

# Hydraulic Swing Clamp

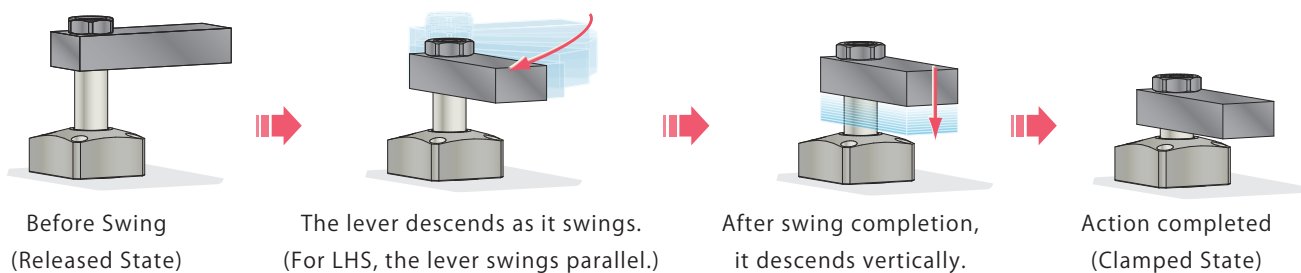
|           |             |
|-----------|-------------|
| Model LHA | Model LG/LT |
| Model LHC | Model TLA-2 |
| Model LHS | Model TLA-1 |
| Model LHW | Model TLB-2 |



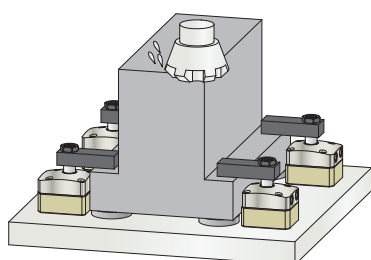
## High Rigidity • Long Life • High Accuracy

High Speed • High Rigidity • Swing Completion Position Repeatability  $\pm 0.5^\circ$  ( $\pm 0.75^\circ$  only for LHS)

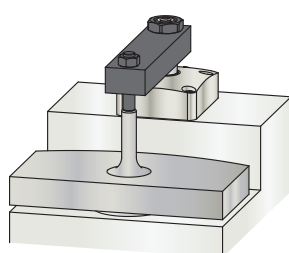
### Action Description



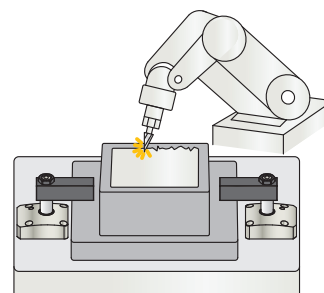
### Application Examples



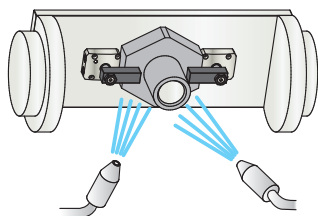
Machining



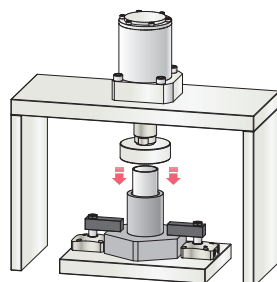
For the applications which require  
clamp position repeatability



Deburring



Cleaning



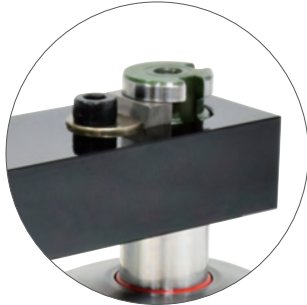
Press Fitting



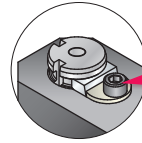
## Swing Clamp Quick Change Lever Option A

Model **LHA-A**

Only one bolt is required for lever installation and removal.  
Allows for the fastest lever setup time.



The Fastest Lever Change,  
with Only One Bolt



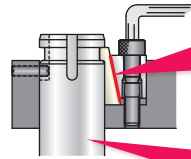
Only One Bolt for  
Lever Change!

Remove the Lever  
with One Wrench



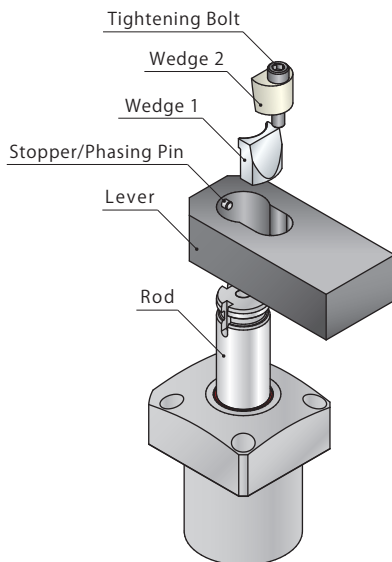
No Special Tools Required!  
Use One Wrench  
for Removal!

Secure Lever Tightening  
Even with Small Torque



Wedge Mechanism for  
Lever Tightening with  
Small Torque

Due to Small Torque,  
Not Required to Fix the Rod!

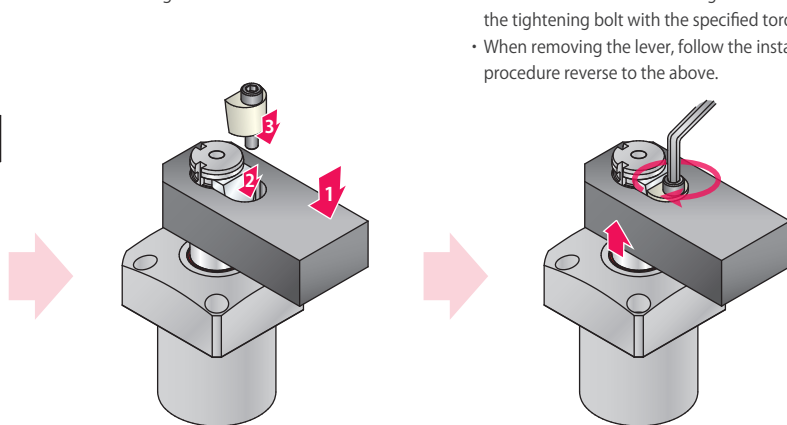


Install the Lever, Wedge1 and 2

- Set Wedge 1 to the slot of the rod.

Tighten the Lever with Tightening Bolt

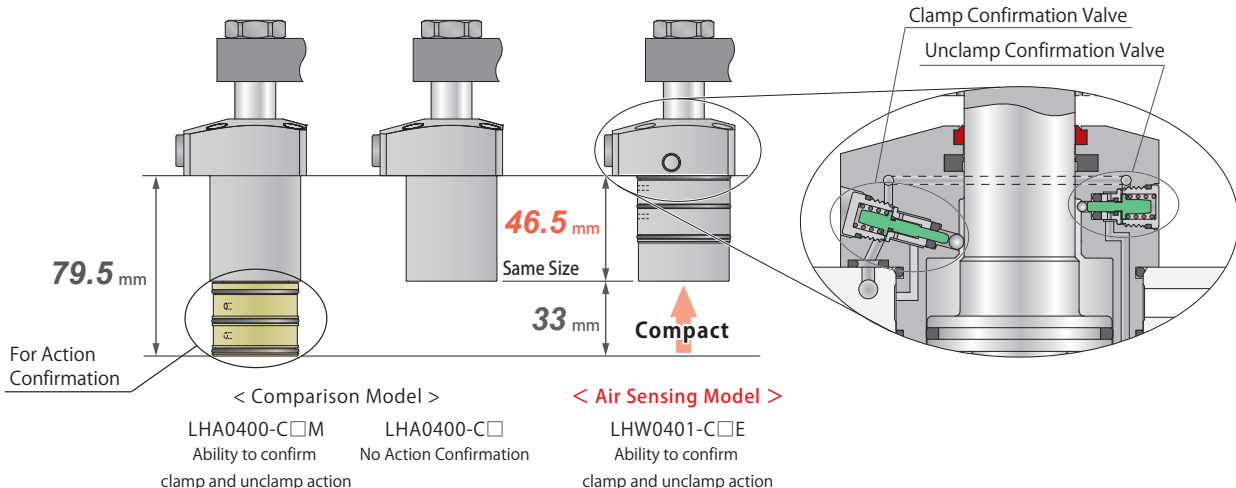
- Pull the lever towards the wedge side and tighten the tightening bolt with the specified torque.
- When removing the lever, follow the installation procedure reverse to the above.



## Air Sensing Swing Clamp

Model **LHW**

Clamp-unclamp confirmation with built-in air catch sensor  
for smaller footprint fixtures.



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  
LG/LT  
TLA-2  
TLB-2  
TLA-1

Link Clamp

LKA  
LKC  
LKW  
LJ/LM  
TMA-2  
TMA-1

Work Support

LD  
LC  
TNC  
TC

Air Sensing  
Lift Cylinder

LLW

Linear Cylinder /  
Compact Cylinder

LL  
LLR  
LLU  
DP  
DR  
DS  
DT

Block Cylinder

DBA/DBC

Centering Vise

FVA  
FVD  
FVC

Control Valve

BZL  
BZT  
BZX/JZG  
BZS

Pallet Clamp

VS/VT

Expansion  
Locating Pin

VFL/VFM  
VFJ/VFK

Pull Stud Clamp

FP  
FQ

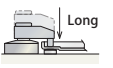
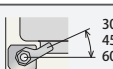
Customized  
Spring Cylinder

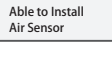
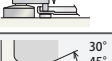
DWA/DWB

# Swing Clamp

| Low Pressure Model<br>MAX. 7MPa |                                                                                                                   | <br>Model <b>LHA</b> → P.429 | <br>Model <b>LHC</b> → P.463 | <br>Model <b>LHS</b> → P.477 | <br>Model <b>LHD</b> |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| Classification                  |                                                                                                                   | Double Action                                                                                                 | Double Action Compact                                                                                         | Double Action Parallel Swing Action                                                                             | Double Action Double Piston                                                                             |
| Operating Pressure Range        |                                                                                                                   | 1.5 ~ 7MPa                                                                                                    | 1.5 ~ 7MPa                                                                                                    | 1.5 ~ 7MPa                                                                                                      | 1.5 ~ 6MPa                                                                                              |
| Standard Model                  |                                                                                                                   | External Dimensions → P.437                                                                                   | External Dimensions → P.471                                                                                   | External Dimensions → P.485                                                                                     | Further information on the website.                                                                     |
| Action Confirmation             | Double End Rod Option for Dog    | External Dimensions → P.439                                                                                   | —                                                                                                             | ★                                                                                                               |                                                                                                         |
|                                 | Air Sensing Manifold Option      | External Dimensions → P.441                                                                                   | —                                                                                                             | ★                                                                                                               |                                                                                                         |
|                                 | Air Sensing Piping Option        | External Dimensions → P.443                                                                                   | —                                                                                                             | ★                                                                                                               |                                                                                                         |
|                                 | Built-in Sensing Valve Model                                                                                      | —                                                                                                             | —                                                                                                             | —                                                                                                               |                                                                                                         |
| Option                          | Quick Change Lever Option A      | External Dimensions → P.445                                                                                   | External Dimensions → P.473                                                                                   | External Dimensions → P.487                                                                                     |                                                                                                         |
|                                 | Quick Change Lever Option F      | External Dimensions → P.447                                                                                   | ★                                                                                                             | External Dimensions → P.489                                                                                     |                                                                                                         |
|                                 | Balance Lever Option             | External Dimensions → P.449                                                                                   | ★                                                                                                             | External Dimensions → P.491                                                                                     |                                                                                                         |
|                                 | Long Stroke Option              | External Dimensions → P.451                                                                                   | —                                                                                                             | ★                                                                                                               |                                                                                                         |
|                                 | Swing Angle Selectable Option  | External Dimensions → P.455                                                                                   | ★                                                                                                             | External Dimensions → P.493                                                                                     |                                                                                                         |
| Accessories                     | Lever                          | LZH-T, LZH-F, LZH-B<br>LZH-A, LZH-W → P.461                                                                   | LZH-T<br>LZH-A, LZH-W → P.476                                                                                 | LZH-T, LZH-F, LZH-B<br>LZH-A, LZH-W → P.497                                                                     |                                                                                                         |
|                                 | Manifold Block                 | LZY-MD                                                                                                        |                                                                                                               | → P.1335                                                                                                        |                                                                                                         |
|                                 | Speed Control Valve Plug       | BZL, BZX, JZG, BZS                                                                                            |                                                                                                               | → P.947                                                                                                         |                                                                                                         |

※ Please contact us for detail dimension at ★ part.

| High Pressure Model<br>MAX. 35MPa |                                                                                                                   | <br>Model <b>TLA-2</b> → P.545 | <br>Model <b>TLB-2</b> → P.571 | <br>Model <b>TLA-1</b> → P.589 | <br>Model <b>TLV-2</b> |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Classification                    |                                                                                                                   | Double Action Top Flange                                                                                          | Double Action Bottom Flange                                                                                       | Single Action (Spring Release) Top Flange                                                                           | Double Action with Action Confirmation                                                                      |
| Operating Pressure Range          |                                                                                                                   | 7 ~ 35MPa                                                                                                         | 7 ~ 35MPa                                                                                                         | 7 ~ 35MPa                                                                                                           | 7 ~ 35MPa                                                                                                   |
| Standard Model                    |                                                                                                                   | External Dimensions → P.553                                                                                       | External Dimensions → P.579                                                                                       | External Dimensions → P.597                                                                                         | Further information on the website.                                                                         |
| Option                            | Balance Lever Option           | External Dimensions → P.557                                                                                       | External Dimensions → P.581                                                                                       | —                                                                                                                   |                                                                                                             |
|                                   | Long Stroke Option             | External Dimensions → P.561                                                                                       | External Dimensions → P.583                                                                                       | —                                                                                                                   |                                                                                                             |
|                                   | Swing Angle Selectable Option  | External Dimensions → P.565                                                                                       | External Dimensions → P.585                                                                                       | —                                                                                                                   |                                                                                                             |
| Accessories                       | Lever                          | TLZ-L2, TLZ-LB<br>→ P.569                                                                                         | TLZ-L2, TLZ-LB<br>→ P.587                                                                                         | TLZ-L2, TLZ-LB<br>→ P.601                                                                                           |                                                                                                             |
|                                   | Speed Control Valve Plug       | BZT, JZG                                                                                                          |                                                                                                                   | → P.947                                                                                                             |                                                                                                             |
|                                   | G-Thread Fitting               | G-Thread Fitting (Made by Ihara Science)                                                                          |                                                                                                                   | → P.1351                                                                                                            |                                                                                                             |

| Low Pressure Model<br>MAX. 7MPa |                                                                                                                      | <br>Model <b>LHW</b> → P.499 | <br>Model <b>LG/LT</b> → P.521 | <br>Model <b>LHV</b> |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| Classification                  |                                                                                                                      | Double Action<br>Built-in Sensing Valve                                                                       | Single Action<br>(Spring Release)                                                                                | Double Action<br>1-Port Sensing                                                                         |
| Operating Pressure Range        |                                                                                                                      | 1.5 ~ 7MPa                                                                                                    | 2.5 ~ 7MPa                                                                                                       | 1.5 ~ 7MPa                                                                                              |
| Standard Model                  |                                                                                                                      | —                                                                                                             | External Dimensions → P.531                                                                                      | Further information<br>on the website.                                                                  |
| Action Confirmation             | Double End Rod<br>Option for Dog    | —                                                                                                             | —                                                                                                                |                                                                                                         |
|                                 | Air Sensing<br>Manifold Option      | —                                                                                                             | —                                                                                                                |                                                                                                         |
|                                 | Air Sensing<br>Piping Option        | —                                                                                                             | —                                                                                                                |                                                                                                         |
|                                 | Built-in Sensing Valve Model                                                                                         | External Dimensions → P.511                                                                                   | —                                                                                                                |                                                                                                         |
| Option                          | Quick Change<br>Lever Option A      | External Dimensions → P.517                                                                                   | External Dimensions → P.533                                                                                      |                                                                                                         |
|                                 | Quick Change<br>Lever Option F      | ★                                                                                                             | External Dimensions → P.535                                                                                      |                                                                                                         |
|                                 | Balance Lever Option                | ★                                                                                                             | External Dimensions → P.537                                                                                      |                                                                                                         |
|                                 | Long Stroke Option                | —                                                                                                             | —                                                                                                                |                                                                                                         |
|                                 | Swing Angle<br>Selectable Option  | ★                                                                                                             | External Dimensions → P.539                                                                                      |                                                                                                         |
| Accessories                     | Lever                             | LZH-T<br>LZH-A, LZH-W → P.520                                                                                 | LZ-LE1, LZ-LE2, LZH-F, LZH-B<br>LZH-A, LZH-W → P.543                                                             |                                                                                                         |
|                                 | Manifold Block                    | —                                                                                                             | LZ-MS → P.1336                                                                                                   |                                                                                                         |
|                                 | Speed Control Valve<br>Plug       | BZL, BZX, JZG, BZS                                                                                            | → P.947                                                                                                          |                                                                                                         |

※ Please contact us for detail dimension at ★ part.



## High-Power Swing Clamp Hydraulic Double Action

### Model **LHE**

2 sizes smaller with equivalent clamping force. Mechanical lock and hydraulic pressure allow for strong clamping and holding force. Refer to P. 11 for further information.

#### 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  
LG/LT  
TLA-2  
TLB-2  
TLA-1

#### Link Clamp

LKA  
LKC  
LKW  
LJ/LM  
TMA-2  
TMA-1

#### Work Support

LD  
LC  
TNC  
TC

#### Air Sensing Lift Cylinder

LLW

#### Linear Cylinder / Compact Cylinder

LL  
LLR  
LLU  
DP  
DR  
DS  
DT

#### Block Cylinder

DBA/DBC

#### Centering Vise

FVA  
FVD  
FVC

#### Control Valve

BZL  
BZT  
BZX/JZG  
BZS

#### Pallet Clamp

VS/VT

#### Expansion Locating Pin

VFL/VFM  
VFJ/VFK

#### Pull Stud Clamp

FP  
FQ

#### Customized Spring Cylinder

DWA/DWB

PAT.

# Hydraulic Double-Acting Parallel Swing Clamp

Model LHS

Low Pressure (1.5 ~ 7MPa)

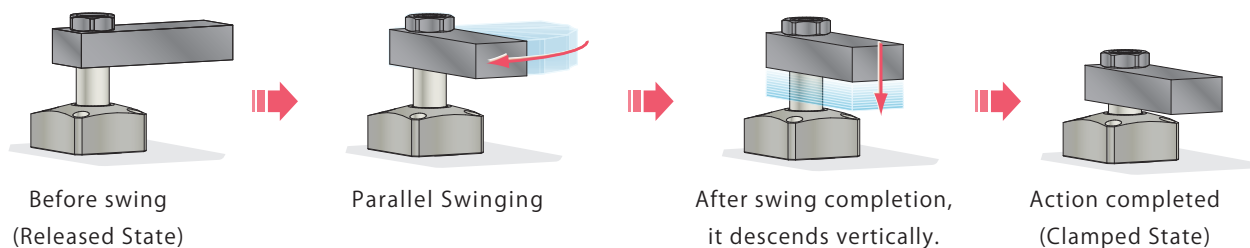
Parallel-Rotation • High Power



## Index

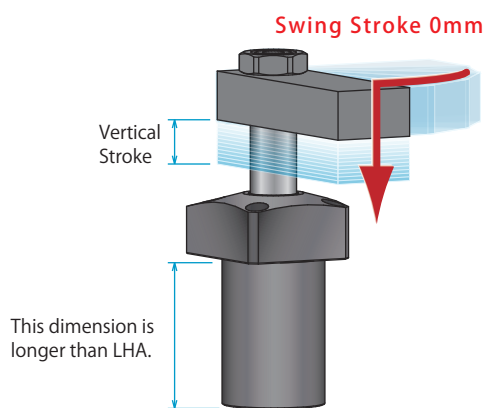
|                                                                                                     |        |
|-----------------------------------------------------------------------------------------------------|--------|
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| Specifications                                                                                      | P.480  |
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| • Clamping Force Curve                                                                              | P.481  |
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| External Dimensions                                                                                 |        |
| • Standard Model (LHS)                                                                              | P.485  |
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| • Speed Control Valve•Plug                                                                          | P.947  |
| • Manifold Block (Common Items of Other Models)                                                     | P.1335 |
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| • Installation Notes   • Hydraulic Fluid List   • Notes on Hydraulic Cylinder Speed Control Circuit |        |
| • Notes on Handling   • Maintenance/Inspection   • Warranty                                         |        |

## Action Description



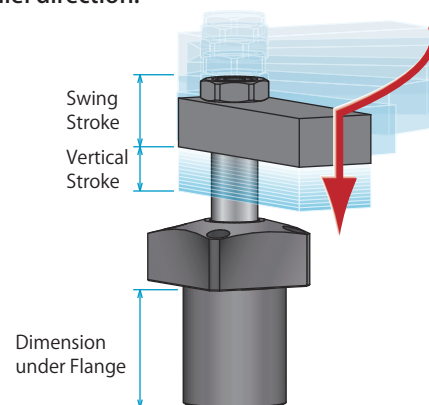
## Features

Clamp piston never goes down, before completing swing movement.  
Lever swings to parallel direction.



Model **LHS**

Interlock function to avoid wrong movement.



Model **LHA**

Standard Swing Clamp

### Excellent Coolant Resistance

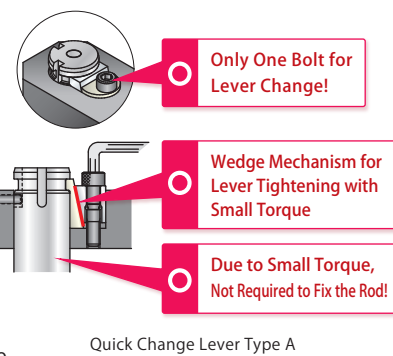
Our exclusive dust seal is designed to protect against high pressure coolant. It also has high durability against chlorine-based coolant by using a sealing material with excellent chemical resistance.

### Simple Design of Swing Lever (Taper sleeve is standard accessory)

As taper sleeve is standard accessory, tapering process while manufacturing clamp lever is eliminated.

Supplied lever sleeve incorporates taper simplifying clamping lever design.

Quick change lever type that is available as option is easy to attach and detach the lever with one wrench. (Refer to the drawing on the right.)



### 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.)

## LHS / LHA Compatibility

- Clamping Force : Same as LHA
- Vertical Stroke : Same as LHA
- Lever Design Dimensions : Same as LHA
- External Dimensions : Dimension under flange is longer than LHA.
- Swing Angle Accuracy : Different
- Swing Completion Position Repeatability : Different
- Allowable Swing Time : Different  
(Same as 90° Swing Time of LHA when locking)

### 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  
LG/LT  
TLA-2  
TLB-2  
TLA-1

#### Link Clamp

LKA  
LKC  
LKW  
LJ/LM  
TMA-2  
TMA-1

#### Work Support

LD  
LC  
TNC  
TC

#### Air Sensing Lift Cylinder

LLW

#### Linear Cylinder / Compact Cylinder

LL  
LLR  
LLU  
DP  
DR  
DS  
DT

#### Block Cylinder

DBA/DBC

#### Centering Vise

FVA  
FVD  
FVC

#### Control Valve

BZL  
BZT  
BZX/JZG  
BZS

#### Pallet Clamp

VS/VT

#### Expansion Locating Pin

VFL/VFM  
VFJ/VFK

#### Pull Stud Clamp

FP  
FQ

#### Customized Spring Cylinder

DWA/DWB

## Model No. Indication

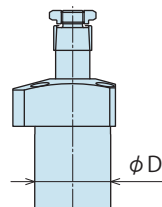
LHS **048** **0** - **C** **R** -

1   2   3   4   5

### 1 Body Size

|                                   |                                    |
|-----------------------------------|------------------------------------|
| <b>036</b> : $\phi D=36\text{mm}$ | <b>065</b> : $\phi D=65\text{mm}$  |
| <b>040</b> : $\phi D=40\text{mm}$ | <b>075</b> : $\phi D=75\text{mm}$  |
| <b>048</b> : $\phi D=48\text{mm}$ | <b>090</b> : $\phi D=90\text{mm}$  |
| <b>055</b> : $\phi D=55\text{mm}$ | <b>105</b> : $\phi D=105\text{mm}$ |

※ Outer diameter ( $\phi D$ ) of body cylinder.



### 2 Design No.

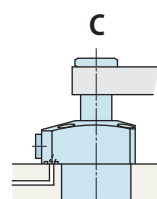
**0** : Revision Number

### 3 Piping Method

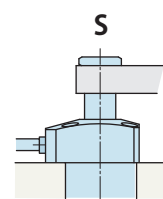
**C** : Gasket Option (With G Thread Plug)

**S** : Piping Option (Rc Thread Port)

※ Speed control valve (BZL) is sold separately.  
Refer to P.947.



Gasket Option



Piping Option

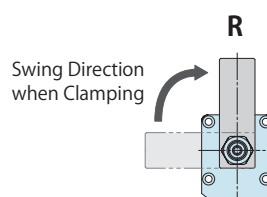
With R Thread Plug (able to  
attach Speed Control Valve)  
(Order the valve separately)  
(Recommended: BZL-B)

Rc Thread Port  
No Gasket Port

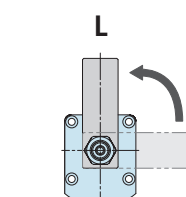
### 4 Swing Direction when Clamping

**R** : Clockwise

**L** : Counter-Clockwise



Swing Direction  
when Clamping



Swing Direction  
when Clamping

### 5 Option

**Blank** : None (Standard: Taper Lock Lever Option)

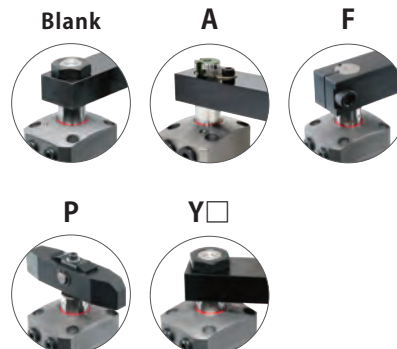
**A** : Quick Change Lever Option A

**F** : Quick Change Lever Option F

**P** : Balance Lever Option

**Y□** : Swing Angle Selectable Option  
(**Y30** : 30° / **Y45** : 45° / **Y60** : 60°)

※ Please contact us for a combination of options.



## Specifications

| Model No.                                                                                                   |                                                                                                               | LHS0360         |                                                                                                                          |         | LHS0400 |                                                                                                                      |         | LHS0480 |                                                                                                                          |         | LHS0550 |                                                                                                                        |         |         |
|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------|---------|---------|----------------------------------------------------------------------------------------------------------------------|---------|---------|--------------------------------------------------------------------------------------------------------------------------|---------|---------|------------------------------------------------------------------------------------------------------------------------|---------|---------|
| Cylinder Area for Locking                                                                                   |                                                                                                               | cm <sup>2</sup> | 3.54                                                                                                                     |         |         | 5.00                                                                                                                 |         |         | 6.95                                                                                                                     |         |         | 10.3                                                                                                                   |         |         |
| Cylinder Inner Diameter ※ <sup>1</sup>                                                                      |                                                                                                               | mm              | 26                                                                                                                       |         |         | 31                                                                                                                   |         |         | 37                                                                                                                       |         |         | 44                                                                                                                     |         |         |
| Rod Diameter ※ <sup>1</sup>                                                                                 |                                                                                                               | mm              | 15                                                                                                                       |         |         | 18                                                                                                                   |         |         | 22                                                                                                                       |         |         | 25                                                                                                                     |         |         |
| Clamping Force<br>(Calculation Formula)※ <sup>2</sup><br>kN                                                 |  Option <b>Blank/A/F/Y</b> □ |                 | F= $\frac{P(1-0.0021 \times L)}{2.9379+0.0052 \times L}$                                                                 |         |         | F= $\frac{P(1-0.0016 \times L)}{2.0920+0.0040 \times L}$                                                             |         |         | F= $\frac{P(1-0.0009 \times L)}{1.4892+0.0018 \times L}$                                                                 |         |         | F= $\frac{P(1-0.0011 \times L)}{1.0039+0.0011 \times L}$                                                               |         |         |
|                                                                                                             |  Option <b>P</b>             |                 | F <sub>1</sub> = (L <sub>2</sub> /L <sub>3</sub> )×0.354×P<br>F <sub>2</sub> = (L <sub>1</sub> /L <sub>3</sub> )×0.354×P |         |         | F <sub>1</sub> = (L <sub>2</sub> /L <sub>3</sub> )×0.5×P<br>F <sub>2</sub> = (L <sub>1</sub> /L <sub>3</sub> )×0.5×P |         |         | F <sub>1</sub> = (L <sub>2</sub> /L <sub>3</sub> )×0.695×P<br>F <sub>2</sub> = (L <sub>1</sub> /L <sub>3</sub> )×0.695×P |         |         | F <sub>1</sub> = (L <sub>2</sub> /L <sub>3</sub> )×1.03×P<br>F <sub>2</sub> = (L <sub>1</sub> /L <sub>3</sub> )×1.03×P |         |         |
|  Option <b>Blank/A/F/P</b> | Full Stroke (Vertical)                                                                                        | mm              | 8                                                                                                                        |         |         | 8                                                                                                                    |         |         | 8                                                                                                                        |         |         | 10                                                                                                                     |         |         |
|                                                                                                             | Swing Angle Accuracy                                                                                          |                 | 90° ±2°                                                                                                                  |         |         |                                                                                                                      |         |         |                                                                                                                          |         |         |                                                                                                                        |         |         |
|                                                                                                             | Swing Completion Position Repeatability                                                                       |                 | ±0.75°                                                                                                                   |         |         |                                                                                                                      |         |         |                                                                                                                          |         |         |                                                                                                                        |         |         |
|  Option <b>Y</b> □         | Option                                                                                                        |                 | Y30                                                                                                                      | Y45     | Y60     | Y30                                                                                                                  | Y45     | Y60     | Y30                                                                                                                      | Y45     | Y60     | Y30                                                                                                                    | Y45     | Y60     |
|                                                                                                             | Full Stroke (Vertical)                                                                                        | mm              | 8                                                                                                                        | 8       | 8       | 8                                                                                                                    | 8       | 8       | 8                                                                                                                        | 8       | 8       | 10                                                                                                                     | 10      | 10      |
|                                                                                                             | Swing Angle Accuracy                                                                                          |                 | 30° ±2°                                                                                                                  | 45° ±2° | 60° ±2° | 30° ±2°                                                                                                              | 45° ±2° | 60° ±2° | 30° ±2°                                                                                                                  | 45° ±2° | 60° ±2° | 30° ±2°                                                                                                                | 45° ±2° | 60° ±2° |
|                                                                                                             | Swing Completion Position Repeatability                                                                       |                 | ±0.75°                                                                                                                   |         |         |                                                                                                                      |         |         |                                                                                                                          |         |         |                                                                                                                        |         |         |
| Max. Operating Pressure                                                                                     |                                                                                                               | MPa             | 7                                                                                                                        |         |         |                                                                                                                      |         |         |                                                                                                                          |         |         |                                                                                                                        |         |         |
| Min. Operating Pressure※ <sup>3</sup>                                                                       |                                                                                                               | MPa             | 1.5                                                                                                                      |         |         |                                                                                                                      |         |         |                                                                                                                          |         |         |                                                                                                                        |         |         |
| Withstanding Pressure                                                                                       |                                                                                                               | MPa             | 10.5                                                                                                                     |         |         |                                                                                                                      |         |         |                                                                                                                          |         |         |                                                                                                                        |         |         |
| Operating Temperature                                                                                       |                                                                                                               | °C              | 0 ~ 70                                                                                                                   |         |         |                                                                                                                      |         |         |                                                                                                                          |         |         |                                                                                                                        |         |         |
| Usable Fluid                                                                                                |                                                                                                               |                 | General Hydraulic Oil Equivalent to ISO-VG-32                                                                            |         |         |                                                                                                                      |         |         |                                                                                                                          |         |         |                                                                                                                        |         |         |

| Model No.                                                                                                     |                                                                                                                 | LHS0650         |                                                                                                                        |         |         | LHS0750 |                                                                                                                        |         | LHS0900 |                                                                                                                        |         | LHS1050 |                                                                                                                        |         |  |
|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-----------------|------------------------------------------------------------------------------------------------------------------------|---------|---------|---------|------------------------------------------------------------------------------------------------------------------------|---------|---------|------------------------------------------------------------------------------------------------------------------------|---------|---------|------------------------------------------------------------------------------------------------------------------------|---------|--|
| Cylinder Area for Locking                                                                                     |                                                                                                                 | cm <sup>2</sup> | 13.4                                                                                                                   |         |         |         | 20.3                                                                                                                   |         |         | 29.5                                                                                                                   |         |         | 41.3                                                                                                                   |         |  |
| Cylinder Inner Diameter ※ <sup>1</sup>                                                                        |                                                                                                                 | mm              | 51                                                                                                                     |         |         |         | 62                                                                                                                     |         |         | 76                                                                                                                     |         |         | 91                                                                                                                     |         |  |
| Rod Diameter ※ <sup>1</sup>                                                                                   |                                                                                                                 | mm              | 30                                                                                                                     |         |         |         | 35.5                                                                                                                   |         |         | 45                                                                                                                     |         |         | 55                                                                                                                     |         |  |
| Clamping Force<br>(Calculation Formula)※ <sup>2</sup><br>kN                                                   |  Option <b>Blank/A/F/Y</b> □ |                 | F= $\frac{P(1-0.0009 \times L)}{0.7822+0.0010 \times L}$                                                               |         |         |         | F= $\frac{P(1-0.0007 \times L)}{0.5175+0.0006 \times L}$                                                               |         |         | F= $\frac{P(1-0.0009 \times L)}{0.3547+0.0004 \times L}$                                                               |         |         | F= $\frac{P(1-0.0008 \times L)}{0.2495+0.0002 \times L}$                                                               |         |  |
|                                                                                                               |  Option <b>P</b>             |                 | F <sub>1</sub> = (L <sub>2</sub> /L <sub>3</sub> )×1.34×P<br>F <sub>2</sub> = (L <sub>1</sub> /L <sub>3</sub> )×1.34×P |         |         |         | F <sub>1</sub> = (L <sub>2</sub> /L <sub>3</sub> )×2.03×P<br>F <sub>2</sub> = (L <sub>1</sub> /L <sub>3</sub> )×2.03×P |         |         | F <sub>1</sub> = (L <sub>2</sub> /L <sub>3</sub> )×2.95×P<br>F <sub>2</sub> = (L <sub>1</sub> /L <sub>3</sub> )×2.95×P |         |         | F <sub>1</sub> = (L <sub>2</sub> /L <sub>3</sub> )×4.13×P<br>F <sub>2</sub> = (L <sub>1</sub> /L <sub>3</sub> )×4.13×P |         |  |
|  Option <b>Blank/A/F/P</b> | Full Stroke (Vertical)                                                                                          | mm              | 10                                                                                                                     |         |         |         | 12                                                                                                                     |         |         | 12                                                                                                                     |         |         | 16                                                                                                                     |         |  |
|                                                                                                               | Swing Angle Accuracy                                                                                            |                 | 90° ±2°                                                                                                                |         |         |         |                                                                                                                        |         |         |                                                                                                                        |         |         |                                                                                                                        |         |  |
|                                                                                                               | Swing Completion Position Repeatability                                                                         |                 | ±0.75°                                                                                                                 |         |         |         |                                                                                                                        |         |         |                                                                                                                        |         |         |                                                                                                                        |         |  |
|  Option <b>Y</b> □         | Option                                                                                                          |                 | Y30                                                                                                                    | Y45     | Y60     | Y30     | Y45                                                                                                                    | Y60     | Y30     | Y45                                                                                                                    | Y60     | Y30     | Y45                                                                                                                    | Y60     |  |
|                                                                                                               | Full Stroke (Vertical)                                                                                          | mm              | 10                                                                                                                     | 10      | 10      | 12      | 12                                                                                                                     | 12      | 12      | 12                                                                                                                     | 12      | 16      | 16                                                                                                                     | 16      |  |
|                                                                                                               | Swing Angle Accuracy                                                                                            |                 | 30° ±2°                                                                                                                | 45° ±2° | 60° ±2° | 30° ±2° | 45° ±2°                                                                                                                | 60° ±2° | 30° ±2° | 45° ±2°                                                                                                                | 60° ±2° | 30° ±2° | 45° ±2°                                                                                                                | 60° ±2° |  |
|                                                                                                               | Swing Completion Position Repeatability                                                                         |                 | ±0.75°                                                                                                                 |         |         |         |                                                                                                                        |         |         |                                                                                                                        |         |         |                                                                                                                        |         |  |
| Max. Operating Pressure                                                                                       |                                                                                                                 | MPa             | 7                                                                                                                      |         |         |         |                                                                                                                        |         |         |                                                                                                                        |         |         |                                                                                                                        |         |  |
| Min. Operating Pressure※ <sup>3</sup>                                                                         |                                                                                                                 | MPa             | 1.5                                                                                                                    |         |         |         |                                                                                                                        |         |         |                                                                                                                        |         |         |                                                                                                                        |         |  |
| Withstanding Pressure                                                                                         |                                                                                                                 | MPa             | 10.5                                                                                                                   |         |         |         |                                                                                                                        |         |         |                                                                                                                        |         |         |                                                                                                                        |         |  |
| Operating Temperature                                                                                         |                                                                                                                 | °C              | 0 ~ 70                                                                                                                 |         |         |         |                                                                                                                        |         |         |                                                                                                                        |         |         |                                                                                                                        |         |  |
| Usable Fluid                                                                                                  |                                                                                                                 |                 | General Hydraulic Oil Equivalent to ISO-VG-32                                                                          |         |         |         |                                                                                                                        |         |         |                                                                                                                        |         |         |                                                                                                                        |         |  |

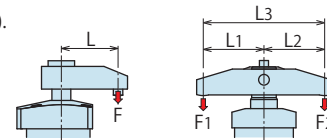
Notes: ※1. Clamping force cannot be calculated from the cylinder inner diameter and rod diameter. Please refer to the clamping force curve.

※2. F, F<sub>1</sub>, F<sub>2</sub> : Clamping Force (kN), P : Supply Hydraulic Pressure (MPa)

L, L<sub>1</sub>, L<sub>2</sub> : Distance between the piston center and the clamping point (mm), L<sub>3</sub> : (mm).

※3. Minimum pressure to operate the clamp without load.

1. Please refer to External Dimensions for the cylinder capacity and the product weight.



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  
LG/LT  
TLA-2  
TLB-2  
TLA-1

Link Clamp

LKA  
LKC  
LKW  
LJ/LM  
TMA-2  
TMA-1

Work Support

LD  
LC  
TNC  
TC

Air Sensing Lift Cylinder

LLW

Linear Cylinder / Compact Cylinder

LL  
LLR  
LLU  
DP  
DR  
DS  
DT

Block Cylinder

DBA/DBC

Centering Vise

FVA  
FVD  
FVC

Control Valve

BZL  
BZT  
BZX/JZG  
BZS

Pallet Clamp

VS/VT

Expansion Locating Pin

VFL/VFM  
VFJ/VFK

Pull Stud Clamp

FP  
FQ

Customized Spring Cylinder

DWA/DWB



## Clamping Force Curve

※ LHS□0-□□-P : For balance lever option, the clamping force curve is different from the graph. Please calculate it with the specification's formula.

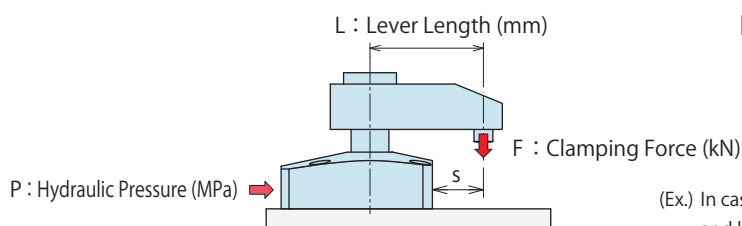
Applicable Model

LHS

0 - C R L

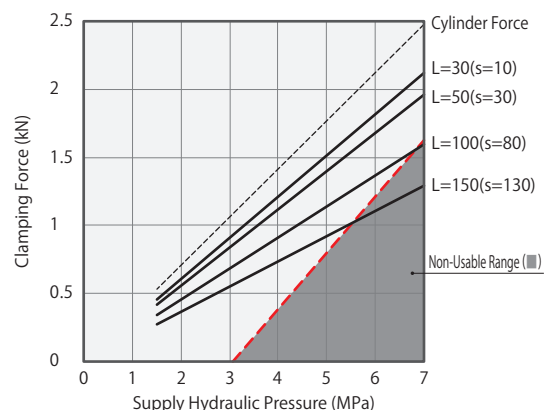
Blank  
A  
F  
Y□

1 Body Size

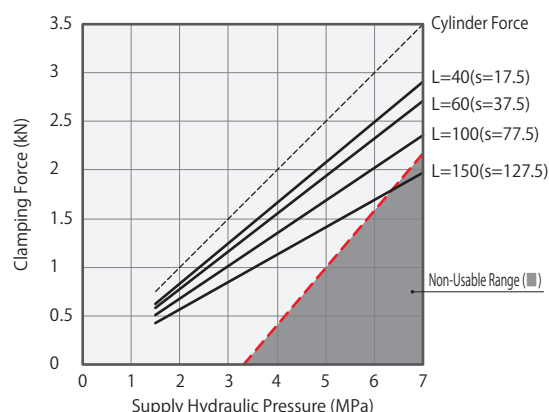
5 Option  
Blank/A/F/Y□

(Ex.) In case of LHS0480 : When supply hydraulic pressure P is 5.0MPa and lever length L is 50mm, clamping force becomes about 3.1kN.

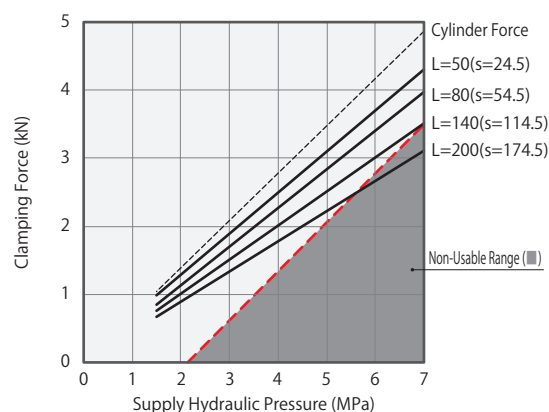
| LHS0360                       |                     | Clamping Force Calculation Formula ※1 (kN) $F = P(1-0.0021 \times L) / (2.9379+0.0052 \times L)$ |      |      |      |      |       |       |       |                      |                            |
|-------------------------------|---------------------|--------------------------------------------------------------------------------------------------|------|------|------|------|-------|-------|-------|----------------------|----------------------------|
| Hydraulic Pressure (MPa)      | Cylinder Force (kN) | Clamping Force (kN)<br>Lever Length L (mm)                                                       |      |      |      |      |       |       |       | Non-Usable Range (■) | Max. Lever Length (L) (mm) |
|                               |                     | L=30                                                                                             | L=40 | L=50 | L=60 | L=80 | L=100 | L=120 | L=150 |                      |                            |
| 7                             | 2.48                | 2.2                                                                                              | 2.1  | 2.0  | 1.9  | 1.8  | 1.5   | 1.3   | 1.1   | ■                    | 96                         |
| 6.5                           | 2.30                | 2.0                                                                                              | 1.9  | 1.9  | 1.8  | 1.7  | 1.5   | 1.3   | 1.1   | ■                    | 110                        |
| 6                             | 2.13                | 1.9                                                                                              | 1.8  | 1.7  | 1.7  | 1.5  | 1.4   | 1.3   | 1.1   | ■                    | 129                        |
| 5.5                           | 1.95                | 1.7                                                                                              | 1.6  | 1.6  | 1.5  | 1.4  | 1.3   | 1.2   | 1.1   | ■                    | 150                        |
| 5                             | 1.77                | 1.6                                                                                              | 1.5  | 1.4  | 1.4  | 1.3  | 1.2   | 1.1   | 1.0   | ■                    | 150                        |
| 4.5                           | 1.59                | 1.4                                                                                              | 1.4  | 1.3  | 1.3  | 1.2  | 1.1   | 1.0   | 0.9   | ■                    | 150                        |
| 4                             | 1.42                | 1.3                                                                                              | 1.2  | 1.2  | 1.1  | 1.0  | 1.0   | 0.9   | 0.8   | ■                    | 150                        |
| 3.5                           | 1.24                | 1.1                                                                                              | 1.1  | 1.0  | 1.0  | 0.9  | 0.8   | 0.8   | 0.7   | ■                    | 150                        |
| 3                             | 1.06                | 1.0                                                                                              | 0.9  | 0.9  | 0.9  | 0.8  | 0.7   | 0.7   | 0.6   | ■                    | 150                        |
| 2.5                           | 0.89                | 0.8                                                                                              | 0.8  | 0.7  | 0.7  | 0.7  | 0.6   | 0.6   | 0.5   | ■                    | 150                        |
| 2                             | 0.71                | 0.7                                                                                              | 0.6  | 0.6  | 0.6  | 0.5  | 0.5   | 0.5   | 0.4   | ■                    | 150                        |
| 1.5                           | 0.53                | 0.5                                                                                              | 0.5  | 0.5  | 0.4  | 0.4  | 0.4   | 0.4   | 0.3   | ■                    | 150                        |
| Max. Operating Pressure (MPa) |                     | 7.0                                                                                              | 7.0  | 7.0  | 7.0  | 7.0  | 6.9   | 6.3   | 5.6   |                      |                            |



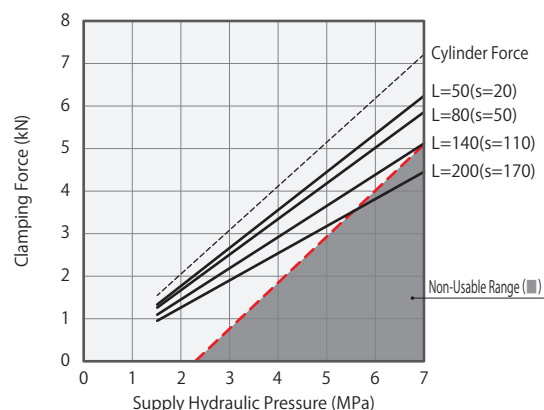
| LHS0400                       |                     | Clamping Force Calculation Formula ※1 (kN) $F = P(1-0.0016 \times L) / (2.0920+0.0040 \times L)$ |      |      |      |      |       |       |       |                      |                            |
|-------------------------------|---------------------|--------------------------------------------------------------------------------------------------|------|------|------|------|-------|-------|-------|----------------------|----------------------------|
| Hydraulic Pressure (MPa)      | Cylinder Force (kN) | Clamping Force (kN)<br>Lever Length L (mm)                                                       |      |      |      |      |       |       |       | Non-Usable Range (■) | Max. Lever Length (L) (mm) |
|                               |                     | L=40                                                                                             | L=50 | L=60 | L=70 | L=80 | L=100 | L=120 | L=150 |                      |                            |
| 7                             | 3.50                | 3.0                                                                                              | 2.9  | 2.8  | 2.7  | 2.6  | 2.4   | 2.2   | 2.0   | ■                    | 124                        |
| 6.5                           | 3.25                | 2.7                                                                                              | 2.7  | 2.6  | 2.5  | 2.4  | 2.2   | 2.1   | 1.9   | ■                    | 144                        |
| 6                             | 3.00                | 2.5                                                                                              | 2.5  | 2.4  | 2.3  | 2.2  | 2.1   | 1.9   | 1.7   | ■                    | 171                        |
| 5.5                           | 2.75                | 2.3                                                                                              | 2.3  | 2.2  | 2.1  | 2.0  | 1.9   | 1.8   | 1.6   | ■                    | 210                        |
| 5                             | 2.50                | 2.1                                                                                              | 2.1  | 2.0  | 1.9  | 1.9  | 1.7   | 1.6   | 1.5   | ■                    | 210                        |
| 4.5                           | 2.25                | 1.9                                                                                              | 1.9  | 1.8  | 1.7  | 1.7  | 1.6   | 1.5   | 1.3   | ■                    | 210                        |
| 4                             | 2.00                | 1.7                                                                                              | 1.7  | 1.6  | 1.5  | 1.5  | 1.4   | 1.3   | 1.2   | ■                    | 210                        |
| 3.5                           | 1.75                | 1.5                                                                                              | 1.4  | 1.4  | 1.3  | 1.3  | 1.2   | 1.1   | 1.0   | ■                    | 210                        |
| 3                             | 1.50                | 1.3                                                                                              | 1.2  | 1.2  | 1.1  | 1.1  | 1.0   | 0.9   | 0.9   | ■                    | 210                        |
| 2.5                           | 1.25                | 1.1                                                                                              | 1.0  | 1.0  | 0.9  | 0.9  | 0.8   | 0.8   | 0.8   | ■                    | 210                        |
| 2                             | 1.00                | 0.9                                                                                              | 0.8  | 0.8  | 0.8  | 0.8  | 0.7   | 0.7   | 0.6   | ■                    | 210                        |
| 1.5                           | 0.75                | 0.7                                                                                              | 0.6  | 0.6  | 0.6  | 0.6  | 0.6   | 0.5   | 0.5   | ■                    | 210                        |
| Max. Operating Pressure (MPa) |                     | 7.0                                                                                              | 7.0  | 7.0  | 7.0  | 7.0  | 7.0   | 7.0   | 6.4   |                      |                            |



| LHS0480                       |                     | Clamping Force Calculation Formula ※1 (kN) $F = P(1-0.0009 \times L) / (1.4892+0.0018 \times L)$ |      |      |       |       |       |       |       |                      |                            |
|-------------------------------|---------------------|--------------------------------------------------------------------------------------------------|------|------|-------|-------|-------|-------|-------|----------------------|----------------------------|
| Hydraulic Pressure (MPa)      | Cylinder Force (kN) | Clamping Force (kN)<br>Lever Length L (mm)                                                       |      |      |       |       |       |       |       | Non-Usable Range (■) | Max. Lever Length (L) (mm) |
|                               |                     | L=50                                                                                             | L=60 | L=80 | L=100 | L=120 | L=140 | L=160 | L=200 |                      |                            |
| 7                             | 4.87                | 4.3                                                                                              | 4.2  | 4.0  | 3.9   | 3.7   | 3.6   | 3.3   | 2.9   | ■                    | 141                        |
| 6.5                           | 4.52                | 4.0                                                                                              | 3.9  | 3.7  | 3.6   | 3.4   | 3.3   | 3.1   | 2.7   | ■                    | 157                        |
| 6                             | 4.17                | 3.7                                                                                              | 3.6  | 3.5  | 3.3   | 3.2   | 3.1   | 2.9   | 2.5   | ■                    | 178                        |
| 5.5                           | 3.82                | 3.4                                                                                              | 3.3  | 3.2  | 3.0   | 2.9   | 2.8   | 2.7   | 2.3   | ■                    | 204                        |
| 5                             | 3.48                | 3.1                                                                                              | 3.0  | 2.9  | 2.8   | 2.7   | 2.6   | 2.5   | 2.1   | ■                    | 230                        |
| 4.5                           | 3.13                | 2.8                                                                                              | 2.7  | 2.6  | 2.5   | 2.4   | 2.3   | 2.2   | 1.8   | ■                    | 230                        |
| 4                             | 2.78                | 2.5                                                                                              | 2.4  | 2.3  | 2.2   | 2.1   | 2.1   | 2.0   | 1.6   | ■                    | 230                        |
| 3.5                           | 2.43                | 2.2                                                                                              | 2.1  | 2.0  | 2.0   | 1.9   | 1.8   | 1.7   | 1.4   | ■                    | 230                        |
| 3                             | 2.09                | 1.9                                                                                              | 1.8  | 1.7  | 1.7   | 1.6   | 1.6   | 1.5   | 1.2   | ■                    | 230                        |
| 2.5                           | 1.74                | 1.6                                                                                              | 1.5  | 1.5  | 1.4   | 1.4   | 1.3   | 1.2   | 1.0   | ■                    | 230                        |
| 2                             | 1.39                | 1.3                                                                                              | 1.2  | 1.2  | 1.1   | 1.1   | 1.0   | 1.0   | 0.8   | ■                    | 230                        |
| 1.5                           | 1.04                | 1.0                                                                                              | 0.9  | 0.9  | 0.9   | 0.8   | 0.8   | 0.8   | 0.7   | ■                    | 230                        |
| Max. Operating Pressure (MPa) |                     | 7.0                                                                                              | 7.0  | 7.0  | 7.0   | 7.0   | 7.0   | 6.6   | 5.7   |                      |                            |



| LHS0550                       |                     | Clamping Force Calculation Formula ※1 (kN) $F = P(1-0.0011 \times L) / (1.0039+0.0011 \times L)$ |      |      |       |       |       |       |       |                      |                            |
|-------------------------------|---------------------|--------------------------------------------------------------------------------------------------|------|------|-------|-------|-------|-------|-------|----------------------|----------------------------|
| Hydraulic Pressure (MPa)      | Cylinder Force (kN) | Clamping Force (kN)<br>Lever Length L (mm)                                                       |      |      |       |       |       |       |       | Non-Usable Range (■) | Max. Lever Length (L) (mm) |
|                               |                     | L=50                                                                                             | L=60 | L=80 | L=100 | L=120 | L=140 | L=160 | L=200 |                      |                            |
| 7                             | 7.21                | 6.3                                                                                              | 6.2  | 5.9  | 5.6   | 5.4   | 5.2   | 4.8   | 4.2   | ■                    | 142                        |
| 6.5                           | 6.69                | 5.8                                                                                              | 5.7  | 5.5  | 5.2   | 5.0   | 4.8   | 4.4   | 3.8   | ■                    | 159                        |
| 6                             | 6.18                | 5.4                                                                                              | 5.3  | 5.1  | 4.8   | 4.6   | 4.4   | 4.2   | 3.6   | ■                    | 180                        |
| 5.5                           | 5.66                | 5.0                                                                                              | 4.8  | 4.6  | 4.4   | 4.2   | 4.1   | 3.9   | 3.3   | ■                    | 209                        |
| 5                             | 5.15                | 4.5                                                                                              | 4.4  | 4.2  | 4.0   | 3.9   | 3.7   | 3.5   | 3.0   | ■                    | 245                        |
| 4.5                           | 4.63                | 4.1                                                                                              | 4.0  | 3.8  | 3.6   | 3.5   | 3.3   | 3.2   | 2.7   | ■                    | 245                        |
| 4                             | 4.12                | 3.6                                                                                              | 3.5  | 3.4  | 3.2   | 3.1   | 3.0   | 2.8   | 2.4   | ■                    | 245                        |
| 3.5                           | 3.60                | 3.2                                                                                              | 3.1  | 3.0  | 2.8   | 2.7   | 2.6   | 2.5   | 2.1   | ■                    | 245                        |
| 3                             | 3.09                | 2.7                                                                                              | 2.7  | 2.6  | 2.4   | 2.3   | 2.2   | 2.1   | 1.8   | ■                    | 245                        |
| 2.5                           | 2.57                | 2.3                                                                                              | 2.2  | 2.1  | 2.0   | 2.0   | 1.9   | 1.8   | 1.5   | ■                    | 245                        |
| 2                             | 2.06                | 1.8                                                                                              | 1.8  | 1.7  | 1.6   | 1.5   | 1.5   | 1.4   | 1.2   | ■                    | 245                        |
| 1.5                           | 1.54                | 1.4                                                                                              | 1.4  | 1.3  | 1.2   | 1.2   | 1.1   | 1.1   | 1.0   | ■                    | 245                        |
| Max. Operating Pressure (MPa) |                     | 7.0                                                                                              | 7.0  | 7.0  | 7.0   | 7.0   | 7.0   | 6.4   | 5.6   |                      |                            |



#### Notes :

1. Tables and graphs show the relationship between the clamping force (kN) and supply hydraulic pressure (MPa).
2. Cylinder force (when L=0) cannot be calculated from the formula of clamping force.
3. Lever with a large inertia sometimes does not work depending on supply hydraulic pressure, lever mounting position, etc.
4. Values in below charts indicate clamping force when the lever locks a workpiece in horizontal position.
5. The clamping force varies depending on the lever length. Set the suitable supply hydraulic pressure based on the lever length.
6. Clamping force in the non-usable range may cause damage and fluid leakage.
7. The tables and graphs are only for reference. The exact results should be calculated based on the clamping force calculation formula.

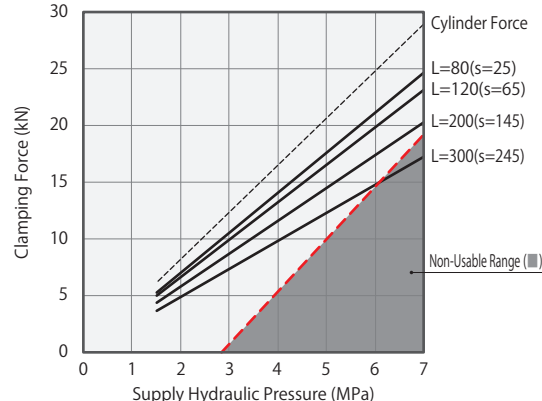
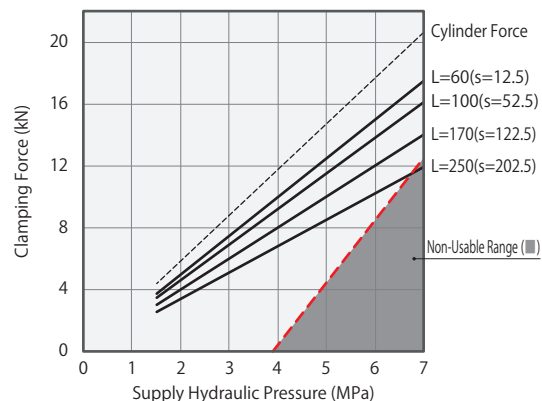
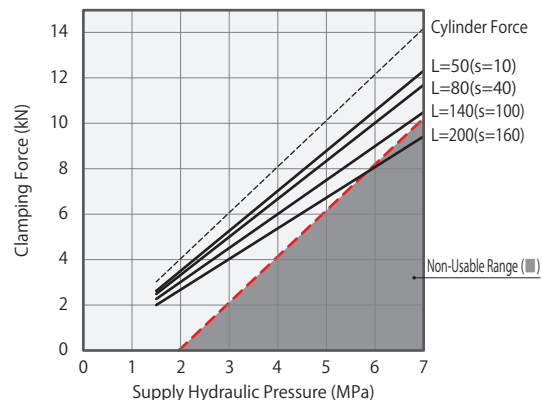
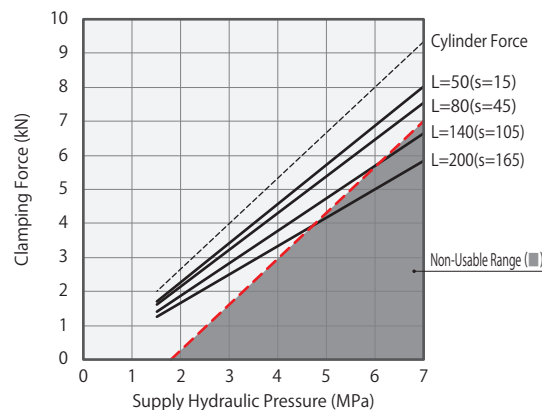
※1. F : Clamping Force (kN), P : Supply Hydraulic Pressure (MPa), L : Lever Length (mm).

| LHS0650                       |                     | Clamping Force Calculation Formula ※1 (kN) $F = P(1-0.0009 \times L) / (0.7822+0.0010 \times L)$ |      |      |       |       |       |       |       |                       |                            |
|-------------------------------|---------------------|--------------------------------------------------------------------------------------------------|------|------|-------|-------|-------|-------|-------|-----------------------|----------------------------|
| Hydraulic Pressure (MPa)      | Cylinder Force (kN) | Clamping Force (kN) Lever Length L (mm)                                                          |      |      |       |       |       |       |       | Non-Usable Range (mm) | Max. Lever Length (L) (mm) |
|                               |                     | L=50                                                                                             | L=60 | L=80 | L=100 | L=120 | L=140 | L=160 | L=200 |                       |                            |
| 7                             | 9.35                | 8.1                                                                                              | 7.9  | 7.6  | 7.3   |       |       |       |       |                       | 115                        |
| 6.5                           | 8.68                | 7.5                                                                                              | 7.3  | 7.0  | 6.7   | 6.5   |       |       |       |                       | 127                        |
| 6                             | 8.02                | 6.9                                                                                              | 6.8  | 6.5  | 6.2   | 6.0   | 5.7   |       |       |                       | 142                        |
| 5.5                           | 7.35                | 6.4                                                                                              | 6.2  | 6.0  | 5.7   | 5.5   | 5.3   | 5.0   |       |                       | 161                        |
| 5                             | 6.68                | 5.8                                                                                              | 5.7  | 5.4  | 5.2   | 5.0   | 4.8   | 4.6   |       |                       | 187                        |
| 4.5                           | 6.01                | 5.2                                                                                              | 5.1  | 4.9  | 4.7   | 4.5   | 4.3   | 4.1   | 3.8   |                       | 221                        |
| 4                             | 5.34                | 4.6                                                                                              | 4.5  | 4.4  | 4.2   | 4.0   | 3.8   | 3.7   | 3.4   |                       | 260                        |
| 3.5                           | 4.68                | 4.1                                                                                              | 4.0  | 3.8  | 3.7   | 3.5   | 3.4   | 3.2   | 3.0   |                       | 260                        |
| 3                             | 4.01                | 3.5                                                                                              | 3.4  | 3.3  | 3.1   | 3.0   | 2.9   | 2.8   | 2.5   |                       | 260                        |
| 2.5                           | 3.34                | 2.9                                                                                              | 2.9  | 2.7  | 2.6   | 2.5   | 2.4   | 2.3   | 2.1   |                       | 260                        |
| 2                             | 2.67                | 2.3                                                                                              | 2.3  | 2.2  | 2.1   | 2.0   | 1.9   | 1.9   | 1.7   |                       | 260                        |
| 1.5                           | 2.00                | 1.8                                                                                              | 1.7  | 1.7  | 1.6   | 1.5   | 1.5   | 1.4   | 1.3   |                       | 260                        |
| Max. Operating Pressure (MPa) |                     | 7.0                                                                                              | 7.0  | 7.0  | 7.0   | 6.8   | 6.1   | 5.6   | 4.8   |                       |                            |

| LHS0750                       |                     | Clamping Force Calculation Formula ※1 (kN) $F = P(1-0.0007 \times L) / (0.5175+0.0006 \times L)$ |      |      |       |       |       |       |       |                       |                            |
|-------------------------------|---------------------|--------------------------------------------------------------------------------------------------|------|------|-------|-------|-------|-------|-------|-----------------------|----------------------------|
| Hydraulic Pressure (MPa)      | Cylinder Force (kN) | Clamping Force (kN) Lever Length L (mm)                                                          |      |      |       |       |       |       |       | Non-Usable Range (mm) | Max. Lever Length (L) (mm) |
|                               |                     | L=50                                                                                             | L=60 | L=80 | L=100 | L=120 | L=140 | L=160 | L=200 |                       |                            |
| 7                             | 14.21               | 12.4                                                                                             | 12.2 | 11.7 | 11.3  | 10.9  | 10.5  |       |       |                       | 147                        |
| 6.5                           | 13.19               | 11.5                                                                                             | 11.3 | 10.9 | 10.5  | 10.2  | 9.8   | 9.5   |       |                       | 163                        |
| 6                             | 12.18               | 10.6                                                                                             | 10.4 | 10.1 | 9.7   | 9.4   | 9.0   | 8.7   |       |                       | 184                        |
| 5.5                           | 11.16               | 9.7                                                                                              | 9.6  | 9.2  | 8.9   | 8.6   | 8.3   | 8.0   | 7.5   |                       | 209                        |
| 5                             | 10.15               | 8.9                                                                                              | 8.7  | 8.4  | 8.1   | 7.8   | 7.5   | 7.3   | 6.8   |                       | 244                        |
| 4.5                           | 9.13                | 8.0                                                                                              | 7.8  | 7.6  | 7.3   | 7.0   | 6.8   | 6.6   | 6.1   |                       | 280                        |
| 4                             | 8.12                | 7.1                                                                                              | 7.0  | 6.7  | 6.5   | 6.3   | 6.0   | 5.8   | 5.4   |                       | 280                        |
| 3.5                           | 7.10                | 6.2                                                                                              | 6.1  | 5.9  | 5.7   | 5.5   | 5.3   | 5.1   | 4.8   |                       | 280                        |
| 3                             | 6.09                | 5.3                                                                                              | 5.2  | 5.1  | 4.9   | 4.7   | 4.5   | 4.4   | 4.1   |                       | 280                        |
| 2.5                           | 5.07                | 4.5                                                                                              | 4.4  | 4.2  | 4.1   | 3.9   | 3.8   | 3.7   | 3.4   |                       | 280                        |
| 2                             | 4.06                | 3.6                                                                                              | 3.5  | 3.4  | 3.3   | 3.2   | 3.0   | 2.9   | 2.7   |                       | 280                        |
| 1.5                           | 3.04                | 2.7                                                                                              | 2.6  | 2.5  | 2.5   | 2.4   | 2.3   | 2.2   | 2.1   |                       | 280                        |
| Max. Operating Pressure (MPa) |                     | 7.0                                                                                              | 7.0  | 7.0  | 7.0   | 7.0   | 7.0   | 6.9   | 5.9   |                       |                            |

| LHS0900                       |                     | Clamping Force Calculation Formula ※1 (kN) $F = P(1-0.0009 \times L) / (0.3547+0.0004 \times L)$ |      |       |       |       |       |       |       |                       |                            |
|-------------------------------|---------------------|--------------------------------------------------------------------------------------------------|------|-------|-------|-------|-------|-------|-------|-----------------------|----------------------------|
| Hydraulic Pressure (MPa)      | Cylinder Force (kN) | Clamping Force (kN) Lever Length L (mm)                                                          |      |       |       |       |       |       |       | Non-Usable Range (mm) | Max. Lever Length (L) (mm) |
|                               |                     | L=60                                                                                             | L=75 | L=100 | L=120 | L=140 | L=170 | L=200 | L=250 |                       |                            |
| 7                             | 20.62               | 17.5                                                                                             | 17.0 | 16.2  | 15.6  | 14.9  | 14.1  | 13.3  |       |                       | 245                        |
| 6.5                           | 19.15               | 16.3                                                                                             | 15.8 | 15.0  | 14.4  | 13.9  | 13.1  | 12.3  | 11.1  |                       | 292                        |
| 6                             | 17.68               | 15.0                                                                                             | 14.6 | 13.9  | 13.3  | 12.8  | 12.1  | 11.4  | 10.3  |                       | 330                        |
| 5.5                           | 16.20               | 13.8                                                                                             | 13.4 | 12.7  | 12.2  | 11.7  | 11.1  | 10.4  | 9.4   |                       | 330                        |
| 5                             | 14.73               | 12.5                                                                                             | 12.2 | 11.6  | 11.1  | 10.7  | 10.1  | 9.5   | 8.6   |                       | 330                        |
| 4.5                           | 13.26               | 11.3                                                                                             | 11.0 | 10.4  | 10.0  | 9.6   | 9.1   | 8.5   | 7.7   |                       | 330                        |
| 4                             | 11.78               | 10.0                                                                                             | 9.7  | 9.3   | 8.9   | 8.6   | 8.1   | 7.6   | 6.9   |                       | 330                        |
| 3.5                           | 10.31               | 8.8                                                                                              | 8.5  | 8.1   | 7.8   | 7.5   | 7.1   | 6.6   | 6.0   |                       | 330                        |
| 3                             | 8.84                | 7.5                                                                                              | 7.3  | 7.0   | 6.7   | 6.4   | 6.1   | 5.7   | 5.2   |                       | 330                        |
| 2.5                           | 7.37                | 6.3                                                                                              | 6.1  | 5.8   | 5.6   | 5.4   | 5.1   | 4.8   | 4.3   |                       | 330                        |
| 2                             | 5.89                | 5.0                                                                                              | 4.9  | 4.7   | 4.5   | 4.3   | 4.1   | 3.8   | 3.5   |                       | 330                        |
| 1.5                           | 4.42                | 3.8                                                                                              | 3.7  | 3.5   | 3.4   | 3.2   | 3.1   | 2.9   | 2.6   |                       | 330                        |
| Max. Operating Pressure (MPa) |                     | 7.0                                                                                              | 7.0  | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   | 6.8   |                       |                            |

| LHS1050                       |                     | Clamping Force Calculation Formula ※1 (kN) $F = P(1-0.0008 \times L) / (0.2495+0.0002 \times L)$ |       |       |       |       |       |       |       |                       |                            |
|-------------------------------|---------------------|--------------------------------------------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-----------------------|----------------------------|
| Hydraulic Pressure (MPa)      | Cylinder Force (kN) | Clamping Force (kN) Lever Length L (mm)                                                          |       |       |       |       |       |       |       | Non-Usable Range (mm) | Max. Lever Length (L) (mm) |
|                               |                     | L=80                                                                                             | L=100 | L=120 | L=140 | L=170 | L=200 | L=250 | L=300 |                       |                            |
| 7                             | 28.90               | 24.7                                                                                             | 23.9  | 23.2  | 22.4  | 21.4  | 20.4  |       |       |                       | 219                        |
| 6.5                           | 26.83               | 23.0                                                                                             | 22.2  | 21.5  | 20.8  | 19.9  | 18.9  |       |       |                       | 249                        |
| 6                             | 24.77               | 21.2                                                                                             | 20.5  | 19.9  | 19.2  | 18.3  | 17.5  | 16.1  | 14.8  |                       | 288                        |
| 5.5                           | 22.70               | 19.4                                                                                             | 18.8  | 18.2  | 17.6  | 16.8  | 16.0  | 14.7  | 13.6  |                       | 342                        |
| 5                             | 20.64               | 17.7                                                                                             | 17.1  | 16.6  | 16.0  | 15.3  | 14.6  | 13.4  | 12.3  |                       | 380                        |
| 4.5                           | 18.58               | 15.9                                                                                             | 15.4  | 14.9  | 14.4  | 13.8  | 13.1  | 12.1  | 11.1  |                       | 380                        |
| 4                             | 16.51               | 14.1                                                                                             | 13.7  | 13.3  | 12.8  | 12.2  | 11.7  | 10.7  | 9.9   |                       | 380                        |
| 3.5                           | 14.45               | 12.4                                                                                             | 12.0  | 11.6  | 11.2  | 10.7  | 10.2  | 9.4   | 8.6   |                       | 380                        |
| 3                             | 12.38               | 10.6                                                                                             | 10.3  | 10.0  | 9.6   | 9.2   | 8.8   | 8.1   | 7.4   |                       | 380                        |
| 2.5                           | 10.32               | 8.9                                                                                              | 8.6   | 8.3   | 8.0   | 7.7   | 7.3   | 6.7   | 6.2   |                       | 380                        |
| 2                             | 8.26                | 7.1                                                                                              | 6.9   | 6.7   | 6.4   | 6.1   | 5.9   | 5.4   | 5.0   |                       | 380                        |
| 1.5                           | 6.19                | 5.3                                                                                              | 5.2   | 5.0   | 4.8   | 4.6   | 4.4   | 4.1   | 3.7   |                       | 380                        |
| Max. Operating Pressure (MPa) |                     | 7.0                                                                                              | 7.0   | 7.0   | 7.0   | 7.0   | 7.0   | 6.4   | 5.8   |                       |                            |



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

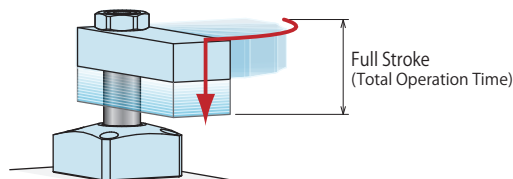
|                                    |
|------------------------------------|
| Hole Clamp                         |
| SFA                                |
| SFC                                |
| Swing Clamp                        |
| LHA                                |
| LHC                                |
| LHS                                |
| LHW                                |
| LG/LT                              |
| TLA-2                              |
| TLB-2                              |
| TLA-1                              |
| Link Clamp                         |
| LKA                                |
| LKC                                |
| LKW                                |
| LJ/LM                              |
| TMA-2                              |
| TMA-1                              |
| Work Support                       |
| LD                                 |
| LC                                 |
| TNC                                |
| TC                                 |
| Air Sensing Lift Cylinder          |
| LLW                                |
| Linear Cylinder / Compact Cylinder |
| LL                                 |
| LLR                                |
| LLU                                |
| DP                                 |
| DR                                 |
| DS                                 |
| DT                                 |
| Block Cylinder                     |
| DBA/DBC                            |
| Centering Vise                     |
| FVA                                |
| FVD                                |
| FVC                                |
| Control Valve                      |
| BZL                                |
| BZT                                |
| BZX/JZG                            |
| BZS                                |
| Pallet Clamp                       |
| VS/VT                              |
| Expansion Locating Pin             |
| VFL/VFM                            |
| VFJ/VFK                            |
| Pull Stud Clamp                    |
| FP                                 |
| FQ                                 |
| Customized Spring Cylinder         |
| DWA/DWB                            |

## ● Allowable Swing Time Graph

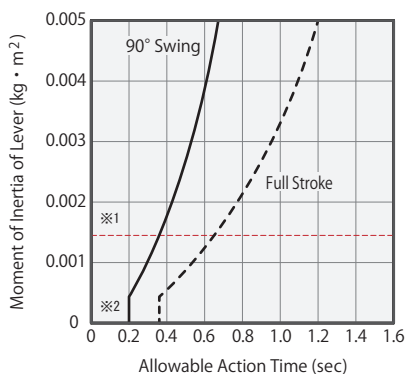
### Adjustment of Swing Time

The graph shows allowable swing time against the moment of inertia of a lever.  
An operation time should be longer than the operation time shown in the graph.

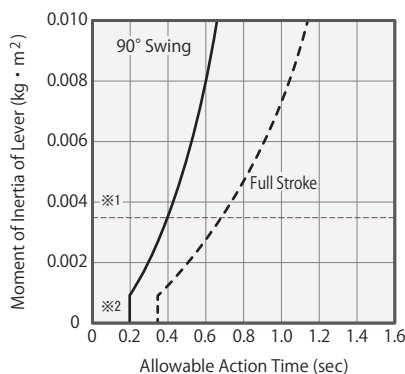
Excessive action speed can reduce stopping accuracy and damage internal components.



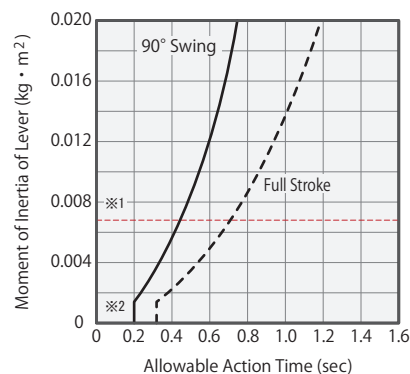
LHS0360



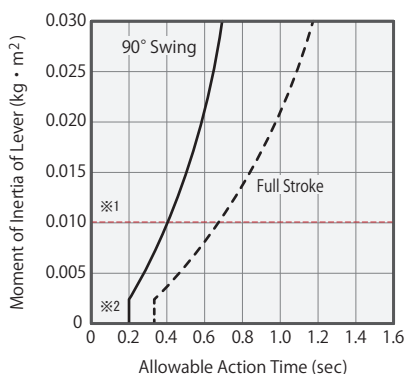
LHS0400



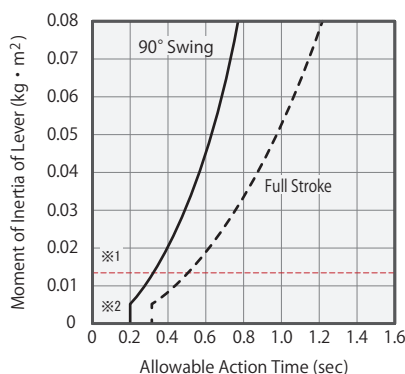
LHS0480



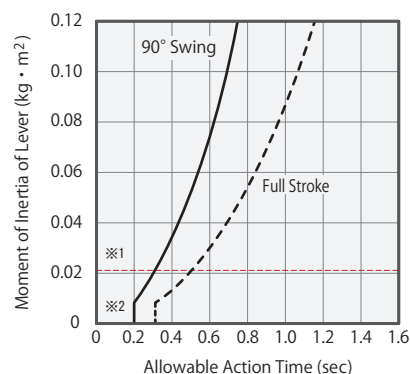
LHS0550



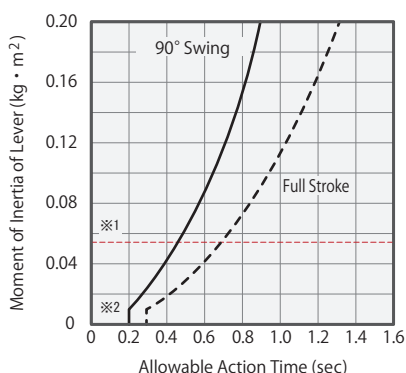
LHS0650



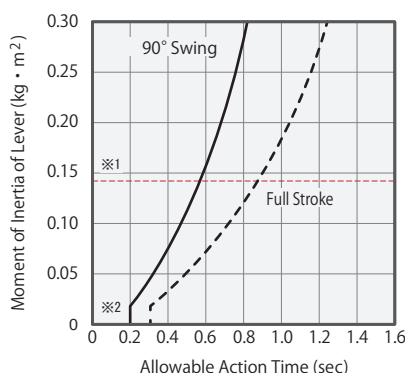
LHS0750



LHS0900



LHS1050



#### Notes:

- ※1. It shows the moment of inertia of material lever (LZH□-T).
- ※2. For any moment of inertia of a lever, the minimum 90° swing time should be 0.2 sec or more.
  1. The graph shows the allowable action time with respect to the moment of inertia of lever when the piston rod operates at constant speed.
  2. Lever with a large inertia sometimes does not work depending on supply hydraulic pressure, oil flow and lever mounting position.
  3. For speed adjustment of clamp lever, please use meter-out flow control valve.  
In case of meter-in control, the clamp lever may be accelerated by its own weight during swinging motion (clamp mounted horizontally) or the piston rod may be moving too fast. Please refer to P.1356 for speed control of the hydraulic cylinder.
  4. Insufficient fluid supply will cause release action failure. Increase the amount of fluid and adjust the action time with meter-out.
  5. Excessive swing speed can reduce stopping accuracy and damage the internal parts.
  6. Please contact us if operational conditions differ from those shown in the graphs.

Model → LHS0480

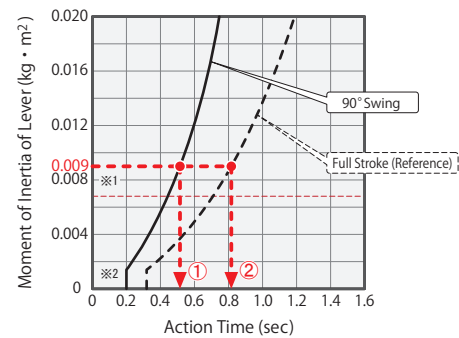
(How to read the allowable swing time graph)

In case of LHS0480

The moment of inertia of a lever : 0.009 kg·m<sup>2</sup>

- ① 90° Swing Time : About 0.52 sec or more  
② Total Action Time : About 0.82 sec or more

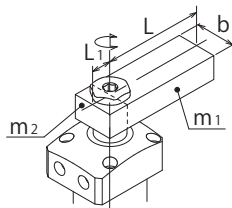
1. The total operation time on the graph represents the allowable operation time when fully stroked.



### How to Calculate the Moment of Inertia (Estimated)

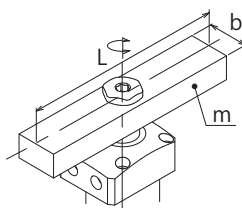
I : Moment of Inertia (kg·m<sup>2</sup>) L, L<sub>1</sub>, L<sub>2</sub>, K, b : Length (m) m, m<sub>1</sub>, m<sub>2</sub>, m<sub>3</sub> : Mass (kg)

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



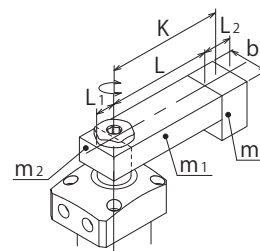
$$I = m_1 \frac{4L^2 + b^2}{12} + m_2 \frac{4L_1^2 + b^2}{12}$$

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



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

- ③ Load is applied on the lever front end.



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

#### 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  
LG/LT  
TLA-2  
TLB-2  
TLA-1

#### Link Clamp

LKA  
LKC  
LKW  
LJ/LM  
TMA-2  
TMA-1

#### Work Support

LD  
LC  
TNC  
TC

#### Air Sensing Lift Cylinder

LLW

#### Linear Cylinder / Compact Cylinder

LL  
LLR  
LLU  
DP  
DR  
DS  
DT

#### Block Cylinder

DBA/DBC

#### Centering Vise

FVA  
FVD  
FVC

#### Control Valve

BZL  
BZT  
BZX/JZG  
BZS

#### Pallet Clamp

VS/VT

#### Expansion Locating Pin

VFL/VFM  
VFJ/VFK

#### Pull Stud Clamp

FP  
FQ

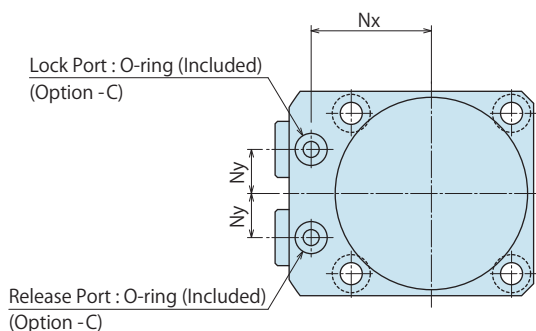
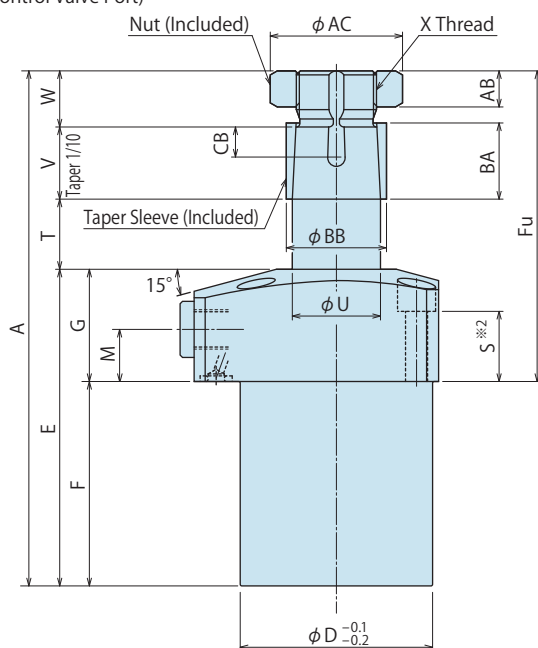
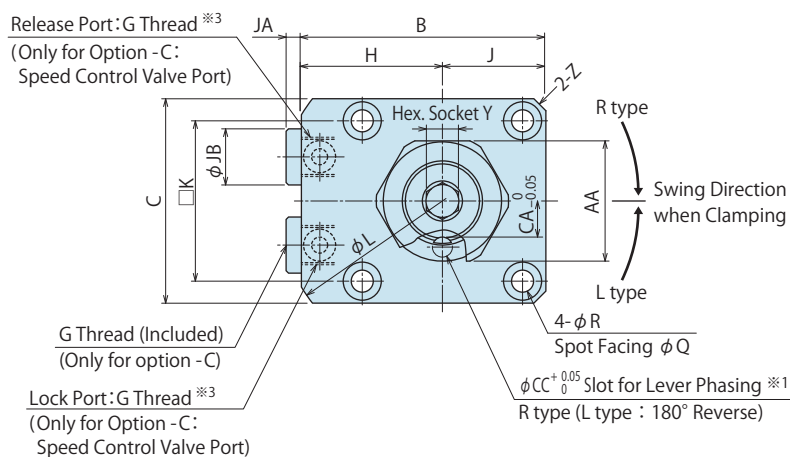
#### Customized Spring Cylinder

DWA/DWB

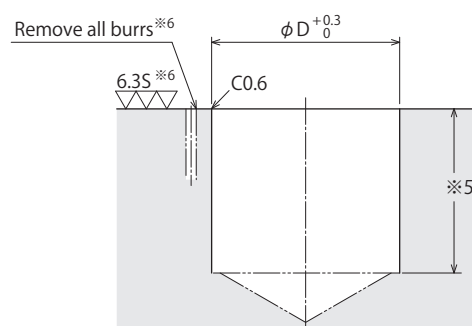
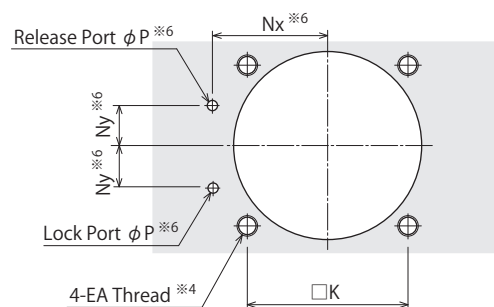
## External Dimensions

C : Gasket Option (With G Thread Plug)

※The drawing shows the released state of LHS-CR.



## Machining Dimensions of Mounting Area



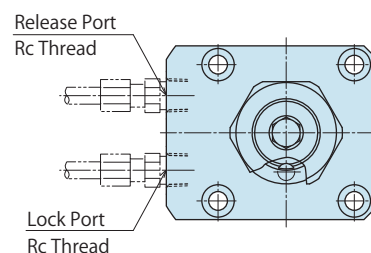
Notes :

- ※4. EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.
- ※5. The depth of the body mounting hole  $\phi$ D should be decided according to the mounting height referring to dimension 'F'.
- ※6. The machining dimension is for -C : Gasket option.

## Piping Method

S : Piping Option (Rc Thread)

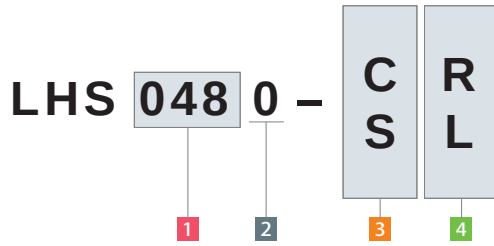
※The drawing shows the released state of LHS-SR.



Notes :

- ※1. The slot for lever phasing faces the port side when locked.
- ※2. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.
- ※3. Speed control valve is sold separately. Please refer to P.947.

## Model No. Indication



(Format Example : LHS0550-CR, LHS0750-SL)

- 1** Body size
- 2** Design No.
- 3** Piping Method
- 4** Swing Direction when Clamping
- 5** Option (When Blank is chosen)

## External Dimensions and Machining Dimensions for Mounting

(mm)

| Model No.                  |                         | LHS0360-□□ | LHS0400-□□ | LHS0480-□□ | LHS0550-□□ | LHS0650-□□ | LHS0750-□□ | LHS0900-□□ | LHS1050-□□ |
|----------------------------|-------------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Full Stroke (Vertical) ※8  |                         | 8          | 8          | 8          | 10         | 10         | 12         | 12         | 16         |
| A ※8                       |                         | 110        | 117        | 133.5      | 150.5      | 164.5      | 192.5      | 220        | 258.5      |
| B                          |                         | 49         | 54         | 61         | 69         | 81         | 92         | 107        | 122        |
| C                          |                         | 40         | 45         | 51         | 60         | 70         | 80         | 95         | 110        |
| D                          |                         | 36         | 40         | 48         | 55         | 65         | 75         | 90         | 105        |
| E ※8                       |                         | 76         | 80         | 91.5       | 102.5      | 112.5      | 132.5      | 151        | 178.5      |
| F ※8                       |                         | 51         | 55         | 63.5       | 72.5       | 81.5       | 94.5       | 105        | 122.5      |
| Fu ※8                      |                         | 59         | 62         | 70         | 78         | 83         | 98         | 115        | 136        |
| G                          |                         | 25         | 25         | 28         | 30         | 31         | 38         | 46         | 56         |
| H                          |                         | 29         | 31.5       | 35.5       | 39         | 46         | 52         | 59.5       | 67         |
| J                          |                         | 20         | 22.5       | 25.5       | 30         | 35         | 40         | 47.5       | 55         |
| K                          |                         | 31.4       | 34         | 40         | 47         | 55         | 63         | 75         | 88         |
| L                          |                         | 66         | 73         | 83         | 88         | 106        | 116        | 136        | 152        |
| M                          |                         | 11         | 11         | 13         | 12         | 13         | 16         | 19         | 22         |
| Nx                         |                         | 23.5       | 26         | 30         | 33.5       | 39.5       | 45         | 52.5       | 60         |
| Ny                         |                         | 8          | 9          | 11         | 12         | 15         | 16         | 18.5       | 22.5       |
| P                          |                         | 3          | 3          | 3          | 3          | 5          | 5          | 5          | 5          |
| Q                          |                         | 7.5        | 9          | 9          | 11         | 11         | 14         | 17.5       | 20         |
| R                          |                         | 4.5        | 5.5        | 5.5        | 6.8        | 6.8        | 9          | 11         | 14         |
| S                          |                         | 16         | 15         | 17.5       | 17         | 17         | 21         | 25         | 32         |
| T ※8                       |                         | 10         | 10         | 10         | 12         | 12         | 14         | 14         | 18         |
| U                          |                         | 15         | 18         | 22         | 25         | 30         | 35.5       | 45         | 55         |
| V                          |                         | 13         | 15         | 18         | 21         | 24         | 30         | 37         | 43         |
| W                          |                         | 11         | 12         | 14         | 15         | 16         | 16         | 18         | 19         |
| X (Nominal × Pitch)        |                         | M14×1.5    | M16×1.5    | M20×1.5    | M22×1.5    | M27×1.5    | M30×1.5    | M39×1.5    | M48×1.5    |
| Y                          |                         | 5          | 6          | 8          | 8          | 10         | 10         | 14         | 14         |
| Z (Chamfer)                |                         | C2         | C3         | C3         | C3         | C4         | C5         | C6         | C6         |
| AA                         |                         | 22         | 24         | 30         | 32         | 41         | 46         | 55         | 65         |
| AB                         |                         | 7          | 8          | 9          | 10         | 11         | 11         | 12         | 12         |
| AC                         |                         | 24.5       | 26.5       | 33         | 35.5       | 45         | 50         | 60         | 71         |
| BA                         |                         | 14         | 16         | 19         | 22         | 25         | 31         | 38         | 44         |
| BB                         |                         | 17         | 20         | 25         | 28         | 34         | 40         | 49         | 60         |
| CA                         |                         | 6          | 7          | 9          | 10         | 12.5       | 14         | 18.5       | 23         |
| CB                         |                         | 6.5        | 6.5        | 7.5        | 9.5        | 11.5       | 12.5       | 11.5       | 13.5       |
| CC                         |                         | 4          | 4          | 5          | 6          | 6          | 8          | 8          | 10         |
| EA (Nominal × Pitch)       |                         | M4×0.7     | M5×0.8     | M5×0.8     | M6×1       | M6×1       | M8×1.25    | M10×1.5    | M12×1.75   |
| JA                         |                         | 3.5        | 3.5        | 3.5        | 3.5        | 4.5        | 4.5        | 4.5        | 4.5        |
| JB                         |                         | 14         | 14         | 14         | 14         | 19         | 19         | 22         | 22         |
| Lock Port/<br>Release Port | Option -C               | G1/8       | G1/8       | G1/8       | G1/8       | G1/4       | G1/4       | G3/8       | G3/8       |
|                            | Option -S               | Rc1/8      | Rc1/8      | Rc1/8      | Rc1/8      | Rc1/4      | Rc1/4      | Rc3/8      | Rc3/8      |
| O-ring (Option -C)         |                         | 1BP5       | 1BP5       | 1BP5       | 1BP5       | 1BP7       | 1BP7       | 1BP7       | 1BP7       |
| Cylinder Capacity ※8       | Lock                    | 6.8        | 10.1       | 15.8       | 27.4       | 39.1       | 72.0       | 119.8      | 202.3      |
|                            | cm <sup>3</sup> Release | 8.2        | 12.1       | 18.9       | 32.3       | 46.2       | 83.8       | 138.9      | 240.3      |
| Weight ※7 ※8 kg            |                         | 0.8        | 1.0        | 1.5        | 2.2        | 3.1        | 5.1        | 8.3        | 11.9       |

Notes: ※7. It shows the weight of single swing clamp including taper sleeve and nut.

※8. It shows different dimensions than LHA□0-□□.

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  
LG/LT

TLA-2  
TLB-2

TLA-1

Link Clamp

LKA  
LKC

LKW  
LJ/LM

TMA-2  
TMA-1

Work Support

LD  
LC

TNC  
TC

Air Sensing  
Lift Cylinder

LLW

Linear Cylinder /  
Compact Cylinder

LL  
LLR

LLU  
DP

DR  
DS

DT

Block Cylinder

DBA/DBC

Centering Vise

FVA  
FVD

FVC

Control Valve

BZL  
BZT

BZX/JZG  
BZS

Pallet Clamp

VS/VT

Expansion  
Locating Pin

VFL/VFM  
VFJ/VFK

Pull Stud Clamp

FP  
FQ

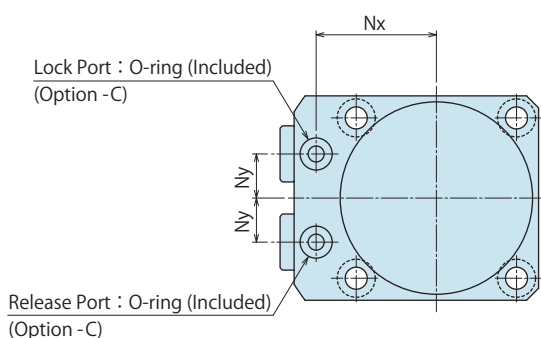
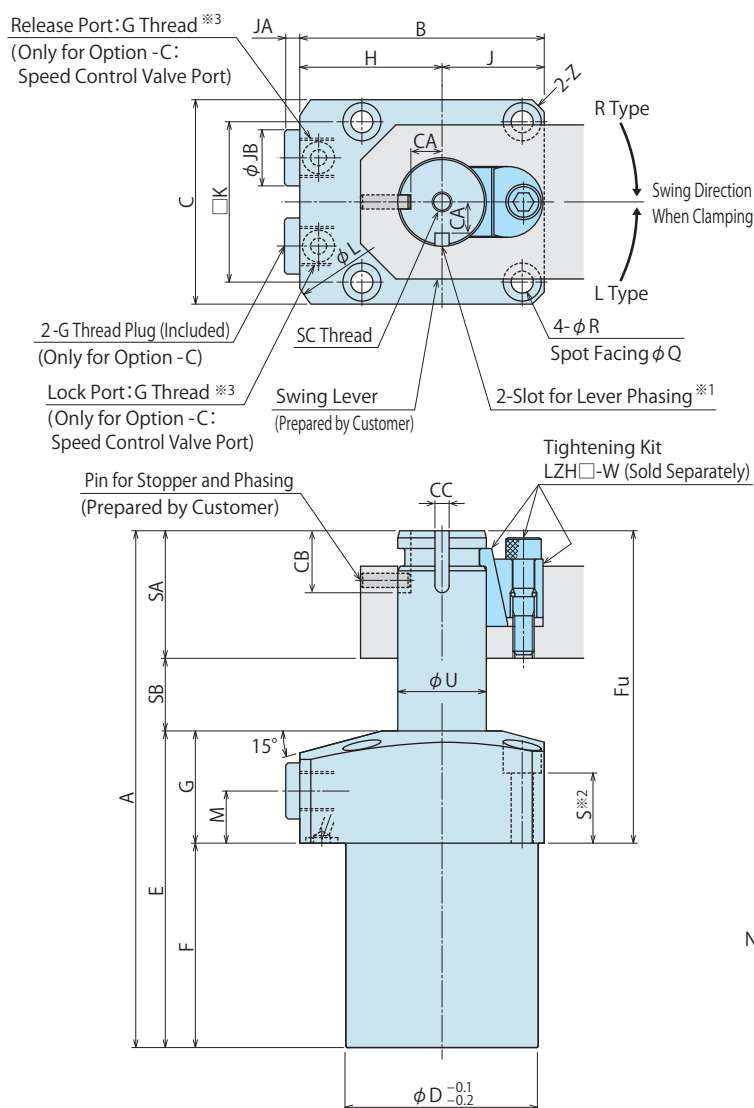
Customized  
Spring Cylinder

DWA/DWB

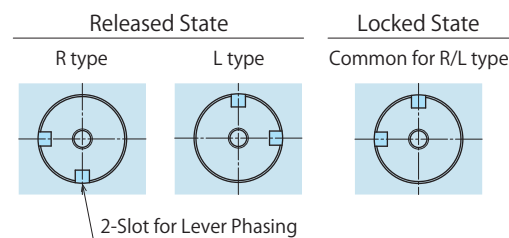
## External Dimensions

C : Gasket Option (With G Thread Plug)

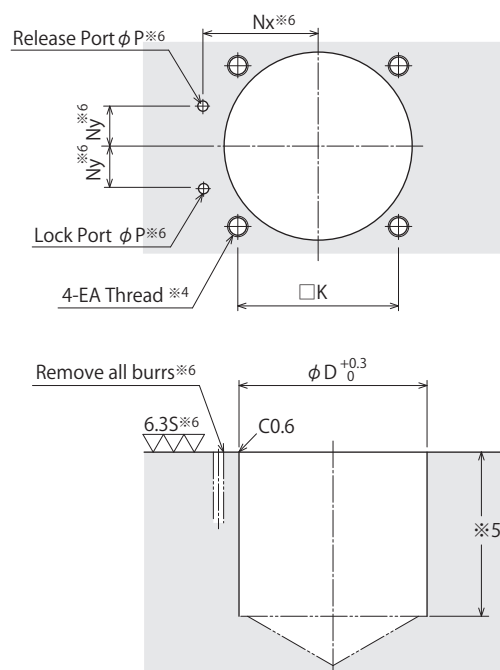
※ The drawing shows the released state of LHS-CR-A.



## ※ 1. Slot for Lever Phasing



## Machining Dimensions of Mounting Area



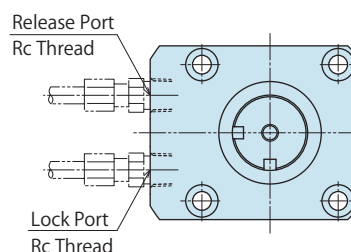
Notes :

- ※4. EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.
- ※5. The depth of the body mounting hole  $\phi D$  should be decided according to the mounting height referring to dimension 'F'.
- ※6. The machining dimension is for -C : Gasket Option.

## Piping Method

S : Piping Option (Rc Thread)

※ The drawing shows the released state of LHS-SR-A.



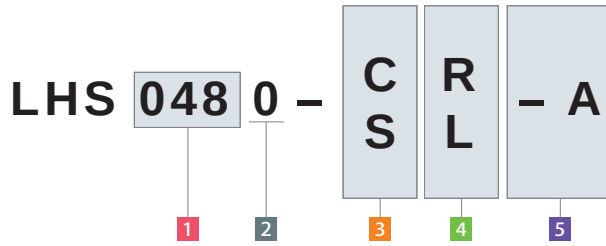
Notes :

- ※2. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.
- ※3. Speed control valve is sold separately. Please refer to P.947.
- 1. Please contact us if it has a combination with other detection methods and/or options.



## Model No. Indication

(Format Example : LHS0550-CR-A, LHS0750-SL-A)



- 1 Body Size
- 2 Design No.
- 3 Piping Method
- 4 Swing Direction When Clamping
- 5 Option (When A is chosen)

## External Dimensions and Machining Dimensions for Mounting

(mm)

| Model No.                   | LHS0360-□□-A                            | LHS0400-□□-A                            | LHS0480-□□-A                            | LHS0550-□□-A                            | LHS0650-□□-A                            | LHS0750-□□-A                            | LHS0900-□□-A                            | LHS1050-□□-A                            |
|-----------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|-----------------------------------------|
| Full Stroke (Vertical) ※8   | 8                                       | 8                                       | 8                                       | 10                                      | 10                                      | 12                                      | 12                                      | 16                                      |
| A ※8                        | 110                                     | 117                                     | 133.5                                   | 150.5                                   | 164.5                                   | 192.5                                   | 220                                     | 258.5                                   |
| B                           | 49                                      | 54                                      | 61                                      | 69                                      | 81                                      | 92                                      | 107                                     | 122                                     |
| C                           | 40                                      | 45                                      | 51                                      | 60                                      | 70                                      | 80                                      | 95                                      | 110                                     |
| D                           | 36                                      | 40                                      | 48                                      | 55                                      | 65                                      | 75                                      | 90                                      | 105                                     |
| E ※8                        | 76                                      | 80                                      | 91.5                                    | 102.5                                   | 112.5                                   | 132.5                                   | 151                                     | 178.5                                   |
| F ※8                        | 51                                      | 55                                      | 63.5                                    | 72.5                                    | 81.5                                    | 94.5                                    | 105                                     | 122.5                                   |
| Fu                          | 59                                      | 62                                      | 70                                      | 78                                      | 83                                      | 98                                      | 115                                     | 136                                     |
| G                           | 25                                      | 25                                      | 28                                      | 30                                      | 31                                      | 38                                      | 46                                      | 56                                      |
| H                           | 29                                      | 31.5                                    | 35.5                                    | 39                                      | 46                                      | 52                                      | 59.5                                    | 67                                      |
| J                           | 20                                      | 22.5                                    | 25.5                                    | 30                                      | 35                                      | 40                                      | 47.5                                    | 55                                      |
| K                           | 31.4                                    | 34                                      | 40                                      | 47                                      | 55                                      | 63                                      | 75                                      | 88                                      |
| L                           | 66                                      | 73                                      | 83                                      | 88                                      | 106                                     | 116                                     | 136                                     | 152                                     |
| M                           | 11                                      | 11                                      | 13                                      | 12                                      | 13                                      | 16                                      | 19                                      | 22                                      |
| Nx                          | 23.5                                    | 26                                      | 30                                      | 33.5                                    | 39.5                                    | 45                                      | 52.5                                    | 60                                      |
| Ny                          | 8                                       | 9                                       | 11                                      | 12                                      | 15                                      | 16                                      | 18.5                                    | 22.5                                    |
| P                           | 3                                       | 3                                       | 3                                       | 3                                       | 5                                       | 5                                       | 5                                       | 5                                       |
| Q                           | 7.5                                     | 9                                       | 9                                       | 11                                      | 11                                      | 14                                      | 17.5                                    | 20                                      |
| R                           | 4.5                                     | 5.5                                     | 5.5                                     | 6.8                                     | 6.8                                     | 9                                       | 11                                      | 14                                      |
| S                           | 16                                      | 15                                      | 17.5                                    | 17                                      | 17                                      | 21                                      | 25                                      | 32                                      |
| U                           | 15                                      | 18                                      | 22                                      | 25                                      | 30                                      | 35.5                                    | 45                                      | 55                                      |
| Z (Chamfer)                 | C2                                      | C3                                      | C3                                      | C3                                      | C4                                      | C5                                      | C6                                      | C6                                      |
| CA                          | 4.8                                     | 5.8                                     | 7.8                                     | 8.8                                     | 10.5                                    | 12.5                                    | 17.5                                    | 22.5                                    |
| CB                          | 12                                      | 15                                      | 16                                      | 17.5                                    | 21.5                                    | 21.5                                    | 26                                      | 26                                      |
| CC                          | 3 <sup>+0.028</sup> / <sub>+0.014</sub> | 4 <sup>+0.038</sup> / <sub>+0.020</sub> | 4 <sup>+0.038</sup> / <sub>+0.020</sub> | 4 <sup>+0.038</sup> / <sub>+0.020</sub> | 6 <sup>+0.038</sup> / <sub>+0.020</sub> | 6 <sup>+0.038</sup> / <sub>+0.020</sub> | 8 <sup>+0.047</sup> / <sub>+0.025</sub> | 8 <sup>+0.047</sup> / <sub>+0.025</sub> |
| EA (Nominal × Pitch)        | M4×0.7                                  | M5×0.8                                  | M5×0.8                                  | M6×1                                    | M6×1                                    | M8×1.25                                 | M10×1.5                                 | M12×1.75                                |
| SA                          | 24                                      | 27                                      | 32                                      | 36                                      | 40                                      | 46                                      | 55                                      | 62                                      |
| SB ※8                       | 10                                      | 10                                      | 10                                      | 12                                      | 12                                      | 14                                      | 14                                      | 18                                      |
| SC (Nominal×Pitch×Depth)    | M4×0.7×7                                | M5×0.8×8                                | M5×0.8×8                                | M6×1×11                                 | M6×1×11                                 | M8×1.25×13                              | M10×1.5×15                              | M10×1.5×15                              |
| JA                          | 3.5                                     | 3.5                                     | 3.5                                     | 3.5                                     | 4.5                                     | 4.5                                     | 4.5                                     | 4.5                                     |
| JB                          | 14                                      | 14                                      | 14                                      | 14                                      | 19                                      | 19                                      | 22                                      | 22                                      |
| Lock Port/<br>Release Port  | Option -C<br>Option -S                  | G1/8<br>Rc1/8                           | G1/8<br>Rc1/8                           | G1/8<br>Rc1/8                           | G1/8<br>Rc1/8                           | G1/4<br>Rc1/4                           | G1/4<br>Rc1/4                           | G3/8<br>Rc3/8                           |
| O-ring (Option -C)          | 1BP5                                    | 1BP5                                    | 1BP5                                    | 1BP5                                    | 1BP7                                    | 1BP7                                    | 1BP7                                    | 1BP7                                    |
| Pin for Stopper and Phasing | φ3(m6)×8                                | φ4(m6)×10                               | φ4(m6)×12                               | φ4(m6)×14                               | φ6(m6)×14                               | φ6(m6)×16                               | φ8(m6)×20                               | φ8(m6)×22                               |
| Cylinder Capacity ※8        | Lock                                    | 6.8                                     | 10.1                                    | 15.8                                    | 27.4                                    | 39.1                                    | 72.0                                    | 119.8                                   |
| cm <sup>3</sup>             | Release                                 | 8.2                                     | 12.1                                    | 18.9                                    | 32.3                                    | 46.2                                    | 83.8                                    | 240.3                                   |
| Weight ※7 ※8                | kg                                      | 0.8                                     | 1.0                                     | 1.5                                     | 2.2                                     | 3.1                                     | 5.1                                     | 11.9                                    |

Notes: ※7. It shows the weight of single swing clamp without the tightening kit and swing lever.

※8. It shows different dimensions than LHA□0-□□-A.

|                                |
|--------------------------------|
| 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  
LG/LT  
TLA-2  
TLB-2  
TLA-1

### Link Clamp

LKA  
LKC  
LKW  
LJ/LM  
TMA-2  
TMA-1

### Work Support

LD  
LC  
TNC  
TC

### Air Sensing Lift Cylinder

LLW

### Linear Cylinder / Compact Cylinder

LL  
LLR  
LLU  
DP  
DR  
DS  
DT

### Block Cylinder

DBA/DBC

### Centering Vise

FVA  
FVD  
FVC

### Control Valve

BZL  
BZT  
BZX/JZG  
BZS

### Pallet Clamp

VS/VT

### Expansion Locating Pin

VFL/VFM  
VFJ/VFK

### Pull Stud Clamp

FP  
FQ

### Customized Spring Cylinder

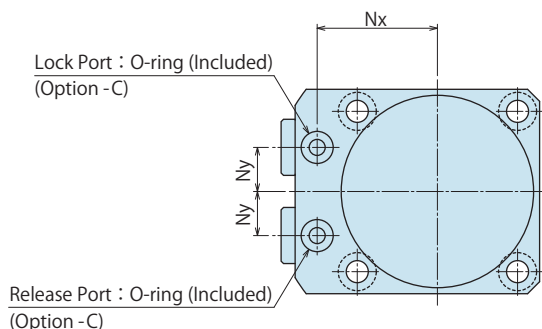
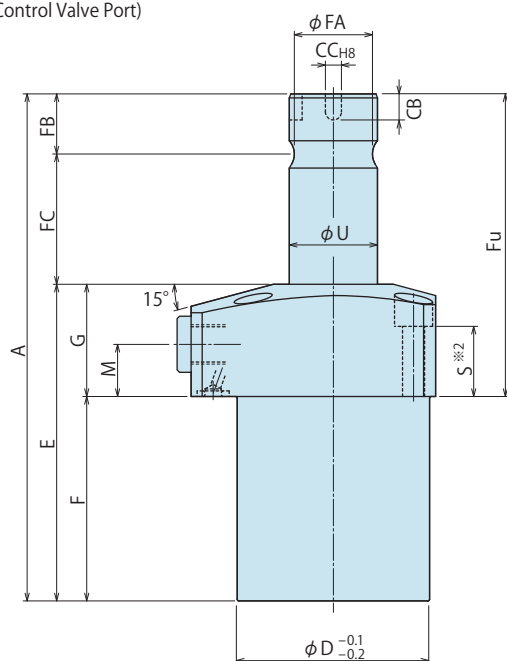
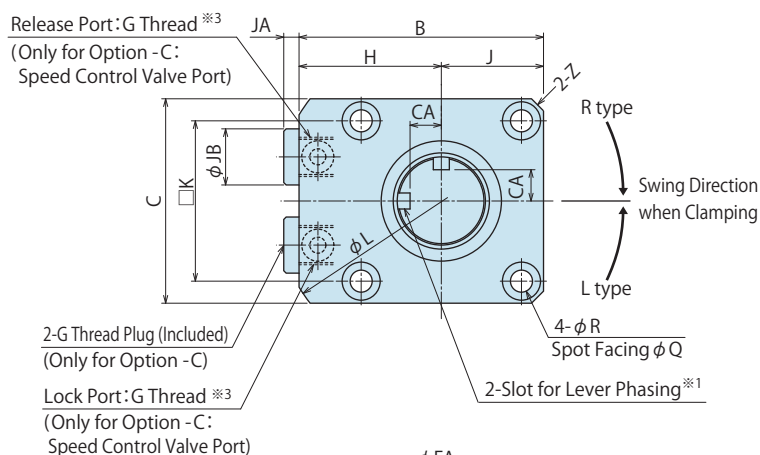
DWA/DWB



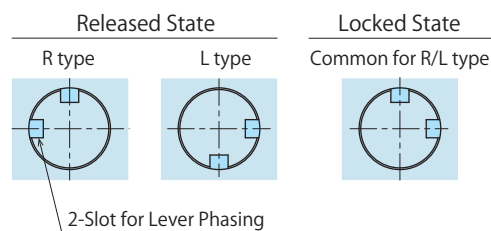
## External Dimensions

C : Gasket Option (With G Thread Plug)

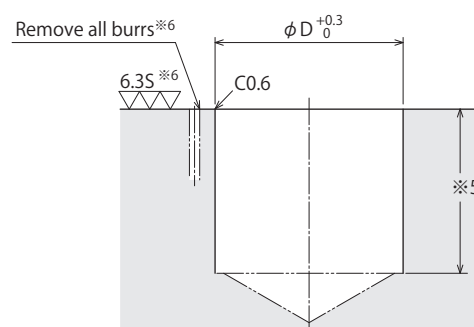
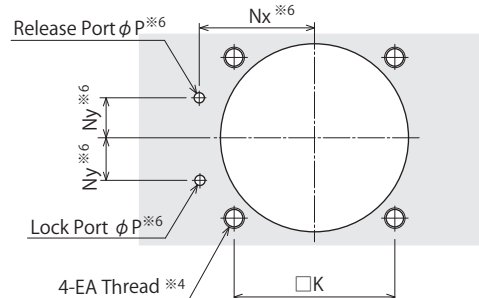
※The drawing shows the released state of LHS-CR-F.



## ※1. Slot for Lever Phasing



## Machining Dimensions of Mounting Area



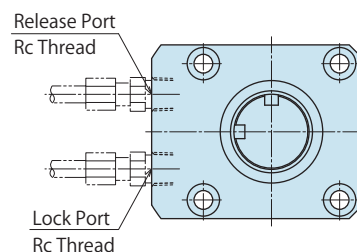
Notes :

- ※4. EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.
- ※5. The depth of the body mounting hole φD should be decided according to the mounting height referring to dimension 'F'.
- ※6. The machining dimension is for -C : Gasket Option.

## Piping Method

S : Piping Option (Rc Thread)

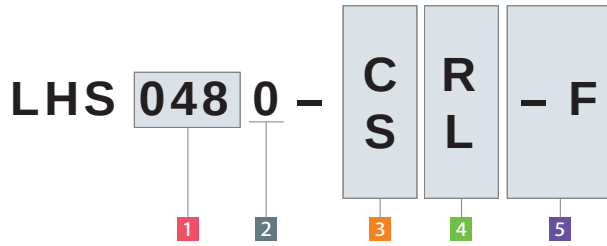
※ The drawing shows the released state of LHS-SR-F.



Notes :

- ※2. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.
- ※3. Speed control valve is sold separately. Please refer to P.947.
- 1. Please contact us if it has a combination with other options.

## Model No. Indication



(Format Example : LHS0550-CR-F, LHS0750-SL-F)

- 1 Body Size
- 2 Design No.
- 3 Piping Method
- 4 Swing Direction when Clamping
- 5 Option (When F is chosen)

## External Dimensions and Machining Dimensions for Mounting

(mm)

| Model No.                  | LHS0360-□□-F                     | LHS0400-□□-F                     | LHS0480-□□-F                     | LHS0550-□□-F                     | LHS0650-□□-F                     | LHS0750-□□-F                     | LHS0900-□□-F                     | LHS1050-□□-F                     |
|----------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| Full Stroke (Vertical) ※8  | 8                                | 8                                | 8                                | 10                               | 10                               | 12                               | 12                               | 16                               |
| A ※8                       | 108                              | 115                              | 131.5                            | 148.5                            | 164.5                            | 192.5                            | 220                              | 256.5                            |
| B                          | 49                               | 54                               | 61                               | 69                               | 81                               | 92                               | 107                              | 122                              |
| C                          | 40                               | 45                               | 51                               | 60                               | 70                               | 80                               | 95                               | 110                              |
| D                          | 36                               | 40                               | 48                               | 55                               | 65                               | 75                               | 90                               | 105                              |
| E ※8                       | 76                               | 80                               | 91.5                             | 102.5                            | 112.5                            | 132.5                            | 151                              | 178.5                            |
| F ※8                       | 51                               | 55                               | 63.5                             | 72.5                             | 81.5                             | 94.5                             | 105                              | 122.5                            |
| Fu ※8                      | 57                               | 60                               | 68                               | 76                               | 83                               | 98                               | 115                              | 134                              |
| G                          | 25                               | 25                               | 28                               | 30                               | 31                               | 38                               | 46                               | 56                               |
| H                          | 29                               | 31.5                             | 35.5                             | 39                               | 46                               | 52                               | 59.5                             | 67                               |
| J                          | 20                               | 22.5                             | 25.5                             | 30                               | 35                               | 40                               | 47.5                             | 55                               |
| K                          | 31.4                             | 34                               | 40                               | 47                               | 55                               | 63                               | 75                               | 88                               |
| L                          | 66                               | 73                               | 83                               | 88                               | 106                              | 116                              | 136                              | 152                              |
| M                          | 11                               | 11                               | 13                               | 12                               | 13                               | 16                               | 19                               | 22                               |
| Nx                         | 23.5                             | 26                               | 30                               | 33.5                             | 39.5                             | 45                               | 52.5                             | 60                               |
| Ny                         | 8                                | 9                                | 11                               | 12                               | 15                               | 16                               | 18.5                             | 22.5                             |
| P                          | 3                                | 3                                | 3                                | 3                                | 5                                | 5                                | 5                                | 5                                |
| Q                          | 7.5                              | 9                                | 9                                | 11                               | 11                               | 14                               | 17.5                             | 20                               |
| R                          | 4.5                              | 5.5                              | 5.5                              | 6.8                              | 6.8                              | 9                                | 11                               | 14                               |
| S                          | 16                               | 15                               | 17.5                             | 17                               | 17                               | 21                               | 25                               | 32                               |
| U                          | 15                               | 18                               | 22                               | 25                               | 30                               | 35.5                             | 45                               | 55                               |
| Z (Chamfer)                | C2                               | C3                               | C3                               | C3                               | C4                               | C5                               | C6                               | C6                               |
| CA                         | 5                                | 5.8                              | 7.8                              | 9                                | 10                               | 13.25                            | 17.5                             | 22.5                             |
| CB                         | 5                                | 6.5                              | 6.5                              | 7                                | 9.5                              | 9.5                              | 13                               | 13.5                             |
| CC                         | 3 <sup>+0.014</sup> <sub>0</sub> | 4 <sup>+0.018</sup> <sub>0</sub> | 4 <sup>+0.018</sup> <sub>0</sub> | 4 <sup>+0.018</sup> <sub>0</sub> | 6 <sup>+0.018</sup> <sub>0</sub> | 6 <sup>+0.018</sup> <sub>0</sub> | 8 <sup>+0.022</sup> <sub>0</sub> | 8 <sup>+0.022</sup> <sub>0</sub> |
| EA (Nominal × Pitch)       | M4×0.7                           | M5×0.8                           | M5×0.8                           | M6×1                             | M6×1                             | M8×1.25                          | M10×1.5                          | M12×1.75                         |
| FA                         | 13.5                             | 16                               | 19.5                             | 22                               | 26                               | 31                               | 39.5                             | 48                               |
| FB                         | 11                               | 12.5                             | 15                               | 17                               | 20                               | 23                               | 27.5                             | 30                               |
| FC ※8                      | 21                               | 22.5                             | 25                               | 29                               | 32                               | 37                               | 41.5                             | 48                               |
| JA                         | 3.5                              | 3.5                              | 3.5                              | 3.5                              | 4.5                              | 4.5                              | 4.5                              | 4.5                              |
| JB                         | 14                               | 14                               | 14                               | 14                               | 19                               | 19                               | 22                               | 22                               |
| Lock Port/<br>Release Port | Option -C<br>Option -S           | G1/8<br>Rc1/8                    | G1/8<br>Rc1/8                    | G1/8<br>Rc1/8                    | G1/8<br>Rc1/8                    | G1/4<br>Rc1/4                    | G1/4<br>Rc1/4                    | G3/8<br>Rc3/8                    |
| O-ring (Option -C)         |                                  | 1BP5                             | 1BP5                             | 1BP5                             | 1BP5                             | 1BP7                             | 1BP7                             | 1BP7                             |
| Cylinder ※8                | Lock                             | 6.8                              | 10.1                             | 15.8                             | 27.4                             | 39.1                             | 72.0                             | 119.8                            |
| Capacity cm <sup>3</sup>   | Release                          | 8.2                              | 12.1                             | 18.9                             | 32.3                             | 46.2                             | 83.8                             | 240.3                            |
| Weight ※7 ※8               | kg                               | 0.8                              | 1.0                              | 1.5                              | 2.2                              | 3.1                              | 5.1                              | 11.9                             |

Notes: ※7. It shows the weight of single swing clamp.  
 ※8. It shows different dimensions than LHA□0-□□-F.

|                                |
|--------------------------------|
| 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  
LG/LT  
TLA-2  
TLB-2  
TLA-1

### Link Clamp

LKA  
LKC  
LKW  
LJ/LM  
TMA-2  
TMA-1

### Work Support

LD  
LC  
TNC  
TC

### Air Sensing

Lift Cylinder  
LLW

### Linear Cylinder / Compact Cylinder

LL  
LLR  
LLU  
DP  
DR  
DS  
DT

### Block Cylinder

DBA/DBC

### Centering Vise

FVA  
FVD  
FVC

### Control Valve

BZL  
BZT  
BZX/JZG  
BZS

### Pallet Clamp

VS/VT

### Expansion

Locating Pin  
VFL/VFM  
VFJ/VFK

### Pull Stud Clamp

FP  
FQ

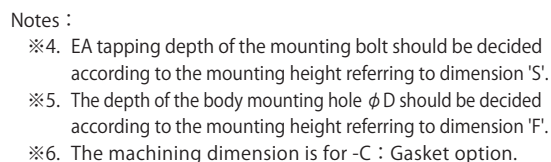
### Customized

Spring Cylinder  
DWA/DWB

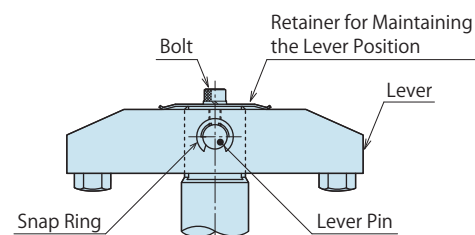
### ● Machining Dimensions of Mounting Area

Release Port  $\phi P \times 6$   $Nx \times 6$

Technical drawing of the front view of a circular component. The component has a circular top face with four ports (Release Port  $\phi P \text{ } \times 6$  and Lock Port  $\phi P \text{ } \times 6$ ) and a conical bottom. The drawing includes dimensions:  $Nx \text{ } \times 6$  (horizontal distance between ports),  $Ny \text{ } \times 6$  (vertical distance between ports),  $4\text{-EA Thread } \times 4$  (thread specification),  $\phi D \text{ } \begin{smallmatrix} +0.3 \\ 0 \end{smallmatrix}$  (outer diameter),  $6.3S \text{ } \times 6$  (fillet radius),  $C0.6$  (corner radius), and  $\times 5$  (height of the conical section).



### ● Balance Lever Reference Drawing



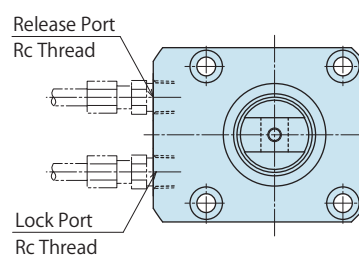
1. Lever, bolt, lever pin, snap ring and retainer for maintaining the lever position are not provided. Please design and prepare by Customer.

Release Port : O-ring (Included)  
(Option - C)

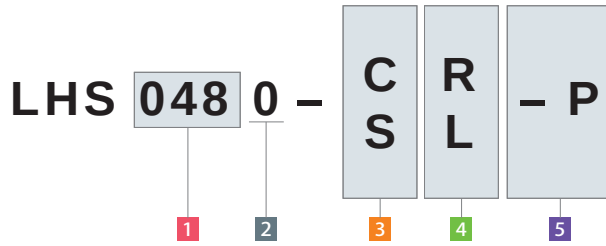
- ※1. Use the tapped hole (PH thread) on top of rod to attach a retainer for lever.
- ※2. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.
- ※3. Speed control valve is sold separately. Please refer to P.947.
  - 1. Please contact us if it has a combination with other options.

## ● Piping Method

※The drawing shows the released state of LHS-S□-P.



## Model No. Indication



(Format Example : LHS0550-CR-P, LHS0750-SL-P)

- 1** Body Size
- 2** Design No.
- 3** Piping Method
- 4** Swing Direction when Clamping
- 5** Option (When P is chosen)

## External Dimensions and Machining Dimensions for Mounting

(mm)

| Model No.                  | LHS0360-□□-P                     | LHS0400-□□-P                     | LHS0480-□□-P                     | LHS0550-□□-P                      | LHS0650-□□-P                      | LHS0750-□□-P                      | LHS0900-□□-P                      | LHS1050-□□-P                      |
|----------------------------|----------------------------------|----------------------------------|----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
| Full Stroke (Vertical) ※8  | 8                                | 8                                | 8                                | 10                                | 10                                | 12                                | 12                                | 16                                |
| A ※8                       | 108                              | 115                              | 131.5                            | 148.5                             | 164.5                             | 192.5                             | 220                               | 256.5                             |
| B                          | 49                               | 54                               | 61                               | 69                                | 81                                | 92                                | 107                               | 122                               |
| C                          | 40                               | 45                               | 51                               | 60                                | 70                                | 80                                | 95                                | 110                               |
| D                          | 36                               | 40                               | 48                               | 55                                | 65                                | 75                                | 90                                | 105                               |
| E ※8                       | 76                               | 80                               | 91.5                             | 102.5                             | 112.5                             | 132.5                             | 151                               | 178.5                             |
| F ※8                       | 51                               | 55                               | 63.5                             | 72.5                              | 81.5                              | 94.5                              | 105                               | 122.5                             |
| Fu ※8                      | 57                               | 60                               | 68                               | 76                                | 83                                | 98                                | 115                               | 134                               |
| G                          | 25                               | 25                               | 28                               | 30                                | 31                                | 38                                | 46                                | 56                                |
| H                          | 29                               | 31.5                             | 35.5                             | 39                                | 46                                | 52                                | 59.5                              | 67                                |
| J                          | 20                               | 22.5                             | 25.5                             | 30                                | 35                                | 40                                | 47.5                              | 55                                |
| K                          | 31.4                             | 34                               | 40                               | 47                                | 55                                | 63                                | 75                                | 88                                |
| L                          | 66                               | 73                               | 83                               | 88                                | 106                               | 116                               | 136                               | 152                               |
| M                          | 11                               | 11                               | 13                               | 12                                | 13                                | 16                                | 19                                | 22                                |
| Nx                         | 23.5                             | 26                               | 30                               | 33.5                              | 39.5                              | 45                                | 52.5                              | 60                                |
| Ny                         | 8                                | 9                                | 11                               | 12                                | 15                                | 16                                | 18.5                              | 22.5                              |
| P                          | 3                                | 3                                | 3                                | 3                                 | 5                                 | 5                                 | 5                                 | 5                                 |
| Q                          | 7.5                              | 9                                | 9                                | 11                                | 11                                | 14                                | 17.5                              | 20                                |
| R                          | 4.5                              | 5.5                              | 5.5                              | 6.8                               | 6.8                               | 9                                 | 11                                | 14                                |
| S                          | 16                               | 15                               | 17.5                             | 17                                | 17                                | 21                                | 25                                | 32                                |
| U                          | 15                               | 18                               | 22                               | 25                                | 30                                | 35.5                              | 45                                | 55                                |
| Z (Chamfer)                | C2                               | C3                               | C3                               | C3                                | C4                                | C5                                | C6                                | C6                                |
| EA (Nominal×Pitch)         | M4×0.7                           | M5×0.8                           | M5×0.8                           | M6×1                              | M6×1                              | M8×1.25                           | M10×1.5                           | M12×1.75                          |
| PA                         | 7                                | 8                                | 10                               | 12                                | 14                                | 16                                | 22                                | 26                                |
| PB                         | 13.5                             | 16                               | 20                               | 23                                | 28                                | 33.5                              | 43                                | 53                                |
| PC                         | 6 <sup>+0.018</sup> <sub>0</sub> | 6 <sup>+0.018</sup> <sub>0</sub> | 8 <sup>+0.022</sup> <sub>0</sub> | 10 <sup>+0.022</sup> <sub>0</sub> | 13 <sup>+0.027</sup> <sub>0</sub> | 13 <sup>+0.027</sup> <sub>0</sub> | 16 <sup>+0.027</sup> <sub>0</sub> | 20 <sup>+0.033</sup> <sub>0</sub> |
| PD                         | 9                                | 11                               | 12                               | 12.5                              | 16.5                              | 19                                | 23.5                              | 25.5                              |
| PE                         | 21                               | 24                               | 27.5                             | 31.5                              | 38.5                              | 43.5                              | 52.5                              | 58.5                              |
| PF                         | 22                               | 25                               | 29                               | 33                                | 40                                | 45                                | 54                                | 60                                |
| PG ※8                      | 10                               | 10                               | 11                               | 13                                | 12                                | 15                                | 15                                | 18                                |
| PH (Nominal×Pitch)         | M3×0.5                           | M3×0.5                           | M4×0.7                           | M5×0.8                            | M6×1                              | M6×1                              | M8×1.25                           | M8×1.25                           |
| JA                         | 3.5                              | 3.5                              | 3.5                              | 3.5                               | 4.5                               | 4.5                               | 4.5                               | 4.5                               |
| JB                         | 14                               | 14                               | 14                               | 14                                | 19                                | 19                                | 22                                | 22                                |
| Lock Port/<br>Release Port | Option -C<br>Option -S           | G1/8<br>Rc1/8                    | G1/8<br>Rc1/8                    | G1/8<br>Rc1/8                     | G1/8<br>Rc1/8                     | G1/4<br>Rc1/4                     | G1/4<br>Rc1/4                     | G3/8<br>Rc3/8                     |
| O-ring (Option -C)         | 1BP5                             | 1BP5                             | 1BP5                             | 1BP5                              | 1BP7                              | 1BP7                              | 1BP7                              | 1BP7                              |
| Cylinder ※8                | Lock                             | 6.8                              | 10.1                             | 15.8                              | 27.4                              | 39.1                              | 72.0                              | 119.8                             |
| Capacity cm <sup>3</sup>   | Release                          | 8.2                              | 12.1                             | 18.9                              | 32.3                              | 46.2                              | 83.8                              | 138.9                             |
| Weight ※7 ※8               | kg                               | 0.8                              | 1.0                              | 1.5                               | 2.2                               | 3.1                               | 5.1                               | 8.3                               |

Notes: ※7. It shows the weight of single swing clamp.  
 ※8. It shows different dimensions than LHA□□0-□□-P.

|                                |
|--------------------------------|
| 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         |
| LG/LT       |
| TLA-2       |
| TLB-2       |
| TLA-1       |

|            |
|------------|
| Link Clamp |
| LKA        |
| LKC        |
| LKW        |
| LJ/LM      |
| TMA-2      |
| TMA-1      |

|              |
|--------------|
| Work Support |
| LD           |
| LC           |
| TNC          |
| TC           |

|                           |
|---------------------------|
| Air Sensing Lift Cylinder |
| LLW                       |

|                                    |
|------------------------------------|
| Linear Cylinder / Compact Cylinder |
| LL                                 |
| LLR                                |
| LLU                                |
| DP                                 |
| DR                                 |
| DS                                 |
| DT                                 |

|                |
|----------------|
| Block Cylinder |
| DBA/DBC        |

|                |
|----------------|
| Centering Vise |
| FVA            |
| FVD            |
| FVC            |

|               |
|---------------|
| Control Valve |
| BZL           |
| BZT           |
| BZX/JZG       |
| BZS           |

|              |
|--------------|
| Pallet Clamp |
| VS/VT        |

|                        |
|------------------------|
| Expansion Locating Pin |
| VFL/VFM                |
| VFJ/VFK                |

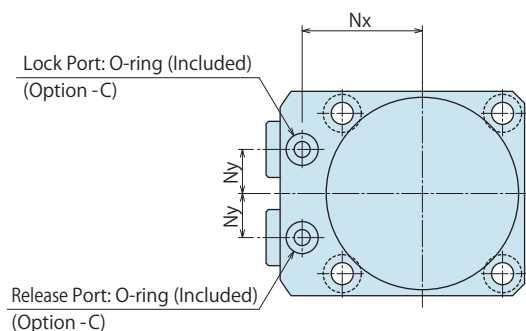
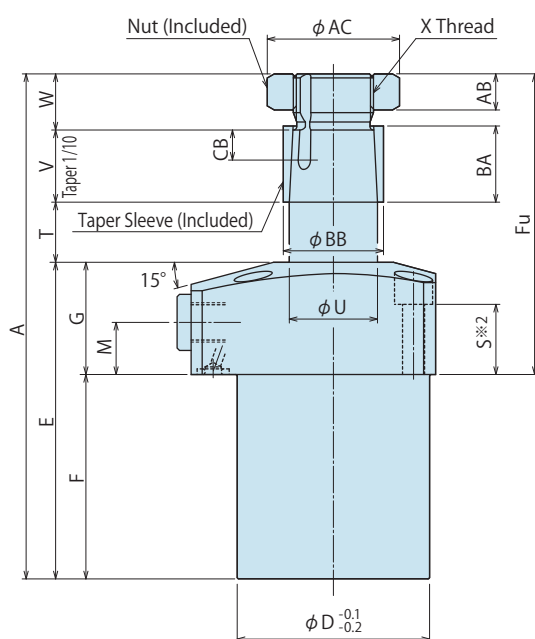
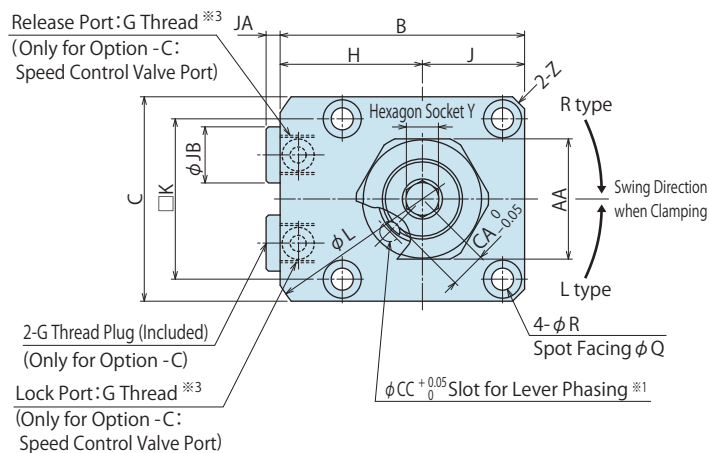
|                 |
|-----------------|
| Pull Stud Clamp |
| FP              |
| FQ              |

|                            |
|----------------------------|
| Customized Spring Cylinder |
| DWA/DWB                    |

## External Dimensions

C : Gasket Option (With G Thread Plug)

※The drawing shows the released state of LHS-CR-Y45.

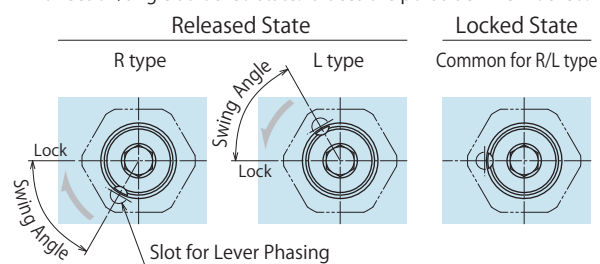


Notes :

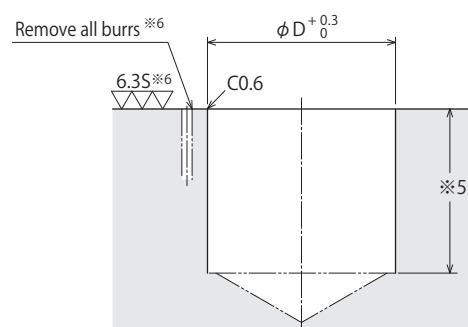
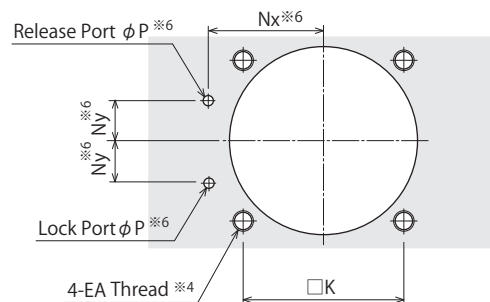
- ※2. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.
- ※3. Speed control valve is sold separately. Please refer to P.947.
- 1. Please contact us if it has a combination with other options.

## ※1. Slot for Lever Phasing

The slot position at released state differs depending on the swing direction/angle at locked state. It faces the port side when locked.



## Machining Dimensions of Mounting Area



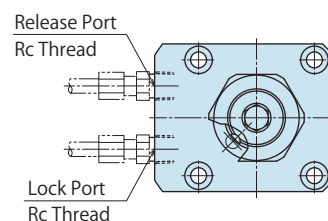
Notes :

- ※4. EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.
- ※5. The depth of the body mounting hole  $\phi D$  should be decided according to the mounting height referring to dimension 'F'.
- ※6. The machining dimension is for -C : Gasket Option.

## Piping Method

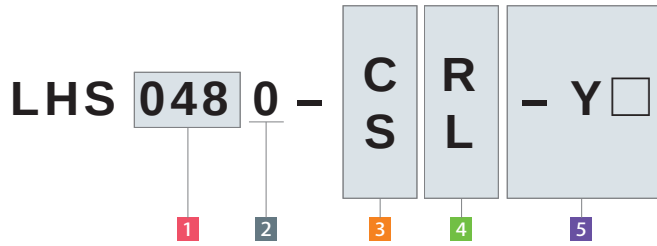
S : Piping Option (Rc Thread)

※The drawing shows the released state of LHS-SR-Y45.



## Model No. Indication

(Format Example : LHS0550-CR-Y30, LHS0750-SL-Y45)



- 1 Body Size
- 2 Design No.
- 3 Piping Method
- 4 Swing Direction when Clamping
- 5 Option (When Y □ is chosen)

## External Dimensions and Machining Dimensions for Mounting

(mm)

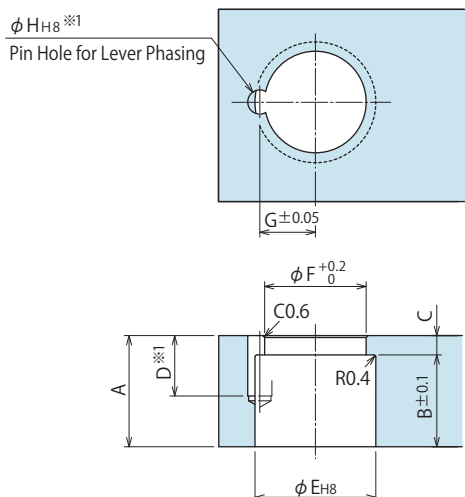
| Model No.                               |           | LHS0360-□□-Y□ |     |     | LHS0400-□□-Y□ |      |      | LHS0480-□□-Y□ |      |      | LHS0550-□□-Y□ |      |      | LHS0650-□□-Y□ |      |      | LHS0750-□□-Y□ |      |      | LHS0900-□□-Y□ |       |       | LHS1050-□□-Y□ |       |       |
|-----------------------------------------|-----------|---------------|-----|-----|---------------|------|------|---------------|------|------|---------------|------|------|---------------|------|------|---------------|------|------|---------------|-------|-------|---------------|-------|-------|
| Option Form                             |           | Y30           | Y45 | Y60 | Y30           | Y45  | Y60  | Y30           | Y45  | Y60  | Y30           | Y45  | Y60  | Y30           | Y45  | Y60  | Y30           | Y45  | Y60  | Y30           | Y45   | Y60   | Y30           | Y45   | Y60   |
| Swing Angle                             |           | 30°           | 45° | 60° | 30°           | 45°  | 60°  | 30°           | 45°  | 60°  | 30°           | 45°  | 60°  | 30°           | 45°  | 60°  | 30°           | 45°  | 60°  | 30°           | 45°   | 60°   | 30°           | 45°   | 60°   |
| Full Stroke (Vertical) ※8               |           | 8             |     |     | 8             |      |      | 8             |      |      | 10            |      |      | 10            |      |      | 12            |      |      | 12            |       |       | 16            |       |       |
| A ※8                                    |           | 110           |     |     | 117           |      |      | 133.5         |      |      | 150.5         |      |      | 164.5         |      |      | 192.5         |      |      | 220           |       |       | 258.5         |       |       |
| B                                       |           | 49            |     |     | 54            |      |      | 61            |      |      | 69            |      |      | 81            |      |      | 92            |      |      | 107           |       |       | 122           |       |       |
| C                                       |           | 40            |     |     | 45            |      |      | 51            |      |      | 60            |      |      | 70            |      |      | 80            |      |      | 95            |       |       | 110           |       |       |
| D                                       |           | 36            |     |     | 40            |      |      | 48            |      |      | 55            |      |      | 65            |      |      | 75            |      |      | 90            |       |       | 105           |       |       |
| E ※8                                    |           | 76            |     |     | 80            |      |      | 91.5          |      |      | 102.5         |      |      | 112.5         |      |      | 132.5         |      |      | 151           |       |       | 178.5         |       |       |
| F ※8                                    |           | 51            |     |     | 55            |      |      | 63.5          |      |      | 72.5          |      |      | 81.5          |      |      | 94.5          |      |      | 105           |       |       | 122.5         |       |       |
| Fu ※8                                   |           | 59            |     |     | 62            |      |      | 70            |      |      | 78            |      |      | 83            |      |      | 98            |      |      | 115           |       |       | 136           |       |       |
| G                                       |           | 25            |     |     | 25            |      |      | 28            |      |      | 30            |      |      | 31            |      |      | 38            |      |      | 46            |       |       | 56            |       |       |
| H                                       |           | 29            |     |     | 31.5          |      |      | 35.5          |      |      | 39            |      |      | 46            |      |      | 52            |      |      | 59.5          |       |       | 67            |       |       |
| J                                       |           | 20            |     |     | 22.5          |      |      | 25.5          |      |      | 30            |      |      | 35            |      |      | 40            |      |      | 47.5          |       |       | 55            |       |       |
| K                                       |           | 31.4          |     |     | 34            |      |      | 40            |      |      | 47            |      |      | 55            |      |      | 63            |      |      | 75            |       |       | 88            |       |       |
| L                                       |           | 66            |     |     | 73            |      |      | 83            |      |      | 88            |      |      | 106           |      |      | 116           |      |      | 136           |       |       | 152           |       |       |
| M                                       |           | 11            |     |     | 11            |      |      | 13            |      |      | 12            |      |      | 13            |      |      | 16            |      |      | 19            |       |       | 22            |       |       |
| Nx                                      |           | 23.5          |     |     | 26            |      |      | 30            |      |      | 33.5          |      |      | 39.5          |      |      | 45            |      |      | 52.5          |       |       | 60            |       |       |
| Ny                                      |           | 8             |     |     | 9             |      |      | 11            |      |      | 12            |      |      | 15            |      |      | 16            |      |      | 18.5          |       |       | 22.5          |       |       |
| P                                       |           | 3             |     |     | 3             |      |      | 3             |      |      | 3             |      |      | 5             |      |      | 5             |      |      | 5             |       |       | 5             |       |       |
| Q                                       |           | 7.5           |     |     | 9             |      |      | 9             |      |      | 11            |      |      | 11            |      |      | 14            |      |      | 17.5          |       |       | 20            |       |       |
| R                                       |           | 4.5           |     |     | 5.5           |      |      | 5.5           |      |      | 6.8           |      |      | 6.8           |      |      | 9             |      |      | 11            |       |       | 14            |       |       |
| S                                       |           | 16            |     |     | 15            |      |      | 17.5          |      |      | 17            |      |      | 17            |      |      | 21            |      |      | 25            |       |       | 32            |       |       |
| T ※8                                    |           | 10            |     |     | 10            |      |      | 10            |      |      | 12            |      |      | 12            |      |      | 14            |      |      | 14            |       |       | 18            |       |       |
| U                                       |           | 15            |     |     | 18            |      |      | 22            |      |      | 25            |      |      | 30            |      |      | 35.5          |      |      | 45            |       |       | 55            |       |       |
| V                                       |           | 13            |     |     | 15            |      |      | 18            |      |      | 21            |      |      | 24            |      |      | 30            |      |      | 37            |       |       | 43            |       |       |
| W                                       |           | 11            |     |     | 12            |      |      | 14            |      |      | 15            |      |      | 16            |      |      | 16            |      |      | 18            |       |       | 19            |       |       |
| X (Nominal × Pitch)                     |           | M14×1.5       |     |     | M16×1.5       |      |      | M20×1.5       |      |      | M22×1.5       |      |      | M27×1.5       |      |      | M30×1.5       |      |      | M39×1.5       |       |       | M48×1.5       |       |       |
| Y                                       |           | 5             |     |     | 6             |      |      | 8             |      |      | 8             |      |      | 10            |      |      | 10            |      |      | 14            |       |       | 14            |       |       |
| Z (Chamfer)                             |           | C2            |     |     | C3            |      |      | C3            |      |      | C3            |      |      | C4            |      |      | C5            |      |      | C6            |       |       | C6            |       |       |
| AA                                      |           | 22            |     |     | 24            |      |      | 30            |      |      | 32            |      |      | 41            |      |      | 46            |      |      | 55            |       |       | 65            |       |       |
| AB                                      |           | 7             |     |     | 8             |      |      | 9             |      |      | 10            |      |      | 11            |      |      | 11            |      |      | 12            |       |       | 12            |       |       |
| AC                                      |           | 24.5          |     |     | 26.5          |      |      | 33            |      |      | 35.5          |      |      | 45            |      |      | 50            |      |      | 60            |       |       | 71            |       |       |
| BA                                      |           | 14            |     |     | 16            |      |      | 19            |      |      | 22            |      |      | 25            |      |      | 31            |      |      | 38            |       |       | 44            |       |       |
| BB                                      |           | 17            |     |     | 20            |      |      | 25            |      |      | 28            |      |      | 34            |      |      | 40            |      |      | 49            |       |       | 60            |       |       |
| CA                                      |           | 6             |     |     | 7             |      |      | 9             |      |      | 10            |      |      | 12.5          |      |      | 14            |      |      | 18.5          |       |       | 23            |       |       |
| CB                                      |           | 6.5           |     |     | 6.5           |      |      | 7.5           |      |      | 9.5           |      |      | 11.5          |      |      | 12.5          |      |      | 11.5          |       |       | 13.5          |       |       |
| CC                                      |           | 4             |     |     | 4             |      |      | 5             |      |      | 6             |      |      | 6             |      |      | 8             |      |      | 8             |       |       | 10            |       |       |
| EA (Nominal × Pitch)                    |           | M4×0.7        |     |     | M5×0.8        |      |      | M5×0.8        |      |      | M6×1          |      |      | M6×1          |      |      | M8×1.25       |      |      | M10×1.5       |       |       | M12×1.75      |       |       |
| JA                                      |           | 3.5           |     |     | 3.5           |      |      | 3.5           |      |      | 3.5           |      |      | 4.5           |      |      | 4.5           |      |      | 4.5           |       |       | 4.5           |       |       |
| JB                                      |           | 14            |     |     | 14            |      |      | 14            |      |      | 14            |      |      | 19            |      |      | 19            |      |      | 22            |       |       | 22            |       |       |
| Lock Port/<br>Release Port              | Option -C | G1/8          |     |     | G1/8          |      |      | G1/8          |      |      | G1/8          |      |      | G1/4          |      |      | G1/4          |      |      | G3/8          |       |       | G3/8          |       |       |
|                                         | Option -S | Rc1/8         |     |     | Rc1/8         |      |      | Rc1/8         |      |      | Rc1/8         |      |      | Rc1/4         |      |      | Rc1/4         |      |      | Rc3/8         |       |       | Rc3/8         |       |       |
| O-ring (Option -C)                      |           | 1BP5          |     |     | 1BP5          |      |      | 1BP5          |      |      | 1BP5          |      |      | 1BP7          |      |      | 1BP7          |      |      | 1BP7          |       |       | 1BP7          |       |       |
| Cylinder ※8<br>Capacity cm <sup>3</sup> | Lock      | 5.0           | 5.5 | 5.9 | 7.3           | 8.0  | 8.7  | 11.2          | 12.4 | 13.6 | 19.7          | 21.6 | 23.5 | 27.5          | 30.4 | 33.2 | 50.0          | 55.6 | 61.1 | 81.5          | 90.9  | 100.6 | 140.5         | 155.9 | 171.4 |
|                                         | Release   | 6.4           | 6.9 | 7.3 | 9.4           | 10.0 | 10.8 | 14.2          | 15.5 | 16.6 | 24.6          | 26.5 | 28.4 | 34.5          | 37.5 | 40.3 | 61.9          | 67.5 | 73.0 | 100.6         | 110.0 | 119.7 | 178.5         | 194.0 | 209.4 |
| Weight ※7 ※8 kg                         |           | 0.8           |     |     | 1.0           |      |      | 1.5           |      |      | 2.2           |      |      | 3.1           |      |      | 5.1           |      |      | 8.3           |       |       | 11.9          |       |       |

## Taper Lock Lever Design Dimensions

※ Reference for designing a taper lock swing lever.

Corresponding Model No.

LHS 0 - C R L - Blank  
Y  
**1** Body Size **5** Option Blank/Y



|                           | (mm)                   |                        |                        |                        |                        |                        |                        |                         |
|---------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-------------------------|
| Corresponding Model No.※3 | LHS0360                | LHS0400                | LHS0480                | LHS0550                | LHS0650                | LHS0750                | LHS0900                | LHS1050                 |
| A                         | 17                     | 19                     | 23                     | 26                     | 29                     | 35                     | 43                     | 50                      |
| B                         | 14                     | 16                     | 19                     | 22                     | 25                     | 31                     | 38                     | 44                      |
| C                         | 3                      | 3                      | 4                      | 4                      | 4                      | 4                      | 5                      | 6                       |
| D                         | 10.5                   | 10.5                   | 12.5                   | 14.5                   | 16.5                   | 17.5                   | 17.5                   | 20.5                    |
| E                         | $17^{+0.027}_0$        | $20^{+0.033}_0$        | $25^{+0.033}_0$        | $28^{+0.033}_0$        | $34^{+0.039}_0$        | $40^{+0.039}_0$        | $49^{+0.039}_0$        | $60^{+0.046}_0$         |
| F                         | 15                     | 17                     | 21                     | 23.5                   | 29                     | 33                     | 42                     | 51                      |
| G                         | 8                      | 9                      | 11.5                   | 13                     | 15.5                   | 18                     | 22.5                   | 28                      |
| H                         | $4^{+0.018}_0$         | $4^{+0.018}_0$         | $5^{+0.018}_0$         | $6^{+0.018}_0$         | $6^{+0.018}_0$         | $8^{+0.022}_0$         | $8^{+0.022}_0$         | $10^{+0.022}_0$         |
| Phasing Pin※2 (Reference) | $\phi 4(h8) \times 10$ | $\phi 4(h8) \times 10$ | $\phi 5(h8) \times 12$ | $\phi 6(h8) \times 14$ | $\phi 6(h8) \times 16$ | $\phi 8(h8) \times 16$ | $\phi 8(h8) \times 16$ | $\phi 10(h8) \times 20$ |

Notes :

- Swing lever should be designed with its length according to performance curve.
- If the swing lever is not in accordance with the dimension shown above, performance may be degraded and damage can occur.

※1. The pin hole ( $\phi H$ ) for determining the lever phase should be added, if necessary.

※2. Phasing pin is not included. Prepare it separately.

※3. Refer to Design Dimensions of Quick Change Lever Option A for -A (Quick Change Lever Option A).

Refer to Design Dimensions of Quick Change Lever Option F for -F (Quick Change Lever Option F).

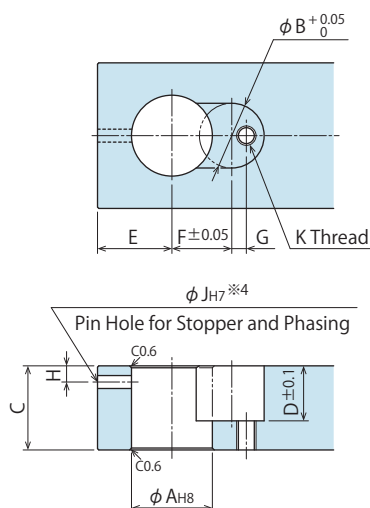
For -P (Balance Lever Option), it should be designed by customer.

## Quick Change Lever Option A Design Dimensions

※ Reference for designing Quick Change Swing Lever Option A.

Corresponding Model No.

LHS 0 - C R L - A  
**1** Body Size **5** Option A



|                               | (mm)                  |                        |                        |                        |                        |                        |                        |                        |
|-------------------------------|-----------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Corresponding Model No.       | LHS0360               | LHS0400                | LHS0480                | LHS0550                | LHS0650                | LHS0750                | LHS0900                | LHS1050                |
| A                             | $15^{+0.027}_0$       | $18^{+0.027}_0$        | $22^{+0.033}_0$        | $25^{+0.033}_0$        | $30^{+0.033}_0$        | $35.5^{+0.039}_0$      | $45^{+0.039}_0$        | $55^{+0.046}_0$        |
| B                             | 12                    | 15                     | 18                     | 20                     | 24                     | 28                     | 36                     | 46                     |
| C                             | 17                    | 19                     | 23                     | 26                     | 29                     | 35                     | 43                     | 50                     |
| D                             | 11                    | 13                     | 15.5                   | 17                     | 19                     | 21                     | 28                     | 33                     |
| E                             | 13                    | 16                     | 20                     | 23                     | 25                     | 29                     | 38                     | 45                     |
| F                             | 12.5                  | 15                     | 16.5                   | 18.5                   | 20.5                   | 25                     | 31                     | 33.5                   |
| G                             | 2                     | 2.5                    | 4                      | 4.5                    | 6.5                    | 6.5                    | 9                      | 14                     |
| H                             | 3                     | 4                      | 4                      | 4                      | 6                      | 6                      | 8                      | 8                      |
| J                             | $3^{+0.010}_0$        | $4^{+0.012}_0$         | $4^{+0.012}_0$         | $4^{+0.012}_0$         | $6^{+0.012}_0$         | $6^{+0.012}_0$         | $8^{+0.015}_0$         | $8^{+0.015}_0$         |
| K                             | M4×0.7                | M5×0.8                 | M5×0.8                 | M6×1                   | M6×1                   | M8×1.25                | M10×1.5                | M10×1.5                |
| Pin for Stopper※4 and Phasing | $\phi 3(m6) \times 8$ | $\phi 4(m6) \times 10$ | $\phi 4(m6) \times 12$ | $\phi 4(m6) \times 14$ | $\phi 6(m6) \times 14$ | $\phi 6(m6) \times 16$ | $\phi 8(m6) \times 20$ | $\phi 8(m6) \times 22$ |

Notes :

- Swing lever should be designed with its length according to performance curve.
- If the swing lever is not in accordance with the dimension shown above, performance may be degraded and damage can occur.
- Tightening Kit (LZH□-W) for Quick Change Lever Option A is sold separately.

※4. The pin hole for stopper and phasing ( $\phi J$ ) should be appropriately machined according to the slot for lever phasing on the clamp body. Pin for stopper and phasing (prepared by customer) is used as phasing when mounting the lever and as stopper when removing the lever. If you are not using a pin for stopper and phasing, a stopper is required to remove the lever.



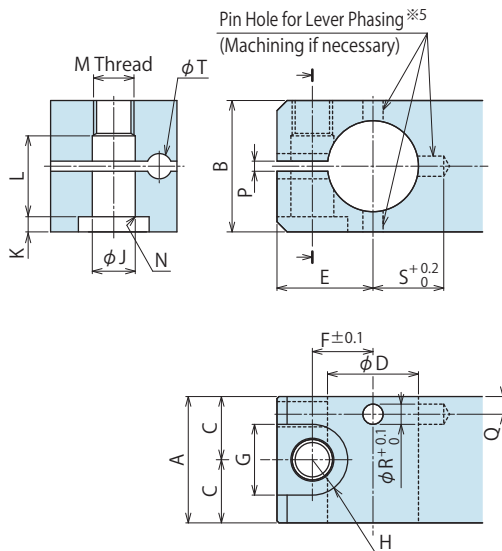
## Quick Change Lever Option F Design Dimensions

※ Reference for designing Quick Change Swing Lever Option F.

Corresponding Model No.

**LHS** 0 - C S R L - **F**

**1** Body Size      **5** Option F



| Corresponding Model No.   | LHS0360                           | LHS0400                           | LHS0480                           | LHS0550                           | LHS0650                           | LHS0750                             | LHS0900                           | LHS1050                           |
|---------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|-----------------------------------|
| A                         | 22                                | 25                                | 30                                | 34                                | 40                                | 46                                  | 55                                | 60                                |
| B                         | 22                                | 26                                | 32                                | 36                                | 45                                | 53                                  | 70                                | 82                                |
| C                         | 11                                | 12.5                              | 15                                | 17                                | 20                                | 23                                  | 27.5                              | 30                                |
| D                         | 15 <sup>-0.016</sup> <sub>0</sub> | 18 <sup>-0.016</sup> <sub>0</sub> | 22 <sup>-0.020</sup> <sub>0</sub> | 25 <sup>-0.020</sup> <sub>0</sub> | 30 <sup>-0.020</sup> <sub>0</sub> | 35.5 <sup>-0.025</sup> <sub>0</sub> | 45 <sup>-0.025</sup> <sub>0</sub> | 55 <sup>-0.030</sup> <sub>0</sub> |
| E                         | 15                                | 19                                | 23                                | 26.5                              | 31.5                              | 36.5                                | 46                                | 55                                |
| F                         | 9.75                              | 12                                | 14.75                             | 17                                | 20                                | 23.5                                | 29.75                             | 36                                |
| G                         | 11                                | 14                                | 17.5                              | 20                                | 23                                | 26                                  | 32                                | 39                                |
| H                         | R5.5                              | R7                                | R8.75                             | R10                               | R11.5                             | R13                                 | R16                               | R19.5                             |
| J                         | 6.5                               | 8.5                               | 10.5                              | 12.5                              | 14.5                              | 16.5                                | 21                                | 25                                |
| K                         | 2                                 | 3                                 | 4                                 | 4                                 | 5                                 | 7                                   | 9                                 | 11                                |
| L                         | 13.5                              | 16                                | 18                                | 22                                | 26.5                              | 31                                  | 42                                | 46                                |
| M                         | M6×1                              | M8×1                              | M10×1.25                          | M12×1.5                           | M14×1.5                           | M16×1.5                             | M20×2                             | M24×2                             |
| N                         | C0.4                              | C0.6                              | C0.6                              | C1                                | C1                                | C1                                  | C1                                | C1                                |
| P                         | 2                                 | 2                                 | 2                                 | 2                                 | 2                                 | 2                                   | 2                                 | 2                                 |
| Q                         | 2.5                               | 3.5                               | 3.5                               | 4                                 | 5.5                               | 5.5                                 | 7.5                               | 8                                 |
| R                         | 3                                 | 4                                 | 4                                 | 4                                 | 6                                 | 6                                   | 8                                 | 8                                 |
| S                         | 13.5                              | 14                                | 18                                | 19.5                              | 24.5                              | 27.75                               | 38                                | 45                                |
| T                         | 3.4                               | 4.5                               | 4.5                               | 4.5                               | 6.5                               | 6.5                                 | 9                                 | 9                                 |
| Phasing Pin※6 (Reference) | φ3×8                              | φ4×8                              | φ4×10                             | φ4×10                             | φ6×14                             | φ6×14                               | φ8×20                             | φ8×22                             |

Notes :

- Swing lever should be designed with its length according to performance curve.
  - If the swing lever is not in accordance with the dimension shown above, performance may be degraded and damage can occur.
  - Tightening Bolt (LZH□-B) for Quick Change Lever Option F is sold separately.
- ※5. The pin hole (φR) for determining the lever phase should be added, if necessary.
- ※6. Phasing pin is not included. Prepare it separately.

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  
LG/LT  
TLA-2  
TLB-2  
TLA-1

Link Clamp

LKA  
LKC  
LKW  
LJ/LM  
TMA-2  
TMA-1

Work Support

LD  
LC  
TNC  
TC

Air Sensing  
Lift Cylinder

LLW

Linear Cylinder /  
Compact Cylinder

LL  
LLR  
LLU  
DP  
DR  
DS  
DT

Block Cylinder

DBA/DBC

Centering Vise

FVA  
FVD  
FVC

Control Valve

BZL  
BZT  
BZX/JZG  
BZS

Pallet Clamp

VS/VT

Expansion  
Locating Pin

VFL/VFM  
VFJ/VFK

Pull Stud Clamp

FP  
FQ

Customized  
Spring Cylinder

DWA/DWB

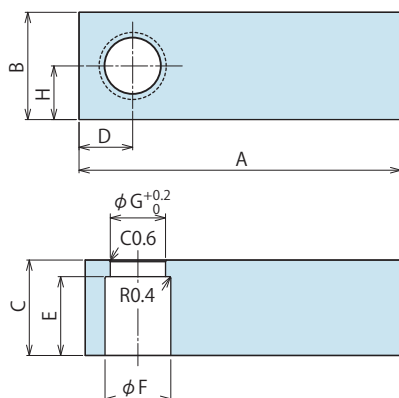
## Accessories : Material Swing Lever for Taper Lock Option

Model No. Indication

**LZH 048 0 - T**

Size (Refer to the table.)

Design No. (Revision Number)



| Model No.                             | LZH0360<br>-T | LZH0400<br>-T | LZH0480<br>-T | LZH0550<br>-T | LZH0650<br>-T | LZH0750<br>-T | LZH0900<br>-T | LZH1050<br>-T |
|---------------------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Corresponding Model No. <sup>*)</sup> | LHS0360       | LHS0400       | LHS0480       | LHS0550       | LHS0650       | LHS0750       | LHS0900       | LHS1050       |
| A                                     | 120           | 145           | 160           | 170           | 175           | 185           | 220           | 270           |
| B                                     | 26            | 32            | 40            | 45            | 50            | 58            | 75            | 90            |
| C                                     | 17            | 19            | 23            | 26            | 29            | 35            | 43            | 50            |
| D                                     | 13            | 16            | 20            | 23            | 25            | 29            | 38            | 45            |
| E                                     | 14            | 16            | 19            | 22            | 25            | 31            | 38            | 44            |
| F                                     | 17            | 20            | 25            | 28            | 34            | 40            | 49            | 60            |
| G                                     | 15            | 17            | 21            | 23.5          | 29            | 33            | 42            | 51            |
| H                                     | 13            | 16            | 20            | 22.5          | 25            | 29            | 37.5          | 45            |

Notes :

- Material : S50CH Surface Finishing : Alkaline Blackening
  - If necessary, the front end should be additionally machined and finished.
  - When determining the phase, refer to taper lock lever design dimensions for each model for the additional machining.
- ※1. Refer to Accessory of Quick Change Lever Option A for -A (Quick Change Lever Option A). Refer to Accessory of Quick Change Lever Option F for -F (Quick Change Lever Option F). For -P (Balance Lever Option), it should be designed by customer.

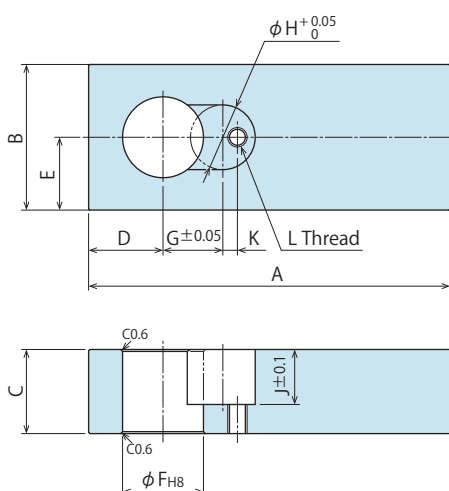
## Accessories : Material Swing Lever for Quick Change Lever Option A

Model No. Indication

**LZH 048 0 - A**

Size (Refer to the table.)

Design No. (Revision Number)



| Model No.               | LZH0360<br>-A                     | LZH0400<br>-A                     | LZH0480<br>-A                     | LZH0550<br>-A                     | LZH0650<br>-A                     | LZH0750<br>-A                       | LZH0900<br>-A                     | LZH1050<br>-A                     |
|-------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|-------------------------------------|-----------------------------------|-----------------------------------|
| Corresponding Model No. | LHS0360<br>-□□-A                  | LHS0400<br>-□□-A                  | LHS0480<br>-□□-A                  | LHS0550<br>-□□-A                  | LHS0650<br>-□□-A                  | LHS0750<br>-□□-A                    | LHS0900<br>-□□-A                  | LHS1050<br>-□□-A                  |
| A                       | 120                               | 145                               | 160                               | 170                               | 175                               | 185                                 | 220                               | 270                               |
| B                       | 26                                | 32                                | 40                                | 45                                | 50                                | 58                                  | 75                                | 90                                |
| C                       | 17                                | 19                                | 23                                | 26                                | 29                                | 35                                  | 43                                | 50                                |
| D                       | 13                                | 16                                | 20                                | 23                                | 25                                | 29                                  | 38                                | 45                                |
| E                       | 13                                | 16                                | 20                                | 22.5                              | 25                                | 29                                  | 37.5                              | 45                                |
| F                       | 15 <sup>+0.027</sup> <sub>0</sub> | 18 <sup>+0.027</sup> <sub>0</sub> | 22 <sup>+0.033</sup> <sub>0</sub> | 25 <sup>+0.033</sup> <sub>0</sub> | 30 <sup>+0.033</sup> <sub>0</sub> | 35.5 <sup>+0.039</sup> <sub>0</sub> | 45 <sup>+0.039</sup> <sub>0</sub> | 55 <sup>+0.046</sup> <sub>0</sub> |
| G                       | 12.5                              | 15                                | 16.5                              | 18.5                              | 20.5                              | 25                                  | 31                                | 33.5                              |
| H                       | 12                                | 15                                | 18                                | 20                                | 24                                | 28                                  | 36                                | 46                                |
| J                       | 11                                | 13                                | 15.5                              | 17                                | 19                                | 21                                  | 28                                | 33                                |
| K                       | 2                                 | 2.5                               | 4                                 | 4.5                               | 6.5                               | 6.5                                 | 9                                 | 14                                |
| L                       | M4×0.7                            | M5×0.8                            | M5×0.8                            | M6×1                              | M6×1                              | M8×1.25                             | M10×1.5                           | M10×1.5                           |

Notes :

- Material : S50CH Surface Finishing : Alkaline Blackening
- If necessary, the front end should be additionally machined and finished.
- The pin hole for stopper and lever phasing should be additionally machined by referring to Quick Change Lever Option A Design Dimensions.
- Tightening Kit (LZH□-W) for Quick Change Lever Option A is sold separately.

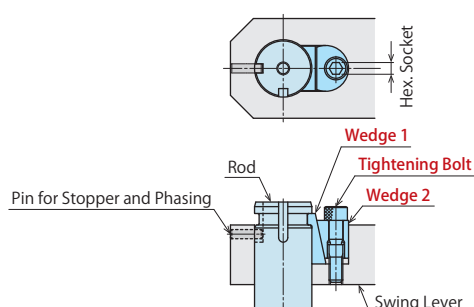
## Accessories : Tightening Kit for Quick Change Lever Option A

Model No. Indication

**LZH 048 1 - W**

Size (Refer to the table.)

Design No. (Revision Number)



Tightening Kit for mounting Quick Change Lever Option A.

Sold separately from clamp body.

【Contents of Tightening Kit】

• Wedge 1 • Wedge 2 • Tightening Bolt

| Model No.                        | LZH0361<br>-W    | LZH0401<br>-W    | LZH0481<br>-W    | LZH0551<br>-W    | LZH0651<br>-W    | LZH0751<br>-W    | LZH0901<br>-W    | LZH1051<br>-W    |
|----------------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Corresponding Model No.          | LHS0360<br>-□□-A | LHS0400<br>-□□-A | LHS0480<br>-□□-A | LHS0550<br>-□□-A | LHS0650<br>-□□-A | LHS0750<br>-□□-A | LHS0900<br>-□□-A | LHS1050<br>-□□-A |
| Nominal×Pitch of Tightening Bolt | M4×0.7           | M5×0.8           | M5×0.8           | M6×1             | M6×1             | M8×1.25          | M10×1.5          | M10×1.5          |
| Hex. Socket mm                   | 2.5              | 3                | 3                | 4                | 4                | 5                | 6                | 6                |
| Tightening Torque N·m            | 2.5              | 5.0              | 5.0              | 8.0              | 8.0              | 20               | 40               | 45               |

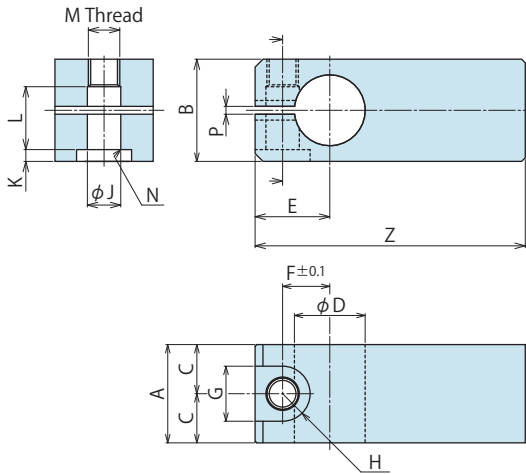
## Accessories : Material Swing Lever for Quick Change Lever Option F

Model No. Indication

**LZH 048 0 - F**

Size  
(Refer to the table.)

Design No.  
(Revision Number)



| Model No.               | LZH0360<br>-F    | LZH0400<br>-F    | LZH0480<br>-F    | LZH0550<br>-F    | LZH0650<br>-F    | LZH0750<br>-F    | LZH0900<br>-F    | LZH1050<br>-F    |
|-------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Corresponding Model No. | LHS0360<br>-□□-F | LHS0400<br>-□□-F | LHS0480<br>-□□-F | LHS0550<br>-□□-F | LHS0650<br>-□□-F | LHS0750<br>-□□-F | LHS0900<br>-□□-F | LHS1050<br>-□□-F |
| A                       | 22               | 25               | 30               | 34               | 40               | 46               | 55               | 60               |
| B                       | 22               | 26               | 32               | 36               | 45               | 53               | 70               | 82               |
| C                       | 11               | 12.5             | 15               | 17               | 20               | 23               | 27.5             | 30               |
| D                       | 15 $-0.016$      | 18 $-0.016$      | 22 $-0.020$      | 25 $-0.020$      | 30 $-0.020$      | 35.5 $-0.025$    | 45 $-0.025$      | 55 $-0.030$      |
| E                       | 15               | 19               | 23               | 26.5             | 31.5             | 36.5             | 46               | 55               |
| F                       | 9.75             | 12               | 14.75            | 17               | 20               | 23.5             | 29.75            | 36               |
| G                       | 11               | 14               | 17.5             | 20               | 23               | 26               | 32               | 39               |
| H                       | R5.5             | R7               | R8.75            | R10              | R11.5            | R13              | R16              | R19.5            |
| J                       | 6.5              | 8.5              | 10.5             | 12.5             | 14.5             | 16.5             | 21               | 25               |
| K                       | 2                | 3                | 4                | 4                | 5                | 7                | 9                | 11               |
| L                       | 13.5             | 16               | 18               | 22               | 26.5             | 31               | 42               | 46               |
| M                       | M6×1             | M8×1             | M10×1.25         | M12×1.5          | M14×1.5          | M16×1.5          | M20×2            | M24×2            |
| N                       | C0.4             | C0.6             | C0.6             | C1               | C1               | C1               | C1               | C1               |
| P                       | 2                | 2                | 2                | 2                | 2                | 2                | 2                | 2                |
| Z                       | 120              | 145              | 160              | 170              | 175              | 185              | 220              | 270              |

Notes :

1. Material : S50CH Surface Finishing : Alkaline Blackening
2. If necessary, the front end should be additionally machined and finished.
3. When determining the phase, refer to Quick Change Lever Option F Design Dimensions for the additional machining.
4. Tightening Bolt (LZH□-B) for Quick Change Lever Option F is sold separately.

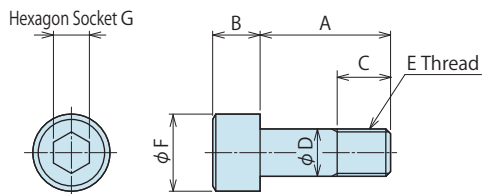
## Accessories : Tightening Bolts for Quick Change Lever Option F

Model No. Indication

**LZH 048 0 - B**

Size  
(Refer to the table.)

Design No.  
(Revision Number)



| Model No.               | LZH0360<br>-B    | LZH0400<br>-B    | LZH0480<br>-B    | LZH0550<br>-B    | LZH0650<br>-B    | LZH0750<br>-B    | LZH0900<br>-B    | LZH1050<br>-B    |
|-------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Corresponding Model No. | LHS0360<br>-□□-F | LHS0400<br>-□□-F | LHS0480<br>-□□-F | LHS0550<br>-□□-F | LHS0650<br>-□□-F | LHS0750<br>-□□-F | LHS0900<br>-□□-F | LHS1050<br>-□□-F |
| A                       | 20               | 23               | 28               | 32               | 40               | 46               | 61               | 71               |
| B                       | 6                | 8                | 10               | 12               | 14               | 16               | 20               | 24               |
| C                       | 7                | 10               | 11               | 13               | 16               | 18               | 23               | 27               |
| D                       | 6                | 8                | 10               | 12               | 14               | 16               | 20               | 24               |
| E                       | M6×1             | M8×1             | M10×1.25         | M12×1.5          | M14×1.5          | M16×1.5          | M20×2            | M24×2            |
| F                       | 10               | 13               | 16               | 18               | 21               | 24               | 30               | 36               |
| G                       | 5                | 6                | 8                | 10               | 12               | 14               | 17               | 19               |

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  
LG/LT  
TLA-2  
TLB-2  
TLA-1

Link Clamp

LKA  
LKC  
LKW  
LJ/LM  
TMA-2  
TMA-1

Work Support

LD  
LC  
TNC  
TC

Air Sensing  
Lift Cylinder

LLW

Linear Cylinder /  
Compact Cylinder

LL  
LLR  
LLU  
DP  
DR  
DS  
DT

Block Cylinder

DBA/DBC

Centering Vise

FVA  
FVD  
FVC

Control Valve

BZL  
BZT  
BZX/JZG  
BZS

Pallet Clamp

VS/VT

Expansion  
Locating Pin

VFL/VFM  
VFJ/VFK

Pull Stud Clamp

FP  
FQ

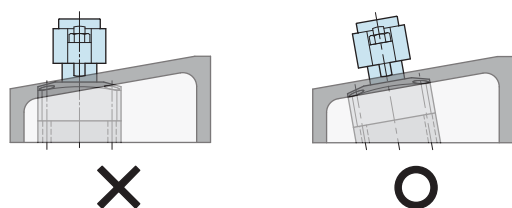
Customized  
Spring Cylinder

DWA/DWB

## Cautions

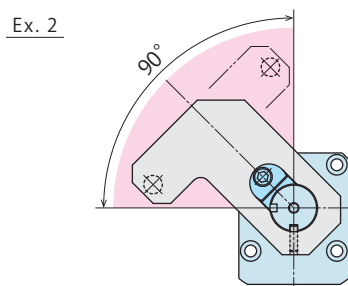
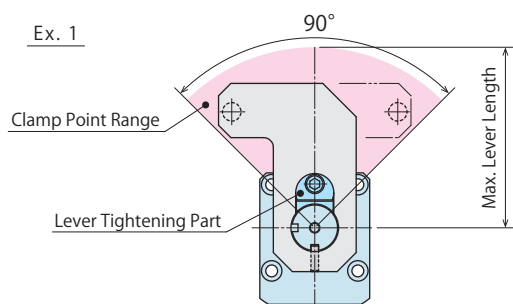
### Notes for Design

- 1) Check Specifications
  - Please use each product according to the specifications.
- 2) Notes for Circuit Design
  - Please read "Notes on Hydraulic Cylinder Speed Control Unit" for proper hydraulic circuit design. Improper circuit design may lead to malfunctions and damages. (Refer to P.1356)
  - Ensure there is no possibility of supplying hydraulic pressure to the lock port and the release port simultaneously.
- 3) Swing lever should be designed to make the moment of inertia small.
  - Large moment of inertia will degrade the lever's stopping accuracy and cause undue wear to the clamp.
  - Additionally, the clamp may not function, depending on supplied hydraulic pressure and lever mounting position.
  - Set the allowable operation time after the moment of inertia is calculated. Refer to "Allowable Swing Time Graph" and make sure to operate clamps within the allowable operation time.
- 4) Protect the exposed area of the piston rod when using on a welding fixture.
  - If spatter attaches to the sliding surface it could lead to malfunction and fluid leakage.
- 5) When clamping on a sloped surface of the workpiece
  - Make sure the clamping surface and the mounting surface of the clamp are parallel.



### Notes for LHA-M/N, LHW

- When using air sensing swing clamp (LHA-M/N, LHW), make sure to check the Notes for Design • Installation • Use (Pages shown below).
    - Swing clamp with air sensing option LHA-M/N : Refer to P.457.
    - Swing clamp with air sensing valve LHW : Refer to P.503.
- 7) When using an offset lever for Quick Change Lever Option A.
    - Clamping point should be in the range of 90° towards lever tightening part.



### Installation Notes

- 1) Check the Usable Fluid
  - Please use the appropriate fluid by referring to the Hydraulic Fluid List (P.1355).
- 2) Installation of the Product
  - When mounting the clamp, use hexagonal socket bolts as multiple bolt holes for mounting (with tensile strength of 12.9) and tighten them with the torque shown in the table below. Tightening with greater torque than recommended can dent the seating surface or break the bolt.

|                          | Model No.                              | Thread Size | Tightening Torque (N·m) |
|--------------------------|----------------------------------------|-------------|-------------------------|
| LHA<br>LHC<br>LHS<br>LHW | LHA0360 / LHC0360<br>LHS0360           | M4×0.7      | 4.0                     |
|                          | LHA0400 / LHC0400<br>LHS0400 / LHW0401 | M5×0.8      | 8.0                     |
|                          | LHA0480 / LHC0480<br>LHS0480 / LHW0481 | M5×0.8      | 8.0                     |
|                          | LHA0550 / LHC0550<br>LHS0550 / LHW0551 | M6×1        | 14                      |
|                          | LHA0650 / LHC0650<br>LHS0650 / LHW0651 | M6×1        | 14                      |
|                          | LHA0750<br>LHS0750 / LHW0751           | M8×1.25     | 33                      |
|                          | LHA0900<br>LHS0900                     | M10×1.5     | 65                      |
|                          | LHA1050<br>LHS1050                     | M12×1.75    | 114                     |
|                          | LG0301 / LT0301                        | M4×0.7      | 3.2                     |
|                          | LG0361 / LT0361                        | M4×0.7      | 3.2                     |
| LG<br>LT                 | LG0401 / LT0401                        | M5×0.8      | 6.3                     |
|                          | LG0481 / LT0481                        | M5×0.8      | 6.3                     |
|                          | LG0551 / LT0551                        | M6×1        | 10                      |
|                          | LG0651 / LT0651                        | M6×1        | 10                      |
|                          | LG0751 / LT0751                        | M8×1.25     | 25                      |
|                          | LG0901                                 | M10×1.5     | 58.8                    |
|                          | LG1051                                 | M12×1.75    | 98                      |
|                          | TLA0401-2 / TLB0401-2<br>TLA0402-1     | M5×0.8      | 6.9                     |
|                          | TLA0601-2 / TLB0601-2<br>TLA0602-1     | M6×1        | 11.8                    |
|                          | TLA0801-2 / TLB0801-2<br>TLA0802-1     | M6×1        | 11.8                    |
| TLA-2<br>TLB-2<br>TLA-1  | TLA1001-2 / TLB1001-2<br>TLA1002-1     | M8×1.25     | 25                      |
|                          | TLA1601-2 / TLB1601-2<br>TLA1602-1     | M8×1.25     | 25                      |
|                          | TLA2001-2 / TLB2001-2<br>TLA2002-1     | M10×1.5     | 58.8                    |
|                          | TLA2501-2 / TLB2501-2<br>TLA2502-1     | M10×1.5     | 58.8                    |
|                          | TLA4001-2 / TLB4001-2<br>TLA4002-1     | M12×1.75    | 98                      |
|                          |                                        |             |                         |
|                          |                                        |             |                         |
|                          |                                        |             |                         |

## 3) Installation / Removal of the Swing Lever

- Oil or debris on the tightened parts of the lever, taper sleeve or piston rod may cause the rod to loosen. Please clean them thoroughly before installation.
- Tighten the tightening bolt of swing lever with the torque shown below. Tightening with greater torque than recommended can damage the bolt and lever tightening function.

LHA/LHC/LHS/LHW/LG/LT Standard : Taper Lock Lever

|                          | Model No.                              | Thread Size | Tightening Torque (N·m) |
|--------------------------|----------------------------------------|-------------|-------------------------|
| LHA<br>LHC<br>LHS<br>LHW | LHA0360 / LHC0360<br>LHS0360           | M14×1.5     | 21 ~ 25                 |
|                          | LHA0400 / LHC0400<br>LHS0400 / LHW0401 | M16×1.5     | 33 ~ 40                 |
|                          | LHA0480 / LHC0480<br>LHS0480 / LHW0481 | M20×1.5     | 54 ~ 65                 |
|                          | LHA0550 / LHC0550<br>LHS0550 / LHW0551 | M22×1.5     | 84 ~ 100                |
|                          | LHA0650 / LHC0650<br>LHS0650 / LHW0651 | M27×1.5     | 120 ~ 145               |
|                          | LHA0750<br>LHS0750 / LHW0751           | M30×1.5     | 175 ~ 210               |
|                          | LHA0900<br>LHS0900                     | M39×1.5     | 280 ~ 335               |
|                          | LHA1050<br>LHS1050                     | M48×1.5     | 333 ~ 400               |
|                          | LG0301 / LT0301                        | M8×1        | 8 ~ 10                  |
|                          | LG0361 / LT0361                        | M10×1       | 15 ~ 18                 |
| LG<br>LT                 | LG0401 / LT0401                        | M12×1.5     | 24 ~ 29                 |
|                          | LG0481 / LT0481                        | M16×1.5     | 37 ~ 45                 |
|                          | LG0551 / LT0551                        | M18×1.5     | 59 ~ 71                 |
|                          | LG0651 / LT0651                        | M22×1.5     | 93 ~ 112                |
|                          | LG0751 / LT0751                        | M28×1.5     | 147 ~ 177               |
|                          | LG0901                                 | M36×1.5     | 235 ~ 282               |
|                          | LG1051                                 | M45×1.5     | 300 ~ 360               |

LHA-F/LHS-F/LG-F/LT-F : Quick Change Lever Option F,

TLA-2/TLB-2/TLA-1 : Standard

|                                | Model No.                                    | Thread Size | Tightening Torque (N·m) |
|--------------------------------|----------------------------------------------|-------------|-------------------------|
| LHA-F<br>LHS-F<br>LG-F<br>LT-F | LG0301-F / LT0301-F                          | M5×0.8      | 7.5                     |
|                                | LHA0360-F / LHS0360-F<br>LG0361-F / LT0361-F | M6×1        | 14                      |
|                                | LHA0400-F / LHS0400-F<br>LG0401-F / LT0401-F | M8×1        | 33                      |
|                                | LHA0480-F / LHS0480-F<br>LG0481-F / LT0481-F | M10×1.25    | 65                      |
|                                | LHA0550-F / LHS0550-F<br>LG0551-F / LT0551-F | M12×1.5     | 100 ~ 114               |
|                                | LHA0650-F / LHS0650-F<br>LG0651-F / LT0651-F | M14×1.5     | 160 ~ 180               |
|                                | LHA0750-F / LHS0750-F<br>LG0751-F / LT0751-F | M16×1.5     | 250 ~ 280               |
|                                | LHA0900-F / LHS0900-F<br>LG0901-F            | M20×2       | 500 ~ 540               |
|                                | LHA1050-F / LHS1050-F<br>LG1051-F            | M24×2       | 760 ~ 810               |
|                                | TLA0401-2 / TLB0401-2<br>TLA0402-1           | M6×1        | 13                      |
| TLA-2<br>TLB-2<br>TLA-1        | TLA0601-2 / TLB0601-2<br>TLA0602-1           | M8×1        | 32                      |
|                                | TLA0801-2 / TLB0801-2<br>TLA0802-1           | M8×1        | 32                      |
|                                | TLA1001-2 / TLB1001-2<br>TLA1002-1           | M10×1.25    | 63                      |
|                                | TLA1601-2 / TLB1601-2<br>TLA1602-1           | M12×1.5     | 100                     |
|                                | TLA2001-2 / TLB2001-2<br>TLA2002-1           | M14×1.5     | 160                     |
|                                | TLA2501-2 / TLB2501-2<br>TLA2502-1           | M16×1.5     | 250                     |
|                                | TLA4001-2 / TLB4001-2<br>TLA4002-1           | M20×2       | 500                     |

LHA-A/LHC-A/LHS-A/LHW-A/LG-A/LT-A : Quick Change Lever Option A

|                                                  | Model No.                                                             | Thread Size | Tightening Torque (N·m) |
|--------------------------------------------------|-----------------------------------------------------------------------|-------------|-------------------------|
| LHA-A<br>LHC-A<br>LHS-A<br>LHW-A<br>LG-A<br>LT-A | LG0301-A / LT0301-A                                                   | M4×0.7      | 2.5                     |
|                                                  | LHA0360-A / LHC0360-A<br>LHS0360-A<br>LG0361-A / LT0361-A             | M4×0.7      | 2.5                     |
|                                                  | LHA0400-A / LHC0400-A<br>LHS0400-A / LHW0401-A<br>LG0401-A / LT0401-A | M5×0.8      | 5.0                     |
|                                                  | LHA0480-A / LHC0480-A<br>LHS0480-A / LHW0481-A<br>LG0481-A / LT0481-A | M5×0.8      | 5.0                     |
|                                                  | LHA0550-A / LHC0550-A<br>LHS0550-A / LHW0551-A<br>LG0551-A / LT0551-A | M6×1        | 8.0                     |
|                                                  | LHA0650-A / LHC0650-A<br>LHS0650-A / LHW0651-A<br>LG0651-A / LT0651-A | M6×1        | 8.0                     |
|                                                  | LHA0750-A<br>LHS0750-A / LHW0751-A<br>LG0751-A / LT0751-A             | M8×1.25     | 20                      |
|                                                  | LHA0900-A<br>LHS0900-A<br>LG0901-A                                    | M10×1.5     | 40                      |
|                                                  | LHA1050-A<br>LHS1050-A<br>LG1051-A                                    | M10×1.5     | 45                      |

High-Power  
Series

## Pneumatic Series

## Hydraulic Series

Valve / Coupler  
Hydraulic UnitManual Operation  
Accessories

## Cautions / Others

## Hole Clamp

SFA  
SFC

## Swing Clamp

LHA  
LHC  
LHS  
LHW  
LG/LT  
TLA-2  
TLB-2  
TLA-1

## Link Clamp

LKA  
LKC  
LKW  
LJ/LM  
TMA-2  
TMA-1

## Work Support

LD  
LC  
TNC  
TCAir Sensing  
Lift Cylinder

LLW

Linear Cylinder /  
Compact CylinderLL  
LLR  
LLU  
DP  
DR  
DS  
DT

## Block Cylinder

DBA/DBC

## Centering Vise

FVA  
FVD  
FVC

## Control Valve

BZL  
BZT  
BZX/JZG  
BZS

## Pallet Clamp

VS/VT

Expansion  
Locating PinVFL/VFM  
VFJ/VFK

## Pull Stud Clamp

FP  
FQCustomized  
Spring Cylinder

DWA/DWB

## Cautions

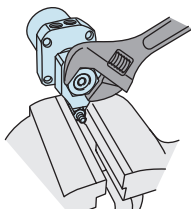
### Installation Notes

#### In case of Taper Lock Lever

If the piston rod is subjected to excessive torque or shock, the rod or the internal mechanism may be damaged. Observe the following points to prevent such shock.

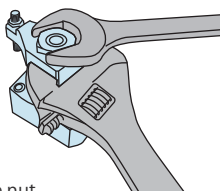
##### Installation Procedure

- ① With a clamp positioned to a jig, determine the lever position, and tighten the nut for fixing the lever (temporal tightening).



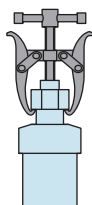
- ② Remove the clamp from the jig, fix the lever with a machine vise etc., and tighten the nut.

- ③ If tightening the nut with the clamp positioned to the jig, use a wrench to the hexagon part of piston rod, or fix the lever with a spanner. It is best to bring the lever to the middle of the swing stroke before tightening the nut.



##### Removal Procedure

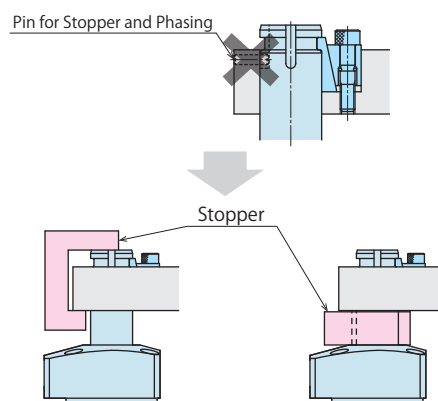
- ① While the clamp is on the jig or vise, use a hex wrench to bring the lever to the middle of the swing stroke and then loosen the nut.
- ② Loosen the nut after securing the lever two or three turns then remove the lever with a puller without any rotational torque applied on the piston rod.



#### In case of Quick Change Lever Option A

A pin for stopper and phasing (prepared by customer) is used for phasing when mounting the lever and as a stopper when removing the lever. If you are not using the pin for stopper and phasing, a stopper is required to remove the lever.

Stopper example for lever removal when not using the pin for stopper and phasing.

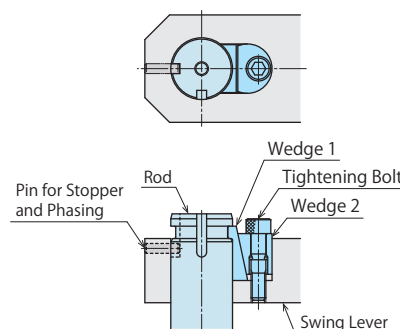


##### Installation Procedure

- ① Install in order of swing lever, wedge 1, wedge 2 to the rod.
- ② Pull the lever towards the wedge side and tighten the tightening bolt with the specified torque.

##### Removal Procedure

- ① By loosening the tightening bolt, the wedges are released and the lever can be removed.



## 4) Swing Speed Adjustment

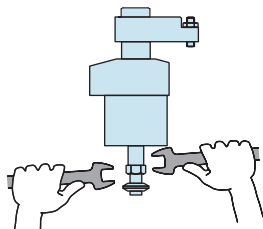
- Adjust the speed following "Allowable Swing Time Graph".  
If the clamp operates too fast the parts will be worn out leading to premature damage and ultimately complete equipment failure.
- Please make sure to release air from the circuit before adjusting speed. It will be difficult to adjust the speed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

## 5) Checking Looseness and Retightening

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

## 6) Notes on dual rod option (-D) for dog application.

- When attaching dog, set up the piston so that it will not turn around. Please secure the dog or cam and prevent any rotation or torque on the piston rod. Tightening torque of mounting screw is shown in the table below.



| Model No.   | Thread Size | Tightening Torque (N·m) |
|-------------|-------------|-------------------------|
| LHA0360-□□D | M4×0.7      | 3.2                     |
| LHA0400-□□D | M6×1        | 10                      |
| LHA0480-□□D | M8×1.25     | 25                      |
| LHA0550-□□D | M8×1.25     | 25                      |
| LHA0650-□□D | M8×1.25     | 25                      |
| LHA0750-□□D | M10×1.5     | 50                      |
| LHA0900-□□D | M10×1.5     | 50                      |
| LHA1050-□□D | M10×1.5     | 50                      |

## High-Power Series

## Pneumatic Series

## Hydraulic Series

Valve / Coupler  
Hydraulic UnitManual Operation  
Accessories

## Cautions / Others

## Hole Clamp

SFA  
SFC

## Swing Clamp

LHA  
LHC  
LHS  
LHW  
LG/LT  
TLA-2  
TLB-2  
TLA-1

## Link Clamp

LKA  
LKC  
LKW  
LJ/LM  
TMA-2  
TMA-1

## Work Support

LD  
LC  
TNC  
TCAir Sensing  
Lift Cylinder

LLW

Linear Cylinder /  
Compact CylinderLL  
LLR  
LLU  
DP  
DR  
DS  
DT

## Block Cylinder

DBA/DBC

## Centering Vise

FVA  
FVD  
FVC

## Control Valve

BZL  
BZT  
BZX/JZG  
BZS

## Pallet Clamp

VS/VT

Expansion  
Locating PinVFL/VFM  
VFJ/VFK

## Pull Stud Clamp

FP  
FQCustomized  
Spring Cylinder

DWA/DWB

※ Please refer to P.1355 for common cautions.

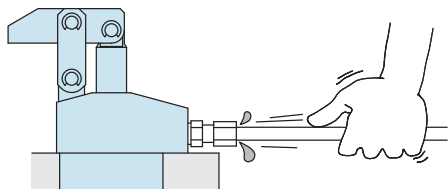
• Installation Notes • Hydraulic Fluid List • Notes on Hydraulic Cylinder Speed Control Circuit  
• Notes on Handling • Maintenance/Inspection • Warranty



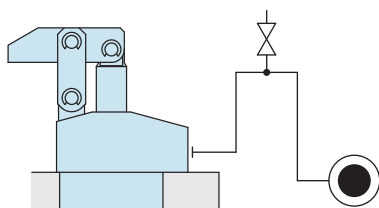
## Cautions

### ● 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.
  - Please implement piping construction in a clear environment to prevent anything getting in products.
- 4) Air Bleeding of the Hydraulic Circuit
  - If the hydraulic circuit has excessive air, the action time may become very long. If air enters the circuit after connecting the hydraulic port or under the condition of no air in the oil tank, please perform the following steps.
    - ① Reduce hydraulic pressure to less than 2MPa.
    - ② Loosen the cap nut of pipe fitting closest to the clamp by one full turn.
    - ③ Shake the pipeline to loosen the outlet of pipe fitting.  
Hydraulic fluid mixed with air comes out.



- ④ Tighten the cap nut after bleeding.
- ⑤ It is more effective to release 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 : Please contact manufacturers when customers require products in the list above.

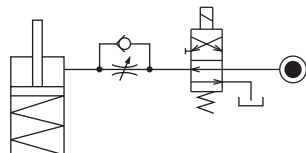
## ● Notes on Hydraulic Cylinder Speed Control Unit



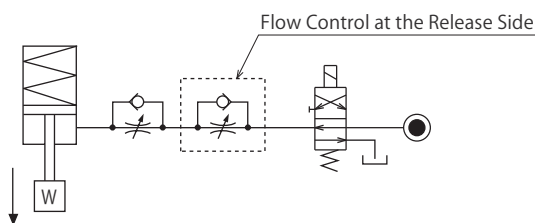
Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

### ● Flow Control Circuit for Single Acting Cylinder

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



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



### ● Flow Control Circuit for Double Acting Cylinder

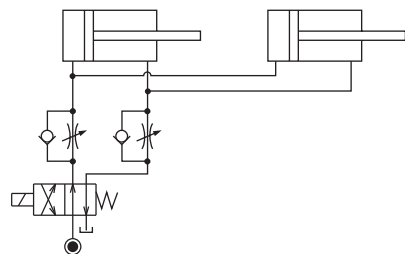
Flow control circuit for double acting cylinder should have meter-out circuits for both the lock and release sides. Meter-in control can have adverse effect by presence of air in the system.

However, in the case of controlling LKE, TMA, TLA, both lock side and release side should be meter-in circuit.

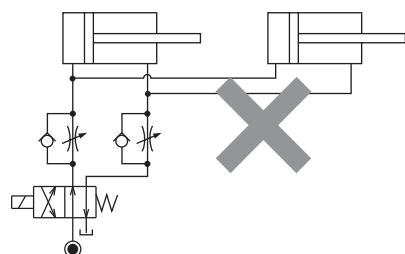
Refer to P.75 for speed adjustment of LKE.

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

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

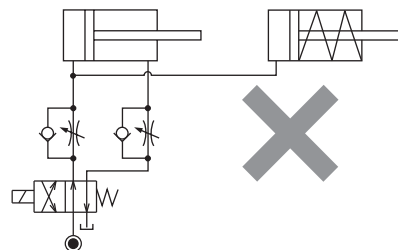


【Meter-in Circuit】 (LKE/TMA/TLA must be controlled with meter-in.)



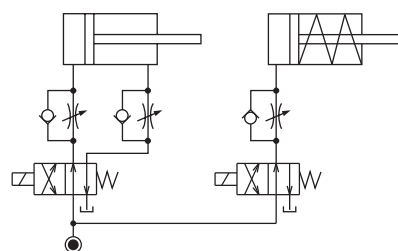
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

- 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.

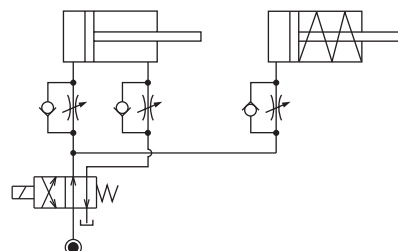


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

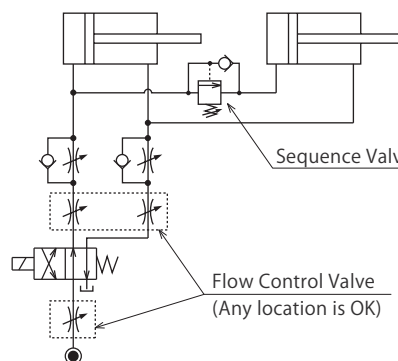
- Separate the control circuit.



- 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.



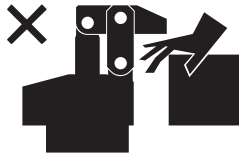
- ② In the case of meter-out circuit, the inner circuit pressure may increase during the cylinder action because of the fluid supply. The increase of the inner circuit pressure can be prevented by reducing the supplied fluid beforehand via the flow control valve. Especially when using sequence valve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

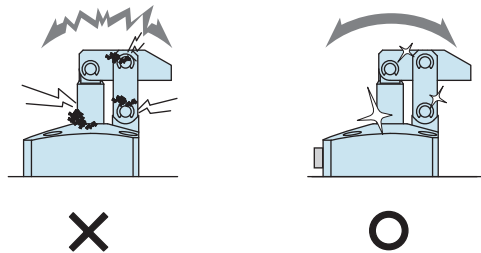
- 1) It should be operated by qualified personnel.
- The hydraulic machine and air compressor should be operated and maintained by qualified personnel.
- 2) Do not operate or remove the product unless the safety protocols are ensured.
  - ① The machine and equipment can only be inspected or prepared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



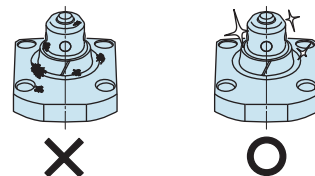
- 4) Do not disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

### ● Maintenance and Inspection

- 1) Removal of the Machine and Shut-off of Pressure Source
  - Before the machine is removed, make sure that safety devices and preventive devices are in place. Shut off the pressure and power source, and make sure no pressure exists in the air and hydraulic circuits.
  - 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 and fluid leakage.



- 3) Please clean out the reference surfaces on a regular basis (taper reference surface and seating surface) of the locating products. (VS/VT/VFL/VFM/VFJ/VFK/WVS/VWM/VWK/VX/VXE/VXF)
  - The locating products, except VX/VXE/VXF model, can remove contaminants with cleaning functions. However, hardened cutting chips, adhesive coolant and others may not be removed. Make sure there are no contaminants before installing a workpiece/pallet.
  - Continuous use with contaminant on components will lead to locating accuracy failure, malfunction and fluid leakage.



- 4) If disconnecting by couplers, air bleeding should be carried out on a regular basis to avoid air mixed in the circuit.
- 5) Regularly tighten nut, bolt, pin, cylinder, pipe line and others to ensure proper use.
- 6) Make sure the hydraulic fluid has not deteriorated.
- 7) Make sure there is a smooth action without an irregular noise.
  - Especially when it is restarted after left unused for a long period, make sure it can be operated correctly.
- 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.

**Cautions**[Installation Notes  
\(For Hydraulic Series\)](#)[Hydraulic Fluid List](#)[Notes on Hydraulic Cylinder  
Speed Control Circuit](#)[Notes on Handling](#)[Maintenance/  
Inspection](#)[Warranty](#)**Company Profile**[Company Profile](#)[Our Products](#)[History](#)**Index**[Search by](#)[Alphabetical Order](#)**Sales Offices**

## ● Warranty

### 1) Warranty Period

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

### 2) Warranty Scope

- If the product is damaged or malfunctions during the warranty period due to faulty design, materials or workmanship, we will replace or repair the defective part at our expense.

Defects or failures caused by the following are not covered.

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

Model BZS



## Directly-Attached Speed Control Valve, Air Bleed Valve, G-Thread Plug and Sequence Valve

### • Directly Attached to Clamps

Control Valves :

Speed control valve, air bleed valve, G-thread plug and sequence valve attached directly into Kosmek hydraulic clamp G-thread piping option.



Speed Control Valve

Model BZL  
Model BZT



Air Bleed Valve

Model BZX



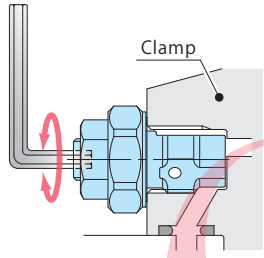
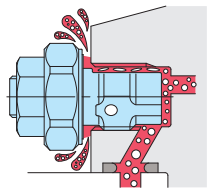
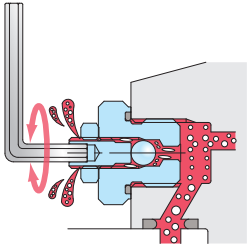
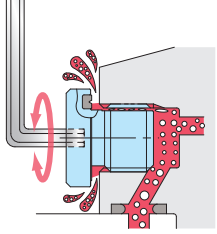
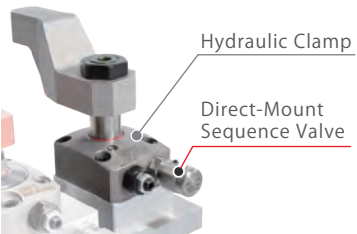
G Thread Plug

Model JZG



Direct-Mount Sequence Valve

Model BZS

|                                                                                      | Operating Pressure Range | Action Description                                                                                                                                                                                                             |
|--------------------------------------------------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Speed Control Valve</b><br>(For Low Pressure)<br><br>Model <b>BZL</b><br>→ P.949  | 7MPa or less             | Adjust the flow rate with a wrench.<br>Able to adjust the clamping speed individually.                                                       |
| <b>Speed Control Valve</b><br>(For High Pressure)<br><br>Model <b>BZT</b><br>→ P.953 | 35MPa or less            | Air bleeding in the circuit is possible by loosening the speed control valve.                                                               |
| <b>Air Bleed Valve</b><br><br>Model <b>BZX</b><br>→ P.955                            | 25MPa or less            | Air bleeding in the circuit is possible by wrench.                                                                                         |
| <b>G Thread Plug</b><br><br>Model <b>JZG</b><br>→ P.957                              | 35MPa or less            | Air bleeding in the circuit is possible by loosening the G thread plug.                                                                   |
| <b>Direct-Mount Sequence Valve</b><br><br>Model <b>BZS</b><br>→ P.959                | 7MPa or less             | Sequence Valve directly attaches to KOSMEK hydraulic clamp's G-thread piping option.<br>Controls the operating sequence of each actuator.  |

## 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  
LG/LT  
TLA-2  
TLB-2  
TLA-1

## Link Clamp

LKA  
LKC  
LKW  
LJ/LM  
TMA-2  
TMA-1

## Work Support

LD  
LC  
TNC  
TC

## Air Sensing Lift Cylinder

LLW

## Linear Cylinder / Compact Cylinder

LL  
LLR  
LLU  
DP  
DR  
DS  
DT

## Block Cylinder

DBA/DBC

## Centering Vise

FVA  
FVD  
FVC

## Control Valve

BZL  
BZT  
BZX/JZG  
BZS

## Pallet Clamp

VS/VT

## Expansion Locating Pin

VFL/VFM  
VFJ/VFK

## Pull Stud Clamp

FP  
FQ

## Customized Spring Cylinder

DWA/DWB

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

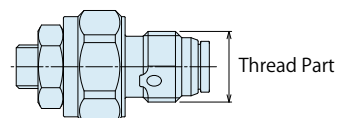
**BZL 0 10 1 - B**

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

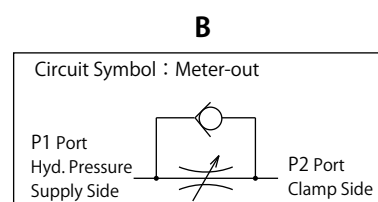
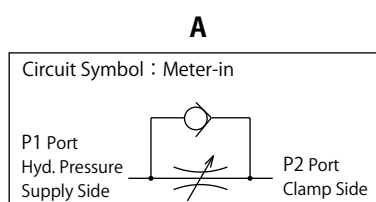


### 2 Design No.

- 1** : Revision Number

### 3 Control Method

- A** : Meter-in  
**B** : Meter-out



## Specifications

| Model No.                           | BZL0101-A                                     | BZL0201-A | BZL0301-A | BZL0101-B | BZL0201-B | BZL0301-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 <sup>2</sup>   | 2.6                                           | 5.0       | 11.6      | 2.6       | 5.0       | 10.2      |
| Usable Fluid                        | General Hydraulic Oil Equivalent to ISO-VG-32 |           |           |           |           |           |
| Operating Temperature °C            | 0 ~ 70                                        |           |           |           |           |           |
| Tightening Torque for Main Body N·m | 10                                            | 25        | 35        | 10        | 25        | 35        |
| Weight g                            | 12                                            | 26        | 48        | 12        | 26        | 48        |

- Notes : 1. 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.
2. Do not attach a 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 (Double Action)<br>Block Cylinder | DBC (Double Action)<br>Block Cylinder | FVA (Double Action)<br>Centering Vise | FVC (Double Action)<br>Centering Vise | FVD (Double Action)<br>Centering Vise | LC (Single Action)<br>Work Support                                                                          | LCW (Single Action)<br>Work Support                                |
|------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|-------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| <b>BZL0101-A</b> | (DBA0250-C□)<br>(DBA0320-C□)          | (DBC0250-C□)<br>(DBC0320-C□)          | (FVA0401)<br>(FVA0631)<br>(FVA1001)   | (FVC0630)                             | (FVD1600)<br>(FVD2500)                | LC0263-C□-□<br>LC0303-C□□-□<br>LC0363-C□□-□<br>LC0403-C□□-□<br>LC0483-C□□-□<br>LC0553-C□□-□<br>LC0653-C□□-□ | LCW0363-C□<br>LCW0403-C□<br>LCW0483-C□<br>LCW0553-C□<br>LCW0653-C□ |
| <b>BZL0101-B</b> | DBA0250-C□<br>DBA0320-C□              | DBC0250-C□<br>DBC0320-C□              | FVA0401<br>FVA0631<br>FVA1001         | FVC0630                               | FVD1600<br>FVD2500                    |                                                                                                             |                                                                    |
| <b>BZL0201-A</b> | (DBA0400-C□)<br>(DBA0500-C□)          | (DBC0400-C□)<br>(DBC0500-C□)          |                                       | (FVC1000)<br>(FVC1600)                | (FVD4000)                             | LC0753-C□□-□<br>LC0903-C□□-□                                                                                |                                                                    |
| <b>BZL0201-B</b> | DBA0400-C□<br>DBA0500-C□              | DBC0400-C□<br>DBC0500-C□              |                                       | FVC1000<br>FVC1600                    | FVD4000                               |                                                                                                             |                                                                    |

## Applicable Products

| Model No.        | LHA (Double Action)<br>Swing Clamp                                   | LHC (Double Action)<br>Swing Clamp                                   | LHD (Double Action)<br>Swing Clamp                 | LHE (Double Action)<br>High-Power Swing Clamp                                | LHS (Double Action)<br>Swing Clamp                                   | LHV (Double Action)<br>Swing Clamp                 | LHW (Double Action)<br>Swing Clamp                 | LT (Single Action)<br>Swing Clamp                                       | LG (Single Action)<br>Swing Clamp                                       |
|------------------|----------------------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------|
| <b>BZL0101-A</b> | (LHA0360-C□□□)<br>(LHA0400-C□□□)<br>(LHA0480-C□□□)<br>(LHA0550-C□□□) | (LHC0360-C□□□)<br>(LHC0400-C□□□)<br>(LHC0480-C□□□)<br>(LHC0550-C□□□) | (LHD0400-C□□□)<br>(LHD0480-C□□□)<br>(LHD0550-C□□□) | /                                                                            | (LHS0360-C□□□)<br>(LHS0400-C□□□)<br>(LHS0480-C□□□)<br>(LHS0550-C□□□) | (LHV0400-C□□□)<br>(LHV0480-C□□□)<br>(LHV0550-C□□□) | (LHW0401-C□□□)<br>(LHW0481-C□□□)<br>(LHW0551-C□□□) | LT0301-C□□□<br>LT0361-C□□□<br>LT0401-C□□□<br>LT0481-C□□□<br>LT0551-C□□□ | LG0301-C□□□<br>LG0361-C□□□<br>LG0401-C□□□<br>LG0481-C□□□<br>LG0551-C□□□ |
| <b>BZL0101-B</b> | LHA0360-C□□□<br>LHA0400-C□□□<br>LHA0480-C□□□<br>LHA0550-C□□□         | LHC0360-C□□□<br>LHC0400-C□□□<br>LHC0480-C□□□<br>LHC0550-C□□□         | LHD0400-C□□□<br>LHD0480-C□□□<br>LHD0550-C□□□       | LHE0300-C□□□<br>LHE0360-C□□□<br>LHE0400-C□□□<br>LHE0480-C□□□<br>LHE0550-C□□□ | LHS0360-C□□□<br>LHS0400-C□□□<br>LHS0480-C□□□<br>LHS0550-C□□□         | LHV0400-C□□□<br>LHV0480-C□□□<br>LHV0550-C□□□       | LHW0401-C□□□<br>LHW0481-C□□□<br>LHW0551-C□□□       | /                                                                       | /                                                                       |
| <b>BZL0201-A</b> | (LHA0650-C□□□)<br>(LHA0750-C□□□)                                     | (LHC0650-C□□□)                                                       | /                                                  | /                                                                            | (LHS0650-C□□□)<br>(LHS0750-C□□□)                                     | (LHV0650-C□□□)<br>(LHV0750-C□□□)                   | (LHW0651-C□□□)<br>(LHW0751-C□□□)                   | LT0651-C□□□<br>LT0751-C□□□                                              | LG0651-C□□□<br>LG0751-C□□□                                              |
| <b>BZL0201-B</b> | LHA0650-C□□□<br>LHA0750-C□□□                                         | LHC0650-C□□□                                                         | /                                                  | /                                                                            | LHS0650-C□□□<br>LHS0750-C□□□                                         | LHV0650-C□□□<br>LHV0750-C□□□                       | LHW0651-C□□□<br>LHW0751-C□□□                       | /                                                                       | /                                                                       |
| <b>BZL0301-A</b> | (LHA0900-C□□□)<br>(LHA1050-C□□□)                                     | /                                                                    | /                                                  | /                                                                            | (LHS0900-C□□□)<br>(LHS1050-C□□□)                                     | /                                                  | /                                                  | /                                                                       | LG0901-C□□□<br>LG1051-C□□□                                              |
| <b>BZL0301-B</b> | LHA0900-C□□□<br>LHA1050-C□□□                                         | /                                                                    | /                                                  | /                                                                            | LHS0900-C□□□<br>LHS1050-C□□□                                         | /                                                  | /                                                  | /                                                                       | /                                                                       |

| Model No.        | LGV (Single Action)<br>Swing Clamp           | LKA (Double Action)<br>Link Clamp                                    | LKC (Double Action)<br>Link Clamp                  | LKE (Double Action)<br>High-Power Link Clamp                                 | LKK (Double Action)<br>Universal Clamp                               | LKV (Double Action)<br>Link Clamp                  | LKW (Double Action)<br>Link Clamp                  | LM (Single Action)<br>Link Clamp                                        | LJ (Single Action)<br>Link Clamp                                        |
|------------------|----------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------|
| <b>BZL0101-A</b> | LGV0400-C□□□<br>LGV0480-C□□□<br>LGV0550-C□□□ | (LKA0360-C□□□)<br>(LKA0400-C□□□)<br>(LKA0480-C□□□)<br>(LKA0550-C□□□) | (LKC0400-C□□□)<br>(LKC0480-C□□□)<br>(LKC0550-C□□□) | LKE0300-C□□□<br>LKE0360-C□□□<br>LKE0400-C□□□<br>LKE0480-C□□□<br>LKE0550-C□□□ | (LKK0360-C□□□)<br>(LKK0400-C□□□)<br>(LKK0480-C□□□)<br>(LKK0550-C□□□) | (LKV0400-C□□□)<br>(LKV0480-C□□□)<br>(LKV0550-C□□□) | (LKW0401-C□□□)<br>(LKW0481-C□□□)<br>(LKW0551-C□□□) | LM0300-C□□□<br>LM0360-C□□□<br>LM0400-C□□□<br>LM0480-C□□□<br>LM0550-C□□□ | LJ0302-C□□□<br>LJ0362-C□□□<br>LJ0402-C□□□<br>LJ0482-C□□□<br>LJ0552-C□□□ |
| <b>BZL0101-B</b> | /                                            | LKA0360-C□□□<br>LKA0400-C□□□<br>LKA0480-C□□□<br>LKA0550-C□□□         | LKC0400-C□□□<br>LKC0480-C□□□<br>LKC0550-C□□□       | /                                                                            | LKK0360-C□□□<br>LKK0400-C□□□<br>LKK0480-C□□□<br>LKK0550-C□□□         | LKV0400-C□□□<br>LKV0480-C□□□<br>LKV0550-C□□□       | LKW0401-C□□□<br>LKW0481-C□□□<br>LKW0551-C□□□       | /                                                                       | /                                                                       |
| <b>BZL0201-A</b> | LGV0650-C□□□<br>LGV0750-C□□□                 | (LKA0650-C□□□)<br>(LKA0750-C□□□)                                     | (LKC0650-C□□□)                                     | /                                                                            | (LKK0650-C□□□)                                                       | (LKV0650-C□□□)<br>(LKV0750-C□□□)                   | (LKW0651-C□□□)<br>(LKW0751-C□□□)                   | LM0650-C□□□<br>LM0750-C□□□                                              | LJ0652-C□□□<br>LJ0752-C□□□                                              |
| <b>BZL0201-B</b> | /                                            | LKA0650-C□□□<br>LKA0750-C□□□                                         | LKC0650-C□□□                                       | /                                                                            | LKK0650-C□□□                                                         | LKV0650-C□□□<br>LKV0750-C□□□                       | LKW0651-C□□□<br>LKW0751-C□□□                       | /                                                                       | /                                                                       |
| <b>BZL0301-A</b> | /                                            | (LKA0900-C□□□)<br>(LKA1050-C□□□)                                     | /                                                  | /                                                                            | /                                                                    | /                                                  | /                                                  | /                                                                       | LJ0902-C□□□<br>LJ1052-C□□□                                              |
| <b>BZL0301-B</b> | /                                            | LKA0900-C□□□<br>LKA1050-C□□□                                         | /                                                  | /                                                                            | /                                                                    | /                                                  | /                                                  | /                                                                       | /                                                                       |

| Model No.        | LJV (Single Action)<br>Link Clamp            | LFW (Double Action)<br>Link Clamp | LFA (Double Action)<br>Link Clamp | LSA (Double Action)<br>Side Clamp | LSE (Double Action)<br>High-Power Side Clamp | LL (Double Action)<br>Linear Cylinder                            | LLR (Double Action)<br>Linear Cylinder                               | LLV (Double Action)<br>Lift Cylinder               | LLW (Double Action)<br>Lift Cylinder               |
|------------------|----------------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|----------------------------------------------|------------------------------------------------------------------|----------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------|
| <b>BZL0101-A</b> | LJV0400-C□□□<br>LJV0480-C□□□<br>LJV0550-C□□□ | (LFW0480-C□□□)<br>(LFW0550-C□□□)  | (LFA0480-C□□□)<br>(LFA0550-C□□□)  | (LSA0360-C□□□)                    | LSE0360-C□□□                                 | (LL0360-C□□□)<br>(LL0400-C□□□)<br>(LL0480-C□□□)<br>(LL0550-C□□□) | (LLR0360-C□□□)<br>(LLR0400-C□□□)<br>(LLR0480-C□□□)<br>(LLR0550-C□□□) | (LLV0360-C□□□)<br>(LLV0400-C□□□)<br>(LLV0480-C□□□) | (LLW0361-C□□□)<br>(LLW0401-C□□□)<br>(LLW0481-C□□□) |
| <b>BZL0101-B</b> | /                                            | LFW0480-C□□□<br>LFW0550-C□□□      | LFA0480-C□□□<br>LFA0550-C□□□      | LSA0360-C□□□                      | /                                            | LL0360-C□□□<br>LL0400-C□□□<br>LL0480-C□□□<br>LL0550-C□□□         | LLR0360-C□□□<br>LLR0400-C□□□<br>LLR0480-C□□□<br>LLR0550-C□□□         | LLV0360-C□□□<br>LLV0400-C□□□<br>LLV0480-C□□□       | LLW0361-C□□□<br>LLW0401-C□□□<br>LLW0481-C□□□       |
| <b>BZL0201-A</b> | LJV0650-C□□□<br>LJV0750-C□□□                 | (LFW0650-C□□□)<br>(LFW0750-C□□□)  | (LFA0650-C□□□)<br>(LFA0750-C□□□)  | /                                 | /                                            | (LL0650-C□□□)<br>(LL0750-C□□□)                                   | (LLR0650-C□□□)<br>(LLR0750-C□□□)                                     | /                                                  | /                                                  |
| <b>BZL0201-B</b> | /                                            | LFW0650-C□□□<br>LFW0750-C□□□      | LFA0650-C□□□<br>LFA0750-C□□□      | /                                 | /                                            | LL0650-C□□□<br>LL0750-C□□□                                       | LLR0650-C□□□<br>LLR0750-C□□□                                         | /                                                  | /                                                  |
| <b>BZL0301-A</b> | /                                            | /                                 | /                                 | /                                 | /                                            | (LL0900-C□□□)<br>(LL1050-C□□□)                                   | (LLR0900-C□□□)<br>(LLR1050-C□□□)                                     | /                                                  | /                                                  |
| <b>BZL0301-B</b> | /                                            | /                                 | /                                 | /                                 | /                                            | LL0900-C□□□<br>LL1050-C□□□                                       | LLR0900-C□□□<br>LLR1050-C□□□                                         | /                                                  | /                                                  |

Note : 1. Flow control circuit for double acting cylinder should have meter-out circuits for both the lock and release sides (except model LKE/LSE). Meter-in circuits can be adversely affected by any air in the system.

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  
LG/LT  
TLA-2  
TLB-2  
TLA-1

Link Clamp

LKA  
LKC  
LKW  
LJ/LM  
TMA-2  
TMA-1

Work Support

LD  
LC  
TNC  
TC

Air Sensing Lift Cylinder

LLW

Linear Cylinder / Compact Cylinder

LL  
LLR  
LLU  
DP  
DR  
DS  
DT

Block Cylinder

DBA/DBC

Centering Vise

FVA  
FVD  
FVC

Control Valve

BZL  
BZT  
BZX/JZG  
BZS

Pallet Clamp

VS/VT

Expansion Locating Pin

VFL/VFM  
VFJ/VFK

Pull Stud Clamp

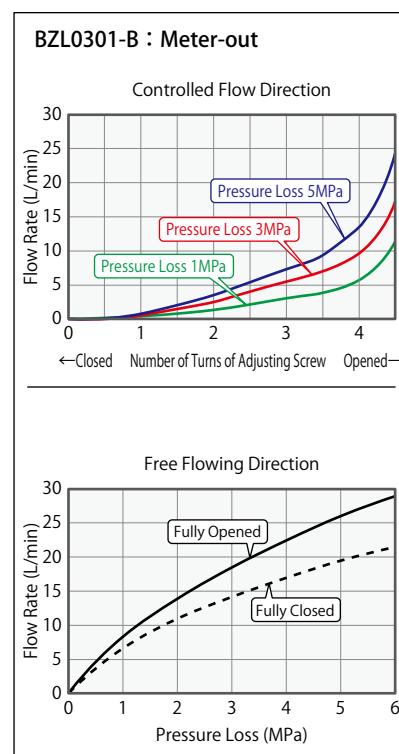
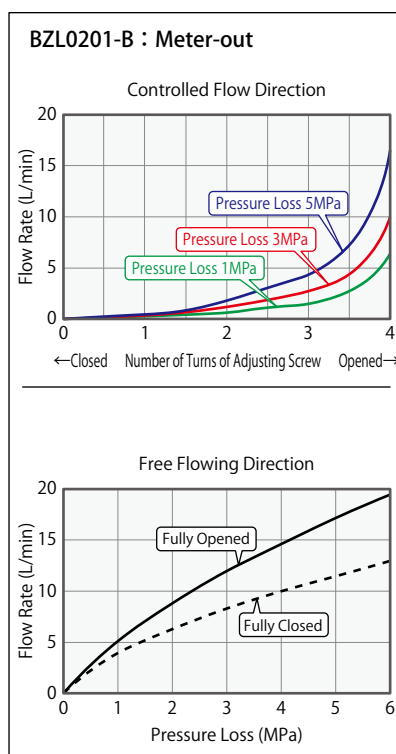
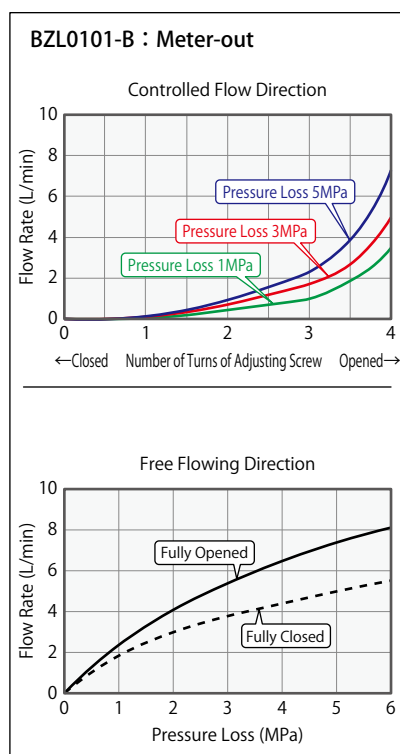
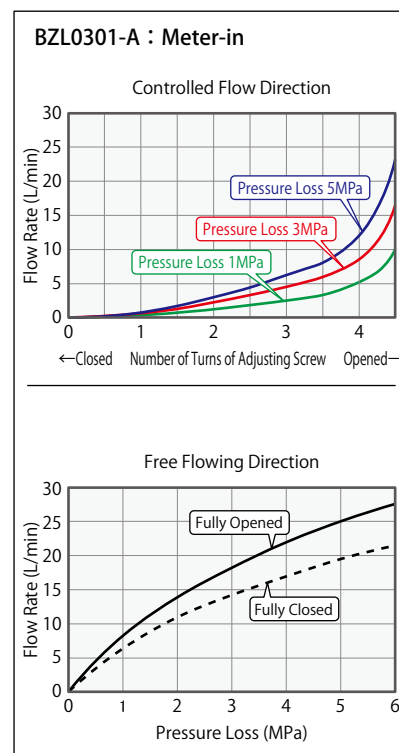
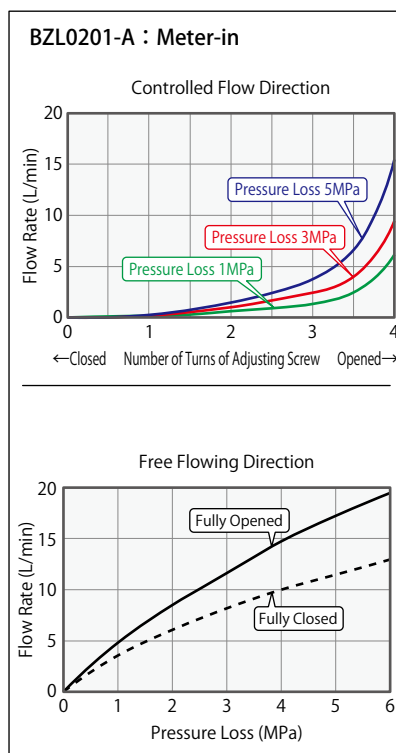
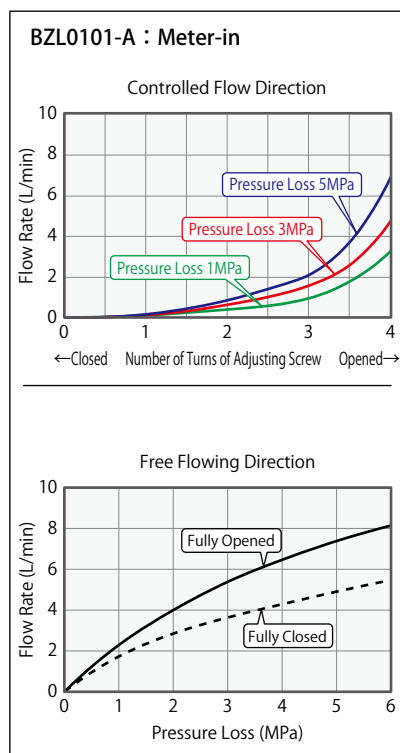
FP  
FQ

Customized Spring Cylinder

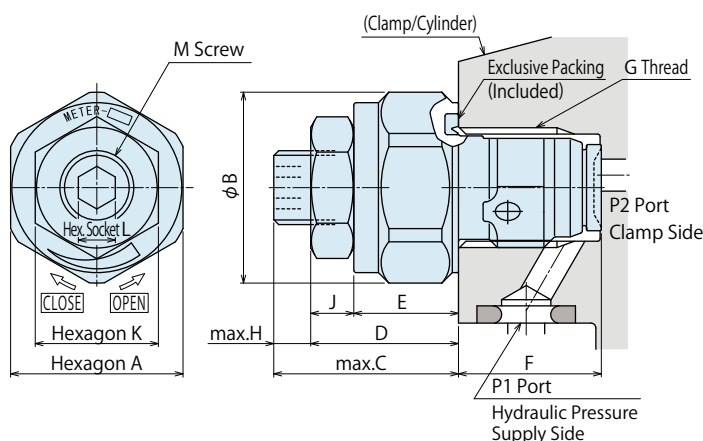
DWA/DWB



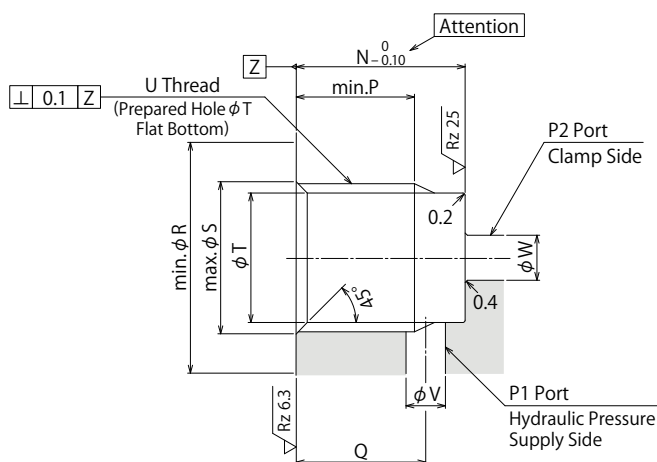
● Flow Rate Graph < Hydraulic Fluids ISO-VG32 (25~35°C) >



## External Dimensions



## Machining Dimensions of Mounting Area



### Notes :

1. Since the  $\sqrt{Rz 6.3}$  area is sealing part, be careful not to damage it.
2. Since the  $\sqrt{Rz 12.5}$  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 side 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 Unit" for proper hydraulic circuit design.  
Improper circuit design may lead to malfunctions and damages. (Refer to P.1356)
2. It is dangerous to release the air under high pressure. It must be done under lower pressure.  
(For reference : the minimum operating range of the product within the circuit.)

(mm)

| Model No.             | BZL0101-□ | BZL0201-□ | BZL0301-□ |
|-----------------------|-----------|-----------|-----------|
| 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 (Nominal×Pitch)     | 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   |

### 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  
LG/LT  
TLA-2  
TLB-2  
TLA-1

#### Link Clamp

LKA  
LKC  
LKW  
LJ/LM  
TMA-2  
TMA-1

#### Work Support

LD  
LC  
TNC  
TC

#### Air Sensing Lift Cylinder

LLW

#### Linear Cylinder / Compact Cylinder

LL  
LLR  
LLU  
DP  
DR  
DS  
DT

#### Block Cylinder

DBA/DBC

#### Centering Vise

FVA  
FVD  
FVC

#### Control Valve

BZL  
BZT  
BZX/JZG  
BZS

#### Pallet Clamp

VS/VT

#### Expansion Locating Pin

VFL/VFM  
VFJ/VFK

#### Pull Stud Clamp

FP  
FQ

#### Customized Spring Cylinder

DWA/DWB

## Model No. Indication (Air Bleed Valve)

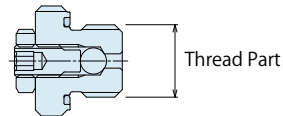
**BZX0** **1** **0**

**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.

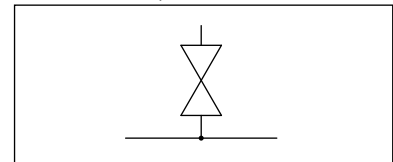
- 0** : Revision Number

## Specifications

| Model No.                           | BZX010                                        | BZX020 | BZX030 |
|-------------------------------------|-----------------------------------------------|--------|--------|
| Max. Operating Pressure MPa         | 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 °C            | 0 ~ 70                                        |        |        |
| Tightening Torque for Main Body N·m | 10                                            | 25     | 35     |
| Weight g                            | 12                                            | 23     | 36     |

- Notes :
- Do not over-loosen the plug during air venting.  
(Do not loosen further than 2 turns from the fully closed position.)
  - Air bleeding under high pressure is dangerous. It must be done under lower pressure.  
(For reference : the minimum operation pressure range of the product within the circuit)
  - Refer to the machining dimensions of BZL mounting area when installing BZX into a hydraulic circuit.

## Circuit Symbol



## Applicable Products

| Model No.     | DBA (Double Action)<br>Block Cylinder | DBC (Double Action)<br>Block Cylinder | FVA (Double Action)<br>Centering Vise | FVC (Double Action)<br>Centering Vise | FVD (Double Action)<br>Centering Vise | LC (Single Action)<br>Work Support | LCW (Single Action)<br>Work Support | TC (Single Action)<br>Work Support |
|---------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|------------------------------------|-------------------------------------|------------------------------------|
| <b>BZX010</b> | DBA0250-C□                            | DBC0250-C□                            | FVA0401                               | FVC0630                               | FVD1600                               | LC0263-C□-□                        | LCW0363-C□                          | TC0403-C□-□-□                      |
|               | DBA0320-C□                            | DBC0320-C□                            | FVA0631                               |                                       | FVD2500                               | LC0303-C□□-□                       | LCW0403-C□                          | TC0483-C□-□-□                      |
|               |                                       |                                       | FVA1001                               |                                       |                                       | LC0363-C□□-□                       | LCW0483-C□                          | TC0553-C□-□-□                      |
|               |                                       |                                       |                                       |                                       |                                       | LC0403-C□□-□                       | LCW0553-C□                          | TC0653-C□-□-□                      |
|               |                                       |                                       |                                       |                                       |                                       | LC0483-C□□-□                       | LCW0653-C□                          | TC0753-C□-□-□                      |
|               |                                       |                                       |                                       |                                       |                                       | LC0553-C□□-□                       |                                     |                                    |
|               |                                       |                                       |                                       |                                       |                                       | LC0653-C□□-□                       |                                     |                                    |
| <b>BZX020</b> | DBA0400-C□                            | DBC0400-C□                            |                                       | FVC1000                               | FVD4000                               | LC0753-C□□-□                       |                                     |                                    |
|               | DBA0500-C□                            | DBC0500-C□                            |                                       | FVC1600                               |                                       | LC0903-C□□-□                       |                                     |                                    |

## ● Applicable Products

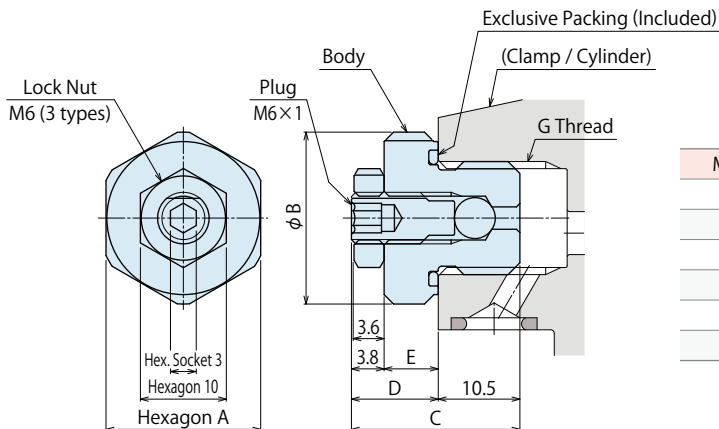
| Model No.     | LHA (Double Action)<br>Swing Clamp | LHC (Double Action)<br>Swing Clamp | LHD (Double Action)<br>Swing Clamp | LHE (Double Action)<br>High-Power Swing Clamp | LHS (Double Action)<br>Swing Clamp | LHV (Double Action)<br>Swing Clamp | LHW (Double Action)<br>Swing Clamp | LT (Single Action)<br>Swing Clamp | LG (Single Action)<br>Swing Clamp |
|---------------|------------------------------------|------------------------------------|------------------------------------|-----------------------------------------------|------------------------------------|------------------------------------|------------------------------------|-----------------------------------|-----------------------------------|
| <b>BZX010</b> | LHA0360-C□□□                       | LHC0360-C□□□                       | LHD0400-C□□□                       | LHE0300-C□                                    | LHS0360-C□□□                       | LHV0400-C□□□                       | LHW0401-C□□□                       | LT0301-C□□□                       | LG0301-C□□□                       |
|               | LHA0400-C□□□                       | LHC0400-C□□□                       | LHD0480-C□□□                       | LHE0360-C□                                    | LHS0400-C□□□                       | LHV0480-C□□□                       | LHW0481-C□□□                       | LT0361-C□□□                       | LG0361-C□□□                       |
|               | LHA0480-C□□□                       | LHC0480-C□□□                       | LHD0550-C□□□                       | LHE0400-C□                                    | LHS0480-C□□□                       | LHV0550-C□□□                       | LHW0551-C□□□                       | LT0401-C□□□                       | LG0401-C□□□                       |
|               | LHA0550-C□□□                       | LHC0550-C□□□                       |                                    | LHE0480-C□                                    | LHS0550-C□□□                       |                                    |                                    | LT0481-C□□□                       | LG0481-C□□□                       |
| <b>BZX020</b> | LHA0650-C□□□                       | LHC0650-C□□□                       |                                    |                                               | LHS0650-C□□□                       | LHV0650-C□□□                       | LHW0651-C□□□                       | LT0651-C□□□                       | LG0651-C□□□                       |
|               | LHA0750-C□□□                       |                                    |                                    |                                               | LHS0750-C□□□                       | LHV0750-C□□□                       | LHW0751-C□□□                       | LT0751-C□□□                       | LG0751-C□□□                       |
| <b>BZX030</b> | LHA0900-C□□□                       |                                    |                                    |                                               | LHS0900-C□□□                       |                                    |                                    |                                   | LG0901-C□□□                       |
|               | LHA1050-C□□□                       |                                    |                                    |                                               | LHS1050-C□□□                       |                                    |                                    |                                   | LG1051-C□□□                       |

| Model No.     | LGV (Single Action)<br>Swing Clamp |
|---------------|------------------------------------|
| <b>BZX010</b> | LGV0400-C□□                        |
|               | LGV0480-C□□                        |
|               | LGV0550-C□□                        |
| <b>BZX020</b> | LGV0650-C□□                        |
|               | LGV0750-C□□                        |
| <b>BZX030</b> |                                    |

| Model No.     | LKA (Double Action)<br>Link Clamp | LKC (Double Action)<br>Link Clamp | LKE (Double Action)<br>High-Power Link Clamp | LKK (Double Action)<br>Universal Clamp | LKV (Double Action)<br>Link Clamp | LKW (Double Action)<br>Link Clamp | LM (Single Action)<br>Link Clamp | LJ (Single Action)<br>Link Clamp | LJV (Single Action)<br>Link Clamp |
|---------------|-----------------------------------|-----------------------------------|----------------------------------------------|----------------------------------------|-----------------------------------|-----------------------------------|----------------------------------|----------------------------------|-----------------------------------|
| <b>BZX010</b> | LKA0360-C□□□                      | LKC0400-C□□□                      | LKE0300-C□                                   | LKK0360-C□□                            | LKV0400-C□□□                      | LKW0401-C□□□                      | LM0300-C□                        | LJ0302-C□                        | LJV0400-C□□□                      |
|               | LKA0400-C□□□                      | LKC0480-C□□□                      | LKE0360-C□                                   | LKK0400-C□□                            | LKV0480-C□□□                      | LKW0481-C□□□                      | LM0360-C□                        | LJ0362-C□                        | LJV0480-C□□□                      |
|               | LKA0480-C□□□                      | LKC0550-C□□□                      | LKE0400-C□                                   | LKK0480-C□□                            | LKV0550-C□□□                      | LKW0551-C□□□                      | LM0400-C□                        | LJ0402-C□                        | LJV0550-C□□□                      |
|               | LKA0550-C□□□                      |                                   | LKE0480-C□                                   | LKK0550-C□□                            |                                   |                                   | LM0480-C□                        | LJ0482-C□                        |                                   |
| <b>BZX020</b> | LKA0650-C□□□                      | LKC0650-C□□□                      |                                              | LKK0650-C□□                            | LKV0650-C□□□                      | LKW0651-C□□□                      | LM0650-C□                        | LJ0652-C□                        | LJV0650-C□□□                      |
|               | LKA0750-C□□□                      |                                   |                                              |                                        | LKV0750-C□□□                      | LKW0751-C□□□                      | LM0750-C□                        | LJ0752-C□                        | LJV0750-C□□□                      |
| <b>BZX030</b> | LKA0900-C□□□                      |                                   |                                              |                                        |                                   |                                   |                                  | LJ0902-C□                        |                                   |
|               | LKA1050-C□□□                      |                                   |                                              |                                        |                                   |                                   |                                  | LJ1052-C□                        |                                   |

| Model No.     | LFW (Double Action)<br>Link Clamp | LFA (Double Action)<br>Link Clamp | LSA (Double Action)<br>Side Clamp | LSE (Double Action)<br>High-Power Side Clamp | LL (Double Action)<br>Linear Cylinder | LLR (Double Action)<br>Linear Cylinder | LLV (Double Action)<br>Lift Cylinder | LLW (Double Action)<br>Lift Cylinder | TTA (Double Action)<br>Linear Cylinder |
|---------------|-----------------------------------|-----------------------------------|-----------------------------------|----------------------------------------------|---------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|----------------------------------------|
| <b>BZX010</b> | LFW0480-C□□                       | LFA0480-C□□                       | LSA0360-C□□                       | LSE0360-C□□                                  | LL0360-C□□□                           | LLR0360-C□□□                           | LLV0360-C□□□                         | LLW0361-C□□□                         | TTA0360-C□□□                           |
|               | LFW0550-C□□                       | LFA0550-C□□                       |                                   |                                              | LL0400-C□□□                           | LLR0400-C□□□                           | LLV0400-C□□□                         | LLW0401-C□□□                         | TTA0400-C□□□                           |
|               |                                   |                                   |                                   |                                              | LL0480-C□□□                           | LLR0480-C□□□                           | LLV0480-C□□□                         | LLW0481-C□□□                         | TTA0480-C□□□                           |
|               |                                   |                                   |                                   |                                              | LL0550-C□□□                           | LLR0550-C□□□                           |                                      |                                      | TTA0550-C□□□                           |
| <b>BZX020</b> | LFW0650-C□□                       | LFA0650-C□□                       |                                   |                                              | LL0650-C□□□                           | LLR0650-C□□□                           |                                      |                                      | TTA0650-C□□□                           |
|               | LFW0750-C□□                       | LFA0750-C□□                       |                                   |                                              | LL0750-C□□□                           | LLR0750-C□□□                           |                                      |                                      |                                        |
| <b>BZX030</b> |                                   |                                   |                                   |                                              | LL0900-C□□□                           | LLR0900-C□□□                           |                                      |                                      |                                        |
|               |                                   |                                   |                                   |                                              | LL1050-C□□□                           | LLR1050-C□□□                           |                                      |                                      |                                        |

## ● External Dimensions



| 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   |

|                                |
|--------------------------------|
| 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   |
| LG/LT |
| TLA-2 |
| TLB-2 |
| TLA-1 |

### Link Clamp

|       |
|-------|
| LKA   |
| LKC   |
| LKW   |
| LJ/LM |
| TMA-2 |
| TMA-1 |

### Work Support

|     |
|-----|
| LD  |
| LC  |
| TNC |
| TC  |

### Air Sensing Lift Cylinder

|     |
|-----|
| LLW |
|-----|

### Linear Cylinder / Compact Cylinder

|     |
|-----|
| LL  |
| LLR |
| LLU |
| DP  |
| DR  |
| DS  |
| DT  |

### Block Cylinder

|         |
|---------|
| DBA/DBC |
|---------|

### Centering Vise

|     |
|-----|
| FVA |
| FVD |
| FVC |

### Control Valve

|         |
|---------|
| BZL     |
| BZT     |
| BZX/JZG |
| BZS     |

### Pallet Clamp

|       |
|-------|
| VS/VT |
|-------|

### Expansion Locating Pin

|         |
|---------|
| VFL/VFM |
| VFJ/VFK |

### Pull Stud Clamp

|    |
|----|
| FP |
| FQ |

### Customized Spring Cylinder

|         |
|---------|
| DWA/DWB |
|---------|

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

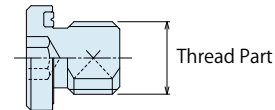
**JZG0 1 0**

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   | °C                                                   | 0 ~ 70                                        |        |        |
| Tightening Torque       | Female Thread Side Material : Steel                  | 10                                            | 25     | 35     |
| for Main Body N·m       | Female Thread Side Material : Aluminum (For LT/LM※1) | 8                                             | 20     | 28     |
| Weight                  | g                                                    | 7                                             | 15     | 23     |

Notes : 1. Air bleeding under high pressure is dangerous. It must be done under lower pressure.

(For reference : the minimum operation pressure range of the product within the circuit)

2. Refer to the machining dimensions of BZL mounting area when installing JZG into a hydraulic circuit.

※1. Body material of LT/LM is aluminum alloy, so install it with the tightening torque for aluminum.

## Applicable Products

| Model No. | LHA (Double Action)<br>Swing Clamp                           | LHC (Double Action)<br>Swing Clamp                           | LHD (Double Action)<br>Swing Clamp           | LHE (Double Action)<br>High-Power Swing Clamp                      | LHS (Double Action)<br>Swing Clamp                           | LHV (Double Action)<br>Swing Clamp           | LHW (Double Action)<br>Swing Clamp           | LT (Single Action)<br>Swing Clamp                                       | LG (Single Action)<br>Swing Clamp                                       |
|-----------|--------------------------------------------------------------|--------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------------|----------------------------------------------|----------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------|
| JZG010    | LHA0360-C□□□<br>LHA0400-C□□□<br>LHA0480-C□□□<br>LHA0550-C□□□ | LHC0360-C□□□<br>LHC0400-C□□□<br>LHC0480-C□□□<br>LHC0550-C□□□ | LHD0400-C□□□<br>LHD0480-C□□□<br>LHD0550-C□□□ | LHE0300-C□<br>LHE0360-C□<br>LHE0400-C□<br>LHE0480-C□<br>LHE0550-C□ | LHS0360-C□□□<br>LHS0400-C□□□<br>LHS0480-C□□□<br>LHS0550-C□□□ | LHV0400-C□□□<br>LHV0480-C□□□<br>LHV0550-C□□□ | LHW0401-C□□□<br>LHW0481-C□□□<br>LHW0551-C□□□ | LT0301-C□□□<br>LT0361-C□□□<br>LT0401-C□□□<br>LT0481-C□□□<br>LT0551-C□□□ | LG0301-C□□□<br>LG0361-C□□□<br>LG0401-C□□□<br>LG0481-C□□□<br>LG0551-C□□□ |
| JZG020    | LHA0650-C□□□<br>LHA0750-C□□□                                 | LHC0650-C□□□                                                 |                                              |                                                                    | LHS0650-C□□□<br>LHS0750-C□□□                                 | LHV0650-C□□□<br>LHV0750-C□□□                 | LHW0651-C□□□<br>LHW0751-C□□□                 | LT0651-C□□□<br>LT0751-C□□□                                              | LG0651-C□□□<br>LG0751-C□□□                                              |
| JZG030    | LHA0900-C□□□<br>LHA1050-C□□□                                 |                                                              |                                              |                                                                    | LHS0900-C□□□<br>LHS1050-C□□□                                 |                                              |                                              |                                                                         | LG0901-C□□□<br>LG1051-C□□□                                              |

| Model No. | LGV (Single Action)<br>Swing Clamp        | DBA (Double Action)<br>Block Cylinder | DBC (Double Action)<br>Block Cylinder | FVA (Double Action)<br>Centering Vise | FVC (Double Action)<br>Centering Vise | FVD (Double Action)<br>Centering Vise | LC (Single Action)<br>Work Support                                                                    | LCW (Single Action)<br>Work Support                                | TC (Single Action)<br>Work Support                                      |
|-----------|-------------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|-------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------------------|
| JZG010    | LGV0400-C□□<br>LGV0480-C□□<br>LGV0550-C□□ | DBA0250-C□<br>DBA0320-C□              | DBC0250-C□<br>DBC0320-C□              | FVA0401<br>FVA0631<br>FVA1001         | FVC0630                               | FVD1600<br>FVD2500                    | LC0263-C□□□<br>LC0303-C□□□<br>LC0363-C□□□<br>LC0403-C□□□<br>LC0483-C□□□<br>LC0553-C□□□<br>LC0653-C□□□ | LCW0363-C□<br>LCW0403-C□<br>LCW0483-C□<br>LCW0553-C□<br>LCW0653-C□ | TC0403-C□□□<br>TC0483-C□□□<br>TC0553-C□□□<br>TC0653-C□□□<br>TC0753-C□□□ |
| JZG020    | LGV0650-C□□<br>LGV0750-C□□                | DBA0400-C□<br>DBA0500-C□              | DBC0400-C□<br>DBC0500-C□              |                                       | FVC1000<br>FVC1600                    | FVD4000                               | LC0753-C□□□<br>LC0903-C□□□                                                                            |                                                                    |                                                                         |

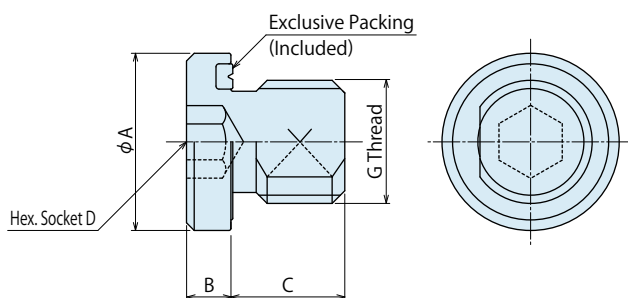
## Applicable Products

| Model No.     | LKA (Double Action)<br>Link Clamp | LKC (Double Action)<br>Link Clamp | LKE (Double Action)<br>High-Power Link Clamp | LKK (Double Action)<br>Universal Clamp | LKV (Double Action)<br>Link Clamp | LKW (Double Action)<br>Link Clamp | LM (Single Action)<br>Link Clamp | LJ (Single Action)<br>Link Clamp | LJV (Single Action)<br>Link Clamp |
|---------------|-----------------------------------|-----------------------------------|----------------------------------------------|----------------------------------------|-----------------------------------|-----------------------------------|----------------------------------|----------------------------------|-----------------------------------|
| <b>JZG010</b> | LKA0360-C□□□                      | LKC0400-C□□□                      | LKE0300-C□                                   | LKK0360-C□                             | LKV0400-C□□□                      | LKW0401-C□□□                      | LM0300-C□                        | LJ0302-C□                        | LJV0400-C□□□                      |
|               | LKA0400-C□□□                      | LKC0480-C□□□                      | LKE0360-C□                                   | LKK0400-C□                             | LKV0480-C□□□                      | LKW0481-C□□□                      | LM0360-C□                        | LJ0362-C□                        | LJV0480-C□□□                      |
|               | LKA0480-C□□□                      | LKC0550-C□□□                      | LKE0400-C□                                   | LKK0480-C□                             | LKV0550-C□□□                      | LKW0551-C□□□                      | LM0400-C□                        | LJ0402-C□                        | LJV0550-C□□□                      |
|               | LKA0550-C□□□                      |                                   | LKE0480-C□                                   | LKK0550-C□                             |                                   |                                   | LM0480-C□                        | LJ0482-C□                        |                                   |
| <b>JZG020</b> | LKA0650-C□□□                      | LKC0650-C□□□                      |                                              | LKK0650-C□                             | LKV0650-C□□□                      | LKW0651-C□□□                      | LM0650-C□                        | LJ0652-C□                        | LJV0650-C□□□                      |
|               | LKA0750-C□□□                      |                                   |                                              |                                        | LKV0750-C□□□                      | LKW0751-C□□□                      | LM0750-C□                        | LJ0752-C□                        | LJV0750-C□□□                      |
| <b>JZG030</b> | LKA0900-C□□□                      |                                   |                                              |                                        |                                   |                                   |                                  | LJ0902-C□                        |                                   |
|               | LKA1050-C□□□                      |                                   |                                              |                                        |                                   |                                   |                                  | LJ1052-C□                        |                                   |

| Model No.     | TLA-1 (Single Action)<br>Swing Clamp | TLA-2 (Double Action)<br>Swing Clamp | TLB-2 (Double Action)<br>Swing Clamp | TLV-2 (Double Action)<br>Swing Clamp | TMA-1 (Double Action)<br>Link Clamp | TMA-2 (Double Action)<br>Link Clamp | TMV-2 (Double Action)<br>Link Clamp |
|---------------|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| <b>JZG010</b> | TLA0402-1C□                          | TLA0401-2C□□                         | TLB0401-2C□□                         | TLV0800-2C□□                         | TMA0250-1C□                         | TMA0250-2C□                         | TMV0400-2C□□                        |
|               | TLA0602-1C□                          | TLA0601-2C□□                         | TLB0601-2C□□                         | TLV1000-2C□□                         | TMA0400-1C□                         | TMA0400-2C□                         | TMV0600-2C□□                        |
|               | TLA0802-1C□                          | TLA0801-2C□□                         | TLB0801-2C□□                         | TLV1600-2C□□                         | TMA0600-1C□                         | TMA0600-2C□                         | TMV1000-2C□□                        |
|               | TLA1002-1C□                          | TLA1001-2C□□                         | TLB1001-2C□□                         |                                      | TMA1000-1C□                         | TMA1000-2C□                         |                                     |
|               | TLA1602-1C□                          | TLA1601-2C□□                         | TLB1601-2C□□                         |                                      |                                     |                                     |                                     |
| <b>JZG020</b> | TLA2002-1C□                          | TLA2001-2C□□                         | TLB2001-2C□□                         | TLV2000-2C□□                         | TMA1600-1C□                         | TMA1600-2C□                         | TMV1600-2C□□                        |
|               | TLA2502-1C□                          | TLA2501-2C□□                         | TLB2501-2C□□                         |                                      | TMA2500-1C□                         | TMA2500-2C□                         |                                     |
|               | TLA4002-1C□                          | TLA4001-2C□□                         | TLB4001-2C□□                         |                                      | TMA3200-1C□                         | TMA3200-2C□                         |                                     |

| Model No.     | LFA (Double Action)<br>Link Clamp | LFW (Double Action)<br>Link Clamp | LSA (Double Action)<br>Side Clamp | LSE (Double Action)<br>High-Power Side Clamp | LL (Double Action)<br>Linear Cylinder | LLR (Double Action)<br>Linear Cylinder | LLV (Double Action)<br>Lift Cylinder | LLW (Double Action)<br>Lift Cylinder | TTA (Double Action)<br>Linear Cylinder |
|---------------|-----------------------------------|-----------------------------------|-----------------------------------|----------------------------------------------|---------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|----------------------------------------|
| <b>JZG010</b> | LFA0480-C□□                       | LFW0480-C□□                       | LSA0360-C□                        | LSE0360-C□                                   | LL0360-C□□□                           | LLR0360-C□□□□                          | LLV0360-C□□□                         | LLW0361-C□□□                         | TTA0360-C□□□                           |
|               | LFA0550-C□□                       | LFW0550-C□□                       |                                   |                                              | LL0400-C□□□                           | LLR0400-C□□□□                          | LLV0400-C□□□                         | LLW0401-C□□□                         | TTA0400-C□□□                           |
|               |                                   |                                   |                                   |                                              | LL0480-C□□□                           | LLR0480-C□□□□                          | LLV0480-C□□□                         | LLW0481-C□□□                         | TTA0480-C□□□                           |
|               |                                   |                                   |                                   |                                              | LL0550-C□□□                           | LLR0550-C□□□□                          |                                      |                                      | TTA0550-C□□□                           |
| <b>JZG020</b> | LFA0650-C□□                       | LFW0650-C□□                       |                                   |                                              | LL0650-C□□□                           | LLR0650-C□□□□                          |                                      |                                      | TTA0650-C□□□                           |
|               | LFA0750-C□□                       | LFW0750-C□□                       |                                   |                                              | LL0750-C□□□                           | LLR0750-C□□□□                          |                                      |                                      |                                        |
| <b>JZG030</b> |                                   |                                   |                                   |                                              | LL0900-C□□□                           | LLR0900-C□□□□                          |                                      |                                      |                                        |
|               |                                   |                                   |                                   |                                              | LL1050-C□□□                           | LLR1050-C□□□□                          |                                      |                                      |                                        |

## External Dimensions



| Model No. | (mm)          |               |               |
|-----------|---------------|---------------|---------------|
|           | <b>JZG010</b> | <b>JZG020</b> | <b>JZG030</b> |
| 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         |

### 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  
LG/LT  
TLA-2  
TLB-2  
TLA-1

### Link Clamp

LKA  
LKC  
LKW  
LJ/LM  
TMA-2  
TMA-1

### Work Support

LD  
LC  
TNC  
TC

### Air Sensing Lift Cylinder

LLW

### Linear Cylinder / Compact Cylinder

LL  
LLR  
LLU  
DP  
DR  
DS  
DT

### Block Cylinder

DBA/DBC

### Centering Vise

FVA  
FVD  
FVC

### Control Valve

BZL  
BZT  
**BZX/JZG**  
BZS

### Pallet Clamp

VS/VT

### Expansion Locating Pin

VFL/VFM  
VFJ/VFK

### Pull Stud Clamp

FP  
FQ

### Customized Spring Cylinder

DWA/DWB

PAT.P.

# Direct-Mount Sequence Valve

Model BZS

Attaches directly into Kosmek hydraulic clamps G-thread piping option.  
Easily and securely controls the operating sequence of actuators.



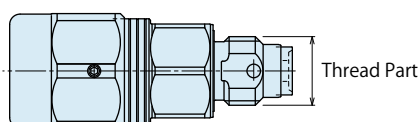
## Model No. Indication

**BZS 0 10 0**

1
2

### 1 G Thread Size

- 10** : G1/8A Thread
- 20** : G1/4A Thread
- 30** : G3/8A Thread



### 2 Design No.

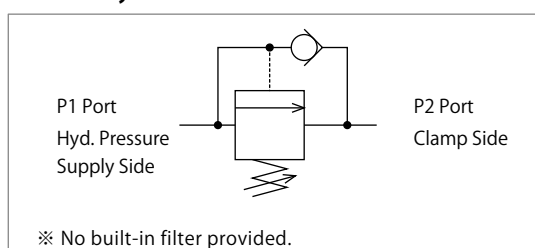
- 0** : Revision Number

## Specifications

| Model No.                                        |         | BZS0100                                       | BZS0200 | BZS0300 |
|--------------------------------------------------|---------|-----------------------------------------------|---------|---------|
| Sequence Operating Pressure Adjustable Range MPa |         | 1.0 ~ 6.0                                     |         |         |
| Operating Pressure Range MPa                     |         | 2.0 ~ 7.0                                     |         |         |
| Withstanding Pressure MPa                        |         | 10.5                                          |         |         |
| G Thread Size                                    |         | G1/8A                                         | G1/4A   | G3/8A   |
| Cracking Pressure MPa                            |         | 0.03                                          |         |         |
| Adjusting Screw Turn Ratio:Reference MPa/Rev     |         | 1.5                                           | 1.3     | 1.1     |
| Min. Passage Area<br>mm <sup>2</sup>             | P1 → P2 | 2.0                                           | 5.7     | 8.5     |
|                                                  | P2 → P1 | 2.0                                           | 5.0     | 8.2     |
| Usable Fluid                                     |         | General Hydraulic Oil Equivalent to ISO-VG-32 |         |         |
| Operating Temperature °C                         |         | 0 ~ 70                                        |         |         |
| Tightening Torque N・m                            |         | 10                                            | 25      | 35      |
| Weight g                                         |         | 35                                            | 82      | 155     |

- Notes:
- Please mount to an actuator using Hex. E shown in External Dimensions on P.961A with the tightening torque shown in the list above. Insufficient or excessive tightening torque leads to malfunction.
  - Do not attach a used BZS to other clamps.  
Sequence movement may not be done because the bottom depth difference of G thread makes metal sealing insufficient.
  - The difference between the set pressure and the supplying pressure should be 1MPa or more.
  - For using multiple sequence valves to operate cylinders in sequence, the difference of each set pressure should be 1MPa or more.
  - Depending on circuit system (actuator capacity, hydraulic pipe diameter, passage length, etc.), sometimes it is necessary to reduce hydraulic flow rate to achieve proper sequence movement. Make sure you are able to control flow rate.  
(Since BZS is directly mounted on and used exclusively for one actuator, it is easily affected by hydraulic flow rate.)
  - Filter is not built in this product. Please note that contaminants such as cutting chips and sealing tapes entering into the product cause malfunction. Also when internal parts are damaged, it will not operate properly even after removing contaminants.

## Circuit Symbol



### What is a Sequence Valve?

The sequence valve controls the clamping and positioning sequence of multiple actuators.

When the incoming side pressure (P1 port) reaches the sequence setting pressure value, the pressure will be supplied to the outgoing side (P2 port). Refer to P.961B for the action description.

## Applicable Products

| Model No.      | DBA (Double Action)<br>Block Cylinder | DBC (Double Action)<br>Block Cylinder | FVA (Double Action)<br>Centering Vise | FVC (Double Action)<br>Centering Vise | FVD (Double Action)<br>Centering Vise | LHA (Double Action)<br>Swing Clamp                           | LHC (Double Action)<br>Swing Clamp                           | LHD (Double Action)<br>Swing Clamp           | LHE (Double Action)<br>High-Power Swing Clamp                      |
|----------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------|
| <b>BZS0100</b> | DBA0250-C□<br>DBA0320-C□              | DBC0250-C□<br>DBC0320-C□              | FVA0401<br>FVA0631<br>FVA1001         | FVC0630                               | FVD1600<br>FVD2500                    | LHA0360-C□□□<br>LHA0400-C□□□<br>LHA0480-C□□□<br>LHA0550-C□□□ | LHC0360-C□□□<br>LHC0400-C□□□<br>LHC0480-C□□□<br>LHC0550-C□□□ | LHD0400-C□□□<br>LHD0480-C□□□<br>LHD0550-C□□□ | LHE0300-C□<br>LHE0360-C□<br>LHE0400-C□<br>LHE0480-C□<br>LHE0550-C□ |
| <b>BZS0200</b> | DBA0400-C□<br>DBA0500-C□              | DBC0400-C□<br>DBC0500-C□              |                                       | FVC1000<br>FVC1600※1                  | FVD4000                               | LHA0650-C□□□<br>LHA0750-C□□□                                 | LHC0650-C□□□                                                 |                                              |                                                                    |
| <b>BZS0300</b> |                                       |                                       |                                       |                                       |                                       | LHA0900-C□□□<br>LHA1050-C□□□                                 |                                                              |                                              |                                                                    |

| Model No.      | LHS (Double Action)<br>Swing Clamp                           | LHV (Double Action)<br>Swing Clamp           | LHW (Double Action)<br>Swing Clamp           | LT (Single Action)<br>Swing Clamp                                       | LG (Single Action)<br>Swing Clamp                                       | LGV (Single Action)<br>Swing Clamp           | LKA (Double Action)<br>Link Clamp                            | LKC (Double Action)<br>Link Clamp            | LKE (Double Action)<br>High-Power Link Clamp                       |
|----------------|--------------------------------------------------------------|----------------------------------------------|----------------------------------------------|-------------------------------------------------------------------------|-------------------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------|
| <b>BZS0100</b> | LHS0360-C□□□<br>LHS0400-C□□□<br>LHS0480-C□□□<br>LHS0550-C□□□ | LHV0400-C□□□<br>LHV0480-C□□□<br>LHV0550-C□□□ | LHW0401-C□□□<br>LHW0481-C□□□<br>LHW0551-C□□□ | LT0301-C□□□<br>LT0361-C□□□<br>LT0401-C□□□<br>LT0481-C□□□<br>LT0551-C□□□ | LG0301-C□□□<br>LG0361-C□□□<br>LG0401-C□□□<br>LG0481-C□□□<br>LG0551-C□□□ | LGV0400-C□□□<br>LGV0480-C□□□<br>LGV0550-C□□□ | LKA0360-C□□□<br>LKA0400-C□□□<br>LKA0480-C□□□<br>LKA0550-C□□□ | LKC0400-C□□□<br>LKC0480-C□□□<br>LKC0550-C□□□ | LKE0300-C□<br>LKE0360-C□<br>LKE0400-C□<br>LKE0480-C□<br>LKE0550-C□ |
| <b>BZS0200</b> | LHS0650-C□□□<br>LHS0750-C□□□                                 | LHV0650-C□□□<br>LHV0750-C□□□                 | LHW0651-C□□□<br>LHW0751-C□□□                 | LT0651-C□□□<br>LT0751-C□□□                                              | LG0651-C□□□<br>LG0751-C□□□                                              | LGV0650-C□□□<br>LGV0750-C□□□                 | LKA0650-C□□□<br>LKA0750-C□□□                                 | LKC0650-C□□□                                 |                                                                    |
| <b>BZS0300</b> | LHS0900-C□□□<br>LHS1050-C□□□                                 |                                              |                                              |                                                                         | LG0901-C□□□<br>LG1051-C□□□                                              |                                              | LKA0900-C□□□<br>LKA1050-C□□□                                 |                                              |                                                                    |

| Model No.      | LKK (Double Action)<br>Universal Clamp               | LKV (Double Action)<br>Link Clamp            | LKW (Double Action)<br>Link Clamp            | LM (Single Action)<br>Link Clamp                              | LJ (Single Action)<br>Link Clamp                              | LJV (Single Action)<br>Link Clamp            |
|----------------|------------------------------------------------------|----------------------------------------------|----------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------|
| <b>BZS0100</b> | LKK0360-C□<br>LKK0400-C□<br>LKK0480-C□<br>LKK0550-C□ | LKV0400-C□□□<br>LKV0480-C□□□<br>LKV0550-C□□□ | LKW0401-C□□□<br>LKW0481-C□□□<br>LKW0551-C□□□ | LM0300-C□<br>LM0360-C□<br>LM0400-C□<br>LM0480-C□<br>LM0550-C□ | LJ0302-C□<br>LJ0362-C□<br>LJ0402-C□<br>LJ0482-C□<br>LJ0552-C□ | LJV0400-C□□□<br>LJV0480-C□□□<br>LJV0550-C□□□ |
| <b>BZS0200</b> | LKK0650-C□                                           | LKV0650-C□□□<br>LKV0750-C□□□                 | LKW0651-C□□□<br>LKW0751-C□□□                 | LM0650-C□<br>LM0750-C□                                        | LJ0652-C□<br>LJ0752-C□                                        | LJV0650-C□□□<br>LJV0750-C□□□                 |
| <b>BZS0300</b> |                                                      |                                              |                                              |                                                               | LJ0902-C□<br>LJ1052-C□                                        |                                              |

| Model No.      | LFW (Double Action)<br>Link Clamp | LFA (Double Action)<br>Link Clamp | LSA (Double Action)<br>Side Clamp | LSE (Double Action)<br>High-Power Side Clamp | LL (Double Action)<br>Linear Cylinder                    | LLR (Double Action)<br>Linear Cylinder                       | LLV (Double Action)<br>Lift Cylinder         | LLW (Double Action)<br>Lift Cylinder         |
|----------------|-----------------------------------|-----------------------------------|-----------------------------------|----------------------------------------------|----------------------------------------------------------|--------------------------------------------------------------|----------------------------------------------|----------------------------------------------|
| <b>BZS0100</b> | LFW0480-C□□<br>LFW0550-C□□        | LFA0480-C□□<br>LFA0550-C□□        | LSA0360-C□                        | LSE0360-C□                                   | LL0360-C□□□<br>LL0400-C□□□<br>LL0480-C□□□<br>LL0550-C□□□ | LLR0360-C□□□<br>LLR0400-C□□□<br>LLR0480-C□□□<br>LLR0550-C□□□ | LLV0360-C□□□<br>LLV0400-C□□□<br>LLV0480-C□□□ | LLW0361-C□□□<br>LLW0401-C□□□<br>LLW0481-C□□□ |
| <b>BZS0200</b> | LFW0650-C□□<br>LFW0750-C□□        | LFA0650-C□□<br>LFA0750-C□□        |                                   |                                              | LL0650-C□□□<br>LL0750-C□□□                               | LLR0650-C□□□<br>LLR0750-C□□□                                 |                                              |                                              |
| <b>BZS0300</b> |                                   |                                   |                                   |                                              | LL0900-C□□□<br>LL1050-C□□□                               | LLR0900-C□□□<br>LLR1050-C□□□                                 |                                              |                                              |

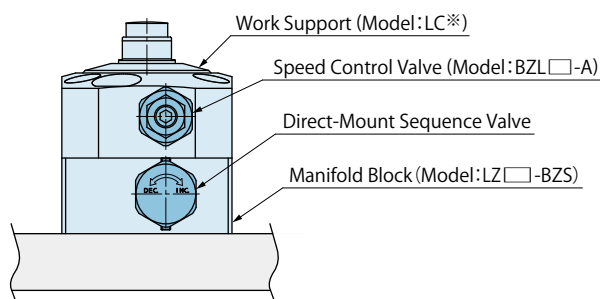
Note : ※1. It is not possible to install two BZS valves to FVC1000.

### [In case of Work Support]

For using Direct-Mount Sequence Valve for Work Support (Model: LC※), mount Speed Control Valve (Model: BZL □□ -A) on Work Support and mount Direct-Mount Sequence Valve on the Manifold Block as shown in the drawing below.

Please refer to P.962A for Manifold Block (Model: LZ □□ -BZS).

※Please contact us when considering the installation to model LCW.



|                                |
|--------------------------------|
| 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   |
| LG/LT |
| TLA-2 |
| TLB-2 |
| TLA-1 |

#### Link Clamp

|       |
|-------|
| LKA   |
| LKC   |
| LKW   |
| LJ/LM |
| TMA-2 |
| TMA-1 |

#### Work Support

|     |
|-----|
| LD  |
| LC  |
| TNC |
| TC  |

#### Air Sensing Lift Cylinder

|     |
|-----|
| LLW |
|-----|

#### Linear Cylinder / Compact Cylinder

|     |
|-----|
| LL  |
| LLR |
| LLU |
| DP  |
| DR  |
| DS  |
| DT  |

#### Block Cylinder

|         |
|---------|
| DBA/DBC |
|---------|

#### Centering Vise

|     |
|-----|
| FVA |
| FVD |
| FVC |

#### Control Valve

|         |
|---------|
| BZL     |
| BZT     |
| BZX/JZG |
| BZS     |

#### Pallet Clamp

|       |
|-------|
| VS/VT |
|-------|

#### Expansion Locating Pin

|         |
|---------|
| VFL/VFM |
| VFJ/VFK |

#### Pull Stud Clamp

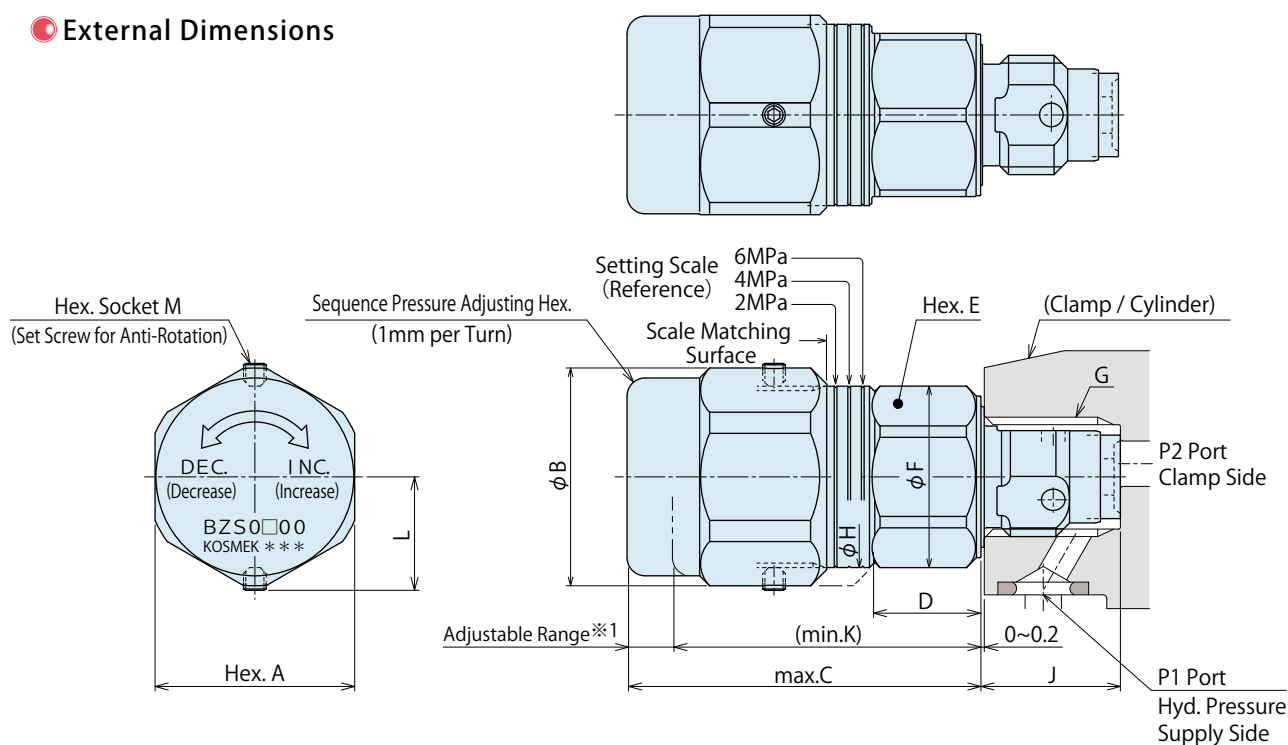
|    |
|----|
| FP |
| FQ |

#### Customized Spring Cylinder

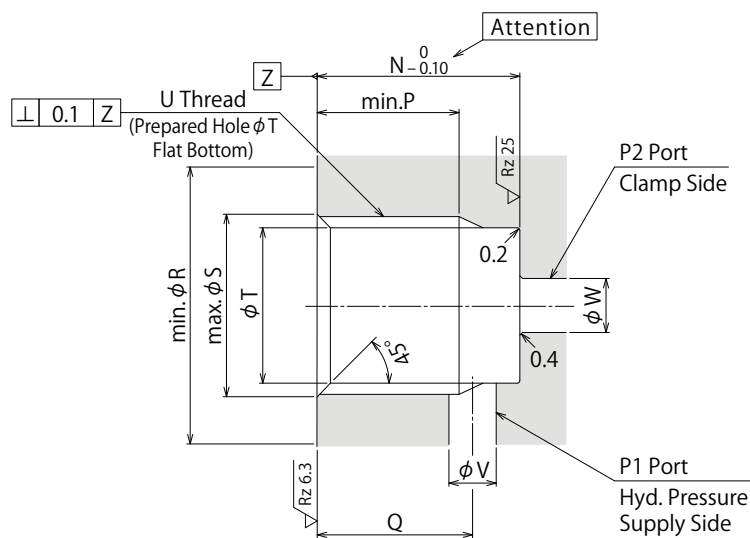
|         |
|---------|
| DWA/DWB |
|---------|



## External Dimensions



## Machining Dimensions of Mounting Area



(mm)

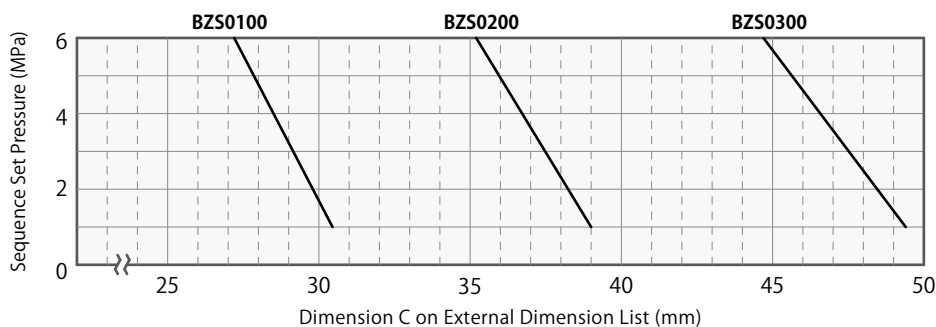
| Model No.             | BZS0100 | BZS0200 | BZS0300 |
|-----------------------|---------|---------|---------|
| A                     | 16      | 22      | 27      |
| B                     | 17.5    | 24      | 29.5    |
| C                     | 30.5    | 39      | 49.5    |
| D                     | 7.5     | 12      | 15      |
| E                     | 14      | 18      | 22      |
| F                     | 15.5    | 20      | 24      |
| G                     | G1/8    | G1/4    | G3/8    |
| H                     | 13.8    | 20      | 24      |
| J ※2                  | (11.6)  | (15.1)  | (17.6)  |
| K                     | (26.5)  | (34)    | (44)    |
| L                     | 9.5     | 12.5    | 15      |
| M                     | 1.3     | 1.3     | 1.5     |
| N                     | 11.5    | 15      | 17.5    |
| P                     | 8.5     | 11※3    | 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:

- Since the  $\sqrt{Rz 6.3}$  area is sealing part, be careful not to damage it.
  - Since the  $\sqrt{Rz 12.5}$  area is the metal sealing part at the edge of BZS, be careful not to damage it (especially when deburring).
  - No cutting chips or burr should be at the tolerance part of machining hole.
  - As shown in the drawing, P1 port is used as the hydraulic supply and P2 port as the clamp side.
- ※1. Use the sequence pressure adjusting hex. within the adjustable range of ※2 (the dimensions K~C in the above).  
Please note that if it is loosened further than max. C, pressure adjusting hex. part and internal spring will come off.
- ※2. Dimension when mounted. (+0.5mm before mounted.)
- ※3. If mounting plugs or fittings with G thread specification available in the market, the dimension '※3' should be 12.5.

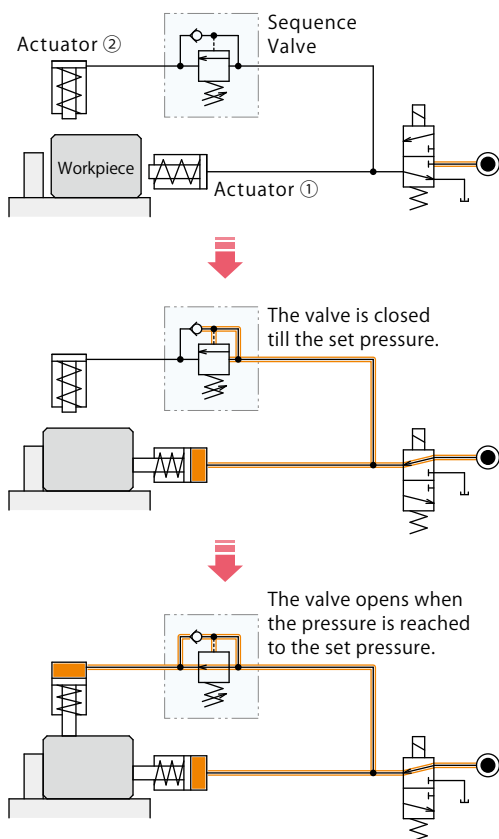
## Cautions

1. Please design hydraulic circuit properly. Improper circuit design may lead to malfunctions and damages.
2. Filter is not built in this product. Be aware that contaminants such as cutting chips and sealing tapes entering into the product cause malfunction. Also when internal parts are damaged, it will not operate properly even after removing contaminants.
3. Depending on circuit system (actuator capacity, hydraulic pipe diameter, passage length, etc.), sometimes it is necessary to reduce hydraulic flow rate to achieve proper sequence movement. Make sure you are able to control flow rate.  
(Since BZS is directly mounted on and used exclusively for one actuator, it is easily affected by hydraulic flow rate.)
4. The difference between the set pressure and the supplying pressure should be 1MPa or more.
5. For using multiple sequence valves to operate cylinders in sequence, the difference of each set pressure should be 1MPa or more.
6. For using multiple sequence valves to operate cylinders simultaneously, adjust them gradually by checking their actions.
7. Please keep in mind that the minimum passage area of each actuator will be decreased by mounting this product and thus operating time may become longer.
8. Please mount to an actuator using Hex. E shown in External Dimensions on P.961 with the tightening torque shown in the specification list on P.959. Insufficient or excessive tightening torque leads to malfunction.
9. Air bleeding is required as air mixed in the circuit causes malfunction.
10. At shipment, sequence pressure is not adjusted. Please adjust it by referring to the graph below. Install a pressure gauge on the circuit to check pressure as necessary. After adjustment, tighten one or more set screw for anti-rotation. (Tightening torque: 0.2N·m)



(This graph is a reference, and the values will not be guaranteed.)

## Action Description



| Operating Procedure            |                                                            | Note                                                                                                          |
|--------------------------------|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Locking                        | Hydraulic pressure is ON.                                  |                                                                                                               |
|                                | Actuator ① is activated.                                   |                                                                                                               |
|                                | Pressure increases to the sequence operation set pressure. | The difference between the operating pressure and the sequence operation set pressure should be 1MPa or more. |
|                                | The sequence valve circuit opens.                          |                                                                                                               |
|                                | Actuator ② is activated.                                   |                                                                                                               |
| Releasing                      | Locking action is completed.                               |                                                                                                               |
|                                | Machining, etc.                                            |                                                                                                               |
|                                | Hydraulic pressure is OFF.                                 |                                                                                                               |
|                                | The actuators ① and ② are released almost simultaneously.  | The check valve in the sequence valve opens when the incoming side pressure decreases.                        |
| Releasing action is completed. |                                                            |                                                                                                               |

### 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  
LG/LT  
TLA-2  
TLB-2  
TLA-1

#### Link Clamp

LKA  
LKC  
LKW  
LJ/LM  
TMA-2  
TMA-1

#### Work Support

LD  
LC  
TNC  
TC

#### Air Sensing Lift Cylinder

LLW

#### Linear Cylinder / Compact Cylinder

LL  
LLR  
LLU  
DP  
DR  
DS  
DT

#### Block Cylinder

DBA/DBC

#### Centering Vise

FVA  
FVD  
FVC

#### Control Valve

BZL  
BZT  
BZX/JZG  
BZS

#### Pallet Clamp

VS/VT

#### Expansion Locating Pin

VFL/VFM  
VFJ/VFK

#### Pull Stud Clamp

FP  
FQ

#### Customized Spring Cylinder

DWA/DWB

# Manifold Block

Model WHZ-MD

Model LZY-MD

Model LZ-MS

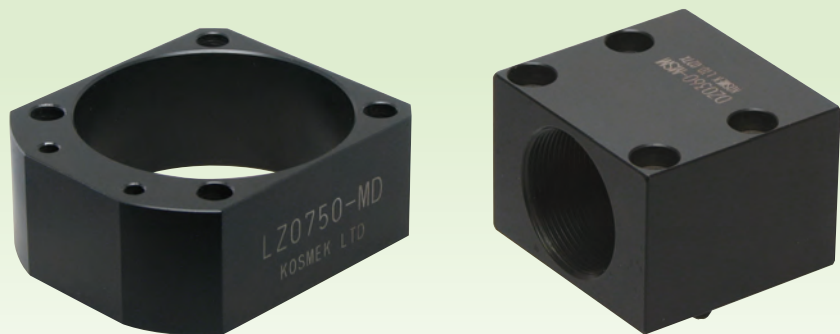
Model LZ-MP

Model TMZ-1MB

Model TMZ-2MB

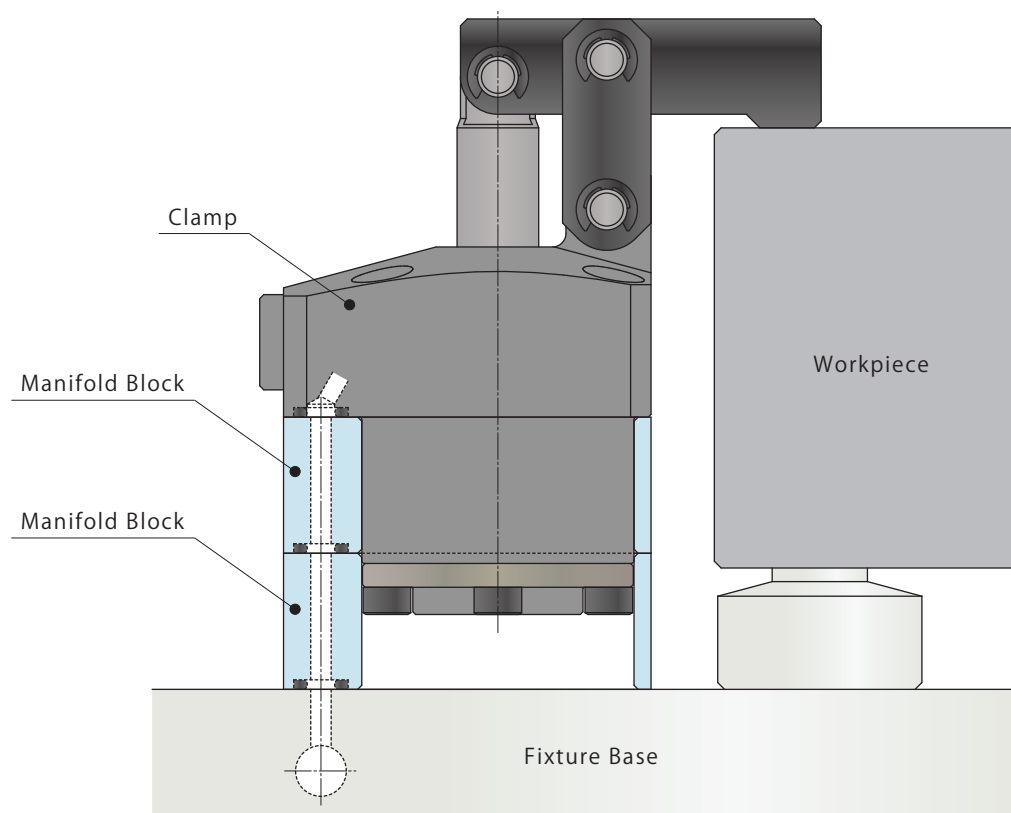
Model DZ-MG ☐

Model DZ-MS ☐



## ● Manifold Block

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

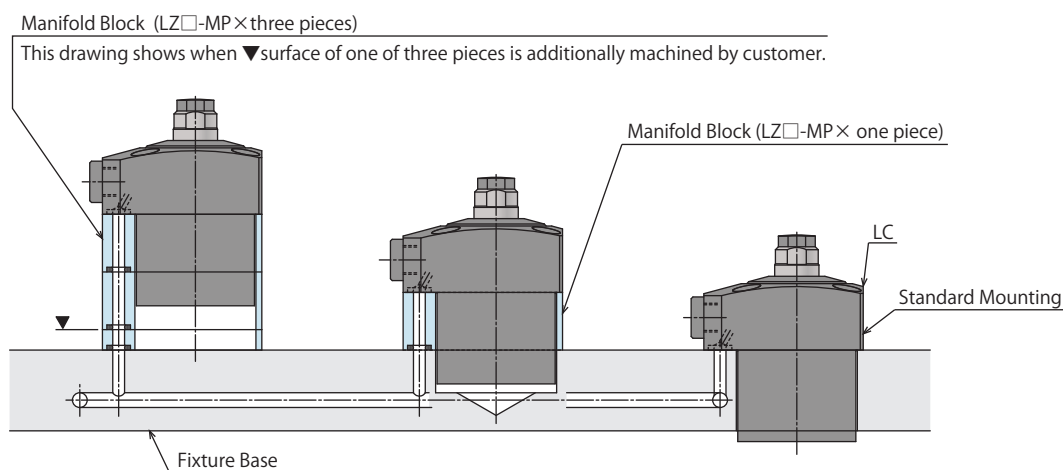


## Applicable Model

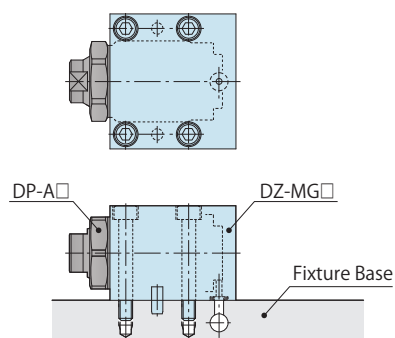
| Manifold Block Model No. | Corresponding Item Model No. |                        |                        |                       |
|--------------------------|------------------------------|------------------------|------------------------|-----------------------|
| Model WHZ-MD             | Model WCA<br>Model WCE       | Model WHA<br>Model WHE |                        |                       |
| Model LZY-MD             | Model LKA<br>Model LKC       | Model LKE<br>Model LHA | Model LHC<br>Model LHE | Model LHS<br>Model LL |
| Model LZ-MS              | Model LJ<br>Model LM         | Model LG<br>Model LT   |                        |                       |
| 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



High-Power Series

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others

Screw Locator

VXF/VXE

Manual Expansion Locating Pin

VX

Manifold Block

WHZ-MD

LZY-MD

LZ-MS

LZ-MP

TMZ-1MB

TMZ-2MB

DZ-M

Manifold Block / Nut

DZ-R

DZ-C

DZ-P

DZ-B

LZ-S

LZ-SQ

WNZ-SQ

TNZ-S

TNZ-SQ

Pressure Switch

JBA

Pressure Gauge

JGA/JGB

Manifold

JX

Coupler Switch

PS

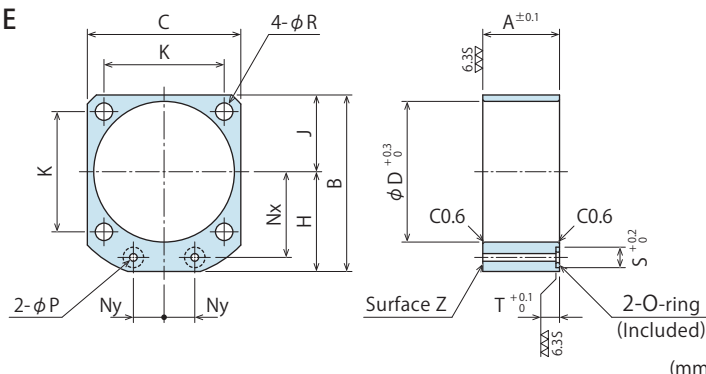
G-Thread Fitting

# Manifold Block for WCA/WCE/WHA/WHE

Model No. Indication

**WHZ 048 0 - MD**

Size  
(Refer to  
following table)

Design No.  
(Revision Number)


(mm)

| Model No.               | WHZ0600-MD         | WHZ0320-MD         | WHZ0400-MD         | WHZ0500-MD         | WHZ0630-MD         |
|-------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Corresponding Model No. | WCE0602<br>WHE0600 | WCA0321<br>WHA0320 | WCE1002<br>WHE1000 | WCA0401<br>WHA0400 | WCE1602<br>WHE1600 |
| 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                 |
| P                       | 3                  | 5                  | 5                  | 5                  | 5                  |
| R                       | 5.5                | 5.5                | 5.5                | 6.5                | 6.5                |
| S                       | 8                  | 10                 | 10                 | 10                 | 10                 |
| T                       | 1.4                | 1.4                | 1.4                | 1.4                | 1.4                |
| O-ring                  | 1BP5               | 1BP7               | 1BP7               | 1BP7               | 1BP7               |
| Weight kg               | 0.1                | 0.1                | 0.1                | 0.2                | 0.2                |

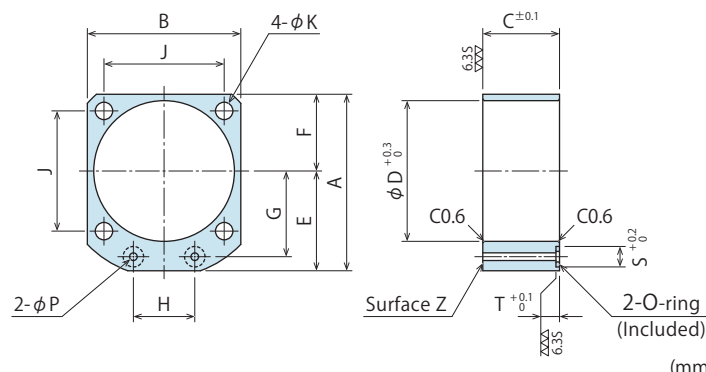
- Notes: 1. Material: A2017BE-T4 Surface Finishing: Zircon Finishing (Zirconium Chemical Conversion Treatment)  
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension A as a reference.  
3. For other block thickness (dim. A), machine the surface Z or design a block referring to the drawing and apply surface treatment if necessary.

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

Model No. Indication

**LZY 048 0 - MD**

Size  
(Refer to  
following table)

Design No.  
(Revision Number)


(mm)

| Model No.               | LZY0360-MD                                                            | LZY0400-MD                                                                      | LZY0480-MD                                                                      | LZY0550-MD                                                                      | LZY0650-MD                                                  | LZY0750-MD                              | LZY0900-MD                              | LZY1050-MD                               |
|-------------------------|-----------------------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------|-----------------------------------------|------------------------------------------|
| Corresponding Model No. | LKA0360 / LKE0360<br>LHA0360 / LHC0360<br>LHE0360 / LHS0360<br>LLO360 | LKA0400 / LKC0400<br>LKE0400 / LHA0400<br>LHC0400 / LHE0400<br>LHS0400 / LLO400 | LKA0480 / LKC0480<br>LKE0480 / LHA0480<br>LHC0480 / LHE0480<br>LHS0480 / LLO480 | LKA0550 / LKC0550<br>LKE0550 / LHA0550<br>LHC0550 / LHE0550<br>LHS0550 / LLO550 | LKA0650 / LKC0650<br>LHA0650 / LHC0650<br>LHS0650<br>LLO650 | LKA0750<br>LHA0750<br>LHS0750<br>LLO750 | LKA0900<br>LHA0900<br>LHS0900<br>LLO900 | LKA1050<br>LHA1050<br>LHS1050<br>LLO1050 |
| 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                                       |
| P                       | 3                                                                     | 3                                                                               | 3                                                                               | 3                                                                               | 5                                                           | 5                                       | 5                                       | 5                                        |
| S                       | 8                                                                     | 8                                                                               | 8                                                                               | 8                                                                               | 10                                                          | 10                                      | 10                                      | 10                                       |
| T                       | 1.4                                                                   | 1.4                                                                             | 1.4                                                                             | 1.4                                                                             | 1.4                                                         | 1.4                                     | 1.4                                     | 1.4                                      |
| O-ring                  | 1BP5                                                                  | 1BP5                                                                            | 1BP5                                                                            | 1BP5                                                                            | 1BP7                                                        | 1BP7                                    | 1BP7                                    | 1BP7                                     |
| Weight kg               | 0.2                                                                   | 0.2                                                                             | 0.3                                                                             | 0.4                                                                             | 0.5                                                         | 0.8                                     | 1.2                                     | 1.7                                      |

- Notes: 1. Material: S45C Surface Finishing: Alkaline Blackening  
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension C as a reference.  
3. For other block thickness (dim. C), machine the surface Z or design a block referring to the drawing and apply surface treatment if necessary.

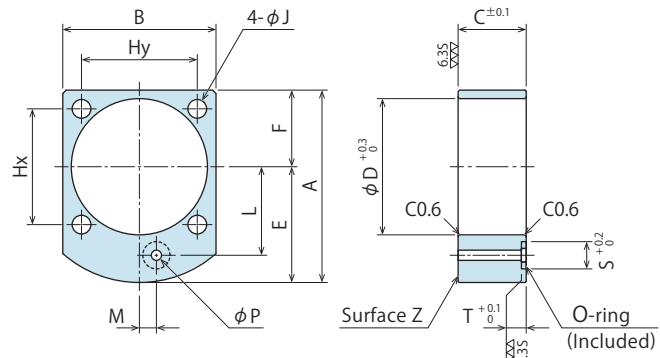
## Manifold Block for LJ/LM/LG/LT

Model No. Indication

**LZ 048 0 - MS**

Size  
(Refer to  
following table)

Design No.  
(Revision Number)



(mm)

| Model No.               | LZ0300-MS                          | LZ0360-MS                          | LZ0400-MS                          | LZ0480-MS                          | LZ0550-MS                          | LZ0650-MS                          | LZ0750-MS                          | LZ0900-MS                 | LZ1050-MS                 |
|-------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|---------------------------|---------------------------|
| Corresponding Model No. | LG0301 / LT0301<br>LJ0302 / LM0300 | LG0361 / LT0361<br>LJ0362 / LM0360 | LG0401 / LT0401<br>LJ0402 / LM0400 | LG0481 / LT0481<br>LJ0482 / LM0480 | LG0551 / LT0551<br>LJ0552 / LM0550 | LG0651 / LT0651<br>LJ0652 / LM0650 | LG0751 / LT0751<br>LJ0752 / LM0750 | LG0901 / LT0901<br>LJ0902 | LG1051 / LT1051<br>LJ1052 |
| A                       | 48                                 | 51.5                               | 56.5                               | 62                                 | 70                                 | 82                                 | 93                                 | 107                       | 122                       |
| B                       | 34                                 | 40                                 | 45                                 | 51                                 | 60                                 | 70                                 | 80                                 | 95                        | 110                       |
| C                       | 18                                 | 20                                 | 20                                 | 27                                 | 30                                 | 32                                 | 37                                 | 45                        | 50                        |
| D                       | 30                                 | 36                                 | 40                                 | 48                                 | 55                                 | 65                                 | 75                                 | 90                        | 105                       |
| E                       | 28.5                               | 31.5                               | 34                                 | 36.5                               | 40                                 | 47                                 | 53                                 | 59.5                      | 67                        |
| F                       | 19.5                               | 20                                 | 22.5                               | 25.5                               | 30                                 | 35                                 | 40                                 | 47.5                      | 55                        |
| Hx                      | 30                                 | 31.4                               | 34                                 | 40                                 | 47                                 | 55                                 | 63                                 | 75                        | 88                        |
| Hy                      | 23                                 | 31.4                               | 34                                 | 40                                 | 47                                 | 55                                 | 63                                 | 75                        | 88                        |
| J                       | 4.5                                | 4.5                                | 5.5                                | 5.5                                | 6.8                                | 6.8                                | 9                                  | 11                        | 14                        |
| L                       | 20.5                               | 23.5                               | 26                                 | 30                                 | 33.5                               | 39.5                               | 45                                 | 52.5                      | 60                        |
| M                       | 3                                  | 5                                  | 5                                  | 0                                  | 0                                  | 0                                  | 0                                  | 0                         | 0                         |
| P                       | 3                                  | 3                                  | 3                                  | 3                                  | 3                                  | 5                                  | 5                                  | 5                         | 5                         |
| S                       | 8                                  | 8                                  | 8                                  | 8                                  | 8                                  | 10                                 | 10                                 | 10                        | 10                        |
| T                       | 1.4                                | 1.4                                | 1.4                                | 1.4                                | 1.4                                | 1.4                                | 1.4                                | 1.4                       | 1.4                       |
| O-ring                  | 1BP5                               | 1BP5                               | 1BP5                               | 1BP5                               | 1BP5                               | 1BP7                               | 1BP7                               | 1BP7                      | 1BP7                      |
| Weight kg               | 0.1                                | 0.2                                | 0.2                                | 0.3                                | 0.4                                | 0.5                                | 0.8                                | 1.2                       | 1.7                       |

- Notes: 1. Material : S45C Surface Finishing : Alkaline Blackening  
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension C as a reference.  
3. For other block thickness (dim. C), machine the surface Z or design a block referring to the drawing and apply surface treatment if necessary.

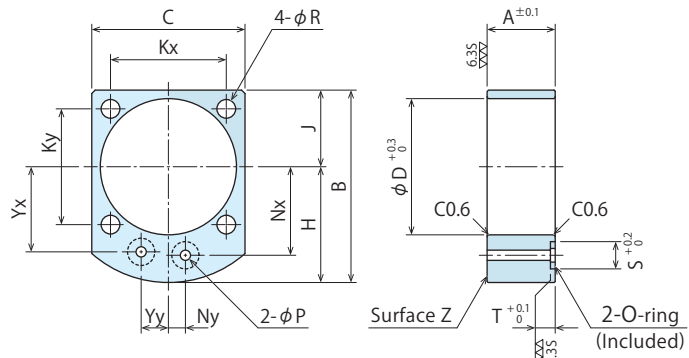
## Manifold Block for LC/TC

Model No. Indication

**LZ 048 0 - MP**

Size  
(Refer to  
following table)

Design No.  
(Revision Number)



(mm)

| Model No.               | LZ0260-MP | LZ0300-MP | LZ0360-MP | LZ0400-MP       | LZ0480-MP       | LZ0550-MP       | LZ0650-MP       | LZ0750-MP       | LZ0900-MP |
|-------------------------|-----------|-----------|-----------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------|
| Corresponding Model No. | LC0262    | LC0302    | LC0362    | LC0402 / TC0402 | LC0482 / TC0482 | LC0552 / TC0552 | LC0652 / TC0652 | LC0752 / TC0752 | LC0902    |
| A                       | 18        | 18        | 20        | 20              | 27              | 30              | 32              | 37              | 45        |
| B                       | 43        | 48        | 51.5      | 56.5            | 62              | 70              | 82              | 93              | 107       |
| C                       | 29        | 34        | 40        | 45              | 51              | 60              | 70              | 80              | 95        |
| D                       | 26        | 30        | 36        | 40              | 48              | 55              | 65              | 75              | 90        |
| H                       | 26.5      | 28.5      | 31.5      | 34              | 36.5            | 40              | 47              | 53              | 59.5      |
| J                       | 16.5      | 19.5      | 20        | 22.5            | 25.5            | 30              | 35              | 40              | 47.5      |
| Kx                      | 25        | 30        | 31.4      | 34              | 40              | 47              | 55              | 63              | 75        |
| Ky                      | 21        | 23        | 31.4      | 34              | 40              | 47              | 55              | 63              | 75        |
| Nx                      | 18.5      | 20.5      | 23.5      | 26              | 30              | 33.5            | 39.5            | 45              | 52.5      |
| Ny                      | 3         | 3         | 5         | 5               | 0               | 0               | 0               | 0               | 0         |
| R                       | 3.4       | 4.5       | 4.5       | 5.5             | 5.5             | 6.8             | 6.8             | 9               | 11        |
| Yx                      | 18.5      | 20.5      | 23.5      | 25              | 28              | 31              | 37              | 42.5            | 50        |
| Yy                      | 7         | 7         | 8         | 8               | 11              | 13              | 14              | 15              | 15        |
| P                       | 3         | 3         | 3         | 3               | 3               | 3               | 5               | 5               | 5         |
| S                       | 8         | 8         | 8         | 8               | 8               | 8               | 10              | 10              | 10        |
| T                       | 1.4       | 1.4       | 1.4       | 1.4             | 1.4             | 1.4             | 1.4             | 1.4             | 1.4       |
| O-ring                  | 1BP5      | 1BP5      | 1BP5      | 1BP5            | 1BP5            | 1BP5            | 1BP7            | 1BP7            | 1BP7      |
| Weight kg               | 0.1       | 0.1       | 0.2       | 0.2             | 0.3             | 0.4             | 0.5             | 0.8             | 1.2       |

- Notes: 1. Material : S45C Surface Finishing : Alkaline Blackening  
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension A as a reference.  
3. For other block thickness (dim. A), machine the surface Z or design a block referring to the drawing and apply surface treatment if necessary.

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

Screw Locator  
VXF/VXE  
Manual Expansion Locating Pin  
VX  
Manifold Block  
WHZ-MD  
LZY-MD  
LZ-MS  
LZ-MP  
TMZ-1MB  
TMZ-2MB  
DZ-M

Manifold Block / Nut  
DZ-R  
DZ-C  
DZ-P  
DZ-B  
LZ-S  
LZ-SQ  
WNZ-SQ  
TNZ-S  
TNZ-SQ

Pressure Switch  
JBA

Pressure Gauge  
JGA/JGB

Manifold  
JX

Coupler Switch  
PS

G-Thread Fitting

# Sales Offices

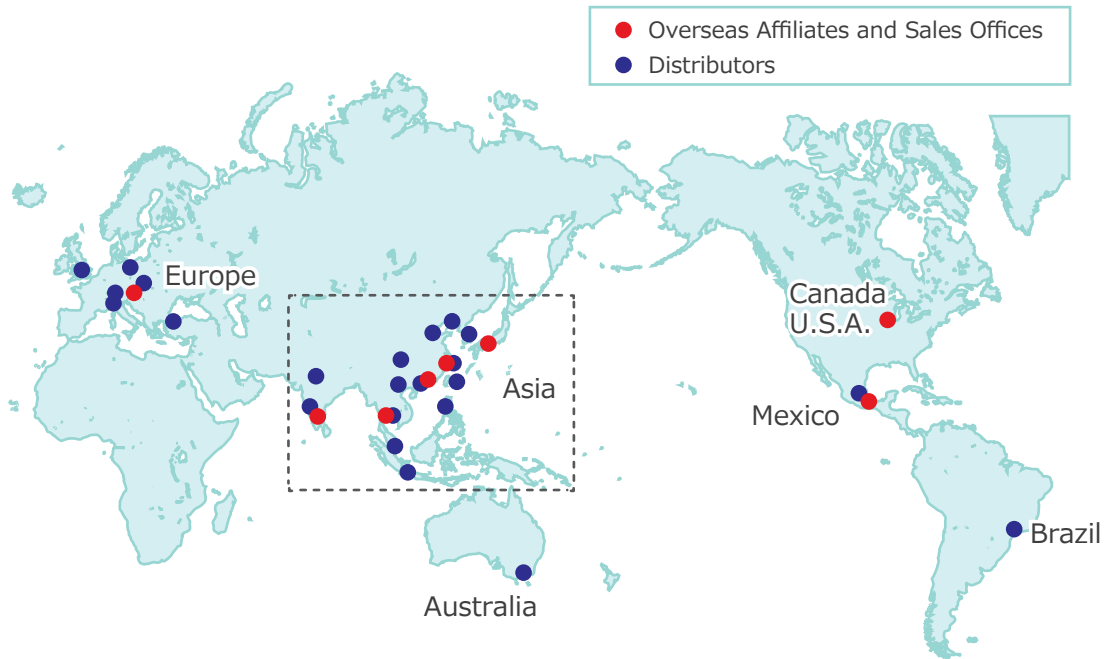
## Sales Offices across the World

|                                                                                     |                                                                                                                          |                               |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| JAPAN<br>HEAD OFFICE<br>Overseas Sales                                              | <b>TEL. +81-78-991-5162</b>                                                                                              | <b>FAX. +81-78-991-8787</b>   |
|                                                                                     | KOSMEK LTD. 1-5, 2-chome, Murotani, Nishi-ku, Kobe-city, Hyogo, Japan 651-2241<br>〒651-2241 兵庫県神戸市西区室谷2丁目1番5号            |                               |
| United States of America<br>SUBSIDIARY<br>KOSMEK (USA) LTD.                         | <b>TEL. +1-630-620-7650</b>                                                                                              | <b>FAX. +1-630-620-9015</b>   |
|                                                                                     | 650 Springer Drive, Lombard, IL 60148 USA                                                                                |                               |
| MEXICO<br>REPRESENTATIVE OFFICE<br>KOSMEK USA Mexico Office                         | <b>TEL. +52-442-161-2347</b>                                                                                             |                               |
|                                                                                     | Av. Santa Fe #103 int 59 Col. Santa Fe Juriquilla C.P. 76230 Queretaro, Qro Mexico                                       |                               |
| EUROPE<br>SUBSIDIARY<br>KOSMEK EUROPE GmbH                                          | <b>TEL. +43-463-287587</b>                                                                                               | <b>FAX. +43-463-287587-20</b> |
|                                                                                     | Schleppeplatz 2 9020 Klagenfurt am Wörthersee Austria                                                                    |                               |
| CHINA<br>KOSMEK (CHINA) LTD.<br>考世美(上海)贸易有限公司                                       | <b>TEL. +86-21-54253000</b>                                                                                              | <b>FAX. +86-21-54253709</b>   |
|                                                                                     | Room601, RIVERSIDE PYRAMID No.55, Lane21, Pusan Rd, Pudong Shanghai 200125, China<br>中国上海市浦东新区浦三路21弄55号银亿滨江中心601室 200125 |                               |
| INDIA<br>BRANCH OFFICE<br>KOSMEK LTD - INDIA                                        | <b>TEL. +91-9880561695</b>                                                                                               |                               |
|                                                                                     | F 203, Level-2, First Floor, Prestige Center Point, Cunningham Road, Bangalore -560052 India                             |                               |
| THAILAND<br>REPRESENTATIVE OFFICE<br>KOSMEK Thailand Representation Office          | <b>TEL. +66-2-300-5132</b>                                                                                               | <b>FAX. +66-2-300-5133</b>    |
|                                                                                     | 67 Soi 58, RAMA 9 Rd., Suanluang, Suanluang, Bangkok 10250, Thailand                                                     |                               |
| TAIWAN<br>(Taiwan Exclusive Distributor)<br>Full Life Trading Co., Ltd.<br>盈生貿易有限公司 | <b>TEL. +886-2-82261860</b>                                                                                              | <b>FAX. +886-2-82261890</b>   |
|                                                                                     | 16F-4, No.2, Jian Ba Rd., Zhonghe District, New Taipei City Taiwan 23511<br>台湾新北市中和區建八路2號 16F-4 (遠東世紀廣場)                 |                               |
| PHILIPPINES<br>(Philippines Exclusive Distributor)<br>G.E.T. Inc, Phil.             | <b>TEL. +63-2-310-7286</b>                                                                                               | <b>FAX. +63-2-310-7286</b>    |
|                                                                                     | Victoria Wave Special Economic Zone Mt. Apo Building, Brgy. 186, North Caloocan City, Metro Manila, Philippines 1427     |                               |
| INDONESIA<br>(Indonesia Exclusive Distributor)<br>PT. Yamata Machinery              | <b>TEL. +62-21-29628607</b>                                                                                              | <b>FAX. +62-21-29628608</b>   |
|                                                                                     | Delta Commercial Park I, Jl. Kenari Raya B-08, Desa Jayamukti, Kec. Cikarang Pusat Kab. Bekasi 17530 Indonesia           |                               |

## Sales Offices in Japan

|                                                     |                                   |                          |
|-----------------------------------------------------|-----------------------------------|--------------------------|
| Head Office<br>Osaka Sales Office<br>Overseas Sales | <b>TEL. 078-991-5162</b>          | <b>FAX. 078-991-8787</b> |
|                                                     | 〒651-2241 兵庫県神戸市西区室谷2丁目1番5号       |                          |
| Tokyo Sales Office                                  | <b>TEL. 048-652-8839</b>          | <b>FAX. 048-652-8828</b> |
|                                                     | 〒331-0815 埼玉県さいたま市北区大成町4丁目81番地    |                          |
| Nagoya Sales Office                                 | <b>TEL. 0566-74-8778</b>          | <b>FAX. 0566-74-8808</b> |
|                                                     | 〒446-0076 愛知県安城市美園町2丁目10番地1       |                          |
| Fukuoka Sales Office                                | <b>TEL. 092-433-0424</b>          | <b>FAX. 092-433-0426</b> |
|                                                     | 〒812-0006 福岡県福岡市博多区上牟田1丁目8-10-101 |                          |

# Global Network



Asia Detailed Map

