New | # Wireless Sensing Clamp
Swing / Link Clamp · Linear Cylinder

HYD. LOCK / HYD. RELEASE

Swing Clamp
model **LHM**

Link Clamp
model **LKM**

Linear Cylinder
model **LLM**

Wirelessly Detect Unclamp Position

No External Power Supply

Required for Sensor

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Harmony in Innovation

NEW

HYD. LOCK / HYD. RELEASE
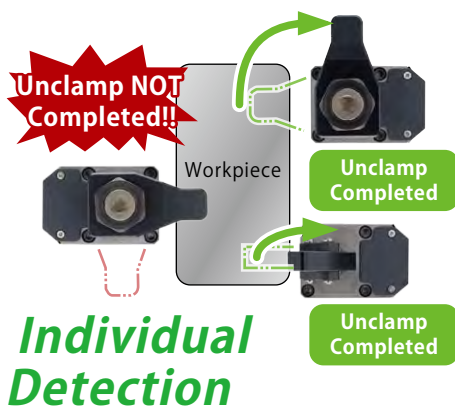
Wireless Sensing Clamp

Swing Clamp
model **LHM**

Link Clamp
model **LKM**

Linear Cylinder
model **LLM**

Wirelessly Detect Unclamp Position

No External Power Supply Required for Sensor

Unclamp NOT Completed!!

Workpiece

Unclamp Completed

Unclamp Completed

Individual Detection

Separate unclamp detection is possible for each clamp.

Clamp in a Processing Machine

Waterproof Rating

Equivalent to **IPX7**

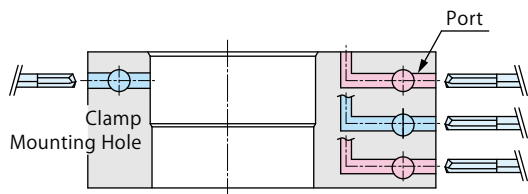※ Shows the protection level of the sensor.
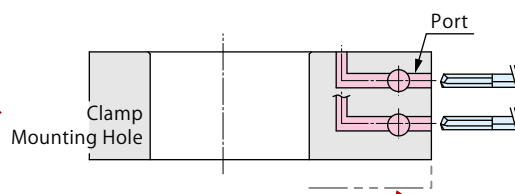
Response Time
0.1sec.

Quick Response※

※ Compared with our conventional air sensing clamps.

Minimized Number of Ports

Solution to fixture port shortage.

Port

Clamp
Mounting Hole

With Wireless Sensing

Port

Clamp
Mounting Hole

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.
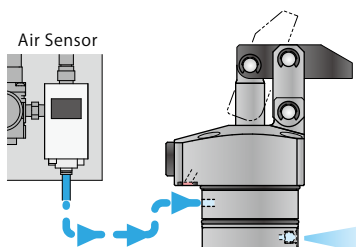
With Wireless Sensing

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.

Air Sensor

With Wireless Sensing
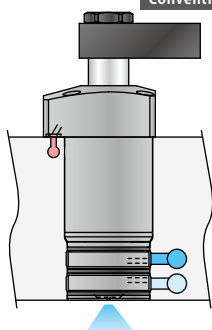
WIRELESS CLAMPING STATE MONITOR

KOSMEK

Consumes air for detection.
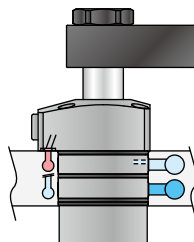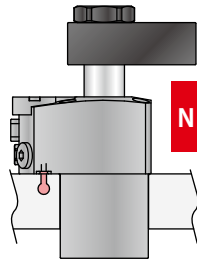
※ Using our conventional air sensing clamp.
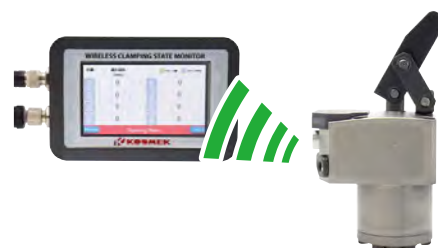
Detects wirelessly, zero air consumption.

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 Swing Clamp

Hydraulic Double Action

Model LHM

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** Inside the Processing Machine	**Place：Fixture**

Amplify and transmit the signal

Transmit unclamp signal by radio wave

WIRELESS CLAMPING STATE MONITOR

KOSMEK

Action Description

Before Swing
(Unclamped State)

The lever descends as it swings.
(Swing Stroke Range)

After swing completion,
it descends vertically.
(Vertical Stroke Range)

Action completed
(Clamped State)

KOSMEK Harmony in Innovation

Wireless Sensing Clamp

Accessory

Common Cautions

Wireless Sensing Swing Clamp
LHM

Wireless Sensing Link Clamp
LKM

Wireless Sensing Linear Cylinder
LLM

Receiver・Repeater
YWA
YWB

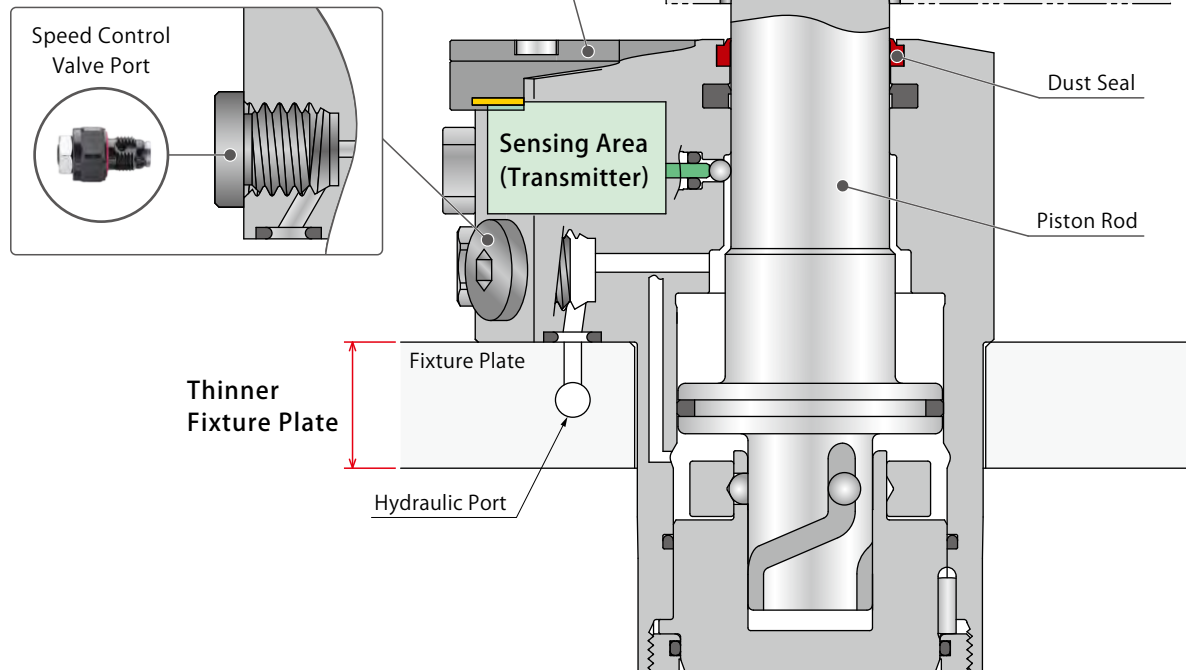◉ **Cross Section** ※ This drawing shows Model LHM-C□-B□.

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.)

Speed Control Valve Port

Cover

Sensing Area (Transmitter)

Taper Sleeve

Swing Lever (Prepared by Customer)

Dust Seal

Piston Rod

Thinner Fixture Plate

Fixture Plate

Hydraulic Port

High Speed and High Endurance with Rotation Mechanism

The resistance created by the swing action is minimized by having the outer race rotates in accordance with the steel ball movement.
High endurance is achieved by enlarging rod diameter which decreases torque and by using bigger steel balls and making the lead groove.
(Position repeatability for swing is within ±0.5°.)

Cam Shaft (Piston Rod)

Lead Groove
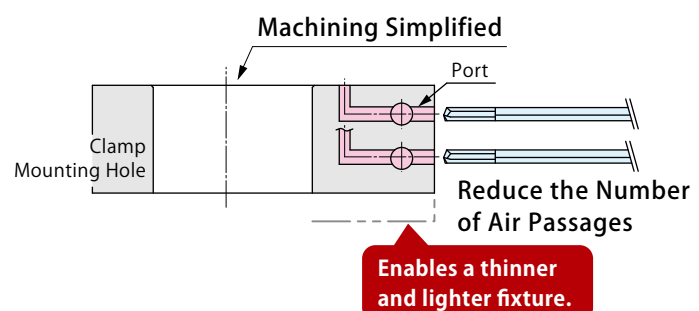
Outer Race

Steel Ball

Ball Guide Area
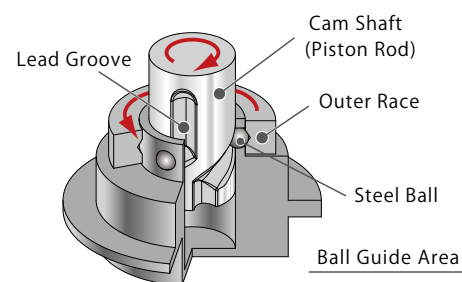
Zero Air Consumption

Detects unclamp position via wireless communication.
Unlike our conventional air sensing clamps, air for action confirmation is not required.
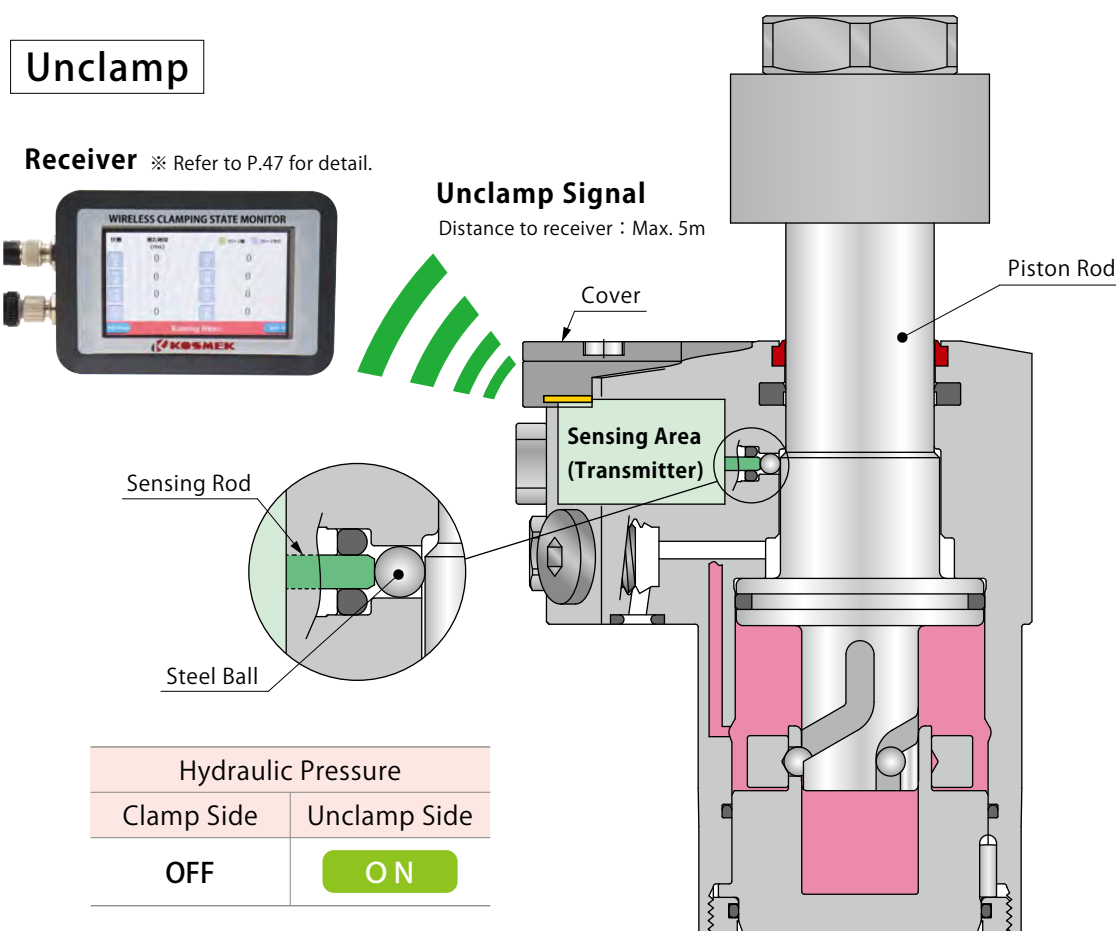
Minimized Number of Ports・Simple Machining

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.

WIRELESS CLAMPING STATE MONITOR

KOSMEK

Machining Simplified

Port

Clamp Mounting Hole

Reduce the Number of Air Passages

Enables a thinner and lighter fixture.

⬤ **Action Description (Internal Structure)** ※ The figure shows Model LHM-C☐-B☐.

Unclamp

Receiver ※ Refer to P.47 for detail.

Unclamp Signal
Distance to receiver：Max. 5m

Cover

Piston Rod

**Sensing Area
(Transmitter)**

Sensing Rod

Steel Ball

Hydraulic Pressure	
Clamp Side	Unclamp Side
OFF	**O N**

■ Unclamp (During Hydraulic Pressure Supply to Unclamping Port)

The piston rod ascends vertically (Vertical Stroke Range).

↓

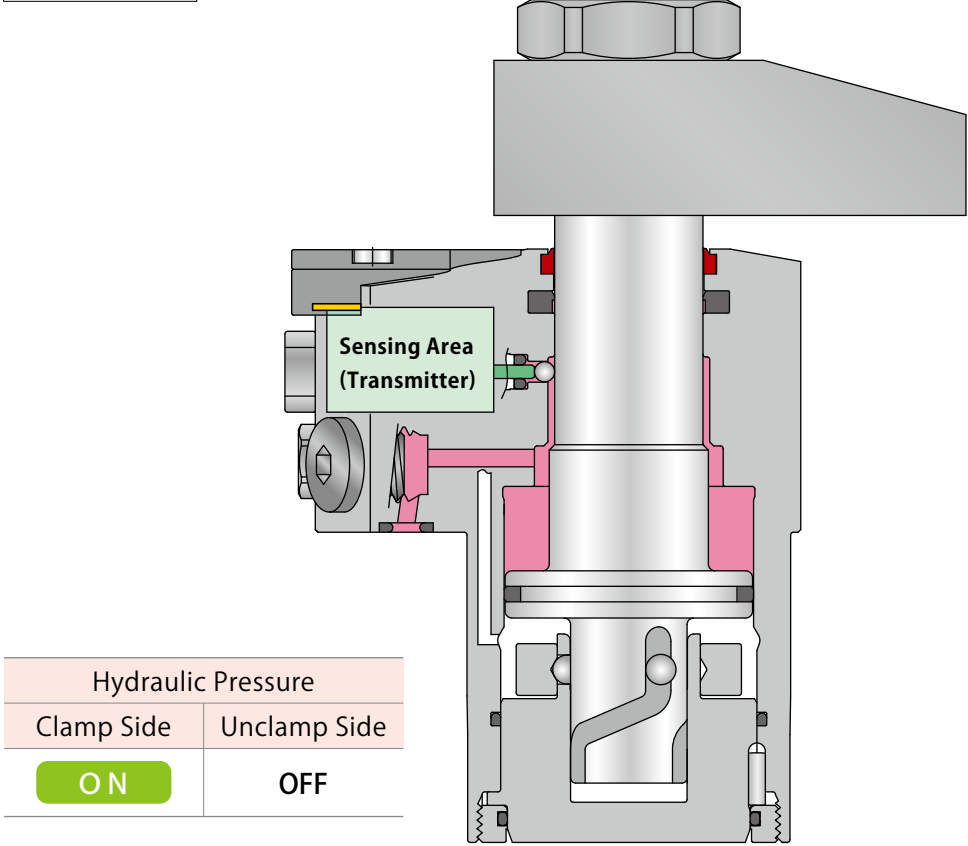After vertical action is completed, the piston rod ascends as it swings.

↓

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.

Wireless Sensing Clamp

Accessory

Common Cautions

Wireless Sensing Swing Clamp
LHM

Wireless Sensing Link Clamp
LKM

Wireless Sensing Linear Cylinder
LLM

Receiver・Repeater
YWA
YWB

Clamp

Sensing Area (Transmitter)

Hydraulic Pressure	
Clamp Side	Unclamp Side
O N	OFF

■ Clamp (During Hydraulic Pressure Supply to Clamping Port)

The piston rod descends as it swings (Swing Stroke Range).

↓

After swing action is completed, the piston rod descends vertically to clamp the workpiece.

※ Make sure to clamp a workpiece within the vertical stroke range.

◉ Model No. Indication

L H M 048 0 - C R - 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).

φD
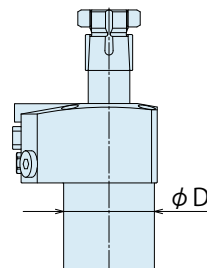
2 Design No.

0　：Revision Number

3 Piping Method

C　：Gasket Option (With G Thread Plug)
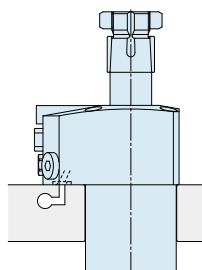
※ Speed control valve (BZL) is sold separately.
　Please refer to P. 55.

With G Thread Plug
Able to attach speed control valve

4 Swing Direction when Clamping

R：Clockwise
L：Counter-Clockwise
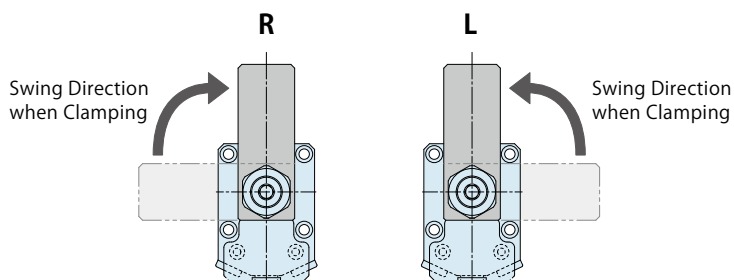
R　　　　**L**

Swing Direction when Clamping　　　　Swing Direction when Clamping

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.

| Features | Cross Section | Action Description | Model No. / Specification | Performance Curve | External Dimensions | Lever Design Dimensions Accessory | Cautions |

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● Specifications

Model No.		LHM0480−C□−B□	LHM0550−C□−B□	LHM0650−C□−B□	LHM0750−C□−B□
Cylinder Area for Clamping	cm²	6.95	10.3	13.4	20.3
Cylinder Inner Diameter ※1	mm	37	44	51	62
Rod Diameter ※1	mm	22	25	30	35.5
Clamping Force ※2 (Calculation Formula)	kN	$F=\dfrac{P(1-0.0009\times L)}{1.4892+0.0018\times L}$	$F=\dfrac{P(1-0.0011\times L)}{1.0039+0.0011\times L}$	$F=\dfrac{P(1-0.0009\times L)}{0.7822+0.0010\times L}$	$F=\dfrac{P(1-0.0007\times L)}{0.5175+0.0006\times L}$
Full Stroke	mm	15.5	18.5	20	24
Swing Stroke (90°)	mm	7.5	8.5	10	12
Vertical Stroke	mm	8	10	10	12
Swing Angle Accuracy		90° ±3°			
Swing Complete Position Repeatability		±0.5°			
Max. Operating Pressure	MPa	7			
Min. Operating Pressure ※3	MPa	1.5			
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			
		5 When selecting **B01**：920MHz Band			
		5 When selecting **B02**：868MHz Band			
	Distance to Receiver	Max. 5m ※4			
	Sensing Position	ON from 10° swing angle before the unclamp end stroke.			
	Waterproof Rating	Equal 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.
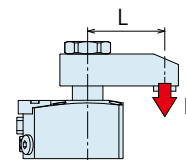
◉ Clamping Force Curve

L：Lever Length (mm)
F：Clamping Force (kN)
S
P：Hydraulic Pressure (MPa)
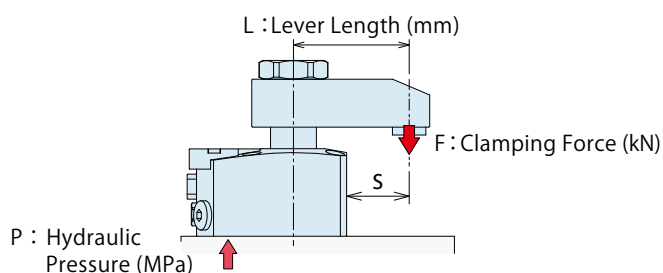
Applicable Model

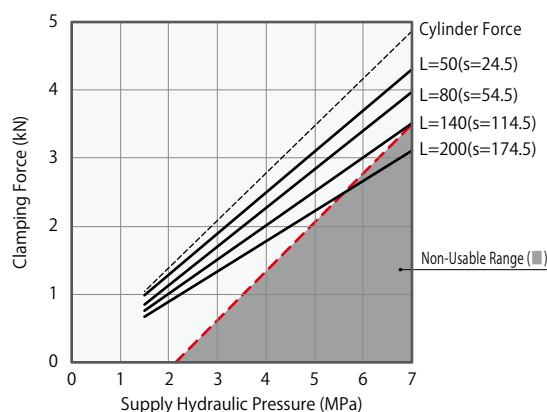**LHM** ▢ **0 − C** [R/L] − [B03 / B01 / B02]

1 Body Size

(Ex.) In case of LHM0480 :
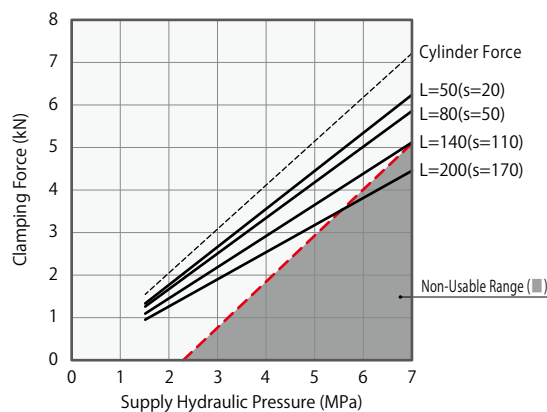When supply hydraulic pressure P is 5.0MPa and lever length L is 50mm, clamping force becomes about 3.1kN.

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).

LHM0480 — Clamping Force Calculation Formula ※1 (kN) $F = P(1-0.0009×L) / (1.4892+0.0018×L)$

Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) 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			141
6.5	4.52	4.0	3.9	3.7	3.6	3.4	3.3			157
6	4.17	3.7	3.6	3.5	3.3	3.2	3.1	2.9		178
5.5	3.82	3.4	3.3	3.2	3.0	2.9	2.8	2.7	2.5	204
5	3.48	3.1	3.0	2.9	2.8	2.7	2.6	2.5	2.3	230
4.5	3.13	2.8	2.7	2.6	2.5	2.4	2.3	2.2	2.0	230
4	2.78	2.5	2.4	2.3	2.2	2.1	2.1	2.0	1.8	230
3.5	2.43	2.2	2.1	2.0	2.0	1.9	1.8	1.7	1.6	230
3	2.09	1.9	1.8	1.7	1.7	1.6	1.6	1.5	1.4	230
2.5	1.74	1.6	1.5	1.5	1.4	1.4	1.3	1.2	1.2	230
2	1.39	1.3	1.2	1.2	1.1	1.1	1.0	1.0	0.9	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	

Clamping Force (kN) vs Supply Hydraulic Pressure (MPa)
Cylinder Force
L=50(s=24.5)
L=80(s=54.5)
L=140(s=114.5)
L=200(s=174.5)
Non-Usable Range (■)

LHM0550 — Clamping Force Calculation Formula ※1 (kN) $F = P(1-0.0011×L) / (1.0039+0.0011×L)$

Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) 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			142
6.5	6.69	5.8	5.7	5.5	5.2	5.0	4.8			159
6	6.18	5.4	5.3	5.1	4.8	4.6	4.4	4.2		180
5.5	5.66	5.0	4.8	4.6	4.4	4.2	4.1	3.9	3.6	209
5	5.15	4.5	4.4	4.2	4.0	3.9	3.7	3.5	3.2	245
4.5	4.63	4.1	4.0	3.8	3.6	3.5	3.3	3.2	2.9	245
4	4.12	3.6	3.5	3.4	3.2	3.1	3.0	2.8	2.6	245
3.5	3.60	3.2	3.1	3.0	2.8	2.7	2.6	2.5	2.3	245
3	3.09	2.7	2.7	2.6	2.4	2.3	2.2	2.1	2.0	245
2.5	2.57	2.3	2.2	2.1	2.0	2.0	1.9	1.8	1.6	245
2	2.06	1.8	1.8	1.7	1.6	1.6	1.5	1.4	1.3	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	

Clamping Force (kN) vs Supply Hydraulic Pressure (MPa)
Cylinder Force
L=50(s=20)
L=80(s=50)
L=140(s=110)
L=200(s=170)
Non-Usable Range (■)

| Features | Cross Section | Action Description | Model No. / Specification | **Performance Curve** | External Dimensions | Lever Design Dimensions Accessory | Cautions |

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LHM0650

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) Non-Usable Range(■) Lever Length L (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	

Cylinder Force
L=50(s=15)
L=80(s=45)
L=140(s=105)
L=200(s=165)
Non-Usable Range (■)

X-axis: Supply Hydraulic Pressure (MPa)
Y-axis: Clamping Force (kN)

LHM0750

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) Non-Usable Range(■) Lever Length L (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	

Cylinder Force
L=50(s=10)
L=80(s=40)
L=140(s=100)
L=200(s=160)
Non-Usable Range (■)

X-axis: Supply Hydraulic Pressure (MPa)
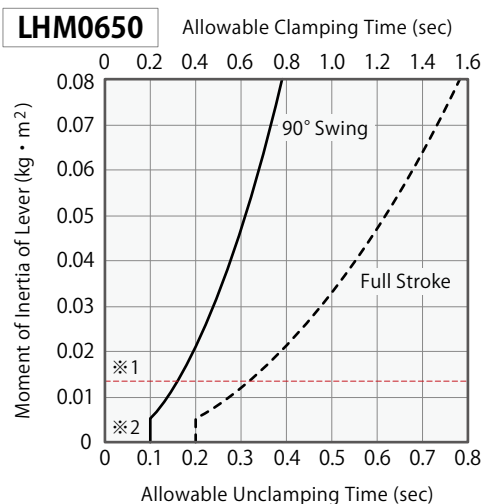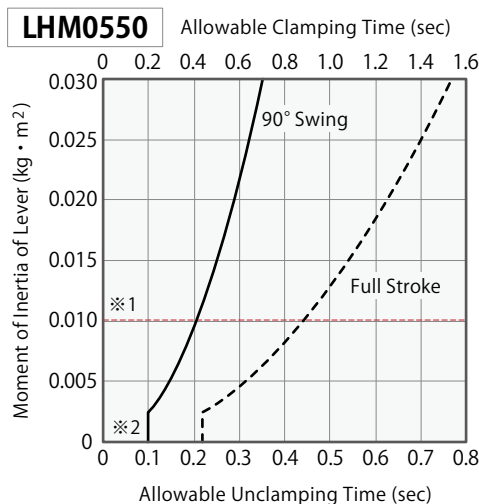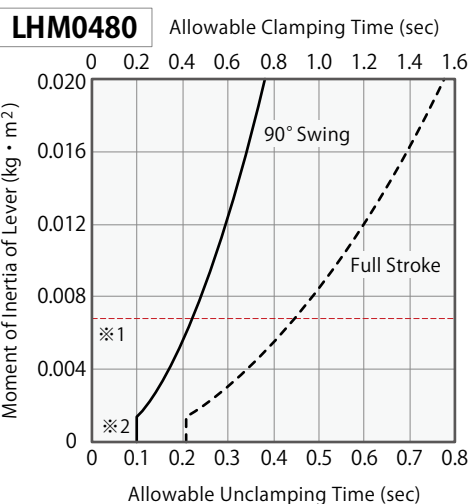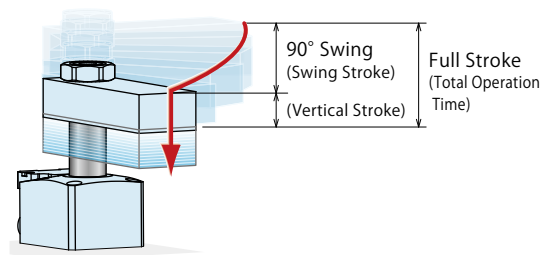Y-axis: Clamping Force (kN)
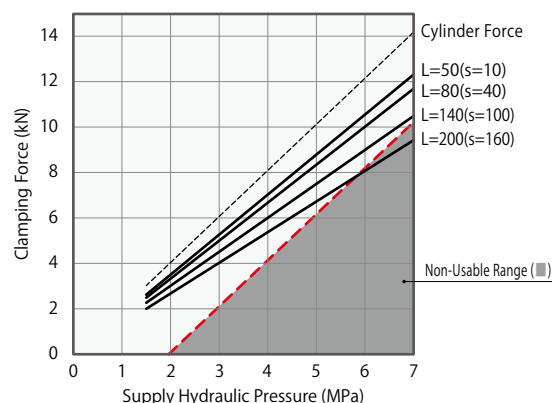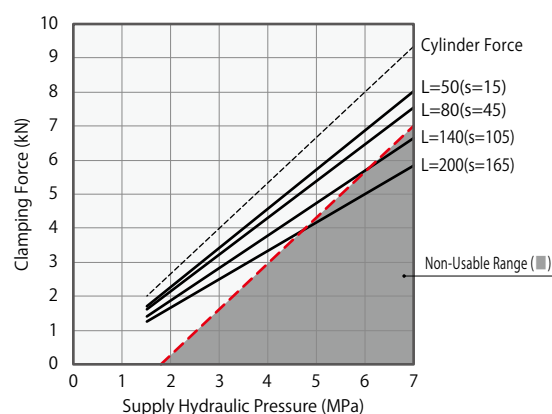
◉ Allowable Swing Time Graph

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.

90° Swing (Swing Stroke) (Vertical Stroke)   Full Stroke (Total Operation Time)

LHM0480   Allowable Clamping Time (sec)

LHM0550   Allowable Clamping Time (sec)

LHM0650   Allowable Clamping Time (sec)

LHM0750   Allowable Clamping Time (sec)

Moment of Inertia of Lever (kg · m²)

Allowable Unclamping Time (sec)

90° Swing

Full Stroke

※1

※2
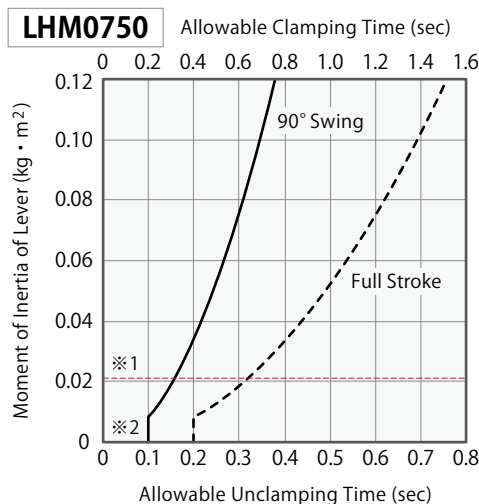
Notes :
※1. It shows the moment of inertia of material lever (LZH□-T).
※2. For any moment of inertia of a lever, the minimum 90° swing time should be 0.2 sec for clamping and 0.1 sec for unclamping or more.
1. The graph shows the allowable action time in regard to the moment of inertia of lever when the piston rod operates at constant speed.
2. There may be no lever swing action with large inertia 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.60 for speed control of the hydraulic cylinder.
4. Excessive swing speed can reduce stopping accuracy and damage the internal components.
5. Please contact us if operational conditions differ from those shown on the graphs.

| Features | Cross Section | Action Description | Model No. / Specification | **Performance Curve** | External Dimensions | Lever Design Dimensions Accessory | Cautions |

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(How to read the allowable swing time graph)

In case of LHM0480

The moment of inertia of a lever : 0.0068kg・m^2

① 90° Swing Time when Clamping ： About 0.44 sec or more

② 90° Swing Time when Unclamping ： About 0.22 sec or more

③ Total Clamp Operation Time ： About 0.9 sec or more

④ Total Unclamp Operation Time ： About 0.45 sec or more

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

Model → LHM0480

Allowable Clamping Time (sec) / Moment of Inertia of Lever (kg・m^2) / Allowable Unclamping Time (sec)
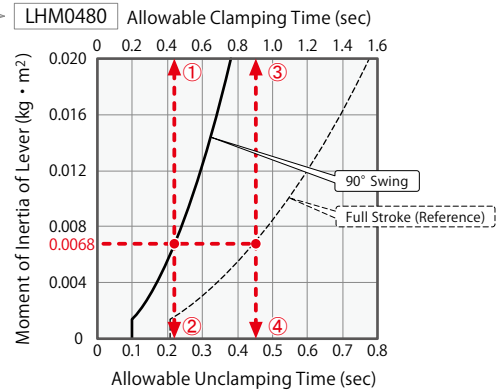
How to Calculate the Moment of Inertia (Estimated)

I：Moment of Inertia (kg・m^2)　　L,L_1,L_2,K,b：Length (m)　　m,m_1,m_2,m_3：Mass (kg)

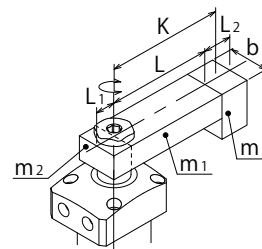① For a rectangular plate (cuboid), the rotating shaft is vertically on one side of the plate.
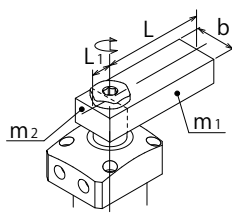
$$I = m_1 \frac{4L^2+b^2}{12} + m_2 \frac{4L_1^2+b^2}{12}$$

② For a rectangular plate (cuboid), the rotating shaft is vertically on the gravity center of the plate.
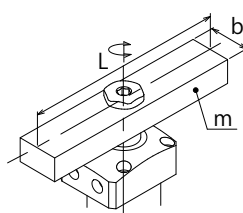
$$I = m \frac{L^2+b^2}{12}$$

③ Load is applied on the lever front end.

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

Calculation Formula of Total Operation Time

Total Clamp Operation Time (sec) = 90° Swing Time when Clamping (sec) × $\dfrac{\text{Full Stroke (mm)}}{\text{Swing Stroke (mm)}}$

Total Unclamp Operation Time (sec) = 90° Swing Time when Unclamping (sec) × $\dfrac{\text{Full Stroke (mm)}}{\text{Swing Stroke (mm)}}$

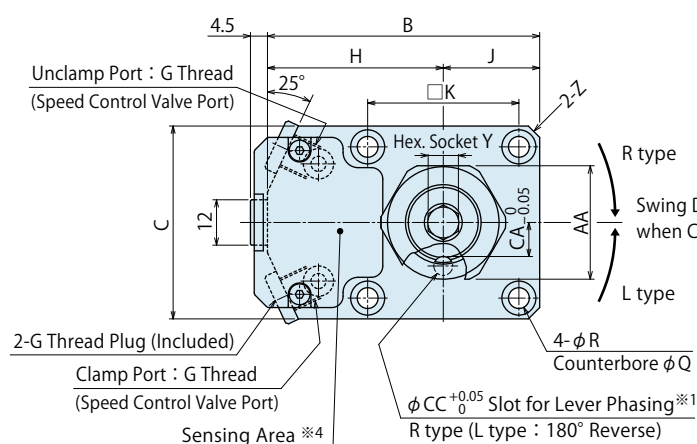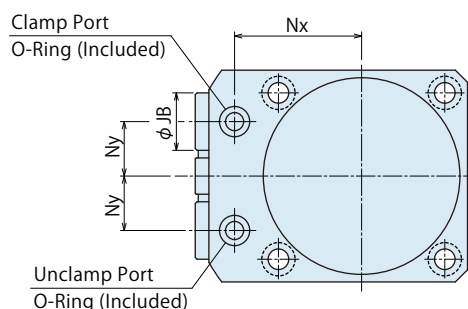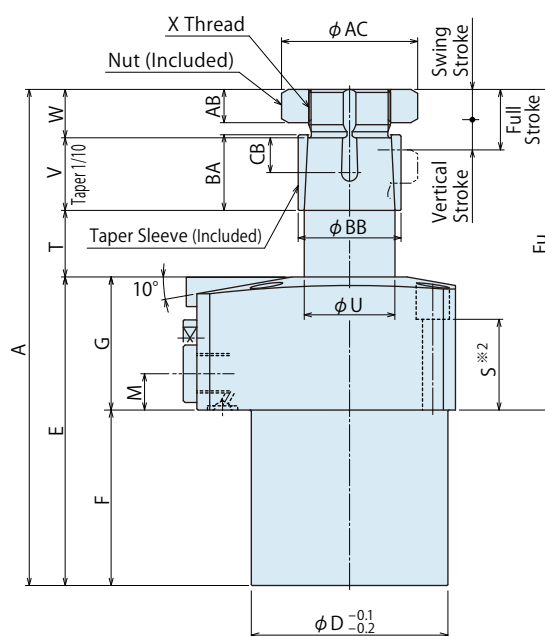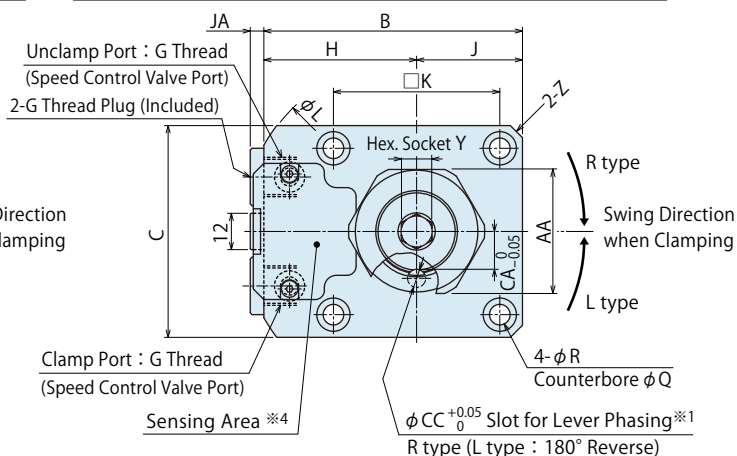## ●External Dimensions
C：Gasket Option (With G Thread Plug)

※ The drawing shows the unclamped state of LHM-CR-B□.

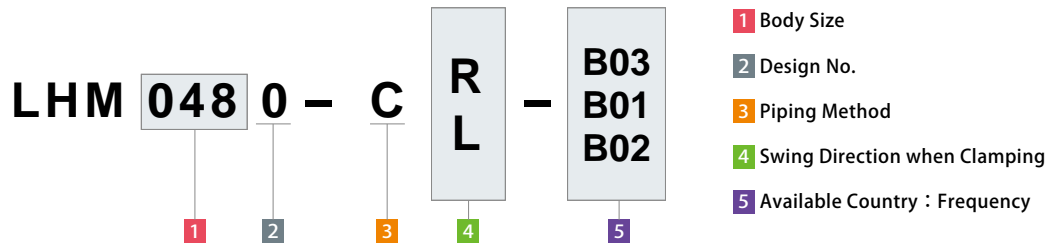### LHM0480-C□-B□ / LHM0550-C□-B□
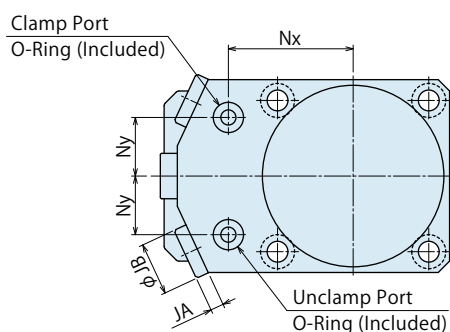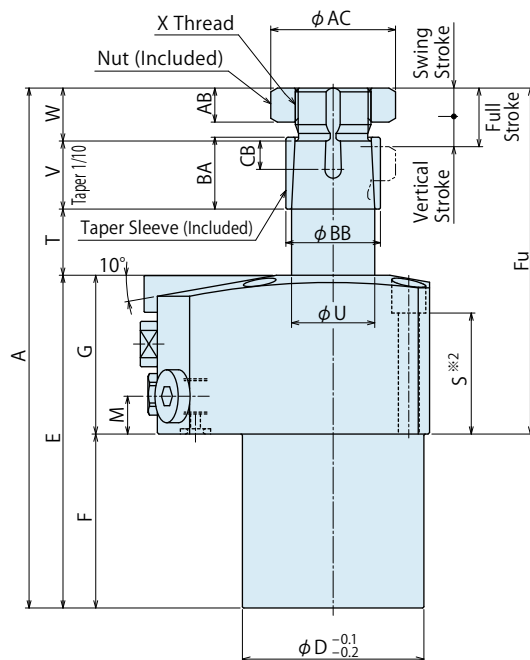
LHM0650-C□-B□ / LHM0750-C□-B□

Notes :
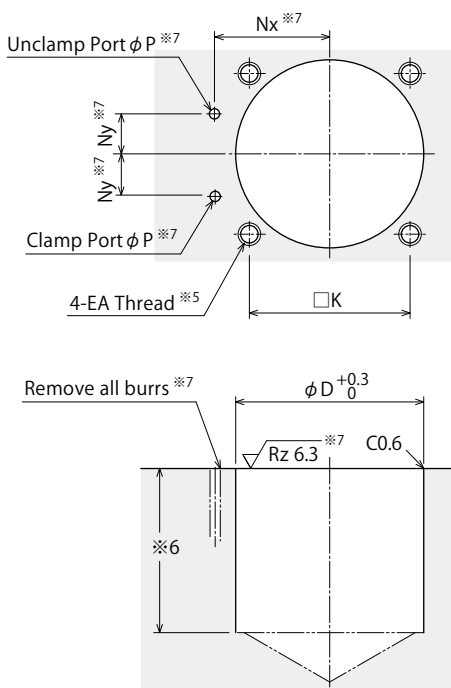※1. The slot for lever phasing faces the port side when clamped.
※2. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.
※3. Speed control valve is sold separately. Please refer to P.55. It is necessary to provide an unclamp operation time difference of at least 100 msec. For adjusting the unclamp operation, please use a speed control valve.
※4. Do not cover the top surface of the sensing area with metal objects (chips). It may obstruct radio wave transmission.

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Wireless Sensing Clamp

Accessory

Common Cautions

Wireless Sensing Swing Clamp
LHM
Wireless Sensing Link Clamp
LKM
Wireless Sensing Linear Cylinder
LLM
Receiver・Repeater
YWA
YWB

◎ Model No. Indication

(Format Example：LHM0550-CR-B03, LHM0750-CL-B03)

LHM **048** 0 – C R L – B03 B01 B02

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

1 2 3 4 5

◎ Machining Dimensions of Mounting Area

Nx ※7

Unclamp Port φP ※7

Ny ※7 Ny ※7 ※7

Clamp Port φP ※7

4-EA Thread ※5

□K

Remove all burrs ※7

φD $^{+0.3}_{0}$

Rz 6.3 ※7 C0.6

※6

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

◎ External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	LHM0480-C□-B□	LHM0550-C□-B□	LHM0650-C□-B□	LHM0750-C□-B□
Full Stroke	15.5	18.5	20	24
Swing Stroke (90°)	7.5	8.5	10	12
Vertical Stroke	8	10	10	12
A	137.5	153.5	164	181
B	72	78	85.5	93.3
C	51	60	70	80
D	48	55	65	75
E	88	97	102	109
F	46	55	58	65
Fu	91.5	98.5	106	116
G	42	42	44	44
H	46.5	48	50.5	53.3
J	25.5	30	35	40
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	17.5	20.5	22	26
U	22	25	30	35.5
V	18	21	24	30
W	14	15	16	16
X (Nominal × Pitch)	M20×1.5	M22×1.5	M27×1.5	M30×1.5
Y	8	8	10	10
Z (Chamfer)	C3	C3	C4	C5
AA	30	32	41	46
AB	9	10	11	11
AC	33	35.5	45	50
BA	19	22	25	31
BB	25	28	34	40
CA	9	10	12.5	14
CB	7.5	9.5	11.5	12.5
CC	5	6	6	8
EA	M5×0.8	M6×1	M6×1	M8×1.25
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	10.8	19	26.7	48.7
Unclamp	16.7	28.1	40.9	72.5
Weight ※8 kg	1.6	2.2	3.2	4.3

Note：※8. It shows the weight of single swing clamp including taper sleeve and nut.

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◉Taper Lock Lever Design Dimensions

※ Reference for designing a taper lock swing lever.

Corresponding Model No.

LHM ☐ **0 -** C | R L | **-** | B03 B01 B02

1 Body Size
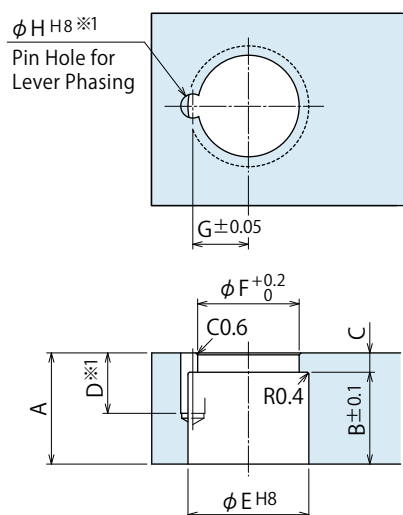
(mm)

Corresponding Model No.	LHM0480 -C☐-B☐	LHM0550 -C☐-B☐	LHM0650 -C☐-B☐	LHM0750 -C☐-B☐
A	23	26	29	35
B	19	22	25	31
C	4	4	4	4
D	12.5	14.5	16.5	17.5
E	$25^{+0.033}_{0}$	$28^{+0.033}_{0}$	$34^{+0.039}_{0}$	$40^{+0.039}_{0}$
F	21	23.5	29	33
G	11.5	13	15.5	18
H	$5^{+0.018}_{0}$	$6^{+0.018}_{0}$	$6^{+0.018}_{0}$	$8^{+0.022}_{0}$
Phasing Pin (Reference)※2	$\phi5(h8)\times12$	$\phi6(h8)\times14$	$\phi6(h8)\times16$	$\phi8(h8)\times16$

Notes :
1. Swing lever should be designed with its length according to performance curve.
2. 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 (ϕH) for determining the lever phase should be added, if necessary.
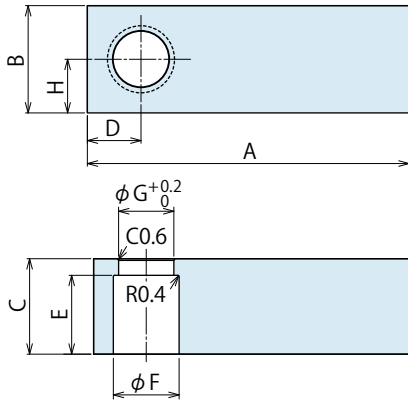※2. Phasing pin is not included. Prepare it separately.

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◉ **Accessory：Material Swing Lever for Taper Lock Lever**

Corresponding Model No.

LZH 048 0 – T

Size
(Refer to the table.)

Design No.
(Revision Number)

(mm)

Model No.	**LZH0480-T**	**LZH0550-T**	**LZH0650-T**	**LZH0750-T**
Corresponding Model No.	LHM0480 -C□-B□	LHM0550 -C□-B□	LHM0650 -C□-B□	LHM0750 -C□-B□
A	160	170	175	185
B	40	45	50	58
C	23	26	29	35
D	20	23	25	29
E	19	22	25	31
F	25	28	34	40
G	21	23.5	29	33
H	20	22.5	25	29

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 taper lock lever design dimensions for each model for the additional machining.

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⬤Cautions

⬤ Notes for Design

-C
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. LHM□-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) 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.

5) 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.

6) When clamping on a sloped surface of the workpiece
● Make sure the clamping surface and the mounting surface of the clamp are parallel.
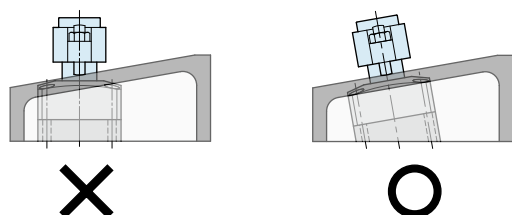
7) Installation of Sequence Valve (model BZS)
● Please contact us when the sequence valve model BZS0200 needs to be installed on LHM0650-C□-B□ or LHM0750-C□-B□. In some cases, installation may not be possible due to conditions and combinations of the products.

⬤ 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) 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.
● 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.

3) 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)
LHM0480-C□-B□	M5×0.8	8.0
LHM0550-C□-B□	M6×1	14
LHM0650-C□-B□	M6×1	14
LHM0750-C□-B□	M8×1.25	33

4) 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.

LHM Standard：Taper Lock Lever

Model No.	Thread Size	Tightening Torque (N·m)
LHM0480-C□-B□	M20×1.5	54 ~ 65
LHM0550-C□-B□	M22×1.5	84 ~ 100
LHM0650-C□-B□	M27×1.5	120 ~ 145
LHM0750-C□-B□	M30×1.5	175 ~ 210

Wireless Sensing Clamp

Accessory

Common Cautions

Wireless Sensing Swing Clamp
LHM

Wireless Sensing Link Clamp
LKM

Wireless Sensing Linear Cylinder
LLM

Receiver・Repeater
YWA
YWB

● In case of Using LHM Standard (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).
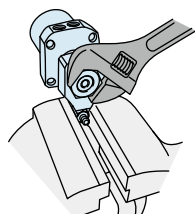
② Remove the clamp from the jig, fix the lever with a machine vise etc., and tighten the nut.

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.
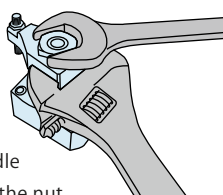
Removal Procedure
① While the clamp is on the jig or vise, use a hex wrench to bring the lever to the middle of the swing stroke and then loosen the nut.

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.
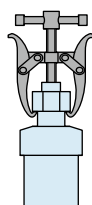
5) Initial Connection Settings for the Receiver
During setup, it is necessary to perform the initial connection settings between the clamp and the receiver. (For detailed instructions, please refer to the instruction manual of receiver YWA1000.)
When attaching or removing the cover, be very careful to 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.

Cover
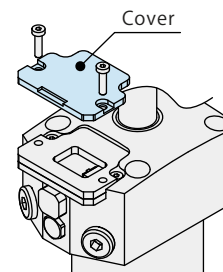
6) Cautions for Repeater Installation
The maximum distance between the clamp and the receiver is 5 meters. Check the radio wave strength displayed on the receiver and consider the location of the repeater. (Recommended Threshold：−85dBm) It is recommended to install the repeater in locations such as the 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
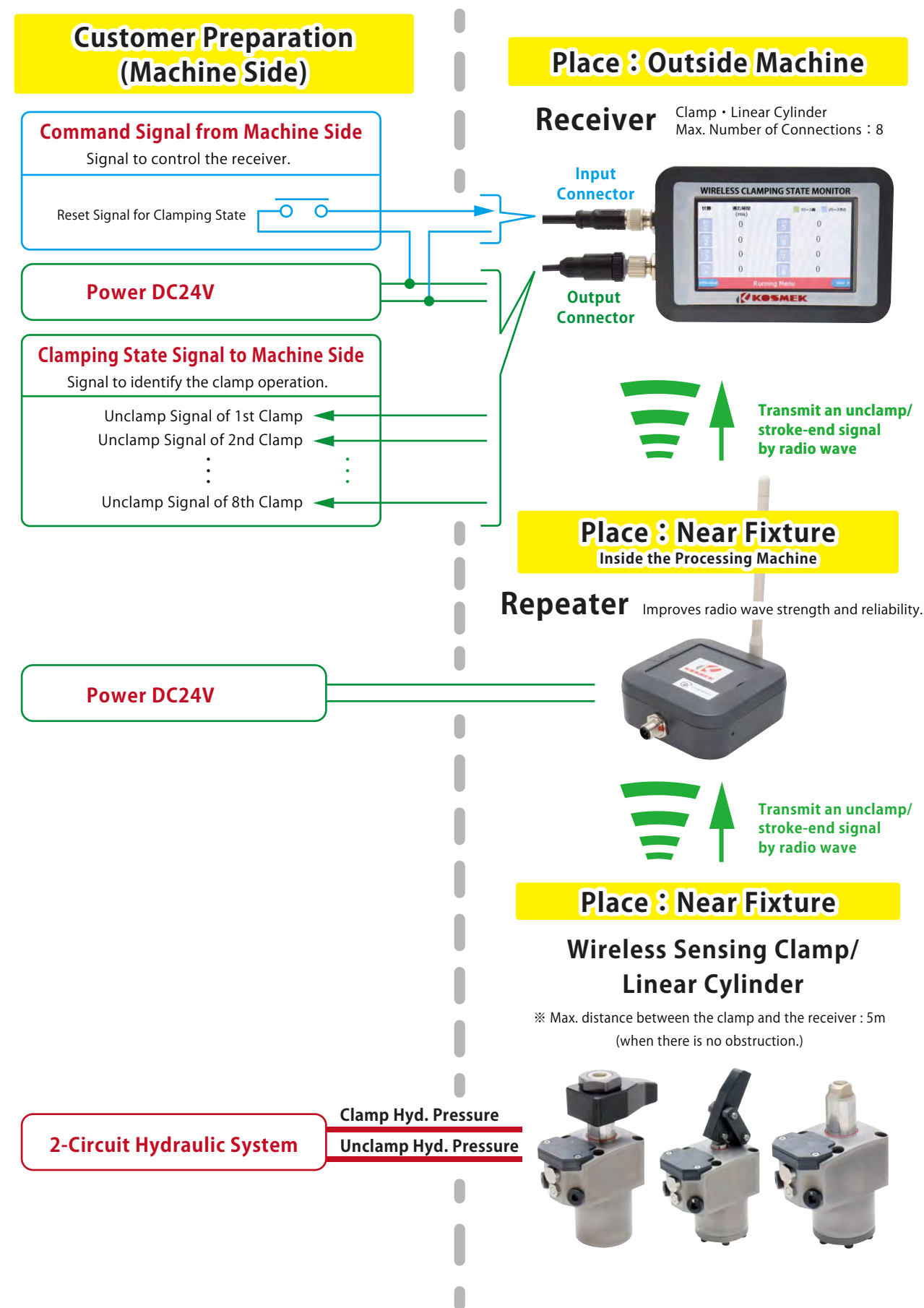
2 Design No.

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.

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◉ 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

WIRELESS CLAMPING STATE MONITOR

KOSMEK

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.)

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● 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)
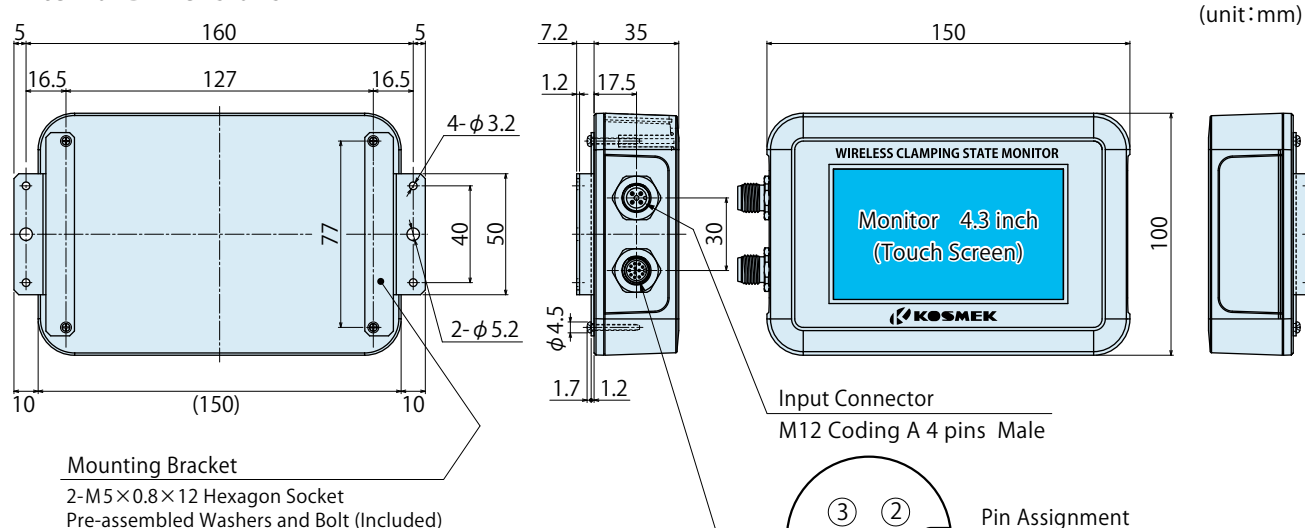and displays them on a monitor and outputs them to an external device.
Clamping state, operating time, and radio wave condition can be checked on the monitor.
The output contact can be turned off and the operating time can be reset by switching the clamping state reset.

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)

Mounting Bracket
2-M5×0.8×12 Hexagon Socket
Pre-assembled Washers and Bolt (Included)

Input Connector
M12 Coding A 4 pins Male
Pin Assignment
Input Connector M12A-4

Output Connector
M12 Coding A 12 pins Male
Pin Assignment
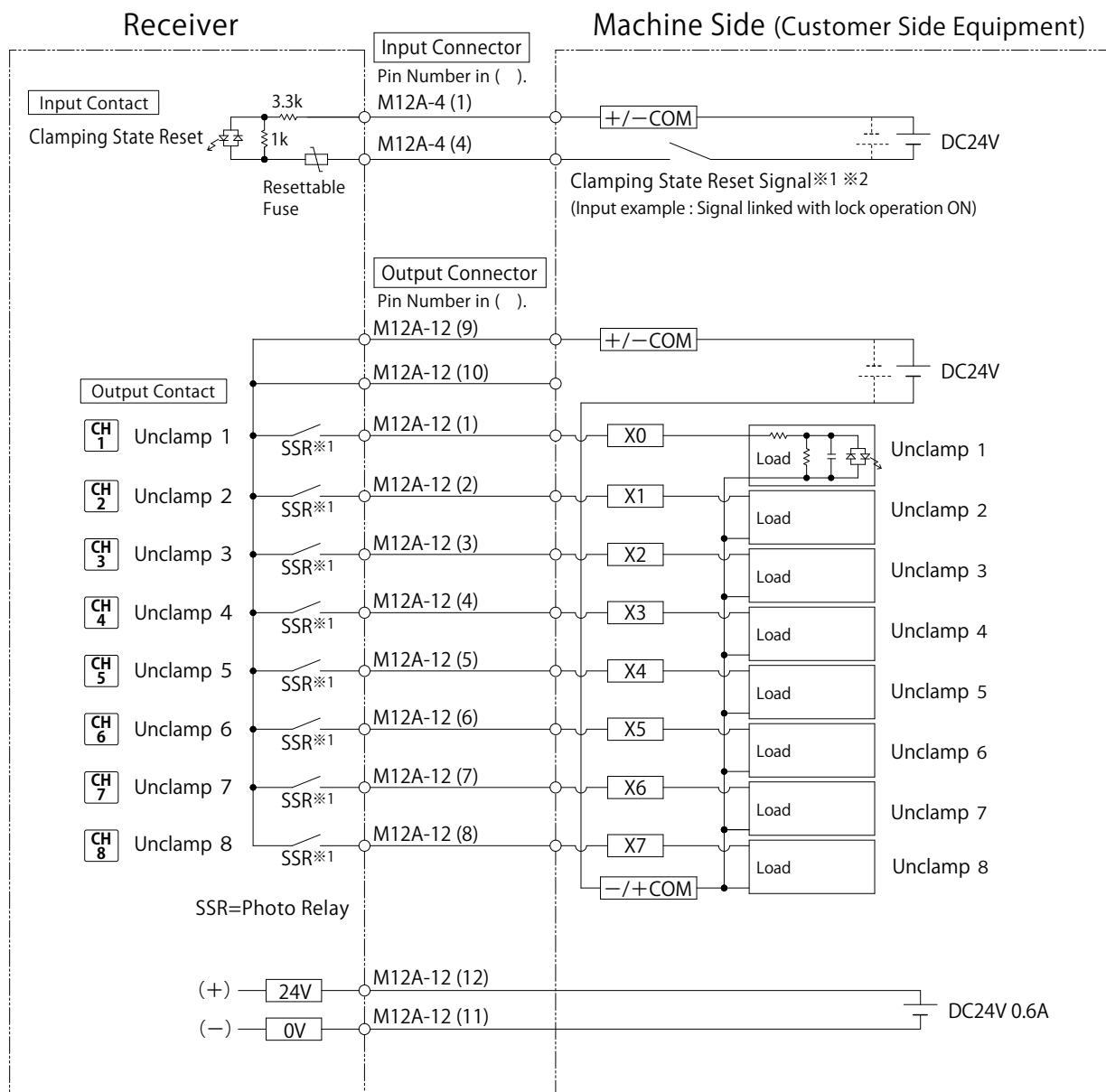Output Connector M12A-12

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)

KOSMEK
Harmony in Innovation

Interface Diagram between Machine Tool and Receiver

Receiver　　　　　　　　　　　　**Machine Side** (Customer Side Equipment)

Input Connector
Pin Number in ( ).

Input Contact
Clamping State Reset　　3.3k　　M12A-4 (1)
　　　　　　　　　　　　1k　　M12A-4 (4)
Resettable Fuse

+/−COM　　　DC24V

Clamping State Reset Signal ※1 ※2
(Input example : Signal linked with lock operation ON)

Output Connector
Pin Number in ( ).
M12A-12 (9)　　　+/−COM
M12A-12 (10)　　　　　DC24V

Output Contact
CH 1	Unclamp 1	SSR※1	M12A-12 (1)	X0	Load	Unclamp 1
CH 2	Unclamp 2	SSR※1	M12A-12 (2)	X1	Load	Unclamp 2
CH 3	Unclamp 3	SSR※1	M12A-12 (3)	X2	Load	Unclamp 3
CH 4	Unclamp 4	SSR※1	M12A-12 (4)	X3	Load	Unclamp 4
CH 5	Unclamp 5	SSR※1	M12A-12 (5)	X4	Load	Unclamp 5
CH 6	Unclamp 6	SSR※1	M12A-12 (6)	X5	Load	Unclamp 6
CH 7	Unclamp 7	SSR※1	M12A-12 (7)	X6	Load	Unclamp 7
CH 8	Unclamp 8	SSR※1	M12A-12 (8)	X7	Load	Unclamp 8

−/+COM

SSR=Photo Relay

(+)　24V　M12A-12 (12)
(−)　0V　M12A-12 (11)　　　DC24V 0.6A

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.

50

● Accessory (Sold Separately : Wall-Mounted Magnet)

Model No. Indication

YL0270

Design No.
(Revision Number)

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

YL0270 Mounting Dimensions

(Unit：mm)

Wireless Sensing Clamp

Accessory

Common Cautions

Wireless Sensing Swing Clamp
LHM
Wireless Sensing Link Clamp
LKM
Wireless Sensing Linear Cylinder
LLM
Receiver・Repeater
YWA
YWB
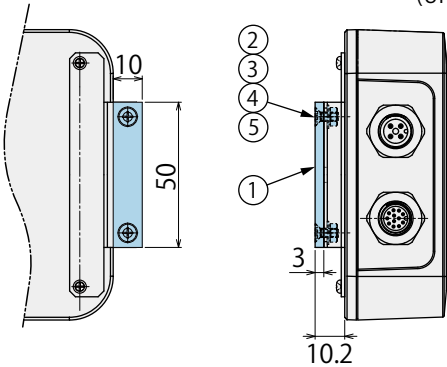
◉ Cautions for Receiver

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.

CH.1

CH.8

Initial Connection Settings Required
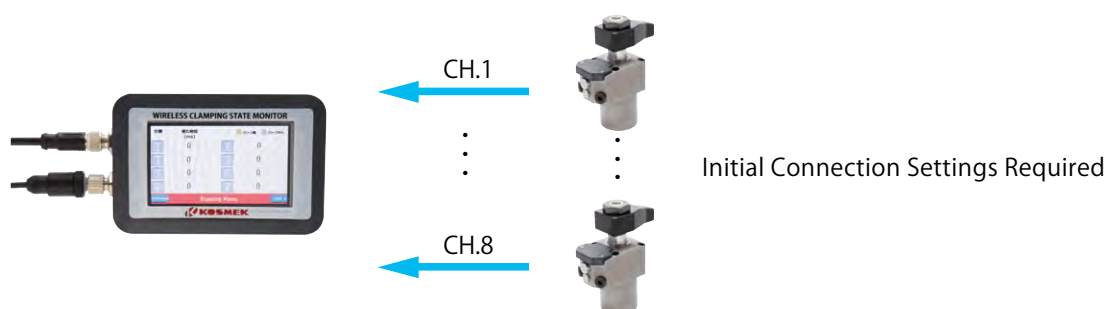
・ Control Design and Electrical Circuit Design

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

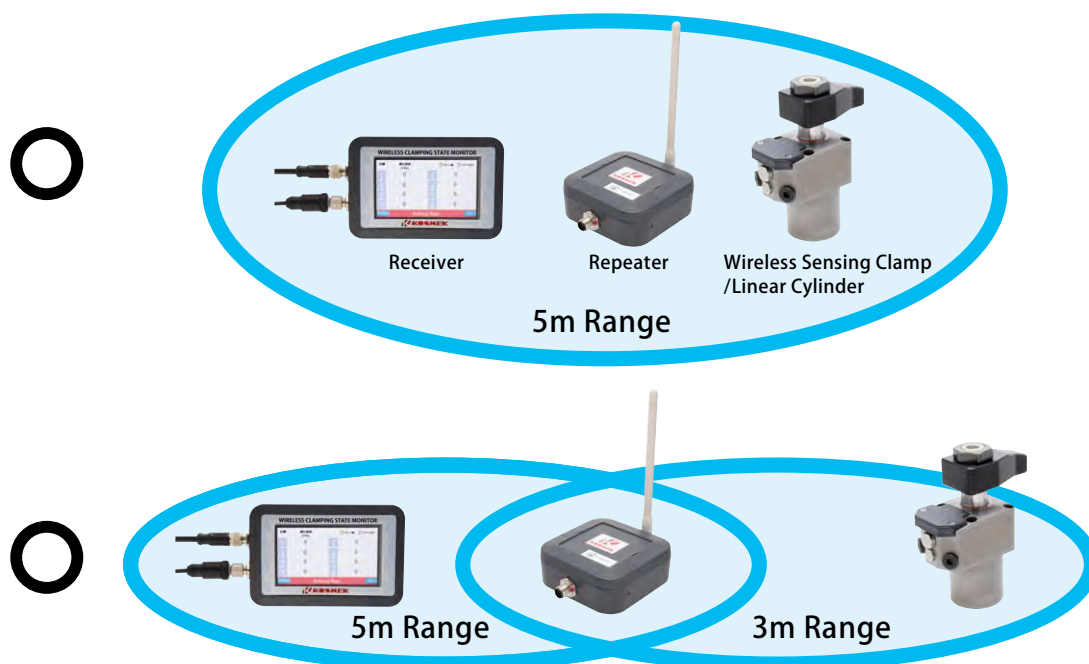・ Repeater Configuration

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.

● 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 (when the housing is completely closed and a waterproof connector is attached)	

External Dimensions

(unit：mm)

Antenna

(φ9)

(160)

(φ12)

Antenna Adjustable※1

15
81
100
15
15

2-Neodymium Magnet

5   40

40

(21)   100   (13)

15

Power Connector
M12 Coding A 12 pins Male
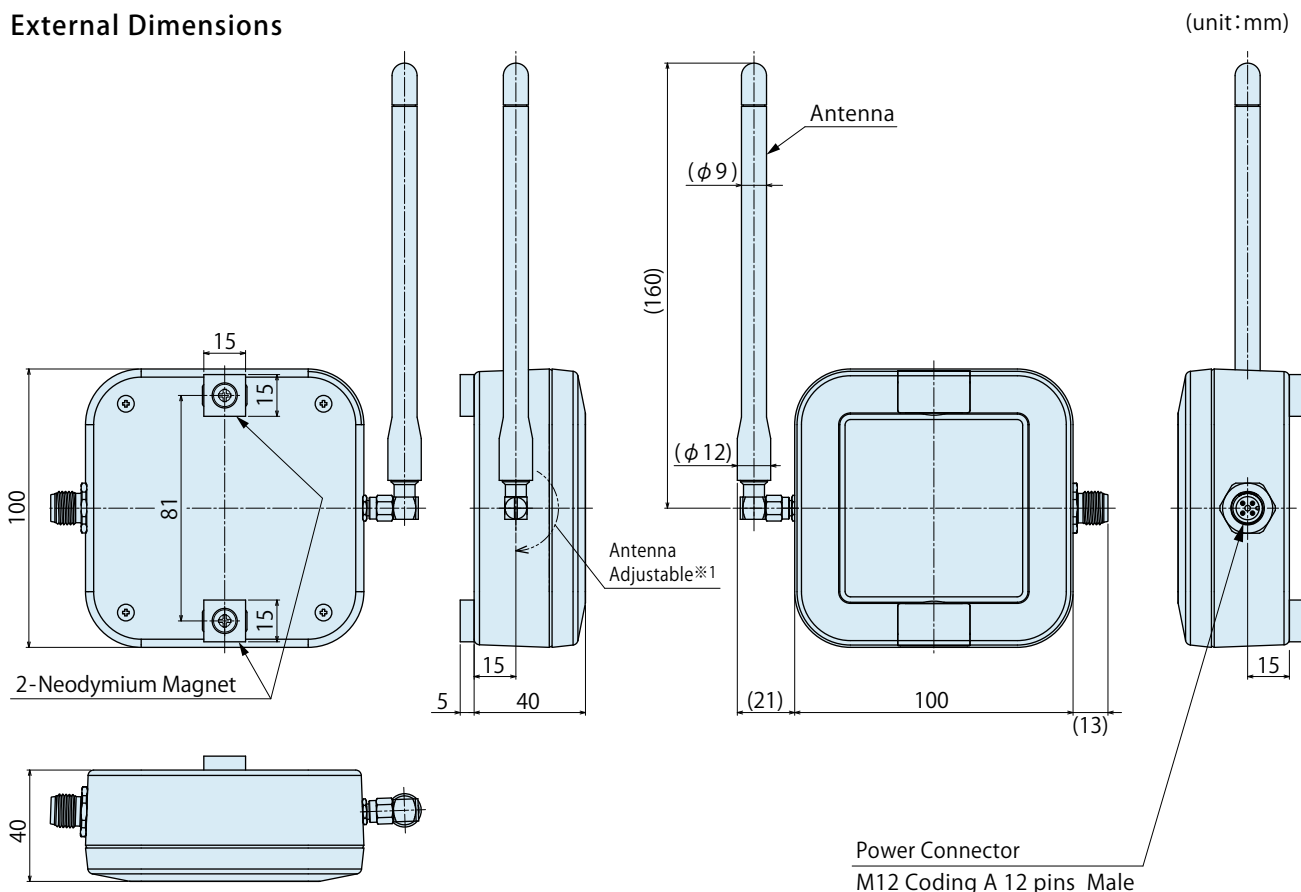
Note :
※1. Loosen the nut to change the direction of the antenna.

③ ②
④ ①

Pin Assignment

Power Connector M12A

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)

Wireless Sensing Clamp

Accessory

Common Cautions

Wireless Sensing Swing Clamp
LHM

Wireless Sensing Link Clamp
LKM

Wireless Sensing Linear Cylinder
LLM

Receiver・Repeater
YWA
YWB
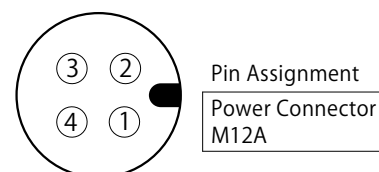
Interface Diagram of Repeater

Repeater   Machine Side (Customer Side Equipment)

Power Connector
Pin Number in ( ).

(＋) — 24V — M12A (1)
(－) — 0V — M12A (3)
DC24V 0.3A
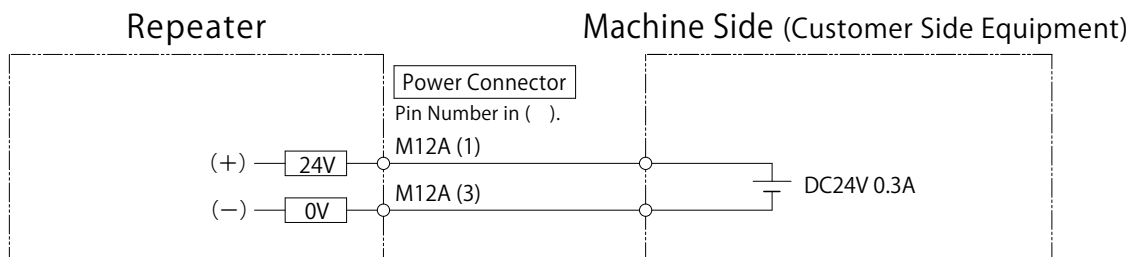
Cautions for Repeater

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.

Receiver   Repeater   Wireless Sensing Clamp /Linear Cylinder

5m Range

5m Range   **3m Range**

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

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◉ **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.

G Thread Plug

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

Adjusting Screw   Lock Nut

Speed Control Valve
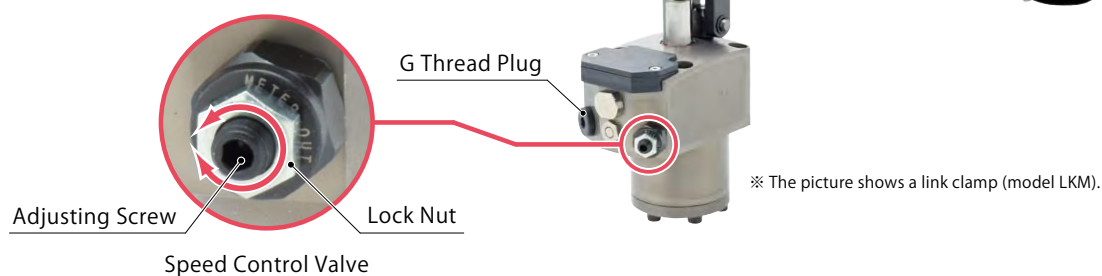
Action Description

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.

Clamp/
Cylinder
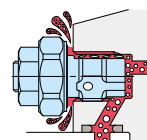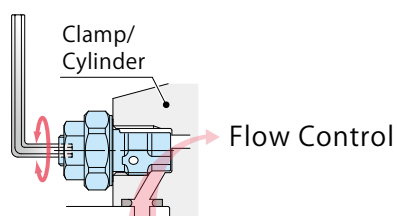
Flow Control

◉ **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

Thread Part
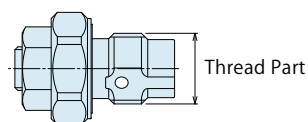
2 Design No.

1 ： Revision Number

3 Control Method

B ： Meter-out (Recommended※1)

A ： Meter-in
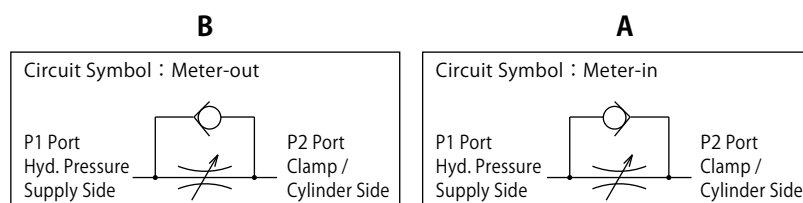
B	A
Circuit Symbol：Meter-out P1 Port — P2 Port Hyd. Pressure — Clamp / Supply Side — Cylinder Side	Circuit Symbol：Meter-in P1 Port — P2 Port Hyd. Pressure — Clamp / Supply Side — Cylinder Side

※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.

Wireless
Sensing Clamp

Accessory

Common
Cautions

Control Valve
BZL

◉ 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	mm²	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□ LHM0550–C□-B□	LKM0480–C□-B□ LKM0550–C□-B□	LLM0480–C□□-B□-□ LLM0550–C□□-B□-□
BZL0101-A	(LHM0480–C□-B□) (LHM0550–C□-B□)	(LKM0480–C□-B□) (LKM0550–C□-B□)	(LLM0480–C□□-B□-□) (LLM0550–C□□-B□-□)
BZL0201-B	LHM0650–C□-B□ LHM0750–C□-B□	LKM0650–C□-B□ LKM0750–C□-B□	
BZL0201-A	(LHM0650–C□-B□) (LHM0750–C□-B□)	(LKM0650–C□-B□) (LKM0750–C□-B□)	

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

BZL0101-B：Meter-out

Controlled Flow Direction

- Pressure Loss 5MPa
- Pressure Loss 3MPa
- Pressure Loss 1MPa

Flow Rate (L/min) vs Number of Turns of Adjusting Screw (←Closed ... Opened→)

Free Flowing Direction

- Fully Opened
- Fully Closed

Flow Rate (L/min) vs Pressure Loss (MPa)

BZL0201-B：Meter-out

Controlled Flow Direction

- Pressure Loss 5MPa
- Pressure Loss 3MPa
- Pressure Loss 1MPa

Flow Rate (L/min) vs Number of Turns of Adjusting Screw (←Closed ... Opened→)

Free Flowing Direction

- Fully Opened
- Fully Closed

Flow Rate (L/min) vs Pressure Loss (MPa)

BZL0101-A：Meter-in

Controlled Flow Direction

- Pressure Loss 5MPa
- Pressure Loss 3MPa
- Pressure Loss 1MPa

Flow Rate (L/min) vs Number of Turns of Adjusting Screw (←Closed ... Opened→)

Free Flowing Direction

- Fully Opened
- Fully Closed

Flow Rate (L/min) vs Pressure Loss (MPa)

BZL0201-A：Meter-in

Controlled Flow Direction

- Pressure Loss 5MPa
- Pressure Loss 3MPa
- Pressure Loss 1MPa

Flow Rate (L/min) vs Number of Turns of Adjusting Screw (←Closed ... Opened→)

Free Flowing Direction

- Fully Opened
- Fully Closed

Flow Rate (L/min) vs Pressure Loss (MPa)

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.
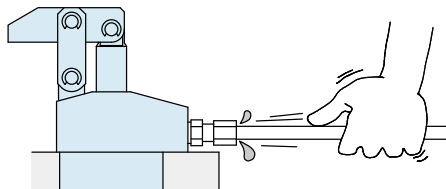
④ Tighten the cap nut after bleeding.
⑤ It is more effective to release air at the highest point inside the circuit or at the end of the circuit.
　 (Set an air bleeding valve at the highest point inside the circuit.)
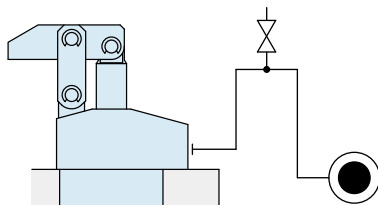
5）Checking Looseness and Retightening
● At the beginning of the machine installation, the bolt and nut may be tightened lightly. Check the looseness and re-tighten as required.

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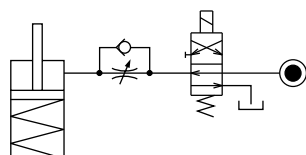
Accelerated clamping speed by excessive hydraulic flow to the cylinder may sustain damage. In this case add flow control to regulate flow. (Please add flow control to release flow if the lever weight is put on at the time of release action when using swing clamps.)

Flow Control at the Release Side
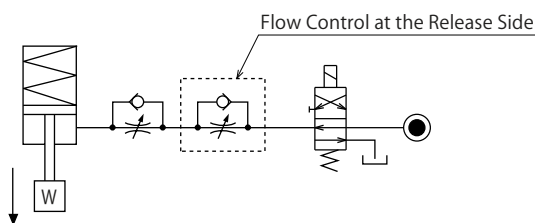
● **Flow Control Circuit for Double Acting Cylinder**
Flow control circuit for double-acting cylinder (except LKE/LSE/TLA/ TLB/TMA/TLV/TMV/TTA) should have meter-out circuits for both the lock and release sides. Meter-in control can have adverse effect by presence of air in the system. However, in the 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)
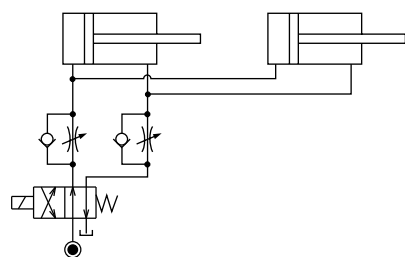
【Meter-in Circuit】(LKE/LSE/TLA/TLB/TMA/TLV/TMV/TTA must be controlled with meter-in.)
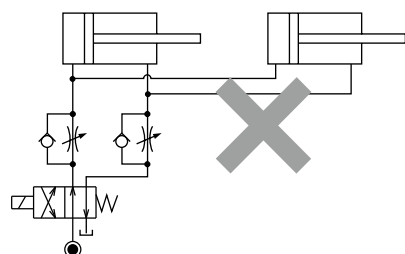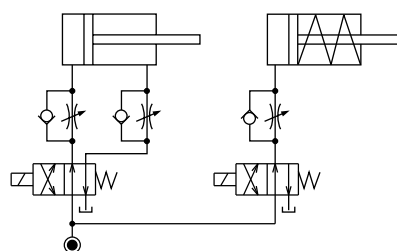

In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.
① Single acting components should not be used in the same flow control circuit as the double acting components. The release action of the single acting cylinders may become erratic or very slow.
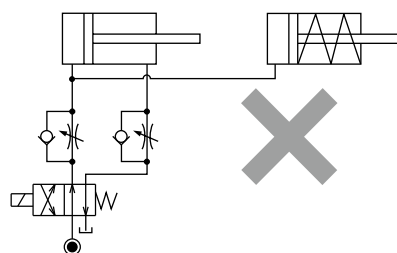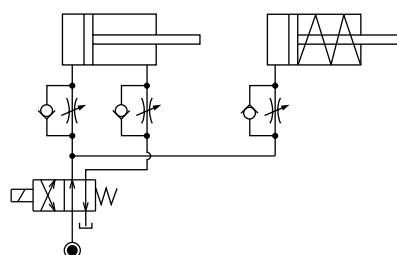

Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.
○ Separate the control circuit.

○ 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.

Sequence Valve

Flow Control Valve (Any location is OK)
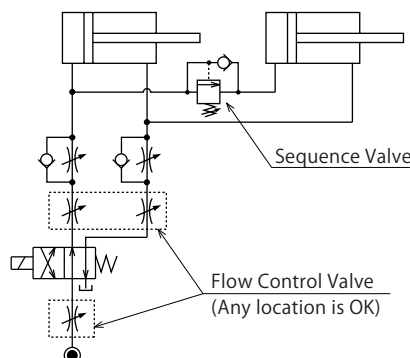
🔴 Cautions

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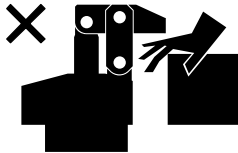
4) Do not disassemble or modify.
● If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

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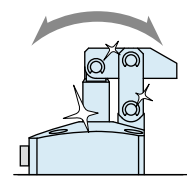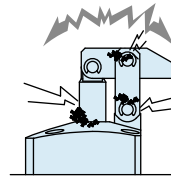
3) If disconnecting by couplers, air bleeding should be carried out on a regular basis to avoid air mixed in the circuit.

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.

Wireless Sensing Clamp

Accessory

Common Cautions

Cautions

Installation Notes (For Hyd. Series)

Hydraulic Fluid List

Notes on Hyd. Cylinder Speed Control Circuit

Notes on Handling

Maintenance/ Inspection

Warranty

● 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.)

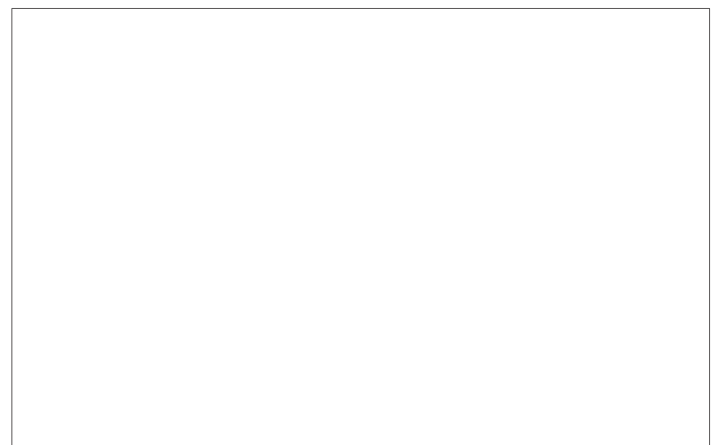Damages excluding from direct result of a product defect shall be excluded from the warranty.

KOSMEK

Harmony in Innovation

■ 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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KOSMEK HEAD OFFICE

MS CM009