# New Wireless Sensing Clamp

HYD. LOCK / HYD. RELEASE

## Swing / Link Clamp • Linear Cylinder

Swing Clamp
model **LHM**

Link Clamp
model **LKM**

Linear Cylinder
model **LLM**

# Wirelessly Detect Unclamp Position

# No External Power Supply

# Required for Sensor

KOSMEK
Harmony in Innovation

NEW

HYD. LOCK / HYD. RELEASE

# Wireless Sensing Clamp

Swing Clamp
model **LHM**

Link Clamp
model **LKM**

Linear Cylinder
model **LLM**

## Wirelessly Detect Unclamp Position

## No External Power Supply Required for Sensor


***Individual Detection***

Separate unclamp detection is possible for each clamp.


Waterproof Rating

***Equivalent to IPX7***

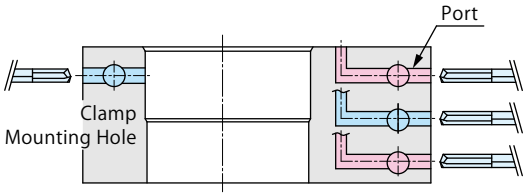
※ Shows the protection level of the sensor.


Quick Response※

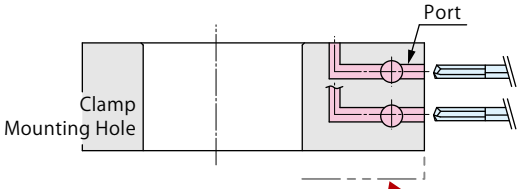
※ Compared with our conventional air sensing clamps.

## Minimized Number of Ports

Solution to fixture port shortage.




With Wireless Sensing




**Conventional Fixture※ : Multiple Ports**

Hydraulic Port × 2, Air Port × 1, Vent Port × 1

※Using our conventional air sensing clamp (model LHW-J)

**Air port is not required.**

Hydraulic Port × 2

**Enables a thinner and lighter fixture.**

## Lower Design • Fixture Cost

Design & machining costs for sensing ports are not required.

※ Image compared with our conventional air sensing clamps.

With Wireless Sensing

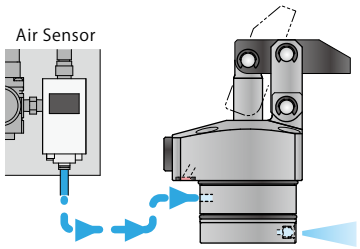
**Conventional※ sensing function needed design and machining costs for ports.**

**Fixture is simplified.**

※ For conventional models, please see the “Changes in Sensing Clamps” .

## Zero Air Consumption

Detect unclamp position via wireless communication.

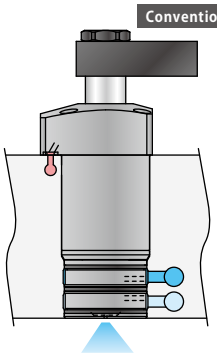
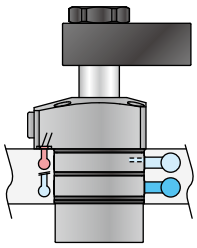
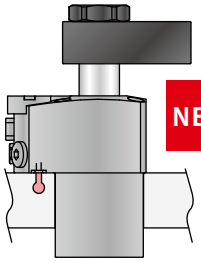



With Wireless Sensing

**Consumes air for detection.**

※ Using our conventional air sensing clamp.

**Detects wirelessly, zero air consumption.**

| Changes in Sensing Clamps | Air Sensor Model (Conventional) | Air Sensing Valve Model (Conventional) | Wireless Sensing Model |
|---|---|---|---|
| Model |  |  |  NEW *No Air Port* |
| Air Consumption | High | Low | **Zero** |
| Cylinder Length | Long (High Interference) | **Short** | **Short** |

Please contact us when considering the wireless sensing clamp.

# Wireless Sensing Link Clamp

## Hydraulic Double Action

Model LKM

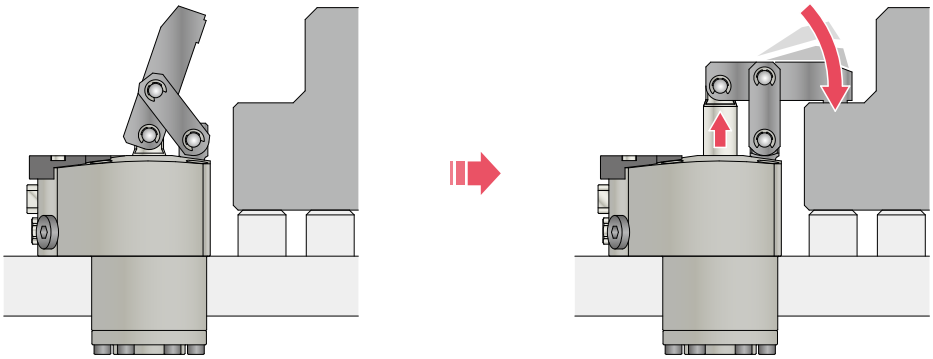
## Wirelessly Detect Unclamp Position.
## Number of Ports is Reduced.

No External Power Supply Required for Sensor

## Detects unclamp position wirelessly.

| Receiver | Repeater | Clamp |
|---|---|---|
| Place：Outside Machine | Place：Near Fixture<br>Inside the Processing Machine | Place：Fixture |


### Action Description



Unclamped State　　Clamped State

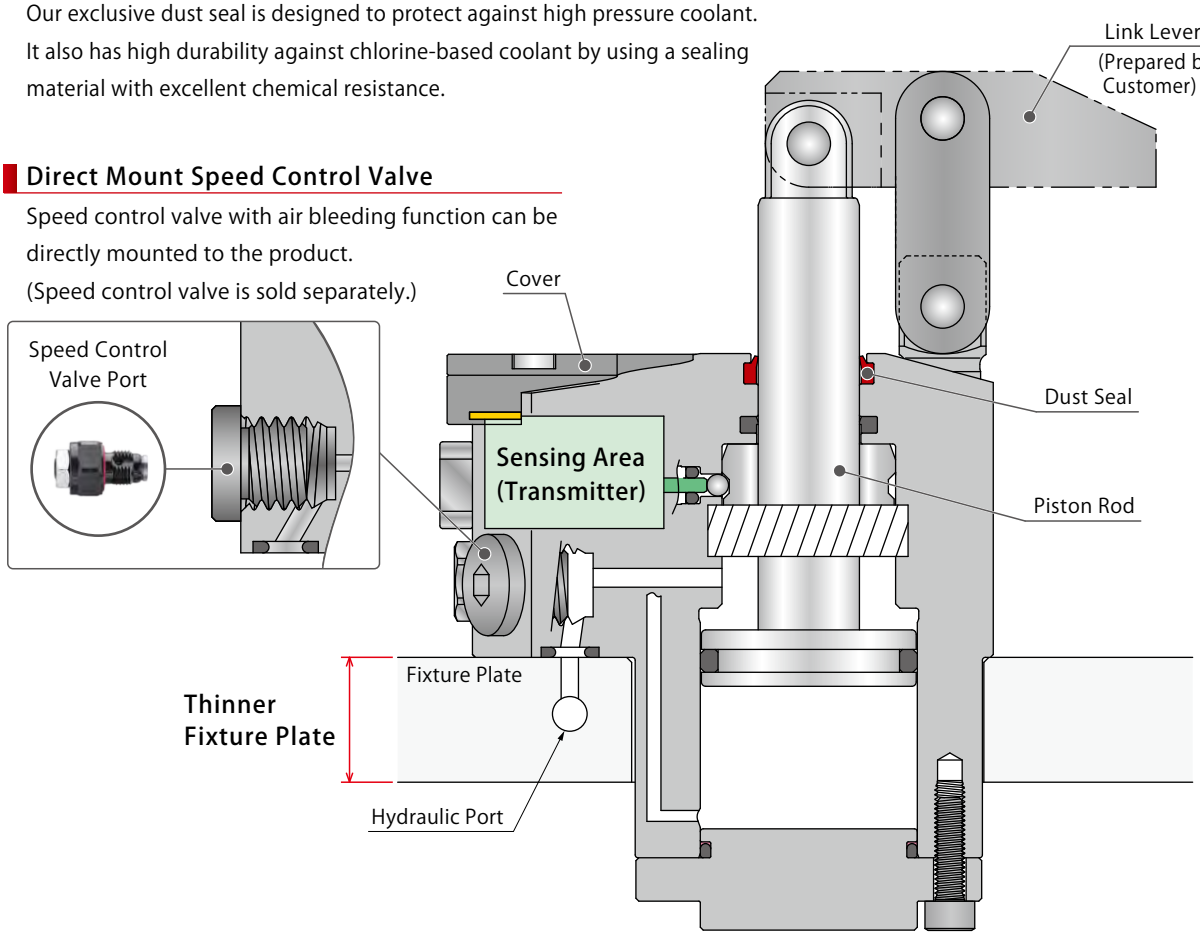
## Cross Section ※ This drawing shows Model LKM-C□-B□.

### 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.

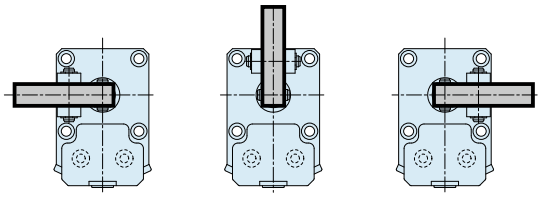
### Direct Mount Speed Control Valve

Speed control valve with air bleeding function can be directly mounted to the product.
(Speed control valve is sold separately.)




### Lever in Three Directions Available

Lever positioning is available in three directions;
L：Left, C：Center, R：Right as seen from the port side.

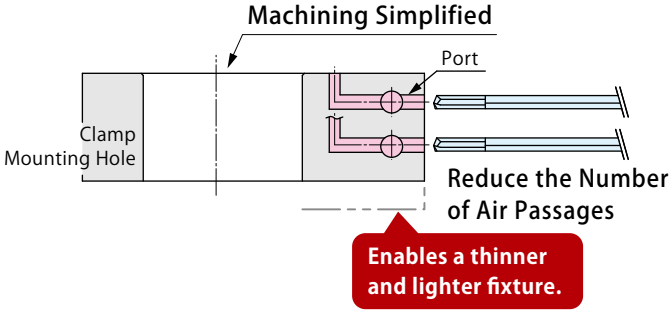



### Zero Air Consumption

Detects unclamp position via wireless communication. Unlike our conventional air sensing clamps, air for action confirmation is not required.


### Minimized Number of Ports・Simple Machining

Integrating ports allows for reducing the number of ports for Rotary Joint and machining for air passage of fixture plate, and simplifying the machining of mounting hole, etc.

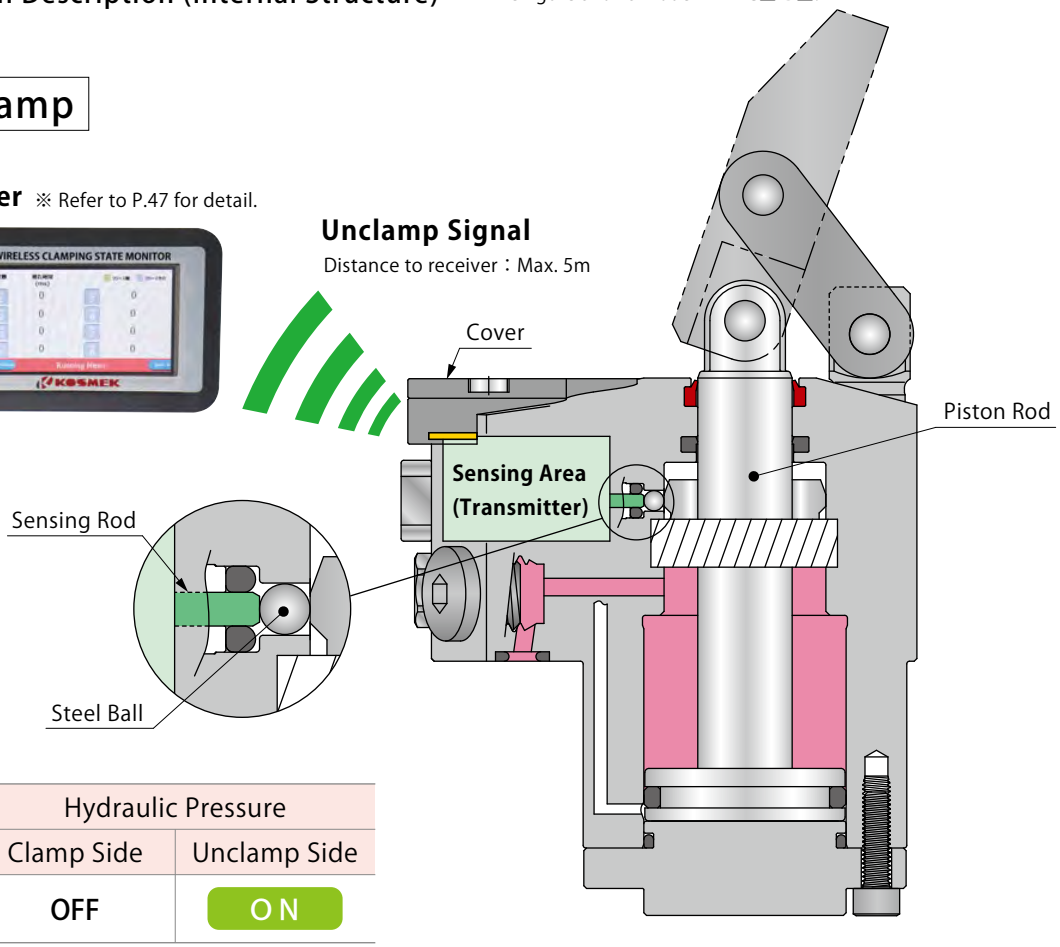


## Action Description (Internal Structure) ※ The figure shows Model LKM-C□-B□.

### Unclamp

**Receiver** ※ Refer to P.47 for detail.


**Unclamp Signal**
Distance to receiver：Max. 5m




| Hydraulic Pressure | |
|---|---|
| Clamp Side | Unclamp Side |
| OFF | ON |

### ■ Unclamp (During Hydraulic Pressure Supply to Unclamping Port)

The piston rod descends.

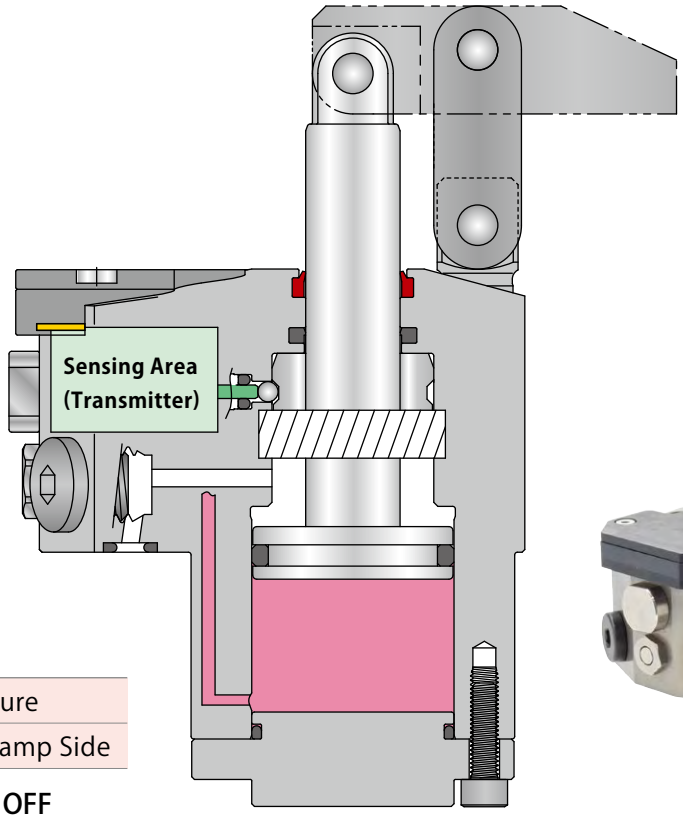
↓

When the piston rod pushes the sensing rod via the steel ball at the unclamp end, an unclamp signal is transmitted from the sensing area.

### Connecting Multiple Wireless Sensing Clamps / Linear Cylinders

When using multiple wireless sensing clamps / linear cylinders, provide an operating time difference of 100msec (0.1 sec.) or more. Please check the operating time at the receiver, and adjust the operating time with the speed control valve if it is within 100msec. Simultaneous operation may cause radio interference, which may result in failure to receive signals properly.

# Clamp




| Hydraulic Pressure | |
|---|---|
| Clamp Side | Unclamp Side |
| ON | OFF |

## Clamp (During Hydraulic Pressure Supply to Clamping Port)

The piston rod ascends to clamp a workpiece.

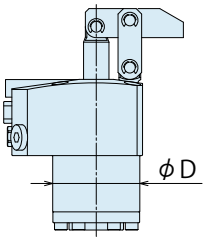
## Model No. Indication

LKM 048 0 - C C - B03
1 2 3 4 5

### 1 Body Size

**048**：ϕD=48mm
**055**：ϕD=55mm
**065**：ϕD=65mm
**075**：ϕD=75mm

※ Indicates the cylinder outer diameter (ϕD).



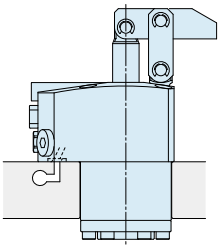

### 2 Design No.

**0** ：Revision Number

### 3 Piping Method

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

※ Speed control valve (BZL) is sold separately.
Please refer to P. 55.

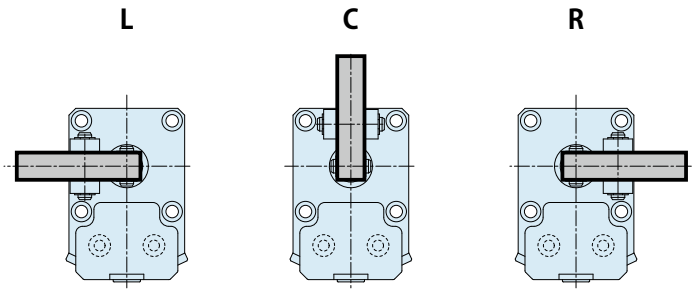


With G Thread Plug
Able to attach speed control valve

### 4 Lever Direction

**L** ：Left
**C** ：Center
**R** ：Right

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




### 5 Available Country：Frequency

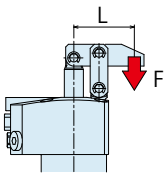
**B03** ： United States
**B01** ： Japan
**B02** ： China

※ There are restrictions on countries where the product can be used according to radio regulations.
Please follow the regulatory requirements of each country.

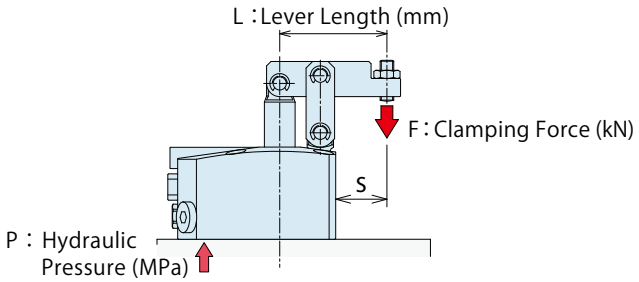
## Specifications

| Model No. | | LKM0480-C□-B□ | LKM0550-C□-B□ | LKM0650-C□-B□ | LKM0750-C□-B□ |
|---|---|---|---|---|---|
| Cylinder Area for Clamping | $cm^2$ | 7.07 | 9.62 | 15.9 | 23.8 |
| Cylinder Inner Diameter ※1 | mm | 30 | 35 | 45 | 55 |
| Rod Diameter ※1 | mm | 14 | 16 | 20 | 22 |
| Clamping Force ※2 (Calculation Formula) | kN | $F = \frac{11.76 \times P}{L - 18.5}$ | $F = \frac{18.18 \times P}{L - 21}$ | $F = \frac{35.06 \times P}{L - 24.5}$ | $F = \frac{64.14 \times P}{L - 30}$ |
| Full Stroke | mm | 23.5 | 26 | 29.5 | 35 |
| Clamp Stroke | mm | 20.5 | 23 | 26.5 | 32 |
| Extra Stroke | mm | 3 | 3 | 3 | 3 |
| Max. Operating Pressure | MPa | 7 | | | |
| Min. Operating Pressure ※3 | MPa | 1.0 | | | |
| Withstanding Pressure | MPa | 10.5 | | | |
| Operating Temperature | ℃ | 0 ~ 70 (Sensing Area: ~ 60℃) | | | |
| Usable Fluid | | General Hydraulic Oil Equivalent to ISO-VG-32 | | | |
| Wireless Sensing (Unclamp Confirmation) | Frequency | 5 When selecting **B03**：902MHz Band<br>5 When selecting **B01**：920MHz Band<br>5 When selecting **B02**：868MHz Band | | | |
| | Distance to Receiver | Max. 5m ※4 | | | |
| | Sensing Position | ON from $1.5^{\pm 0.5}$ mm before the unclamp end stroke. | | | |
| | Waterproof Rating | Equivalent to IPX7 (When the cover of the sensing area is completely closed.) | | | |

Notes : ※1. Clamping force cannot be calculated from the cylinder inner diameter and rod diameter.
Please refer to the clamping force calculation formula and the clamping force curve.
※2. F：Clamping Force (kN), P：Supply Hydraulic Pressure (MPa), L：Distance between the piston center and the clamping point (mm).
※3. Minimum pressure to operate the clamp without load.
※4. The maximum distance when there is no obstruction. Check the radio wave strength displayed on the receiver and consider the location of the repeater. (Recommended Threshold Value：-85dBm)
1. Please refer to the external dimensions for cylinder capacity and product weight.



## Clamping Force Curve




**Applicable Model**

**LKM** □ **0 - C** L C R - B03 B01 B02

1 Body Size

(Ex.) In case of LKM0480 :
When supply hydraulic pressure P is 5.0MPa and lever length L is 42mm, clamping force becomes about 2.6kN.

Notes :

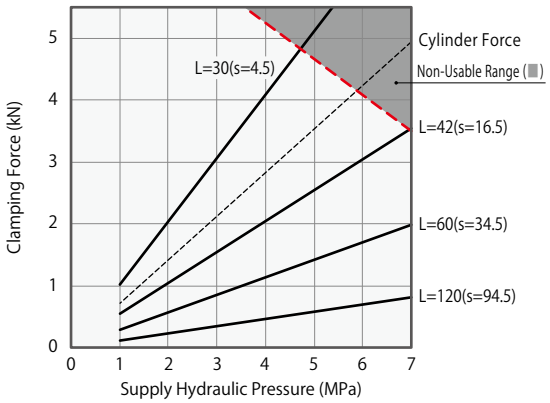
1. Tables and graphs show the relationship between the clamping force (kN) and supply hydraulic pressure (MPa).
2. Cylinder force (when L=0) cannot be calculated from the formula of clamping force.
3. Clamping force in the non-usable range may cause damage and fluid leakage.

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

**LKM0480-C□-B□**

Clamping Force Calculation Formula ※1 (kN) $F = (11.76 \times P) / (L - 18.5)$

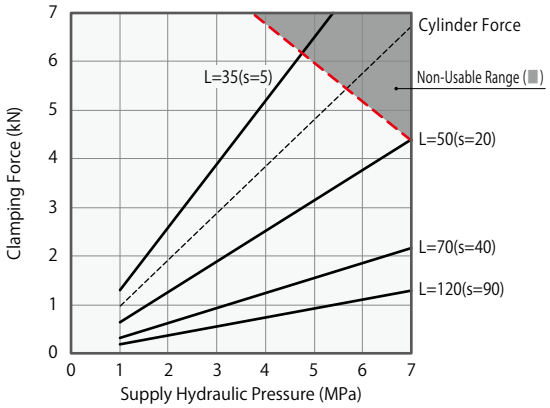
| Hydraulic Pressure (MPa) | Cylinder Force (kN) | Clamping Force (kN) Non-Usable Range(■) Lever Length L (mm) | | | | | | | | Min. Lever Length (L) (mm) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | L=30 | L=35 | L=42 | L=50 | L=60 | L=80 | L=100 | L=120 | |
| 7 | 5.0 | | | 3.6 | 2.7 | 2.0 | 1.4 | 1.1 | 0.9 | 42 |
| 6.5 | 4.6 | | | 3.3 | 2.5 | 1.9 | 1.3 | 1.0 | 0.8 | 39 |
| 6 | 4.3 | | | 3.1 | 2.3 | 1.8 | 1.2 | 0.9 | 0.7 | 36 |
| 5.5 | 3.9 | | 4.0 | 2.8 | 2.1 | 1.6 | 1.1 | 0.8 | 0.7 | 34 |
| 5 | 3.6 | | 3.6 | 2.6 | 1.9 | 1.5 | 1.0 | 0.8 | 0.6 | 32 |
| 4.5 | 3.2 | 4.7 | 3.3 | 2.3 | 1.7 | 1.3 | 0.9 | 0.7 | 0.6 | 30 |
| 4 | 2.9 | 4.1 | 2.9 | 2.1 | 1.5 | 1.2 | 0.8 | 0.6 | 0.5 | 28 |
| 3.5 | 2.5 | 3.6 | 2.5 | 1.8 | 1.4 | 1.0 | 0.7 | 0.6 | 0.5 | 26 |
| 3 | 2.2 | 3.1 | 2.2 | 1.6 | 1.2 | 0.9 | 0.6 | 0.5 | 0.4 | 26 |
| 2.5 | 1.8 | 2.6 | 1.8 | 1.3 | 1.0 | 0.8 | 0.5 | 0.4 | 0.3 | 26 |
| 2 | 1.5 | 2.1 | 1.5 | 1.1 | 0.8 | 0.6 | 0.4 | 0.3 | 0.3 | 26 |
| 1.5 | 1.1 | 1.6 | 1.1 | 0.8 | 0.6 | 0.5 | 0.3 | 0.3 | 0.2 | 26 |
| 1 | 0.8 | 1.1 | 0.8 | 0.6 | 0.4 | 0.3 | 0.2 | 0.2 | 0.2 | 26 |
| Max. Operating Pressure (MPa) | | 4.8 | 5.9 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | |




**LKM0480-C□-B□**

Clamping Force Calculation Formula ※1 (kN) $F = (18.18 \times P) / (L - 21)$

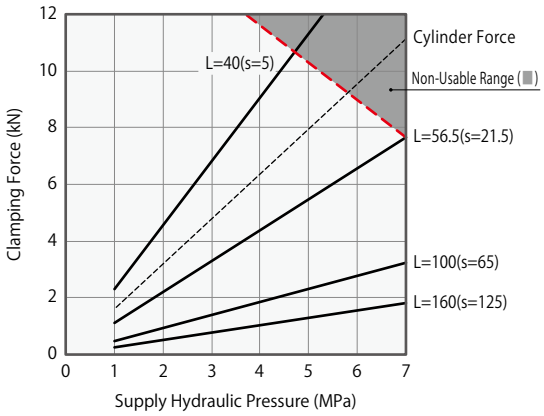
| Hydraulic Pressure (MPa) | Cylinder Force (kN) | Clamping Force (kN) Non-Usable Range(■) Lever Length L (mm) | | | | | | | | Min. Lever Length (L) (mm) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | L=35 | L=40 | L=50 | L=60 | L=70 | L=80 | L=100 | L=120 | |
| 7 | 6.8 | | | 4.4 | 3.3 | 2.6 | 2.2 | 1.7 | 1.3 | 50 |
| 6.5 | 6.3 | | | 4.1 | 3.1 | 2.5 | 2.1 | 1.5 | 1.2 | 46 |
| 6 | 5.8 | | | 3.8 | 2.8 | 2.3 | 1.9 | 1.4 | 1.2 | 43 |
| 5.5 | 5.3 | | 5.3 | 3.5 | 2.6 | 2.1 | 1.7 | 1.3 | 1.1 | 39 |
| 5 | 4.9 | | 4.8 | 3.2 | 2.4 | 1.9 | 1.6 | 1.2 | 1.0 | 37 |
| 4.5 | 4.4 | 5.9 | 4.4 | 2.9 | 2.1 | 1.7 | 1.4 | 1.1 | 0.9 | 34 |
| 4 | 3.9 | 5.2 | 3.9 | 2.6 | 1.9 | 1.5 | 1.3 | 1.0 | 0.8 | 32 |
| 3.5 | 3.4 | 4.6 | 3.4 | 2.2 | 1.7 | 1.3 | 1.1 | 0.9 | 0.7 | 30 |
| 3 | 2.9 | 3.9 | 2.9 | 1.9 | 1.4 | 1.2 | 1.0 | 0.7 | 0.6 | 30 |
| 2.5 | 2.5 | 3.3 | 2.4 | 1.6 | 1.2 | 1.0 | 0.8 | 0.6 | 0.5 | 30 |
| 2 | 2.0 | 2.6 | 2.0 | 1.3 | 1.0 | 0.8 | 0.7 | 0.5 | 0.4 | 30 |
| 1.5 | 1.5 | 2.0 | 1.5 | 1.0 | 0.7 | 0.6 | 0.5 | 0.4 | 0.3 | 30 |
| 1 | 1.0 | 1.3 | 1.0 | 0.7 | 0.5 | 0.4 | 0.4 | 0.3 | 0.2 | 30 |
| Max. Operating Pressure (MPa) | | 4.8 | 5.7 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | |



## LKM0650-C□-B□

Clamping Force Calculation Formula ※1 (kN) $F = (35.06 \times P) / (L - 24.5)$

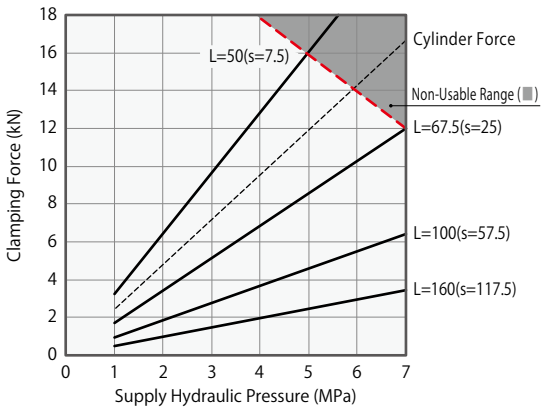
| Hydraulic Pressure (MPa) | Cylinder Force (kN) | Clamping Force (kN) Non-Usable Range(▩) Lever Length L (mm) | | | | | | | | Min. Lever Length (L) (mm) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | L=40 | L=50 | L=56.5 | L=80 | L=100 | L=120 | L=140 | L=160 | |
| 7 | 11.2 | ▩ | ▩ | 7.7 | 4.5 | 3.3 | 2.6 | 2.2 | 1.9 | 56.5 |
| 6.5 | 10.4 | ▩ | ▩ | 7.2 | 4.2 | 3.1 | 2.4 | 2.0 | 1.7 | 52 |
| 6 | 9.6 | ▩ | 8.3 | 6.6 | 3.8 | 2.8 | 2.3 | 1.9 | 1.6 | 48 |
| 5.5 | 8.8 | ▩ | 7.6 | 6.1 | 3.5 | 2.6 | 2.1 | 1.7 | 1.5 | 45 |
| 5 | 8.0 | ▩ | 6.9 | 5.5 | 3.2 | 2.4 | 1.9 | 1.6 | 1.3 | 42 |
| 4.5 | 7.2 | 10.2 | 6.2 | 5.0 | 2.9 | 2.1 | 1.7 | 1.4 | 1.2 | 39 |
| 4 | 6.4 | 9.1 | 5.5 | 4.4 | 2.6 | 1.9 | 1.5 | 1.3 | 1.1 | 37 |
| 3.5 | 5.6 | 8.0 | 4.9 | 3.9 | 2.3 | 1.7 | 1.3 | 1.1 | 1.0 | 35 |
| 3 | 4.8 | 6.8 | 4.2 | 3.3 | 1.9 | 1.4 | 1.2 | 1.0 | 0.8 | 35 |
| 2.5 | 4.0 | 5.7 | 3.5 | 2.8 | 1.6 | 1.2 | 1.0 | 0.8 | 0.7 | 35 |
| 2 | 3.2 | 4.6 | 2.8 | 2.2 | 1.3 | 1.0 | 0.8 | 0.7 | 0.6 | 35 |
| 1.5 | 2.4 | 3.4 | 2.1 | 1.7 | 1.0 | 0.7 | 0.6 | 0.5 | 0.4 | 35 |
| 1 | 1.6 | 2.3 | 1.4 | 1.1 | 0.7 | 0.5 | 0.4 | 0.4 | 0.3 | 35 |
| Max. Operating Pressure (MPa) | | 4.8 | 6.3 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | |



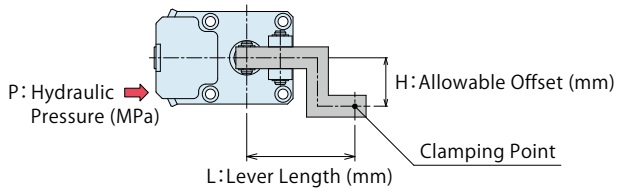

## LKM0750-C□-B□

Clamping Force Calculation Formula ※1 (kN) $F = (64.14 \times P) / (L - 30)$

| Hydraulic Pressure (MPa) | Cylinder Force (kN) | Clamping Force (kN) Non-Usable Range(▩) Lever Length L (mm) | | | | | | | | Min. Lever Length (L) (mm) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | L=50 | L=60 | L=67.5 | L=80 | L=100 | L=120 | L=140 | L=160 | |
| 7 | 16.7 | ▩ | ▩ | 12.0 | 9.0 | 6.5 | 5.0 | 4.1 | 3.5 | 67.5 |
| 6.5 | 15.5 | ▩ | ▩ | 11.2 | 8.4 | 6.0 | 4.7 | 3.8 | 3.3 | 63 |
| 6 | 14.3 | ▩ | 12.9 | 10.3 | 7.7 | 5.5 | 4.3 | 3.5 | 3.0 | 58 |
| 5.5 | 13.1 | ▩ | 11.8 | 9.5 | 7.1 | 5.1 | 4.0 | 3.3 | 2.8 | 54 |
| 5 | 11.9 | 16.1 | 10.7 | 8.6 | 6.5 | 4.6 | 3.6 | 3.0 | 2.5 | 51 |
| 4.5 | 10.7 | 14.5 | 9.7 | 7.7 | 5.8 | 4.2 | 3.3 | 2.7 | 2.3 | 48 |
| 4 | 9.6 | 12.9 | 8.6 | 6.9 | 5.2 | 3.7 | 2.9 | 2.4 | 2.0 | 45 |
| 3.5 | 8.4 | 11.3 | 7.5 | 6.0 | 4.5 | 3.3 | 2.5 | 2.1 | 1.8 | 43 |
| 3 | 7.2 | 9.7 | 6.5 | 5.2 | 3.9 | 2.8 | 2.2 | 1.8 | 1.5 | 43 |
| 2.5 | 6.0 | 8.1 | 5.4 | 4.3 | 3.3 | 2.3 | 1.8 | 1.5 | 1.3 | 43 |
| 2 | 4.8 | 6.5 | 4.3 | 3.5 | 2.6 | 1.9 | 1.5 | 1.2 | 1.0 | 43 |
| 1.5 | 3.6 | 4.9 | 3.3 | 2.6 | 2.0 | 1.4 | 1.1 | 0.9 | 0.8 | 43 |
| 1 | 2.4 | 3.3 | 2.2 | 1.8 | 1.3 | 1.0 | 0.8 | 0.6 | 0.5 | 43 |
| Max. Operating Pressure (MPa) | | 5.0 | 6.3 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | 7.0 | |



## Allowable Offset Graph




Applicable Model

LKM [ ] 0 - C [L/C/R] - [B03/B01/B02]

1 Body Size

(Ex.) In case of LKM0480 :

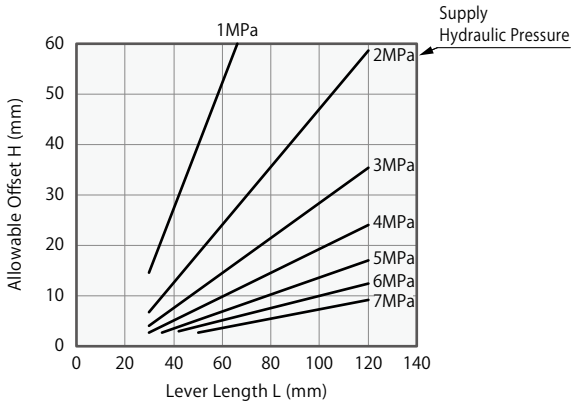
When supply hydraulic pressure P is 5.0MPa and lever length L is 80mm, allowable offset becomes about 10mm.

Notes :

1. Tables and graphs show the relationship between the lever length and the allowable offset according to the supply hydraulic pressure.
2. Using the lever beyond allowable offset may cause deformation, seizure and fluid leakage etc.
3. The tables and graphs are only for reference. The design should be carried out with allowance fully taken into consideration.

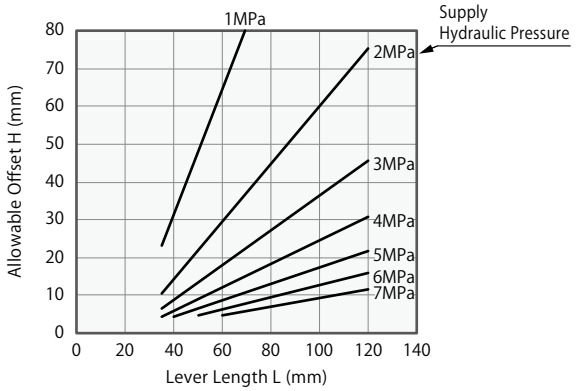
**LKM0480-C□-B□**

| Hydraulic Pressure (MPa) | Allowable Offset H (mm) Non-Usable Range (■) Lever Length L (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | L=30 | L=35 | L=42 | L=50 | L=60 | L=80 | L=100 | L=120 |
| 7 | | | | 3 | 4 | 6 | 7 | 9 |
| 6.5 | | | 2 | 3 | 4 | 6 | 9 | 11 |
| 6 | | | 3 | 4 | 5 | 8 | 10 | 12 |
| 5.5 | | 2 | 3 | 5 | 6 | 9 | 12 | 15 |
| 5 | | 3 | 4 | 5 | 7 | 10 | 14 | 17 |
| 4.5 | | 3 | 5 | 6 | 8 | 12 | 16 | 20 |
| 4 | 3 | 4 | 6 | 7 | 10 | 15 | 19 | 24 |
| 3.5 | 3 | 5 | 7 | 9 | 12 | 18 | 23 | 29 |
| 3 | 4 | 6 | 8 | 11 | 15 | 22 | 29 | 36 |
| 2.5 | 5 | 7 | 10 | 14 | 18 | 27 | 36 | 45 |
| 2 | 7 | 10 | 14 | 18 | 24 | 36 | 47 | 59 |
| 1.5 | 9 | 13 | 19 | 25 | 33 | 50 | 60 | 60 |
| 1 | 14 | 21 | 30 | 40 | 52 | 60 | 60 | 60 |



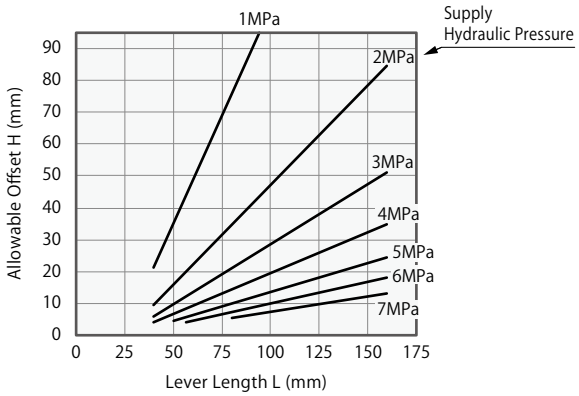

**LKM0550-C□-B□**

| Hydraulic Pressure (MPa) | Allowable Offset H (mm) Non-Usable Range (■) Lever Length L (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | L=35 | L=40 | L=50 | L=60 | L=70 | L=80 | L=100 | L=120 |
| 7 | | | | 5 | 6 | 7 | 9 | 12 |
| 6.5 | | | 4 | 5 | 7 | 8 | 11 | 14 |
| 6 | | | 5 | 6 | 8 | 10 | 13 | 16 |
| 5.5 | | | 5 | 7 | 9 | 11 | 15 | 19 |
| 5 | | 4 | 6 | 9 | 11 | 13 | 17 | 22 |
| 4.5 | | 5 | 8 | 10 | 13 | 15 | 21 | 26 |
| 4 | 4 | 6 | 9 | 12 | 15 | 18 | 25 | 31 |
| 3.5 | 5 | 7 | 11 | 15 | 18 | 22 | 30 | 37 |
| 3 | 6 | 9 | 13 | 18 | 23 | 27 | 36 | 46 |
| 2.5 | 8 | 11 | 17 | 23 | 28 | 34 | 46 | 57 |
| 2 | 11 | 14 | 22 | 30 | 37 | 45 | 60 | 75 |
| 1.5 | 15 | 20 | 31 | 41 | 52 | 62 | 80 | 80 |
| 1 | 23 | 31 | 48 | 65 | 80 | 80 | 80 | 80 |



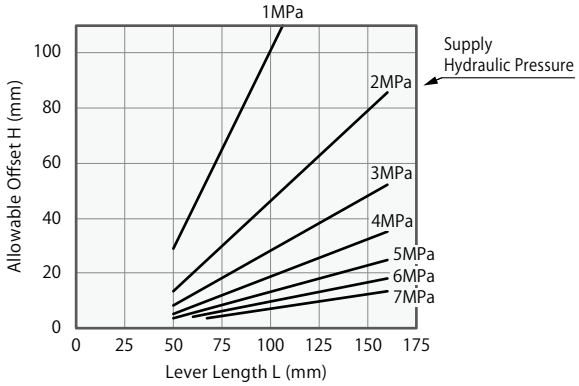
## LKM0650-C□-B□

| Hydraulic Pressure (MPa) | Allowable Offset H (mm) Non-Usable Range (■) Lever Length L (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | L=40 | L=50 | L=56.5 | L=80 | L=100 | L=120 | L=140 | L=160 |
| 7 | | | | 5 | 7 | 9 | 11 | 13 |
| 6.5 | | | 4 | 6 | 9 | 11 | 13 | 15 |
| 6 | | | 4 | 7 | 10 | 13 | 15 | 18 |
| 5.5 | | 4 | 5 | 9 | 12 | 15 | 18 | 21 |
| 5 | | 5 | 6 | 10 | 14 | 17 | 21 | 25 |
| 4.5 | 3 | 5 | 7 | 12 | 16 | 20 | 25 | 29 |
| 4 | 4 | 7 | 8 | 14 | 19 | 24 | 30 | 35 |
| 3.5 | 5 | 8 | 10 | 17 | 23 | 29 | 36 | 42 |
| 3 | 6 | 10 | 12 | 21 | 29 | 36 | 44 | 51 |
| 2.5 | 7 | 12 | 15 | 26 | 36 | 46 | 55 | 65 |
| 2 | 10 | 16 | 20 | 35 | 47 | 60 | 72 | 85 |
| 1.5 | 13 | 22 | 28 | 48 | 66 | 83 | 95 | 95 |
| 1 | 21 | 35 | 44 | 76 | 95 | 95 | 95 | 95 |




## LKM0750-C□-B□

| Hydraulic Pressure (MPa) | Allowable Offset H (mm) Non-Usable Range (■) Lever Length L (mm) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | L=50 | L=60 | L=67.5 | L=80 | L=100 | L=120 | L=140 | L=160 |
| 7 | | | | 5 | 7 | 9 | 11 | 13 |
| 6.5 | | | 5 | 6 | 8 | 11 | 13 | 16 |
| 6 | | 4 | 5 | 7 | 10 | 13 | 15 | 18 |
| 5.5 | | 5 | 6 | 8 | 11 | 15 | 18 | 21 |
| 5 | 4 | 6 | 7 | 10 | 13 | 17 | 21 | 25 |
| 4.5 | 5 | 7 | 9 | 11 | 16 | 20 | 25 | 30 |
| 4 | 5 | 8 | 10 | 14 | 19 | 24 | 30 | 35 |
| 3.5 | 7 | 10 | 12 | 16 | 23 | 29 | 36 | 42 |
| 3 | 8 | 12 | 15 | 20 | 28 | 36 | 44 | 52 |
| 2.5 | 10 | 15 | 19 | 25 | 35 | 45 | 56 | 66 |
| 2 | 13 | 20 | 25 | 33 | 46 | 60 | 73 | 86 |
| 1.5 | 18 | 28 | 35 | 46 | 65 | 83 | 101 | 110 |
| 1 | 29 | 43 | 54 | 72 | 101 | 110 | 110 | 110 |

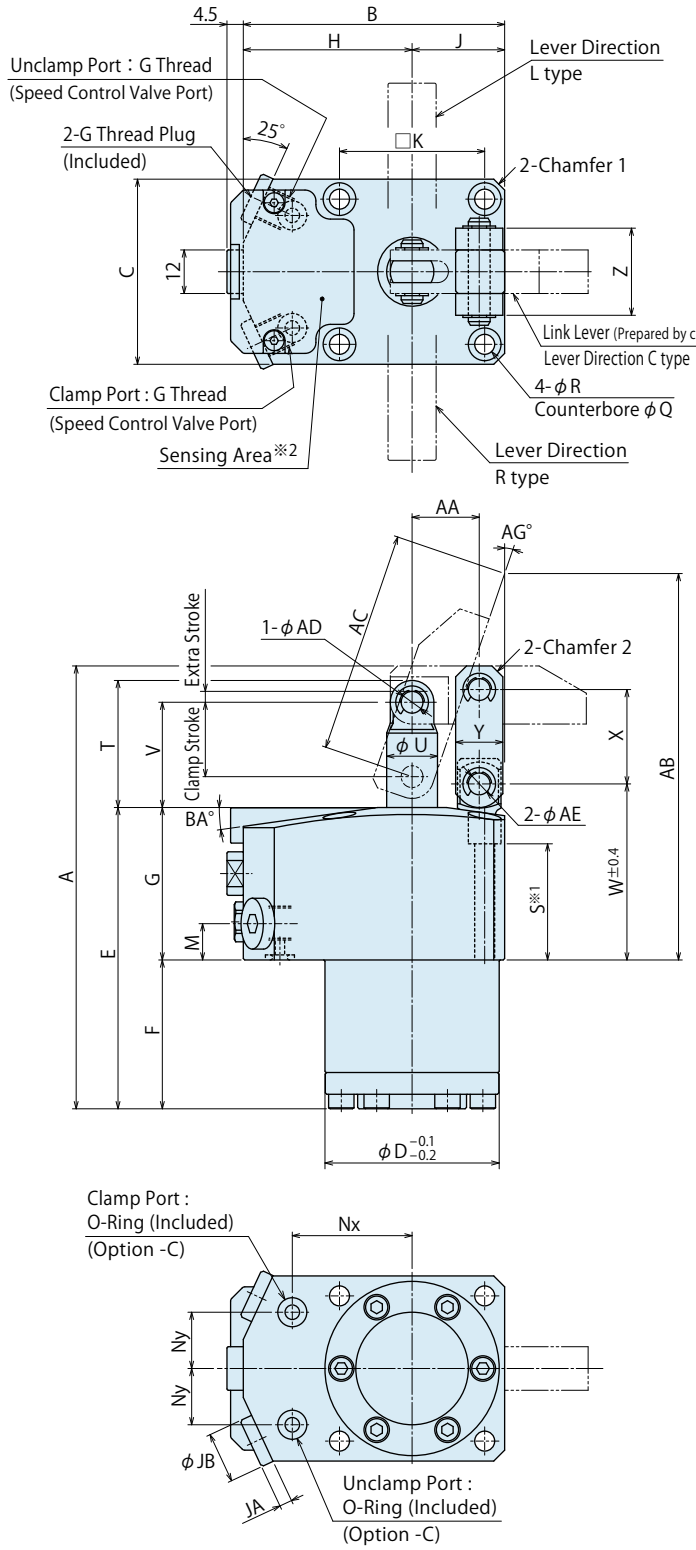


## External Dimensions

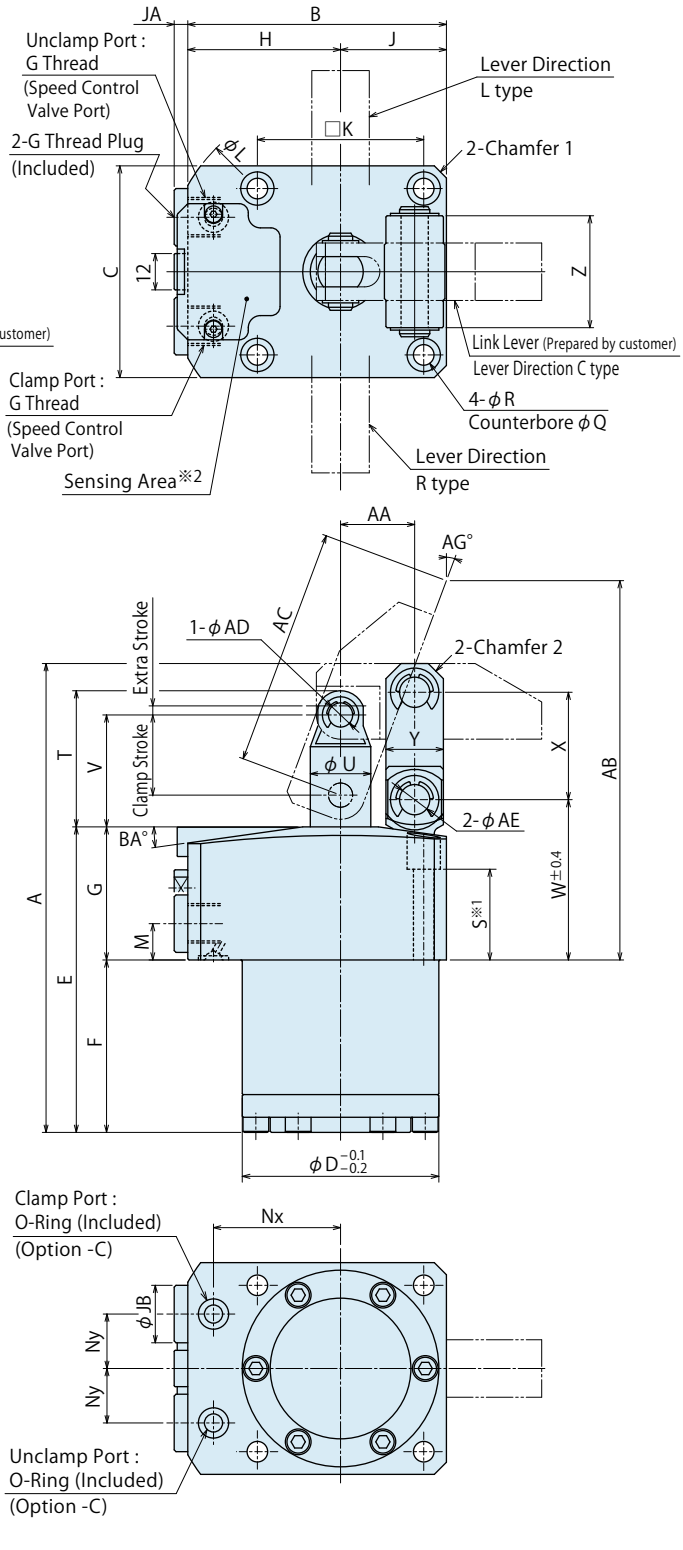
C：Gasket Option (With G Thread Plug)

※ The drawing shows the clamped state of LKM-CC-B□.

LKM0480-C□-B□ / LKM0550-C□-B□




LKM0650-C□-B□ / LKM0750-C□-B□




Notes :

※1. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.

※2. Do not cover the top surface of the sensing area with metal objects (chips). It may obstruct radio wave transmission.

1. Please use the provided pin (equivalent to ϕADf6, ϕAEf6, HRC60) as mounting pin for lever.
2. Speed control valve is sold separately. Please refer to P.55. It is necessary to provide an unclamp operation time difference of at least 100 msec. For adjusting the unclamp operation, please use a speed control valve.

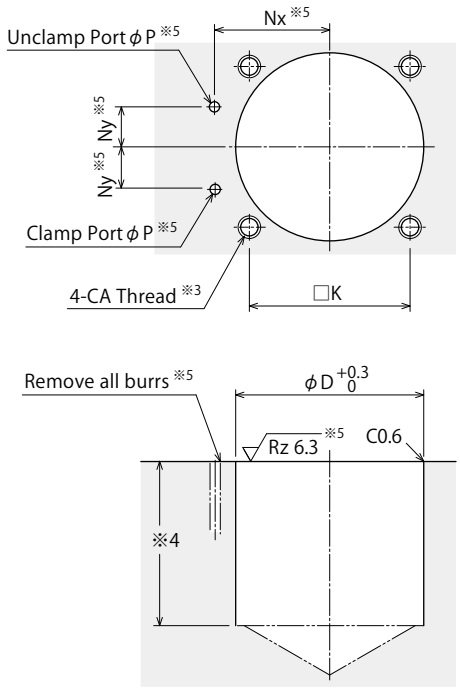
## Model No. Indication

(Format Example：LKM0550-CC-B03, LKM0750-CR-B03 )

LKM 048 0 – C L C R – B03 B01 B02

1 Body Size
2 Design No.
3 Piping Method
4 Lever Direction
5 Available Country：Frequency

## Machining Dimensions of Mounting Area




Notes：

※3. CA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.

※4. The depth of the body mounting hole φD should be decided according to the mounting height referring to dimension 'F'.

※5. The machining dimension is for -C: Gasket Option.

## External Dimensions and Machining Dimensions for Mounting

(mm)

| Model No. | LKM0480-C□-B□ | LKM0550-C□-B□ | LKM0650-C□-B□ | LKM0750-C□-B□ |
|---|---|---|---|---|
| Full Stroke | 23.5 | 26 | 29.5 | 35 |
| Clamp Stroke | 20.5 | 23 | 26.5 | 32 |
| Extra Stroke | 3 | 3 | 3 | 3 |
| A | 122 | 130.5 | 155 | 178.5 |
| B | 72 | 78 | 85.5 | 95.8 |
| C | 51 | 60 | 70 | 85 |
| D | 48 | 55 | 65 | 75 |
| E | 83 | 85 | 101 | 111.5 |
| F | 41 | 43 | 57 | 67.5 |
| G | 42 | 42 | 44 | 44 |
| H | 46.5 | 48 | 50.5 | 53.3 |
| J | 25.5 | 30 | 35 | 42.5 |
| K | 40 | 47 | 55 | 63 |
| L | – | – | 116 | 122 |
| M | 10 | 10 | 12 | 12 |
| Nx | 33 | 34.5 | 42 | 45 |
| Ny | 15.5 | 16 | 18 | 19 |
| P | 3 | 3 | 5 | 5 |
| Q | 9 | 10.5 | 11 | 14 |
| R | 5.5 | 6.8 | 6.8 | 9 |
| S | 32 | 30 | 30 | 27 |
| T | 35 | 37.5 | 45 | 55 |
| U | 14 | 16 | 20 | 22 |
| V | 29 | 31.5 | 37 | 45 |
| W | 48.5 | 49.5 | 53 | 55 |
| X | 26 | 30 | 35.5 | 43.5 |
| Y | 13 | 16 | 19 | 25 |
| Z | 24 | 28 | 37 | 40 |
| Chamfer 1 | C3 | C3 | C4 | C10 |
| Chamfer 2 | C3 | C3 | C5 | C5 |
| AA | 18.5 | 21 | 24.5 | 30 |
| AB | 106.5 | 115.9 | 125.4 | 137.8 |
| AC | 61.2 | 71.7 | 78.7 | 90.8 |
| AD | 6 | 6 | 8 | 10 |
| AE | 6 | 8 | 10 | 12 |
| AG | 18.9 | 19.9 | 20.5 | 21.4 |
| BA | 8 | 8 | 8 | 11 |
| CA | M5×0.8 | M6 | M6 | M8 |
| JA | 3.5 | 3.5 | 4.5 | 4.5 |
| JB | 14 | 14 | 19 | 19 |
| Clamp Port：G Thread Unclamp Port：G Thread | G1/8 | G1/8 | G1/4 | G1/4 |
| O-ring | OR NBR-90 P5-N | OR NBR-90 P5-N | OR NBR-90 P7-N | OR NBR-90 P7-N |
| Cylinder Capacity cm³ Clamp | 16.6 | 25 | 46.9 | 83.2 |
| Cylinder Capacity cm³ Unclamp | 13 | 19.8 | 37.7 | 69.8 |
| Weight ※6 kg | 1.5 | 1.9 | 3.1 | 4.3 |

Note： ※6. It shows the weight of single clamp without the link lever.

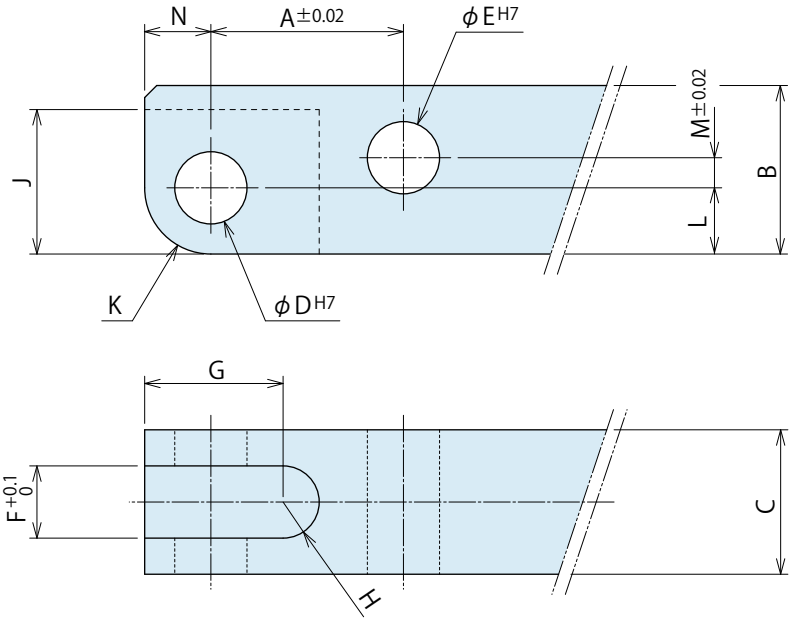
## Link Lever Design Dimensions

※ Reference for designing link lever.

Corresponding Model No.

LKM □ 0 - C (L C R)

1 Body Size




## Link Lever Design Dimension List

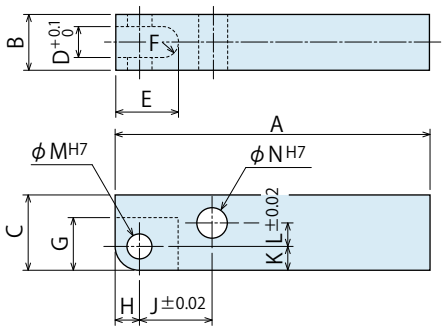
(mm)

| Corresponding Model No. | LKM0480 -C□-B□ | LKM0550 -C□-B□ | LKM0650 -C□-B□ | LKM0750 -C□-B□ |
|---|---|---|---|---|
| A | 18.5 | 21 | 24.5 | 30 |
| B | 16 | 20 | 25 | 32 |
| C | $12^{\ 0}_{-0.3}$ | $16^{\ 0}_{-0.3}$ | $19^{\ 0}_{-0.3}$ | $22^{\ 0}_{-0.3}$ |
| D | $6^{+0.012}_{\ 0}$ | $6^{+0.012}_{\ 0}$ | $8^{+0.015}_{\ 0}$ | $10^{+0.015}_{\ 0}$ |
| E | $6^{+0.012}_{\ 0}$ | $8^{+0.015}_{\ 0}$ | $10^{+0.015}_{\ 0}$ | $12^{+0.018}_{\ 0}$ |
| F | 6 | 8 | 10 | 11 |
| G | 13 | 12.5 | 16 | 20 |
| H | R3 | R4 | R5 | R5.5 |
| J | 13 | 13 | 17.5 | 22 |
| K | R6 | R6 | R8 | R10 |
| L | 6 | 6 | 8 | 10 |
| M | 3.5 | 6 | 7.5 | 9.5 |
| N | 6 | 6 | 8 | 10 |

Notes :

1. Link lever should be designed with its length according to performance curve.
2. If the link lever is not in accordance with the dimension shown above, its performance may be degraded, and damage can occur.
3. Please use the provided pin (equivalent to φADf6, φAEf6, HRC60) as the lever mounting pin.
   (Refer to external dimensions of the clamp body for the dimensions of φAD, φAE.)

## Accessory：Material Link Lever




### Model No. Indication

**LZK 048 0 – L**

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

(mm)

| Model No. | LZK0480-L | LZK0550-L | LZK0650-L | LZK0750-L |
|---|---|---|---|---|
| Corresponding Model No. | LKM0480 -C□-B□ | LKM0550-C□ -C□-B□ | LKM0650-C□ -C□-B□ | LKM0750-C□ -C□-B□ |
| A | 85 | 90 | 105 | 110 |
| B | $12^{0}_{-0.3}$ | $16^{0}_{-0.3}$ | $19^{0}_{-0.3}$ | $22^{0}_{-0.3}$ |
| C | 16 | 20 | 25 | 32 |
| D | 6 | 8 | 10 | 11 |
| E | 16 | 16.5 | 21 | 25.5 |
| F | R3 | R4 | R5 | R5.5 |
| G | 13 | 13 | 17.5 | 22 |
| H | 6 | 6 | 8 | 10 |
| J | 18.5 | 21 | 24.5 | 30 |
| K | 6 | 6 | 8 | 10 |
| L | 3.5 | 6 | 7.5 | 9.5 |
| M | $6^{+0.012}_{0}$ | $6^{+0.012}_{0}$ | $8^{+0.015}_{0}$ | $10^{+0.015}_{0}$ |
| N | $6^{+0.012}_{0}$ | $8^{+0.015}_{0}$ | $10^{+0.015}_{0}$ | $12^{+0.018}_{0}$ |

Notes：

1. Material : S45C　Surface Finishing：Alkaline Blackening
2. If necessary, the front end should be additionally machined and finished.
3. Please use the provided pin (equivalent to ϕADf6, ϕAEf6, HRC60) as the lever mounting pin.

## Cautions

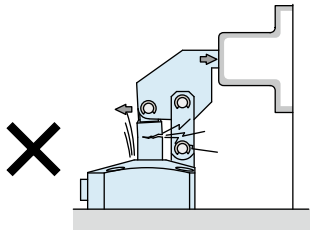
### Notes for Design

1) Check Specifications
- Please use each product according to the specifications.

2) Radio Regulations
- There are restrictions on countries where the product can be used according to radio regulations. Please follow the regulatory requirements of each country. LKM□-C□-B03 can be used in United States.

3) 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.60)
- Ensure there is no possibility of supplying hydraulic pressure to the clamp port and the unclamp port simultaneously.

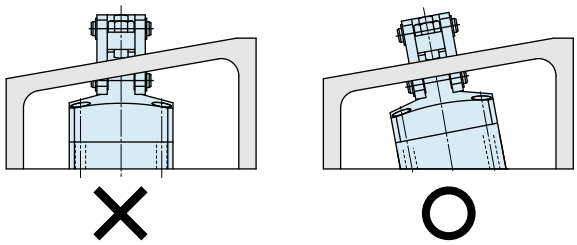
4) Notes for Link Lever Design
- Make sure no force is applied to the piston rod except from the axial direction. The usage like the one shown in the drawing below will apply a large bending stress to the piston rod and must be avoided.



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

5) Protect the exposed area of the piston rod and link plate when using on a welding fixture.
- If spatter attaches to the sliding surface it could lead to malfunction and fluid leakage.

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



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

8) Installation of Sequence Valve (model BZS)
- Please contact us when the sequence valve model BZS0200 needs to be installed on LKM0650-C□-B□ or LKM0750-C□-B□. In some cases, installation may not be possible due to conditions and combinations of the products.

### Notes for Usage

1) Do not cover the top surface of the sensing area with metal objects (chips, sludge, etc.). It may obstruct radio wave transmission. The cover is made of plastic material and should be protected from chips.

## Installation Notes

1) Check the Usable Fluid

- Please use the appropriate fluid by referring to the Hydraulic Fluid List (P.59).

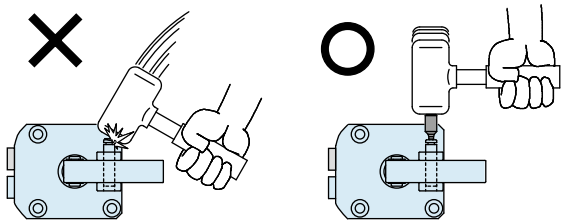
2) Installation of the Product

- 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. | Mounting Bolt Size | Tightening Torque (N·m) |
|---|---|---|
| **LKM0480-C□-B□** | M5×0.8 | 8.0 |
| **LKM0550-C□-B□** | M6×1 | 14 |
| **LKM0650-C□-B□** | M6×1 | 14 |
| **LKM0750-C□-B□** | M8×1.25 | 33 |

3) Installation / Removal of the Link Lever

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



4) Speed Adjustment

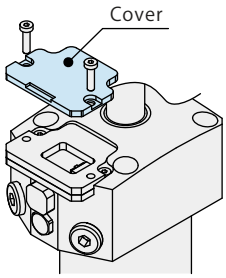
- Adjust the speed so that the total operating time is at least 1 second. If the clamp operates too fast the parts will be worn out leading to premature damage and ultimately complete equipment failure.
- Please make sure to release air from the circuit before adjusting speed. It will be difficult to 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.
- When using multiple wireless sensing clamps / linear cylinders, provide an operating time difference of 100msec (0.1 sec.) or more. Simultaneous operation may cause radio interference, which may result in failure to receive unclamp signals properly. For adjusting the unclamp operation, please use a speed control valve.

5) Initial Connection Settings for the Receiver

During setup, it is necessary to perform the initial connection settings between the clamp and the receiver. (For detailed instructions, please refer to the instruction manual of receiver YWA1000.)

When attaching or removing the cover, be very careful to avoid any seals being pinched. Loss of sealing ability may allow chips or coolant to infiltrate, preventing normal operation.

When reassembling, tighten the bolts with the specified torque (0.8 N・m) using the attached bolts.




6) Cautions for Repeater Installation

The maximum distance between the clamp and the receiver is 5 meters. Check the radio wave strength displayed on the receiver and consider the location of the repeater. (Recommended Threshold：−85dBm)

It is recommended to install the repeater in locations such as the upper part inside the processing machine, where it is less likely to be exposed to coolant or chips.

Guidelines for Repeater Installation

① When the receiver cannot be installed at a height of 2 meters or more.
② When there is a radio wave obstruction between the clamp and the receiver.
③ When the clamp and the receiver are more than 3 meters apart.

※ Please refer to P.59 for common cautions.
・Installation Notes ・Hydraulic Fluid List ・Notes on Hydraulic Cylinder Speed Control Circuit
・Notes on Handling ・Maintenance/Inspection ・Warranty

# Wireless Sensing Receiver • Repeater

Receiver Model YWA
Repeater Model YWB


## System Configuration Products Required for Wireless Sensing

### Model No. Indication


Receiver

**YWA 100 0 – B03 – E**
(1) (2) (3) (4)

**1 Classification**

**100**：Standard Model

**2 Design No.**

**0** ：Revision Number

**3 Available Country：Frequency**

**B03** ： United States
**B01** ： Japan
**B02** ： China

※ There are restrictions on countries where the product can be used according to radio regulations. Please follow the regulatory requirements of each country.

**4 Monitor Display Language**

**E** ： English
**J** ： Japanese
**C** ： Chinese (Simplified)

Repeater

**YWB 100 0 – B03**
(1) (2) (3)

**1 Classification**

**100**：Standard Model

**2 Design No.**

**0** ：Revision Number

**3 Available Country：Frequency**

**B03** ： United States
**B01** ： Japan
**B02** ： China

※ There are restrictions on countries where the product can be used according to radio regulations. Please follow the regulatory requirements of each country.

## System Configuration Diagram

### Customer Preparation (Machine Side)

**Command Signal from Machine Side**
Signal to control the receiver.
Reset Signal for Clamping State

**Power DC24V**

**Clamping State Signal to Machine Side**
Signal to identify the clamp operation.
Unclamp Signal of 1st Clamp
Unclamp Signal of 2nd Clamp
⋮
Unclamp Signal of 8th Clamp

**Power DC24V**

**2-Circuit Hydraulic System**
Clamp Hyd. Pressure
Unclamp Hyd. Pressure

### Place : Outside Machine

**Receiver**
Clamp・Linear Cylinder
Max. Number of Connections：8

Input Connector
Output Connector


Transmit an unclamp/ stroke-end signal by radio wave

### Place : Near Fixture
Inside the Processing Machine

**Repeater**
Improves radio wave strength and reliability.

Transmit an unclamp/ stroke-end signal by radio wave

### Place : Near Fixture

**Wireless Sensing Clamp/ Linear Cylinder**

※ Max. distance between the clamp and the receiver : 5m
(when there is no obstruction.)

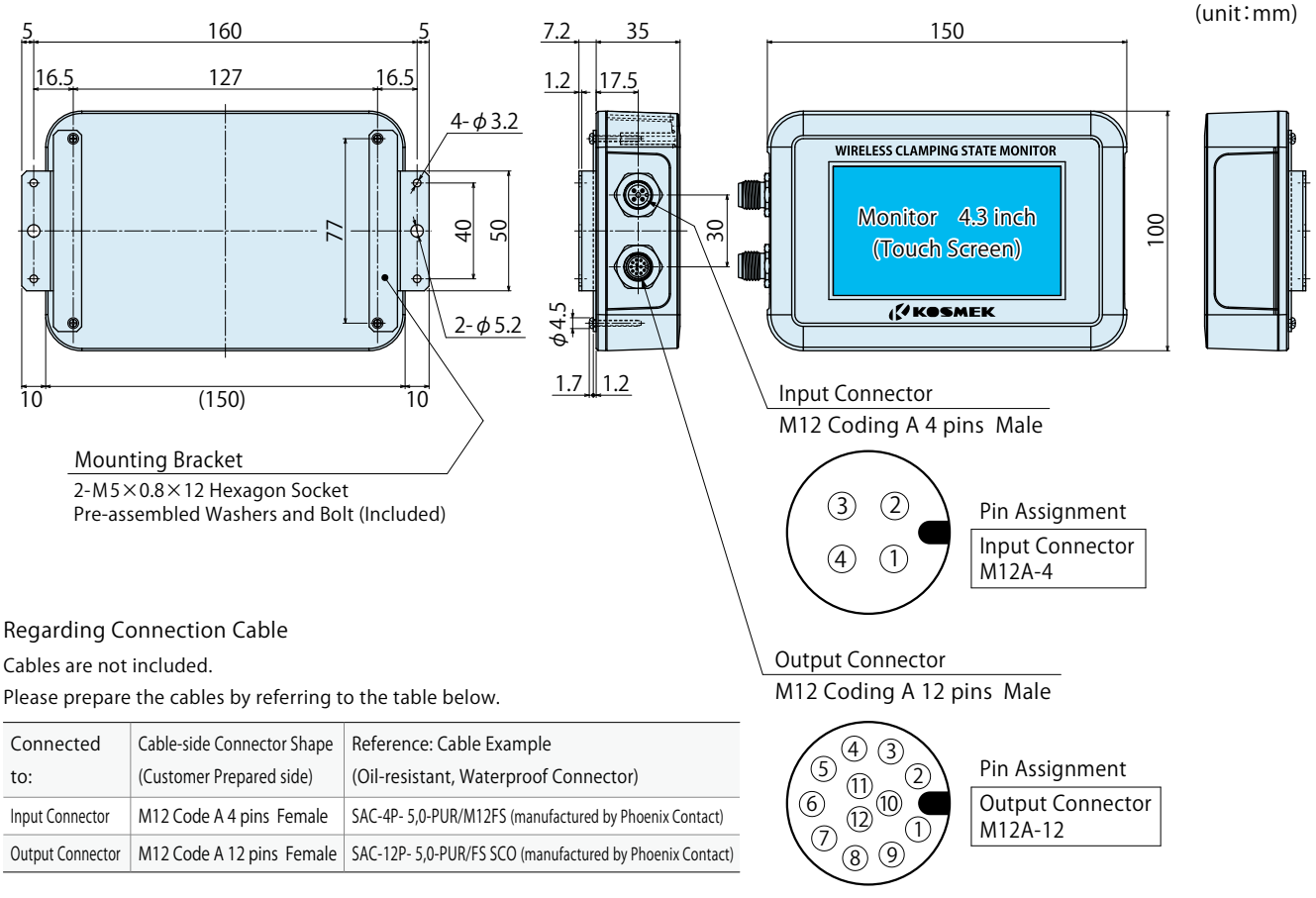
## Specifications : Receiver model YWA1000-B□-□


This receiver receives unclamp and stroke-end confirmation signals from wireless sensing clamps, linear cylinders (model LHM / LKM / LLM), and repeater (model YWB) and displays them on a monitor and outputs them to an external device.
Clamping state, operating time, and radio wave condition can be checked on the monitor.
The output contact can be turned off and the operating time can be reset by switching the clamping state reset.

| Model No. | | YWA1000-B□-□ |
|---|---|---|
| Receiving Frequency | | 3 When selecting **B03** : 902MHz Band |
| | | 3 When selecting **B01** : 920MHz Band |
| | | 3 When selecting **B02** : 868MHz Band |
| Receiving Sensitivity | | −85dBm(25℃) |
| Number of Receivable Connections (Number of Wireless Sensing Clamps / Linear Cylinders Connected) | | Up to 8 units |
| Response Time | | ≦100msec (from wireless detection to state output) |
| Number of Simultaneous Wireless Signals Received | | 1 |
| Power Supply | | DC24V±20% 0.6A |
| Operating Temperature and Humidity | | −10℃ ~ 60℃ ・ 90% or less (at 40℃) |
| Storage Temperature and Humidity | | −20℃ ~ 70℃ ・ 90% or less (at 60℃) |
| Clamping State Output | Number of Outputs | 8 (M12 Coding A 12 pins) |
| | Output Attributes | 8-output collective common (PNP/NPN switchable) |
| | Output Ratings | MAX DC24V±10% 0.45A |
| | Output Protection | Built-in overvoltage and overcurrent protection elements |
| Clamping State Reset Input | Number of Inputs | 1 (M12 Coding A 4 pins) |
| | Input Terminals | Operation-end reset input by the signal linked with lock operation ON |
| | Input Attributes | External voltage input optocoupler (MAX DC24V) |
| Weight | | 500 g (including mounting bracket) |

## External Dimensions

(unit：mm)

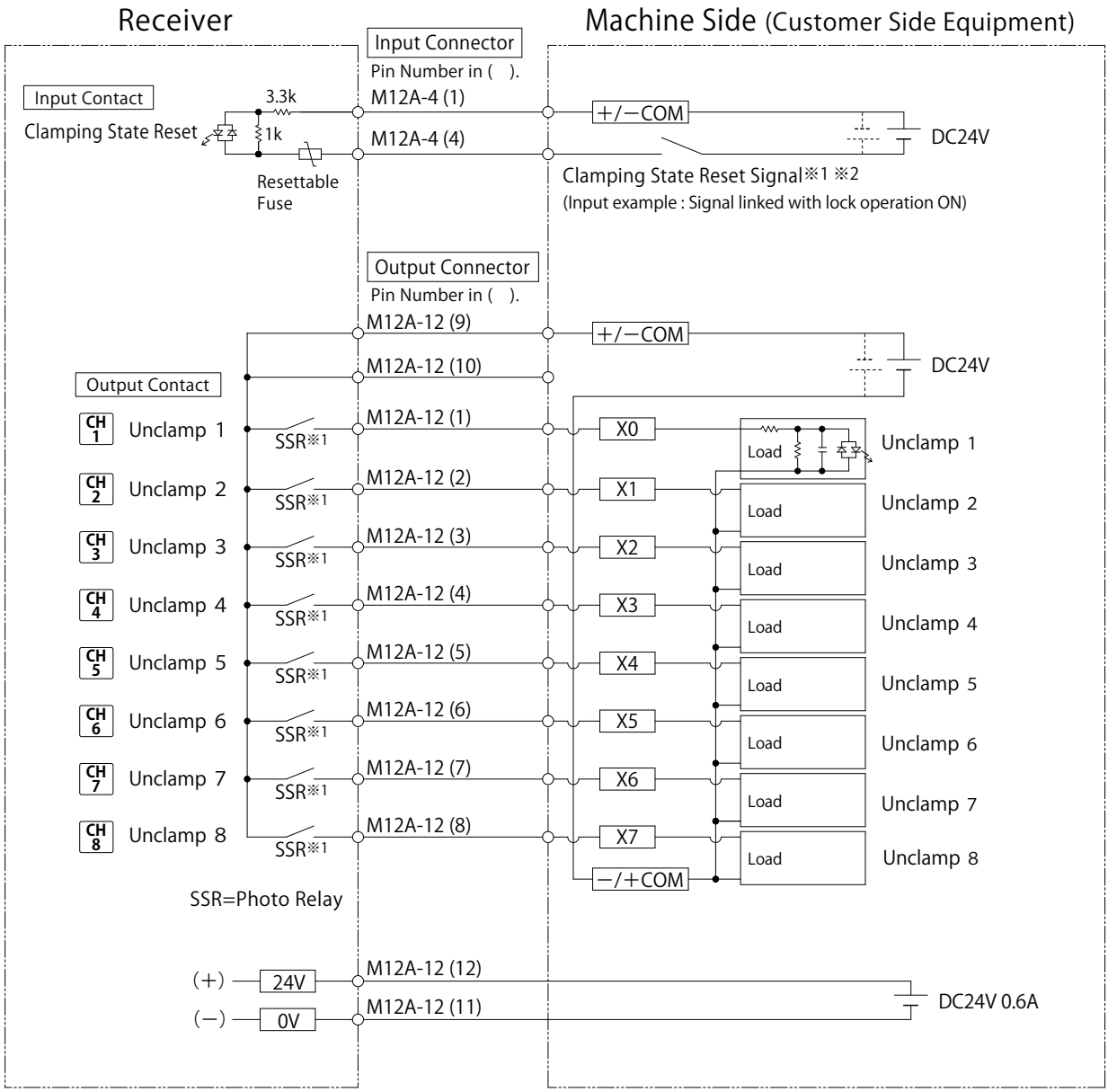



### Regarding Connection Cable

Cables are not included.
Please prepare the cables by referring to the table below.

| Connected to: | Cable-side Connector Shape (Customer Prepared side) | Reference: Cable Example (Oil-resistant, Waterproof Connector) |
|---|---|---|
| Input Connector | M12 Code A 4 pins Female | SAC-4P- 5,0-PUR/M12FS (manufactured by Phoenix Contact) |
| Output Connector | M12 Code A 12 pins Female | SAC-12P- 5,0-PUR/FS SCO (manufactured by Phoenix Contact) |

## Interface Diagram between Machine Tool and Receiver




Notes :

1. If the receiver power is turned OFF (in case of power failure), 'Unclamp 1-8' will be OFF (contact open). When power is restored, reactivate clamps or linear cylinders to resume operation.
2. If the clamps or linear cylinder inadvertently move from the operation ends, the corresponding unclamp signals will be turned OFF (contact open).

※1. When switching the clamping state reset signal ( ON→OFF or OFF→ON ), 'Unclamp 1-8' will be OFF (contact open). Also, the operating time of the receiver will be reset to "0".

※2. The clamping state reset signal is required in this system to ensure proper operating detection.

## Accessory (Sold Separately : Wall-Mounted Magnet)

Model No. Indication

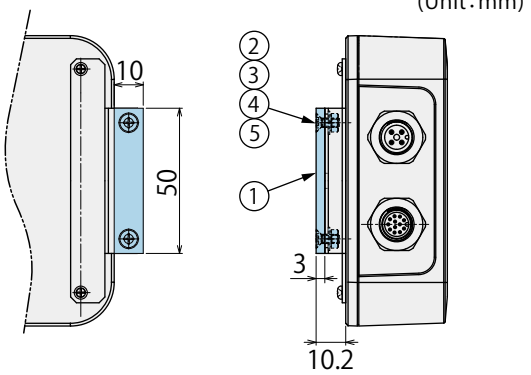
**YL0270**

Design No.
(Revision Number)

| Model No. | No. | Name | | Quantity |
|---|---|---|---|---|
| YL0270 | ① | Neodymium Magnet | | 2 |
| | ② | Phillips Head Countersunk Screw | M3×0.5×8 | 4 |
| | ③ | Hex Nut | M3×0.5×8 | 4 |
| | ④ | Spring Washer | M3 JIS | 4 |
| | ⑤ | Flat Washer | M3 | 4 |

YL0270 Mounting Dimensions

(Unit：mm)



## Cautions for Receiver

1) Radio Regulations

There are restrictions on countries where the product can be used according to radio regulations.
Please follow the regulatory requirements of each country. YWA1000-B03-□ can be used in United States.

2) Please read the instruction manual (IM-YWA001-00□E) carefully before designing and setting up.

The instruction manual can be downloaded from Kosmek website (product page for LHM/LKM/LLM/YWA/YWB).

- Screen Display and Operation Method

  Please refer to the instruction manual for the screen display and operation method of the receiver.

- Initial Connection Settings

  Initial connection settings are required to connect the receiver with the wireless sensing clamp/linear cylinder.
  Please refer to the instruction manual for the setting method.


- Control Design and Electrical Circuit Design

  Please check the operation timing chart in the instruction manual and design the appropriate control and electrical circuit.

- Repeater Configuration

  After completing the initial connection settings between the clamp/linear cylinder and the receiver, please proceed with the settings for the receiver and the repeater.
  Please refer to the instruction manual for the configuration method.

3) Cautions for Repeater Installation

- The maximum distance between the clamp and the receiver is 5 meters.
  Check the radio wave strength displayed on the receiver and consider the location of the repeater.
  (Recommended Threshold：−85dBm)
- It is recommended to install the repeater in locations such as the upper part inside the processing machine, where it is less likely to be exposed to coolant or chips.

[ Guidelines for Repeater Installation ]

- When the receiver cannot be installed at a height of 2 meters or more.
- When there is a radio wave obstruction between the clamp/linear cylinder and the receiver.
- When the clamp/linear cylinder and the receiver are more than 3 meters apart.

※ Please refer to P.61 for common cautions. ・Notes on Handling ・Maintenance/Inspection ・Warranty

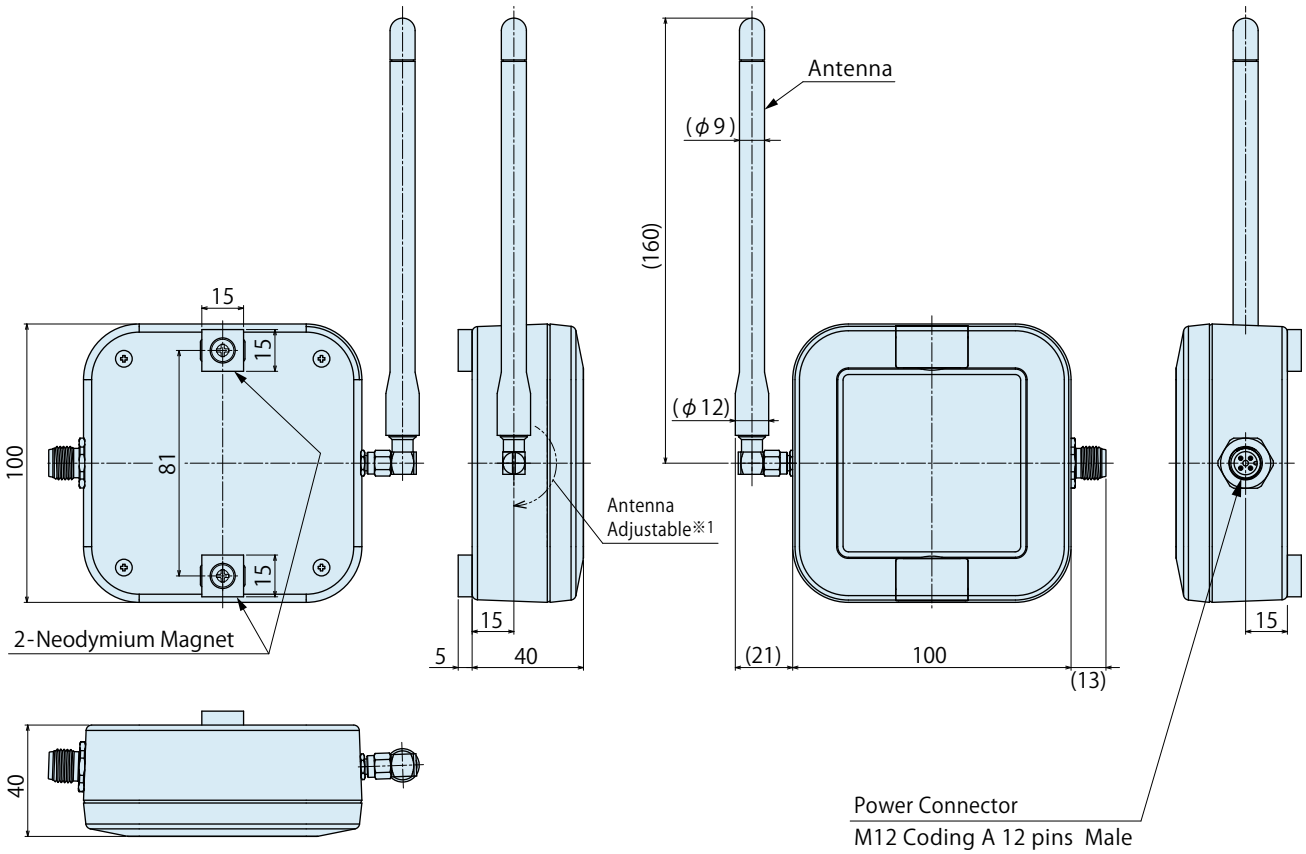
## Specifications : Repeater model YWB1000-B□

This repeater receives wireless signals for unclamp and stroke-end confirmation from the wireless sensing clamp (model LHM / LKM / LLM), amplifies the radio signal strength, and transmits them to the receiver (model YWA).

| Model No. | | YWB1000−B□ |
|---|---|---|
| Receiving Frequency | | 3 When selecting **B03** : 902MHz Band |
| | | 3 When selecting **B01** : 920MHz Band |
| | | 3 When selecting **B02** : 868MHz Band |
| Receiving Sensitivity | | −85dBm(25℃) |
| Number of Simultaneous Wireless Connections | | 1 |
| Operating Temperature and Humidity | | −10℃ ~ 60℃ ・ 90% or less (at 40℃) |
| Storage Temperature and Humidity | | −20℃ ~ 70℃ ・ 90% or less (at 60℃) |
| Power Input | Connector | M12 Coding A 4 pins |
| | Power | DC24V±20% 0.3A |
| Weight | | 300g |
| Waterproof Rating | | Equivalent to IPX7<br>(when the housing is completely closed and a waterproof connector is attached) |

## External Dimensions

(unit：mm)




Note :

※1. Loosen the nut to change the direction of the antenna.

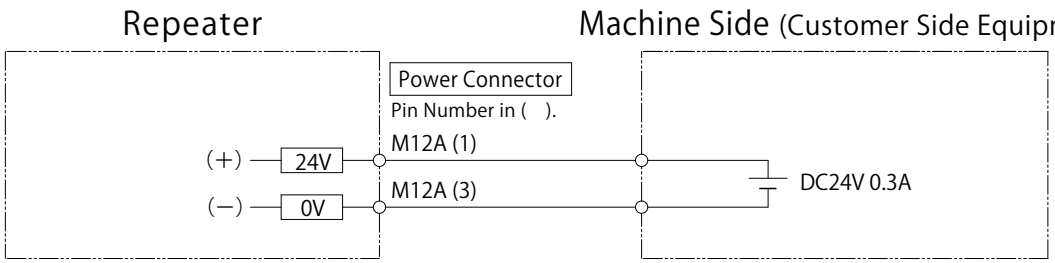
### Regarding Connection Cable

Cables are not included.

Please prepare the cables by referring to the table below.

| Connected to: | Cable-side Connector Shape (Customer Prepared side) | Reference: Cable Example (Oil-resistant, Waterproof Connector) |
|---|---|---|
| Power Connector | M12 Code A 4 pins Female | SAC-4P- 5,0-PUR/M12FS (manufactured by Phoenix Contact) |

## Interface Diagram of Repeater




## Cautions for Repeater

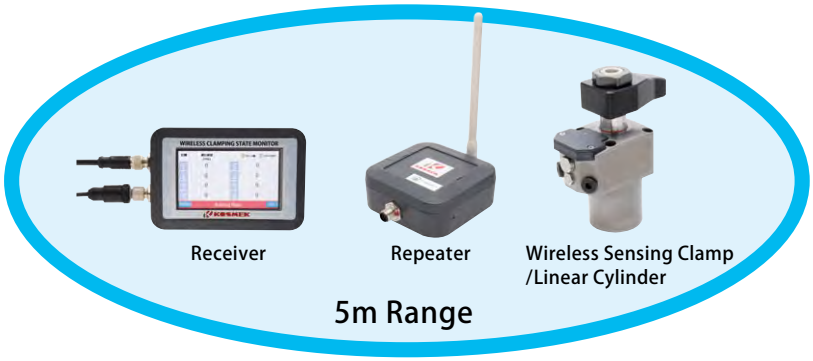
1. Radio Regulations
   There are restrictions on countries where the product can be used according to radio regulations.
   Please follow the regulatory requirements of each country. YWB1000-B03 can be used in United States.

2. Repeater Configuration
   After completing the initial connection settings between the clamp/linear cylinder and the receiver,
   please proceed with the settings for the receiver and the repeater.
   Please refer to the instruction manual of the receiver YWA (IM-YWA000-□E) for the configuration method.

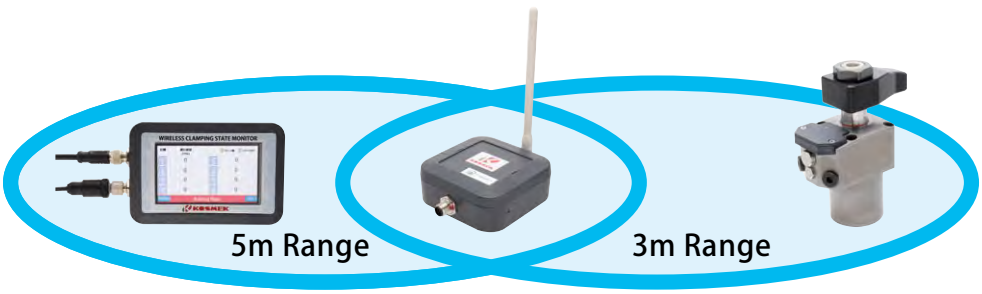
3. Cautions for Repeater Installation
   - The maximum distance between the clamp and the receiver is 5 meters. Check the radio wave strength displayed on the receiver and consider the location of the repeater. (Recommended Threshold：-85dBm)
     It is recommended to install the repeater in locations such as the upper part inside the processing machine, where it is less likely to be exposed to coolant or chips.

[ Guidelines for Repeater Installation ]
- When the receiver cannot be installed at a height of 2 meters or more.
- When there is a radio wave obstruction between the clamp/linear cylinder and the receiver.
- When the clamp/linear cylinder and the receiver are more than 3 meters apart.

○




○

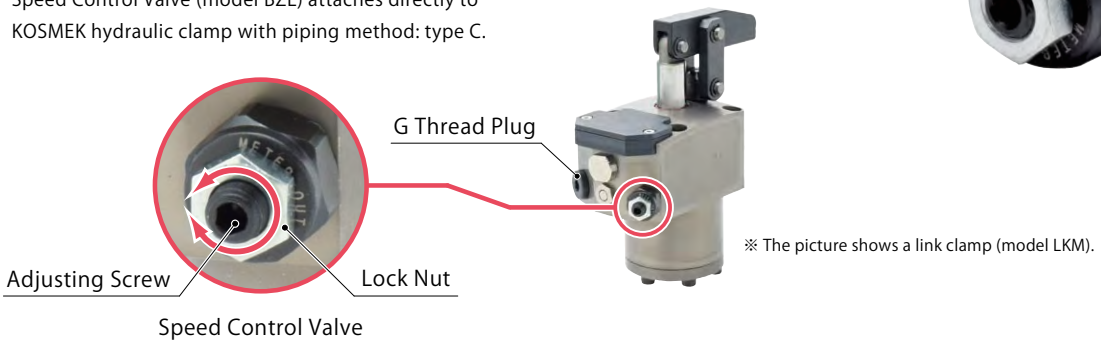



※ Please refer to P.61 for common cautions. ・Notes on Handling ・Maintenance/Inspection ・Warranty

## Speed Control Valve (For Low Pressure)

### Directly Mounted to Clamps / Cylinders

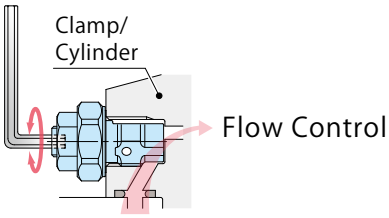
Speed Control Valve (model BZL) attaches directly to KOSMEK hydraulic clamp with piping method: type C.



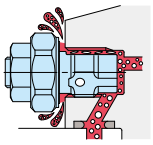

※ The picture shows a link clamp (model LKM).

### Action Description

Control the flow with a wrench. Able to change the operating speed of a clamp/cylinder individually.




Able to release the air in the circuit by loosening the Speed Control Valve.



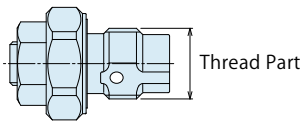
## Model No. Indication (Speed Control Valve for Low Pressure)

**BZL 0 10 1 - B**

1 2 3

### 1 G Thread Size

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




### 2 Design No.

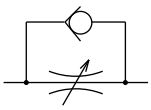
**1** : Revision Number

### 3 Control Method

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

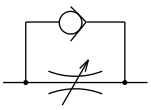
**B**

Circuit Symbol : Meter-out




**A**

Circuit Symbol : Meter-in




※1. Flow control circuit for double-acting clamp/cylinder should have meter-out circuits for both the clamp and unclamp sides (except model LKE/TLA/TMA). Meter-in circuits can be adversely affected by any air in the system.

## Specifications

| Model No. | | BZL0101-B | BZL0201-B | BZL0101-A | BZL0201-A |
|---|---|---|---|---|---|
| Max. Operating Pressure | MPa | 7 | | | |
| Withstanding Pressure | MPa | 10.5 | | | |
| Control Method | | Meter-out | | Meter-in | |
| G Thread Size | | G1/8A | G1/4A | G1/8A | G1/4A |
| Cracking Pressure | MPa | 0.12 | | 0.04 | |
| Max. Passage Area | $mm^2$ | 2.6 | 5.0 | 2.6 | 5.0 |
| Usable Fluid | ℃ | 0 ~ 70 | | | |
| Operating Temperature | | General Hydraulic Oil Equivalent to ISO-VG-32 | | | |
| Tightening Torque for Main Body | N·m | 10 | 25 | 10 | 25 |
| Weight | g | 12 | 26 | 12 | 26 |

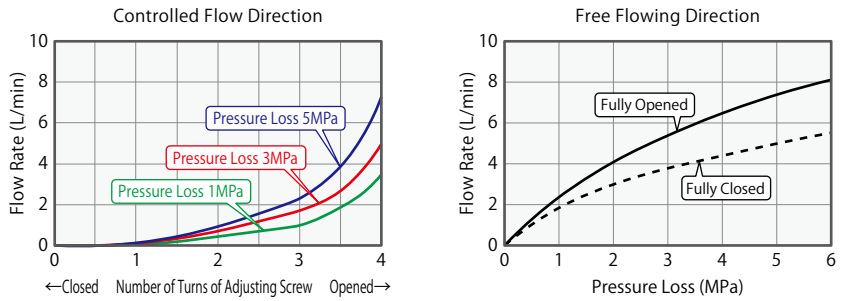
Notes : 1. It must be mounted with recommended torque. Because of the structure of the metal seal, if mounting torque is insufficient, the flow control valve may not be able to adjust the flow rate.
2. Do not attach a used BZL to other clamps/cylinders. Flow control will not be made because the bottom depth difference of G thread makes metal seal insufficient.

## Applicable Products

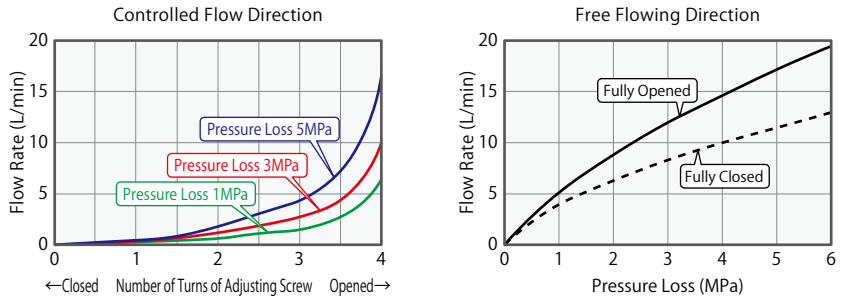
| Model No. | LHM (Double Action) Swing Clamp | LKM (Double Action) Link Clamp | LLM (Double Action) Linear Cylinder |
|---|---|---|---|
| **BZL0101-B** | LHM0480-C□-B□<br>LHM0550-C□-B□ | LKM0480-C□-B□<br>LKM0550-C□-B□ | LLM0480-C□□-B□-□<br>LLM0550-C□□-B□-□ |
| **BZL0101-A** | (LHM0480-C□-B□)<br>(LHM0550-C□-B□) | (LKM0480-C□-B□)<br>(LKM0550-C□-B□) | (LLM0480-C□□-B□-□)<br>(LLM0550-C□□-B□-□) |
| **BZL0201-B** | LHM0650-C□-B□<br>LHM0750-C□-B□ | LKM0650-C□-B□<br>LKM0750-C□-B□ | |
| **BZL0201-A** | (LHM0650-C□-B□)<br>(LHM0750-C□-B□) | (LKM0650-C□-B□)<br>(LKM0750-C□-B□) | |

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

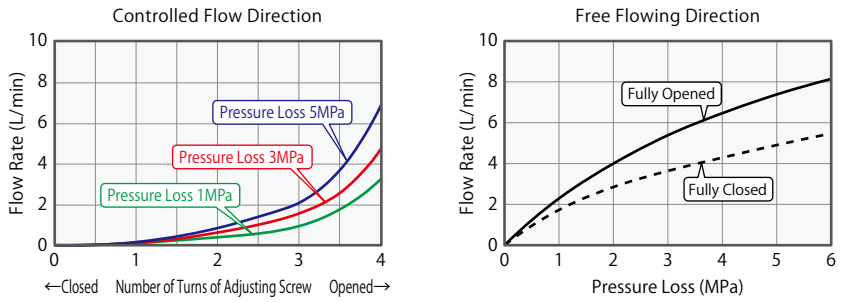
### BZL0101-B : Meter-out



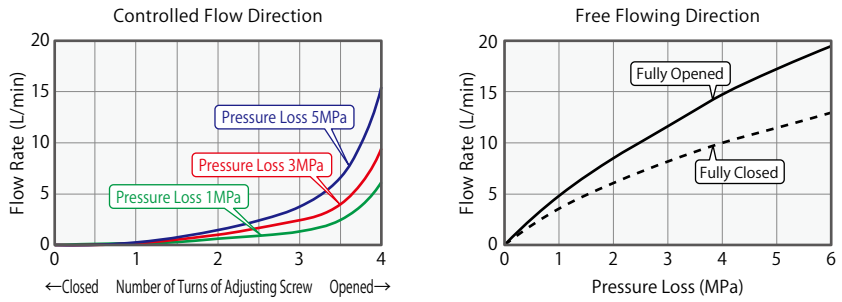

### BZL0201-B : Meter-out



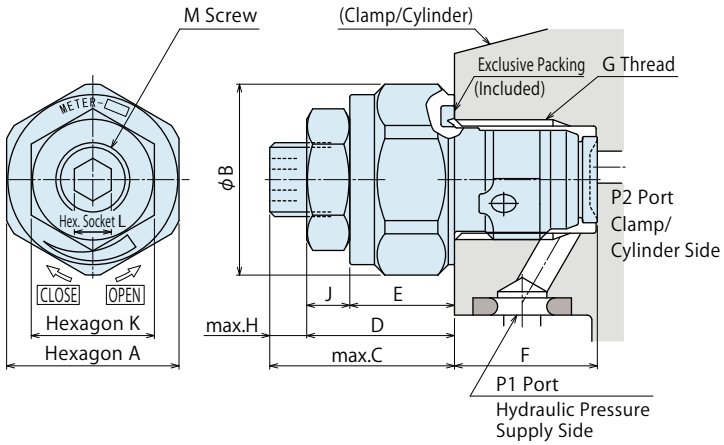

### BZL0101-A : Meter-in




### BZL0201-A : Meter-in



## External Dimensions




(mm)

| Model No. | BZL0101-□ | BZL0201-□ |
|---|---|---|
| A | 14 | 18 |
| B | 15.5 | 20 |
| C | 15 | 16 |
| D | 12 | 13 |
| E | 8.5 | 9.5 |
| F | (11.6) | (15.1) |
| G | G1/8 | G1/4 |
| H | 3 | 3 |
| J | 3.5 | 3.5 |
| K | 10 | 10 |
| L | 3 | 3 |
| M (Nominal×Pitch) | M6×0.75 | M6×0.75 |

## 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.60)
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.)
3. Flow control circuit for double-acting clamp/cylinder should have meter-out circuits for both the clamp and unclamp sides (except model LKE/TLA/TMA). Meter-in circuits can be adversely affected by any air in the system.

## 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.

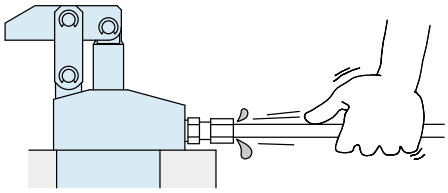
3) Applying Sealing Tape

- 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.

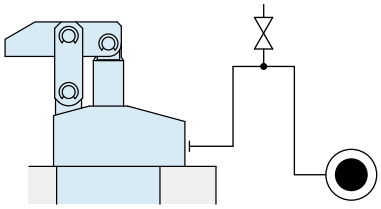
4) Air Bleeding of the Hydraulic Circuit

- 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 | |

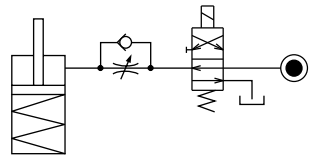
Note : Please contact manufacturers when customers require products in the list above.

## Notes on Hydraulic Cylinder Speed Control Unit

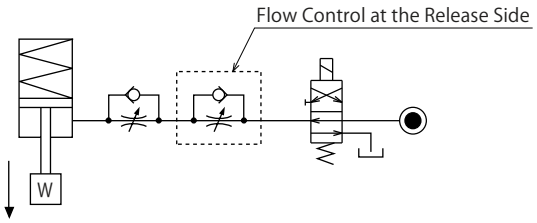
Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

### 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.



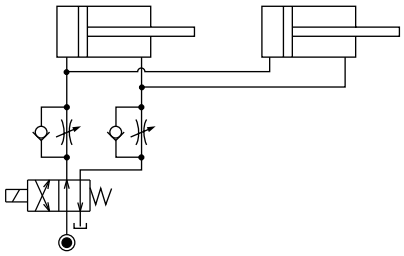
Accelerated clamping speed by excessive hydraulic flow to the cylinder may sustain damage. In this case add flow control to regulate flow. (Please add flow control to release flow if the lever weight is put on at the time of release action when using swing clamps.)



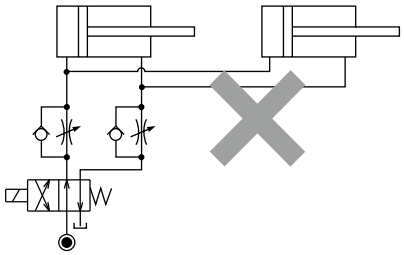

### Flow Control Circuit for Double Acting Cylinder

Flow control circuit for double-acting cylinder (except LKE/LSE/TLA/TLB/TMA/TLV/TMV/TTA) should have meter-out circuits for both the lock and release sides. Meter-in control can have adverse effect by presence of air in the system. However, in the case of controlling LKE, LSE, TLA, TLB, TMA, TLV, TMV, TTA both lock side and release side should be meter-in circuit.
If meter-out circuit is used for TLA, TLB, TMA, TLV, TMV, TTA, abnormal high pressure is created, which causes oil leakage and damage.

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

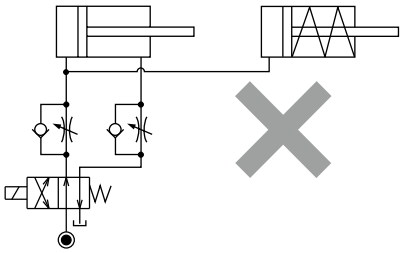


【Meter-in Circuit】(LKE/LSE/TLA/TLB/TMA/TLV/TMV/TTA must be controlled with meter-in.)



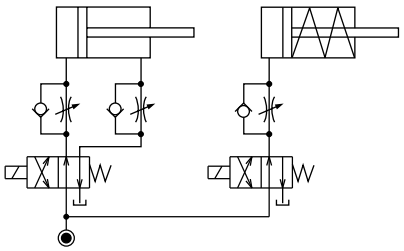
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

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

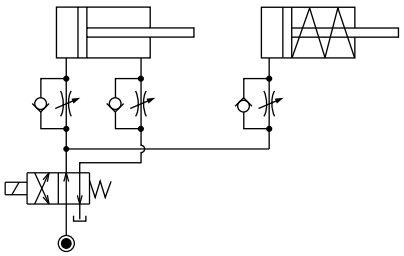


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

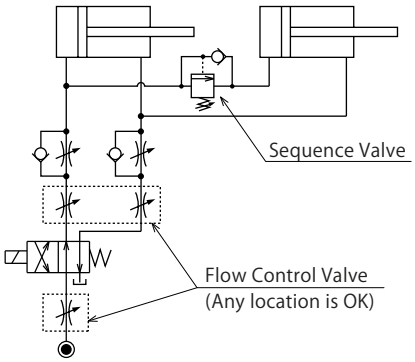
○ Separate the control circuit.



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



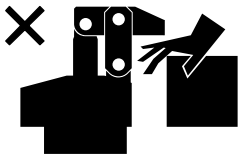
## Cautions

### Notes on Handling

1) It should be operated by qualified personnel.
- Machines and devices with hydraulic and pneumatic products should be operated and maintained by qualified personnel.

2) Do not operate or remove the product unless the safety protocols are ensured.
① Machines and devices 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 trouble/issue in the bolts and respective parts before restarting a machine or device.

3) Do not touch a clamp (cylinder) while it is working.
Otherwise, your hands may be injured due to clinching.

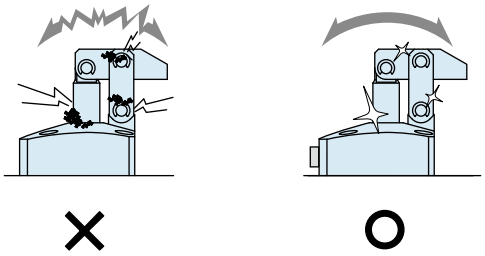


4) Do not disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

### 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.
- If it is used when the surface is contaminated with dirt, it may lead to packing seal damage, malfunctioning and fluid leakage.



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

4) Regularly tighten pipe line, mounting bolt, nut, snap ring, cylinder and others to ensure proper use.

5) Make sure the hydraulic fluid has not deteriorated.

6) 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.

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

8) Please contact us for overhaul and repair.

## Warranty

1) Warranty Period

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

2) Warranty Scope

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

① If the stipulated maintenance and inspection are not carried out.
② If the product is used while it is not suitable for use based on the operator's judgment, resulting in defect.
③ If it is used or 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.

KOSMEK
Harmony in Innovation

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

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