt or attachment with the plunger. Plunger doesn't rise since plunger spring is free to move.
 - You must set an O-ring at the attachment.
- With contact bolt or attachment removed, cutting fluid or other foreign material will get in easily, causing malfunction.

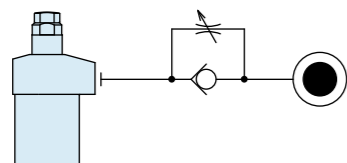


5) Protect the plunger surface at the time of use on welding fixture etc.

- If sputtered substances adheres to a plunger, poor sliding will occur and a normal support function will not be sustained.

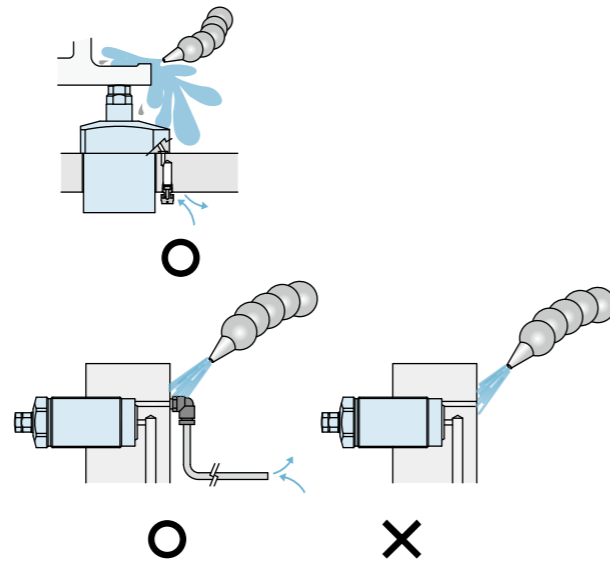
6) Adjust plunger operation time with flow rate.

- A rough guideline for the full stroke is between 0.5 and 1 second.
 - As with single-action cylinders, use a flow regulating valve with a check valve (meter-in) in consideration of the decreasing speed at release.
 - If the action speed is too fast, it may bounce back due to shock impact & will lock it self with the clearance between plunger & the workpiece.
 - Use a flow regulating valve with check valve that has 0.1 MPa or less of cracking pressure.
- If the cracking pressure is too high the plunger will not move at the time of release.



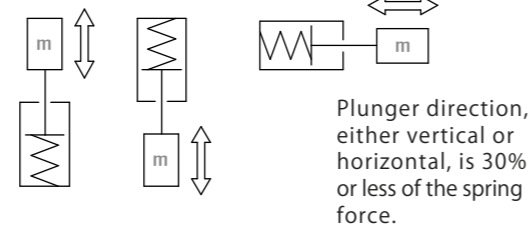
7) Appropriate Measures for the Vent Port

- The work support, although only slightly, breathes like a single-action cylinder. Take the environment where it is used into consideration to avoid taking in cutting fluid or other foreign materials.
- Use only in an environment where cutting fluids cannot invade when the attached air vent undergoes dry cutting process. Invasion of cutting fluids may result in action failure.
- If it is used without a vent port it may not function properly.



8) Keep the right weight when designing and manufacturing attachments.

- Make sure the weight of attachments is 30% or less of the plunger spring force.



- Example) In the case of LC0262-L, the maximum mass of contact bolt = $2.2 \times 0.3 / 9.807 = 0.07\text{kg}$ when the plunger spring force is between 2.2-3.0N.

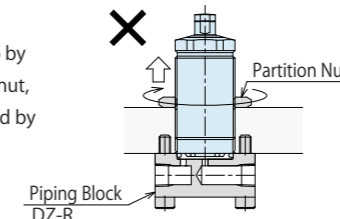
- It is recommended to use extreme low mass due to variation from tribological resistance of the plunger and spring properties.
- The dimensions of the installing thread area needs to be processed as per the design dimensions for contact bolts as shown on respective product pages.
- If the plunger spring is fixed, different dimensions at the thread area may lead to spring force fluctuation and damage, resulting in malfunctioning.

9) LD Work Support (Threaded Model) Mounting Method

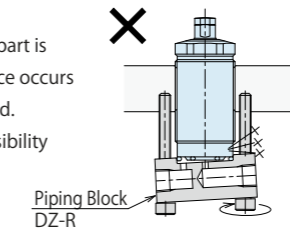
- The base is horizontal to bearing surface and load cannot be received on the base at the time of work support attachment. By the following mounting method, load cannot be received on the base and there is a possibility of equipment's damaging and the increased amount of displacement by load.

Bad Examples

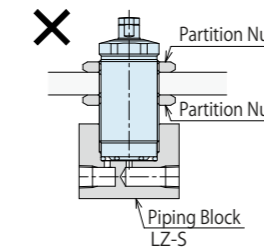
- ① Work support is lifted up by tightening the partition nut, and it cannot receive load by bearing surface.



- ② Bearing surface contact part is not horizontal, a clearance occurs and it cannot receive load. Moreover, there is a possibility of damaging equipment by tightening bolts.



- ③ Since the piping block which receives load has floated, load cannot be received.



Installation Notes

1) Check the Usable Fluid

- Please use the appropriate fluid by referring to the Hydraulic Fluid List. (Refer to P.27 for Hydraulic Fluid List)

2) Mounting Work Support

- All the hexagon socket bolts (with tensile strength 12.9) should be used for LC model with tightening torque shown in the table below.

Model No.	Thread Size	Tightening Torque (N·m)
LC0262-C□	M3×0.5	1.3
LC0302-C□	M4×0.7	3.2
LC0362-C□	M4×0.7	3.2

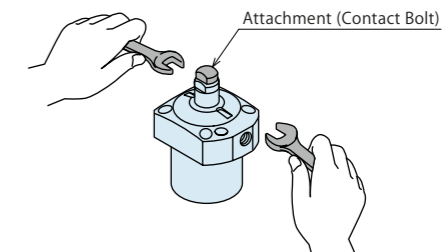
- For LD (Threaded) model, make sure there are no scratches or damage on the O-ring or the sealing and tighten it with the torque shown in the table below.

Model No.	Thread Size	Tightening Torque (N·m)
LD0222-□-□	M22×1.5	16

- Apply an adequate amount of grease to the O-ring.
- If it is mounted under dry state, the O-ring may have twisting or be defective.
- If it is tightened with higher torque, it may lead to malfunction.

3) Replacement of Attachment

- Do not lose the plunger spring when the attachment (contact bolt) is removed.
- When the attachment is removed, stop the plunger with a spanner at its front end and tighten it with torque as shown in the table below.



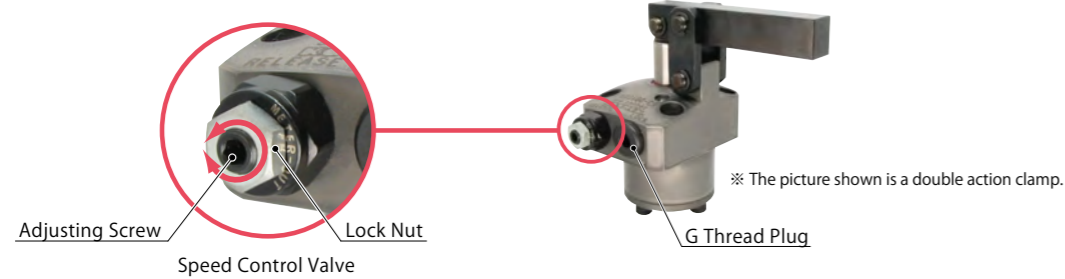
Model No.	Front Thread Size	Tightening Torque (N·m)	
LC	LC0262-C□	M4×0.7	1.6
	LC0302-C□	M6×1	5
	LC0362-C□	M8×1.25	10
LD	LD0222-□-□	M4×0.7	1.6

※ Please refer to P.27 for common cautions. • Installation Notes • Hydraulic Fluid List • Notes on Hydraulic Cylinder Speed Control Circuit • Notes on Handling • Maintenance/Inspection • Warranty

Speed Control Valve for Low Pressure PAT.

Directly Mounted to Clamps

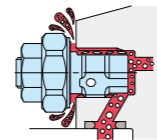
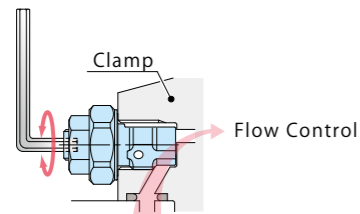
Speed control valve (model BZL) is mounted to hydraulic clamp / work support with piping method: type C.



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.



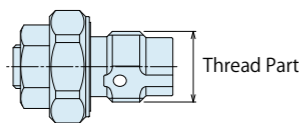
Model No. Indication (Speed Control Valve for Low Pressure)

BZL 0 10 0 - A

1 2 3

1 G Thread Size

10 : Thread Part G1/8A Thread

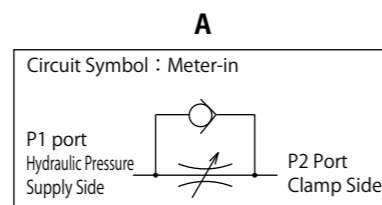


2 Design No.

0 : Revision Number

3 Control Method

A : Meter-in



Specifications

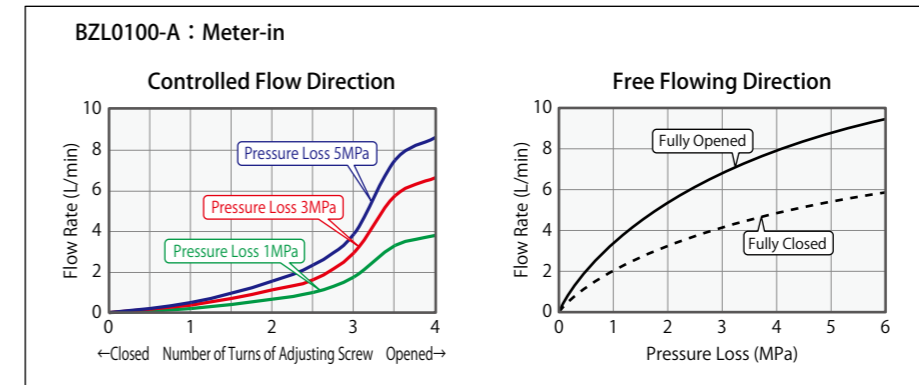
Model No.	BZL0100-A	
Max. Operating Pressure	MPa	7
Withstanding Pressure	MPa	10.5
Control Method		Meter-in
G Thread Size		G1/8A
Cracking Pressure	MPa	0.04
Maximum Passage Area	mm ²	2.6
Usable Fluid	General Hydraulic Oil Equivalent to ISO-VG-32	
Operating Temperature	°C	0 ~ 70
Tightening Torque for Main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

- 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.

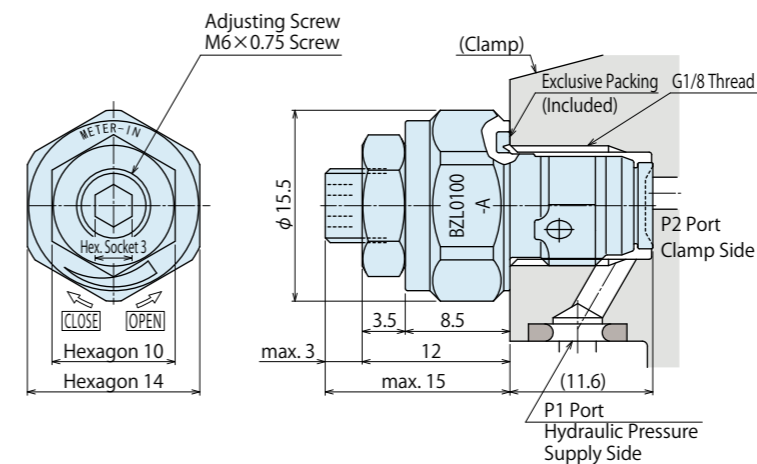
Applicable Products

Model No.	LT (Single Action) Swing Clamp	LM/LJ (Single Action) Link Clamp	LC (Single Action) Work Support
BZL0100-A	LT0301-C□	LM0300-C□	LC0262-C□ LC0302-C□ LC0362-C□

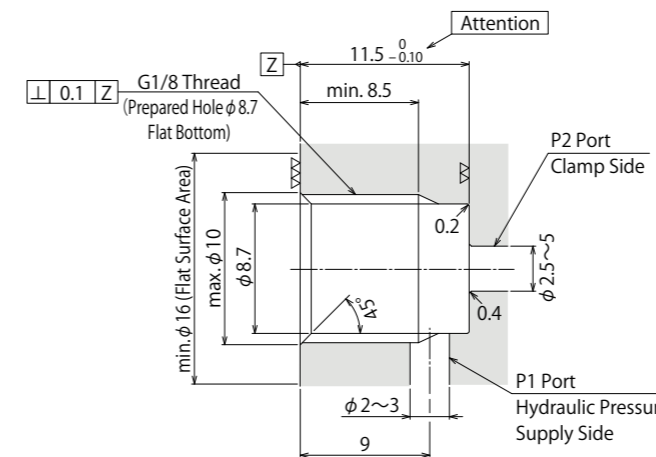
Flow Rate Graph < Hydraulic Fluids ISO-VG32 (25~35°C) >



External Dimensions



Machining Dimensions of Mounting Area



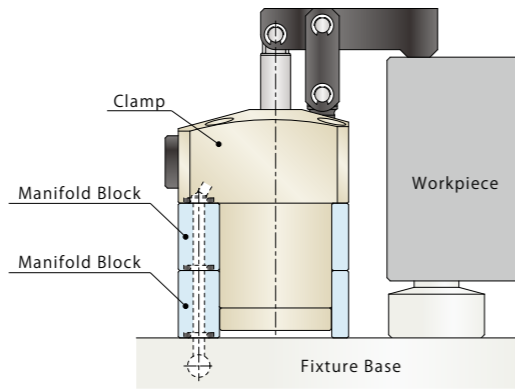
Notes

1. Since the ▽▽ 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.

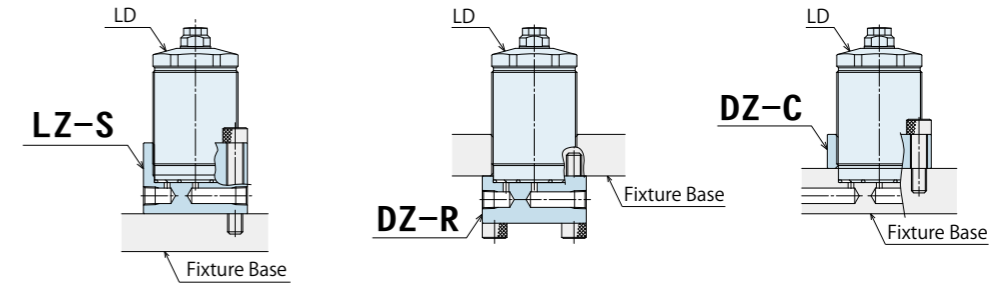
Notes

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.28)
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.)

Manifold Block



Manifold Block

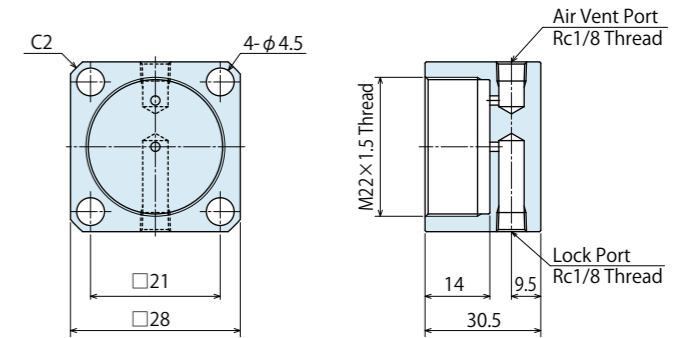


Manifold Block for LD

Model No. Indication
LZ 022 0 - S
Size Design No. (Revision Number)

Model No.	LZ0220-S
Corresponding Model No.	LD0222
Mass kg	0.12

- Notes 1. Material: S45C
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the block thickness as a reference.

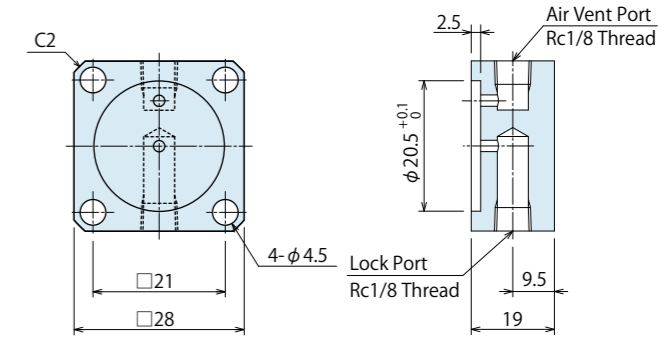


Manifold Block for LD

Model No. Indication
DZ 022 0 - R
Size Design No. (Revision Number)

Model No.	DZ0220-R
Corresponding Model No.	LD0222
Mass kg	0.1

- Notes 1. Material: S45C
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the block thickness as a reference.

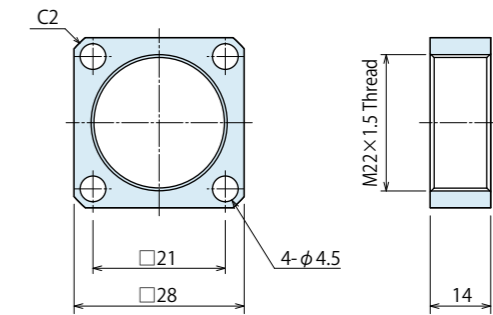


Flange Nut for LD

Model No. Indication
DZ 022 0 - C
Size Design No. (Revision Number)

Model No.	DZ0220-C
Corresponding Model No.	LD0222
Mass kg	0.04

- Notes 1. Material: S45C
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the block thickness as a reference.

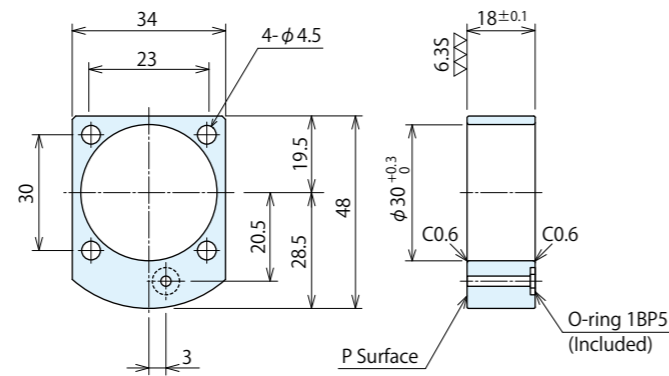


Manifold Block for LM/LT Made-to-Order

Model No. Indication
LZ 030 0 - MS
Size Design No. (Revision Number)

Model No.	LZ0300-MS
Corresponding Item	LT0301
Model No.	LM0300
Mass kg	0.1

- Notes 1. Material: S45C
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the block thickness as a reference.
3. If thickness is required, perform additional machining on surface P. Please refer to the drawing.

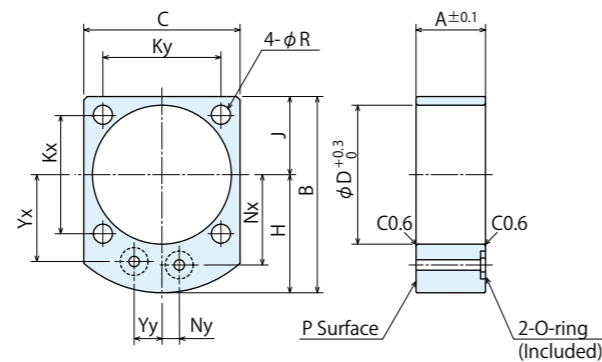


Manifold Block for LC Made-to-Order

Model No. Indication
LZ 026 0 - MP
Size (Refer to the Following Table) Design No. (Revision Number)

	(mm)		
Model No.	LZ0260-MP	LZ0300-MP	LZ0360-MP
Corresponding Model No.	LC0262	LC0302	LC0362
A	18	18	20
B	43	48	51.5
C	29	34	40
D	26	30	36
H	26.5	28.5	31.5
J	16.5	19.5	20
Kx	25	30	31.4
Ky	21	23	31.4
Nx	18.5	20.5	23.5
Ny	3	3	5
R	3.4	4.5	4.5
Yx	18.5	20.5	23.5
Yy	7	7	8
O-ring	1BP5	1BP5	1BP5
Mass kg	0.1	0.1	0.2

- Notes 1. Material: S45C
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the A dimensions as a reference.
3. If thickness (dimension A) is required, perform additional machining on surface P. Please refer to the drawing.



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.

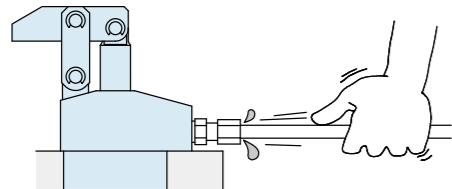
3) Applying Sealing Tape

- 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.

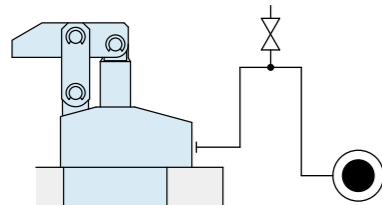
4) Air Bleeding of the Hydraulic Circuit

- 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	

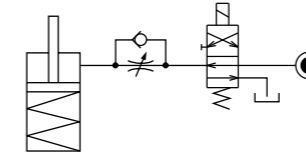
Note As it may be difficult to purchase the products as shown in the table from overseas, please contact the respective manufacturer.

● Notes on Hydraulic Cylinder Speed Control Unit

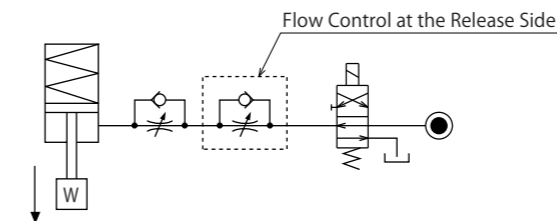
Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

● 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.



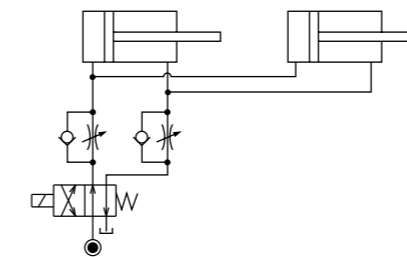
Accelerated clamping speed by excessive hydraulic flow to the cylinder may sustain damage. In this case add flow control to regulate flow. (Please add flow control to release flow if the lever weight is put on at the time of release action when using swing clamps.)



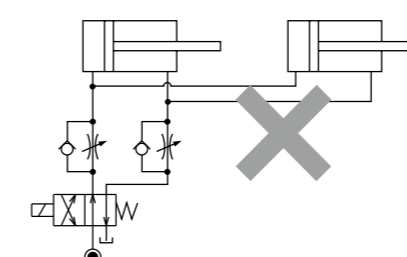
● Flow Control Circuit for Double Acting Cylinder

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. For TMA and TLA, if meter-out circuit is used, abnormal high pressure is created, which causes oil leakage and damage.

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

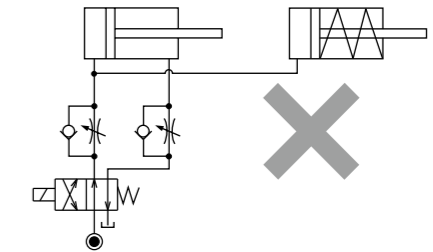


【Meter-in Circuit】(LKE/TMA/TLA must be controlled with meter-in.)



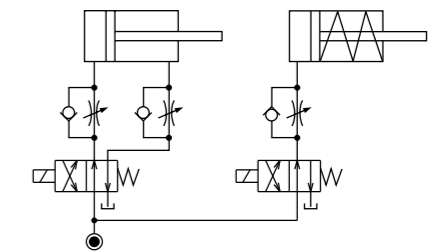
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

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

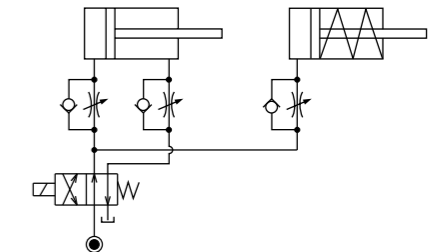


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

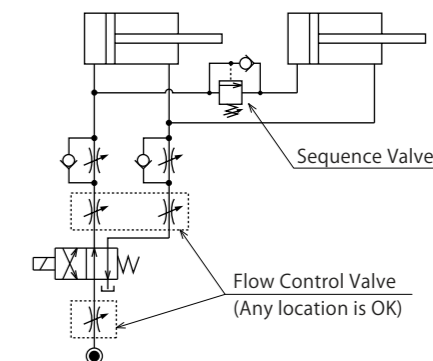
- Separate the control circuit.



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



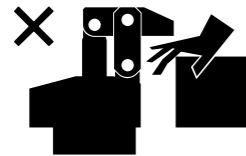
- ② In the case of meter-out circuit, the inner circuit pressure may increase during the cylinder action because of the fluid supply. The increase of the inner circuit pressure can be prevented by reducing the supplied fluid beforehand via the flow control valve. Especially when using sequence valve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



Cautions

● Notes on Handling

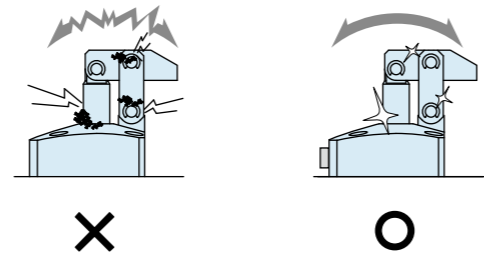
- 1) It should be handled by qualified personnel.
 - The hydraulic machine and air compressor should be handled and maintained by qualified personnel.
- 2) Do not handle or remove the machine unless the safety protocols are ensured.
 - ① The machine and equipment can only be inspected or prepared when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

Hydraulic Series

Cautions

Installation Notes (For Hydraulic Series)

Hydraulic Fluid List

Notes on Hydraulic Cylinder Speed Control Circuit

Notes on Handling

Maintenance/Inspection

Warranty

KOSMEK

Harmony in Innovation

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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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