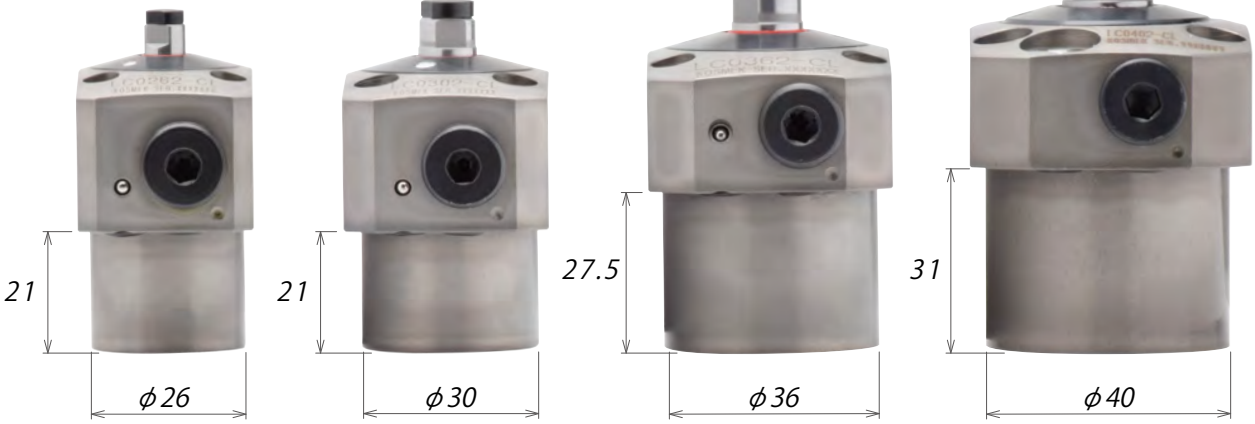
Hydraulic Work Support

3 Models Added to the Flange Series. M22 Short Model Added to the Threaded Series

Flange Series



model LC0262-C□

NEW

model LC0302-C□

NEW

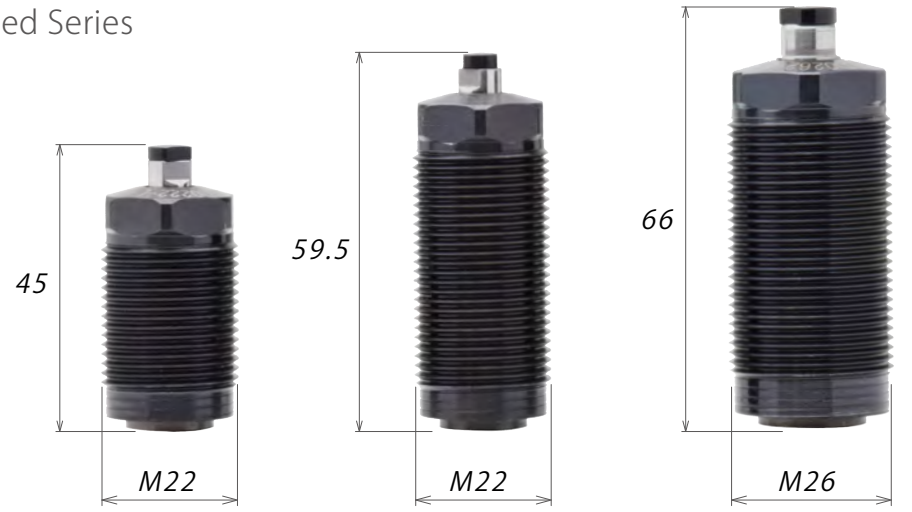
model LC0362-C□

NEW

model LC0402-C□

Current Smallest Model

Threaded Series



model LD0222-□-S

M22 Short Model

NEW

model LD0222-□

M22 Standard Model

NEW

model LD0262-□

M26 Standard Model

Current Smallest Model

Additional Models

Please refer to
P.15～P.30

Current Models

Please refer to
P.545～

NEW MODELS

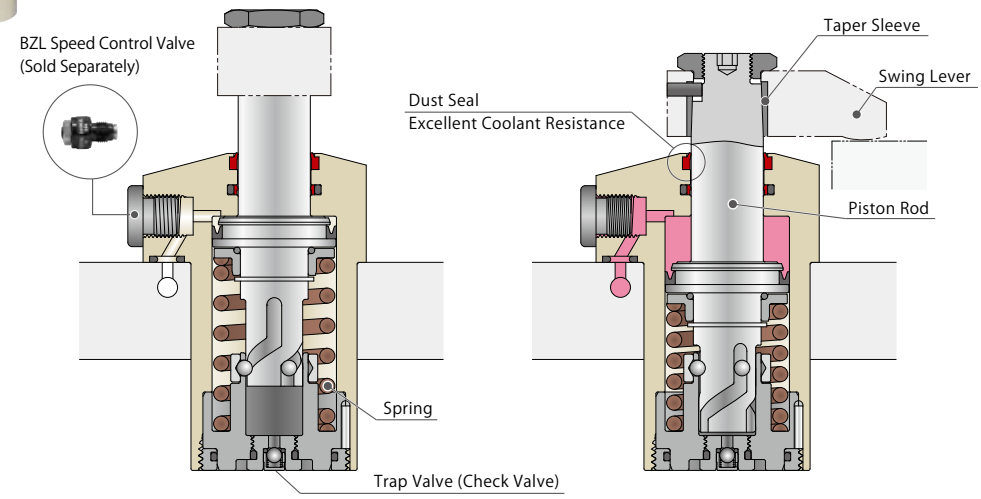
Kosmek Work Clamping Systems
Additional Product Catalog

Hydraulic Single Action Swing Clamp

Model **LT**

▸ P.3

Compact Model LT0301 with Cylinder Outer Diameter ϕ30



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

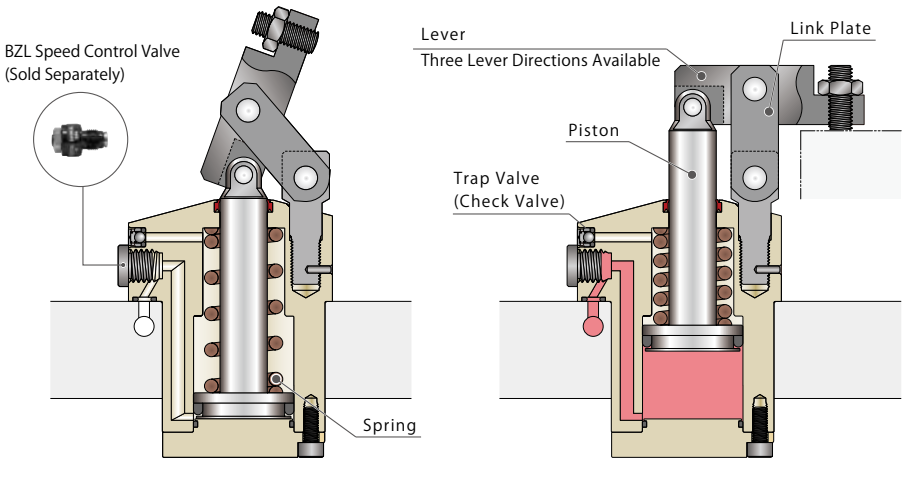
When Locking
Locking action is done by
hydraulic pressure.

Hydraulic Single Action Link Clamp

Model **LM**

▸ P.9

Compact Model LM0300 with Cylinder Outer Diameter ϕ30



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

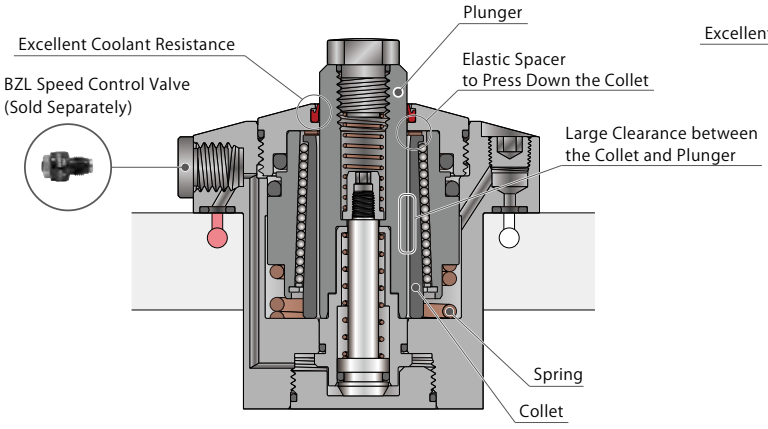
When Locking
Locking action is done by
hydraulic pressure.

Hydraulic Work Support Model LC/LD

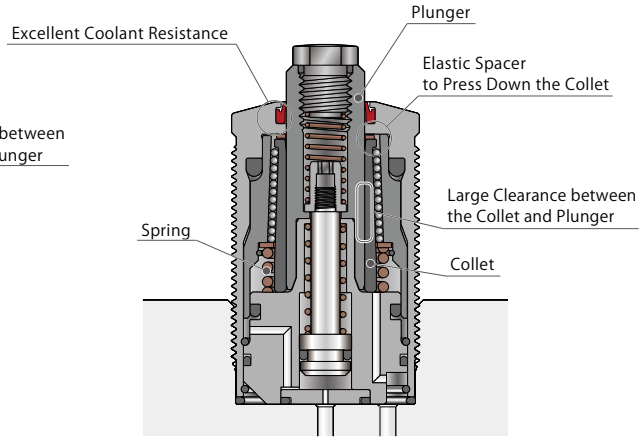
▸ P.15

LC：Cylinder Outer Diameter ϕ26, ϕ30, ϕ36 Models are Added to the Flange Series.

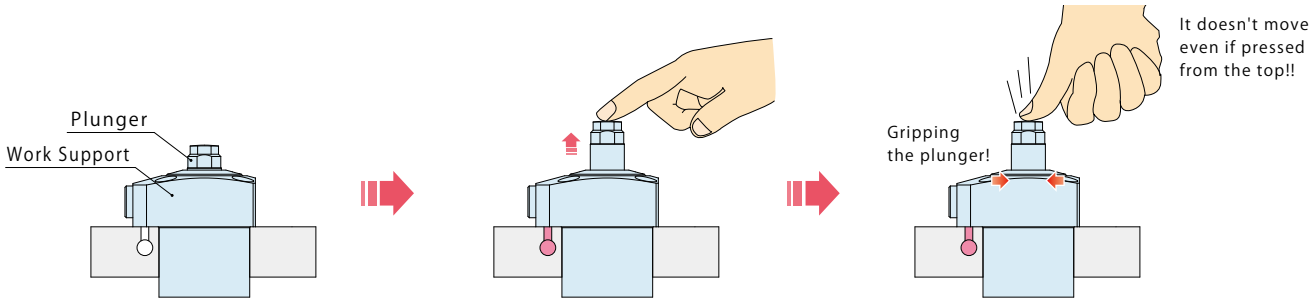
LD：Outer Thread M22 Short Body Model is Added to the Threaded Series.



model LC
Flange Model



model LD
Threaded Model



Hydraulic Pressure：OFF
The state of plunger down.

Hydraulic Pressure：ON
Plunger rises with oil pressure
and stops after touching workpiece.

Hydraulic Pressure：ON
Once it is in the stopped position where
it touches the workpiece, the plunger
doesn't go down even if pressed from above.

※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)

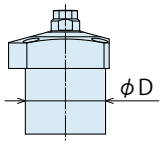
Model No. Indication

LC 026 2 - C L □ - □

1 2 3 4 5 6

1 Body Size

026： φD=26mm
030： φD=30mm
036： φD=36mm



※ Outer diameter (φD) of the cylinder.

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

040： φD=40mm **065**： φD=65mm
048： φD=48mm **075**： φD=75mm
055： φD=55mm **090**： φD=90mm

2 Design No.

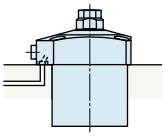
2 ： Revision Number

3 Piping Method

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

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

C



Gasket Option

With G Thread Plug
Able to Attach
Speed Control Valve

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)

Blank Q E EQ D

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×P-0.69	0.53×P-0.68	0.70×P-0.91
Plunger Stroke		mm	6.5	6.5	8
Cylinder Capacity		cm³	0.4	0.6	0.8
Plunger Spring Force ※2 N	L: Low Spring Force		2.2 ～ 3.0	2.8 ～ 3.8	3.6 ～ 5.6
	H: 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		℃	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.

Performance Curve

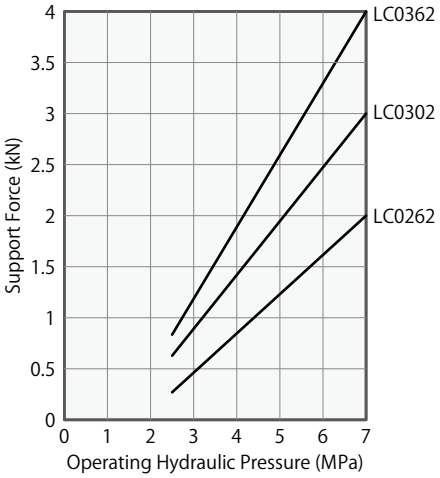
Applicable Model

LC 026 2 - C L/H - Blank

1 Body Size

6 Option : Blank selected

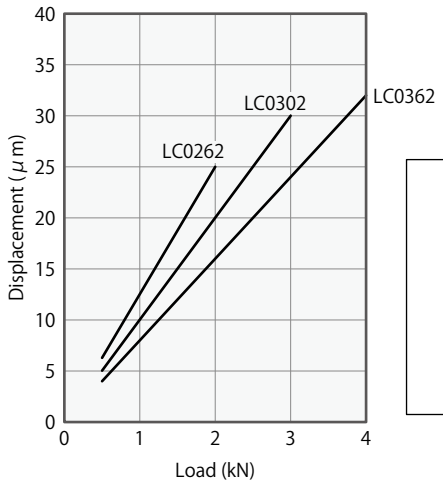
Support Force Graph ※ This graph shows the support force under static load condition.

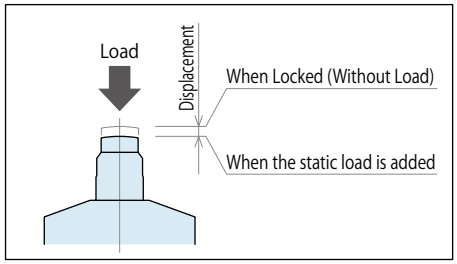


Model No. / Hydraulic Pressure (MPa)	Support Force (kN) LC0262-C□	LC0302-C□	LC0362-C□
7	2.0	3.0	4.0
6.5	1.8	2.8	3.6
6	1.6	2.5	3.3
5.5	1.4	2.2	2.9
5	1.2	2.0	2.6
4.5	1.0	1.7	2.2
4	0.8	1.4	1.9
3.5	0.6	1.2	1.5
3	0.5	0.9	1.2
2.5	0.3	0.6	0.8
Support Force Formula ※3 kN	0.38×P-0.69	0.53×P-0.68	0.70×P-0.91

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

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

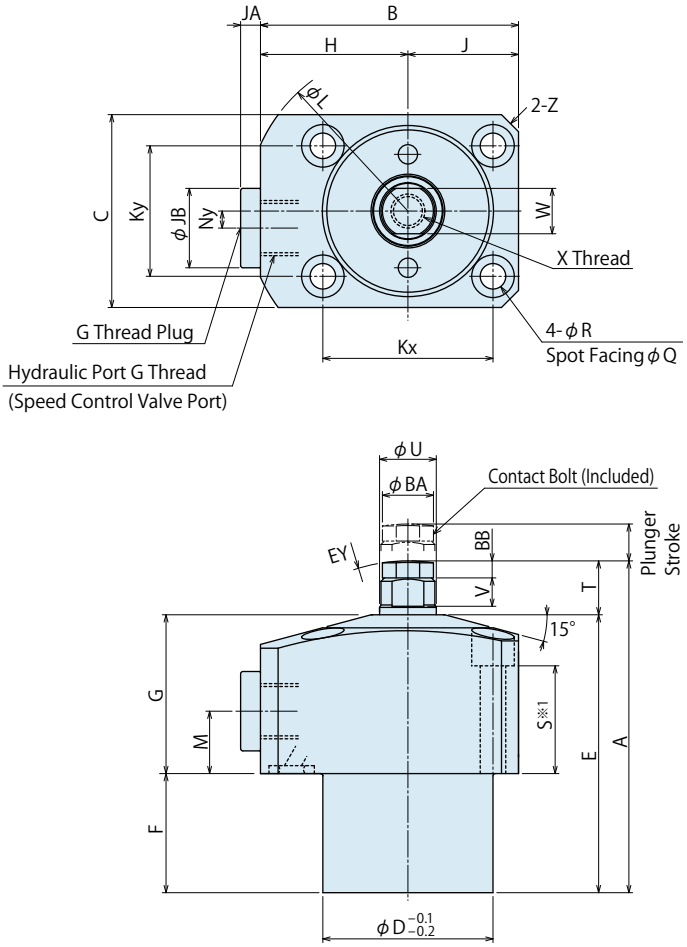


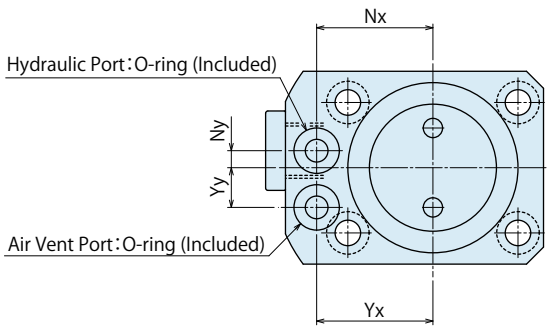


External Dimensions

C: Gasket Option (with G Thread Plug)

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

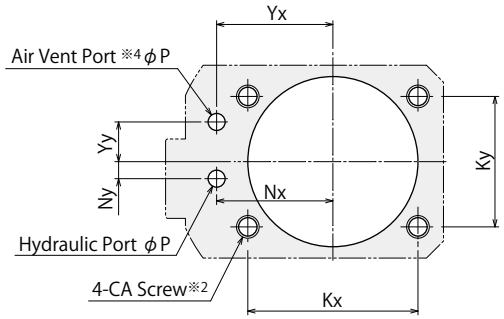


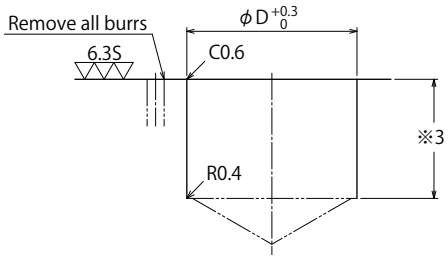


Note

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

Machining Dimensions of Mounting Area





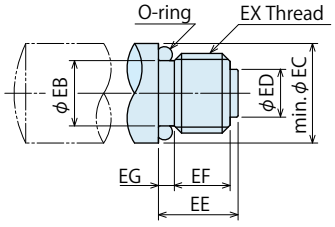
Notes

※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.

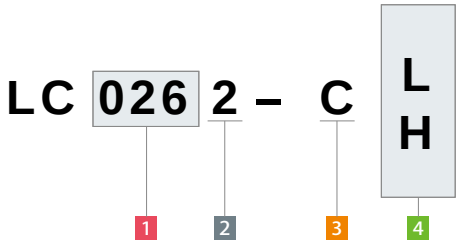
※4. The vent port needs to be processed in an open air environment without the presence of coolant, dust, etc. to avoid any internal contamination.
Refer to P.21 : Appropriate Position of Vent Port for reference.

Contact Bolt Design Dimensions



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.

(mm)

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	S53 (Made by NOK)	S5 (Made by NOK)	S6 (Made by NOK)

Model No. Indication

LD 022 2 - L - S

1 2 3 4

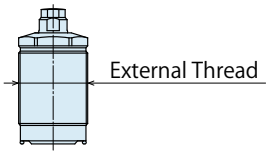
1 Body Size

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) LD0222-□	Hydraulic Advance Short Model 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 N	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 ℃		0 ～ 70	
Mass kg		0.1	0.1

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

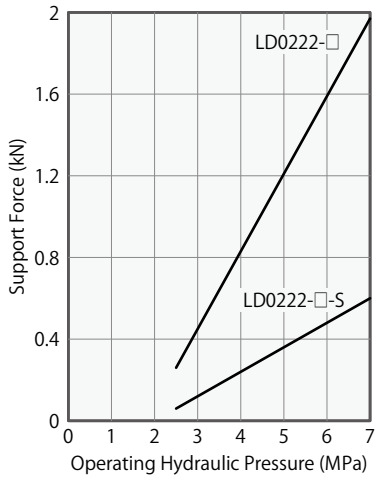
※2. The plunger spring force figure indicates the spring design force.
It may vary due to moving resistance of the plunger and spring. Please use it as reference for the workpiece contacting force.

Performance Curve

Applicable Model **LD 022 2 -** [L / H] **-** [Blank / S]

Support Force Graph

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



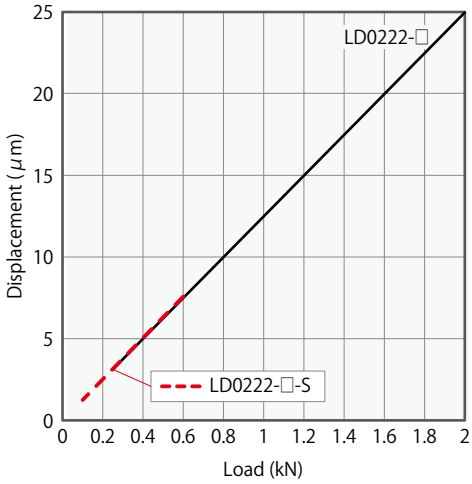
Model No. / Hydraulic Pressure (MPa)	Support Force (kN) LD0222-□	LD0222-□-S
7	2.0	0.6
6.5	1.8	0.5
6	1.6	0.5
5.5	1.4	0.4
5	1.2	0.4
4.5	1.0	0.3
4	0.8	0.2
3.5	0.6	0.2
3	0.5	0.1
2.5	0.3	0.1
Support Force Formula ※3 kN	0.38×P-0.69	0.12×P-0.24

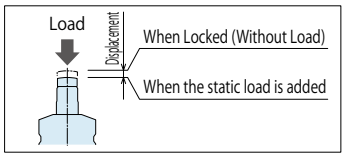
Note

※ 3. P: Operating Hydraulic Pressure (MPa)

Load / Displacement Graph

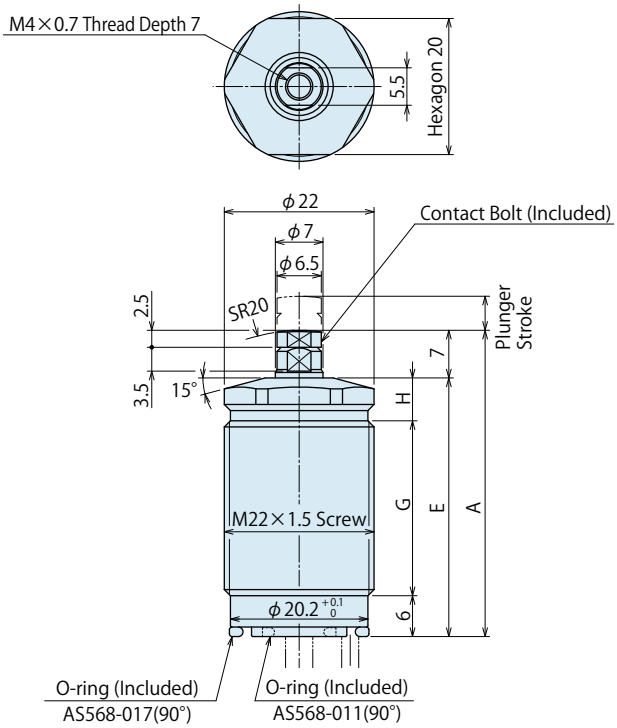
※ This graph shows the static load displacement at 7 MPa hydraulic pressure.





External Dimensions

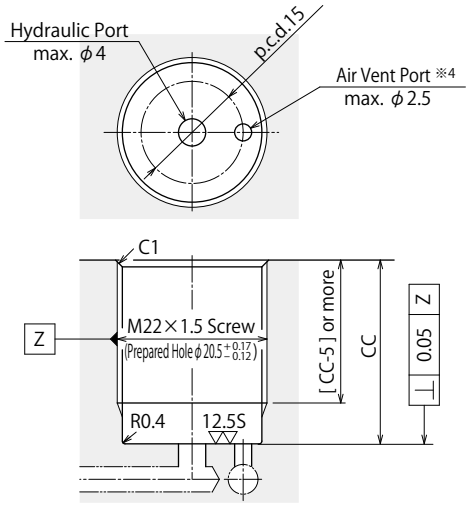
※ This drawing shows the released state of LD0222-□-□ (before the plunger is lifted).



(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

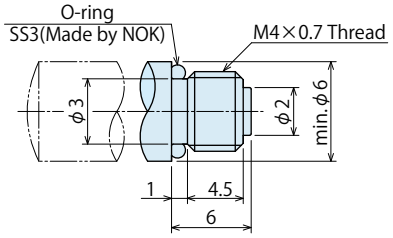


Note

※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.



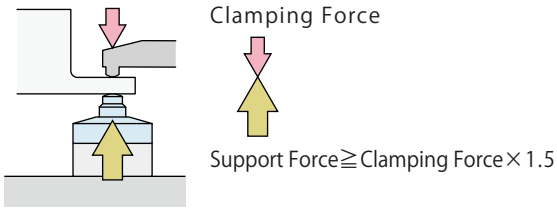
Cautions

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

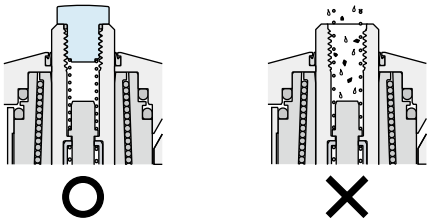
- Please read "Notes on Hydraulic Cylinder Speed Control Circuit" on P.28 to assist with proper hydraulic circuit designing.

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.

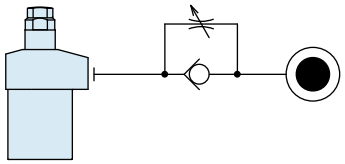


5) Protect the plunger surface at the time of use on welding fixture etc.

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

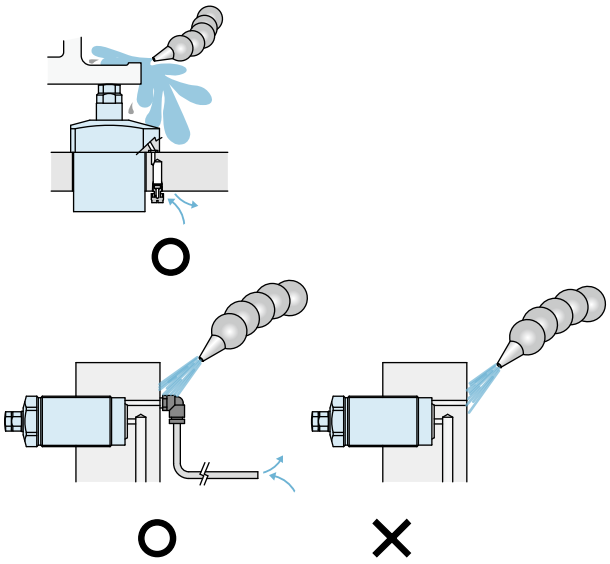
6) Adjust plunger operation time with flow rate.

- 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.



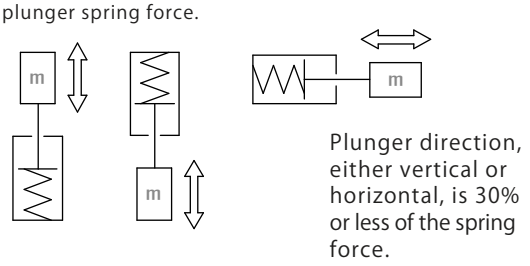
7) Appropriate Measures for the Vent Port

- 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.



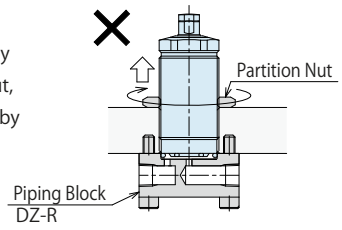
- Example) In the case of LC0262-L, the maximum mass of contact bolt = 2.2×0.3/9.807=0.07kg when the plunger spring force is between 2.2-3.0N. It is recommended to use extreme low mass due to variation from tribological resistance of the plunger and spring properties.
- The dimensions of the installing 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

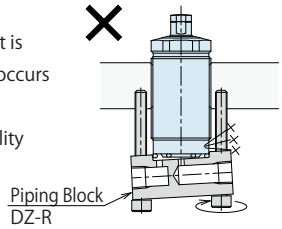
- The base is horizontal to bearing surface and load cannot be received on the base at the time of work support attachment. By the following mounting method, load cannot be received on the base and there is a possibility of equipment's damaging and the increased amount of displacement by load.

Bad Examples

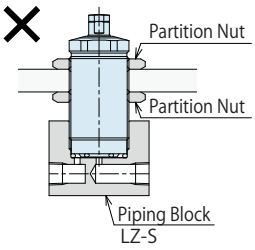
① Work support is lifted up by tightening the partition nut, and it cannot receive load by bearing surface.



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

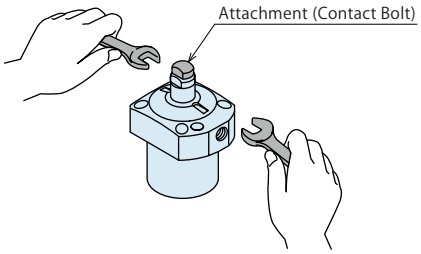
- For LD (Threaded) model, make sure there are no scratches or damage on the O-ring or the sealing and tighten it with the torque shown in the table below.

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.



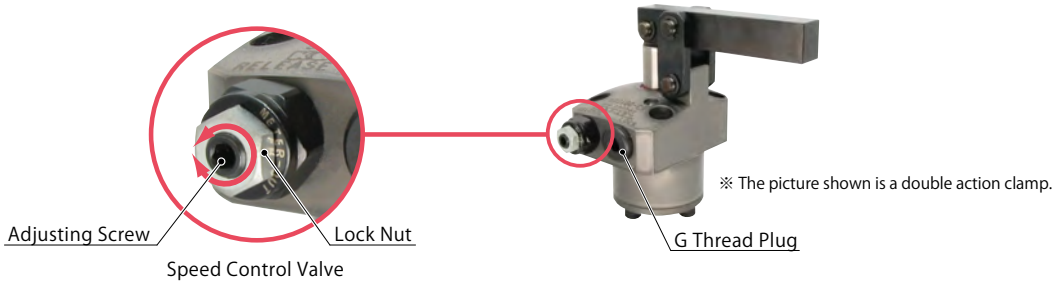
Model No.		Front Thread Size	Tightening Torque (N·m)
LC	LC0262-C□	M4×0.7	1.6
	LC0302-C□	M6×1	5
	LC0362-C□	M8×1.25	10
LD	LD0222-□-□	M4×0.7	1.6

※ 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.

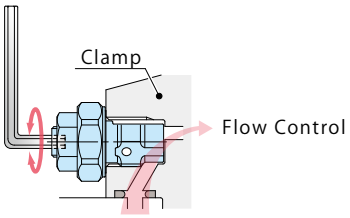
Directly Mounted to Clamps

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

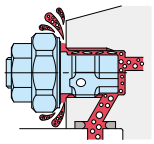


Action Description

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.



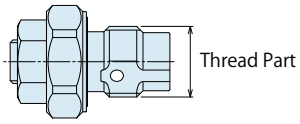
Model No. Indication (Speed Control Valve for Low Pressure)

BZL 0 10 0 - A

1 2 3

1 G Thread Size

10 : Thread Part G1/8A Thread

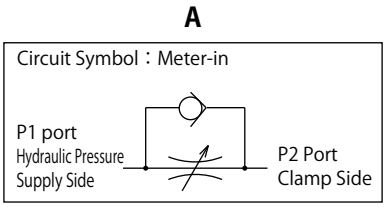


2 Design No.

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	℃	0 ~ 70
Tightening Torque for Main Body	N·m	10

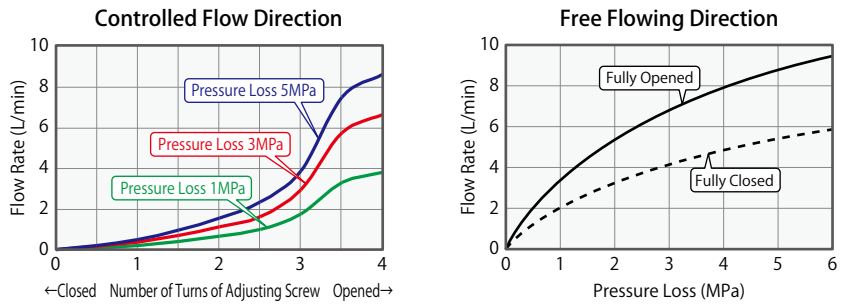
Applicable Products

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□

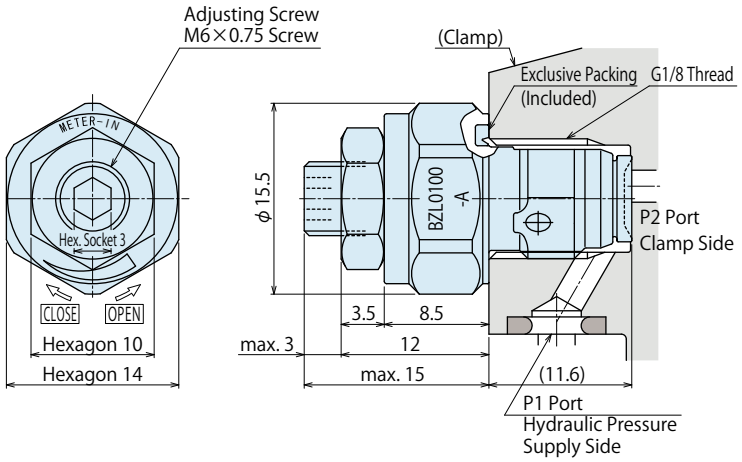
Notes
1. Minimum passage area when fully opened is the same as the maximum passage area in the table above.
2. It must be mounted with recommended torque. Because of the structure of the metal seal, if mounting torque is insufficient, the flow control valve may not be able to adjust the flow rate.
3. 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.

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

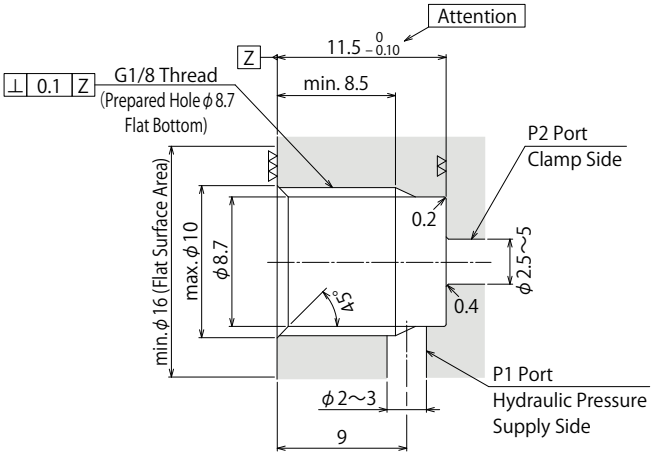
BZL0100-A : Meter-in



External Dimensions



Machining Dimensions of Mounting Area



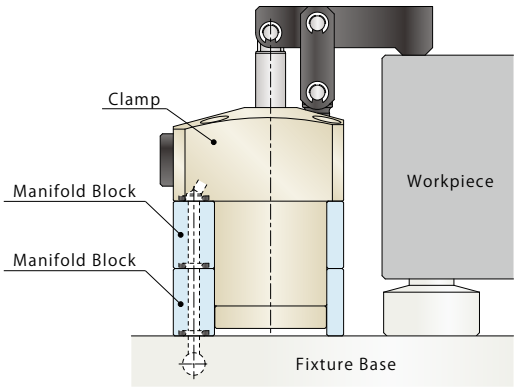
Notes

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



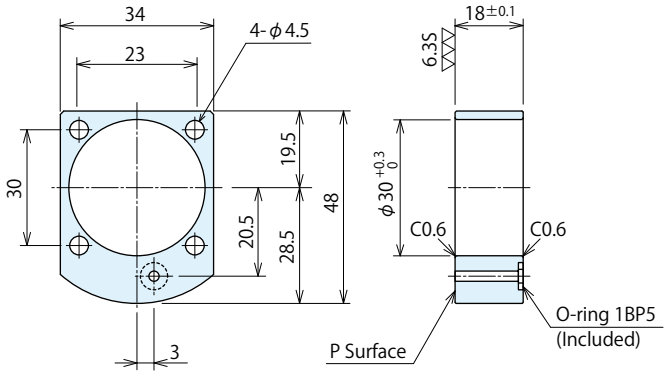
Manifold Block for LM/LT

Made-to-Order

Model No. Indication

LZ 030 0 – MS

- 030: Size
- 0: Design No. (Revision Number)



Model No.	LZ0300-MS
Corresponding Item Model No.	LT0301 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.

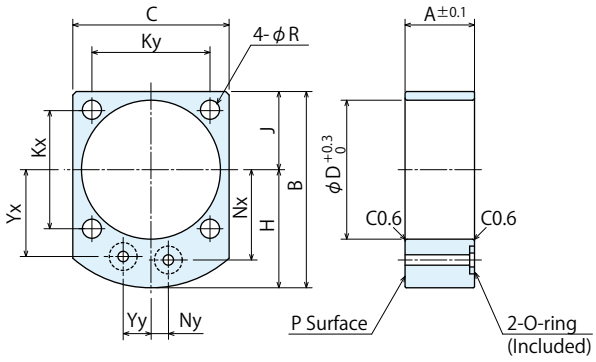
Manifold Block for LC

Made-to-Order

Model No. Indication

LZ 026 0 – MP

- 026: Size (Refer to the Following Table)
- 0: Design No. (Revision Number)

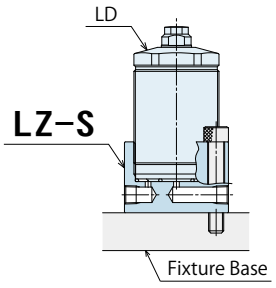


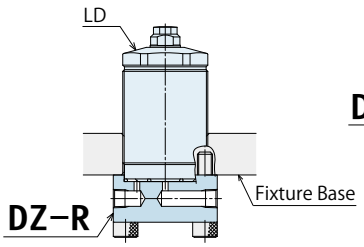
(mm)

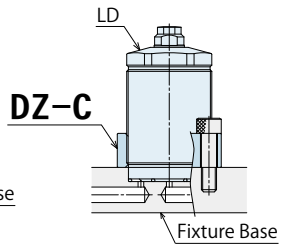
Model No.	LZ0260-MP	LZ0300-MP	LZ0360-MP
Corresponding Model No.	LC0262	LC0302	LC0362
A	18	18	20
B	43	48	51.5
C	29	34	40
D	26	30	36
H	26.5	28.5	31.5
J	16.5	19.5	20
Kx	25	30	31.4
Ky	21	23	31.4
Nx	18.5	20.5	23.5
Ny	3	3	5
R	3.4	4.5	4.5
Yx	18.5	20.5	23.5
Yy	7	7	8
O-ring	1BP5	1BP5	1BP5
Mass kg	0.1	0.1	0.2

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.

Manifold Block







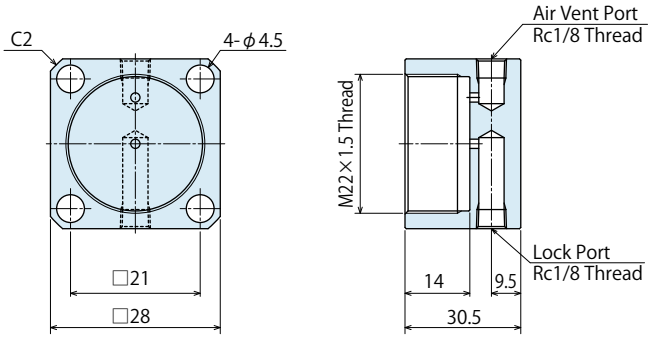
Manifold Block for LD

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.

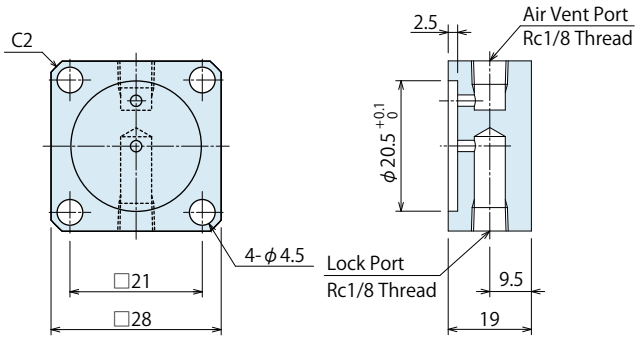
Manifold Block for LD

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.

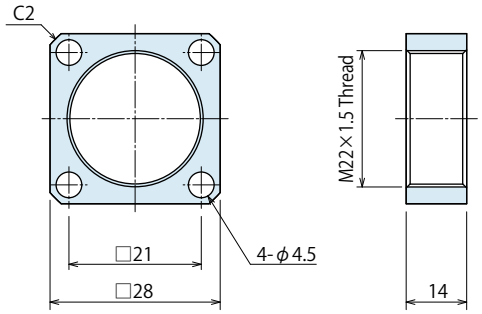
Flange Nut for LD

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.

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.

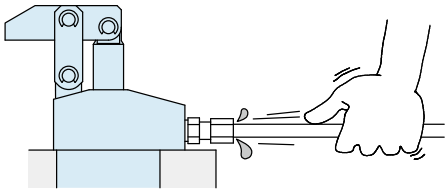
3) Applying Sealing Tape

- 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.

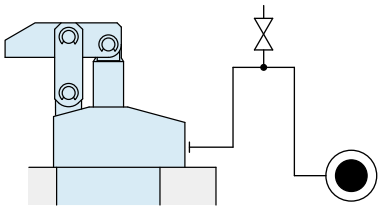
4) Air Bleeding of the Hydraulic Circuit

- 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

ISO Viscosity Grade ISO-VG-32

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

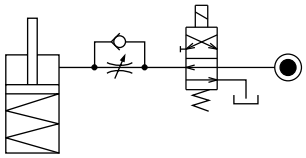
Note As it may be difficult to purchase the products as shown in the table from overseas, please contact the respective manufacturer.

Notes on Hydraulic Cylinder Speed Control Unit

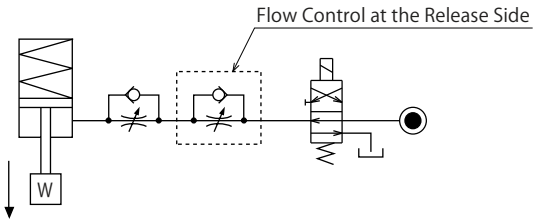
Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

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.



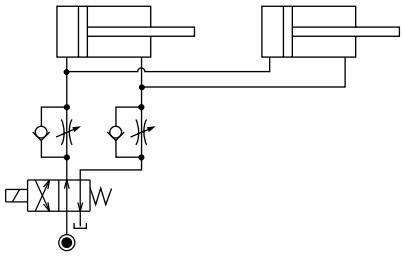
Accelerated clamping speed by excessive hydraulic flow to the cylinder may sustain damage. In this case add flow control to regulate flow. (Please add flow control to release flow if the lever weight is put on at the time of release action when using swing clamps.)



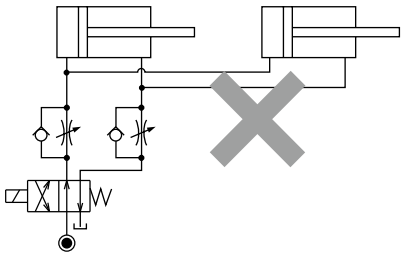
Flow Control Circuit for Double Acting Cylinder

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)

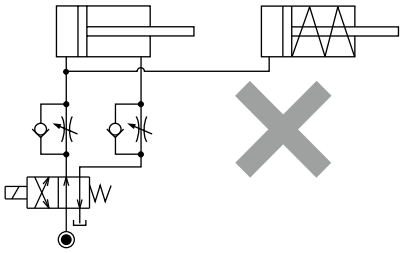


【Meter-in Circuit】(LKE/TMA/TLA must be controlled with meter-in.)



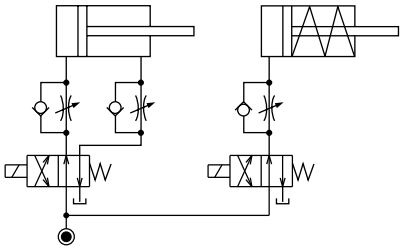
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

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.

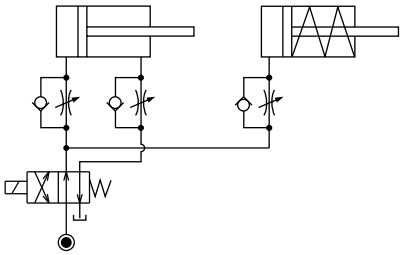


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

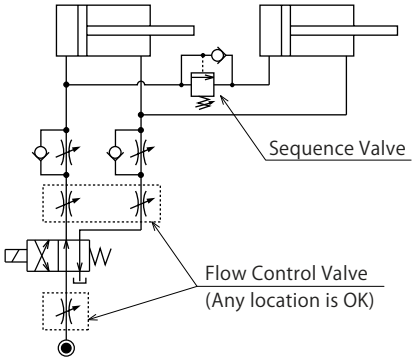
○ Separate the control circuit.



○ 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.

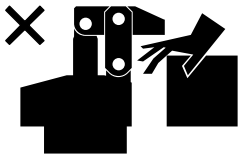
① The machine and equipment can only be inspected or prepared when it is confirmed that the preventive devices are in place.

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.

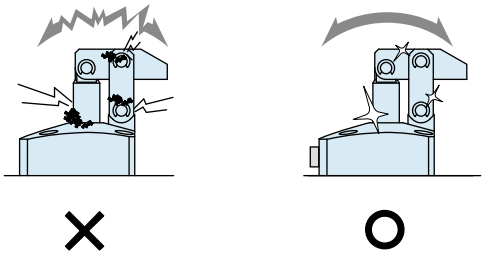


4) Do not disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

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.

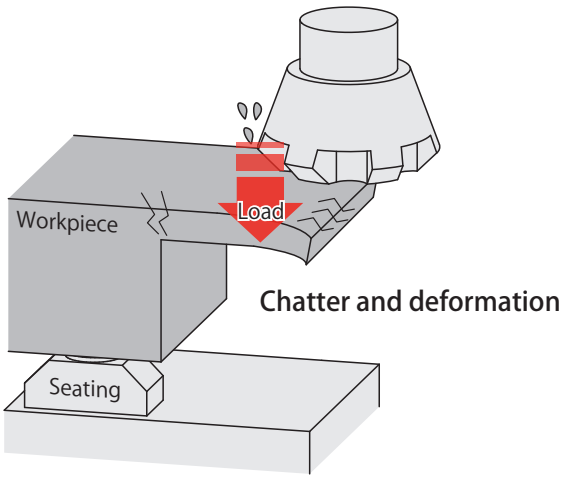
Hydraulic Work Support

Model LD
Model LC
Model TNC
Model TC

Strong support from opposite side when load is exerted

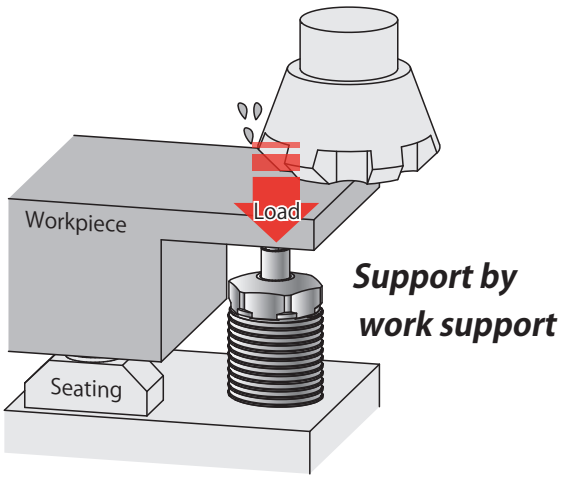
Pioneer and leading innovator of hydraulic work support collet technology. PAT.

Work support eliminates chattering while machining and prevents deformation by the cutting load.



Chatter and deformation

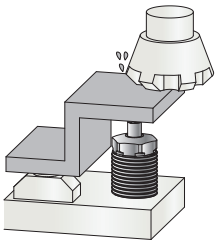
< No work support >



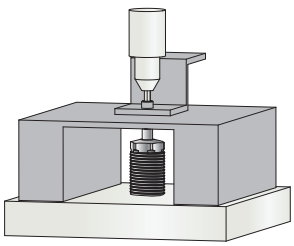
Support by work support

< With work support >

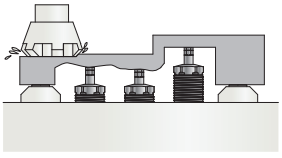
Application Examples



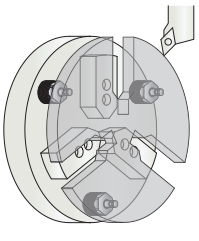
To avoid chattering during machining of thin-walled sections.



To back up the screw fastener machine and a nut-runner.



Work piece with different heights.



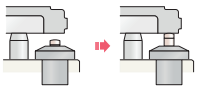
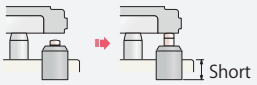
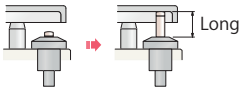
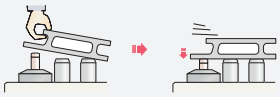
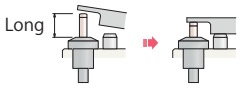
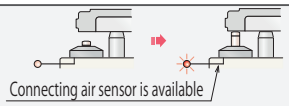
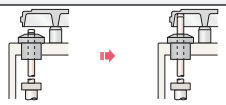
To avoid the radial chatter on lathe machining.

Low Pressure Model

MAX 7MPa

Model LD → P.547

Model LC → P.571

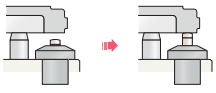
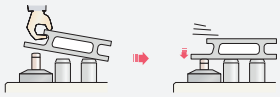
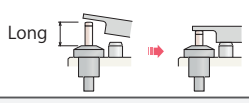
Classification		Single Action External Thread	Single Action Top Flange
Operating Pressure Range		2.5～7MPa	2.5～7MPa
Standard Hydraulic Advance Model		External Dimensions → P.557	External Dimensions → P.583
Options: Hydraulic Advance Short Model		External Dimensions → P.557	–
Options: Hydraulic Advance Long Stroke Model		External Dimensions → P.559	External Dimensions → P.585
Options: Spring Advance Model Spring Advance Short Model		External Dimensions → P.561	External Dimensions → P.587
Options: Spring Advance Long Stroke Model		External Dimensions → P.563	External Dimensions → P.589
Options: Air Sensing Option		External Dimensions → P.565	External Dimensions → P.593
Options: Rodless Hollow Model		–	External Dimensions → P.591
Accessories: Manifold Block		–	LZ-MP → P.1026
Accessories: Piping Block		LZ-S/SQ DZ-C/R → P.1029	–
Accessories: Speed Control Valve Plug		–	BZL、BZX、JZG → P.727

High Pressure Model

TNC:MAX 35MPa / TC:MAX 25MPa

Model TNC → P.599

Model TC → P.613

Classification		Single Action External Thread	Single Action Top Flange
Operating Pressure Range		7～35MPa	7～25MPa
Standard Hydraulic Advance Model		External Dimensions → P.607	External Dimensions → P.617
Options: Spring Advance Model		External Dimensions → P.611	External Dimensions → P.619
Options: Hydraulic Advance Long Stroke Model		External Dimensions → P.609	★
Accessories: Manifold Block		–	LZ-MP → P.1026
Accessories: Piping Block		TNZ-S/SQ → P.1034	–

※ Please contact us for detail dimension at ★ part.

PAT.

Hydraulic Work Support

Model LD

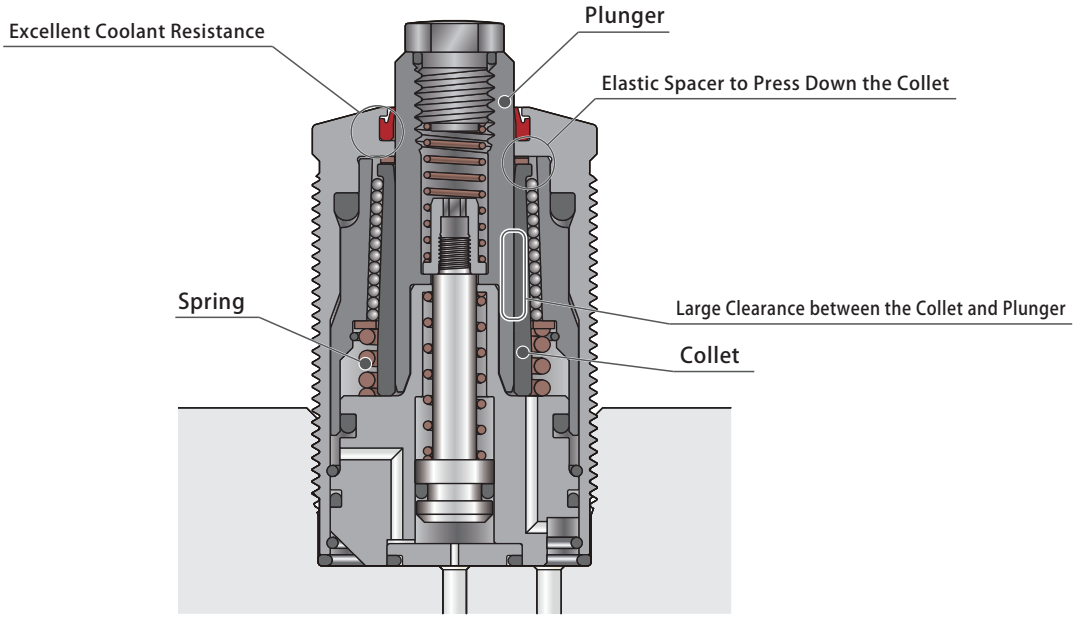
Low Pressure (2.5～7MPa)

Single Action • Threaded Body Model

Powerful Support • Smooth Action

Index

Cross Section



It adopts the collet structure, the first in the world, ensuring powerful support and smooth action.

KOSMEK was the first to develop the collet design in 1996.
Compared with the traditional sleeve design, it ensures powerful gripping force via a wedge effect.
In addition, a larger gap between collet and plunger is designed to prevent sticking and allow smoother action.

Concrete Workpiece Touch

As the collet gripping the plunger is always pressed downwards, it helps prevent tilting when locked and the clearance with the workpiece.

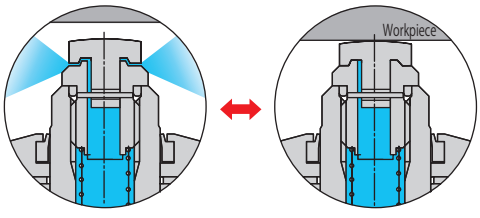
Certain Sequence Action

As it is equipped with a powerful sequencing spring, the action sequences as such;
Plunger goes up→ workpiece touches→ collet locks. This is carried out via one hydraulic circuit system.

Excellent Coolant Resistance

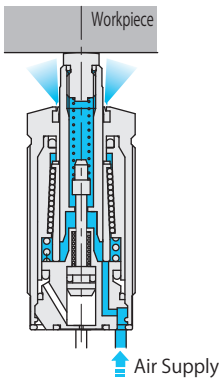
Our exclusive dust seal is designed to protect against high pressure coolant. It also has high durability against chlorine-based coolant by using a sealing material with excellent chemical resistance.

Air Sensing Option



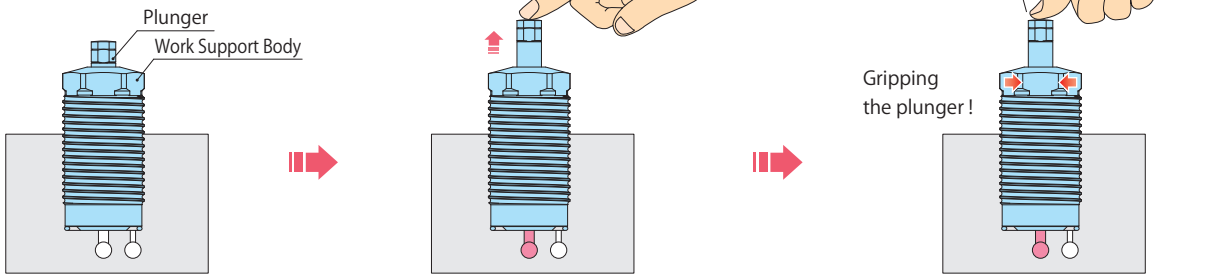
Sensor OFF　　Sensor ON

Air Purge Function



Action Description

Hydraulic Advance Model (LD/LD-Q)



Hydraulic Pressure : OFF
The state of plunger down.

Hydraulic Pressure : ON
Plunger rises with oil pressure
and stops after touching workpiece.

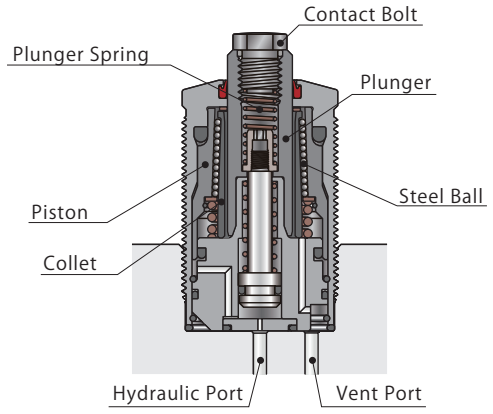
Hydraulic Pressure : ON
Once it is in the stopped position where
it touches the workpiece, the plunger
doesn't go down even if pressed from above.

Air Sensing Option (LD-M/LD-M-E)

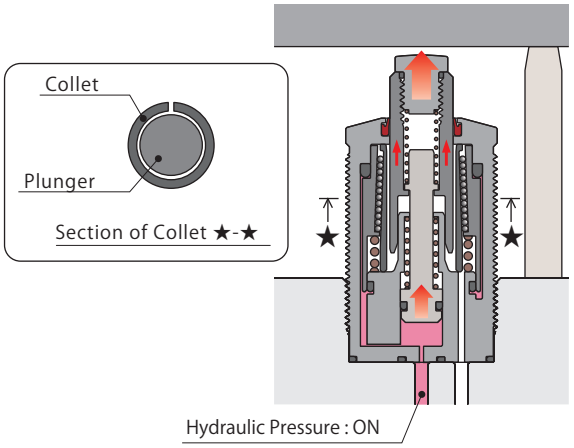
Available to check action by connecting the air catch sensor at vent port and then detecting differential pressure.
Please refer to the air sensor page for further details.

Internal Action Description

Hydraulic Advance model LD

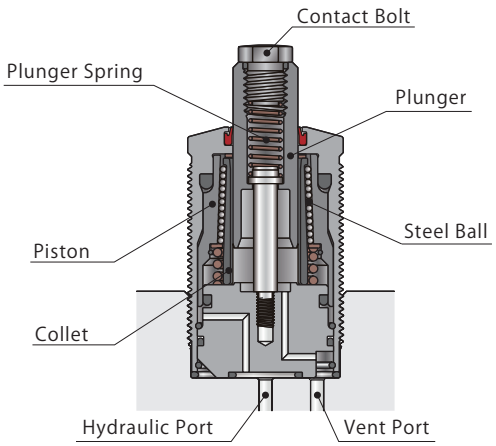


When releasing (Cross Section)

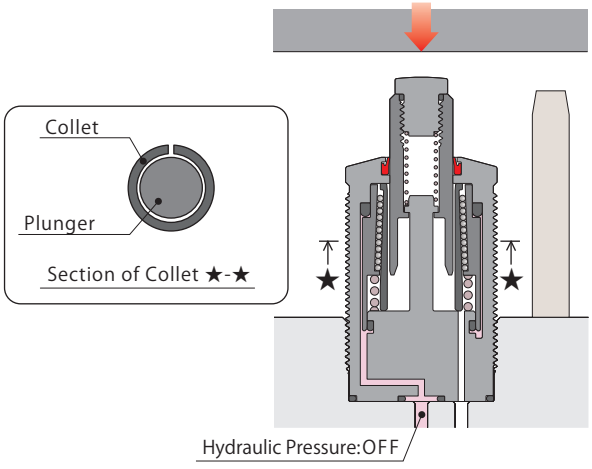


Plunger extends

Spring Advance model LD-E

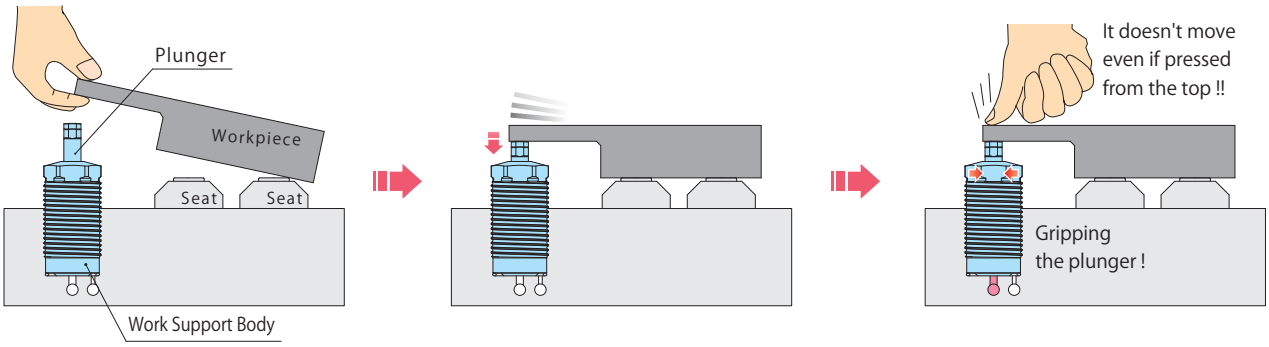


When releasing (Cross Section)



Released State

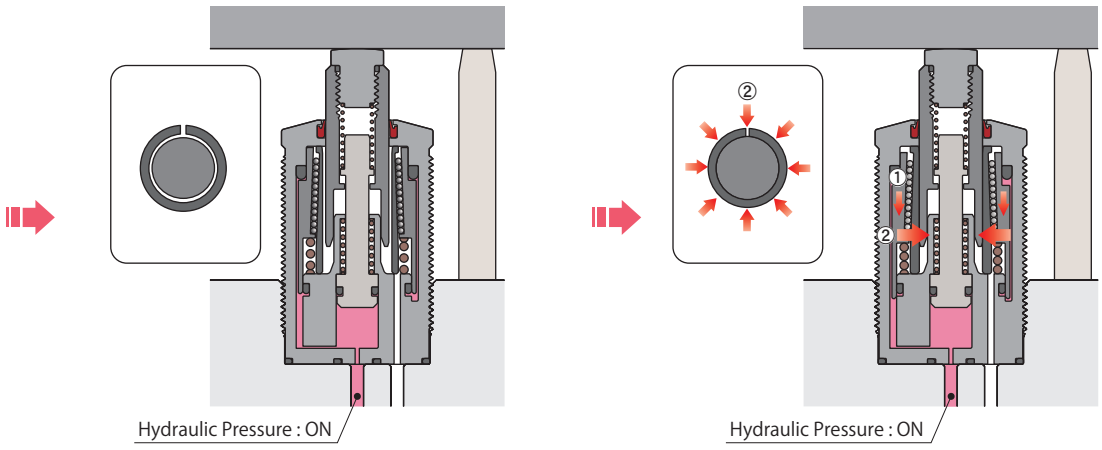
● Spring Advance Model (LD-E/LD-EQ)



Hydraulic Pressure：OFF
The state of plunger up.

Hydraulic Pressure：OFF
When work piece rests on the work support, plunger goes down due to the weight of work piece and is balanced.

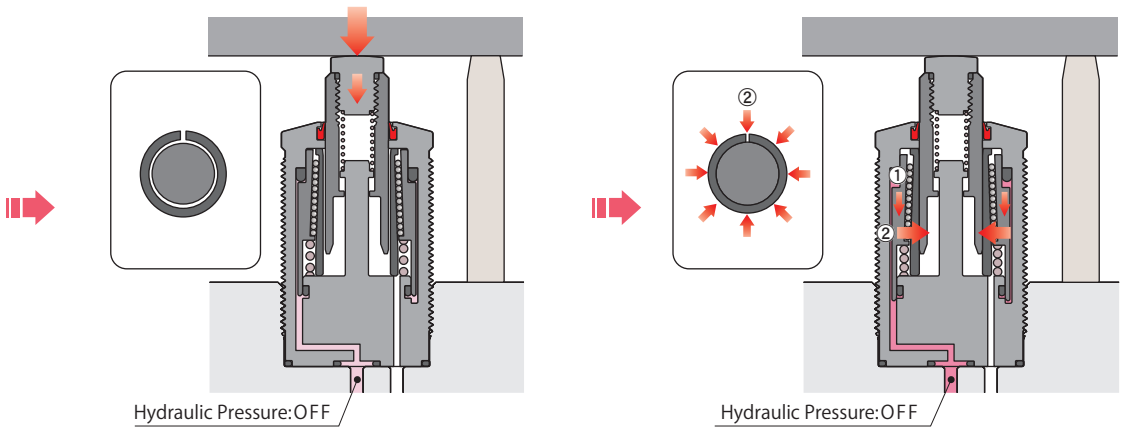
Hydraulic Pressure：ON
Once it is in the stopped position where it touches the work piece, the plunger doesn't go down even if pressed from above.



Contact bolt makes contact with workpiece

Locked State

① The piston starts to press down via hydraulic pressure.
② The tapering action between the piston and collet affects the steel ball so that the collect can grip the plunger with even and strong power to generate the supporting force.



Workpiece set （Plunger goes down）

Locked State

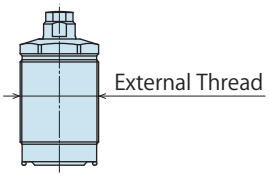
Model No. Indication

LD 026 2 - L □ - □

1 2 3 4 5

1 Body Size

022 : External Thread M22×1.5
026 : External Thread M26×1.5
030 : External Thread M30×1.5
036 : External Thread M36×1.5
045 : External Thread M45×1.5



2 Design No.

2 : Revision Number

3 Plunger Spring Force

L : Low Spring Force
H : High Spring Force
Blank : 5 Q,EQ selected

4 Plunger Action Confirmation

Blank : Standard (No Action Confirmation)
M : Air Sensing Option※1 (Except for LD022)

5 Options

Blank : Hydraulic Advance Model (Standard)
S : Hydraulic Advance Short Model※1
Q : Hydraulic Advance Long Stroke Model※1
E : Spring Advance Model
ES : Spring Advance Short Model※1
EQ : Spring Advance Long Stroke Model※1

● = Available Option

5 Option Symbol	Blank	S	Q	E	ES	EQ
						
LD022	●			●		
LD026	●	●	●	●	●	●
LD030	●	●	●	●	●	●
LD036	●		●	●		●
LD045	●		●	●		●

Note
※1. Please contact us for the combination of 4 M: Air Sensing option and 5 Q/EQ: Long Stroke model and S/ES Short model.

Specifications

5 Blank / E selected

Model No.		LD0222-□ LD0222-□-E	LD0262-□ LD0262-□M LD0262-□-E LD0262-□M-E	LD0302-□ LD0302-□M LD0302-□-E LD0302-□M-E	LD0362-□ LD0362-□M LD0362-□-E LD0362-□M-E	LD0452-□ LD0452-□M LD0452-□-E LD0452-□M-E
Support Force at 7MPa kN		2.0	3.0	4.0	5.5	10.0
Support Force (Calculation Formula)※2 kN		0.38×P−0.69	0.53×P−0.68	0.70×P−0.91	0.96×P−1.25	1.75×P−2.28
Plunger Stroke mm		6.5	6.5	8	8	10
Cylinder Capacity cm³	5 Blank selected	0.4	0.6	0.9	1.3	2
	5 E selected	0.2	0.3	0.5	0.6	1.3
Plunger Spring Force※3 N	L:Low Spring Force	2.1～3.1	2.8～4.1	3.6～5.7	4.7～7.8	5.8～9.7
	H:High Spring Force	3.0～4.4	3.8～5.9	4.9～8.0	6.2～11.0	7.9～13.6
Max. Operating Pressure MPa		7.0				
Min. Operating Pressure MPa		2.5				
Withstanding Pressure MPa		10.5				
Operating Temperature ℃		0～70				
Mass kg		0.1	0.2	0.25	0.35	0.75

5 S / ES selected

Model No.		LD0262-□-S LD0262-□-ES	LD0302-□-S LD0302-□-ES
Support Force at 7MPa kN		1.0	2.0
Support Force (Calculation Formula)※2 kN		0.19×P−0.30	0.35×P−0.46
Plunger Stroke mm		5	6
Cylinder Capacity cm³	5 S selected	0.3	0.5
	5 ES selected	0.1	0.2
Plunger Spring Force※3 N	L:Low Spring Force	2.8～4.2	3.5～6.3
	H:High Spring Force	3.1～5.9	4.0～8.2
Max. Operating Pressure MPa		7.0	
Min. Operating Pressure MPa		2.5	
Withstanding Pressure MPa		10.5	
Operating Temperature ℃		0～70	
Mass kg		0.1	0.2

5 Q / EQ selected

Model No.		LD0262-Q LD0262-EQ	LD0302-Q LD0302-EQ	LD0362-Q LD0362-EQ	LD0452-Q LD0452-EQ
Support Force at 7MPa kN		3.0	4.0	5.5	10.0
Support Force (Calculation Formula)※2 kN		0.53×P-0.68	0.70×P-0.91	0.96×P-1.25	1.75×P-2.28
Plunger Stroke mm		13	16	16	20
Cylinder Capacity cm³	5 Q selected	0.8	1.3	1.9	2.8
	5 EQ selected	0.3	0.5	0.6	1.3
Plunger Spring Force※3 N		3.8～7.4	4.9～11.4	6.2～12.9	7.8～20.4
Max. Operating Pressure MPa		7.0			
Min. Operating Pressure MPa		2.5			
Withstanding Pressure MPa		10.5			
Operating Temperature ℃		0～70			
Mass kg	5 Q selected	0.25	0.30	0.45	0.85
	5 EQ selected	0.20	0.25	0.35	0.75

Notes ※2. P in the formula for support force indicates the hydraulic pressure (MPa).
※3. 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 work piece contacting force.
Regarding to work piece contacting force for 4 M: Air Sensing option, please refer to P.567.

High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others
Hole Clamp
SFA
SFC
Swing Clamp
LHA
LHC
LHS
LHW
LT/LG
TLA-2
TLB-2
TLA-1
Link Clamp
LKA
LKC
LKW
LM/LJ
TMA-2
TMA-1
Work Support
LD
LC
TNC
TC
Air Sensing Lift Cylinder
LLW
Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT
Block Cylinder
DBA
DBC
Control Valve
BZL
BZT
BZX/JZG
Pallet Clamp
VS
VT
Expansion Locating Pin
VL
VM
VJ
VK
Pull Stud Clamp
FP
FQ
Customized Spring Cylinder
DWA/DWB

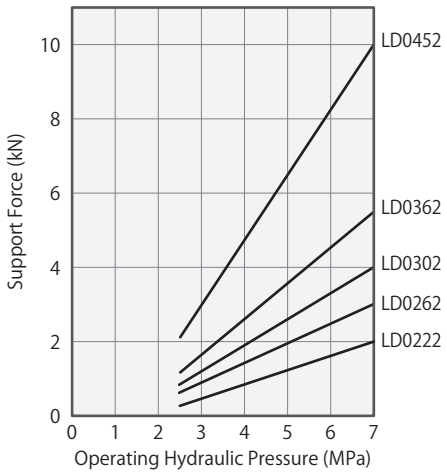
Performance Curve (LD-□ : Hydraulic Advance Model / LD-□-E : Spring Advance Model)

Applicable Model

LD 026 2 - L H - Blank E

1 Body Size　5 Options : Blank, E selected

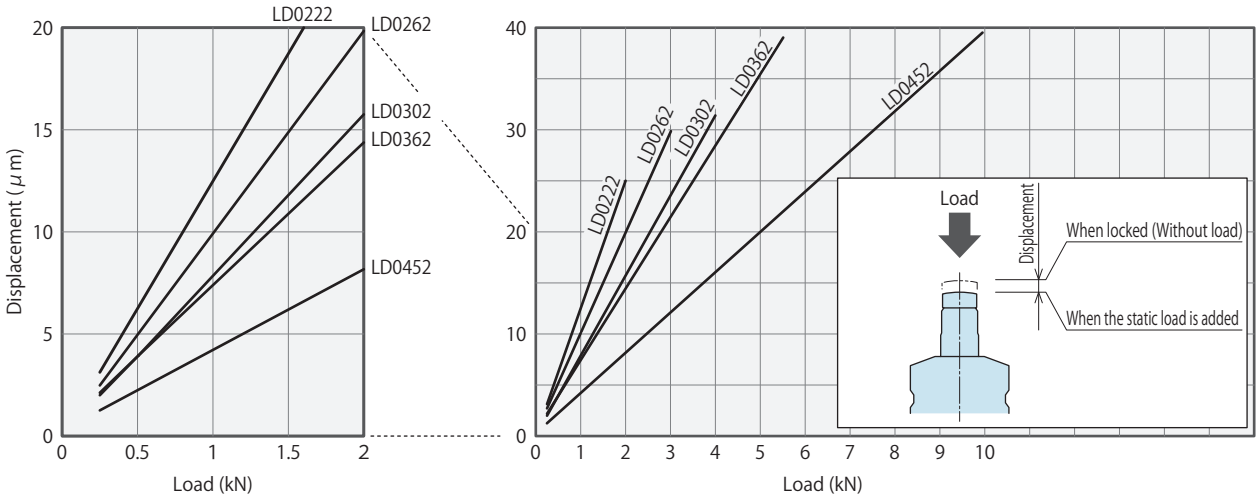
Support Force Graph ※ This graph shows the support force under static load condition.



Model No.	Support Force (kN) LD0222-□	LD0262-□	LD0302-□	LD0362-□	LD0452-□
Operating Hydraulic Pressure (MPa)	LD0222-□-E	LD0262-□-E	LD0302-□-E	LD0362-□-E	LD0452-□-E
7	2.0	3.0	4.0	5.5	10.0
6.5	1.8	2.8	3.6	5.0	9.1
6	1.6	2.5	3.3	4.5	8.2
5.5	1.4	2.2	2.9	4.0	7.3
5	1.2	2.0	2.6	3.6	6.5
4.5	1.0	1.7	2.2	3.1	5.6
4	0.8	1.4	1.9	2.6	4.7
3.5	0.6	1.2	1.5	2.1	3.8
3	0.5	0.9	1.2	1.6	3.0
2.5	0.3	0.6	0.8	1.2	2.1
Support Force Formula ※1 kN	0.38×P−0.69	0.53×P−0.68	0.70×P−0.91	0.96×P−1.25	1.75×P−2.28

Note ※1. P : Operating hydraulic pressure (MPa)

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



Performance Curve (LD-□-S：Hydraulic Advance Short Stroke Model / LD-□-ES：Spring Advance Short Stroke Model)

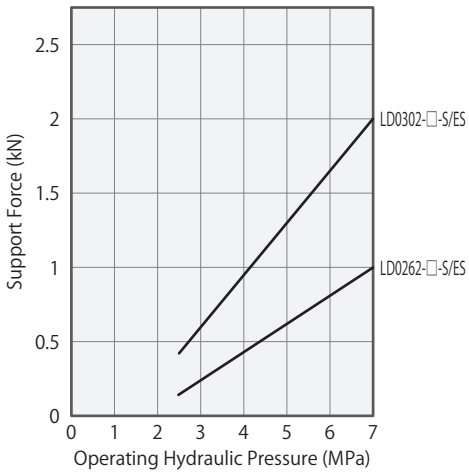
Applicable Model

LD 026 2 - L/H - S/ES

1 Body Size

5 Options：S, ES selected

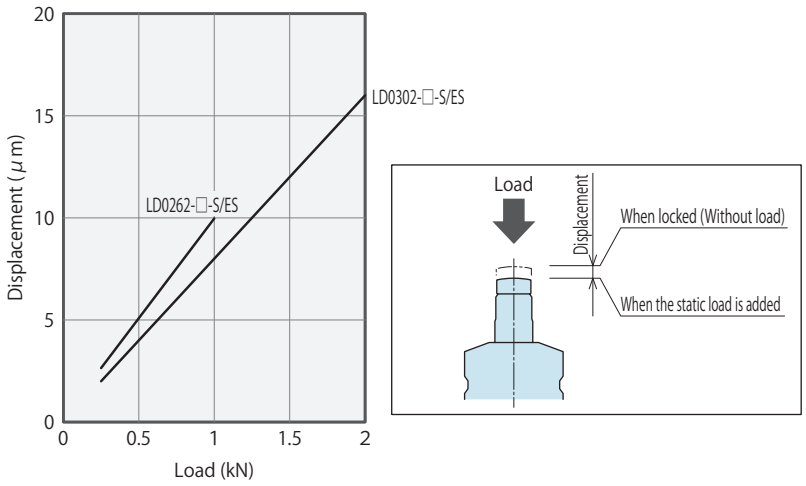
Support Force Graph ※This graph shows the support force under static load condition.



Model No.	Support Force (kN) LD0262-□-S / LD0262-□-ES	LD0302-□-S / LD0302-□-ES
Operating Hydraulic Pressure (MPa)		
7	1.0	2.0
6.5	0.9	1.8
6	0.8	1.6
5.5	0.7	1.5
5	0.7	1.3
4.5	0.6	1.1
4	0.5	0.9
3.5	0.4	0.8
3	0.3	0.6
2.5	0.2	0.4
Support Force Formula ※1 kN	0.19×P−0.30	0.35×P−0.46

Note ※1. P : Operating hydraulic pressure (MPa)

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



Performance Curve (LD-Q：Hydraulic Advance Long Stroke Model / LD-EQ：Spring Advance Long Stroke Model)

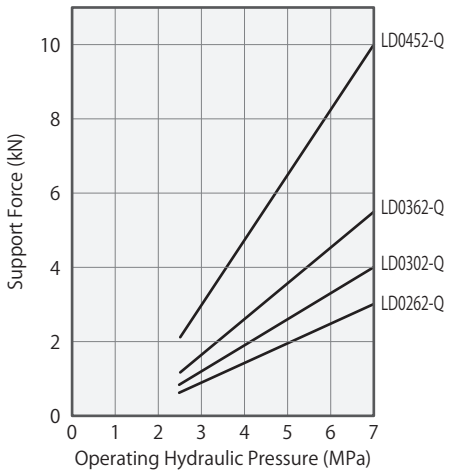
Applicable Model

LD 026 2 - Q / EQ

1 Body Size

5 Variation：Q、EQ selected

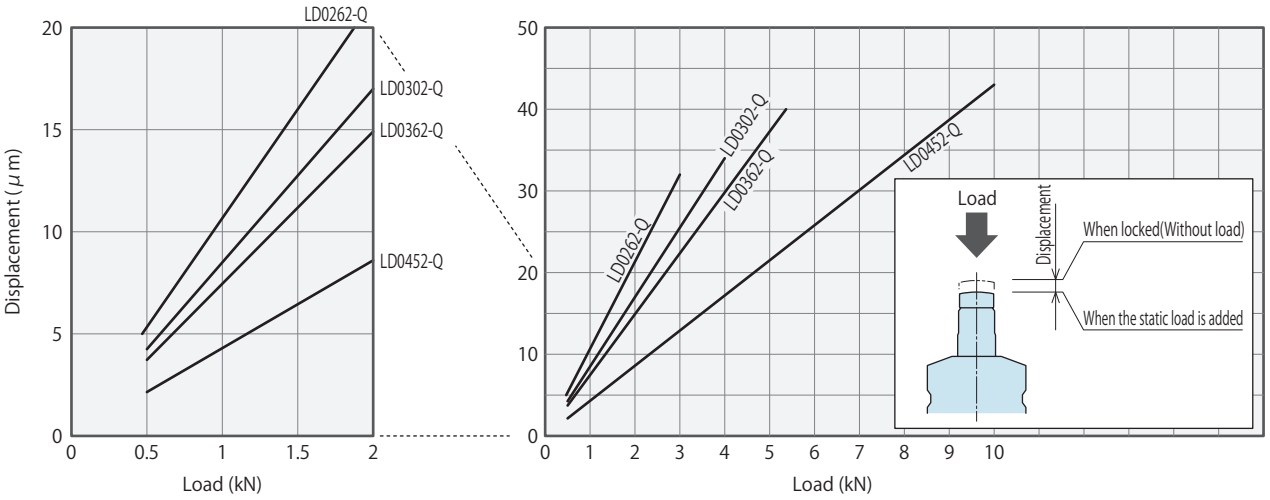
Support Force Graph ※ This graph shows the support force under static load condition.



Model No.	Support Force (kN)			
	LD0262-Q	LD0302-Q	LD0362-Q	LD0452-Q
Operating Hydraulic Pressure (MPa)	LD0262-EQ	LD0302-EQ	LD0362-EQ	LD0452-EQ
7	3.0	4.0	5.5	10.0
6.5	2.8	3.6	5.0	9.1
6	2.5	3.3	4.5	8.2
5.5	2.2	2.9	4.0	7.3
5	2.0	2.6	3.6	6.5
4.5	1.7	2.2	3.1	5.6
4	1.4	1.9	2.6	4.7
3.5	1.2	1.5	2.1	3.8
3	0.9	1.2	1.6	3.0
2.5	0.6	0.8	1.2	2.1
Support Force Formula ※1 kN	0.53×P-0.68	0.70×P-0.91	0.96×P-1.25	1.75×P-2.28

Note ※1. P : Operating hydraulic pressure (MPa)

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



※ The Displacement of LD-Q / LD-EQ: long stoke model is bigger than LD/LD-E: standard model.

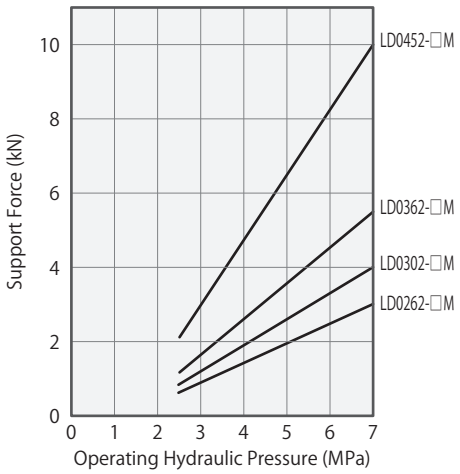
Performance Curve (LD-□M：Hydraulic Advance Air Sensing Option / LD-□M-E：Spring Advance Air Sensing Option)

Applicable Model

LD 026 2 - L H M - Blank E

1 Body Size
5 Variation：Blank、E selected
4 Plunger Action Confirmation：M selected

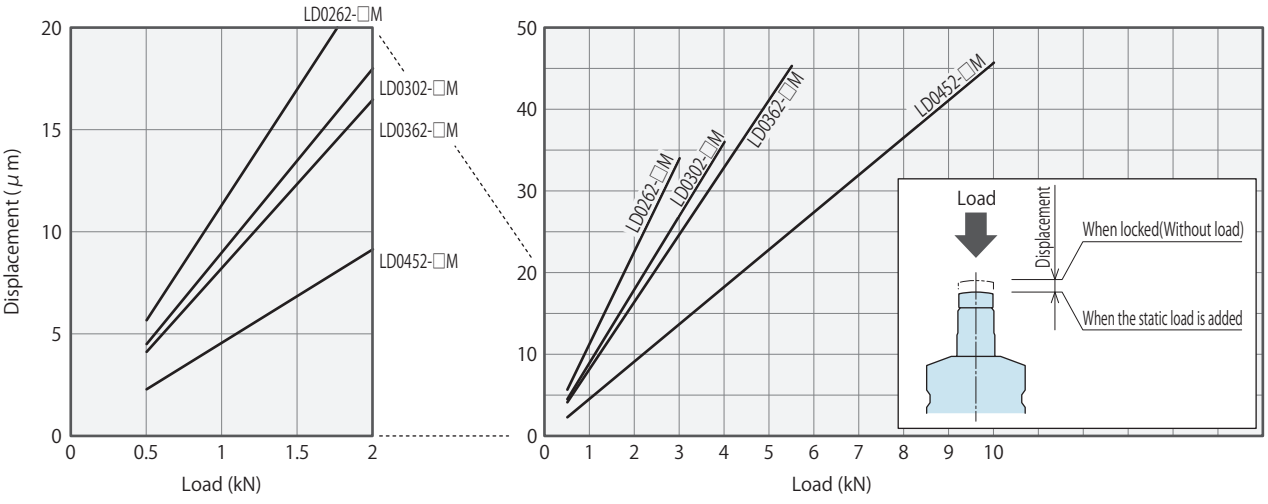
Support Force Graph ※This graph shows the support force under static load condition.



Model No.	Support Force (kN) LD0262-□M	LD0302-□M	LD0362-□M	LD0452-□M
Operating Hydraulic Pressure (MPa)	LD0262-□M-E	LD0302-□M-E	LD0362-□M-E	LD0452-□M-E
7	3.0	4.0	5.5	10.0
6.5	2.8	3.6	5.0	9.1
6	2.5	3.3	4.5	8.2
5.5	2.2	2.9	4.0	7.3
5	2.0	2.6	3.6	6.5
4.5	1.7	2.2	3.1	5.6
4	1.4	1.9	2.6	4.7
3.5	1.2	1.5	2.1	3.8
3	0.9	1.2	1.6	3.0
2.5	0.6	0.8	1.2	2.1
Support Force Formula ※1 kN	0.53×P-0.68	0.70×P-0.91	0.96×P-1.25	1.75×P-2.28

Note ※1. P : Operating hydraulic pressure (MPa)

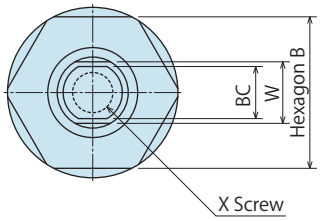
Load / Displacement Graph ※This graph shows the static load displacement at 7 MPa hydraulic pressure.

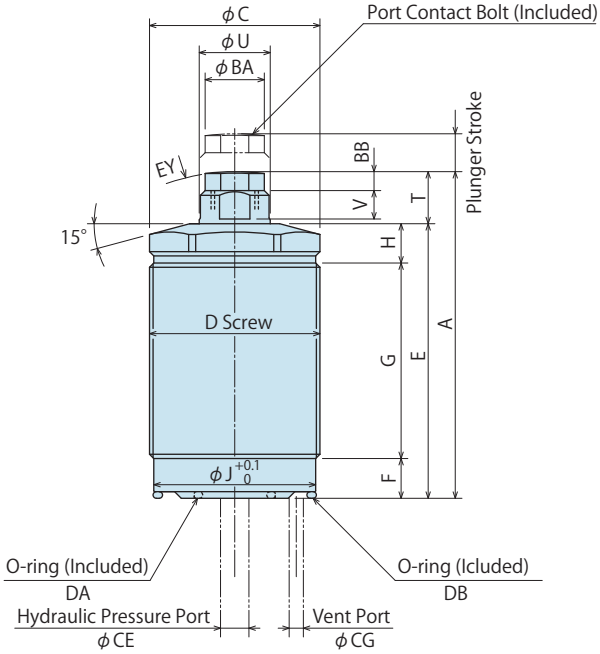


※ The Displacement of LD-□M / LD-□M-E : Air sensing option is larger than LD/LD-E：standard model.

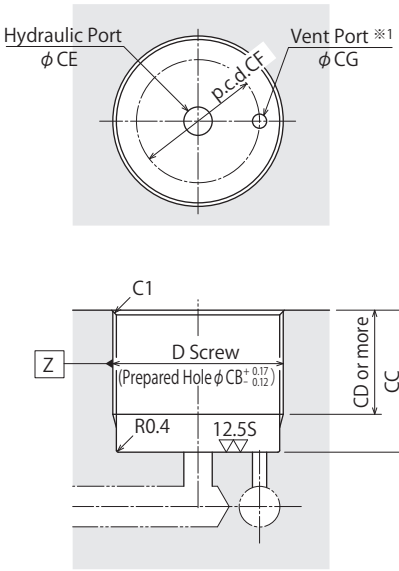
External Dimensions

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





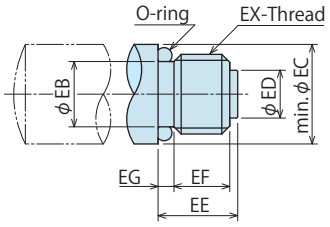
Machining Dimensions of Mounting Area



Note

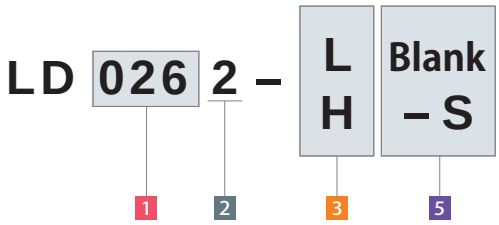
※1. The vent port needs to be processed in an open air environment without the presence of coolant,dust, etc. to avoid any internal contamination.
(Refer to P.623: Appropriate Position of Vent Port for reference.)

Contact Bolt Design Dimensions



Model No. Indication

(Format Example：LD0452-H、LD262-L-S)



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

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	LD0222-□	LD0262-□-S	LD0262-□	LD0302-□-S	LD0302-□	LD0362-□	LD0452-□
Plunger Stroke	6.5	5	6.5	6	8	8	10
A	59.5	48.5	66	52	73	69	82
B	20	24	24	27	27	32	41
C	22	26	26	30	30	36	45
D (Nominal × Pitch)	M22×1.5	M26×1.5	M26×1.5	M30×1.5	M30×1.5	M36×1.5	M45×1.5
E	52.5	39.5	57	41	62	58	71
F	6	7.4	7.4	9.4	9.4	8.4	9
G	37.7	25.8	40.8	23.8	42.3	41.3	50.2
H	8.8	6.3	8.8	7.8	10.3	8.3	11.8
J	20.2	24.2	24.2	28.2	28.2	34.2	43.2
T	7	9	9	11	11	11	11
U	7	10	10	12	12	15	16
V	3.5	5	5	6	6	6	6
W	5.5	8	8	10	10	13	13
X (Nominal×Pitch×Depth)	M4×0.7×7	M6×1×9	M6×1×9	M8×1.25×12	M8×1.25×12	M10×1.5×11	M10×1.5×11
BA	6.5	9	9	11.5	11.5	12.5	12.5
BB	2.5	3	3	4	4	4	4
BC	5.5	8	8	10	10	11	11
CB	20.5	24.5	24.5	28.5	28.5	34.5	43.5
CC	14～43	16～32	16～47	17～32	17～50	18～48	21～58
CD	CC-5	CC-6	CC-6	CC-8	CC-8	CC-7	CC-7.5
CE	max. 4	max. 8	max. 8	max. 10	max. 10	max. 10	max. 12
CF	p.c.d. 15	p.c.d. 19	p.c.d. 19	p.c.d. 22	p.c.d. 22	p.c.d. 26	p.c.d. 30
CG	max. 2.5	max. 2.5	max. 2.5	max. 3	max. 3	max. 5	max. 6
DA	AS568-011(90°)	AS568-013(90°)	AS568-013(90°)	AS568-014(90°)	AS568-014(90°)	AS568-015(90°)	AS568-016(90°)
DB	AS568-017(90°)	AS568-020(90°)	AS568-020(90°)	AS568-022(90°)	AS568-022(90°)	AS568-026(90°)	AS568-030(90°)
EY	SR20	SR30	SR30	SR30	SR30	SR50	SR50
Tightening Torque for Main Body ※2	16 N·m	31.5 N·m	31.5 N·m	50 N·m	50 N·m	63 N·m	80 N·m

Note ※2. The table above shows the recommended torque for mounting of the body.
If the recommended torque is exceeded, abnormal action may be incurred due to deformation of the body.
However, if the torque is much lower than the recommended one, the O ring may be damaged due to loosening, resulting in oil leakage.

Contact Bolt Design Dimensions

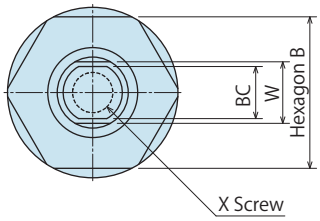
※Please use as reference in case contact bolts (attachment) other than the attached contact bolt are designed and manufactured to the customer.

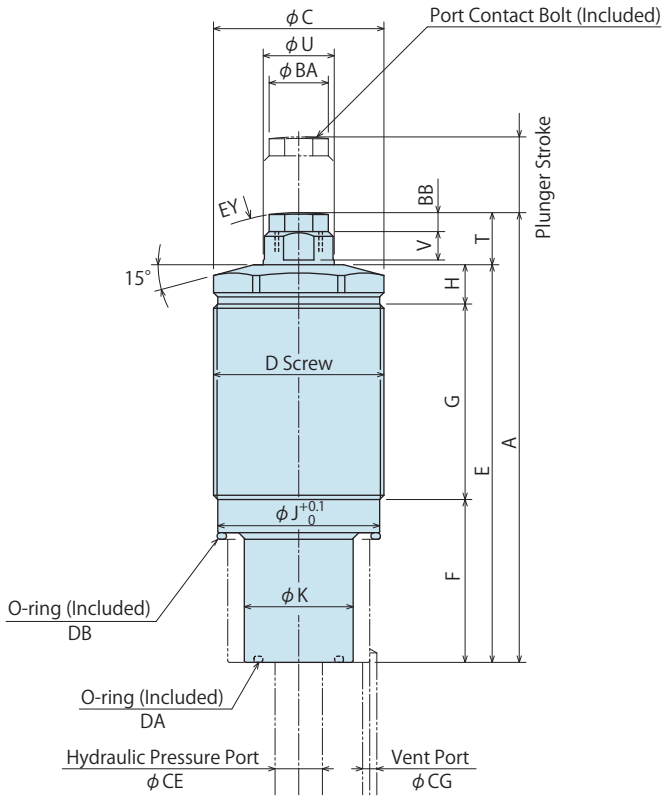
(mm)

Corresponding Item Model No.	LD0222-□	LD0262-□-S	LD0262-□	LD0302-□-S	LD0302-□	LD0362-□	LD0452-□
EB	3	4.5	4.5	6	6	8.2	8.2
EC	6	8.5	8.5	10	10	12.5	12.5
ED	2	3.5	3.5	5	5	6	6
EE	6	8	8	10	10	10	10
EF	4.5	6	6	7	7	7	7
EG	1	1.5	1.5	2	2	2	2
EX (Nominal × Pitch)	M4×0.7	M6×1	M6×1	M8×1.25	M8×1.25	M10×1.5	M10×1.5
O-ring	SS3 (Made by NOK)	S5 (Made by NOK)	S5 (Made by NOK)	S6 (Made by NOK)	S6 (Made by NOK)	S8 (Made by NOK)	S8 (Made by NOK)

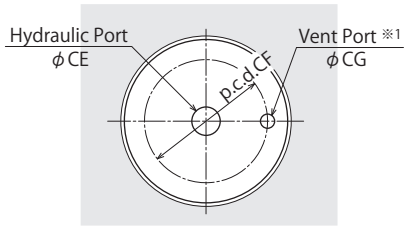
External Dimensions

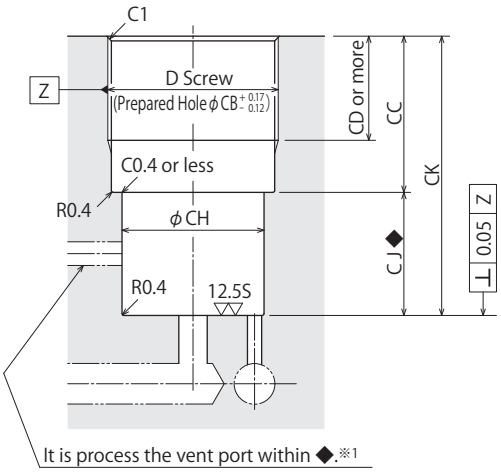
※This drawing shows the released state of LD-Q (before the plunger is lifted).





Machining Dimensions of Mounting Area

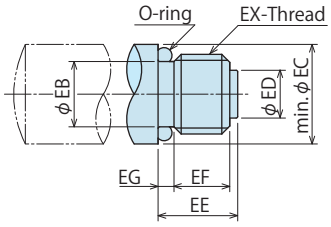




Note

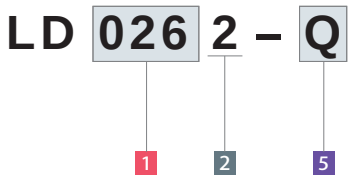
※1. The vent port needs to be processed in an open air environment without the presence of coolant,dust, etc. to avoid any internal contamination.
(Refer to P.623: Appropriate Position of Vent Port for reference.)

Contact Bolt Design Dimensions



Model No. Indication

(Format Example：LD0262-Q、LD452-Q)



1 Body Size
2 Design No.
3 Plunger Spring Force (Blank)
4 Plunger Action Confirmation (Blank)
5 Options (When Q is chosen)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	LD0262-Q	LD0302-Q	LD0362-Q	LD0452-Q
Plunger Stroke	13	16	16	20
A	83	92.5	95	112
B	24	27	32	41
C	26	30	36	45
D (Nominal × Pitch)	M26×1.5	M30×1.5	M36×1.5	M45×1.5
E	74	81.5	84	101
F	24.4	28.9	34.4	39
G	40.8	42.3	41.3	50.2
H	8.8	10.3	8.3	11.8
J	24.2	28.2	34.2	43.2
K	18.5	21	23	25
T	9	11	11	11
U	10	12	15	16
V	5	6	6	6
W	8	10	13	13
X (Nominal×Pitch×Depth)	M6×1×9	M8×1.25×12	M10×1.5×11	M10×1.5×11
BA	9	11.5	12.5	12.5
BB	3	4	4	4
BC	8	10	11	11
CB	24.5	28.5	34.5	43.5
CC	16～47	17～50	18～48	21～58
CD	CC-6	CC-8	CC-7	CC-7.5
CE	max. 8	max. 10	max. 10	max. 12
CF	p.c.d. 20	p.c.d. 24	p.c.d. 26	p.c.d. 30
CG	max. 2	max. 3	max. 3	max. 6
CH	20	24	30	39
CK	CC+17	CC+19.5	CC+26	CC+30
CJ	17	19.5	26	30
DA	AS568-014(90°)	AS568-015(90°)	AS568-016(90°)	AS568-017(90°)
DB	AS568-020(90°)	AS568-022(90°)	AS568-026(90°)	AS568-030(90°)
EY	SR30	SR30	SR50	SR50
Tightening Torque for Main Body ※2	31.5 N·m	50 N·m	63 N·m	80 N·m

Note ※2. The table above shows the recommended torque for mounting of the body.
If the recommended torque is exceeded, abnormal action may be incurred due to deformation of the body.
However, if the torque is much lower than the recommended one, the O ring may be damaged due to loosening, resulting in oil leakage.

Contact Bolt Design Dimensions

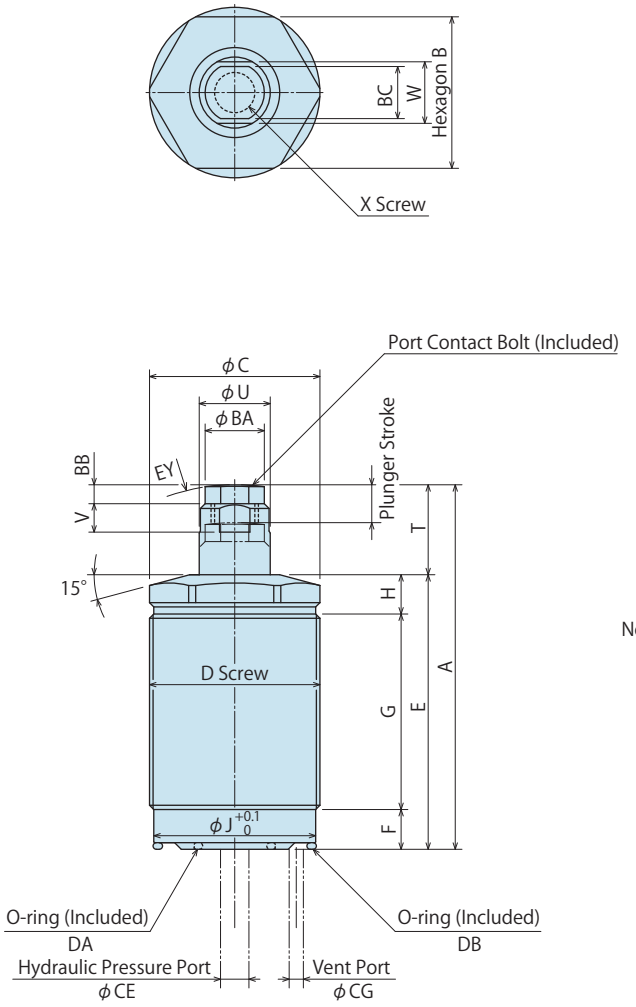
※Please use as reference in case contact bolts (attachment) other than the attached contact bolt are designed and manufactured to the customer.

(mm)

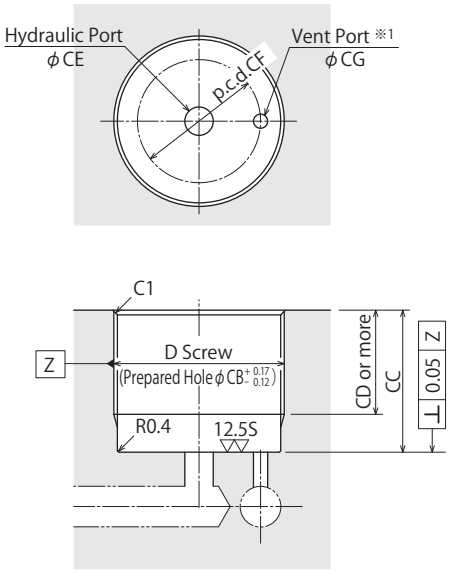
Corresponding Item Model No.	LD0262-Q	LD0302-Q	LD0362-Q	LD0452-Q
EB	4.5	6	8.2	8.2
EC	8.5	10	12.5	12.5
ED	3.5	5	6	6
EE	8	10	10	10
EF	6	7	7	7
EG	1.5	2	2	2
EX (Nominal × Pitch)	M6×1	M8×1.25	M10×1.5	M10×1.5
O-ring	S5 (Made by NOK)	S6 (Made by NOK)	S8 (Made by NOK)	S8 (Made by NOK)

External Dimensions

※This drawing shows the released state of LD-□-E□ (plunger rises).



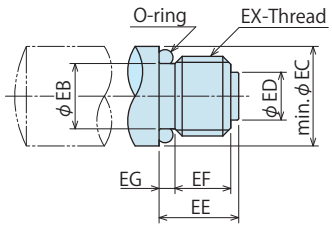
Machining Dimensions of Mounting Area



Note

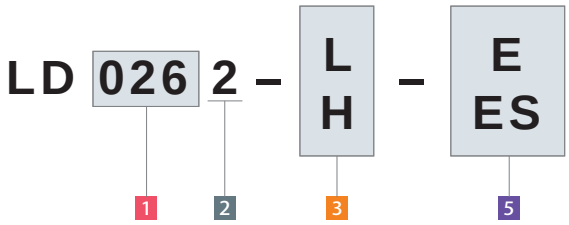
※1. The vent port needs to be processed in an open air environment without the presence of coolant,dust, etc. to avoid any internal contamination.
(Refer to P.623: Appropriate Position of Vent Port for reference.)

Contact Bolt Design Dimensions



Model No. Indication

(Format Example：LD0452-H-E、LD262-L-ES)



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

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	LD0222-□-E	LD0262-□-ES	LD0262-□-E	LD0302-□-ES	LD0302-□-E	LD0362-□-E	LD0452-□-E
Plunger Stroke	6.5	5	6.5	6	8	8	10
A	66	53.5	72.5	58	81	77	92
B	20	24	24	27	27	32	41
C	22	26	26	30	30	36	45
D (Nominal × Pitch)	M22×1.5	M26×1.5	M26×1.5	M30×1.5	M30×1.5	M36×1.5	M45×1.5
E	52.5	39.5	57	41	62	58	71
F	6	7.4	7.4	9.4	9.4	8.4	9
G	37.7	25.8	40.8	23.8	42.3	41.3	50.2
H	8.8	6.3	8.8	7.8	10.3	8.3	11.8
J	20.2	24.2	24.2	28.2	28.2	34.2	43.2
T	13.5	14	15.5	17	19	19	21
U	7	10	10	12	12	15	16
V	3.5	5	5	6	6	6	6
W	5.5	8	8	10	10	13	13
X (Nominal×Pitch×Depth)	M4×0.7×7	M6×1×9	M6×1×9	M8×1.25×12	M8×1.25×12	M10×1.5×11	M10×1.5×11
BA	6.5	9	9	11.5	11.5	12.5	12.5
BB	2.5	3	3	4	4	4	4
BC	5.5	8	8	10	10	11	11
CB	20.5	24.5	24.5	28.5	28.5	34.5	43.5
CC	14～43	16～32	16～47	17～32	17～50	18～48	21～58
CD	CC-5	CC-6	CC-6	CC-8	CC-8	CC-7	CC-7.5
CE	max. 4	max. 8	max. 8	max. 10	max. 10	max. 10	max. 12
CF	p.c.d. 15	p.c.d. 19	p.c.d. 19	p.c.d. 22	p.c.d. 22	p.c.d. 26	p.c.d. 30
CG	max. 2.5	max. 2.5	max. 2.5	max. 3	max. 3	max. 5	max. 6
DA	AS568-011(90°)	AS568-013(90°)	AS568-013(90°)	AS568-014(90°)	AS568-014(90°)	AS568-015(90°)	AS568-016(90°)
DB	AS568-017(90°)	AS568-020(90°)	AS568-020(90°)	AS568-022(90°)	AS568-022(90°)	AS568-026(90°)	AS568-030(90°)
EY	SR20	SR30	SR30	SR30	SR30	SR50	SR50
Tightening Torque for Main Body ※2	16 N·m	31.5 N·m	31.5 N·m	50 N·m	50 N·m	63 N·m	80 N·m

Note ※2. The table above shows the recommended torque for mounting of the body.
If the recommended torque is exceeded, abnormal action may be incurred due to deformation of the body.
However, if the torque is much lower than the recommended one, the O ring may be damaged due to loosening, resulting in oil leakage.

Contact Bolt Design Dimensions

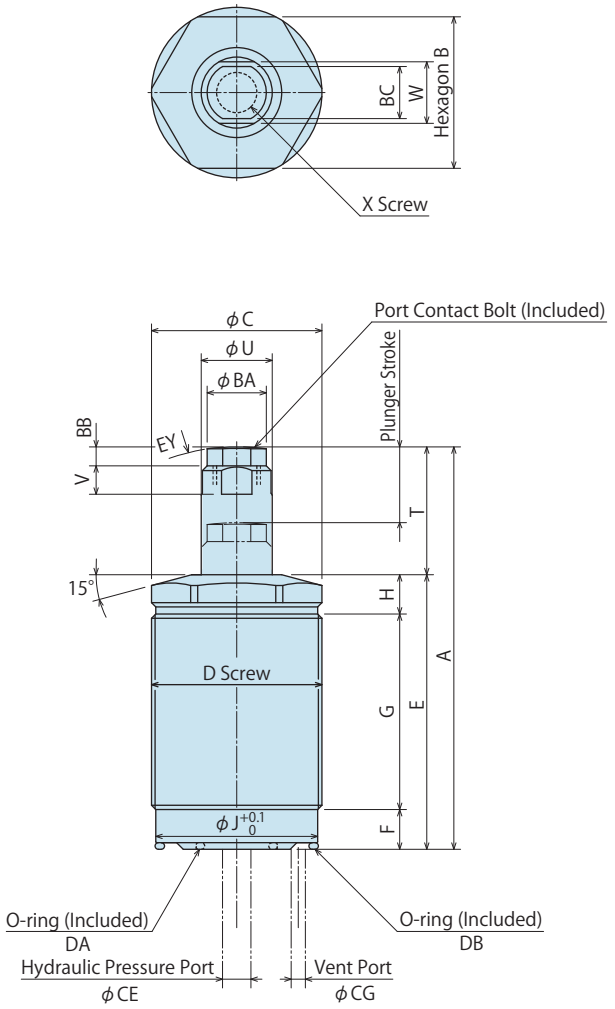
※Please use as reference in case contact bolts (attachment) other than the attached contact bolt are designed and manufactured to the customer.

(mm)

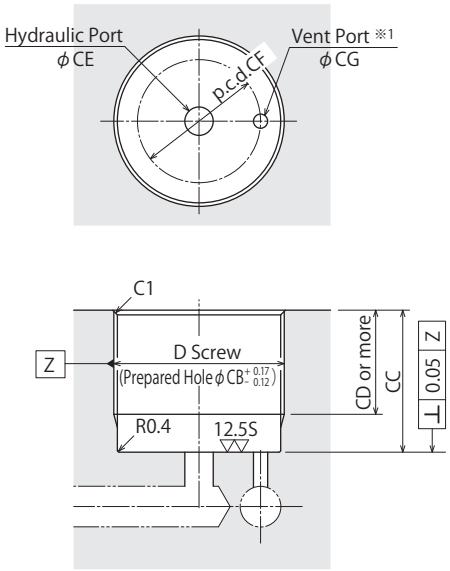
Corresponding Item Model No.	LD0222-□-E	LD0262-□-ES	LD0262-□-E	LD0302-□-ES	LD0302-□-E	LD0362-□-E	LD0452-□-E
EB	3	4.5	4.5	6	6	8.2	8.2
EC	6	8.5	8.5	10	10	12.5	12.5
ED	2	3.5	3.5	5	5	6	6
EE	6	8	8	10	10	10	10
EF	4.5	6	6	7	7	7	7
EG	1	1.5	1.5	2	2	2	2
EX (Nominal × Pitch)	M4×0.7	M6×1	M6×1	M8×1.25	M8×1.25	M10×1.5	M10×1.5
O-ring	SS3 (Made by NOK)	S5 (Made by NOK)	S5 (Made by NOK)	S6 (Made by NOK)	S6 (Made by NOK)	S8 (Made by NOK)	S8 (Made by NOK)

External Dimensions

※This drawing shows the released state of LD-EQ (plunger rises).



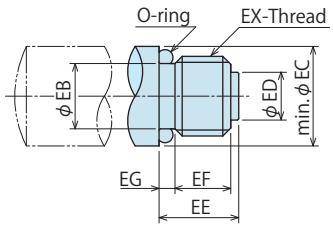
Machining Dimensions of Mounting Area



Note

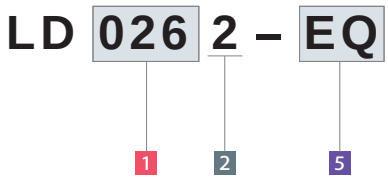
※1. The vent port needs to be processed in an open air environment without the presence of coolant,dust, etc. to avoid any internal contamination.
(Refer to P.623: Appropriate Position of Vent Port for reference.)

Contact Bolt Design Dimensions



Model No. Indication

(Format Example：LD0262-EQ、LD452-EQ)



1 Body Size
2 Design No.
3 Plunger Spring Force (Blank)
4 Plunger Action Confirmation (Blank)
5 Options (When EQ is chosen)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	LD0262-EQ	LD0302-EQ	LD0362-EQ	LD0452-EQ
Plunger Stroke	13	16	16	20
A	79	89	85	102
B	24	27	32	41
C	26	30	36	45
D (Nominal × Pitch)	M26×1.5	M30×1.5	M36×1.5	M45×1.5
E	57	62	58	71
F	7.4	9.4	8.4	9
G	40.8	42.3	41.3	50.2
H	8.8	10.3	8.3	11.8
J	24.2	28.2	34.2	43.2
T	22	27	27	31
U	10	12	15	16
V	5	6	6	6
W	8	10	13	13
X (Nominal×Pitch×Depth)	M6×1×9	M8×1.25×12	M10×1.5×11	M10×1.5×11
BA	9	11.5	12.5	12.5
BB	3	4	4	4
BC	8	10	11	11
CB	24.5	28.5	34.5	43.5
CC	16～47	17～50	18～48	21～58
CD	CC-6	CC-8	CC-7	CC-7.5
CE	max. 8	max. 10	max. 10	max. 12
CF	p.c.d. 19	p.c.d. 22	p.c.d. 26	p.c.d. 30
CG	max. 2.5	max. 3	max. 5	max. 6
DA	AS568-013(90°)	AS568-014(90°)	AS568-015(90°)	AS568-016(90°)
DB	AS568-020(90°)	AS568-022(90°)	AS568-026(90°)	AS568-030(90°)
EY	SR30	SR30	SR50	SR50
Tightening torque for main body ※2	31.5 N·m	50 N·m	63 N·m	80 N·m

Note ※2. The table above shows the recommended torque for mounting of the body.
If the recommended torque is exceeded, abnormal action may be incurred due to deformation of the body.
However, if the torque is much lower than the recommended one, the O ring may be damaged due to loosening, resulting in oil leakage.

Contact Bolt Design Dimensions

※Please use as reference in case contact bolts (attachment) other than the attached contact bolt are designed and manufactured to the customer.

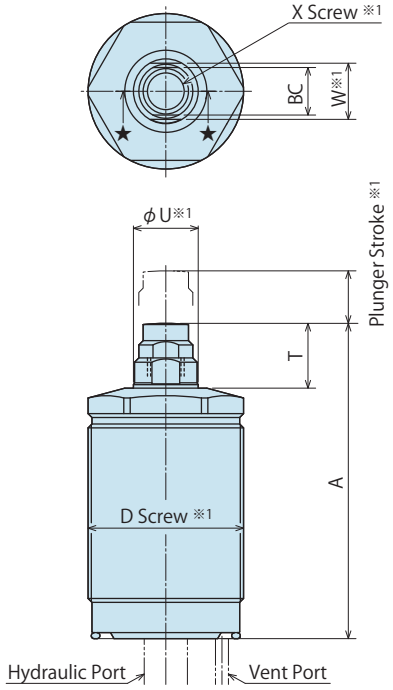
(mm)

Corresponding Item Model No.	LD0262-EQ	LD0302-EQ	LD0362-EQ	LD0452-EQ
EB	4.5	6	8.2	8.2
EC	8.5	10	12.5	12.5
ED	3.5	5	6	6
EE	8	10	10	10
EF	6	7	7	7
EG	1.5	2	2	2
EX (Nominal × Pitch)	M6×1	M8×1.25	M10×1.5	M10×1.5
O-ring	S5 (Made by NOK)	S6 (Made by NOK)	S8 (Made by NOK)	S8 (Made by NOK)

External Dimensions

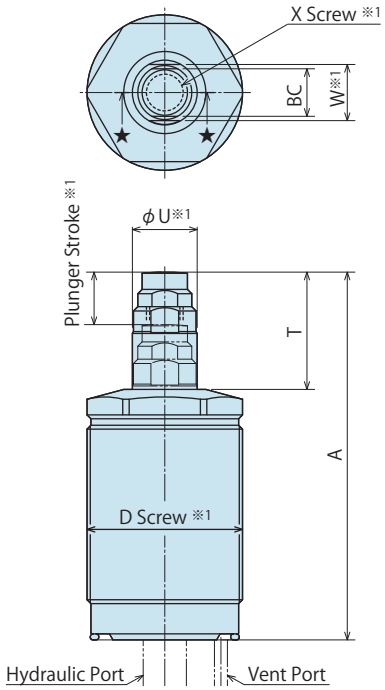
LD-□M : Hydraulic Advance Model

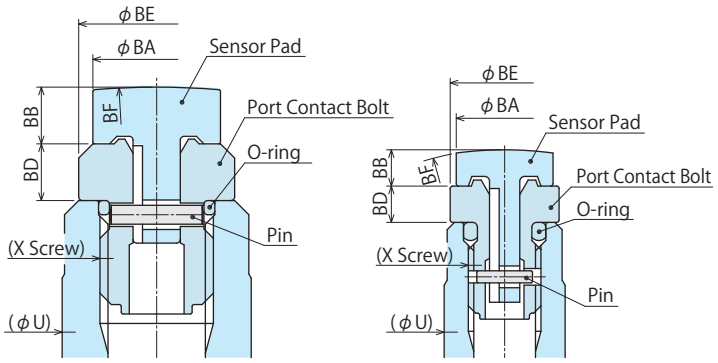
※This drawing shows the released state of LD-□M (before the plunger is lifted). Refer to P.557, P.558 hydraulic advance model (standard) regarding to the dimension that is not mentioned



LD-□M-E : Spring Advance Model

※This drawing shows the released state of LD-□M-E (plunger rises). Refer to page P.561, P.562 spring advance model regarding to the dimension that is not mentioned above.



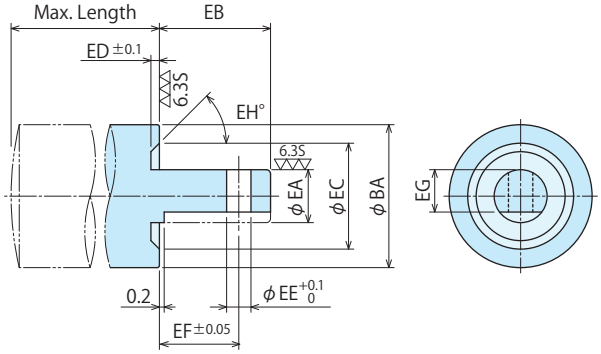


Notes

※1. ※1 dimension is the same as LD standard model and LD-E model.

1. Even if the contact bolt for LD standard model, LD-E model is exchanged with air sensing option, it doesn't work as air sensing option.
   Internal parts (plunger) must be changed with air sensor corresponding product.
2. Please contact us for the dimension of long stroke model and short model.
3. Please refer to P.567, P.568 for air sensing chart.

Sensor Pad Design Dimension

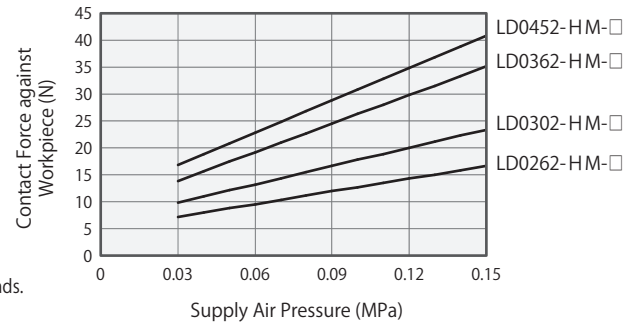


※Please machine it following the dimensions for design when exchanging sensor pads.

Contact Force against Workpiece Curve Graph (Reference)

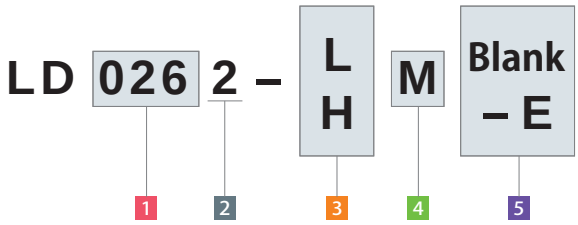
This graph shows the workpiece contacting force (reference value) when work support is high spring force (H-Type) in the middle of plunger stroke.

※ Regarding to workpiece contacting force, please refer to P.567 .



Model No. Indication

(Format Example：LD0452-HM-E、LD262-LM)



1 Body Size
2 Design No.
3 Plunger Spring Force
4 Plunger Action Confirmation (When M is chosen)
5 Options

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.		LD0262-□M-□	LD0302-□M-□	LD0362-□M-□	LD0452-□M-□
Plunger Stroke		6.5	8	8	10
A	LD:Hydraulic Advance Model	69	77	73	86
	LD-E: Spring Advance Model	75.5	85	81	96
D (Nominal × Pitch)※1		M26×1.5	M30×1.5	M36×1.5	M45×1.5
T	LD: Hydraulic Advance Model	12	15	15	15
	LD-E: Spring Advance Model	18.5	23	23	25
U※1		10	12	15	16
W※1		8	10	13	13
X (Nominal×Pitch×Depth)※1		M6×1×9	M8×1.25×12	M10×1.5×11	M10×1.5×11
BA		8	9.5	10.5	10.5
BB		3	4	4	4
BC		8	10	11	11
BD		3	4	4	4
BE		9	11.5	12.5	12.5
BF		SR30	SR30	SR50	SR50
Pin (Diameter×Length)		ϕ1×4	ϕ1×5.8	ϕ1×7.8	ϕ1×7.8
O-ring		S5 (made by NOK)	S6 (made by NOK)	S8 (made by NOK)	S8 (made by NOK)

Note ※ 1. ※1 dimension is the same as LD standard model and LD-E model.

Sensor Pad Design Dimension Table

(mm)

Corresponding Item Model No.	LD0262-□M-□	LD0302-□M-□	LD0362-□M-□	LD0452-□M-□
EA	$2.5g7\ ^{-0.002}_{-0.012}$	$3g7\ ^{-0.002}_{-0.012}$	$4g7\ ^{-0.004}_{-0.016}$	$4g7\ ^{-0.004}_{-0.016}$
EB	9.5	7.5	7.5	7.5
EC	6	7.5	8.5	8.5
ED	0.8	0.8	0.8	0.8
EE	1.4	1.2	1.2	1.2
EF	7.5	5.3	5.3	5.3
EG	1.7	2.1	3.2	3.2
EH	20	45	45	45
Max. Length ※2	max. 6	max. 8	max. 8	max. 8

Note ※2. Sensor response may decrease if the pad is longer than maximum length.

Air Sensing Option (Plunger Action Confirmation･･･M：Air Sensing Option)

Plunger action is detected by the circuit at the vent port like the drawing below. This is done by detecting the differential pressure between P1 and P2 with air catch sensor.

- Action confirmation works even for the workpiece that has rough, casting surface or black scale with the structure that doesn't detect directly to the work piece surface.
- This sensing accuracy design is higher than the switch sensing design with the dog option etc.
- This design is to prevent the coolant from going into sensing area.

Applicable Model

LD 026 2 - [L / H] [M] - [Blank / E]

5 Plunger Action Confirmation：M

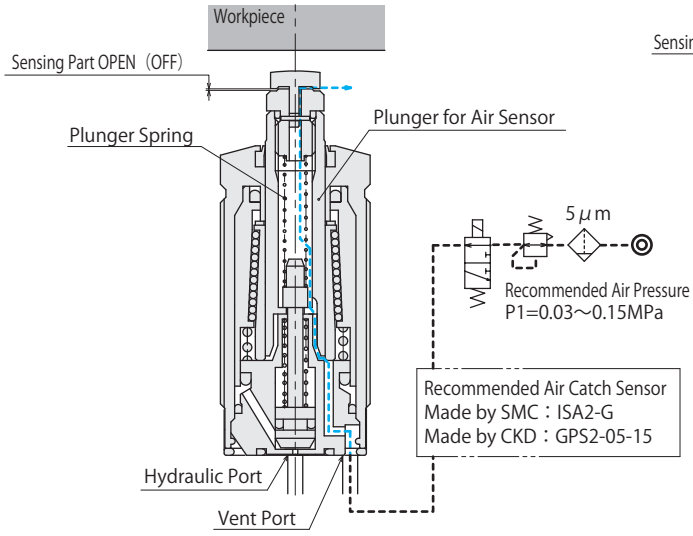
Structure Drawing

Recommend Operating Air Pressure：0.03～0.15 MPa

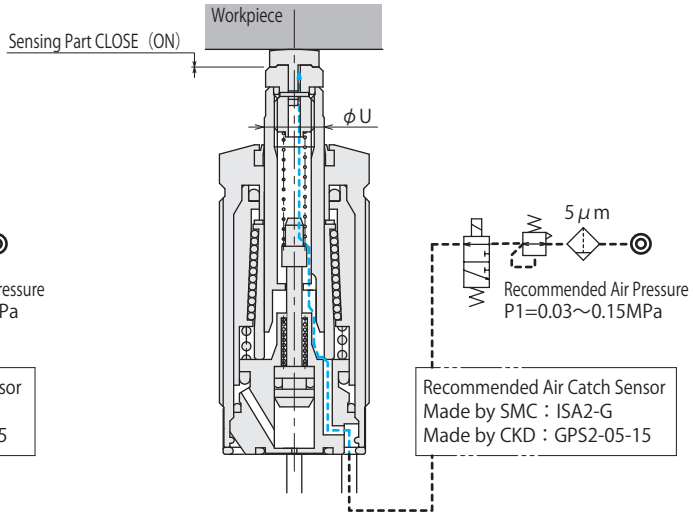
Recommended Air Catch Sensor

Manufacturer	SMC	CKD
Name	Air Catch Sensor	Gap Switch
Model No.	ISA2-G	GPS2-05-15

LD When releasing (Air Sensor OFF)



LD Plunger extends・Contact with workpiece (Air Sensor ON)



Workpiece Contacting Force Formula when using Air Sensor ※1

Workpiece Contacting Force（N）＝Plunger Spring Force（N）＋Supply Air Pressure（MPa）× U^2（mm）× π ／ 4

Model No.		LD0262-□M LD0262-□M-E	LD0302-□M LD0302-□M-E	LD0362-□M LD0362-□M-E	LD0452-□M LD0452-□M-E
U	mm	10	12	15	16
Plunger Spring Force※2 N	L：Low Spring Force	2.8～4.1	3.6～5.7	4.7～7.8	5.8～9.7
	H：High Spring Force	3.8～5.9	4.9～8.0	6.2～11.0	7.9～13.6

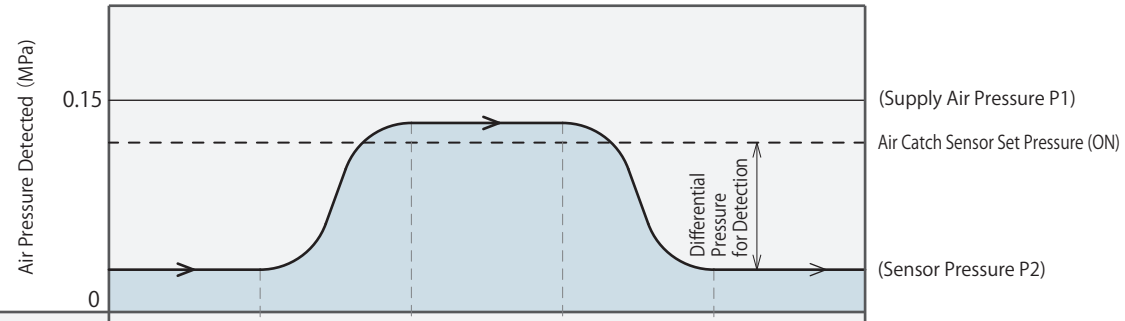
Notes

※1. Please prepare the stopper if necessary when the work piece is light and thin. There is a possibility to push up the workpiece.

※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.

Air Sensing Chart

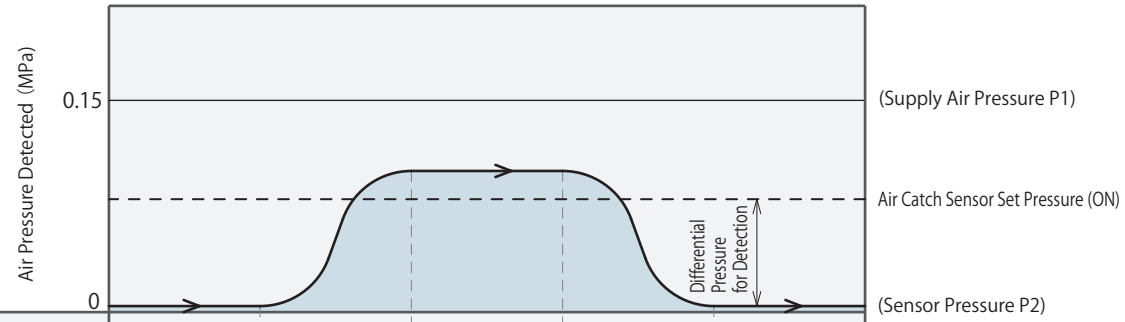
Connect 1 piece of work support with one air catch sensor
In the case of air catch sensor, supply pressure P1=0.15MPa



Air Catch Sensor		OFF	OFF→ON	ON	ON→OFF	OFF
Hydraulic Advance Model	Hydraulic Valve	Hydraulic Pressure OFF	Hydraulic Pressure ON	Hydraulic Pressure ON	Hydraulic Pressure OFF	Hydraulic Pressure OFF
	Work Support Action	Released State	Rising up action completed In the middle of locking action	Locking action completed	Releasing lock During going down	Release action completed
Spring Advance Model	Hydraulic Valve	Hydraulic Pressure OFF	Hydraulic Pressure OFF	Hydraulic Pressure ON	Hydraulic Pressure OFF	Hydraulic Pressure OFF
	Work Support Action	Released State	Carrying workpiece in	Locking action completed	Carrying workpiece out	Release action completed

Note 1. Depending on the used condition, detecting differential pressure becomes lower by repeated action.
Please tell us to overhaul when the detecting differential pressure is lower than before.

Connect 4 piece of work support with one air catch sensor
In the case of air catch sensor, supply pressure P1=0.15MPa



Air catch sensor		OFF	OFF→ON	ON	ON→OFF	OFF
Hydraulic Advance Model	Hydraulic Valve	Hydraulic Pressure OFF	Hydraulic Pressure ON	Hydraulic Pressure ON	Hydraulic Pressure OFF	Hydraulic Pressure OFF
	Work Support Action	Released State	Rising up action completed In the middle of locking action	Locking action completed	Releasing lock During going down	Release action completed
Spring Advance Model	Hydraulic Valve	Hydraulic Pressure OFF	Hydraulic Pressure OFF	Hydraulic Pressure ON	Hydraulic Pressure OFF	Hydraulic Pressure OFF
	Work Support Action	Released State	Carrying workpiece in	Locking action completed	Carrying workpiece out	Release action completed

Note 1. Depending on the used condition, detecting differential pressure becomes lower by repeated action.
Please tell us to overhaul when the detecting differential pressure is lower than before.

Notes

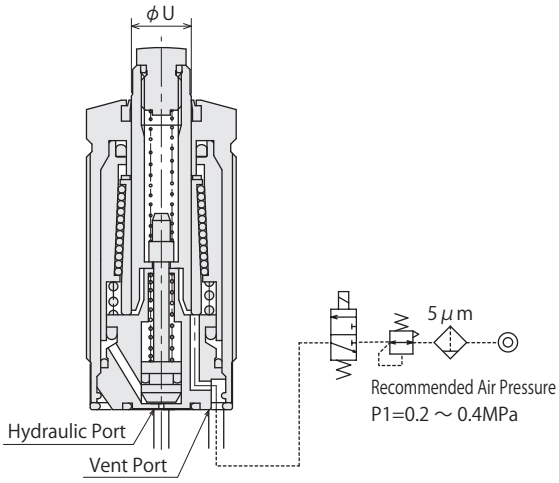
1. This specification is designed for confirming the plunger action of the work support.
   If it is used for confirming the close contact with the workpiece, other clamping (force) is necessary.
2. If the plunger goes up too fast, it may bounce back and locks itself. Resulting in a gap with the work piece and possible damage to the internal parts due to the impact force. Set the plunger action time at 0.5-1.0 sec. to adjust the air supply with the flow control valve with check valve (meter-in), and make sure that there is no clearance with the workpiece for operation.
3. If it is used in the condition where cutting fluids or cutting chips may invade, the vent port needs to have air supply at all the times.
   If it is used when the air supply is shut off, the coolant or cutting chips may contaminate the sensing area.
   This may lead to malfunctioning of the work support.
4. Even if the contact bolt for LD standard model, LD-E model is exchanged with air sensing option, it doesn't work as air sensing option.
   Internal parts (plunger) must be changed with air sensor corresponding product.
5. In certain circumstances it has been known for the plunger to move slower through continued use because of the airflow change in the circuit, turn the operating air supply off fully to reset the work support.

Air Purge Function

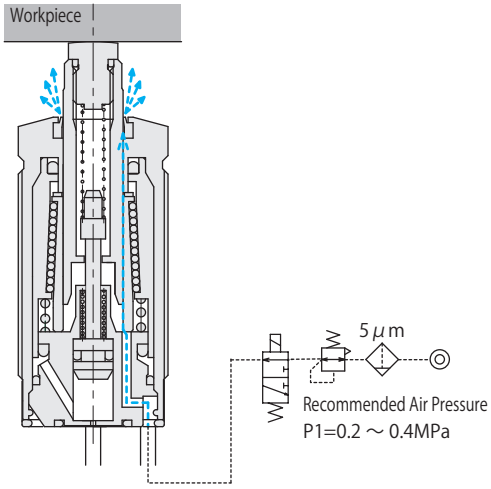
The special dust seal that features low friction and high sealing capabilities is used at LD.
However, when it is used in worse condition, if the circuit at vent port is machined like the drawing below, air purge function is available.

Structure Drawing

LD plunger going down and at releasing position（Air Supply OFF）※1



LD plunger going up and at locking position（Air Supply ON）※1



Workpiece Contact Force Formula when Using Air Purge Function ※2

Workpiece Contacting Force（N）＝Plunger Spring Force（N）＋Supply Air Pressure（MPa）× U^2（mm）× π ／4

Model No.		LD0222-□ LD0222-□-E	LD0262-□ LD0262-□M LD0262-□-E LD0262-□M-E	LD0302-□ LD0302-□M LD0302-□-E LD0302-□M-E	LD0362-□ LD0362-□M LD0362-□-E LD0362-□M-E	LD0452-□ LD0452-□M LD0452-□-E LD0452-□M-E
U mm		7	10	12	15	16
Plunger Spring Force※3 N	L:Low Spring Force	2.1～3.1	2.8～4.1	3.6～5.7	4.7～7.8	5.8～9.7
	H:High Spring Force	3.0～4.4	3.8～5.9	4.9～8.0	6.2～11.0	7.9～13.6

Model No.		LD0262-□-S LD0262-□-ES	LD0302-□-S LD0302-□-ES
U mm		10	12
Plunger Spring Force※3 N	L:Low Spring Force	2.8～4.2	3.5～6.3
	H:High Spring Force	3.1～5.9	4.0～8.2

Model No.		LD0262-Q LD0262-EQ	LD0302-Q LD0302-EQ	LD0362-Q LD0362-EQ	LD0452-Q LD0452-EQ
U	mm	10	12	15	16
Plunger Spring Force※3	N	3.8～7.4	4.9～11.4	6.2～12.9	7.8～20.4

Notes
※2. Please prepare the stopper if necessary when the workpiece is light and thin. There is a possibility to push up the workpiece.
※3. 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.

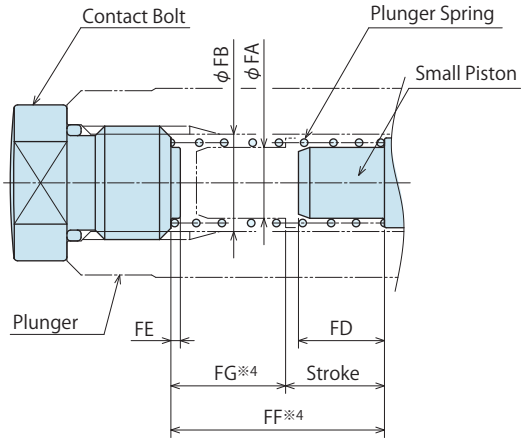
Notes

※1. When plunger goes down, shut off the air supply. Plunger doesn't go back when air always is supplied.

1. If the plunger goes up too fast, it may bounce back and locks itself.
   Resulting in a gap with the work piece and possible damage to the internal parts due to the impact force.
   Set the plunger action time at 0.5-1.0 sec. to adjust the air supply with the flow control valve with check valve (meter-in), and make sure that there is no clearance with the work piece for operation.
2. Air cannot be vented as the air supply pressure is too low because the cracking pressure at the dust seal lip is about 0.1MPa.

Plunger Spring Design Dimension

※Please use as reference in case springs other than an attached plunger spring are designed and manufactured to the customer.
※This drawing shows the released state.



(mm)

Corresponding Product Model		LD0222	LD0262-S	LD0262	LD0302-S	LD0302	LD0362	LD0452
LD LD-M	FA	–	3.5	3.5	5	5	6	6
	FB	3.4	5.1	5.1	6.8	6.8	8.5	8.5
	FD	–	1	0.5	4.8	3.9	8.1	8.1
	FE	0.5	0.5	0.5	1	1	1	1
	FF※4	19.5	10	15.9	12.3	24.6	17.6	19.6
	FG※4	13	5	9.4	6.3	16.6	9.6	9.6
	Stroke	6.5	5	6.5	6	8	8	10
LD-E LD-M-E	FA	–	3.5	3.5	5	5	6	6
	FB	3.4	5.1	5.1	6.8	6.8	8.5	8.5
	FD	–	1	0.5	4.8	3.9	2.5	2.5
	FE	0.5	0.5	0.5	1	1	1	1
	FF※4	19.5	10	15.9	12.3	24.6	17.6	19.6
	FG※4	13	5	9.4	6.3	16.6	9.6	9.6
	Stroke	6.5	5	6.5	6	8	8	10
LD-Q	FA	–	–	3.5	–	5	6	6
	FB	–	–	5.1	–	6.8	8.5	8.5
	FD	–	–	0.5	–	3.9	8.1	8.1
	FE	–	–	0.5	–	1	1	1
	FF※4	–	–	22.6	–	26.6	28.6	36.2
	FG※4	–	–	9.6	–	10.6	12.6	16.2
	Stroke	–	–	13	–	16	16	20
LD-EQ	FA	–	–	3.5	–	5	6	6
	FB	–	–	5.1	–	6.8	8.5	8.5
	FD	–	–	0.5	–	1	2.5	2.5
	FE	–	–	0.5	–	1	1	1
	FF※4	–	–	22.6	–	26.6	28.6	36.2
	FG※4	–	–	9.6	–	10.6	12.6	16.2
	Stroke	–	–	13	–	16	16	20

Note
※4. Please perform a spring design so that spring set length is below FF dimension and spring contact length is below FG dimension.

High-Power Series
Pneumatic Series
Hydraulic Series
Valve / Coupler Hydraulic Unit
Manual Operation Accessories
Cautions / Others
Hole Clamp
SFA
SFC
Swing Clamp
LHA
LHC
LHS
LHW
LT/LG
TLA-2
TLB-2
TLA-1
Link Clamp
LKA
LKC
LKW
LM/LJ
TMA-2
TMA-1
Work Support
LD
LC
TNC
TC
Air Sensing Lift Cylinder
LLW
Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT
Block Cylinder
DBA
DBC
Control Valve
BZL
BZT
BZX/JZG
Pallet Clamp
VS
VT
Expansion Locating Pin
VL
VM
VJ
VK
Pull Stud Clamp
FP
FQ
Customized Spring Cylinder
DWA/DWB

PAT.

Hydraulic Work Support

Model LC

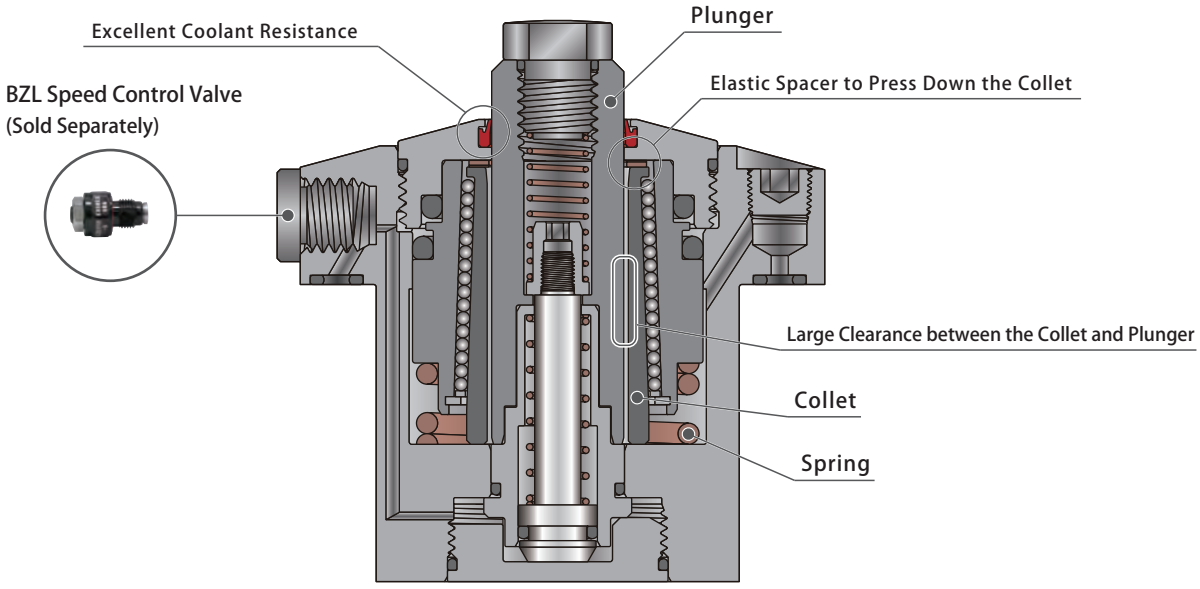
Low Pressure (2.5～7MPa)

Single Action・Flange Model

Powerful Support・Smooth Action

Index

Cross Section



It adopts the collet structure, the first in the world, ensuring powerful support and smooth action.

KOSMEK was the first to develop the collet design in 1996.
Compared with the traditional sleeve design, it ensures powerful gripping force via a wedge effect.
In addition, a larger gap between collet and plunger is designed to prevent sticking and allow smoother action.

Concrete Workpiece Touch

As the collet gripping the plunger is always pressed downwards, it helps prevent tilting when locked and the clearance with the work piece.

Certain Sequence Action

As it is equipped with a powerful sequencing spring, the action sequences as such;
Plunger goes up→ workpiece touches→ collet locks. This is carried out via one hydraulic circuit system.

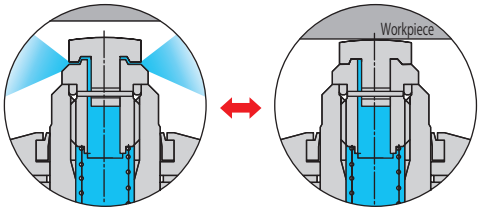
Excellent Coolant Resistance

Our exclusive dust seal is designed to protect against high pressure coolant. It also has high durability against chlorine-based coolant by using a sealing material with excellent chemical resistance.

Able to Attach Speed Control Valve Directly

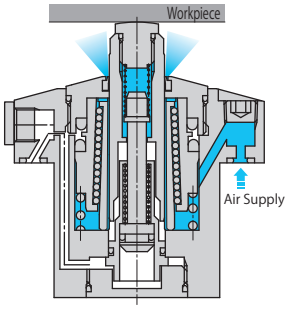
When fitting the gasket (-C option), it is able to attach the speed control valve with air venting function. (Speed control valve is sold separately.)

Air Sensing Option



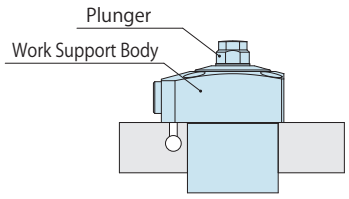
Sensor OFF　　Sensor ON

Air Purge Function



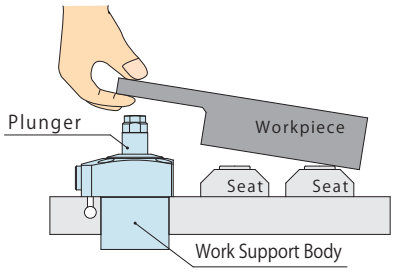
Action Description

● Hydraulic Advance Model（LC/LC-Q)



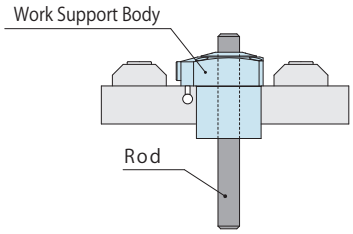
Hydraulic Pressure：OFF
The state of plunger down.

● Spring Advance Model（LC-E/LC-EQ)



Hydraulic Pressure：OFF
The state of plunger up.

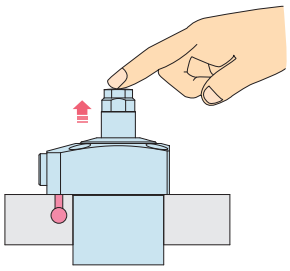
● Rodless Hollow Model（LC-D)



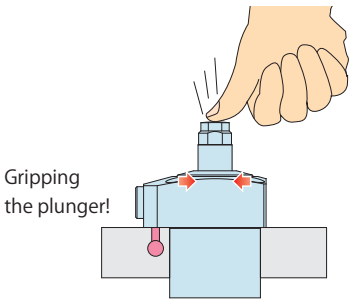
Hydraulic Pressure：OFF
Rod is not gripped.
（The rod is prepared by the customer.）

● Air Sensing Model（LC-M/LC-M-E)

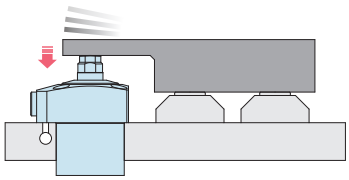
Available to check action by connecting the air catch sensor at vent port and then detecting differential pressure.
Refer to P.595 for detail.



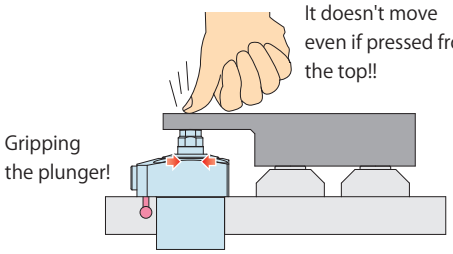
Hydraulic Pressure : ON
Plunger rises with oil pressure
and stops after touching workpiece.



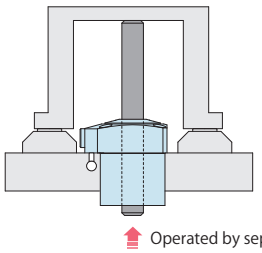
Hydraulic Pressure : ON
Once it is in the stopped position where
it touches the workpiece, the plunger
doesn't go down even if pressed from above.



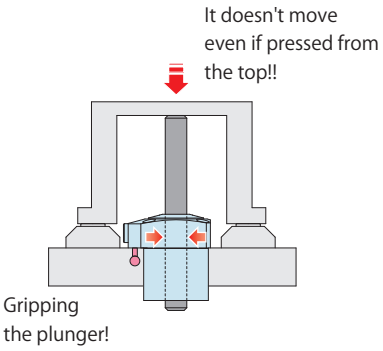
Hydraulic Pressure : OFF
When workpiece rests on the work support,
plunger goes down due to the weight of
workpiece and is balanced.



Hydraulic Pressure : ON
Once it is in the stopped position where it
touches the workpiece, the plunger doesn't
go down even if pressed from above.



Hydraulic Pressure : OFF
The rod is pushed up by the cylinder which is
prepared separately to make contact with workpiece.

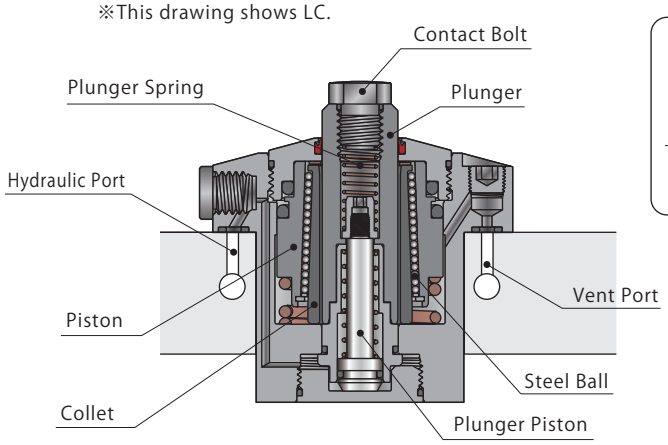


Hydraulic Pressure : ON
After the rod is gripped by hydraulic pressure,
the rod will not go down if pressing from the top.

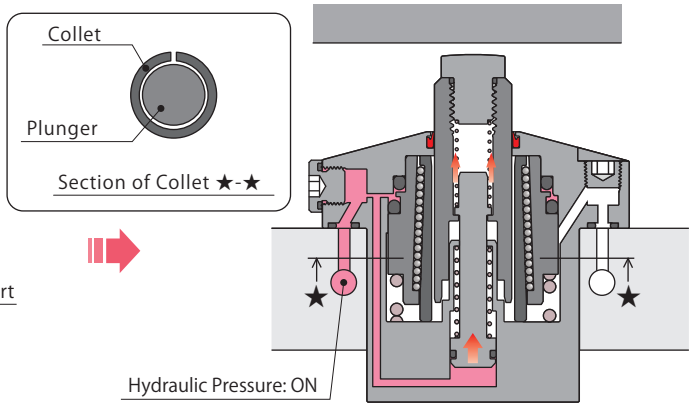
Internal Action Description

Hydraulic Advance Model (LC)

※This drawing shows LC.



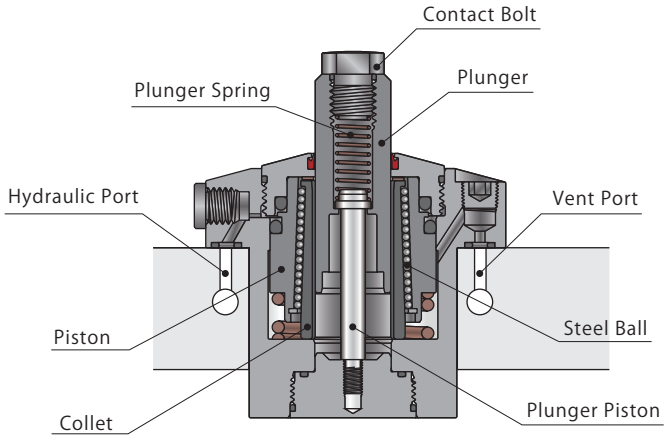
When releasing (Cross Section)



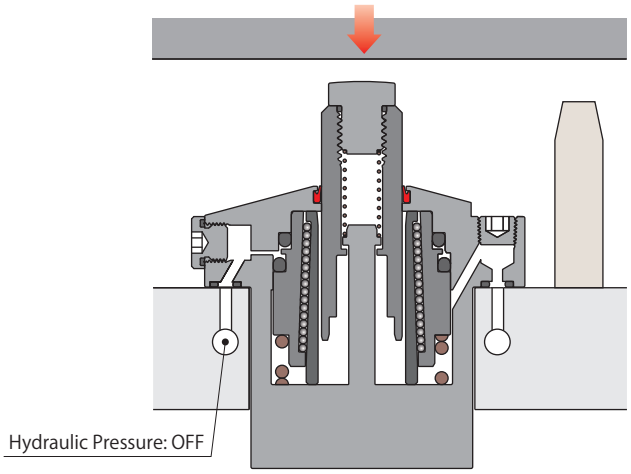
Plunger extends

Spring Advance Model (LC-E)

※This drawing shows LC-E.



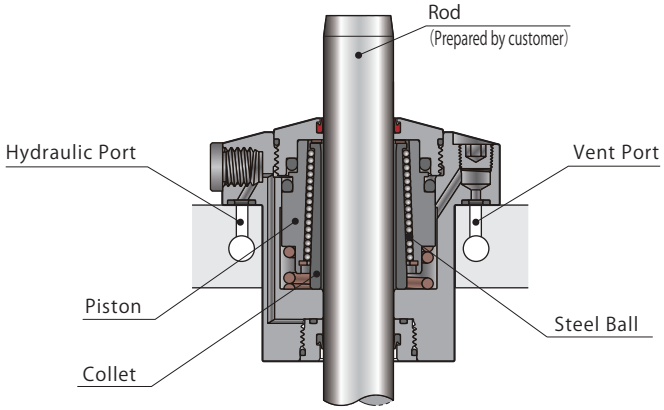
When releasing (Cross Section)



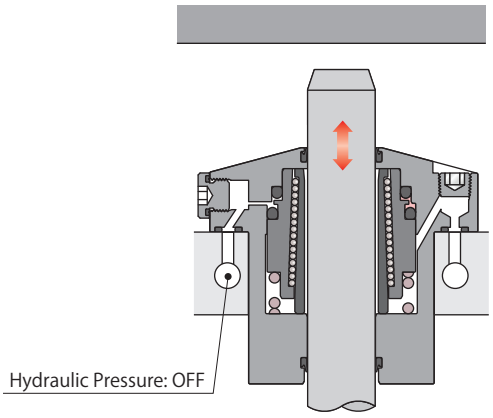
Released State

Rodless Hollow Model (LC-D)

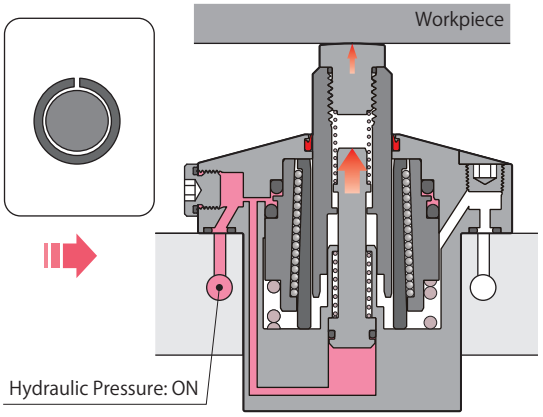
※This drawing shows LC-D.



Cross Section

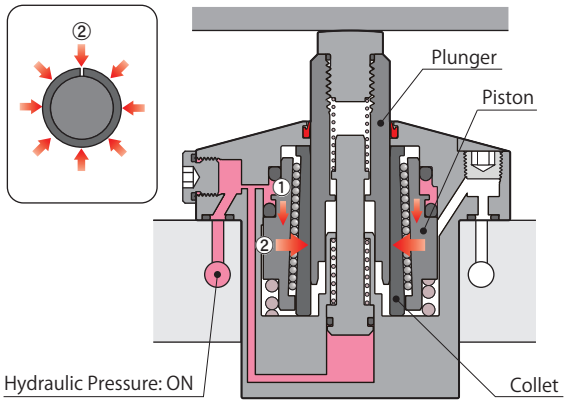


When releasing



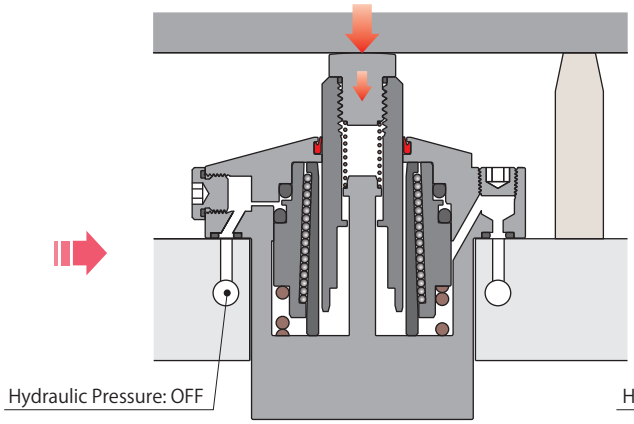
When the plunger piston is completely extended

In contact with the workpiece

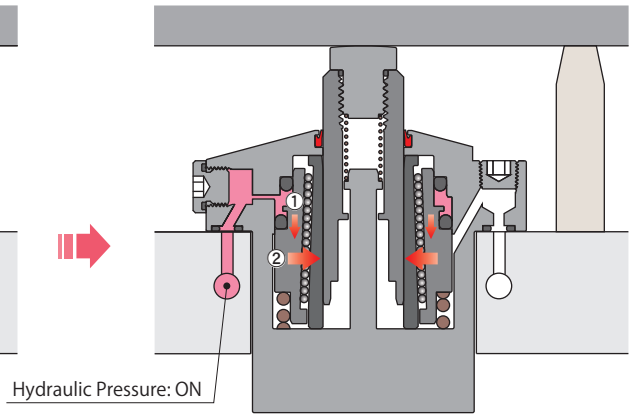


Locked State

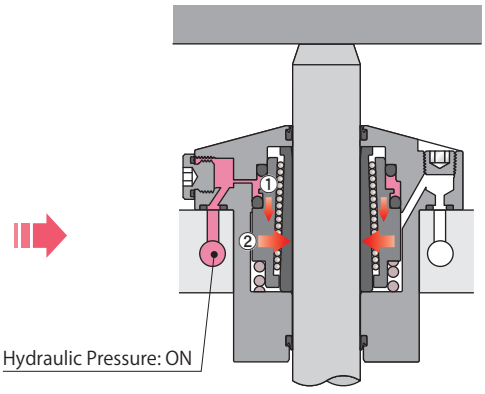
① The piston starts to press down via hydraulic pressure.
② The tapering action between the piston and collet affects the steel ball so that the collect can grip the plunger with even and strong power to generate the supporting force.



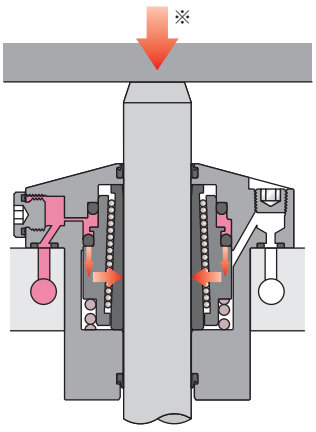
Workpiece set（Plunger goes down）



Locked State



Locked State



The Load Direction

※The load acts towards the arrow shown in the drawing.

Model No. Indication

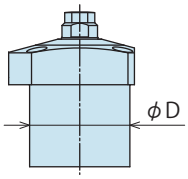
LC 055 2 - C L □ - □

1 2 3 4 5 6

1 Body Size

040 : φD=40mm
048 : φD=48mm
055 : φD=55mm
065 : φD=65mm
075 : φD=75mm
090 : φD=90mm

※ Outer diameter (φD) of the cylinder.



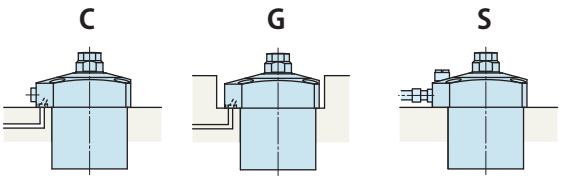
2 Design No.

2 : Revision Number

3 Piping Method

C : Gasket Option (With G Thread Plug • Air Venting Function)
G : Gasket Option (With R Thread Plug)
S : Piping Option (Rc Thread Port)

※ Speed control valve (BZL) is sold separately.
Refer to P. 727.



Gasket Option		Piping Option
With G Thread Plug Able to attach speed control valve	With R Thread Plug	Rc Thread Port No Gasket Port

4 Plunger Spring Force

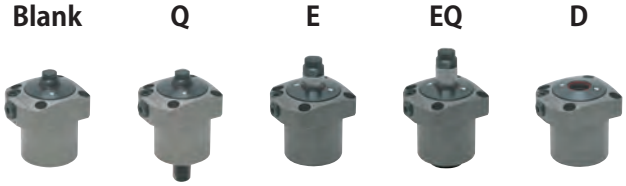
L : Low Spring Force
H : High Spring Force
Blank : 6 Q,EQ,D selected

5 Plunger Action Confirmation

Blank : None (Standard)
M : Air Sensing Option ※1 ※2

6 Options

Blank : Hydraulic Advance Model (Standard)
Q : Hydraulic Advance Long Stroke Model ※1
E : Spring Advance Model
EQ : Spring Advance Long Stroke Model ※1
D : Rodless Hollow Model ※2
(The rod is prepared by the customer)



Notes
※1. Please contact us for a combination of 5 M: Air Sensing option and 6 Q, EQ: Long Stroke model.
※2. A combination of 5 M: Air Sensing option and 6 D: Rodless Hollow model is not available.

Specifications

6 Blank / E selected

Model No.		LC0402-□□ LC0402-□□M LC0402-□□-E LC0402-□□M-E	LC0482-□□ LC0482-□□M LC0482-□□-E LC0482-□□M-E	LC0552-□□ LC0552-□□M LC0552-□□-E LC0552-□□M-E	LC0652-□□ LC0652-□□M LC0652-□□-E LC0652-□□M-E	LC0752-□□ LC0752-□□M LC0752-□□-E LC0752-□□M-E	LC0902-□□ LC0902-□□M LC0902-□□-E LC0902-□□M-E
Support Force at 7MPa kN		5.5	10	15.5	25	40	65
Support Force (Calculation Formula)※3 kN		0.96×P-1.25	1.75×P-2.28	2.72×P-3.54	4.39×P-5.70	7.02×P-9.12	11.4×P-14.8
Plunger Stroke mm		8	10	12	14	16	20
Cylinder Capacity cm³		1.2	2	3.3	4.8	8.9	13.1
Plunger Spring Force※4 N	L:Low Spring Force	4.7～7.8	5.8～9.7	8.3～14.6	9.8～14.6	12.4～18.8	14.6～21.0
	H:High Spring Force	6.2～11.0	7.9～13.6	10.1～21.9	15.8～22.0	18.7～31.9	21.4～34.2
Max. Operating Pressure MPa		7.0					
Min. Operating Pressure MPa		2.5					
Withstanding Pressure MPa		10.5					
Operating Temperature ℃		0～70					
Mass kg		0.6	0.9	1.4	2.2	3.6	6.0

6 Q / EQ selected

Model No.		LC0402-□-Q LC0402-□-EQ	LC0482-□-Q LC0482-□-EQ	LC0552-□-Q LC0552-□-EQ	LC0652-□-Q LC0652-□-EQ	LC0752-□-Q LC0752-□-EQ	LC0902-□-Q LC0902-□-EQ
Support Force at 7MPa kN		5.5	10	15.5	25	40	65
Support Force (Calculation Formula)※3 kN		0.96×P-1.25	1.75×P-2.28	2.72×P-3.54	4.39×P-5.70	7.02×P-9.12	11.4×P-14.8
Plunger Stroke mm		16	20	24	28	32	40
Cylinder Capacity cm³	6 Q selected	1.8	2.8	4.7	6.4	12.1	17.2
	6 EQ selected	0.6	1.3	2.0	3.3	5.7	9.1
Plunger Spring Force※4 N		6.2～12.9	7.8～20.4	10.1～24.8	15.8～28.4	18.7～42.3	21.4～44.0
Max. Operating Pressure MPa		7.0					
Min. Operating Pressure MPa		2.5					
Withstanding Pressure MPa		10.5					
Operating Temperature ℃		0～70					
Mass kg	6 Q selected	0.7	1.0	1.5	2.4	3.9	6.5
	6 EQ selected	0.6	0.9	1.4	2.3	3.7	6.2

6 D selected

Model No.	LC0402-□-D	LC0482-□-D	LC0552-□-D	LC0652-□-D	LC0752-□-D	LC0902-□-D
Support Force at 7MPa kN	3.5	6.3	10	16	25	40
Support Force (Calculation Formula)※3 kN	0.58×P-0.58	1.05×P-1.05	1.67×P-1.67	2.67×P-2.67	4.17×P-4.17	6.67×P-6.67
Cylinder Capacity cm³	0.6	1.3	2.0	3.3	5.7	9.1
Max. Operating Pressure MPa	7.0					
Min. Operating Pressure MPa	2.5					
Withstanding Pressure MPa	10.5					
Operating Temperature ℃	0～70					
Mass kg	0.5	0.8	1.2	2.0	3.2	5.4

Notes ※3. P in the formula for support force indicates the hydraulic pressure (MPa).
※4. 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.
Regarding to workpiece contacting force for 5 M: Air Sensing option, please refer to the P.595.

Performance Curve (LC-□□ : Hydraulic Advance Model / LC-□□-E : Spring Advance Model)

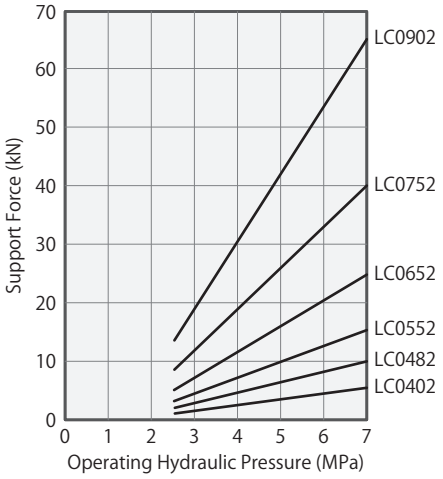
Applicable Model

LC 040 2 - C G S - L H - Blank E

1 Body Size

6 Option : Blank、E selected

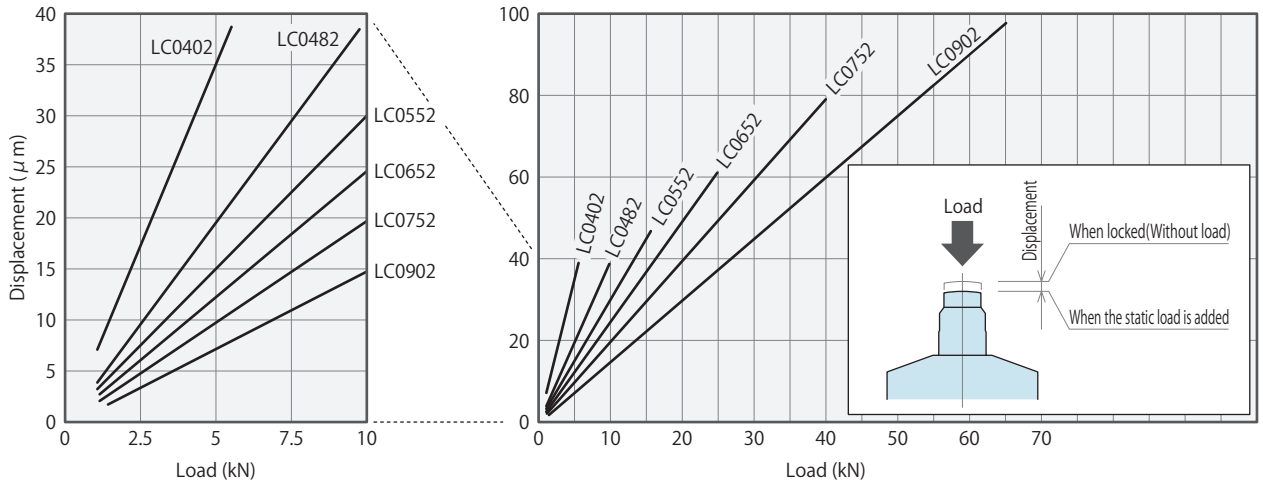
Support Force Graph ※ This graph shows the support force under static load condition.



	Support Force (kN)					
Model No.	LC0402-□□	LC0482-□□	LC0552-□□	LC0652-□□	LC0752-□□	LC0902-□□
Operating Hydraulic Pressure (MPa)	LC0402-□□-E	LC0482-□□-E	LC0552-□□-E	LC0652-□□-E	LC0752-□□-E	LC0902-□□-E
7	5.5	10.0	15.5	25.0	40.0	65.0
6.5	5.0	9.1	14.1	22.8	36.5	59.3
6	4.5	8.2	12.8	20.6	33.0	53.6
5.5	4.0	7.3	11.4	18.4	29.5	47.9
5	3.6	6.5	10.1	16.3	26.0	42.2
4.5	3.1	5.6	8.7	14.1	22.5	36.5
4	2.6	4.7	7.3	11.9	19.0	30.8
3.5	2.1	3.8	6.0	9.7	15.5	25.1
3	1.6	3.0	4.6	7.5	11.9	19.4
2.5	1.2	2.1	3.3	5.3	8.4	13.7
Support Force Formula ※1 kN	0.96×P-1.25	1.75×P-2.28	2.72×P-3.54	4.39×P-5.70	7.02×P-9.12	11.4×P-14.8

Note ※1. P : Operating hydraulic pressure (MPa)

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



Performance Curve (LC-□-Q : Hydraulic Advance Long Stroke Model / LC-□-EQ : Spring Advance Long Stroke Model)

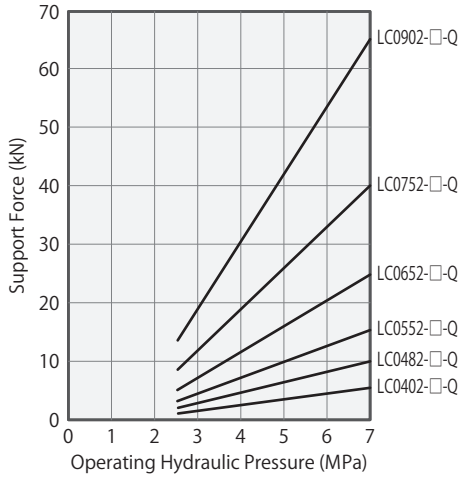
Applicable Model

LC 040 2 - C G S - Q EQ

1 Body Size

6 Option : Q、EQ selected

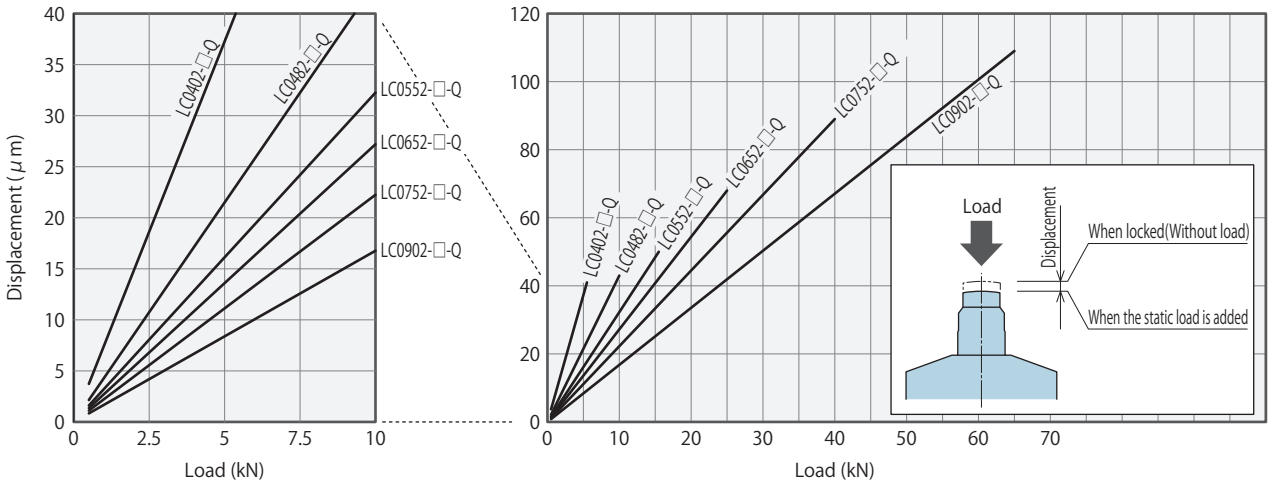
Support Force Graph ※ This graph shows the support force under static load condition.



Model No.	Support Force (kN)					
	LC0402-□-Q	LC0482-□-Q	LC0552-□-Q	LC0652-□-Q	LC0752-□-Q	LC0902-□-Q
Operating Hydraulic Pressure (MPa)	LC0402-□-EQ	LC0482-□-EQ	LC0552-□-EQ	LC0652-□-EQ	LC0752-□-EQ	LC0902-□-EQ
7	5.5	10.0	15.5	25.0	40.0	65.0
6.5	5.0	9.1	14.1	22.8	36.5	59.3
6	4.5	8.2	12.8	20.6	33.0	53.6
5.5	4.0	7.3	11.4	18.4	29.5	47.9
5	3.6	6.5	10.1	16.3	26.0	42.2
4.5	3.1	5.6	8.7	14.1	22.5	36.5
4	2.6	4.7	7.3	11.9	19.0	30.8
3.5	2.1	3.8	6.0	9.7	15.5	25.1
3	1.6	3.0	4.6	7.5	11.9	19.4
2.5	1.2	2.1	3.3	5.3	8.4	13.7
Support Force Formula ※1 kN	0.96×P-1.25	1.75×P-2.28	2.72×P-3.54	4.39×P-5.70	7.02×P-9.12	11.4×P-14.8

Note ※1. P : Operating hydraulic pressure (MPa)

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



※ The Displacement of LC-□-Q / LC-□-EQ : long stoke model is bigger than LC-□□/LC-□□-E : standard model.

Performance Curve (LC-□□M：Hydraulic Advance Air Sensing Option / LC-□□M-E：Spring Advance Air Sensing Option)

Applicable Model

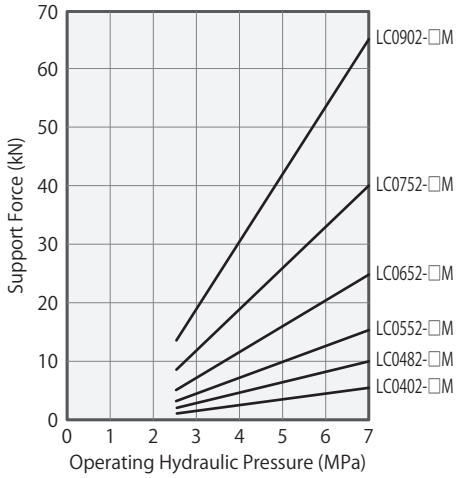
LC 040 2 - C G S / L H / M - Blank E

6 Options：Blank, E selected

1 Body Size

5 Plunger Action Confirmation：M selected

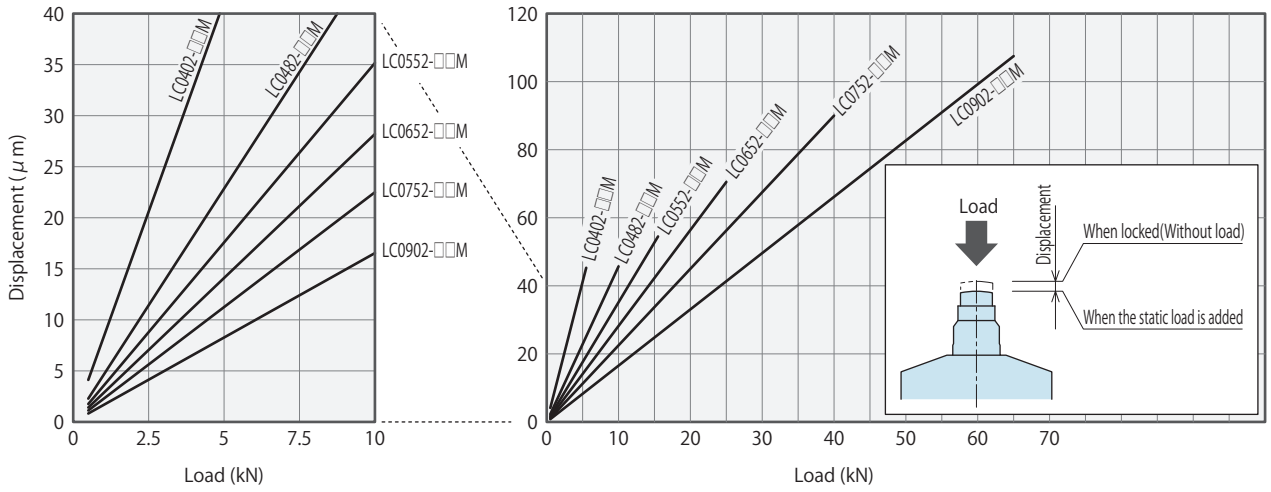
Support Force Graph ※ This graph shows the support force under static load condition.



Model No.	Support Force (kN)					
	LC0402-□□M	LC0482-□□M	LC0552-□□M	LC0652-□□M	LC0752-□□M	LC0902-□□M
Operating Hydraulic Pressure (MPa)	LC0402-□□M-E	LC0482-□□M-E	LC0552-□□M-E	LC0652-□□M-E	LC0752-□□M-E	LC0902-□□M-E
7	5.5	10.0	15.5	25.0	40.0	65.0
6.5	5.0	9.1	14.1	22.8	36.5	59.3
6	4.5	8.2	12.8	20.6	33.0	53.6
5.5	4.0	7.3	11.4	18.4	29.5	47.9
5	3.6	6.5	10.1	16.3	26.0	42.2
4.5	3.1	5.6	8.7	14.1	22.5	36.5
4	2.6	4.7	7.3	11.9	19.0	30.8
3.5	2.1	3.8	6.0	9.7	15.5	25.1
3	1.6	3.0	4.6	7.5	11.9	19.4
2.5	1.2	2.1	3.3	5.3	8.4	13.7
Support Force Formula ※1 kN	0.96×P-1.25	1.75×P-2.28	2.72×P-3.54	4.39×P-5.70	7.02×P-9.12	11.4×P-14.8

Note ※1. P : Operating hydraulic pressure (MPa)

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



※ The Displacement of LC-□□M / LC-□□M-E：Air sensing option is larger than LC-□□/LC-□□-E：standard model.

Performance Curve (LC-□-D : Rodless Hollow Model)

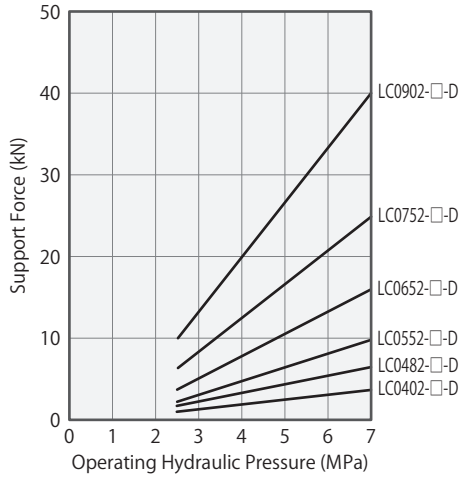
Applicable Model

LC 040 2 - C G S - D

1 Body Size

6 Options : D selected

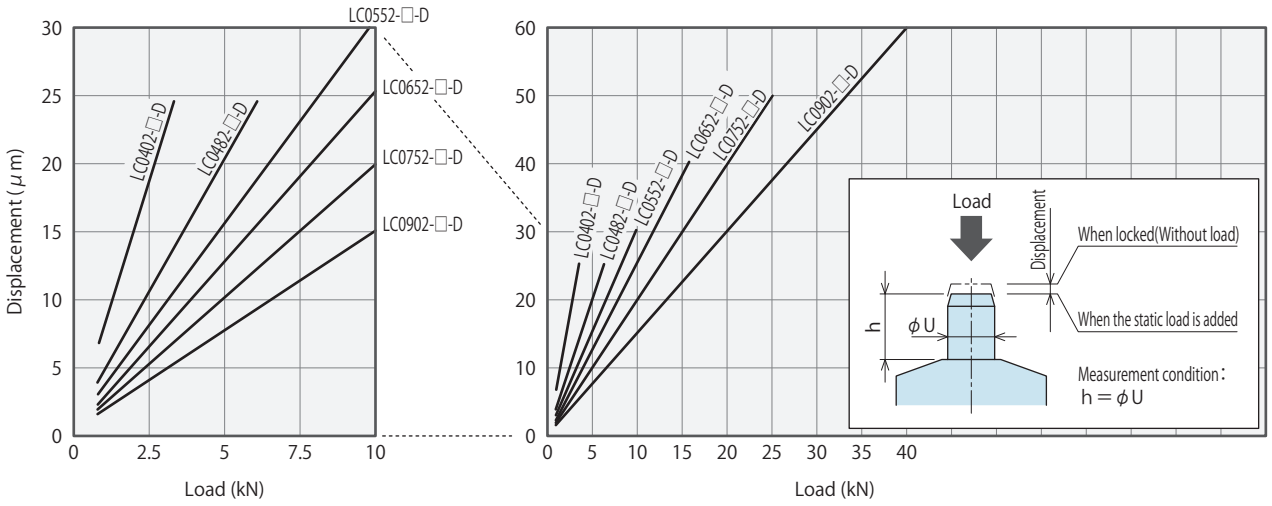
Support Force Graph ※ This graph shows the support force under static load condition.



Model No. / Operating Hydraulic Pressure (MPa)	Support Force (kN) LC0402-□-D	LC0482-□-D	LC0552-□-D	LC0652-□-D	LC0752-□-D	LC0902-□-D
7	3.5	6.3	10.0	16.0	25.0	40.0
6.5	3.2	5.8	9.2	14.7	22.9	36.7
6	2.9	5.3	8.4	13.4	20.9	33.4
5.5	2.6	4.7	7.5	12.0	18.8	30.0
5	2.3	4.2	6.7	10.7	16.7	26.7
4.5	2.0	3.7	5.8	9.3	14.6	23.3
4	1.7	3.2	5.0	8.0	12.5	20.0
3.5	1.5	2.6	4.2	6.7	10.4	16.7
3	1.2	2.1	3.3	5.3	8.3	13.3
2.5	0.9	1.6	2.5	4.0	6.3	10.0
Support Force Formula ※1 kN	0.58×P-0.58	1.05×P-1.05	1.67×P-1.67	2.67×P-2.67	4.17×P-4.17	6.67×P-6.67

Note ※1. P : Operating hydraulic pressure (MPa)

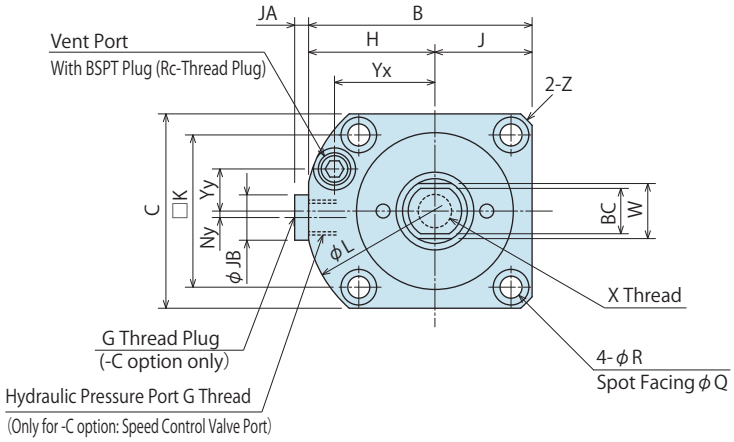
Load / Displacement Graph ※ This graph shows the static load displacement at 7 MPa hydraulic pressure.

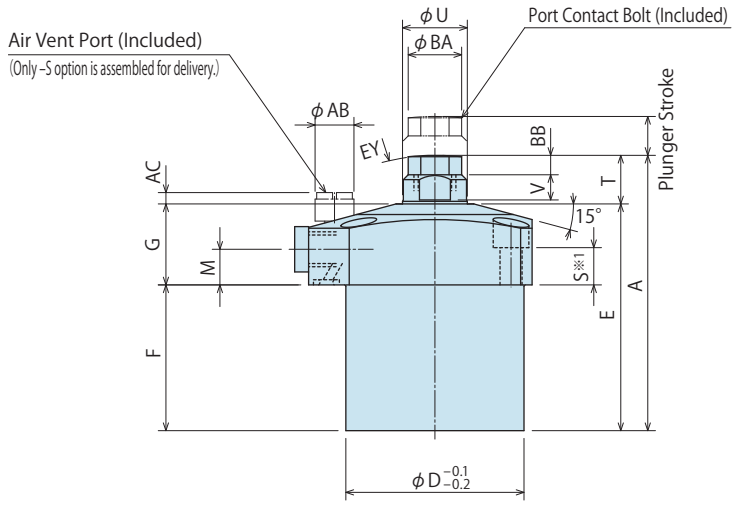


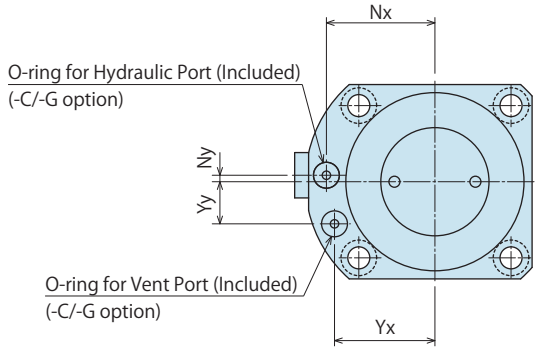
External Dimensions

C：Gasket Option (with G Thread Plug)

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



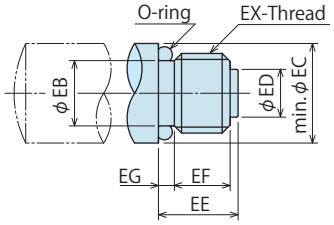




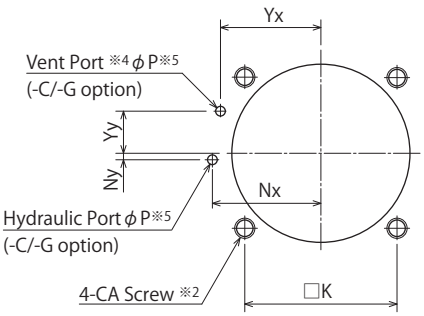
Note

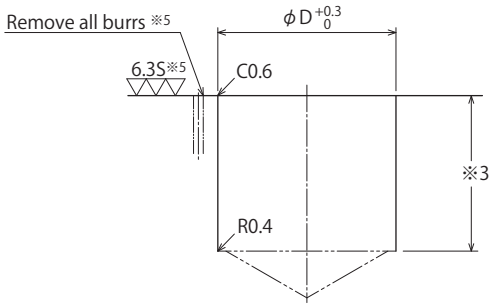
※1. Mounting bolts are not provided.
Customer should prepare based on dimension "S".

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.

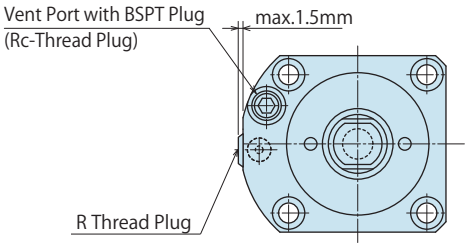
※4. The vent port needs to be processed in an open air environment without the presence of coolant, dust, etc. to avoid any internal contamination.
Refer to P.623 : Appropriate Position of Vent Port for reference.

※5. This process indicates -C/-G：Gasket option.

Piping Method

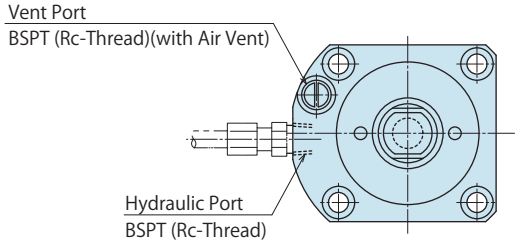
G：Gasket Option (with R Thread Plug)

※The graph shows LC-G□.

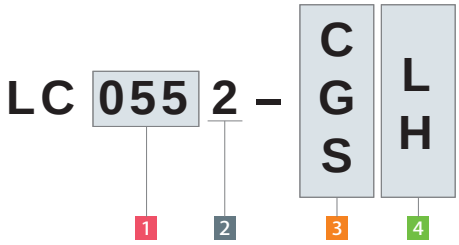


S：Piping Option (Rc-Thread)

※The graph shows LC-S□.



Model No. Indication



(Format Example：LC0552-CL、LC0902-SH)

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.	LC0402-□□	LC0482-□□	LC0552-□□	LC0652-□□	LC0752-□□	LC0902-□□
Plunger Stroke	8	10	12	14	16	20
A	67	75	85	101	126	149
B	54	61	69	81	92	107
C	45	51	60	70	80	95
D	40	48	55	65	75	90
E	56	64	70	85	107	128
F	31	39	45	56	72	88
G	25	25	25	29	35	40
H	31.5	35.5	39	46	52	59.5
J	22.5	25.5	30	35	40	47.5
K	34	40	47	55	63	75
L	68	73	80	94	106	126
M	11	11	11	11	13	13
Nx	26	30	33.5	39.5	45	52.5
Ny	5	0	0	0	0	0
P	3	3	3	5	5	5
Q	9.5	9.5	11	11	14	17.5
R	5.5	5.5	6.8	6.8	9	11
S	14.5	13.5	11.5	14.5	17	18
T	11	11	15	16	19	21
U	15	16	20	22	25	30
V	6	6	8	9	9	10.5
W	13	13	17	19	22	24
X (Nominal×Pitch×Depth)	M10×1.5×11	M10×1.5×11	M12×1.75×13	M12×1.75×13	M16×2×20	M16×2×20
Yx	25	28	31	37	42.5	50
Yy	8	11	13	14	15	15
Z (Chamfer)	C1	C3	R40	R47	R53	R63
AB	12	12	12	12	12	12
AC	5	4	3.5	2	1.5	0
BA	12.5	12.5	16.5	16.5	21.5	21.5
BB	4	4	6	6	9	9
BC	11	11	14	14	19	19
CA (Nominal × Pitch)	M5×0.8	M5×0.8	M6×1	M6×1	M8×1.25	M10×1.5
EY	SR50	SR50	SR80	SR80	SR125	SR125
JA	3.5	3.5	3.5	3.5	4.5	4.5
JB	14	14	14	14	19	19
Hydraulic Port -C option	G1/8	G1/8	G1/8	G1/8	G1/4	G1/4
Hydraulic Port -S option	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/4	Rc1/4
R Thread Plug -G option	R1/8	R1/8	R1/8	R1/8	R1/4	R1/4
O-ring (-C/-G option)	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7
Vent port BSPT (Rc-Thread)	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8

Contact Bolt Design Dimensions

※Please use as reference in case contact bolts (attachment) other than the attached contact bolt are designed and manufactured to the customer.

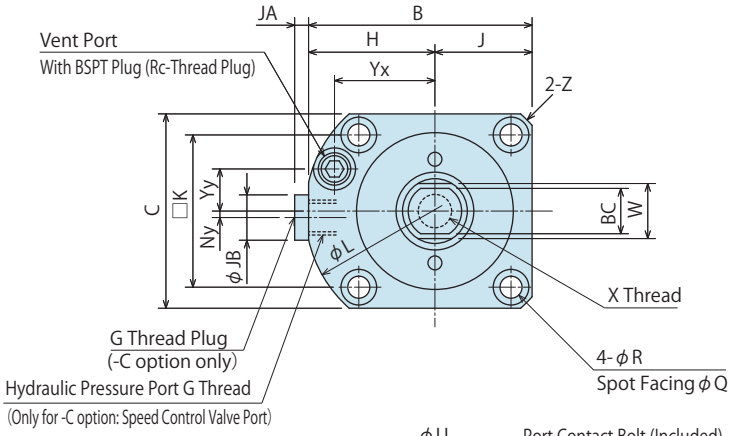
(mm)

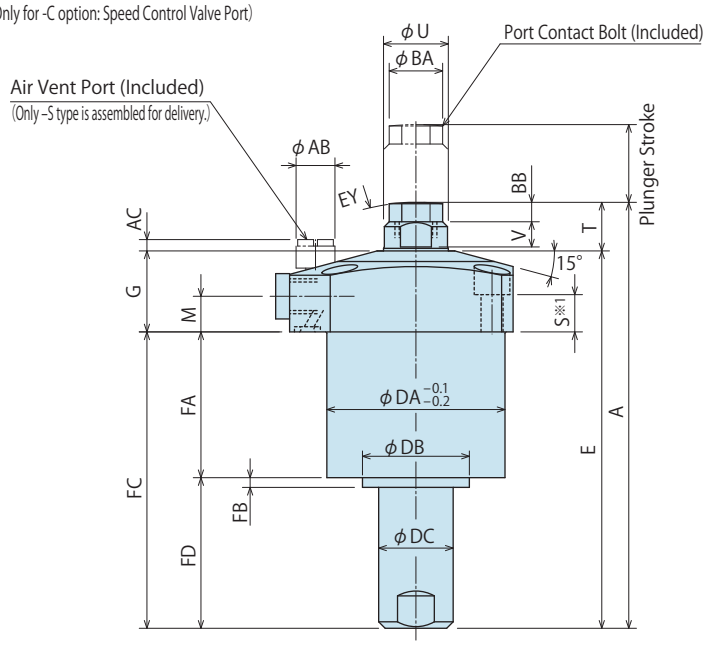
Corresponding item model number	LC0402-□□	LC0482-□□	LC0552-□□	LC0652-□□	LC0752-□□	LC0902-□□
EB	8.2	8.2	10	10	13.5	13.5
EC	12.5	12.5	16.5	16.5	21.5	21.5
ED	6	6	7.5	7.5	10.5	10.5
EE	10	10	12	12	16	16
EF	7	7	8	8	11	11
EG	2	2	3	3	4	4
EX (Nominal × Pitch)	M10×1.5	M10×1.5	M12×1.75	M12×1.75	M16×2	M16×2
O-ring	S8 (Made by NOK)	S8 (Made by NOK)	S10 (Made by NOK)	S10 (Made by NOK)	AS568-014 (70°)	AS568-014 (70°)

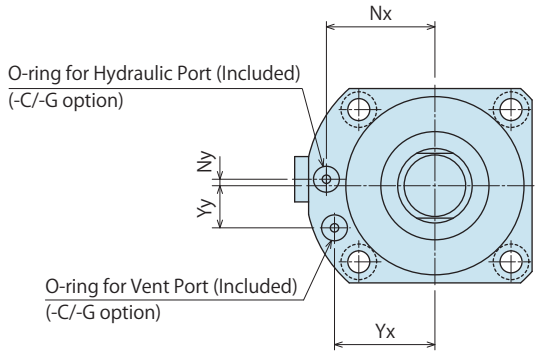
External Dimensions

C：Gasket Option (with G Thread Plug)

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



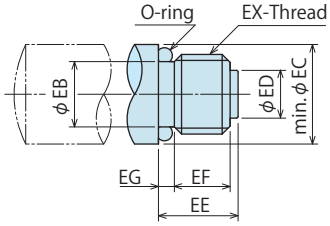




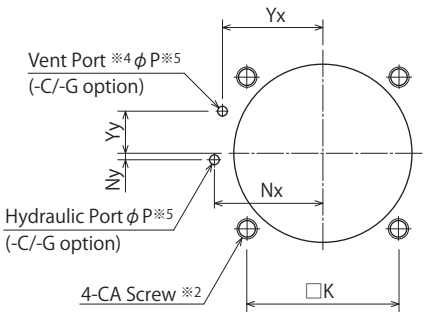
Note

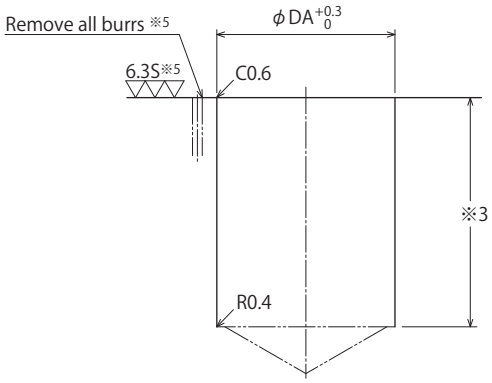
※1. Mounting bolts are not provided.
Customer should prepare based on dimension "S".

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.

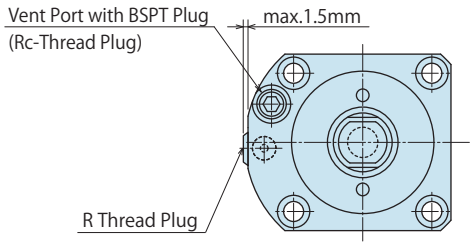
※4. The vent port needs to be processed in an open air environment without the presensce of coolant,dust, etc. to avoid any internal contamination.
Refer to P.623: Appropriate Position of Vent Port for reference.

※5. This process indicates -C/-G：Gasket option.

Piping Method

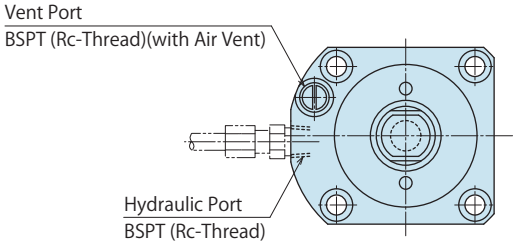
G：Gasket Option (with R Thread Plug)

※The graph shows LC-G-Q.



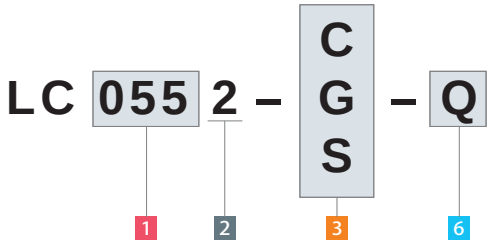
S：Piping Option (Rc-Thread)

※The graph shows LC-S-Q.



Model No. Indication

(Format Example：LC0552-C-Q、LC0902-S-Q)



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

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.		LC0402-□-Q	LC0482-□-Q	LC0552-□-Q	LC0652-□-Q	LC0752-□-Q	LC0902-□-Q
Plunger Stroke		16	20	24	28	32	40
A		95	112	131.5	149.5	177.5	212
B		54	61	69	81	92	107
C		45	51	60	70	80	95
DA		40	48	55	65	75	90
DB		0	0	33	36	42	52
DC		19	19	23	23	30	30
E		84	101	116.5	133.5	158.5	191
FA		31	39	45	56	72	88
FB		0	0	3	5	10	14
FC		59	76	91.5	104.5	123.5	151
FD		28	37	46.5	48.5	51.5	63
G		25	25	25	29	35	40
H		31.5	35.5	39	46	52	59.5
J		22.5	25.5	30	35	40	47.5
K		34	40	47	55	63	75
L		68	73	80	94	106	126
M		11	11	11	11	13	13
Nx		26	30	33.5	39.5	45	52.5
Ny		5	0	0	0	0	0
P		3	3	3	5	5	5
Q		9.5	9.5	11	11	14	17.5
R		5.5	5.5	6.8	6.8	9	11
S		14.5	13.5	11.5	14.5	17	18
T		11	11	15	16	19	21
U		15	16	20	22	25	30
V		6	6	8	9	9	10.5
W		13	13	17	19	22	24
X (Nominal×Pitch×Depth)		M10×1.5×11	M10×1.5×11	M12×1.75×13	M12×1.75×13	M16×2×20	M16×2×20
Yx		25	28	31	37	42.5	50
Yy		8	11	13	14	15	15
Z (Chamfer)		C1	C3	R40	R47	R53	R63
AB		12	12	12	12	12	12
AC		5	4	3.5	2	1.5	0
BA		12.5	12.5	16.5	16.5	21.5	21.5
BB		4	4	6	6	9	9
BC		11	11	14	14	19	19
CA (Nominal × Pitch)		M5×0.8	M5×0.8	M6×1	M6×1	M8×1.25	M10×1.5
EY		SR50	SR50	SR80	SR80	SR125	SR125
JA		3.5	3.5	3.5	3.5	4.5	4.5
JB		14	14	14	14	19	19
Hydraulic Port	-C option	G1/8	G1/8	G1/8	G1/8	G1/4	G1/4
	-S option	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/4	Rc1/4
R thread Plug	-G option	R1/8	R1/8	R1/8	R1/8	R1/4	R1/4
O-ring (-C/-G option)		1BP5	1BP5	1BP5	1BP7	1BP7	1BP7
Vent Port BSPT (Rc-Thread)		Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8

Contact Bolt Design Dimensions

※Please use as reference in case contact bolts (attachment) other than the attached contact bolt are designed and manufactured to the customer.

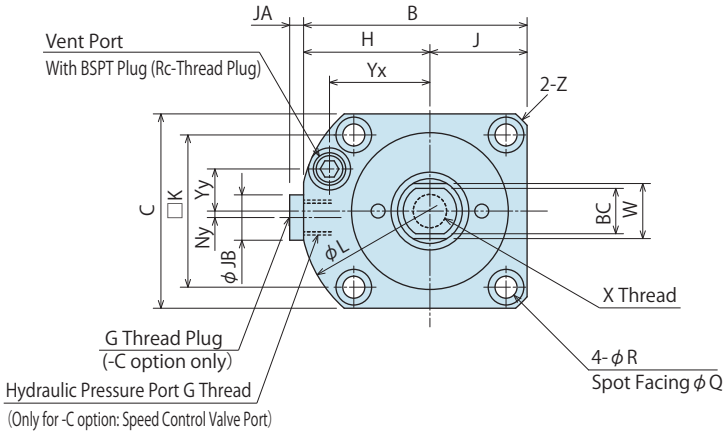
(mm)

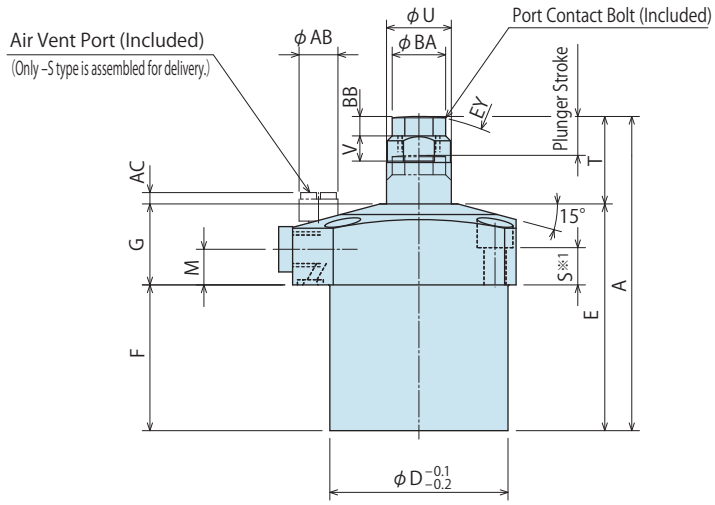
Corresponding Item Model No.	LC0402-□-Q	LC0482-□-Q	LC0552-□-Q	LC0652-□-Q	LC0752-□-Q	LC0902-□-Q
EB	8.2	8.2	10	10	13.5	13.5
EC	12.5	12.5	16.5	16.5	21.5	21.5
ED	6	6	7.5	7.5	10.5	10.5
EE	10	10	12	12	16	16
EF	7	7	8	8	11	11
EG	2	2	3	3	4	4
EX (Nominal × Pitch)	M10×1.5	M10×1.5	M12×1.75	M12×1.75	M16×2	M16×2
O-ring	S8 (Made by NOK)	S8 (Made by NOK)	S10 (Made by NOK)	S10 (Made by NOK)	AS568-014 (70°)	AS568-014 (70°)

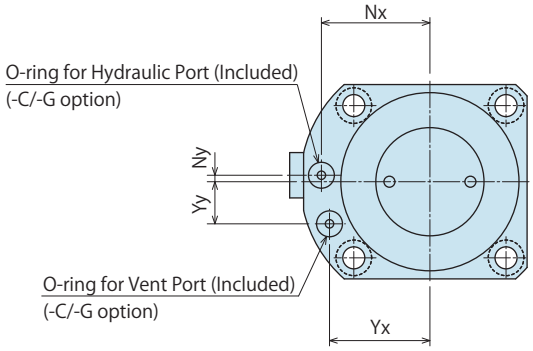
External Dimensions

C：Gasket Option (with G Thread Plug)

※This drawing shows the released state of LC-C□-E (plunger rises).



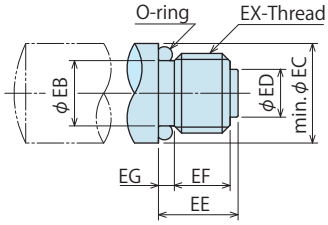




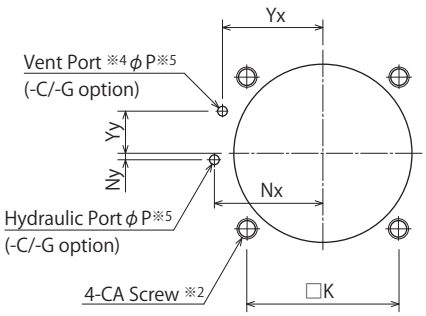
Note

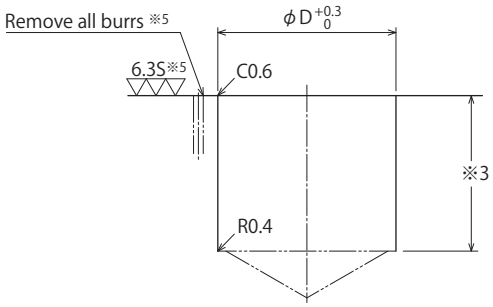
※1. Mounting bolts are not provided.
Customer should prepare based on dimension "S".

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.

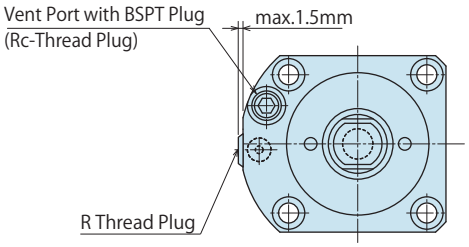
※4. The vent port needs to be processed in an open air environment without the presence of coolant, dust, etc. to avoid any internal contamination.
Refer to P.623: Appropriate Position of Vent Port for reference.

※5. This process indicates -C/-G：Gasket option.

Piping Method

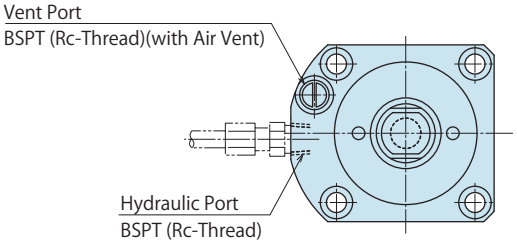
G：Gasket Option (with R Thread Plug)

※The graph shows LC-G□-E.



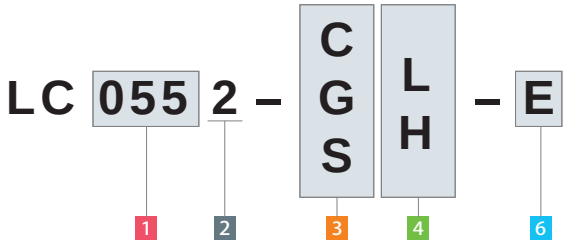
S：Piping Option (Rc-Thread)

※The graph shows LC-S□-E.



Model No. Indication

(Format Example：LC0552-CL-E、LC0902-SH-E)



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

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	LC0402-□□-E	LC0482-□□-E	LC0552-□□-E	LC0652-□□-E	LC0752-□□-E	LC0902-□□-E
Plunger Stroke	8	10	12	14	16	20
A	75	85	97	115	142	169
B	54	61	69	81	92	107
C	45	51	60	70	80	95
D	40	48	55	65	75	90
E	56	64	70	85	107	128
F	31	39	45	56	72	88
G	25	25	25	29	35	40
H	31.5	35.5	39	46	52	59.5
J	22.5	25.5	30	35	40	47.5
K	34	40	47	55	63	75
L	68	73	80	94	106	126
M	11	11	11	11	13	13
Nx	26	30	33.5	39.5	45	52.5
Ny	5	0	0	0	0	0
P	3	3	3	5	5	5
Q	9.5	9.5	11	11	14	17.5
R	5.5	5.5	6.8	6.8	9	11
S	14.5	13.5	11.5	14.5	17	18
T	19	21	27	30	35	41
U	15	16	20	22	25	30
V	6	6	8	9	9	10.5
W	13	13	17	19	22	24
X (Nominal×Pitch×Depth)	M10×1.5×11	M10×1.5×11	M12×1.75×13	M12×1.75×13	M16×2×20	M16×2×20
Yx	25	28	31	37	42.5	50
Yy	8	11	13	14	15	15
Z (Chamfer)	C1	C3	R40	R47	R53	R63
AB	12	12	12	12	12	12
AC	5	4	3.5	2	1.5	0
BA	12.5	12.5	16.5	16.5	21.5	21.5
BB	4	4	6	6	9	9
BC	11	11	14	14	19	19
CA (Nominal × Pitch)	M5×0.8	M5×0.8	M6×1	M6×1	M8×1.25	M10×1.5
EY	SR50	SR50	SR80	SR80	SR125	SR125
JA	3.5	3.5	3.5	3.5	4.5	4.5
JB	14	14	14	14	19	19
Hydraulic Port -C option	G1/8	G1/8	G1/8	G1/8	G1/4	G1/4
Hydraulic Port -S option	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/4	Rc1/4
R Thread Plug -G option	R1/8	R1/8	R1/8	R1/8	R1/4	R1/4
O-ring (-C/-G option)	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7
Vent Port BSPT (Rc-Thread)	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8

Contact Bolt Design Dimensions

※Please use as reference in case contact bolts (attachment) other than the attached contact bolt are designed and manufactured to the customer.

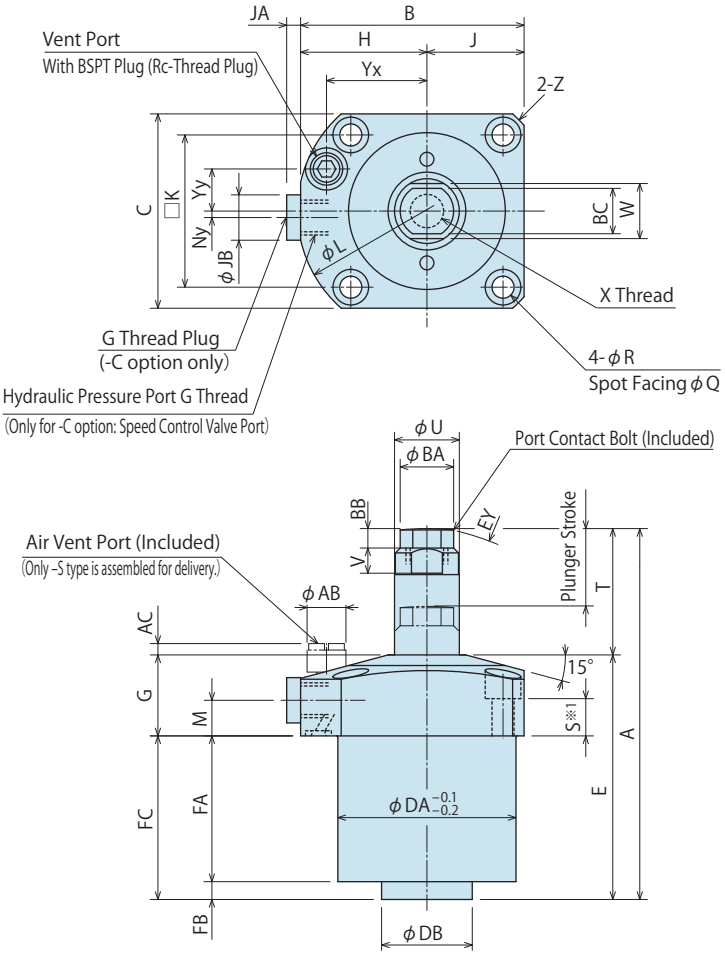
(mm)

Corresponding Item Model No.	LC0402-□□-E	LC0482-□□-E	LC0552-□□-E	LC0652-□□-E	LC0752-□□-E	LC0902-□□-E
EB	8.2	8.2	10	10	13.5	13.5
EC	12.5	12.5	16.5	16.5	21.5	21.5
ED	6	6	7.5	7.5	10.5	10.5
EE	10	10	12	12	16	16
EF	7	7	8	8	11	11
EG	2	2	3	3	4	4
EX (Nominal × Pitch)	M10×1.5	M10×1.5	M12×1.75	M12×1.75	M16×2	M16×2
O-ring	S8 (Made by NOK)	S8 (Made by NOK)	S10 (Made by NOK)	S10 (Made by NOK)	AS568-014(70°)	AS568-014(70°)

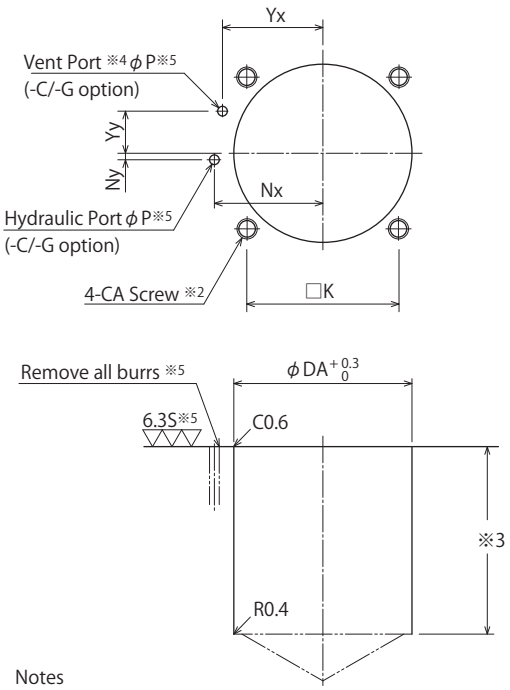
External Dimensions

C：Gasket Option (with G Thread Plug)

※This drawing shows the released state of LC-C-EQ (plunger rises).



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.

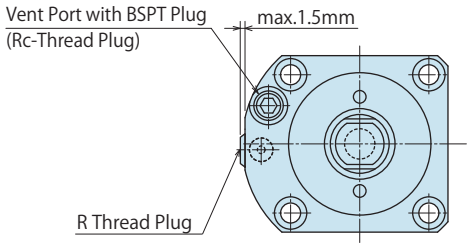
※4. The vent port needs to be processed in an open air environment without the presence of coolant, dust, etc. to avoid any internal contamination.
Refer to P.623 : Appropriate Position of Vent Port for reference.

※5. This process indicates -C/-G：Gasket option.

Piping Method

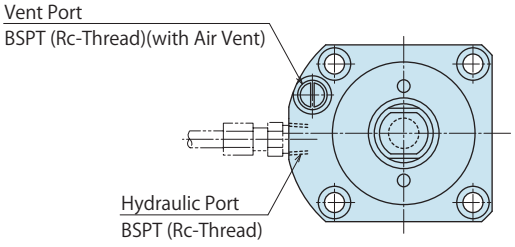
G：Gasket Option (with R Thread Plug)

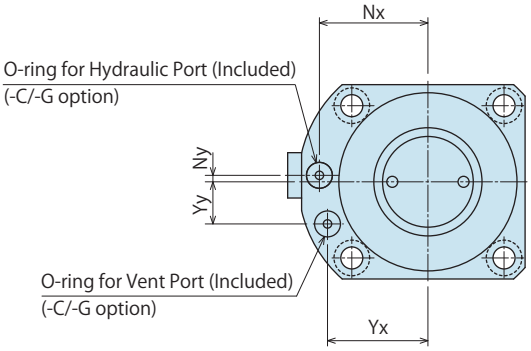
※The graph shows LC-G-EQ.



S：Piping Option (Rc-Thread)

※The graph shows LC-S-EQ.

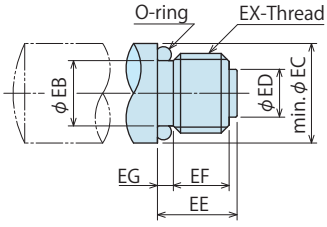




Note

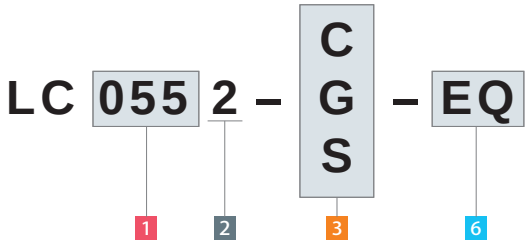
※1. Mounting bolts are not provided.
Customer should prepare based on dimension "S".

Contact Bolt Design Dimensions



Model No. Indication

(Format Example：LC0552-C-EQ、LC0902-S-EQ)



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

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	LC0402-□-EQ	LC0482-□-EQ	LC0552-□-EQ	LC0652-□-EQ	LC0752-□-EQ	LC0902-□-EQ
Plunger Stroke	16	20	24	28	32	40
A	83	98.5	114.5	138.5	170	203.5
B	54	61	69	81	92	107
C	45	51	60	70	80	95
DA	40	48	55	65	75	90
DB	0	26	28	31	36	44
E	56	67.5	75.5	94.5	119	142.5
FA	31	39	45	56	72	88
FB	0	3.5	5.5	9.5	12	14.5
FC	31	42.5	50.5	65.5	84	102.5
G	25	25	25	29	35	40
H	31.5	35.5	39	46	52	59.5
J	22.5	25.5	30	35	40	47.5
K	34	40	47	55	63	75
L	68	73	80	94	106	126
M	11	11	11	11	13	13
Nx	26	30	33.5	39.5	45	52.5
Ny	5	0	0	0	0	0
P	3	3	3	5	5	5
Q	9.5	9.5	11	11	14	17.5
R	5.5	5.5	6.8	6.8	9	11
S	14.5	13.5	11.5	14.5	17	18
T	27	31	39	44	51	61
U	15	16	20	22	25	30
V	6	6	8	9	9	10.5
W	13	13	17	19	22	24
X (Nominal×Pitch×Depth)	M10×1.5×11	M10×1.5×11	M12×1.75×13	M12×1.75×13	M16×2×20	M16×2×20
Yx	25	28	31	37	42.5	50
Yy	8	11	13	14	15	15
Z (Chamfer)	C1	C3	R40	R47	R53	R63
AB	12	12	12	12	12	12
AC	5	4	3.5	2	1.5	0
BA	12.5	12.5	16.5	16.5	21.5	21.5
BB	4	4	6	6	9	9
BC	11	11	14	14	19	19
CA (Nominal × Pitch)	M5×0.8	M5×0.8	M6×1	M6×1	M8×1.25	M10×1.5
EY	SR50	SR50	SR80	SR80	SR125	SR125
JA	3.5	3.5	3.5	3.5	4.5	4.5
JB	14	14	14	14	19	19
Hydraulic Port -C option	G1/8	G1/8	G1/8	G1/8	G1/4	G1/4
Hydraulic Port -S option	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/4	Rc1/4
R Thread Plug -G option	R1/8	R1/8	R1/8	R1/8	R1/4	R1/4
O-ring (-C/-G option)	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7
Vent Port BSPT (Rc-Thread)	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8

Contact Bolt Design Dimensions

※Please use as reference in case contact bolts (attachment) other than the attached contact bolt are designed and manufactured to the customer.

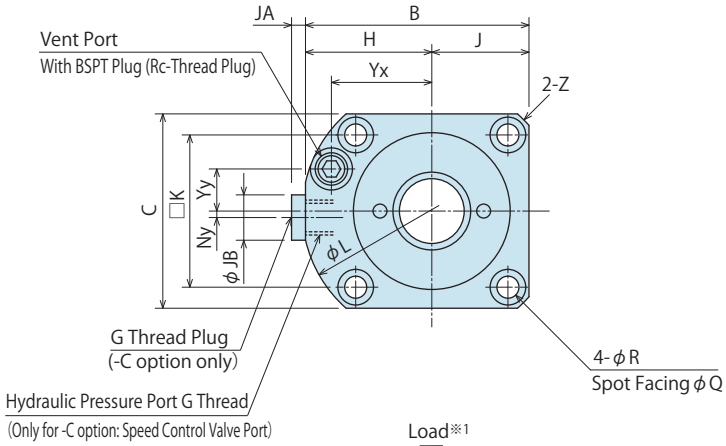
(mm)

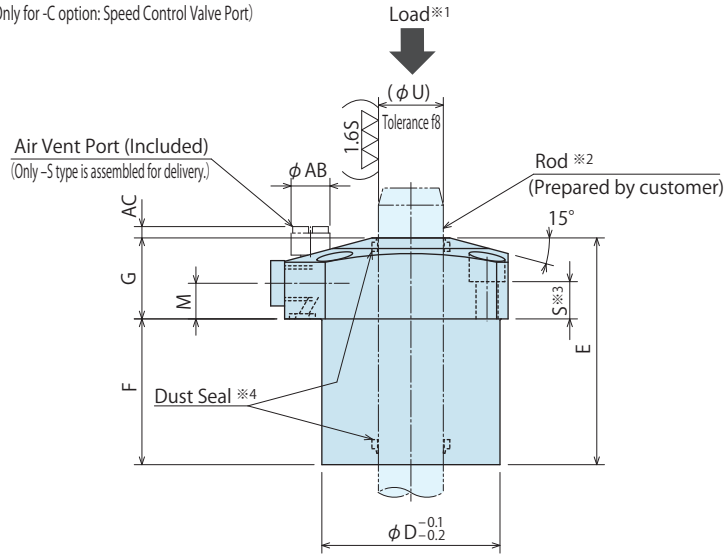
Corresponding Item Model No.	LC0402-□-EQ	LC0482-□-EQ	LC0552-□-EQ	LC0652-□-EQ	LC0752-□-EQ	LC0902-□-EQ
EB	8.2	8.2	10	10	13.5	13.5
EC	12.5	12.5	16.5	16.5	21.5	21.5
ED	6	6	7.5	7.5	10.5	10.5
EE	10	10	12	12	16	16
EF	7	7	8	8	11	11
EG	2	2	3	3	4	4
EX (Nominal × Pitch)	M10×1.5	M10×1.5	M12×1.75	M12×1.75	M16×2	M16×2
O-ring	S8 (Made by NOK)	S8 (Made by NOK)	S10 (Made by NOK)	S10 (Made by NOK)	AS568-014(70°)	AS568-014(70°)

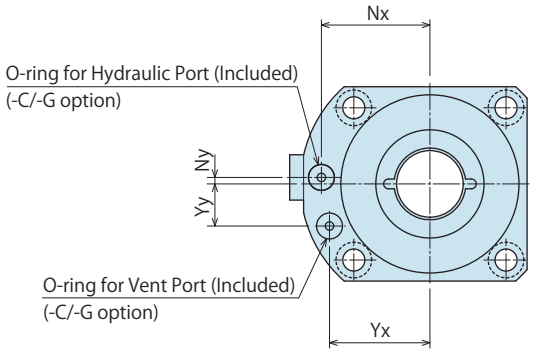
External Dimensions

C：Gasket Option (with G Thread Plug)

※The graph shows LC-C-D.







Notes

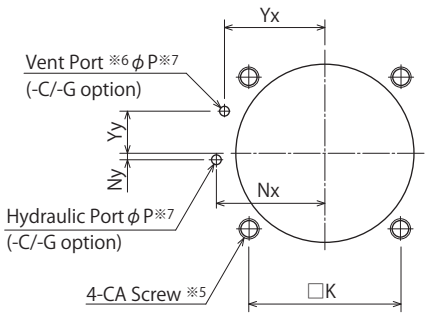
※1. The load acts towards the arrow direction (⬇) as shown in the drawing. If used in a reversed position the internal parts are likely to be damaged.

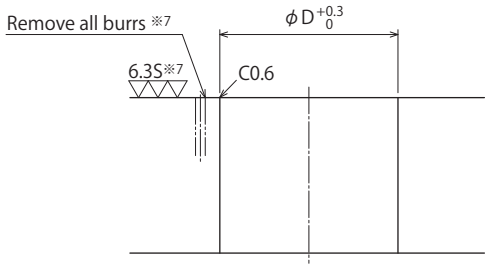
※2. The surface hardness of the rod (prepared by the customer) should be above HRc60. (The hard Cr plated metal is acceptable.)

※3. Mounting bolts are not provided.
Customer should prepare based on dimension "S".

※4. Deburr the rod end, and pay attention not to damage the dust seal when the rod is inserted into the body (upper and lower parts).

Machining Dimensions of Mounting Area





Notes

※5. CA tapping depth should be calculated so that mounting bolts engage fixture by at least 1.5 x bolt diameter.

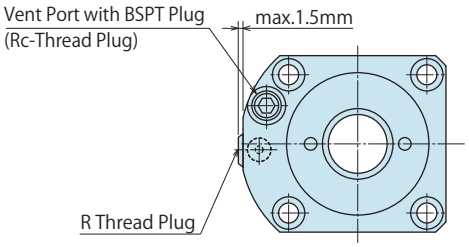
※6. The vent port needs to be processed in an open air environment without the presence of coolant, dust, etc. to avoid any internal contamination.
Refer to P.623 : Appropriate Position of Vent Port for reference.

※7. This process indicates -C/-G：Gasket option.

Piping Method

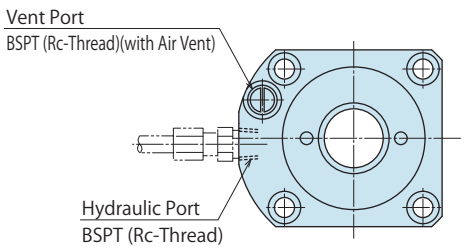
G：Gasket Option (with R Thread Plug)

※The graph shows LC-G-D.

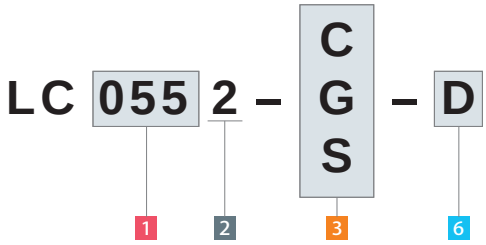


S：Piping Option (Rc-Thread)

※The graph shows LC-S-D.



Model No. Indication



(Format Example：LC0552-C-D、LC0902-S-D)

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

External Dimensions and Machining Dimensions for Mounting

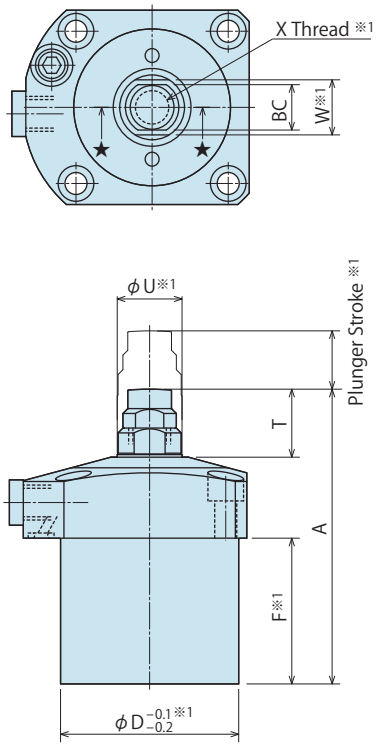
(mm)

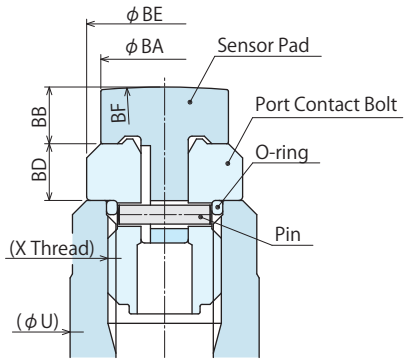
Model No.		LC0402-□-D	LC0482-□-D	LC0552-□-D	LC0652-□-D	LC0752-□-D	LC0902-□-D
B		54	61	69	81	92	107
C		45	51	60	70	80	95
D		40	48	55	65	75	90
E		56	64	70	85	107	128
F		31	39	45	56	72	88
G		25	25	25	29	35	40
H		31.5	35.5	39	46	52	59.5
J		22.5	25.5	30	35	40	47.5
K		34	40	47	55	63	75
L		68	73	80	94	106	126
M		11	11	11	11	13	13
Nx		26	30	33.5	39.5	45	52.5
Ny		5	0	0	0	0	0
P		3	3	3	5	5	5
Q		9.5	9.5	11	11	14	17.5
R		5.5	5.5	6.8	6.8	9	11
S		14.5	13.5	11.5	14.5	17	18
U		$15^{-0.016}_{-0.043}$	$16^{-0.016}_{-0.043}$	$20^{-0.020}_{-0.053}$	$22^{-0.020}_{-0.053}$	$25^{-0.020}_{-0.053}$	$30^{-0.020}_{-0.053}$
Yx		25	28	31	37	42.5	50
Yy		8	11	13	14	15	15
Z		C1	C3	R40	R47	R53	R63
AB		12	12	12	12	12	12
AC		5	4	3.5	2	1.5	0
CA (Nominal × Pitch)		M5×0.8	M5×0.8	M6×1	M6×1	M8×1.25	M10×1.5
JA		3.5	3.5	3.5	3.5	4.5	4.5
JB		14	14	14	14	19	19
Hydraulic Port	-C option	G1/8	G1/8	G1/8	G1/8	G1/4	G1/4
	-S option	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/4	Rc1/4
R Thread Plug	-G option	R1/8	R1/8	R1/8	R1/8	R1/4	R1/4
O-ring (-C/-G option)		1BP5	1BP5	1BP5	1BP7	1BP7	1BP7
Vent Port BSPT (Rc-Thread)		Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8

External Dimensions

LC-□M：Hydraulic Advance Model

※ This drawing shows the released state of LC-C□M (before the plunger is lifted).
Refer to P.583, P.584 LC : Hydraulic advance model (standard) regarding to the dimension that is not mentioned above.

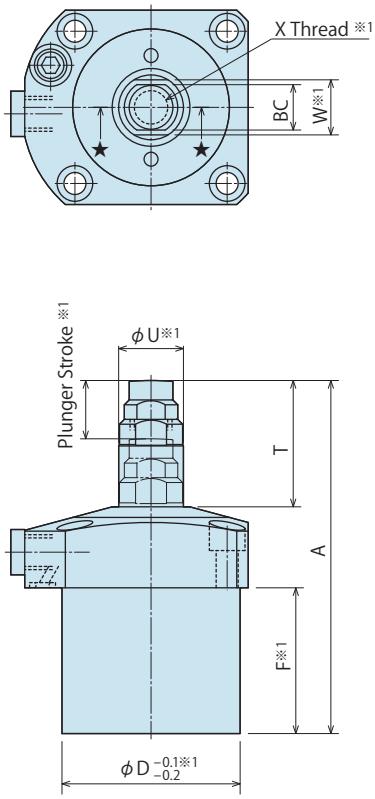




A Section of ★-★ (Common)

LC-□M-E：Spring Advance Model

※ This drawing shows the released state of LC-C□M-E (plunger rises).
Refer to P.587, P.588 LC-E : spring advance model regarding to the dimension that is not mentioned above.

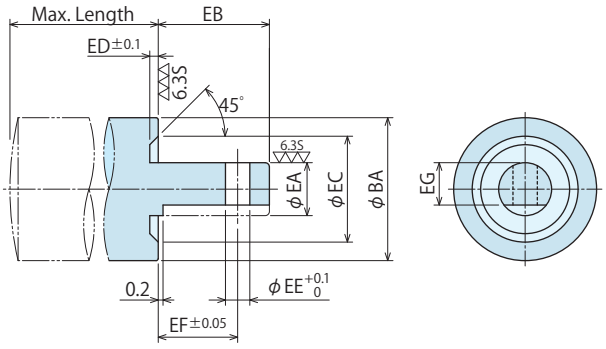


Notes

※1. ※1 dimension is the same as LD standard model and LD-E model.

1. Even if the contact bolt for LD standard model, LD-E model is exchanged with air sensing option, it doesn't work as air sensing option.
   Internal parts (plunger) must be changed with air sensor corresponding product.
2. Please contact us for the dimension of long stroke model and short model.
3. Please refer to P.595, P.596 for air sensing chart.

Sensor Pad Design Dimension

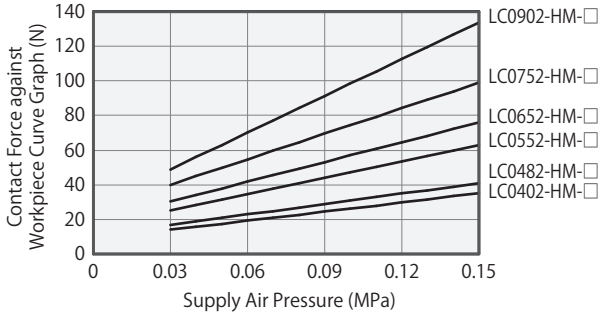


※Please machine it following the dimensions for design when exchanging sensor pads.

Contact Force against Workpiece Curve Graph (Reference)

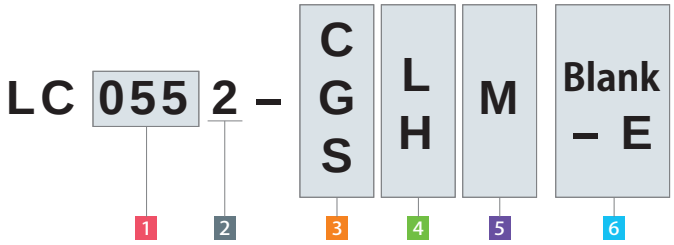
This graph shows the workpiece contacting force (reference value) when work support is high spring force (H-Type) in the middle of plunger stroke.

※ Regarding to work piece contacting force, please refer to P.595 .



Model No. Indication

(Format Example：LC0552-CLM、LC0902-SHM-E)



1 Body Size
2 Design No.
3 Piping Method
4 Plunger Spring Force
5 Plunger Action Confirmation (When M is chosen)
6 Options

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.		LC0402-□□M-□	LC0482-□□M-□	LC0552-□□M-□	LC0652-□□M-□	LC0752-□□M-□	LC0902-□□M-□
Plunger Stroke		8	10	12	14	16	20
A	LC: Hydraulic Advance Model	71	79	91	107	135	158
	LC-E: Spring Advance Model	79	89	103	121	151	178
D※1		40	48	55	65	75	90
F※1		31	39	45	56	72	88
T	LC: Hydraulic Advance Model	15	15	21	22	28	30
	LC-E: Spring Advance Model	23	25	33	36	44	50
U※1		15	16	20	22	25	30
W※1		13	13	17	19	22	24
X (Nominal×Pitch×Depth) ※1		M10×1.5×11	M10×1.5×11	M12×1.75×13	M12×1.75×13	M16×2×20	M16×2×20
BA		10.5	10.5	13.5	13.5	18.5	18.5
BB		4	4	6	6	9	9
BC		11	11	14	14	19	19
BD		4	4	6	6	9	9
BE		12.5	12.5	16.5	16.5	21.5	21.5
BF		SR50	SR50	SR80	SR80	SR125	SR125
Pin (Diameter×Length)		ϕ1×7.8	ϕ1×7.8	ϕ2×9.8	ϕ2×9.8	ϕ2×11.8	ϕ2×11.8
O-ring		S8 (Made by NOK)	S8 (Made by NOK)	S10 (Made by NOK)	S10 (Made by NOK)	AS568-014 (70°)	AS568-014 (70°)

Note ※1. ※1 dimension is the same as LD standard model and LD-E model .

Sensor Pad Design Dimension

(mm)

Corresponding Item Model No.	LC0402-□□M-□	LC0482-□□M-□	LC0552-□□M-□	LC0652-□□M-□	LC0752-□□M-□	LC0902-□□M-□
EA	$4g7^{-0.004}_{-0.016}$	$4g7^{-0.004}_{-0.016}$	$5g7^{-0.004}_{-0.016}$	$5g7^{-0.004}_{-0.016}$	$6g7^{-0.004}_{-0.016}$	$6g7^{-0.004}_{-0.016}$
EB	7.5	7.5	10.5	10.5	13.5	13.5
EC	8.5	8.5	10	10	14	14
ED	0.8	0.8	0.8	0.8	1.3	1.3
EE	1.2	1.2	2.3	2.3	2.3	2.3
EF	5.3	5.3	7.5	7.5	10.5	10.5
EG	3.2	3.2	3.9	3.9	5	5
Max. Length ※2	max. 8	max. 8	max. 12	max. 12	max. 18	max. 18

Note ※2. Sensor response may decrease if the pad is longer than maximum length.

Air Sensing Option (Plunger Action Confirmation･･･M：Air Sensing Option)

Plunger action is detected by the circuit at the vent port like the drawing below. This is done by detecting the differential pressure between P1 and P2 with air catch sensor.

- Action confirmation works even for the work piece that has rough, casting surface or black scale with the structure that doesn't detect directly to the work piece surface.
- This sensing accuracy design is higher than the switch sensing design with the dog option etc.
- This design is to prevent the coolant from going into sensing area.

Applicable Model

LC 055 2 - C/G/S L/H **M** - Blank/E

5 Plunger Action Confirmation ：M selected

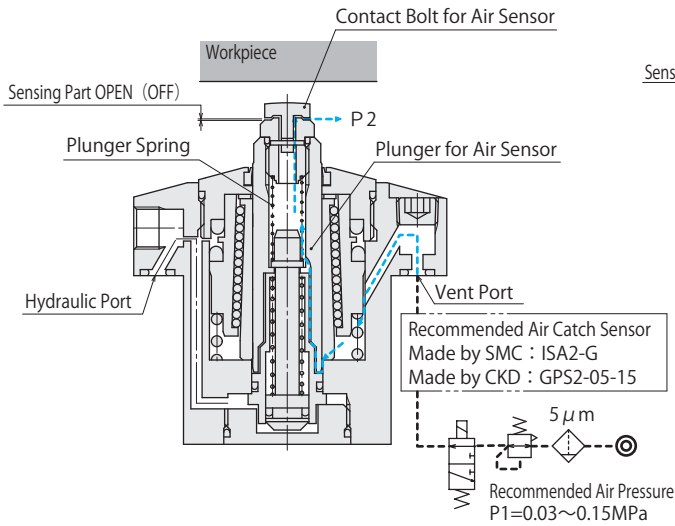
Structure Drawing

Recommend Operating Air Pressure：0.03～0.15 MPa

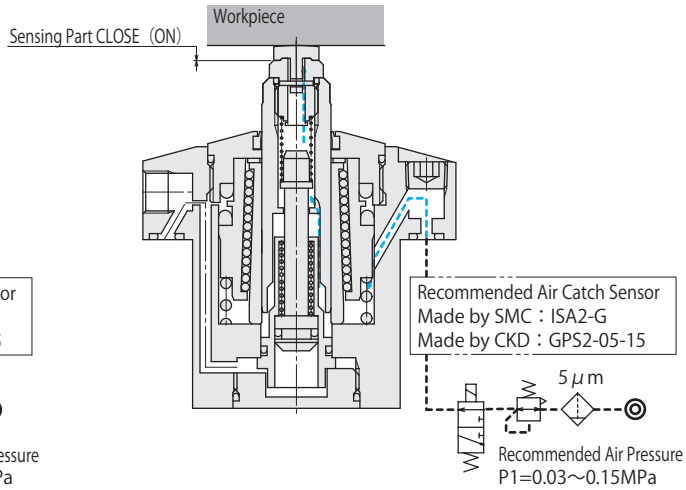
Recommended Air Catch Sensor

Manufacturer	SMC	CKD
Name	Air Catch Sensor	Gap Switch
Model	ISA2-G	GPS2-05-15

LC When releasing (Air Sensor OFF)



LC Plunger extends・Contact with workpiece（Air Sensor ON）



Workpiece Contacting Force Formula when using Air Sensor ※1

Workpiece Contacting Force（N）＝Plunger Spring Force（N）＋Supply Air Pressure（MPa）× U^2（mm）× π ／4

Model No.		LC0402-□□M LC0402-□□M-E	LC0482-□□M LC0482-□□M-E	LC0552-□□M LC0552-□□M-E	LC0652-□□M LC0652-□□M-E	LC0752-□□M LC0752-□□M-E	LC0902-□□M LC0902-□□M-E
U	mm	15	16	20	22	25	30
Plunger Spring Force※2 N	L:Low Spring Force	4.7～7.8	5.8～9.7	8.3～14.6	9.8～14.6	12.4～18.8	14.6～21.0
	H:High Spring Force	6.2～11.0	7.9～13.6	10.1～21.9	15.8～22.0	18.7～31.9	21.4～34.2

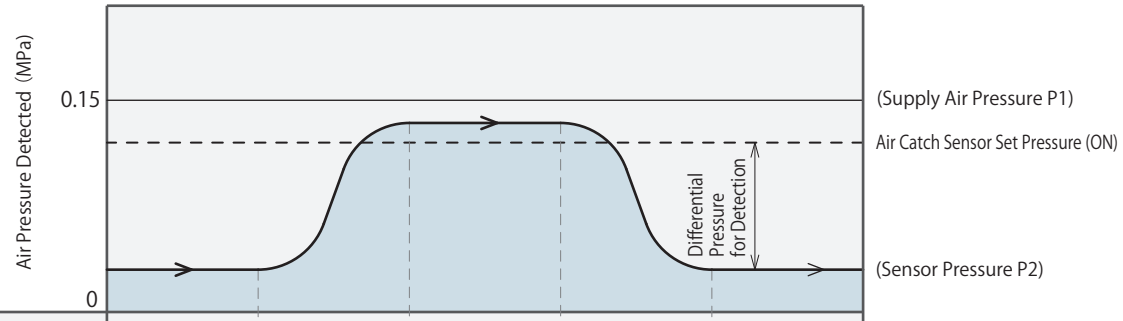
Notes

※1. Please prepare the stopper if necessary when the work piece is light and thin. There is a possibility to push up the workpiece.

※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.

Air Sensing Chart

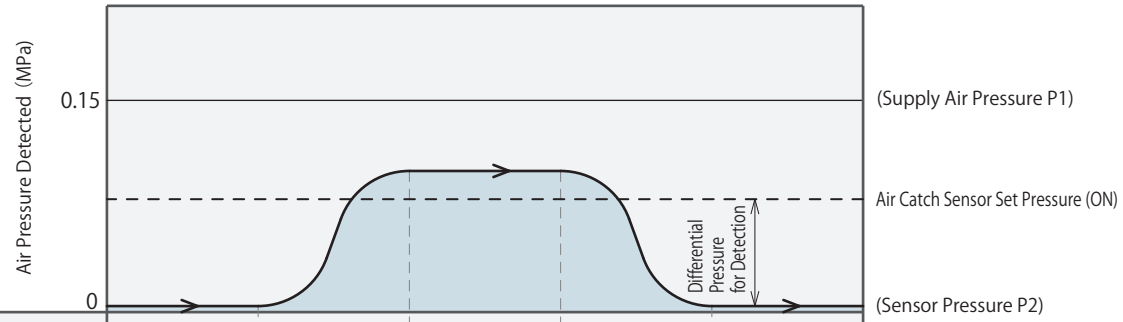
Connect 1 piece of work support with one air catch sensor
In the case of air catch sensor, supply pressure P1=0.15MPa



Air Catch Sensor		OFF	OFF→ON	ON	ON→OFF	OFF
Hydraulic Advance Model	Hydraulic Valve	Hydraulic Pressure OFF	Hydraulic Pressure ON	Hydraulic Pressure ON	Hydraulic Pressure OFF	Hydraulic Pressure OFF
	Work support action	Released State	Rising up action completed In the middle of locking action	Locking action completed	Releasing lock During going down	Release action completed
Spring Advance Model	Hydraulic Valve	Hydraulic Pressure OFF	Hydraulic Pressure OFF	Hydraulic Pressure ON	Hydraulic Pressure OFF	Hydraulic Pressure OFF
	Work support action	Released State	Carrying workpiece in	Locking action completed	Carrying workpiece out	Release action completed

Note 1. Depending on the used condition, detecting differential pressure becomes lower by repeated action. Please tell us to overhaul when the detecting differential pressure is lower than before.

Connect 4 piece of work support with one air catch sensor
In the case of air catch sensor, supply pressure P1=0.15MPa



Air Catch Sensor		OFF	OFF→ON	ON	ON→OFF	OFF
Hydraulic Advance Model	Hydraulic Valve	Hydraulic Pressure OFF	Hydraulic Pressure ON	Hydraulic Pressure ON	Hydraulic Pressure OFF	Hydraulic Pressure OFF
	Work support action	Released State	Rising up action completed In the middle of locking action	Locking action completed	Releasing lock During going down	Release action completed
Spring Advance Model	Hydraulic Valve	Hydraulic Pressure OFF	Hydraulic Pressure OFF	Hydraulic Pressure ON	Hydraulic Pressure OFF	Hydraulic Pressure OFF
	Work support action	Released State	Carrying workpiece in	Locking action completed	Carrying workpiece out	Release action completed

Note 1. Depending on the used condition, detecting differential pressure becomes lower by repeated action. Please tell us to overhaul when the detecting differential pressure is lower than before.

Notes

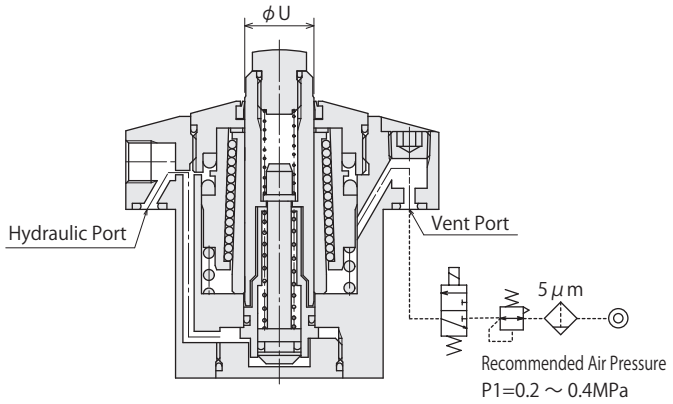
1. This specification is designed for confirming the plunger action of the work support.
   If it is used for confirming the close contact with the workpiece, other clamping (force) is necessary.
2. If the plunger goes up too fast, it may bounce back and locks itself. Resulting in a gap with the workpiece and possible damage to the internal parts due to the impact force. Set the plunger action time at 0.5-1.0 sec. to adjust the air supply with the flow control valve with check valve (meter-in), and make sure that there is no clearance with the work piece for operation.
3. If it is used in the condition where cutting fluids or cutting chips may invade, the vent port needs to have air supply at all the times.
   If it is used when the air supply is shut off, the coolant or cutting chips may contaminate the sensing area.
   This may lead to malfunctioning of the work support.
4. Even if the contact bolt for LC standard model, LC-E model is exchanged with air sensing option, it doesn't work as air sensing option. Internal parts (plunger) must be changed with air sensor corresponding product.
5. In certain circumstances it has been known for the plunger to move slower through continued use because of the airflow change in the circuit, turn the operating air supply off fully to reset the work support.

Air Purge Function

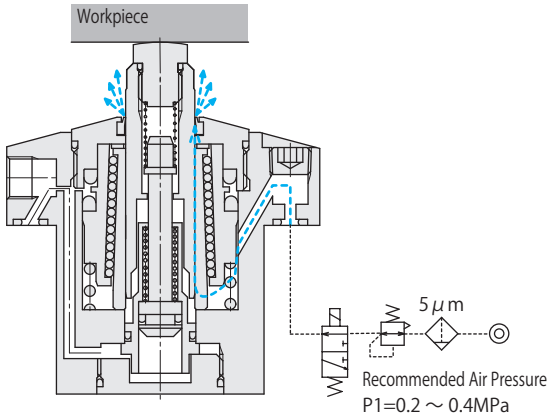
The special dust seal that features low friction and high sealing capabilities is used at LC.
However, when it is used in worse condition, if the circuit at vent port is machined like the drawing below, air purge function is available.

Structure Drawing

LC plunger going down and at releasing position (Air Supply OFF) ※1



LC plunger going up and at locking position (Air Supply ON) ※1



Workpiece Contact Force Formula when Using Air Purge Function ※2

Workpiece Contacting Force (N) = Plunger Spring Force (N) + Supply Air Pressure (MPa) × U^2 (mm) × π ／ 4

Model No.		LC0402-□□ LC0402-□□M LC0402-□□-E LC0402-□□M-E	LC0482-□□ LC0482-□□M LC0482-□□-E LC0482-□□M-E	LC0552-□□ LC0552-□□M LC0552-□□-E LC0552-□□M-E	LC0652-□□ LC0652-□□M LC0652-□□-E LC0652-□□M-E	LC0752-□□ LC0752-□□M LC0752-□□-E LC0752-□□M-E	LC0902-□□ LC0902-□□M LC0902-□□-E LC0902-□□M-E
U	mm	15	16	20	22	25	30
Plunger Spring Force※3 N	L:Low Spring Force	4.7~7.8	5.8~9.7	8.3~14.6	9.8~14.6	12.4~18.8	14.6~21.0
	H:High Spring Force	6.2~11.0	7.9~13.6	10.1~21.9	15.8~22.0	18.7~31.9	21.4~34.2

Model No.		LC0402-□-Q LC0402-□-EQ	LC0482-□-Q LC0482-□-EQ	LC0552-□-Q LC0552-□-EQ	LC0652-□-Q LC0652-□-EQ	LC0752-□-Q LC0752-□-EQ	LC0902-□-Q LC0902-□-EQ
U	mm	15	16	20	22	25	30
Plunger Spring Force※3	N	6.2~12.9	7.8~20.4	10.1~24.8	15.8~28.4	18.7~42.3	21.4~44.0

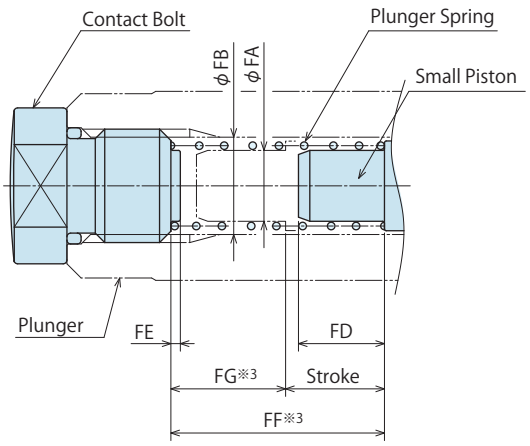
Notes
※2. Please prepare the stopper if necessary when the work piece is light and thin. There is a possibility to push up the workpiece.
※3. The plunger spring force figure indicates the spring design force.
It may vary due to moving resistance of the plunger and spring. Please use it as reference for the workpiece contacting force.
1. Except D : rodless hollow option.

Notes

※1. When plunger goes down, shut off the air supply. Plunger doesn't go back when air always is supplied.
1. If the plunger goes up too fast, it may bounce back and locks itself.
Resulting in a gap with the work piece and possible damage to the internal parts due to the impact force.
Set the plunger action time at 0.5-1.0 sec. to adjust the air supply with the flow control valve with check valve (meter-in), and make sure that there is no clearance with the work piece for operation.
2. Air cannot be vented as the air supply pressure is too low because the cracking pressure at the dust seal lip is about 0.1MPa.

Plunger Spring Design Dimension

※ Please use as reference in case springs other than an attached plunger spring are designed and manufactured to the customer.
※ This drawing shows at the released state.



(mm)

Corresponding Product Model		LC0402	LC0482	LC0552	LC0652	LC0752	LC0902
LC LC-M	FA	6	6	7.5	7.5	10.5	10.5
	FB	8.5	8.5	10.3	10.3	14	14
	FD	8.1	8.1	9.1	9.1	12.6	12.6
	FE	1	1	1	1	1	1
	FF※2	17.6	19.6	22.6	34.6	34.3	46.3
	FG※2	9.6	9.6	10.6	20.6	18.3	26.3
	Stroke	8	10	12	14	16	20
LC-E LC-M-E	FA	6	6	7.5	7.5	10.5	10.5
	FB	8.5	8.5	10.3	10.3	14	14
	FD	2.5	2.5	3	3	3.5	3.5
	FE	1	1	1	1	1	1
	FF※2	17.6	19.6	22.6	34.6	34.3	46.3
	FG※2	9.6	9.6	10.6	20.6	18.3	26.3
	Stroke	8	10	12	14	16	20
LC-Q	FA	6	6	7.5	7.5	10.5	10.5
	FB	8.5	8.5	10.3	10.3	14	14
	FD	8.1	8.1	9.1	9.1	12.6	12.6
	FE	1	1	1	1	1	1
	FF※2	28.6	36.2	40.5	49.5	53.5	66.9
	FG※2	12.6	16.2	16.5	21.5	21.5	26.9
	Stroke	16	20	24	28	32	40
LC-EQ	FA	6	6	7.5	7.5	10.5	10.5
	FB	8.5	8.5	10.3	10.3	14	14
	FD	2.5	2.5	3	3	3.5	3.5
	FE	1	1	1	1	1	1
	FF※2	28.6	36.2	40.5	49.5	53.5	66.9
	FG※2	12.6	16.2	16.5	21.5	21.5	26.9
	Stroke	16	20	24	28	32	40

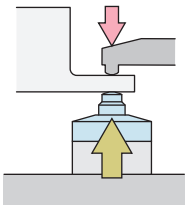
Note
※2. Please perform a spring design so that spring set length is below FF dimension and spring contact length is below FG dimension.

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

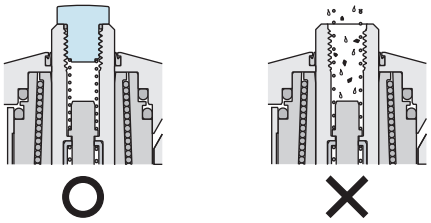
- Please read "Notes on Hydraulic Cylinder Speed Control Circuit" on P.1044 to assist with proper hydraulic circuit designing.

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.

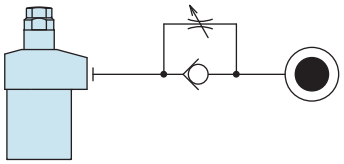


5) Protect the plunger surface at the time of use on welding fixture etc.

- 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.

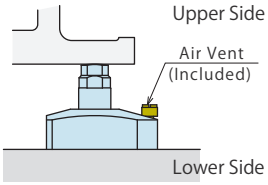


7) Appropriate Measures for the Vent Port

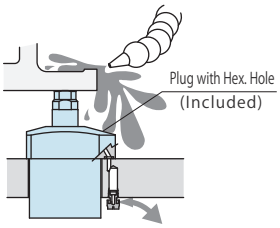
- The work support, although only slightly, breathes like a single-action cylinder. Take the environment where it is used into consideration to avoid taking in cutting fluid or other foreign materials.
- Use only in an environment where cutting fluids cannot invade when the attached air vent undergoes 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.

Application sample

① Use the attached air vent. As shown in the right diagram, this mounting method can prevent coolant fluids from directly invading.



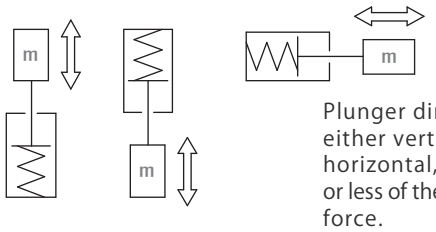
② Use a hexagonal hole plug. Put the vent hole through the fixture in the form of a manifold pipe and make sure venting is not affected by cutting fluids or coolant fluids.



③ Process the piping outside. If the manifold pipe is not possible as in the previous clause 2 due to coolant fluid, move the vent hole to a place where there is no coolant fluid.

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 LC0402-L, the maximum mass of contact bolt = 4.7×0.3/9.807=0.14kg when the plunger spring force is between 4.7-7.8N. 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.

Installation Notes

1) Check the Usable Fluid

- Please use the appropriate fluid by referring to the Hydraulic Fluid List. (Refer to P.1043 for Hydraulic Fluid List)

2) Mounting the Unit

- All the mounting bolt holes should be used for the plunger type with tightening torque shown in the table below.

Model No.		Thread Size	Tightening Torque (N·m)
LC	LC0402	M5×0.8	6.3
	LC0482	M5×0.8	6.3
	LC0552	M6×1	10
	LC0652	M6×1	10
	LC0752	M8×1.25	25
	LC0902	M10×1.5	50
TC	TC0402	M5×0.8	6.3
	TC0482	M5×0.8	6.3
	TC0552	M6×1	10
	TC0652	M6×1	10
	TC0752	M8×1.25	25

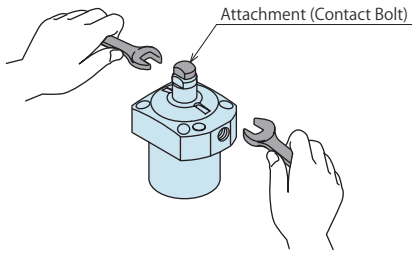
- While mounting, make sure there are no scratches or damage to the O-ring or to the seals. Tighten according to the torque' s mentioned in the table.

Model No.		Thread Size	Tightening Torque (N·m)
LD	LD0222	M22×1.5	16
	LD0262	M26×1.5	31.5
	LD0302	M30×1.5	50
	LD0362	M36×1.5	63
	LD0452	M45×1.5	80
TNC	TNC0400	M26×1.5	31.5
	TNC0600	M30×1.5	50
	TNC1000	M36×1.5	63
	TNC1600	M45×1.5	80

- 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	LC0402	M10×1.5	16
	LC0482	M10×1.5	16
	LC0552	M12×1.75	40
	LC0652	M12×1.75	40
	LC0752	M16×2	80
	LC0902	M16×2	80
TC	TC0402	M10×1.5	16
	TC0482	M12×1.75	40
	TC0552	M12×1.75	40
	TC0652	M16×2	80
	TC0752	M16×2	80
LD	LD0222	M4×0.7	1.6
	LD0262	M6×1	5
	LD0302	M8×1.25	10
	LD0362	M10×1.5	16
	LD0452	M10×1.5	16
TNC	TNC0400	M8×1.25	10
	TNC0600	M10×1.5	16
	TNC1000	M10×1.5	16
	TNC1600	M12×1.75	40

※ Please refer to P.1043 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.

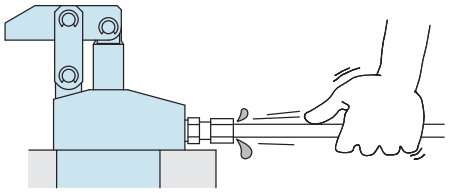
3) Applying Sealing Tape

- 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.

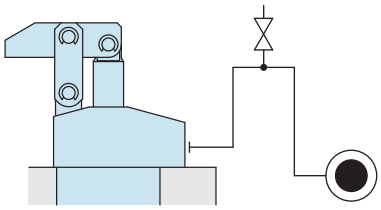
4) Air Bleeding of the Hydraulic Circuit

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

Hydraulic Fluid List

ISO Viscosity Grade ISO-VG-32

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

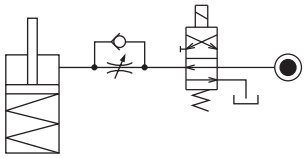
Note As it may be difficult to purchase the products as shown in the table from overseas, please contact the respective manufacturer.

Notes on Hydraulic Cylinder Speed Control Unit

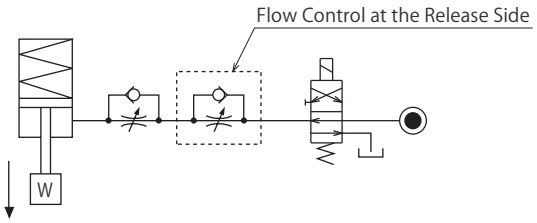
Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

Flow Control Circuit for Single Acting Cylinder

For spring return single acting cylinders, restricting flow during release can extremely slow down or disrupt release action. The preferred method is to control the flow during the lock action using a valve that has free-flow in the release direction. It is also preferred to provide a flow control valve at each actuator.



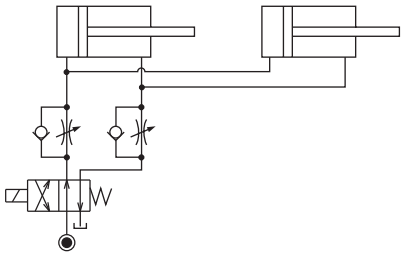
Accelerated clamping speed by excessive hydraulic flow to the cylinder may sustain damage. In this case add flow control to regulate flow. (Please add flow control to release flow if the lever weight is put on at the time of release action when using swing clamps.)



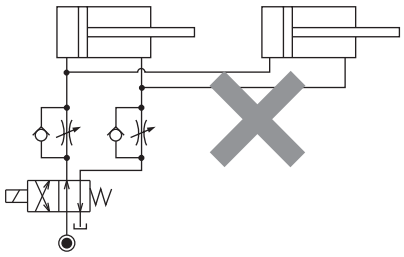
Flow Control Circuit for Double Acting Cylinder

Flow control circuit for double acting cylinder should have meter-out circuits for both the lock and release sides. Meter-in control can have adverse effect by presence of air in the system.
However, in the case of controlling LKE, TMA, TLA, both lock side and release side should be meter-in circuit.
Refer to P.47 for speed adjustment of LKE.
For TMA and TLA, if meter-out circuit is used, abnormal high pressure is created, which causes oil leakage and damage.

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

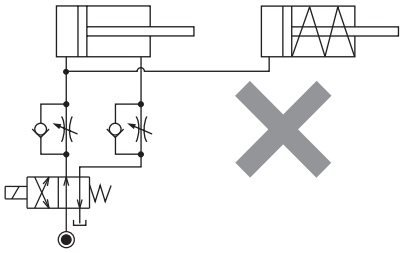


【Meter-in Circuit】(LKE/TMA/TLA must be controlled with meter-in.)



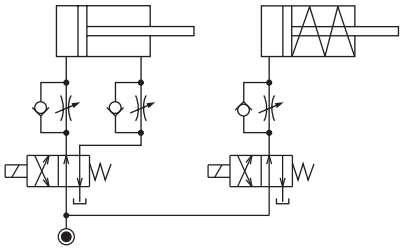
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

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

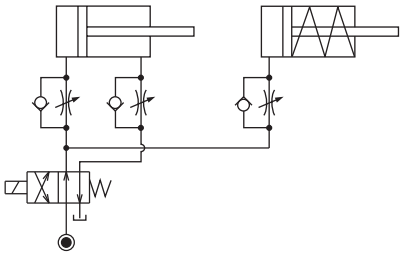


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

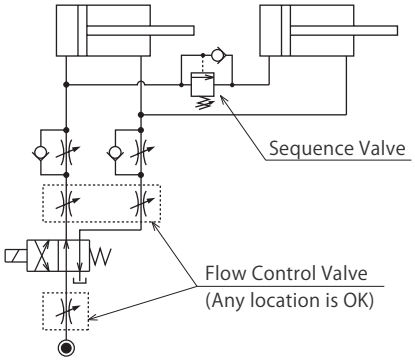
○ Separate the control circuit.



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



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



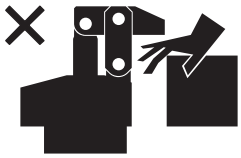
Cautions

Notes on Handling

1) It should be 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.

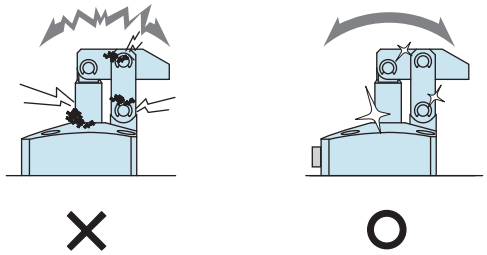


4) Do not disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

Maintenance and Inspection

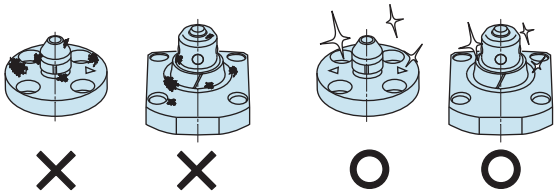
1) Removal of the Machine and Shut-off of Pressure Source
- Before the machine is removed, make sure that the above-mentioned safety measures are in place. Shut off the air of hydraulic source and make sure no pressure exists in the hydraulic and air circuit.
- Make sure there is no abnormality in the 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) Please clean out the reference surface regularly (taper reference surface and seating surface) of locating machine .(VS/VT/VL/VM/VJ/VK/WVS/WM/WK/VX/VXF)

- Location products, except VX/VXF model, can remove contaminants with cleaning functions.
  When installing pallets makes sure there is no thick sludge like substances on pallets.
- Continuous use with dirt on components will lead to locating functions not work properly, leaking and malfunction.



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

5) Regularly tighten nuts, bolts, pins, cylinders and pipe line to ensure proper use.

6) Make sure the hydraulic fluid has not deteriorated.

7) Make sure there is smooth action and no abnormal noise.
- Especially when it is restarted after left unused for a long period, make sure it can be operated correctly.

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

9) Please contact us for overhaul and repair.

Warranty

1) Warranty Period

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

2) Warranty Scope

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

① If the stipulated maintenance and inspection are not carried out.
② If the product is used while it is not suitable for use based on the operator's judgment, resulting in defect.
③ If it is used or handled in inappropriate way by the operator.
(Including damage caused by the misconduct of the third party.)
④ If the defect is caused by reasons other than our responsibility.
⑤ If repair or modifications are carried out by anyone other than Kosmek, or without our approval and confirmation, it will void warranty.
⑥ Other caused by natural disasters or calamities not attributable to our company.
⑦ Parts or replacement expenses due to parts consumption and deterioration.
(Such as rubber, plastic, seal material and some electric components.)

Damages excluding from direct result of a product defect shall be excluded from the warranty.

Control Valve

Model BZL
Model BZT
Model BZX
Model JZG

Directly mounted to clamps, flow control valve • Air bleeding • plug

- **Directly mounted to clamps**

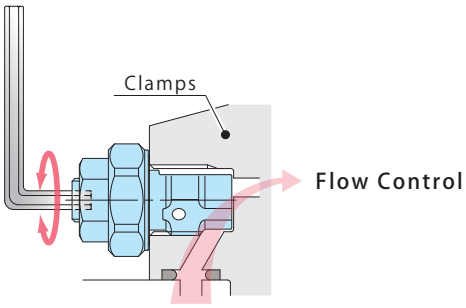
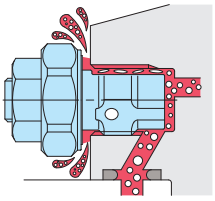
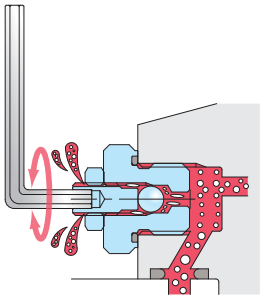
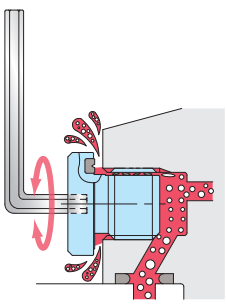
  Flow control valve, air bleeding valve, G-thread plug for G-thread (-C option) directly mounted.

Speed Control Valve

Speed Control Valve
Model BZL
Model BZT

Air Bleed Valve
Model BZX

G Thread Plug
Model JZG

	Operating Pressure Range	Action Description
Speed Control Valve (For Low Pressure) Model **BZL** → P.729 	7MPa or less	Adjust the flow by wrench. It can adjust the clamping action speed individually. 
Speed Control Valve (For High Pressure) Model **BZT** → P.733	35MPa or less	Air bleeding in the circuit is possible by loosening flow control valve. 
Air Bleed Valve Model **BZX** → P.735 	25MPa or less	Air bleeding in the circuit is possible by wrench. 
G Thread Plug Model **JZG** → P.737 	35MPa or less	Air bleeding in the circuit is possible by loosening G thread plug. 

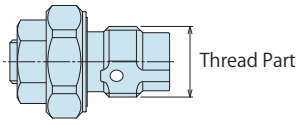
Model No. Indication (Speed Control Valve for Low Pressure)

BZL 0 10 0 - B

1 2 3

1 G Thread Size

10 : Thread Part G1/8A Thread
20 : Thread Part G1/4A Thread
30 : Thread Part G3/8A Thread



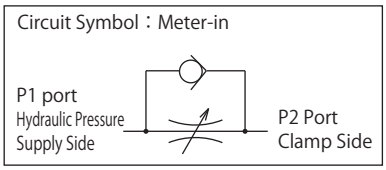
2 Design No.

0 : Revision Number

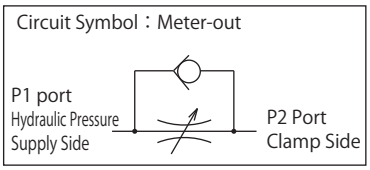
3 Control Method

A : Meter-in
B : Meter-out

A



B



Specifications

Model No.		BZL0100-A	BZL0200-A	BZL0300-A	BZL0100-B	BZL0200-B	BZL0300-B
Max. Operating Pressure	MPa	7					
Withstanding Pressure	MPa	10.5					
Control Method		Meter-in			Meter-out		
G Thread Size		G1/8A	G1/4A	G3/8A	G1/8A	G1/4A	G3/8A
Cracking Pressure	MPa	0.04			0.12		
Max. Passage Area	mm^2	2.6	5.0	11.6	2.6	5.0	10.2
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32					
Operating Temperature	℃	0 ~ 70					
Tightening Torque for Main Body	N·m	10	25	35	10	25	35

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.	DBA (Single Action) Block Cylinder	DBC (Single Action) Block Cylinder	LC (Single Action) Work Support	LHA (Double Action) Swing Clamp	LHC (Double Action) Swing Clamp	LHE (Double Action) High-Power Swing Clamp	LHS (Double Action) Swing Clamp	LHW (Double Action) Swing Clamp
BZL0100-A	(DBA0250-C□) (DBA0320-C□)	(DBC0250-C□) (DBC0320-C□)	LC0402-C□□-□ LC0482-C□□-□ LC0552-C□□-□ LC0652-C□□-□	(LHA0360-C□□-□) (LHA0400-C□□-□) (LHA0480-C□□-□) (LHA0550-C□□-□)	(LHC0360-C□□-□) (LHC0400-C□□-□) (LHC0480-C□□-□) (LHC0550-C□□-□)		(LHS0360-C□□-□) (LHS0400-C□□-□) (LHS0480-C□□-□) (LHS0550-C□□-□)	(LHW0400-C□□-□) (LHW0480-C□□-□) (LHW0550-C□□-□)
BZL0100-B	DBA0250-C□ DBA0320-C□	DBC0250-C□ DBC0320-C□		LHA0360-C□□-□ LHA0400-C□□-□ LHA0480-C□□-□ LHA0550-C□□-□	LHC0360-C□□-□ LHC0400-C□□-□ LHC0480-C□□-□ LHC0550-C□□-□	LHE0300-C□ LHE0360-C□ LHE0400-C□ LHE0480-C□ LHE0550-C□	LHS0360-C□□-□ LHS0400-C□□-□ LHS0480-C□□-□ LHS0550-C□□-□	LHW0400-C□□-□ LHW0480-C□□-□ LHW0550-C□□-□
BZL0200-A	(DBA0400-C□) (DBA0500-C□)	(DBC0400-C□) (DBC0500-C□)	LC0752-C□□-□ LC0902-C□□-□	(LHA0650-C□□-□) (LHA0750-C□□-□)	(LHC0650-C□□-□)		(LHS0650-C□□-□) (LHS0750-C□□-□)	(LHW0650-C□□-□)
BZL0200-B	DBA0400-C□ DBA0500-C□	DBC0400-C□ DBC0500-C□		LHA0650-C□□-□ LHA0750-C□□-□	LHC0650-C□□-□		LHS0650-C□□-□ LHS0750-C□□-□	LHW0650-C□□-□
BZL0300-A				(LHA0900-C□□-□) (LHA1050-C□□-□)			(LHS0900-C□□-□) (LHS1050-C□□-□)	
BZL0300-B				LHA0900-C□□-□ LHA1050-C□□-□			LHS0900-C□□-□ LHS1050-C□□-□	

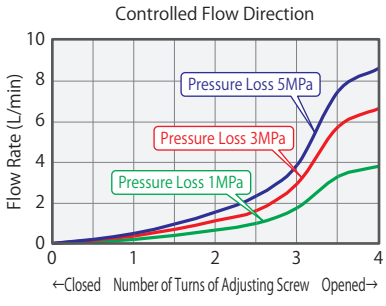
Model No.	LT/LG (Single Action) Swing Clamp	LKA (Double Action) Link Clamp	LKC (Double Action) Link Clamp	LKE (Double Action) High-Power Link Clamp	LKW (Double Action) Link Clamp	LM/LJ (Single Action) Link Clamp	LL (Double Action) Linear Cylinder	LLR (Double Action) Linear Cylinder
BZL0100-A	LT0360-C□ LT0400-C□ LT0480-C□ LT0550-C□	(LKA0360-C□□-□) (LKA0400-C□□-□) (LKA0480-C□□-□) (LKA0550-C□□-□)	(LKC0400-C□-□) (LKC0480-C□-□) (LKC0550-C□-□)	LKE0300-C□ LKE0360-C□ LKE0400-C□ LKE0480-C□ LKE0550-C□	(LKW0400-C□□-□) (LKW0480-C□□-□) (LKW0550-C□□-□)	LM0360-C□ LM0400-C□ LM0480-C□ LM0550-C□	(LL0360-C□□-□) (LL0400-C□□-□) (LL0480-C□□-□) (LL0550-C□□-□)	(LLR0360-C□□-□-□) (LLR0400-C□□-□-□) (LLR0480-C□□-□-□) (LLR0550-C□□-□-□)
BZL0100-B		LKA0360-C□□-□ LKA0400-C□□-□ LKA0480-C□□-□ LKA0550-C□□-□	LKC0400-C□-□ LKC0480-C□-□ LKC0550-C□-□		LKW0400-C□□-□ LKW0480-C□□-□ LKW0550-C□□-□		LL0360-C□□-□ LL0400-C□□-□ LL0480-C□□-□ LL0550-C□□-□	LLR0360-C□□-□-□ LLR0400-C□□-□-□ LLR0480-C□□-□-□ LLR0550-C□□-□-□
BZL0200-A	LT0650-C□ LT0750-C□	(LKA0650-C□□-□) (LKA0750-C□□-□)	(LKC0650-C□-□)		(LKW0650-C□□-□)	LM0650-C□ LM0750-C□	(LL0650-C□□-□) (LL0750-C□□-□)	(LLR0650-C□□-□-□) (LLR0750-C□□-□-□)
BZL0200-B		LKA0650-C□□-□ LKA0750-C□□-□	LKC0650-C□-□		LKW0650-C□□-□		LL0650-C□□-□ LL0750-C□□-□	LLR0650-C□□-□-□ LLR0750-C□□-□-□
BZL0300-A	LG0900-C□ LG1050-C□	(LKA0900-C□□-□) (LKA1050-C□□-□)				LJ0902-C□ LJ1052-C□	(LL0900-C□□-□) (LL1050-C□□-□)	(LLR0900-C□□-□-□) (LLR1050-C□□-□-□)
BZL0300-B		LKA0900-C□□-□ LKA1050-C□□-□					LL0900-C□□-□ LL1050-C□□-□	LLR0900-C□□-□-□ LLR1050-C□□-□-□

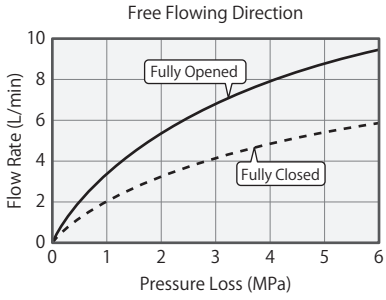
Model No.	LLW (Double Action) Lift Cylinder
BZL0100-A	(LLW0360-C□□-□) (LLW0400-C□□-□) (LLW0480-C□□-□)
BZL0100-B	LLW0360-C□□-□ LLW0400-C□□-□ LLW0480-C□□-□

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

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

BZL0100-A：Meter-in





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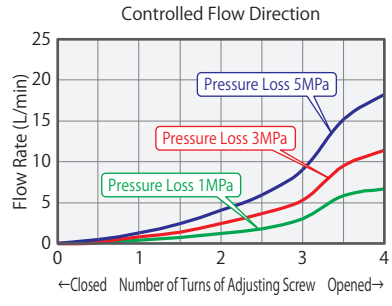

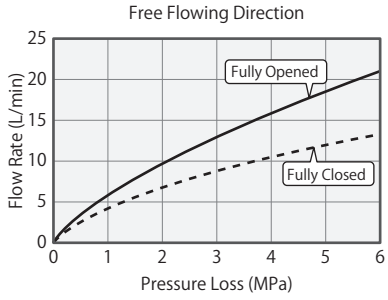

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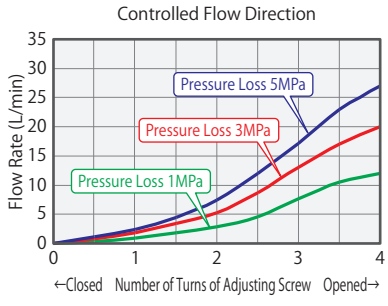

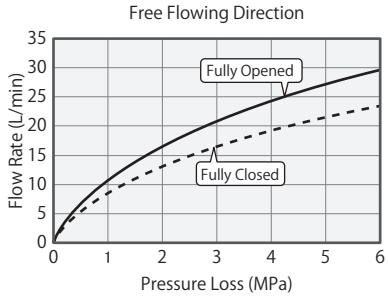

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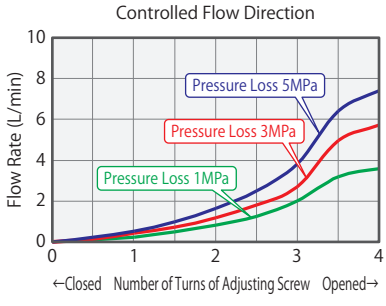

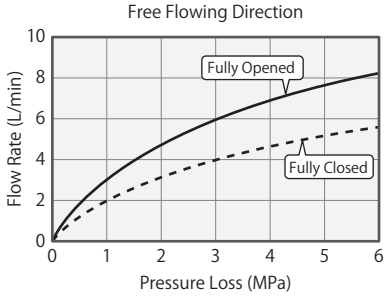

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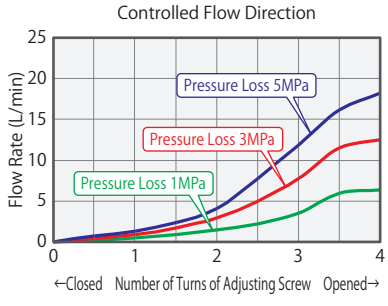
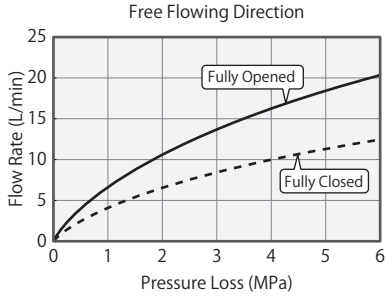
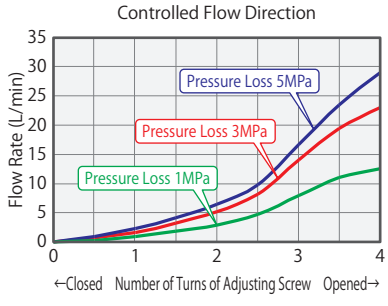
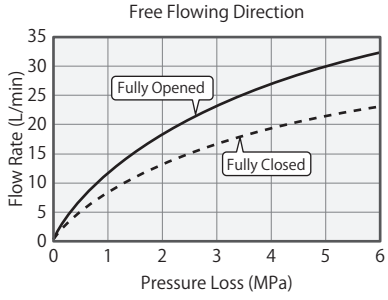


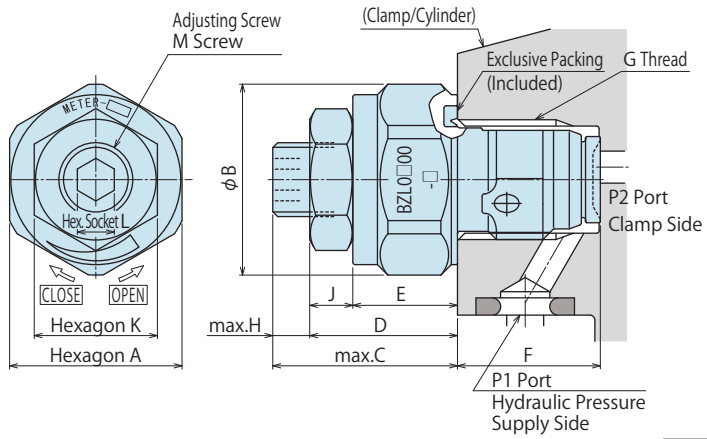


BZL0300-B：Meter-out

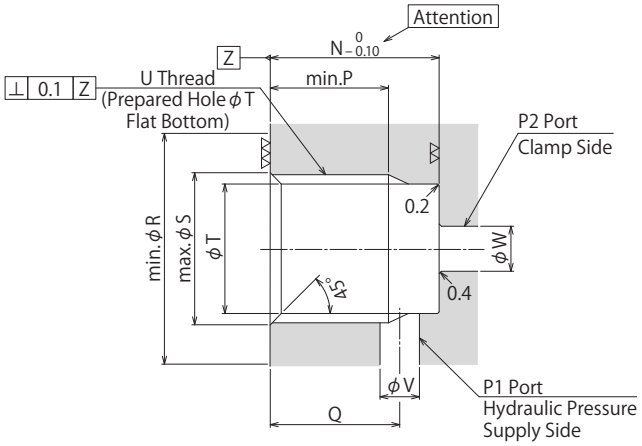




External Dimensions



Machining Dimensions of Mounting Area



(mm)

Model No.	BZL0100-□	BZL0200-□	BZL0300-□
A	14	18	22
B	15.5	20	24
C	15	16	19
D	12	13	16
E	8.5	9.5	11
F	(11.6)	(15.1)	(17.6)
G	G1/8	G1/4	G3/8
H	3	3	3
J	3.5	3.5	5
K	10	10	13
L	3	3	4
M	M6×0.75	M6×0.75	M8×0.75
N	11.5	15	17.5
P	8.5	11※1	13
Q	9	11.5	13
R (Flat Surface Area)	16	20.5	24.5
S	10	13.5	17
T	8.7	11.5	15
U	G1/8	G1/4	G3/8
V	2～3	3～4	4～5
W	2.5～5	3.5～7	4.5～9

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.
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.1044)
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.)

Model No. Indication (Air Bleed Valve)

BZX0 1 0

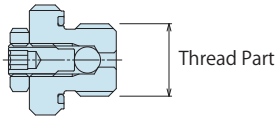
1 2

1 G Thread Size

1 : Thread Part G1/8A Thread

2 : Thread Part G1/4A Thread

3 : Thread Part G3/8A Thread



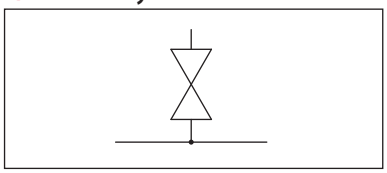
2 Design No.

0 : Revision Number

Specifications

Model No.		BZX010	BZX020	BZX030
Max. Operating Pressure	MPa	25		
Withstanding Pressure	MPa	37.5		
G Thread Size		G1/8A	G1/4A	G3/8A
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32		
Operating Temperature	℃	0 ~ 70		
Tightening Torque for Main Body	N·m	10	25	35

Circuit Symbol



Notes
1. Do not over loosen the plug during air venting.
(Do not loosen for more than 2 turns from the fully closed position.)
2. It is dangerous to have air venting operation under high pressure. It must be done under lower pressure.
(For reference: the minimum operation pressure range of the product within the circuit)
3. Refer to the processing dimensions for BZL mounting area.

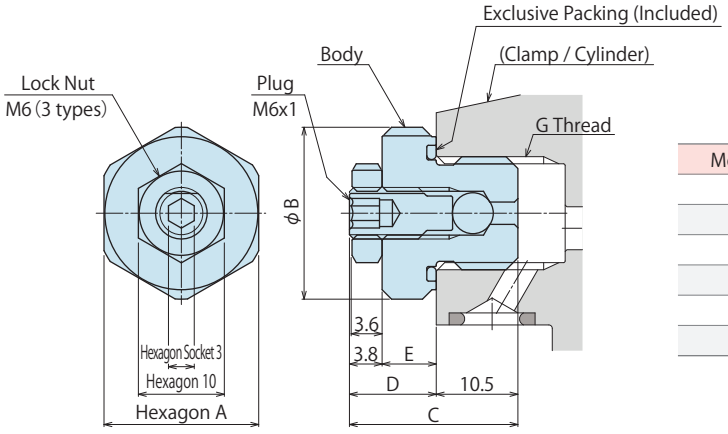
Applicable Products

Model No.	DBA (Single Action) Block Cylinder	DBC (Single Action) Block Cylinder	LC (Single Action) Work Support	LHA (Double Action) Swing Clamp	LHC (Double Action) Swing Clamp	LHE (Double Action) High-Power Swing Clamp	LHS (Double Action) Swing Clamp	LHW (Double Action) Swing Clamp
BZX010	DBA0250-C□ DBA0320-C□	DBC0250-C□ DBC0320-C□	LC0402-C□□-□ LC0482-C□□-□ LC0552-C□□-□ LC0652-C□□-□	LHA0360-C□□-□ LHA0400-C□□-□ LHA0480-C□□-□ LHA0550-C□□-□	LHC0360-C□□-□ LHC0400-C□□-□ LHC0480-C□□-□ LHC0550-C□□-□	LHE0300-C□ LHE0360-C□ LHE0400-C□ LHE0480-C□ LHE0550-C□	LHS0360-C□□-□ LHS0400-C□□-□ LHS0480-C□□-□ LHS0550-C□□-□	LHW0400-C□□-□ LHW0480-C□□-□ LHW0550-C□□-□
BZX020	DBA0400-C□ DBA0500-C□	DBC0400-C□ DBC0500-C□	LC0752-C□□-□ LC0902-C□□-□	LHA0650-C□□-□ LHA0750-C□□-□	LHC0650-C□□-□		LHS0650-C□□-□ LHS0750-C□□-□	LHW0650-C□□-□
BZX030				LHA0900-C□□-□ LHA1050-C□□-□			LHS0900-C□□-□ LHS1050-C□□-□	

Model No.	LT/LG (Single Action) Swing Clamp	LKA (Double Action) Link Clamp	LKC (Double Action) Link Clamp	LKE (Double Action) High-Power Link Clamp	LKW (Double Action) Link Clamp	LM/LJ (Single Action) Link Clamp	LL (Double Action) Linear Cylinder	LLR (Double Action) Linear Cylinder
BZX010	LT0360-C□ LT0400-C□ LT0480-C□ LT0550-C□	LKA0360-C□□-□ LKA0400-C□□-□ LKA0480-C□□-□ LKA0550-C□□-□	LKC0400-C□-□ LKC0480-C□-□ LKC0550-C□-□	LKE0300-C□ LKE0360-C□ LKE0400-C□ LKE0480-C□ LKE0550-C□	LKW0400-C□□-□ LKW0480-C□□-□ LKW0550-C□□-□	LM0360-C□ LM0400-C□ LM0480-C□ LM0550-C□	LL0360-C□□-□ LL0400-C□□-□ LL0480-C□□-□ LL0550-C□□-□	LLR0360-C□□-□-□ LLR0400-C□□-□-□ LLR0480-C□□-□-□ LLR0550-C□□-□-□
BZX020	LT0650-C□ LT0750-C□	LKA0650-C□□-□ LKA0750-C□□-□	LKC0650-C□-□		LKW0650-C□□-□	LM0650-C□ LM0750-C□	LL0650-C□□-□ LL0750-C□□-□	LLR0650-C□□-□-□ LLR0750-C□□-□-□
BZX030	LG0900-C□ LG1050-C□	LKA0900-C□□-□ LKA1050-C□□-□				LJ0902-C□ LJ1052-C□	LL0900-C□□-□ LL1050-C□□-□	LLR0900-C□□-□-□ LLR1050-C□□-□-□

Model No.	LLW (Double Action) Lift Cylinder
BZX010	LLW0360-C□□-□ LLW0400-C□□-□ LLW0480-C□□-□

External Dimensions



(mm)

Model No.	BZX010	BZX020	BZX030
A	14	18	22
B	15.5	20	24
C	19.8	20.6	20.6
D	9.3	10.1	10.1
E	5.5	6.3	6.3
G	G1/8	G1/4	G3/8

Model No. Indication (G Thread Plug with Air Bleeding Function)

JZG0 **1** **0**

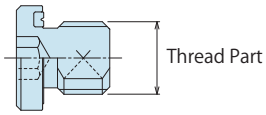
1 2

1 G Thread Size

1 : Thread Part G1/8A Thread

2 : Thread Part G1/4A Thread

3 : Thread Part G3/8A Thread



2 Design No.

0 : Revision Number

Specifications

Model No.		JZG010	JZG020	JZG030
Max. Operating Pressure	MPa	35		
Withstanding Pressure	MPa	42		
G Thread Size		G1/8A	G1/4A	G3/8A
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32		
Operating Temperature	℃	0 ～ 70		
Tightening Torque for Main Body	N·m	10	25	35

Notes 1. It is dangerous to have air venting operation under high pressure. It must be done under lower pressure.
(For reference: the minimum operation pressure range of the product within the circuit)
2. Refer to the processing dimensions for BZL mounting area.

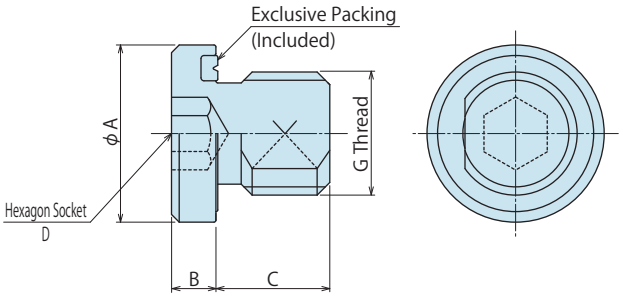
Applicable Products

Model No.	DBA (Single Action) Block Cylinder	DBC (Single Action) Block Cylinder	LC (Single Action) Work Support	LHA (Double Action) Swing Clamp	LHC (Double Action) Swing Clamp	LHE (Double Action) High-Power Swing Clamp	LHS (Double Action) Swing Clamp	LHW (Double Action) Swing Clamp
JZG010	DBA0250-C□ DBA0320-C□	DBC0250-C□ DBC0320-C□	LC0402-C□□-□ LC0482-C□□-□ LC0552-C□□-□ LC0652-C□□-□	LHA0360-C□□-□ LHA0400-C□□-□ LHA0480-C□□-□ LHA0550-C□□-□	LHC0360-C□□-□ LHC0400-C□□-□ LHC0480-C□□-□ LHC0550-C□□-□	LHE0300-C□ LHE0360-C□ LHE0400-C□ LHE0480-C□ LHE0550-C□	LHS0360-C□□-□ LHS0400-C□□-□ LHS0480-C□□-□ LHS0550-C□□-□	LHW0400-C□□-□ LHW0480-C□□-□ LHW0550-C□□-□
JZG020	DBA0400-C□ DBA0500-C□	DBC0400-C□ DBC0500-C□	LC0752-C□□-□ LC0902-C□□-□	LHA0650-C□□-□ LHA0750-C□□-□	LHC0650-C□□-□		LHS0650-C□□-□ LHS0750-C□□-□	LHW0650-C□□-□
JZG030				LHA0900-C□□-□ LHA1050-C□□-□			LHS0900-C□□-□ LHS1050-C□□-□	

Model No.	LT/LG (Single Action) Swing Clamp	LKA (Double Action) Link Clamp	LKC (Double Action) Link Clamp	LKE (Double Action) High-Power Link Clamp	LKW (Double Action) Link Clamp	LM/LJ (Single Action) Link Clamp	LL (Double Action) Linear Cylinder	LLR (Double Action) Linear Cylinder
JZG010	LT0360-C□ LT0400-C□ LT0480-C□ LT0550-C□	LKA0360-C□□-□ LKA0400-C□□-□ LKA0480-C□□-□ LKA0550-C□□-□	LKC0400-C□-□ LKC0480-C□-□ LKC0550-C□-□	LKE0300-C□ LKE0360-C□ LKE0400-C□ LKE0480-C□ LKE0550-C□	LKW0400-C□□-□ LKW0480-C□□-□ LKW0550-C□□-□	LM0360-C□ LM0400-C□ LM0480-C□ LM0550-C□	LL0360-C□□-□ LL0400-C□□-□ LL0480-C□□-□ LL0550-C□□-□	LLR0360-C□□-□-□ LLR0400-C□□-□-□ LLR0480-C□□-□-□ LLR0550-C□□-□-□
JZG020	LT0650-C□ LT0750-C□	LKA0650-C□□-□ LKA0750-C□□-□	LKC0650-C□-□		LKW0650-C□□-□	LM0650-C□ LM0750-C□	LL0650-C□□-□ LL0750-C□□-□	LLR0650-C□□-□-□ LLR0750-C□□-□-□
JZG030	LG0900-C□ LG1050-C□	LKA0900-C□□-□ LKA1050-C□□-□				LJ0902-C□ LJ1052-C□	LL0900-C□□-□ LL1050-C□□-□	LLR0900-C□□-□-□ LLR1050-C□□-□-□

Model No.	LLW (Double Action) Lift Cylinder	TLA-2 (Double Action) Swing Clamp	TLB-2 (Double Action) Swing Clamp	TLA-1 (Single Action) Swing Clamp	TMA-2 (Double Action) Link Clamp	TMA-1 (Single Action) Link Clamp
JZG010	LLW0360-C□□-□ LLW0400-C□□-□ LLW0480-C□□-□	TLA0401-2C□-□ TLA0601-2C□-□ TLA0801-2C□-□ TLA1001-2C□-□ TLA1601-2C□-□	TLB0401-2C□-□ TLB0601-2C□-□ TLB0801-2C□-□ TLB1001-2C□-□ TLB1601-2C□-□	TLA0402-1C□ TLA0602-1C□ TLA0802-1C□ TLA1002-1C□ TLA1602-1C□	TMA0250-2C□ TMA0400-2C□ TMA0600-2C□ TMA1000-2C□	TMA0250-1C□ TMA0400-1C□ TMA0600-1C□ TMA1000-1C□
JZG020		TLA2001-2C□-□ TLA2501-2C□-□ TLA4001-2C□-□	TLB2001-2C□-□ TLB2501-2C□-□ TLB4001-2C□-□	TLA2002-1C□ TLA2502-1C□ TLA4002-1C□	TMA1600-2C□ TMA2500-2C□ TMA3200-2C□	TMA1600-1C□ TMA2500-1C□ TMA3200-1C□

External Dimensions



(mm)

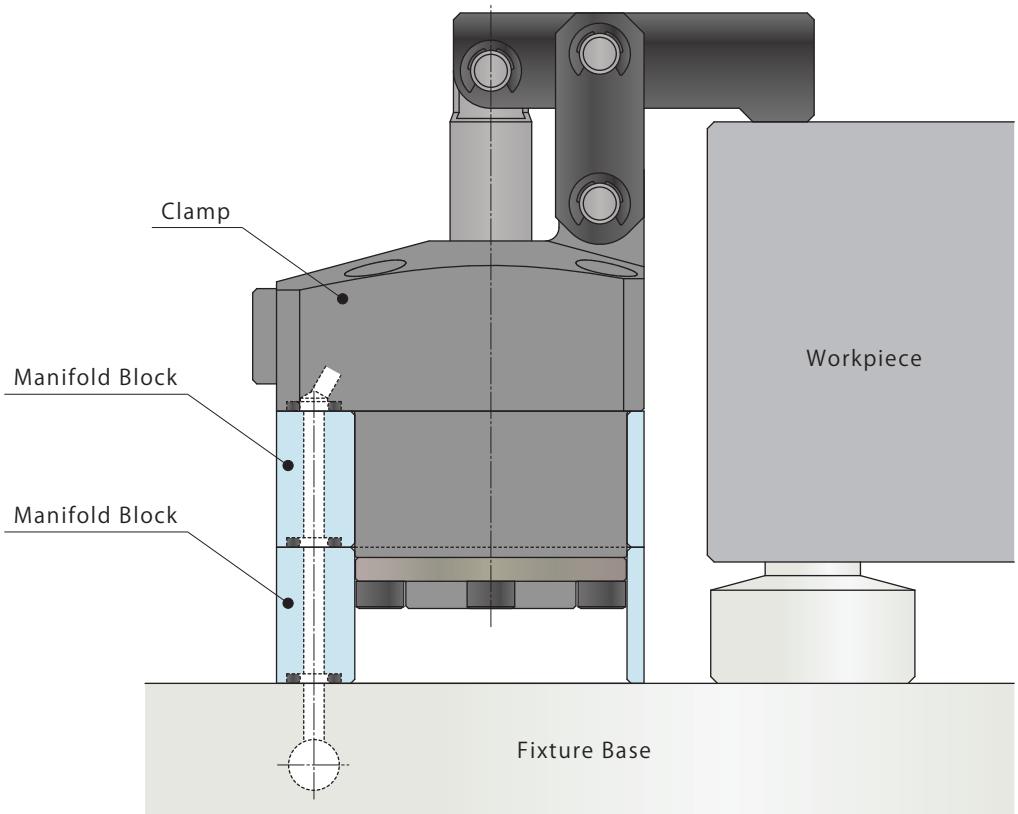
Model No.	JZG010	JZG020	JZG030
A	14	18	22
B	3.5	4.5	4.5
C	8	9	10
D	5	6	8
G	G1/8A	G1/4A	G3/8A

Manifold Block

Model WHZ-MD
Model LZY-MD
Model LZ-MS
Model LZ-MP
Model TMZ-1MB
Model TMZ-2MB
Model DZ-MG□
Model DZ-MS□

Manifold Block

The mounting height of clamp is adjustable with the manifold block.

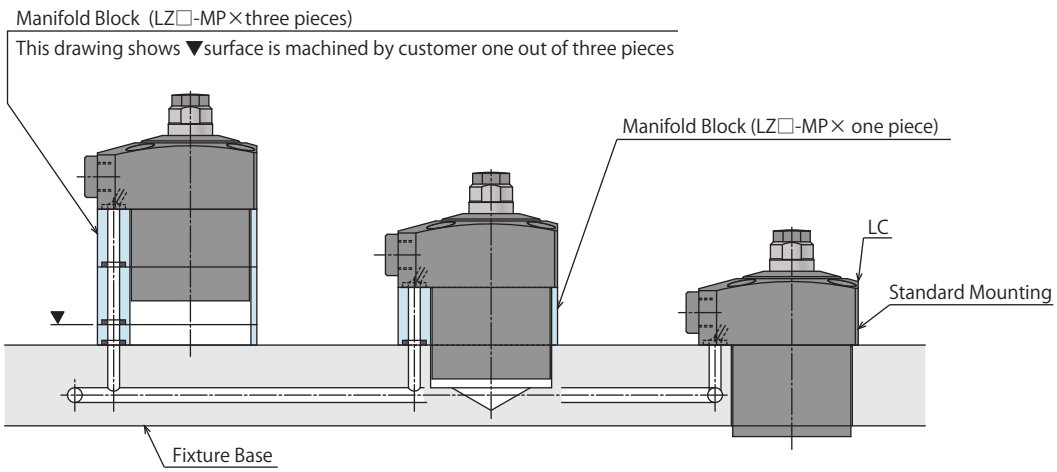


Applicable Model

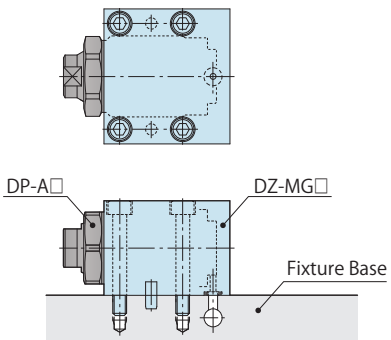
Manifold Block Model No.	Corresponding Item Model No.
Model WHZ-MD	Model WCA, Model WHA, Model WCE, Model WHE
Model LZY-MD	Model LKA, Model LKE, Model LHC, Model LHS, Model LKC, Model LHA, Model LHE, Model LL
Model LZ-MS	Model LM, Model LT, Model LJ, Model LG
Model LZ-MP	Model LC, Model TC
Model TMZ-1MB	Model TMA-1
Model TMZ-2MB	Model TMA-2
Model DZ-MG□/MS□	Model DP

Application Examples

Work Support (LC) Application Example



Push Cylinder (DP) Application Example

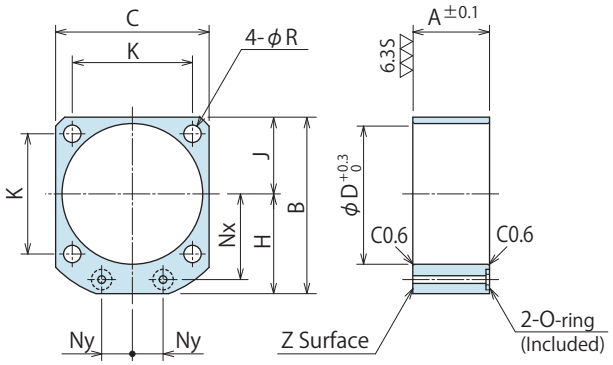


Manifold Block for WCA/WCE/WHA/WHE

Model No. Indication

WHZ 048 0 – MD

- 048: Size (Refer to following table)
- 0: Design No. (Revision Number)



(mm)

Model No.	WHZ0600-MD	WHZ0320-MD	WHZ0400-MD	WHZ0500-MD	WHZ0630-MD
Corresponding Item Model Number	WCE0601 WHE0600	WCA0321 WCE1001 WHA0320 WHE1000	WCA0401 WCE1601 WHA0400 WHE1600	WCA0501 WCE2501 WHA0500 WHE2500	WCA0631 WCE4001 WHA0630 WHE4000
A	23	25	27	31	35
B	54	60	67	77	88.5
C	45	50	58	68	81
D	40	46	54	64	77
H	31.5	35	38	43	48
J	22.5	25	29	34	40.5
K	34	39	45	53	65
Nx	26	28	31	36	41
Ny	9	10	13	15	20
R	5.5	5.5	5.5	6.5	6.5
O-ring	1BP5	1BP7	1BP7	1BP7	1BP7
Mass kg	0.1	0.1	0.1	0.2	0.2

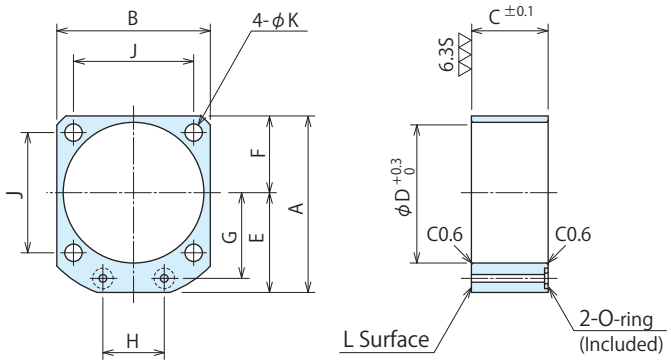
Notes
1. Material: A2017BE-T4
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the A dimensions as a reference.
3. If thickness other than A is required, perform additional machining on surface Z. Please refer to the drawing.

Manifold Block for LKA/LKC/LKE/LHA/ LHC/LHE/LHS/LL

Model No. Indication

LZY 048 0 – MD

- 048: Size (Refer to following table)
- 0: Design No. (Revision Number)



(mm)

Model No.	LZY0360-MD	LZY0400-MD	LZY0480-MD	LZY0550-MD	LZY0650-MD	LZY0750-MD	LZY0900-MD	LZY1050-MD
Corresponding Item Model Number	LKA0360 / LKE0360 LHA0360 / LHC0360 LHE0360 / LHS0360 LL0360	LKA0400 / LKC0400 LKE0400 / LHA0400 LHC0400 / LHE0400 LHS0400 / LL0400	LKA0480 / LKC0480 LKE0480 / LHA0480 LHC0480 / LHE0480 LHS0480 / LL0480	LKA0550 / LKC0550 LKE0550 / LHA0550 LHC0550 / LHE0550 LHS0550 / LL0550	LKA0650 / LKC0650 LHA0650 / LHC0650 LHS0650 LL0650	LKA0750 LHA0750 LHS0750 LL0750	LKA0900 LHA0900 LHS0900 LL0900	LKA1050 LHA1050 LHS1050 LL1050
A	49	54	61	69	81	92	107	122
B	40	45	51	60	70	80	95	110
C	20	20	27	30	32	37	45	50
D	36	40	48	55	65	75	90	105
E	29	31.5	35.5	39	46	52	59.5	67
F	20	22.5	25.5	30	35	40	47.5	55
G	23.5	26	30	33.5	39.5	45	52.5	60
H	16	18	22	24	30	32	37	45
J	31.4	34	40	47	55	63	75	88
K	4.5	5.5	5.5	6.8	6.8	9	11	14
O-ring	1BP5	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7	1BP7
Mass kg	0.2	0.2	0.3	0.4	0.5	0.8	1.2	1.7

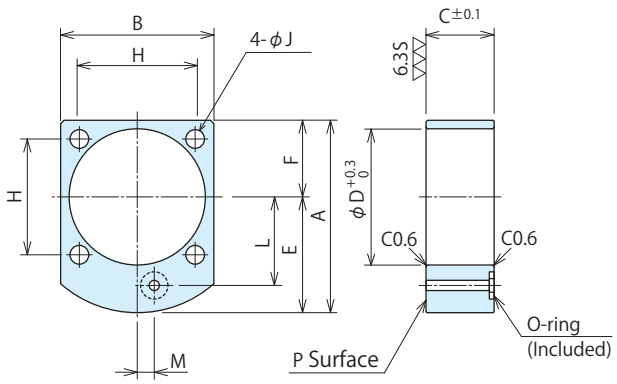
Notes
1. Material: S45C
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the C dimensions as a reference.
3. If thickness other than C is required, perform additional machining on surface L. Please refer to the drawing.

Manifold Block for LM/LJ/LT/LG

Model No. Indication

LZ 048 0 – MS

- 048: Size (Refer to following table)
- 0: Design No. (Revision Number)



(mm)

Model No.	LZ0360-MS	LZ0400-MS	LZ0480-MS	LZ0550-MS	LZ0650-MS	LZ0750-MS	LZ0900-MS	LZ1050-MS
Corresponding Item Model Number	LT0360 LM0360	LT0400 LM0400	LT0480 LM0480	LT0550 LM0550	LT0650 LM0650	LT0750 LM0750	LG0900 LJ0902	LG1050 LJ1052
A	51.5	56.5	62	70	82	93	107	122
B	40	45	51	60	70	80	95	110
C	20	20	27	30	32	37	45	50
D	36	40	48	55	65	75	90	105
E	31.5	34	36.5	40	47	53	59.5	67
F	20	22.5	25.5	30	35	40	47.5	55
H	31.4	34	40	47	55	63	75	88
J	4.5	5.5	5.5	6.8	6.8	9	11	14
L	23.5	26	30	33.5	39.5	45	52.5	60
M	5	5	0	0	0	0	0	0
O-ring	1BP5	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7	1BP7
Mass kg	0.2	0.2	0.3	0.4	0.5	0.8	1.2	1.7

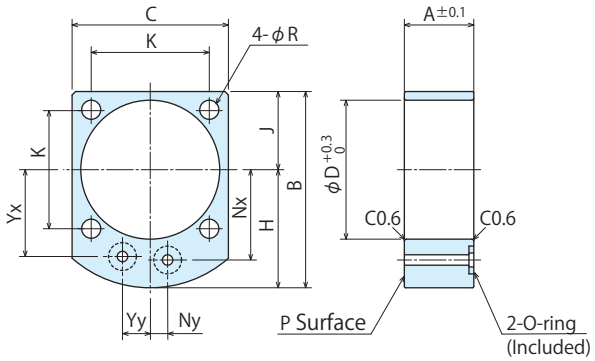
Notes
1. Material:S45C
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the C dimensions as a reference.
3. If thickness other than C is required, perform additional machining on surface L. Please refer to the drawing.

Manifold Block for LC/TC

Model No. Indication

LZ 048 0 – MP

- 048: Size (Refer to following table)
- 0: Design No. (Revision Number)



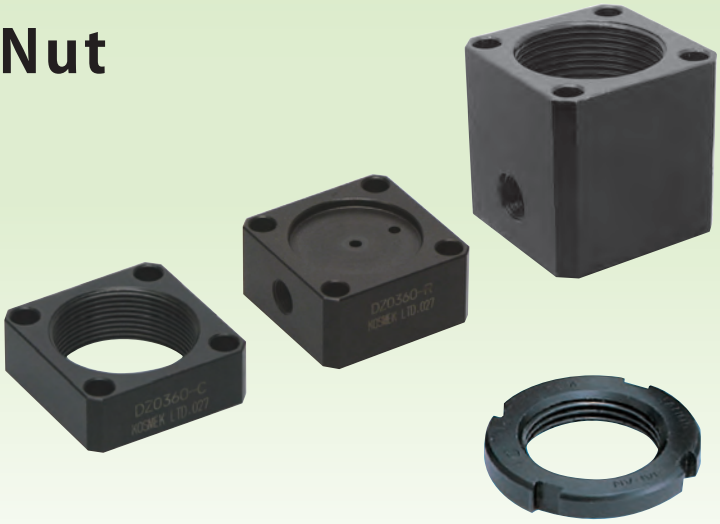
(mm)

Model No.	LZ0400-MP	LZ0480-MP	LZ0550-MP	LZ0650-MP	LZ0750-MP	LZ0900-MP
Corresponding Item Model Number	LC0402 TC0402	LC0482 TC0482	LC0552 TC0552	LC0652 TC0652	LC0752 TC0752	LC0902
A	20	27	30	32	37	45
B	56.5	62	70	82	93	107
C	45	51	60	70	80	95
D	40	48	55	65	75	90
H	34	36.5	40	47	53	59.5
J	22.5	25.5	30	35	40	47.5
K	34	40	47	55	63	75
Nx	26	30	33.5	39.5	45	52.5
Ny	5	0	0	0	0	0
R	5.5	5.5	6.8	6.8	9	11
Yx	25	28	31	37	42.5	50
Yy	8	11	13	14	15	15
O-ring	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7
Mass kg	0.2	0.3	0.4	0.5	0.8	1.2

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 other than A is required, perform additional machining on surface P. Please refer to the drawing.

Manifold Block / Nut

Model DZ-R
Model DZ-C
Model DZ-P
Model DZ-B
Model LZ-S
Model LZ-SQ
Model TNZ-S
Model TNZ-SQ

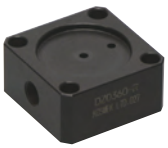


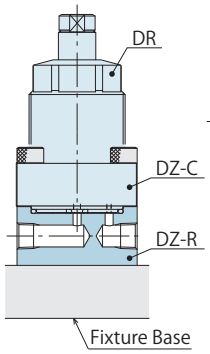
Applicable Model/Application Examples

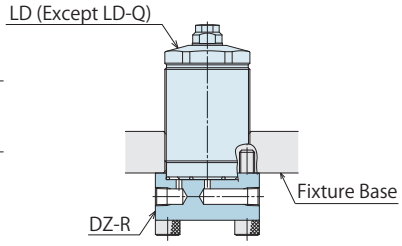
DZ-R

Manifold Block for DR/LD/WNC

Corresponding Item Model No. : DR / LD / WNC



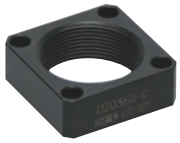


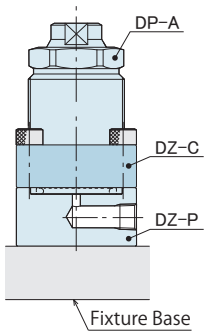


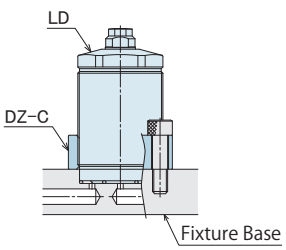
DZ-C

Flanged Nut for DP/DR/DS/DT/LD/WNC

Corresponding Item Model No. : DP / DR / DS / DT / LD / WNC





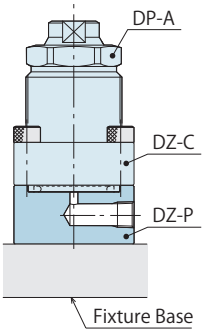


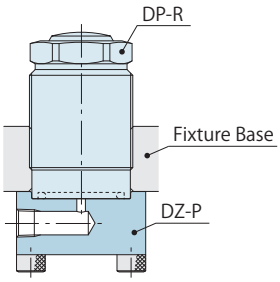
Applicable Model/Application Examples

DZ-P

Manifold Block for DP

Corresponding Item Model No. : DP

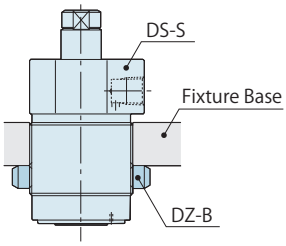


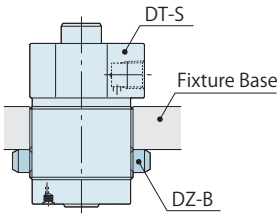


DZ-B

Bulkhead Nut for DP/DR/DS/DT

Corresponding Item Model No. : DP / DR / DS / DT





LZ-S

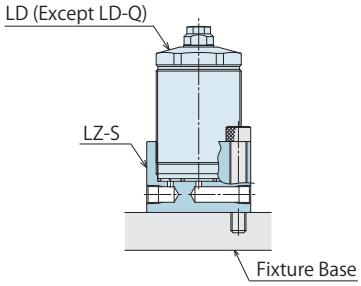
Manifold Block for LD/WNC

Corresponding Item Model No. : LD / WNC

TNZ-S

Manifold Block for TNC

Corresponding Item Model No. : TNC



LZ-SQ

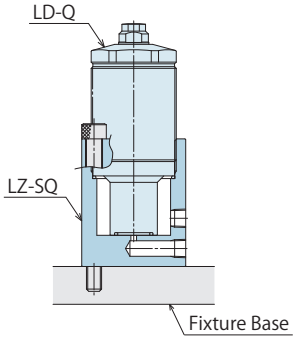
Manifold Block for LD-Q

Corresponding Item Model No. : LD-Q

TNZ-SQ

Manifold Block for TNC-Q

Corresponding Item Model No. : TNC-Q

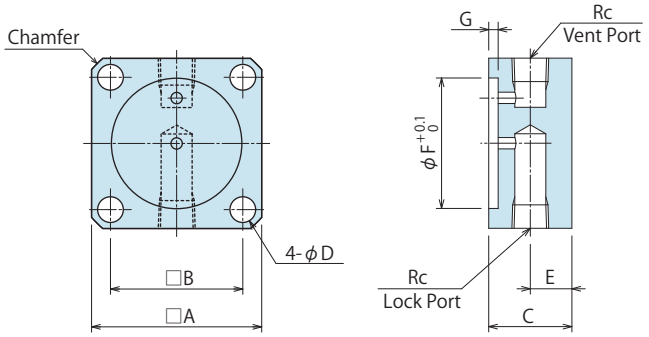


Manifold Block for DR/LD/WNC

Model No. Indication

DZ 036 0 – R

- 036: Size (Refer to following table)
- 0: Design No. (Revision Number)



(mm)

Model No.	DZ0220-R	DZ0240-R	DZ0260-R	DZ0300-R	DZ0360-R	DZ0450-R	DZ0550-R	DZ0600-R	DZ0650-R	DZ0800-R
Corresponding Item Model Number	DR0221	DR0241	–	DR0301	DR0361	DR0451	DR0551	–	DR0651	DR0801
	LD0222	–	LD0262※1	LD0302※1	LD0362※1	LD0452※1	–	–	–	–
	WNC0350	–	WNC0600	WNC1000	WNC1600	WNC3000	–	WNC6000	–	–
A	28	32	35	38	45	55	70	75	80	90
B	21	23	26	29	35	42	54	59	62	72
C	19	19	19	22	22	25	25	25	25	28
D	4.5	5.5	5.5	5.5	6.8	9	11	11	14	14
E	9.5	9.5	9.5	11	11	12.5	12.5	12.5	12.5	14
F	20.5	22.5	24.5	28.5	34.5	43.5	53	58	63	78
G	2.5	2.5	2.5	2.5	2.5	3.5	3.5	3.5	3.5	4
Rc	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/4	Rc1/4	Rc1/4	Rc1/4	Rc1/4
Chamfer	C2	C3	C3	C3	C3	C4	C5	C4	C5.5	C5.5
Mass kg	0.1	0.2	0.2	0.2	0.3	0.6	0.8	0.9	1.0	1.5

Notes 1. Material : S45C

2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the C dimensions as a reference.

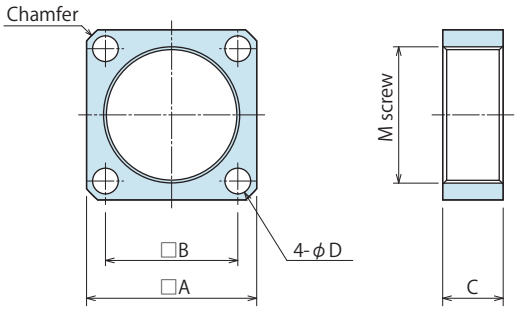
※1. It is not applicable for LD-Q: work support hydraulic advance long stroke option. (Please select from LZ-SQ.)

Flange Nut for DP/DR/DS/DT/LD/WNC

Model No. Indication

DZ 036 0 – C

- 036: Size (Refer to following table)
- 0: Design No. (Revision Number)



(mm)

Model No.	DZ0160-C	DZ0220-C	DZ0240-C	DZ0260-C	DZ0300-C	DZ0360-C	DZ0450-C	DZ0550-C	DZ0600-C	DZ0650-C	DZ0800-C
Corresponding Item Model Number	DP0160	DP0221	DP0241	–	DP0301	DP0361	DP0451	DP0551	–	DP0651	DP0801
	–	DR0221	DR0241	–	DR0301	DR0361	DR0451	DR0551	–	DR0651	DR0801
	–	DS0221	DS0241	–	DS0301	DS0361	DS0451	DS0551	–	DS0651	DS0801
	–	–	–	–	-	DT0361	DT0451	DT0551	–	DT0651	DT0801
	–	LD0222	–	LD0262	LD0302	LD0362	LD0452	–	–	–	–
	–	WNC0350	–	WNC0600	WNC1000	WNC1600	WNC3000	–	WNC6000	–	–
A	25	28	32	35	38	45	55	70	75	80	90
B	18	21	23	26	29	35	42	54	59	62	72
C	12	14	14	14	15	16	18	20	22	25	25
D	4.5	4.5	5.5	5.5	5.5	6.8	9	11	11	14	14
M (Nominal × Pitch)	M16×1.5	M22×1.5	M24×1.5	M26×1.5	M30×1.5	M36×1.5	M45×1.5	M55×2	M60×2	M65×2	M80×2
Chamfer	C2	C2	C3	C3	C3	C3	C4	C5	C4	C5.5	C5.5
Mass kg	0.04	0.04	0.06	0.07	0.08	0.1	0.2	0.4	0.45	0.5	0.6

Notes 1. Material : S45C

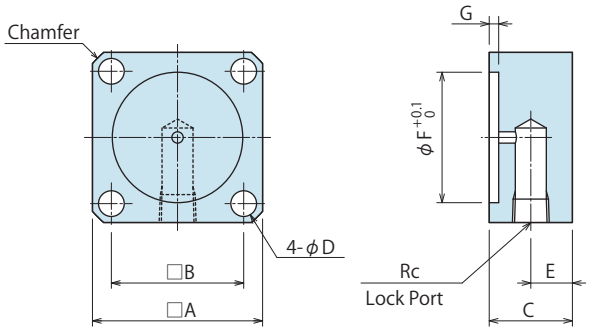
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the C dimensions as a reference.

Manifold Block for DP

Model No. Indication

DZ 036 0 – P

- 036: Size (Refer to following table)
- 0: Design No. (Revision Number)



(mm)

Model No.	DZ0160-P	DZ0220-P	DZ0240-P	DZ0300-P	DZ0360-P	DZ0450-P	DZ0550-P	DZ0650-P	DZ0800-P
Corresponding Item Model Number	DP0160	DP0221	DP0241	DP0301	DP0361	DP0451	DP0551	DP0651	DP0801
A	25	28	32	38	45	55	70	80	90
B	18	21	23	29	35	42	54	62	72
C	19	19	19	22	22	25	25	25	28
D	4.5	4.5	5.5	5.5	6.8	9	11	14	14
E	9.5	9.5	9.5	11	11	12.5	12.5	12.5	14
F	14.5	20.5	22.5	28.5	34.5	43.5	53	63	78
G	1.5	2.5	2.5	2.5	2.5	3.5	3.5	3.5	4
Rc	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/8	Rc1/4	Rc1/4	Rc1/4	Rc1/4
Chamfer	C2	C2	C3	C3	C3	C4	C5	C5.5	C5.5
Mass kg	0.1	0.1	0.2	0.2	0.3	0.6	0.8	1.0	1.5

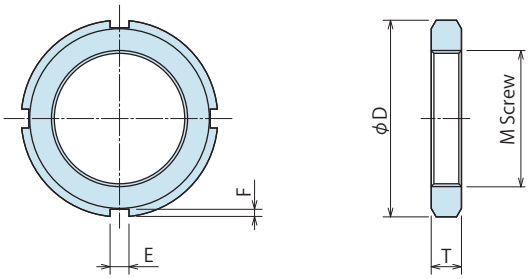
Notes 1. Material : S45C
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the C dimensions as a reference.

Bulkhead Nut for DP/DR/DS/DT

Model No. Indication

DZ 036 0 – B

- 036: Size (Refer to following table)
- 0: Design No. (Revision Number)



(mm)

Model No.	DZ0160-B	DZ0220-B	DZ0240-B	DZ0300-B	DZ0360-B	DZ0450-B	DZ0550-B	DZ0650-B	DZ0800-B
Corresponding Item Model Number	DP0160	DP0221	DP0241	DP0301	DP0361	DP0451	DP0551	DP0651	DP0801
	–	DR0221	DR0241	DR0301	DR0361	DR0451	DR0551	DR0651	DR0801
	–	DS0221	DS0241	DS0301	DS0361	DS0451	DS0551	DS0651	DS0801
	–	–	–	–	DT0361	DT0451	DT0551	DT0651	DT0801
D	25	32	38	45	52	65	75	85	105
E	4	5	5	5	5	6	7	7	8
F	2	2	2	2	2	2.5	3	3	3.5
M (Nominal × Pitch)	M16×1.5	M22×1.5	M24×1.5	M30×1.5	M36×1.5	M45×1.5	M55×2	M65×2	M80×2
T	5	6	7	7	8	10	11	12	15
Mass kg	0.02	0.03	0.03	0.05	0.08	0.1	0.2	0.3	0.5

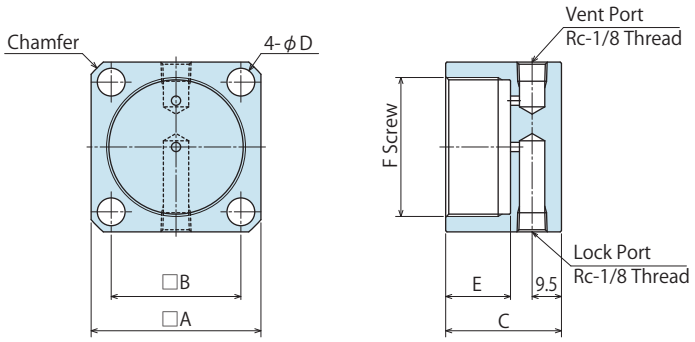
Notes 1. Material : S45C

Manifold Block for LD/WNC

Model No. Indication

LZ 036 0 – S

- 036: Size (Refer to following table)
- 0: Design No. (Revision Number)



(mm)

Model No.	LZ0220-S	LZ0260-S	LZ0300-S	LZ0360-S	LZ0450-S	LZ0600-S
Corresponding Item Model Number	LD0222 WNC0350	LD0262 (Except Q option) ※1 WNC0600	LD0302 (Except Q option) ※1 WNC1000	LD0362 (Except Q option) ※1 WNC1600	LD0452 (Except Q option) ※1 WNC3000	– WNC6000
A	28	35	38	45	55	75
B	21	26	29	35	42	59
C	30.5	32.5	33.5	34.5	37.5	41.5
D	4.5	5.5	5.5	6.8	9	11
E	14	16	17	18	21	25
F (Nominal × Pitch)	M22×1.5	M26×1.5	M30×1.5	M36×1.5	M45×1.5	M60×2
Chamfer	C2	C3	C3	C3	C4	C4
Mass kg	0.12	0.20	0.24	0.34	0.52	1.12

Notes 1. Material：S45C

2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the C dimensions as a reference.

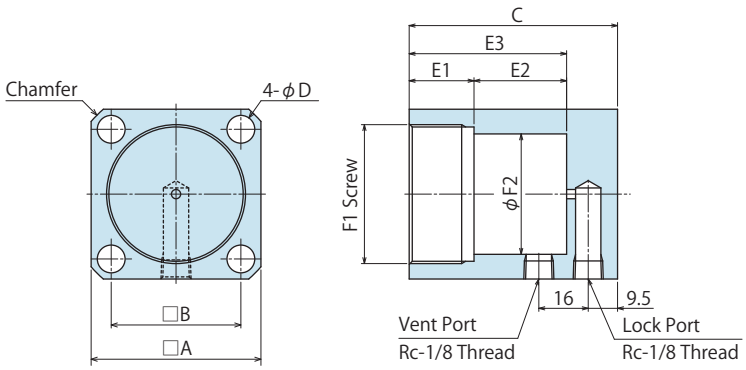
※1. It is not applicable for LD-Q: work support hydraulic advance long stroke option. (Please select from LZ-SQ.)

Manifold Block for LD-Q

Model No. Indication

LZ 036 0 – SQ

- 036: Size (Refer to following table)
- 0: Design No. (Revision Number)



(mm)

Model No.	LZ0260-SQ	LZ0300-SQ	LZ0360-SQ	LZ0450-SQ
Corresponding Item Model Number	LD0262-Q※2	LD0302-Q※2	LD0362-Q※2	LD0452-Q※2
A	35	38	45	55
B	26	29	35	42
C	49.5	53	60.5	67.5
D	5.5	5.5	6.8	9
E1	16	17	18	21
E2	17	19.5	26	30
E3	33	36.5	44	51
F1 (Nominal × Pitch)	M26×1.5	M30×1.5	M36×1.5	M45×1.5
F2	20	24	30	39
Chamfer	C3	C3	C3	C4
Mass kg	0.31	0.38	0.58	0.89

Notes 1. Material：S45C

2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the C dimensions as a reference.

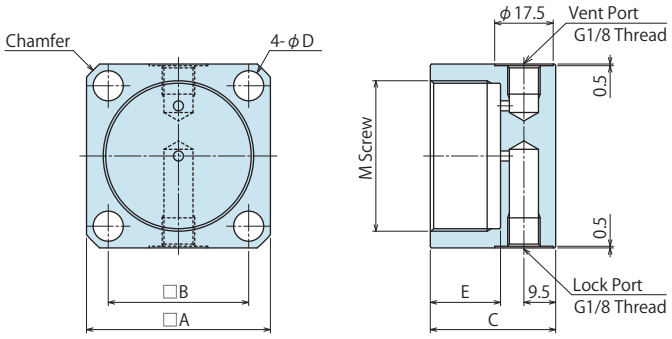
※1. It is not applicable for LD-EQ work support hydraulic advance long stroke option. (Please select from LZ-S.)

Manifold Block for TNC

Model No. Indication

TNZ 060 0 – S

- 060: Size (Refer to following table)
- 0: Design No. (Revision Number)



(mm)

Model No.	TNZ0400-S	TNZ0600-S	TNZ1000-S	TNZ1600-S
Corresponding Item Model Number	TNC0400	TNC0600	TNC1000	TNC1600
A	35	38	45	55
B	26	29	35	42
C	32.5	33.5	34.5	37.5
D	5.5	5.5	6.8	9
E	16	17	18	21
M (Nominal × Pitch)	M26×1.5	M30×1.5	M36×1.5	M45×1.5
Chamfer	C3	C3	C3	C4
Mass kg	0.20	0.23	0.34	0.52

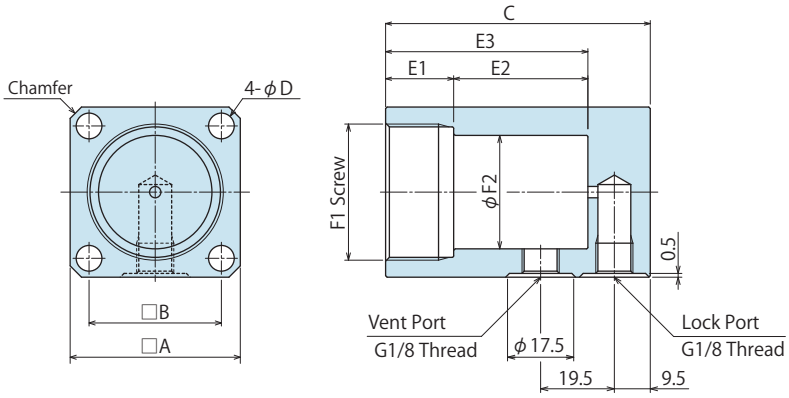
Notes 1. Material : S45C
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the C dimensions as a reference.

Manifold Block for TNC-Q

Model No. Indication

TNZ 060 0 – SQ

- 060: Size (Refer to following table)
- 0: Design No. (Revision Number)



(mm)

Model No.	TNZ0400-SQ	TNZ0600-SQ	TNZ1000-SQ	TNZ1600-SQ
Corresponding Item Model Number	TNC0400-Q	TNC0600-Q	TNC1000-Q	TNC1600-Q
A	35	38	45	55
B	26	29	35	42
C	56	63.5	70	86.5
D	5.5	5.5	6.8	9
E1	16	17	18	21
E2	23.5	30	35.5	49
E3	39.5	47	53.5	70
F1 (Nominal × Pitch)	M26×1.5	M30×1.5	M36×1.5	M45×1.5
F2	20	24	30	39
Chamfer	C3	C3	C3	C4
Mass kg	0.36	0.46	0.68	1.16

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

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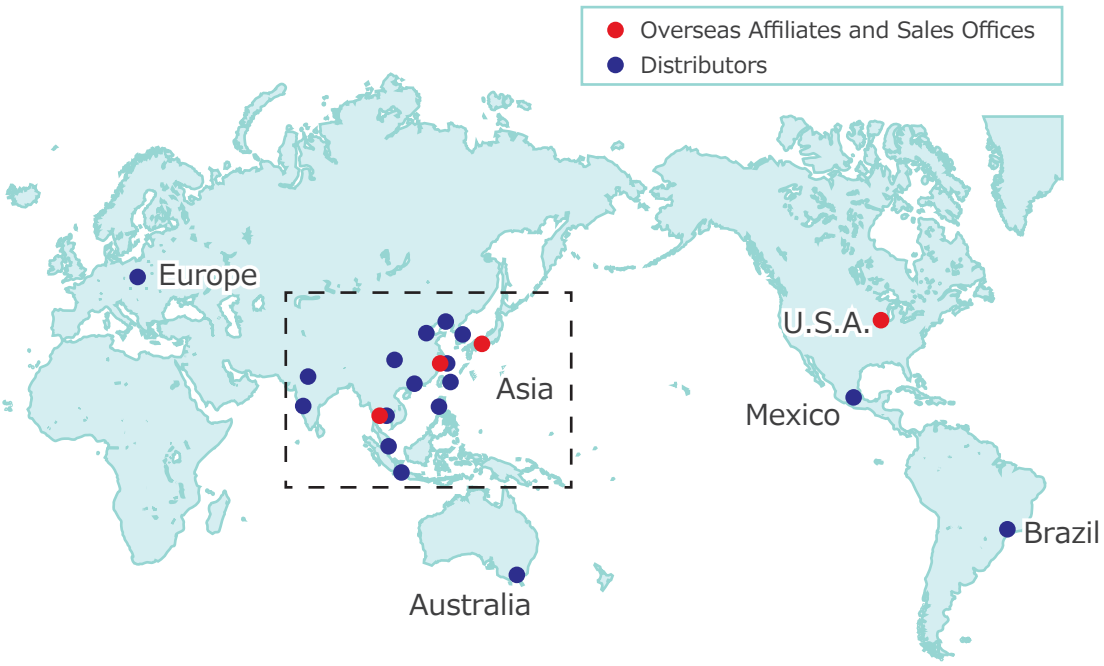
Global Network



Asia Detailed Map

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