Air Sensing Swing Clamp

Hydraulic Double Action

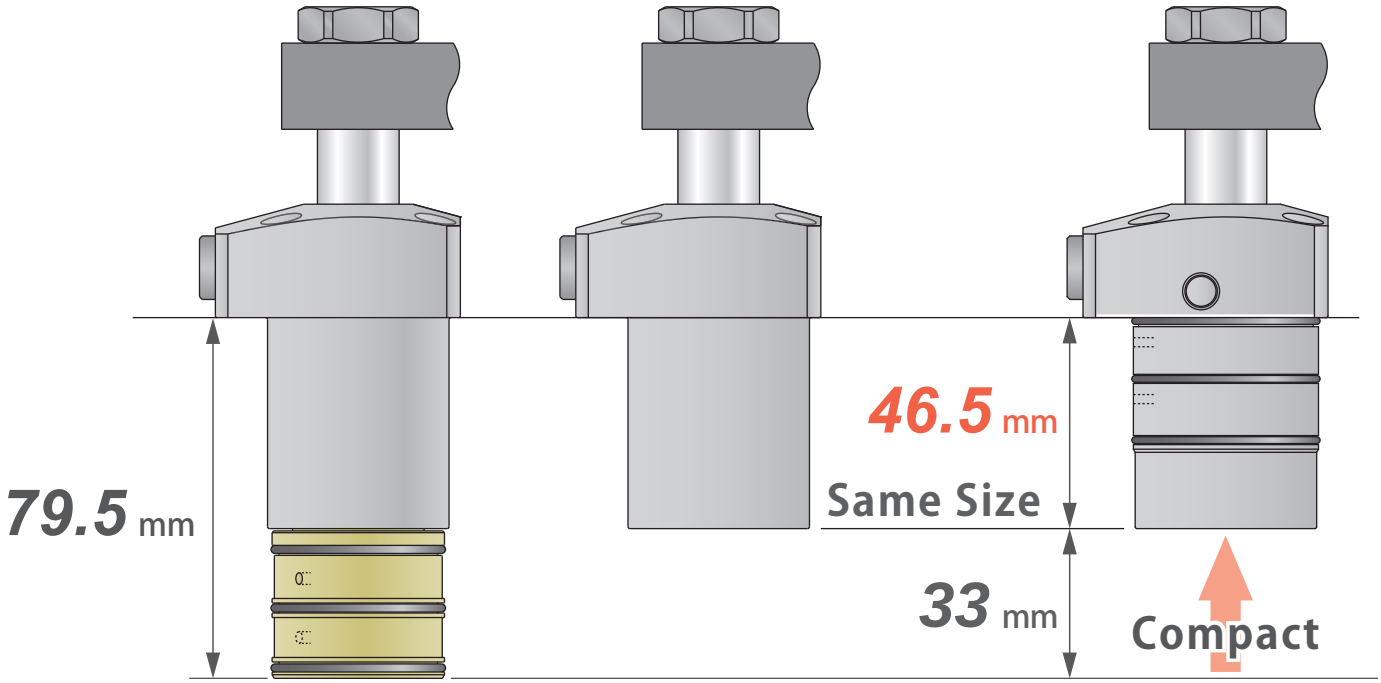
Model LHW

Redeveloped Clamp - Unclamp Confirmation for Smaller Footprint

Ideal for automated equipment, with the built-in action confirmation valve.

PAT.P.

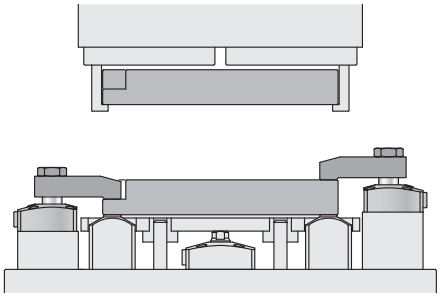
Comparison diagram of standard LHA model vs. LHW model



< Comparison Model >	< Comparison Model >	< Air Sensing Model >
LHA0400-C□M	LHA0400-C□	LHW0401-C□E
Ability to confirm clamp and unclamp action	No Action Confirmation	Ability to confirm clamp and unclamp action

Body Size 075 Has Been Introduced.

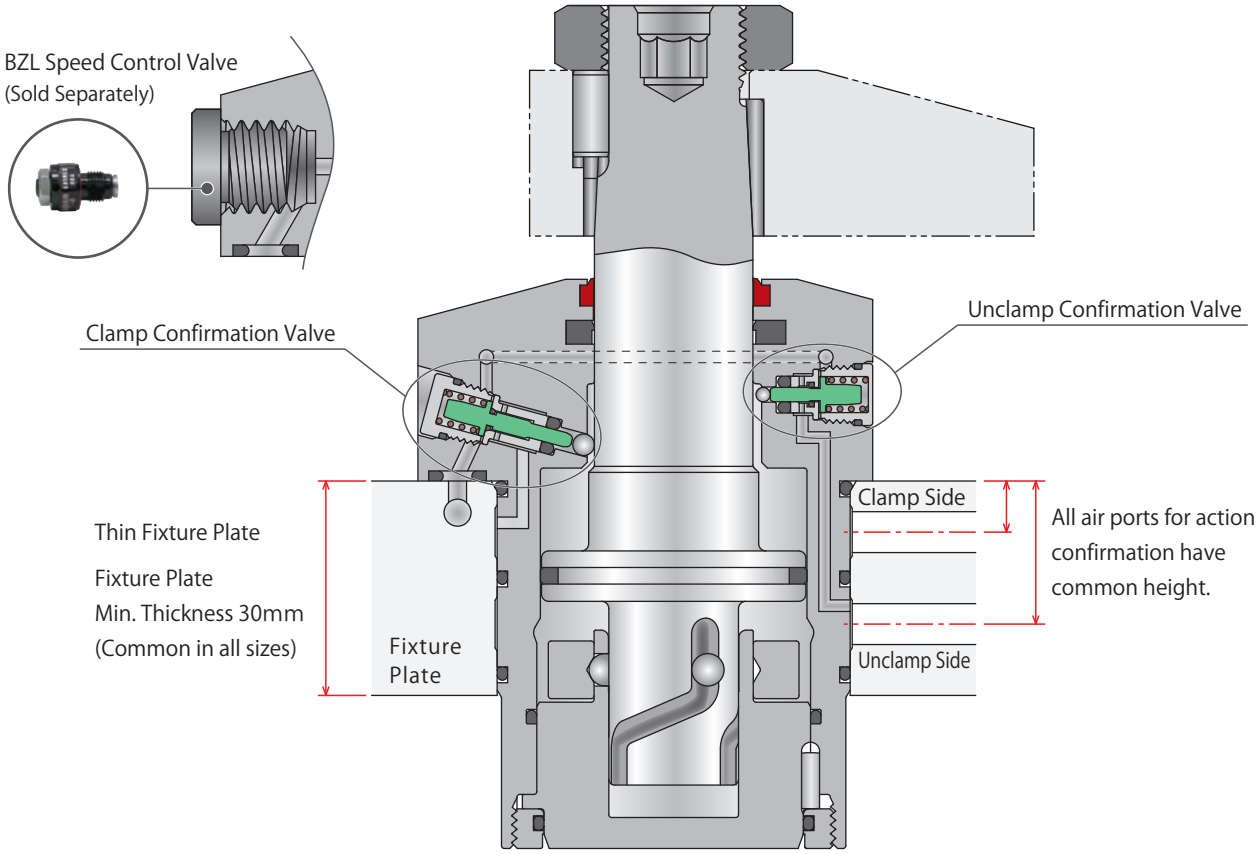
Application Example



For automated setup
requiring action confirmation

Cross Section

※ This drawing shows clamp - unclamp confirmation model (LHW-C□E).



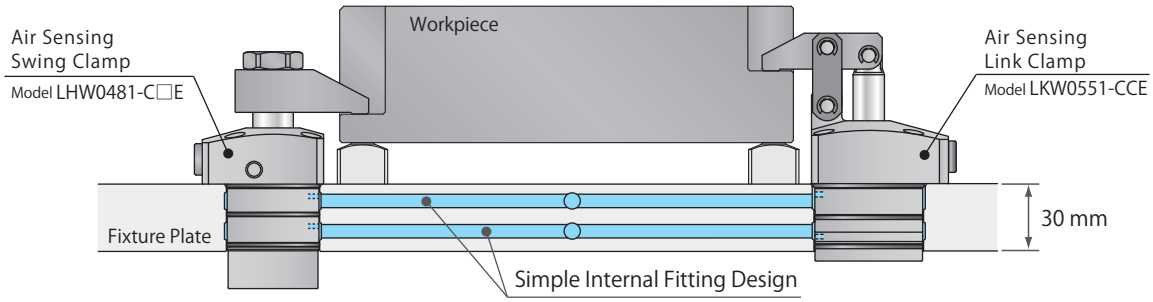
- Action confirmation allows for safe and secure loading and unloading of workpieces.
- Built-in sensing valves enable for thinner fixture designing.

  Zero air leakage when the valve is closed. Air sensor with limited flow rate is available.
- Simpler Internal Fitting Design

  Common air port height for action confirmation allows for simpler circuit designing as shown below.

  • When using different sizes of swing clamps (Model LHW-C□E).

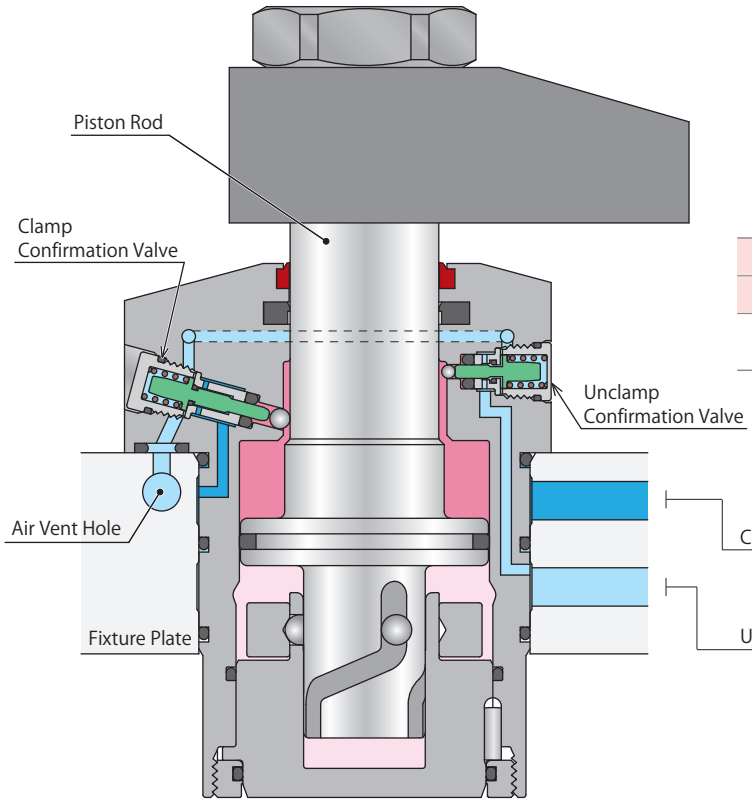
  • When using swing clamp (Model LHW-C□E) in combination with link clamp (Model LKW-C□E).

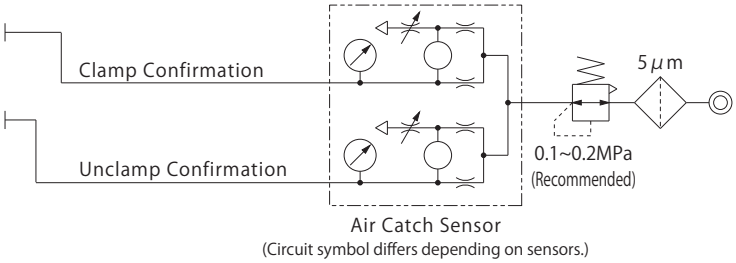


Action Description

※ This drawing shows clamp - unclamp confirmation model (LHW-C□E).

Clamp





Clamp (Supplying hydraulic pressure to clamp port)

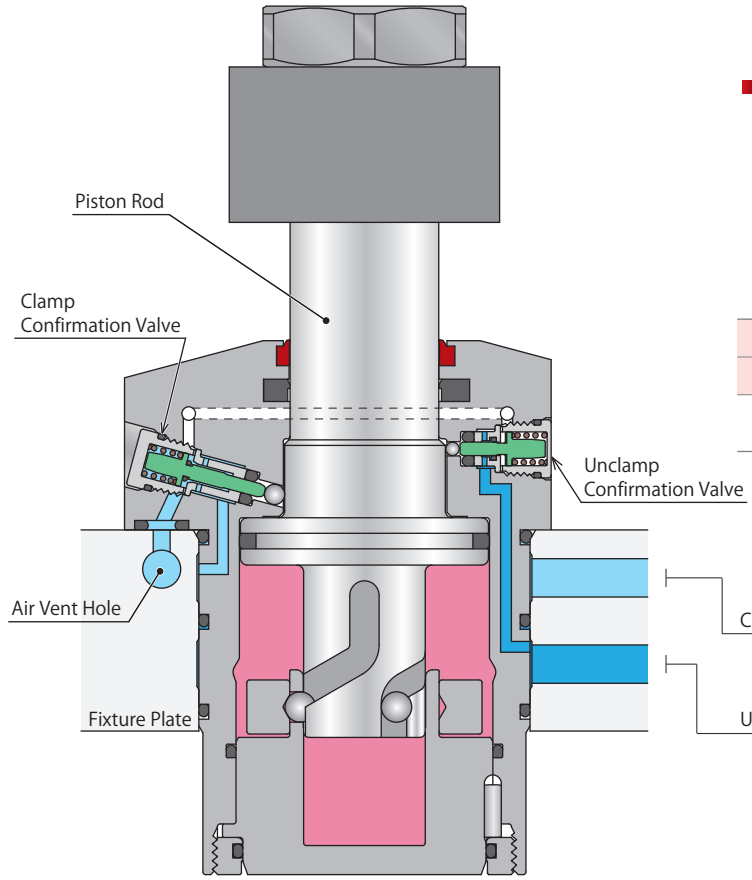
The piston rod descends as it swings.

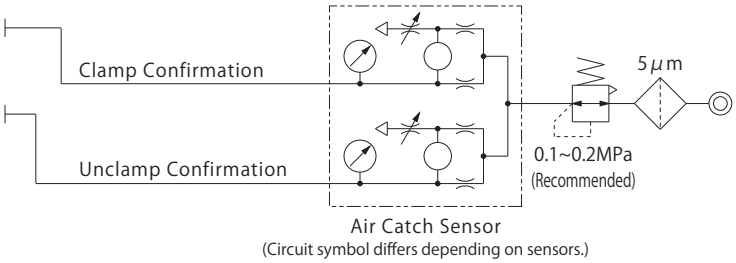
↓

After swing action is completed, the piston rod descends vertically and clamps the workpiece.

Hydraulic Pressure		Air Catch Sensor	
Clamp Side	Unclamp Side	Clamp Confirmation	Unclamp Confirmation
ON	OFF	ON	OFF

Unclamp





Unclamp (Supplying hydraulic pressure to unclamp port)

The piston rod ascends vertically (Clamp Stroke Range).

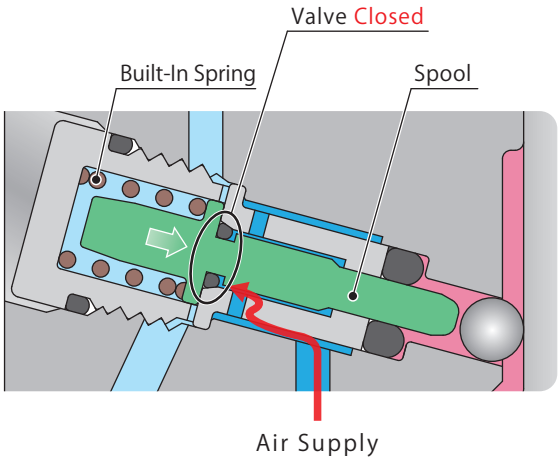
↓

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

Hydraulic Pressure		Air Catch Sensor	
Clamp Side	Unclamp Side	Clamp Confirmation	Unclamp Confirmation
OFF	ON	OFF	ON

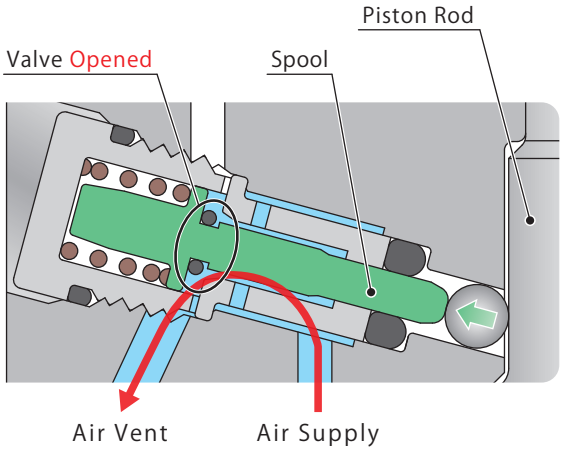
Clamp Confirmation Valve

Hyd. Pressure to Clamp Port Air Catch Sensor ON



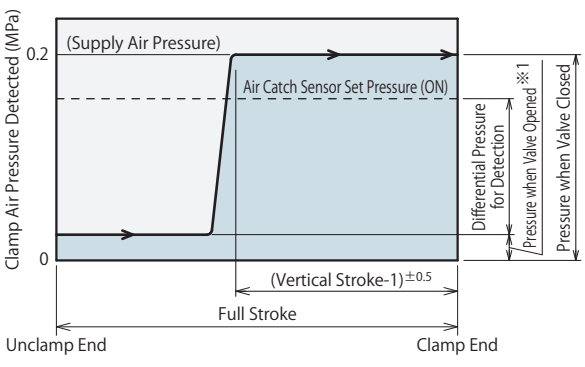
The spool is pushed forward by the built-in spring.
The valve is closed when stroking 1mm after swing stroke.

Hyd. Pressure to Unclamp Port Air Catch Sensor OFF



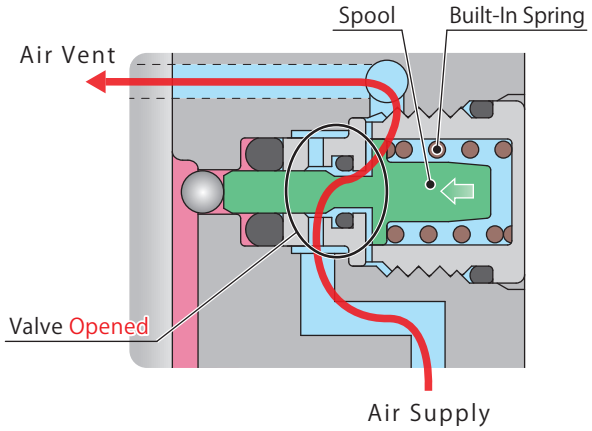
The spool is pushed back by the piston rod, and the valve is opened.

Sensing Chart for Clamp Confirmation



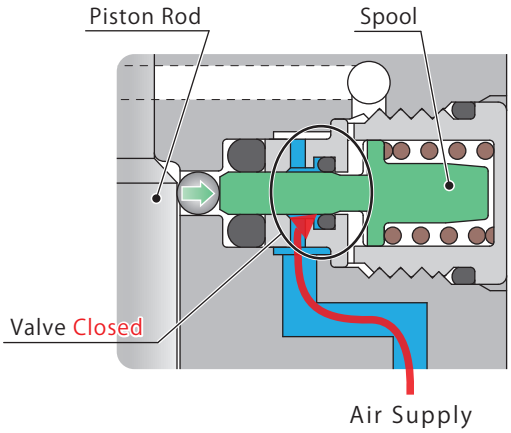
Unclamp Confirmation Valve

Hyd. Pressure to Clamp Port Air Catch Sensor OFF



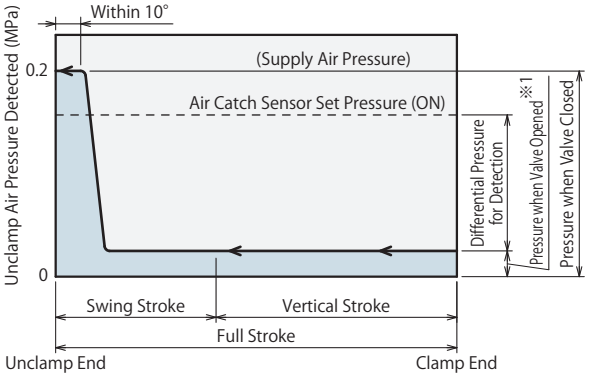
The spool is pushed forward by the built-in spring, and the valve is opened.

Hyd. Pressure to Unclamp Port Air Catch Sensor ON



The spool is pushed back by the piston rod, and the valve is closed.

Sensing Chart for Unclamp Confirmation



※1. The sensor pressure for opening the valve depends on the sensor.
With air sensor with large air flow, the sensor pressure for opening the valve is higher and the differential pressure for detection is lower.

Action Description（Air Sensing Chart Explanation）

Action confirmation can be conducted by detecting differential pressure with the built-in valve for air catch sensor.

Applicable Model

LHW 048 1 - C R/L **E H J**

5 Sensing Valve
- **E**：Clamp - Unclamp Confirmation (Both)
- **H**：Clamp Confirmation Only
- **J**：Unclamp Confirmation Only

Air Catch Sensor

- Air catch sensor is required in order to conduct the action confirmation.

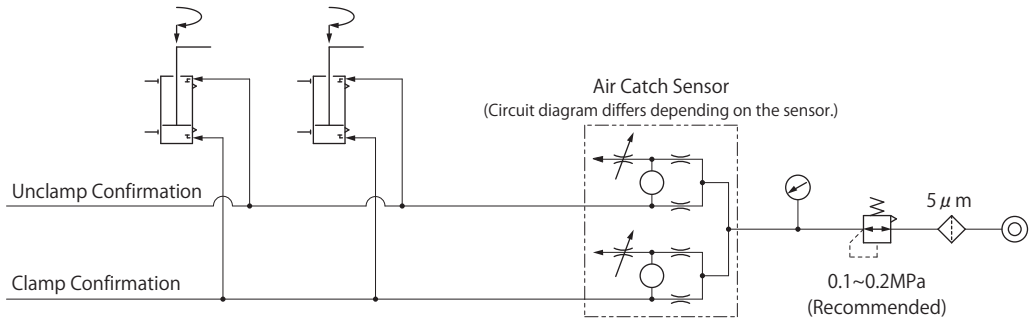
  Sensing can be done by the air catch sensor with small air flow (recommended models are in the chart below).

  Recommended Operating Air Pressure：0.1~0.2MPa

Recommended Air Catch Sensor

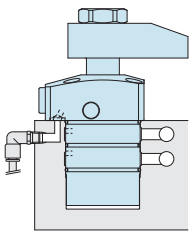
Maker	SMC	CKD
Name	Air Catch Sensor	Gap Switch
Model No.	ISA3-F , ISA3-G , ISA2-G	GPS2-05-15

- Please refer to maker's catalog etc. for the detail of the air catch sensor.
- The air pressure to the air catch sensor should be 0.1~0.2MPa.
- Continuously supply air pressure to the clamps when in use.
- Refer to the drawing below for the pneumatic circuit construction.

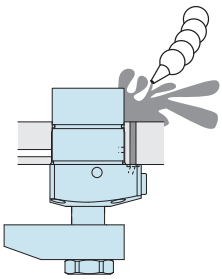


Notes for Design・Installation・Use

- Air vent port must be open to the atmosphere, and prevent coolant and chips from entering the air vent port. The air catch sensor can malfunction if the air vent port is blocked.

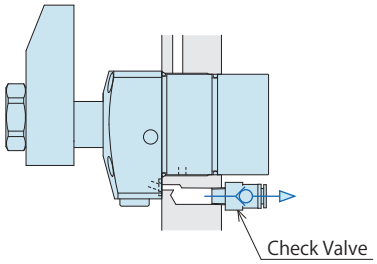


O The air vent port is open to the atmosphere.



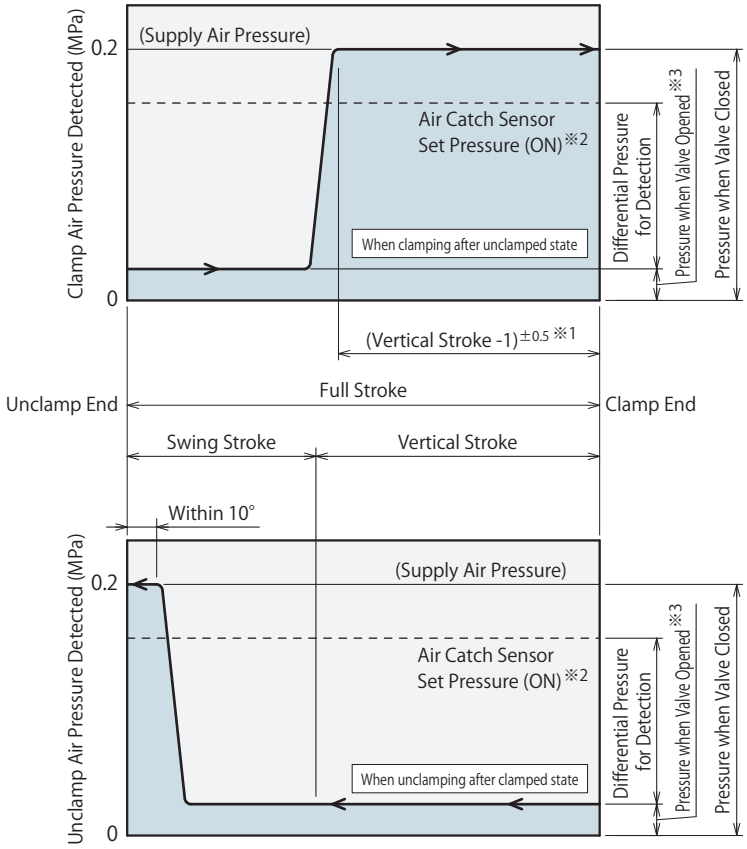
✕ Coolant and chips enter from the air vent port.

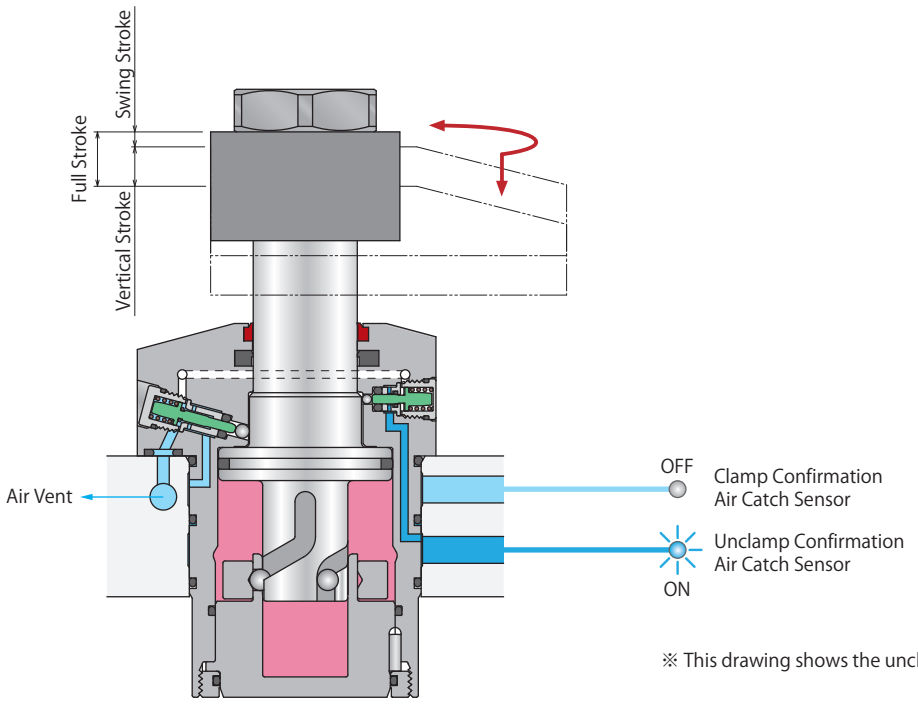
- Continuously supply air pressure to the air port when in use.
- Prevention of Foreign Substance to the Air Vent Port
  Coolant and chips can be prevented by setting a check valve with low cracking pressure. (Recommended check valve: SMC-made series AKH, cracking pressure: 0.005MPa)



Air Sensing Chart

Number Directly Connected to Clamp: 1, Air Catch Sensor ISA3-F, Supply Air Pressure 0.2MPa





※ This drawing shows the unclamped state.

Notes:

1. Sensing chart shown is the relationship between the stroke and detection circuit air pressure.
2. The specifications may vary depending on the air circuit. The hose length should be as short as possible. (Less than 5m)
3. There is only clamp confirmation for sensing valve symbol [H], and only unclamp confirmation for sensing valve symbol [J].

※1. There is a certain tolerance with regard to the position where the pressure for closing the valve is reached depending on the sensor structure. (Refer to the sensing chart.)

※2. The position where the air catch sensor has ON signal output varies depending on the sensor setting.

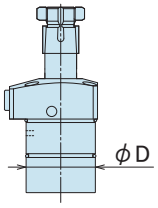
※3. The sensor pressure for opening the valve depends on the sensor.
With air sensor with large air flow, the sensor pressure for opening the valve is higher and the differential pressure for detection is lower.

Model No. Indication

LHW 048 1 - C R E
1 2 3 4 5

1 Body Size

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



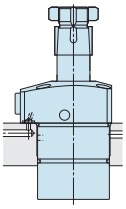
※ Outer diameter (ϕD) of the cylinder.

2 Design No.

1 : Revision Number

3 Piping Method

C : Gasket Option (With G Thread Plug)

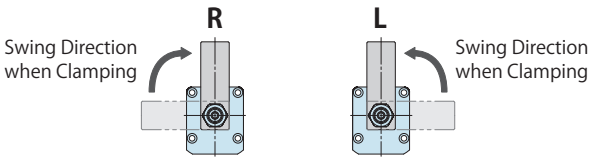


With G Thread Plug
Able to attach speed control valve

※ Speed control valve (BZL) is sold separately.
Please refer to P. 59.

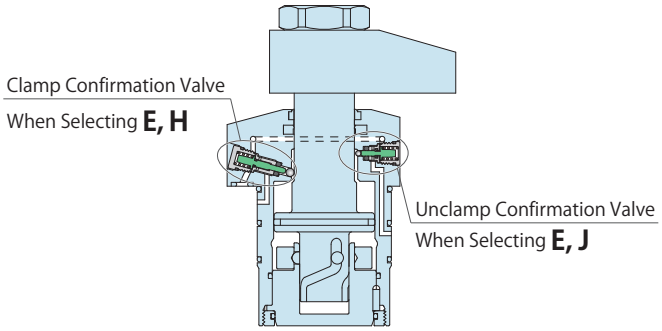
4 Swing Direction when Clamping

R : Clockwise
L : Counter-Clockwise



5 Sensing Valve

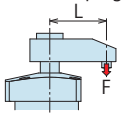
E : Clamp - Unclamp Confirmation (Both)
H : Clamp Confirmation Only
J : Unclamp Confirmation Only



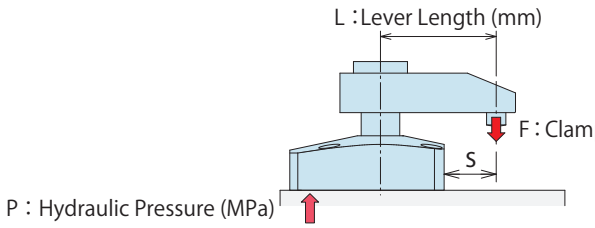
Specifications

Model No.			LHW0401-C□□	LHW0481-C□□	LHW0551-C□□	LHW0651-C□□	LHW0751-C□□
Cylinder Area for Clamping		cm2	5.00	6.95	10.3	13.4	20.3
Clamping Force ※1 (Calculation Formula)		kN	$F=\frac{P(1-0.0016\times L)}{2.0920+0.0040\times L}$	$F=\frac{P(1-0.0009\times L)}{1.4892+0.0018\times L}$	$F=\frac{P(1-0.0011\times L)}{1.0039+0.0011\times L}$	$F=\frac{P(1-0.0009\times L)}{0.7822+0.0010\times L}$	$F=\frac{P(1-0.0007\times L)}{0.5175+0.0006\times L}$
Cylinder Capacity	Clamp	cm3	7.3	10.8	19.0	26.7	48.7
	Unclamp	cm3	10.9	16.7	28.1	40.9	72.5
Full Stroke		mm	14.5	15.5	18.5	20	24
Swing Stroke (90°)		mm	6.5	7.5	8.5	10	12
Vertical Stroke		mm	8	8	10	10	12
Swing Angle Accuracy			90° ±3°				
Swing Complete Position Repeatability			±0.5°				
Hydraulic Pressure	Max. Operating Pressure	MPa	7.0				
	Min. Operating Pressure ※2	MPa	1.5				
	Withstanding Pressure	MPa	10.5				
Recommended Operating Air Pressure		MPa	0.1～0.2				
Recommended Air Catch Sensor			ISA3-F , ISA3-G , ISA2-G (SMC) / GPS2-05-15(CKD)				
Operating Temperature		℃	0～70				
Mass ※3		kg	0.9	1.4	2.0	2.9	4.2

Notes: ※1. F：Clamping Force (kN) , P：Supply Hydraulic Pressure (MPa), L：Distance between the piston center and the clamping point (mm).
※2. Minimum pressure to operate the clamp without load.
※3. Mass of single swing clamp including taper sleeve and nut.



Clamping Force Curve



(Ex.) When using LHW0481
Supply Hydraulic Pressure 5.0MPa, Lever Length L=50mm
Clamping force is about 3.1kN.

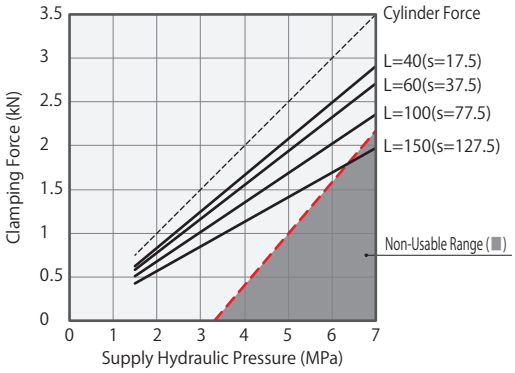
Notes:

1. Tables and graphs shown are the relationships between the clamping force (kN) and supply hydraulic pressure (MPa).
2. Cylinder output (when L=0) cannot be calculated from the calculation formula of clamping force.
3. There may be no lever swing action with large inertia depending on supply hydraulic pressure or lever mounting position.
4. The clamping force is shown with lever in the locked position.
5. The clamping force varies depending on the lever length. Set the supply hydraulic pressure suitable to the lever length.
6. Using in the non-usable range may damage the clamp and lead to 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)

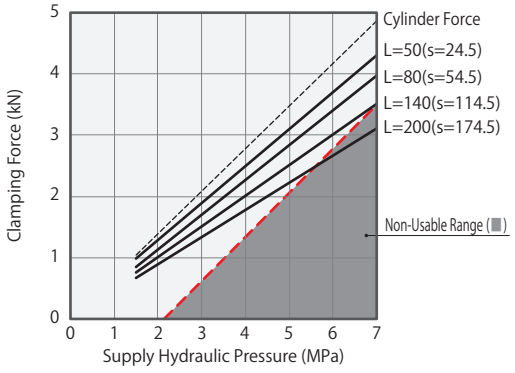
LHW0401 Clamping Force Calculation Formula ※1 (kN) $F = P(1-0.0016\times L) / (2.0920+0.0040\times L)$

Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm) L=40	L=50	L=60	L=70	L=80	L=100	L=120	L=150	Max. Lever Length (L) (mm)
7	3.50	3.0	2.9	2.8	2.7	2.6	2.4	2.2		124
6.5	3.25	2.7	2.7	2.6	2.5	2.4	2.2	2.1		144
6	3.00	2.5	2.5	2.4	2.3	2.2	2.1	1.9	1.7	171
5.5	2.75	2.3	2.3	2.2	2.1	2.0	1.9	1.8	1.6	210
5	2.50	2.1	2.1	2.0	1.9	1.9	1.7	1.6	1.5	210
4.5	2.25	1.9	1.9	1.8	1.7	1.7	1.6	1.5	1.3	210
4	2.00	1.7	1.7	1.6	1.5	1.5	1.4	1.3	1.2	210
3.5	1.75	1.5	1.4	1.4	1.4	1.3	1.2	1.1	1.0	210
3	1.50	1.3	1.2	1.2	1.2	1.1	1.1	1.0	0.9	210
2.5	1.25	1.1	1.0	1.0	1.0	0.9	0.9	0.8	0.8	210
2	1.00	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.6	210
1.5	0.75	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.5	210
Max. Operating Pressure (MPa)		7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.4	



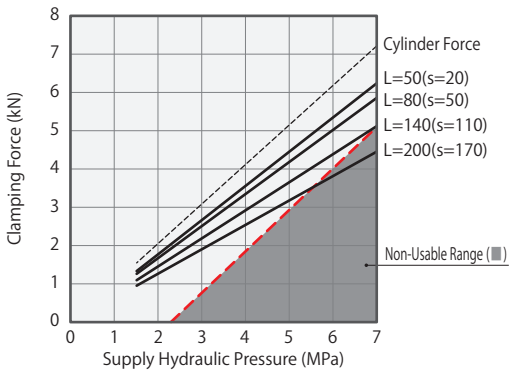
LHW0481 Clamping Force Calculation Formula ※1 (kN) $F = P(1-0.0009\times L) / (1.4892+0.0018\times L)$

Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm) L=50	L=60	L=80	L=100	L=120	L=140	L=160	L=200	Max. Lever Length (L) (mm)
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	



LHW0551 Clamping Force Calculation Formula ※1 (kN) $F = P(1-0.0011\times L) / (1.0039+0.0011\times L)$

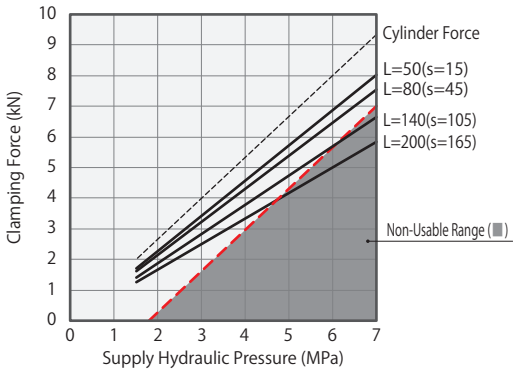
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm) L=50	L=60	L=80	L=100	L=120	L=140	L=160	L=200	Max. Lever Length (L) (mm)
7	7.21	6.3	6.2	5.9	5.6	5.4	5.2			142
6.5	6.69	5.8	5.7	5.5	5.2	5.0	4.8			159
6	6.18	5.4	5.3	5.1	4.8	4.6	4.4	4.2		180
5.5	5.66	5.0	4.8	4.6	4.4	4.2	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	



LHW0651

Clamping Force Calculation Formula ※1 (kN) $F = P(1\text{-}0.0009 \times L) / (0.7822 + 0.0010 \times L)$

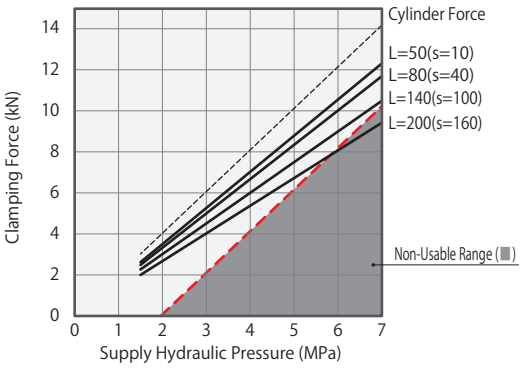
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm) L=50	L=60	L=80	L=100	L=120	L=140	L=160	L=200	Max. Lever Length (L) (mm)
7	9.35	8.1	7.9	7.6	7.3					115
6.5	8.68	7.5	7.3	7.0	6.7	6.5				127
6	8.02	6.9	6.8	6.5	6.2	6.0	5.7			142
5.5	7.35	6.4	6.2	6.0	5.7	5.5	5.3	5.0		161
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	



LHW0751

Clamping Force Calculation Formula ※1 (kN) $F = P(1\text{-}0.0007 \times L) / (0.5175 + 0.0006 \times L)$

Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm) L=50	L=60	L=80	L=100	L=120	L=140	L=160	L=200	Max. Lever Length (L) (mm)
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	

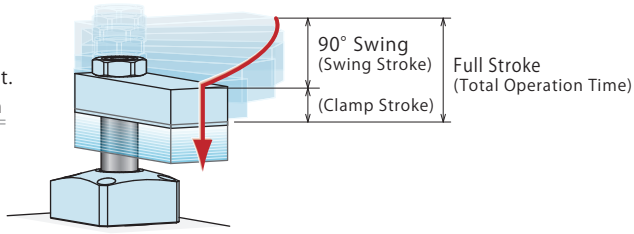


Allowable Swing Time Graph

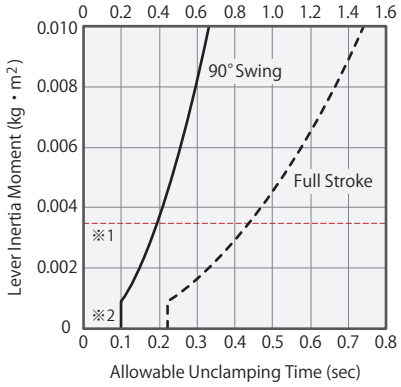
Adjustment of Swing Time

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

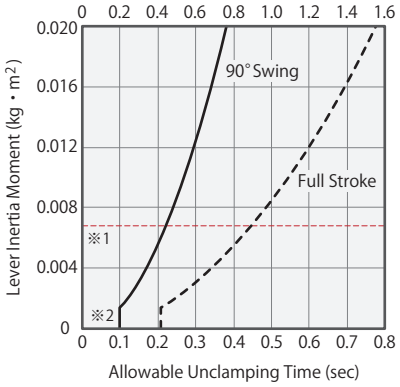
Excessive action speed can reduce stopping accuracy and damage internal components.



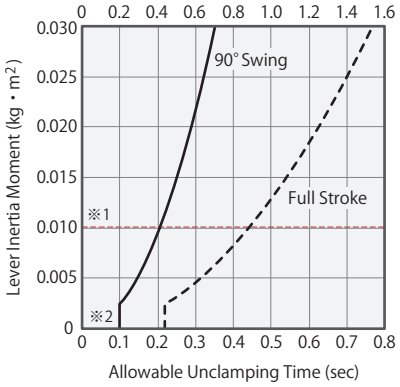
LHW0401



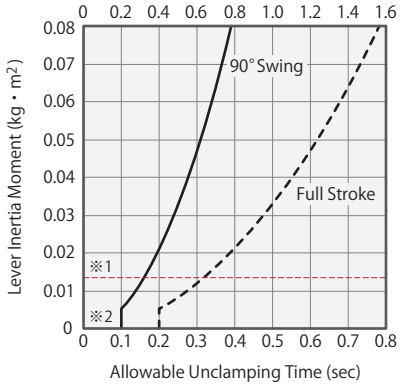
LHW0481



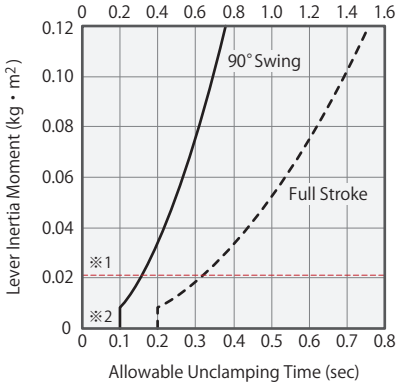
LHW0551



LHW0651



LHW0751



Notes:

※1. It shows the inertia moment with material lever (LZH□-T).

※2. For any lever inertia moment, 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 lever inertia moment 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.64 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.

(How to read the allowable swing time graph)

When using LHW0481

Lever Inertia Moment : 0.0068kg・m²

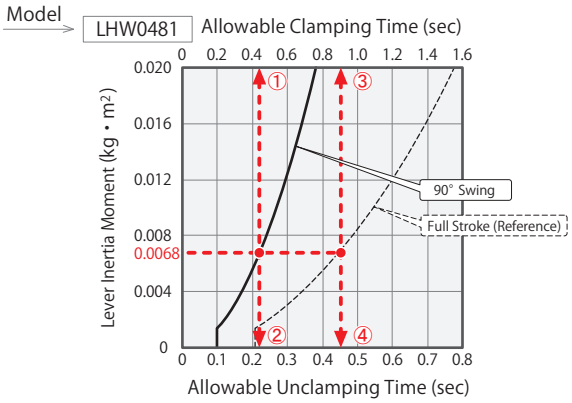
①90° Swing Time when Clamping : About 0.44 sec or more

②90° Swing Time when Unclamping : About 0.22 sec or more

③Total Clamp Operation Time : About 0.9 sec or more

④Total Unclamp Operation Time : About 0.45 sec or more

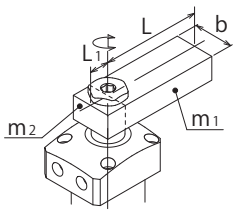
1. The total operation time on the graph represents the allowable operation time when fully stroked.



How to calculate inertia moment (Estimated)

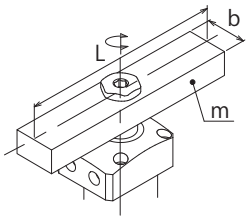
I : Inertia Moment (kg・m²) L, L_1, L_2, K, b : Length (m) m, m_1, m_2, m_3 : Mass (kg)

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



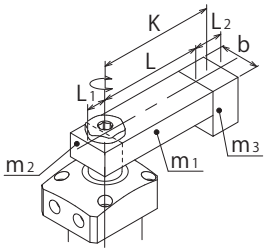
$$I = m_1 \frac{4L^2+b^2}{12} + m_2 \frac{4L_1^2+b^2}{12}$$

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



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

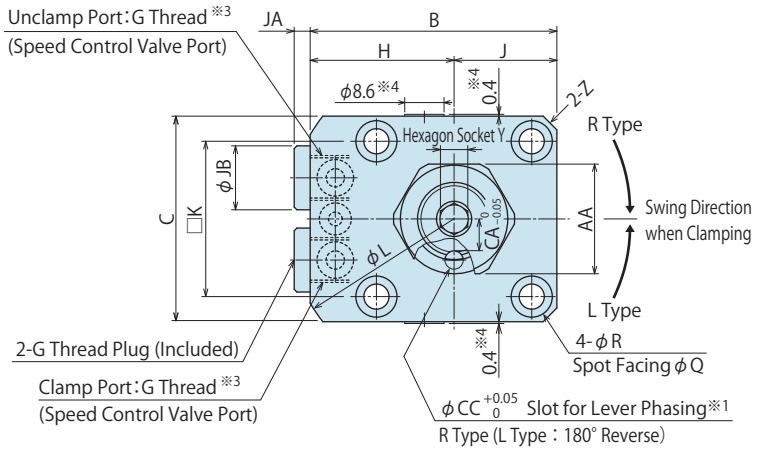
③ Load is applied on the lever front end.

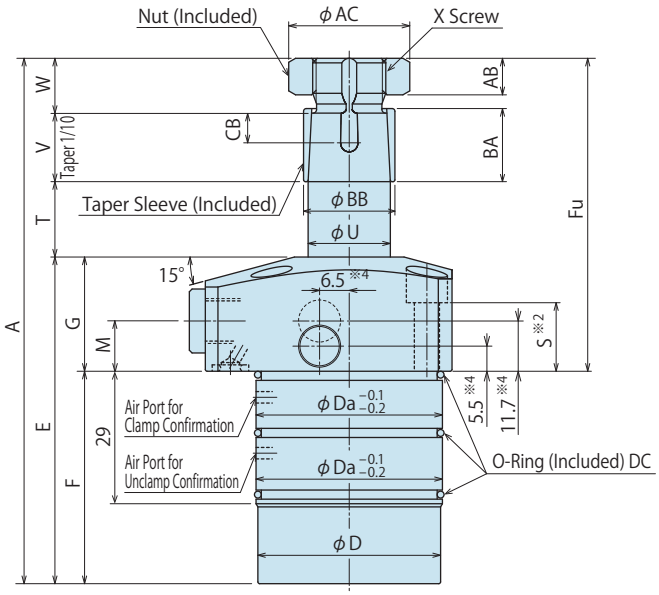


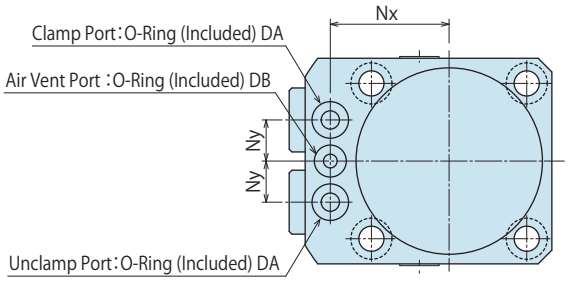
$$I = m_1 \frac{4L^2+b^2}{12} + m_2 \frac{4L_1^2+b^2}{12} + m_3K^2 + m_3 \frac{L_2^2+b^2}{12}$$

External Dimensions (Clamp - Unclamp Confirmation)

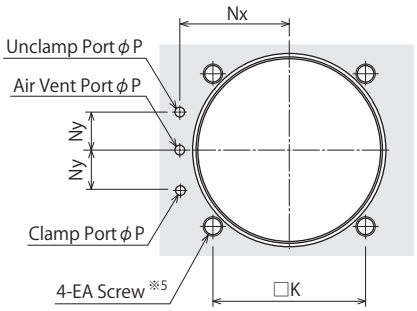
※The drawing shows the unclamped state of LHW-CRE.



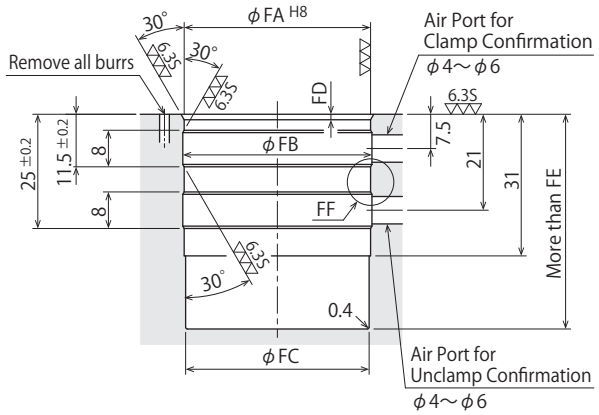




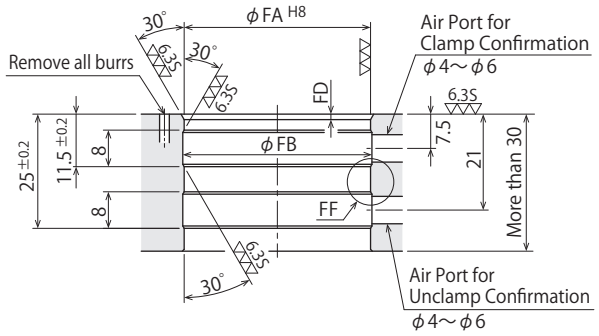
Machining Dimensions of Mounting Area

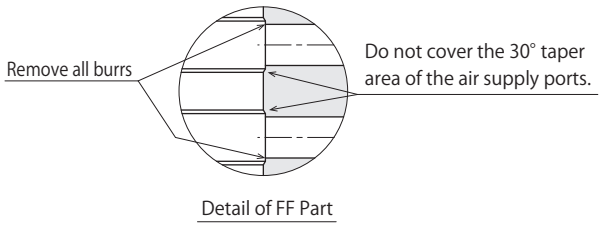


For Blind Hole



For Through Hole





Notes:

※1. The slot for lever phasing faces the port side when clamped.

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

※3. Speed control valve is sold separately.
Please refer to P.59 for detail.

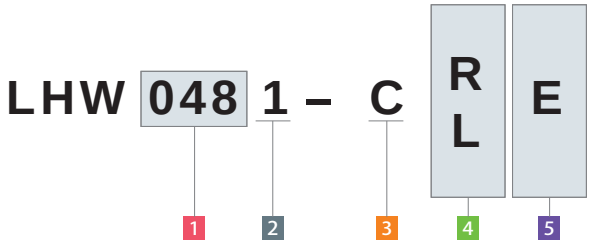
※4. The valve of LHW0401 is protruded as shown in the drawing.

Note:

※5. EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimensions 'S'.

Model No. Indication

(Format Example：LHW0481-CRE, LHW0551-CLE)



1 Body Size
2 Design No.
3 Piping Method
4 Swing Direction when Clamping
5 Sensing Valve
(When selecting E：Clamp - Unclamp Confirmation)

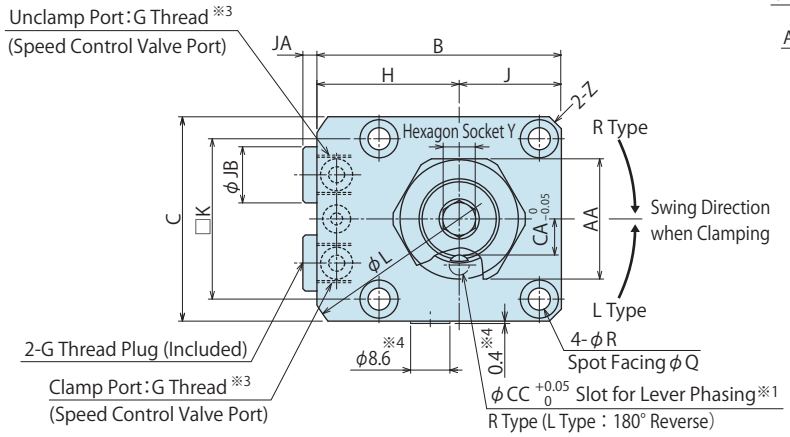
External Dimensions and Machining Dimensions of Mounting

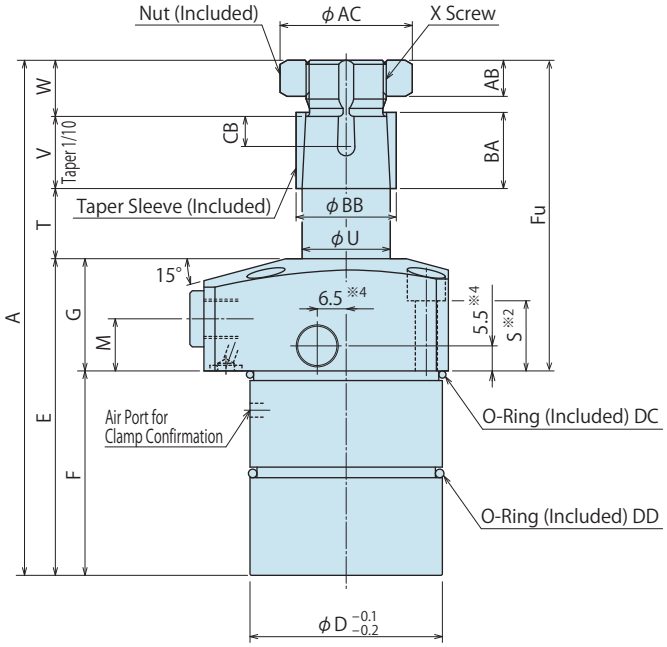
(mm)

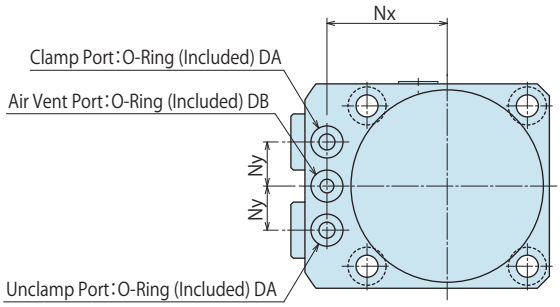
Model No.		LHW0401-C□E	LHW0481-C□E	LHW0551-C□E	LHW0651-C□E	LHW0751-C□E
Full Stroke		14.5	15.5	18.5	20	24
Swing Stroke (90°)		6.5	7.5	8.5	10	12
Vertical Stroke		8	8	10	10	12
A		115	128.5	145.5	156	181
B		54	61	69	81	92
C		45	51	60	70	80
D		40	48	55	65	75
Da		40.8	49	56	66	76
E		71.5	79	89	94	109
F		46.5	51	59	63	71
Fu		68.5	77.5	86.5	93	110
G		25	28	30	31	38
H		31.5	35.5	39	46	52
J		22.5	25.5	30	35	40
K		34	40	47	55	63
L		73	83	88	106	116
M		11	13	12	13	16
Nx		26	30	33.5	39.5	45
Ny		9	11	12	15	16
P		3	3	3	5	5
Q		9	9	11	11	14
R		5.5	5.5	6.8	6.8	9
S		15	17.5	17	17	21
T		16.5	17.5	20.5	22	26
U		18	22	25	30	35.5
V		15	18	21	24	30
W		12	14	15	16	16
X (Nominal × Pitch)		M16×1.5	M20×1.5	M22×1.5	M27×1.5	M30×1.5
Y		6	8	8	10	10
Z (Chamfer)		C3	C3	C3	C4	C5
AA		24	30	32	41	46
AB		8	9	10	11	11
AC		26.5	33	35.5	45	50
BA		16	19	22	25	31
BB		20	25	28	34	40
CA		7	9	10	12.5	14
CB		6.5	7.5	9.5	11.5	12.5
CC		4	5	6	6	8
EA (Nominal × Pitch)		M5×0.8	M5×0.8	M6×1	M6×1	M8×1.25
FA		$40.8^{+0.039}_{0}$	$49^{+0.039}_{0}$	$56^{+0.046}_{0}$	$66^{+0.046}_{0}$	$76^{+0.046}_{0}$
FB		41.4	49.6	56.6	66.6	76.6
FC		40.5	48.5	55.5	65.5	75.5
FD		1.2	1.2	1.5	1.5	1.5
FE		47	51.5	59.5	63.5	71.5
JA		3.5	3.5	3.5	4.5	4.5
JB		14	14	14	19	19
Clamp Port：G Thread Unclamp Port：G Thread		G1/8	G1/8	G1/8	G1/4	G1/4
O-Ring	DA	1BP5	1BP5	1BP5	1BP7	1BP7
	DB	AS568-007 (90°)	1BP5	1BP5	1BP7	1BP7
	DC	38×1.5 (Internal diameter × Wire diameter)	AS568-031(70°)	AS568-033(70°)	AS568-036(70°)	AS568-040(70°)

External Dimensions (Clamp Confirmation Only)

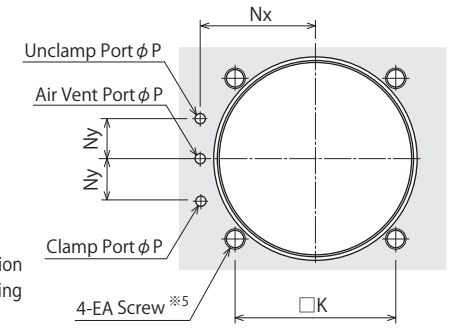
※The drawing shows the unclamped state of LHW-CRH.



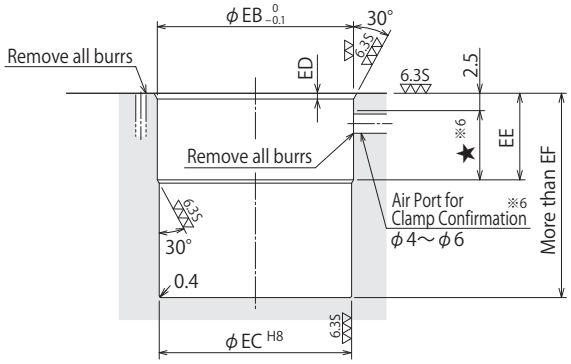




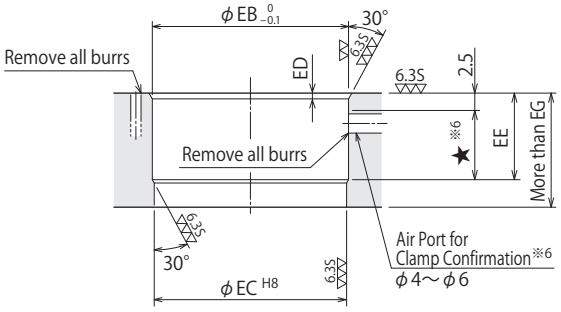
Machining Dimensions of Mounting Area



For Blind Hole



For Through Hole



Notes:

※5. EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimensions 'S'.

※6. Provide the air port for clamp confirmation within the part ★.

Notes:

※1. The slot for lever phasing faces the port side when clamped.

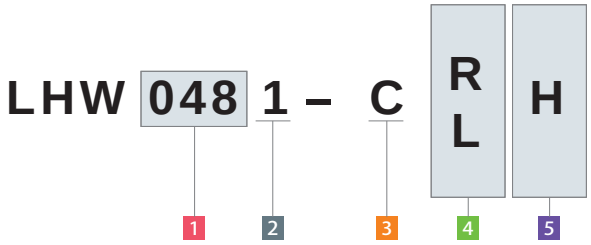
※2. Mounting bolts are not provided with the product. Please prepare them according to the mounting height referring to dimension 'S'.

※3. Speed control valve is sold separately. Please refer to P.59 for detail.

※4. The valve of LHW0401 is protruded as shown in the drawing.

Model No. Indication

(Format Example：LHW0481-CRH, LHW0551-CLH)



1 Body Size
2 Design No.
3 Piping Method
4 Swing Direction when Clamping
5 Sensing Valve
(When selecting H：Clamp Confirmation Only)

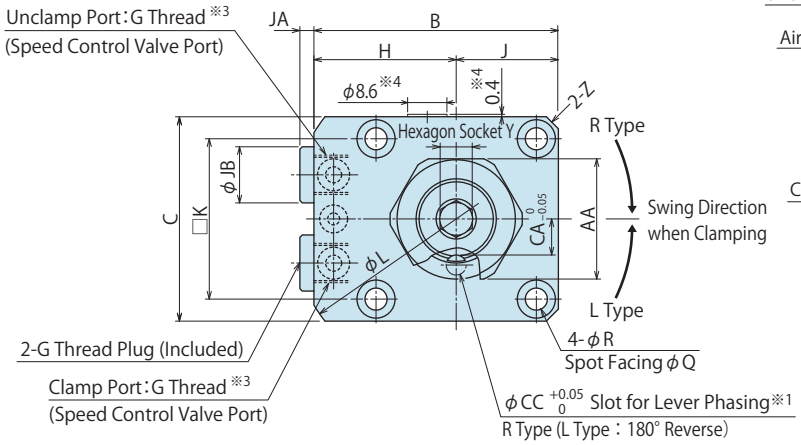
External Dimensions and Machining Dimensions of Mounting

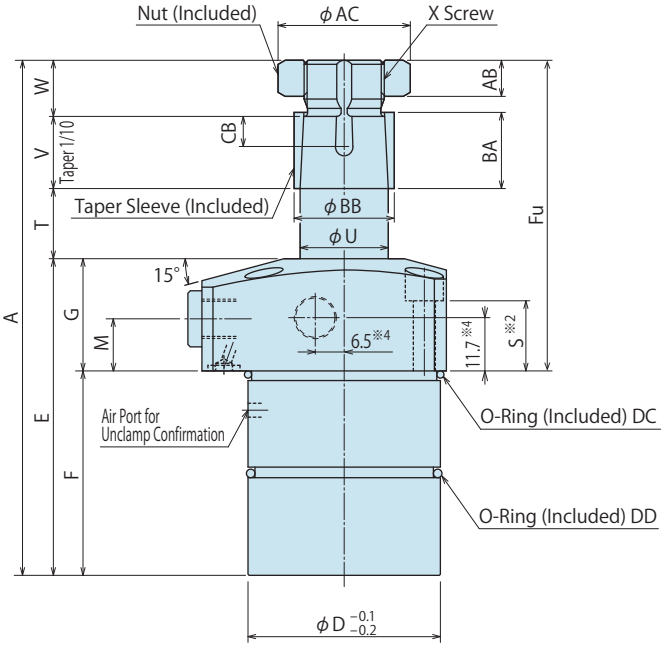
(mm)

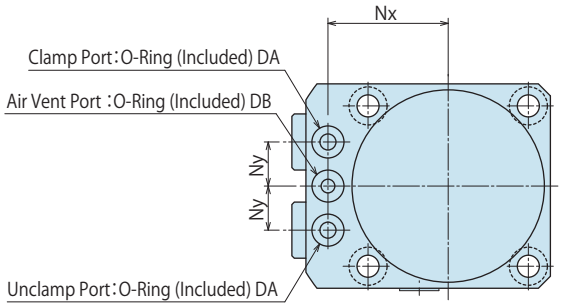
Model No.		LHW0401-C□H	LHW0481-C□H	LHW0551-C□H	LHW0651-C□H	LHW0751-C□H
Full Stroke		14.5	15.5	18.5	20	24
Swing Stroke (90°)		6.5	7.5	8.5	10	12
Vertical Stroke		8	8	10	10	12
A		115	128.5	145.5	156	181
B		54	61	69	81	92
C		45	51	60	70	80
D		40	48	55	65	75
E		71.5	79	89	94	109
F		46.5	51	59	63	71
Fu		68.5	77.5	86.5	93	110
G		25	28	30	31	38
H		31.5	35.5	39	46	52
J		22.5	25.5	30	35	40
K		34	40	47	55	63
L		73	83	88	106	116
M		11	13	12	13	16
Nx		26	30	33.5	39.5	45
Ny		9	11	12	15	16
P		3	3	3	5	5
Q		9	9	11	11	14
R		5.5	5.5	6.8	6.8	9
S		15	17.5	17	17	21
T		16.5	17.5	20.5	22	26
U		18	22	25	30	35.5
V		15	18	21	24	30
W		12	14	15	16	16
X (Nominal × Pitch)		M16×1.5	M20×1.5	M22×1.5	M27×1.5	M30×1.5
Y		6	8	8	10	10
Z (Chamfer)		C3	C3	C3	C4	C5
AA		24	30	32	41	46
AB		8	9	10	11	11
AC		26.5	33	35.5	45	50
BA		16	19	22	25	31
BB		20	25	28	34	40
CA		7	9	10	12.5	14
CB		6.5	7.5	9.5	11.5	12.5
CC		4	5	6	6	8
EA (Nominal × Pitch)		M5×0.8	M5×0.8	M6×1	M6×1	M8×1.25
EB		40.8	49	56	66	76
EC		$40^{+0.039}_{0}$	$48^{+0.039}_{0}$	$55^{+0.046}_{0}$	$65^{+0.046}_{0}$	$75^{+0.046}_{0}$
ED		1.2	1.2	1.5	1.5	1.5
EE		20	20	24	24	34
EF		47	51.5	59.5	63.5	71.5
EG		26	26	30	30	40
JA		3.5	3.5	3.5	4.5	4.5
JB		14	14	14	19	19
Clamp Port：G Thread Unclamp Port：G Thread		G1/8	G1/8	G1/8	G1/4	G1/4
O-Ring	DA	1BP5	1BP5	1BP5	1BP7	1BP7
	DB	AS568-007(90°)	1BP5	1BP5	1BP7	1BP7
	DC	38×1.5 (Internal diameter × Wire diameter)	AS568-031(70°)	AS568-033(70°)	AS568-036(70°)	AS568-040(70°)
	DD	AS568-028(70°)	AS568-031(70°)	AS568-033(70°)	AS568-036(70°)	AS568-039(70°)

External Dimensions (Unclamp Confirmation Only)

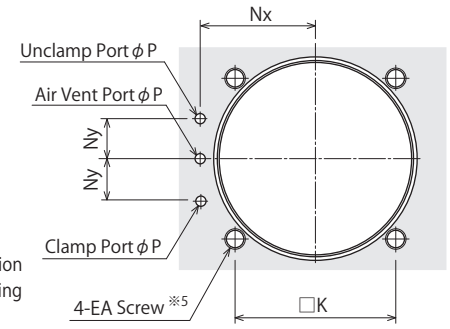
※The drawing shows the unclamped state of LHW-CRJ.



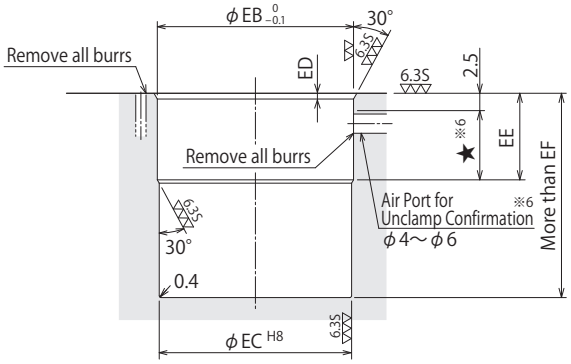




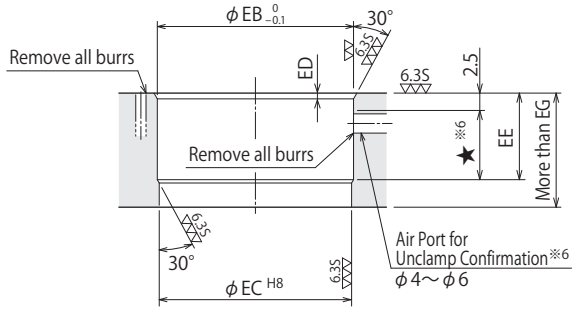
Machining Dimensions of Mounting Area



For Blind Hole



For Through Hole



Notes:

※5. EA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimensions 'S'.

※6. Provide the air port for unclamp confirmation within the part ★.

Notes:

※1. The slot for lever phasing faces the port side when clamped.

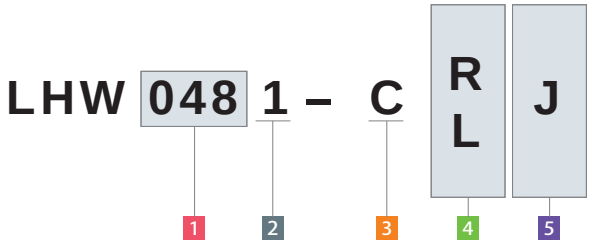
※2. Mounting bolts are not provided with the product. Please prepare them according to the mounting height referring to dimension 'S'.

※3. Speed control valve is sold separately. Please refer to P.59 for detail.

※4. The valve of LHW0401 is protruded as shown in the drawing.

Model No. Indication

(Format Example：LHW0481-CRJ, LHW0551-CLJ)



1 Body Size
2 Design No.
3 Piping Method
4 Swing Direction when Clamping
5 Sensing Valve
(When selecting J：Unclamp Confirmation Only)

External Dimensions and Machining Dimensions of Mounting

(mm)

Model No.		LHW0401-C□J	LHW0481-C□J	LHW0551-C□J	LHW0651-C□J	LHW0751-C□J
Full Stroke		14.5	15.5	18.5	20	24
Swing Stroke (90°)		6.5	7.5	8.5	10	12
Vertical Stroke		8	8	10	10	12
A		115	128.5	145.5	156	181
B		54	61	69	81	92
C		45	51	60	70	80
D		40	48	55	65	75
E		71.5	79	89	94	109
F		46.5	51	59	63	71
Fu		68.5	77.5	86.5	93	110
G		25	28	30	31	38
H		31.5	35.5	39	46	52
J		22.5	25.5	30	35	40
K		34	40	47	55	63
L		73	83	88	106	116
M		11	13	12	13	16
Nx		26	30	33.5	39.5	45
Ny		9	11	12	15	16
P		3	3	3	5	5
Q		9	9	11	11	14
R		5.5	5.5	6.8	6.8	9
S		15	17.5	17	17	21
T		16.5	17.5	20.5	22	26
U		18	22	25	30	35.5
V		15	18	21	24	30
W		12	14	15	16	16
X (Nominal × Pitch)		M16×1.5	M20×1.5	M22×1.5	M27×1.5	M30×1.5
Y		6	8	8	10	10
Z (Chamfer)		C3	C3	C3	C4	C5
AA		24	30	32	41	46
AB		8	9	10	11	11
AC		26.5	33	35.5	45	50
BA		16	19	22	25	31
BB		20	25	28	34	40
CA		7	9	10	12.5	14
CB		6.5	7.5	9.5	11.5	12.5
CC		4	5	6	6	8
EA (Nominal × Pitch)		M5×0.8	M5×0.8	M6×1	M6×1	M8×1.25
EB		40.8	49	56	66	76
EC		$40^{+0.039}_{0}$	$48^{+0.039}_{0}$	$55^{+0.046}_{0}$	$65^{+0.046}_{0}$	$75^{+0.046}_{0}$
ED		1.2	1.2	1.5	1.5	1.5
EE		20	20	24	24	34
EF		47	51.5	59.5	63.5	71.5
EG		26	26	30	30	40
JA		3.5	3.5	3.5	4.5	4.5
JB		14	14	14	19	19
Clamp Port：G Thread Unclamp Port：G Thread		G1/8	G1/8	G1/8	G1/4	G1/4
O-Ring	DA	1BP5	1BP5	1BP5	1BP7	1BP7
	DB	AS568-007(90°)	1BP5	1BP5	1BP7	1BP7
	DC	38×1.5 (Internal diameter × Wire diameter)	-031(70°)	AS568-033(70°)	AS568-036(70°)	AS568-040(70°)
	DD	AS568-028(70°)	AS568-031(70°)	AS568-033(70°)	AS568-036(70°)	AS568-039(70°)

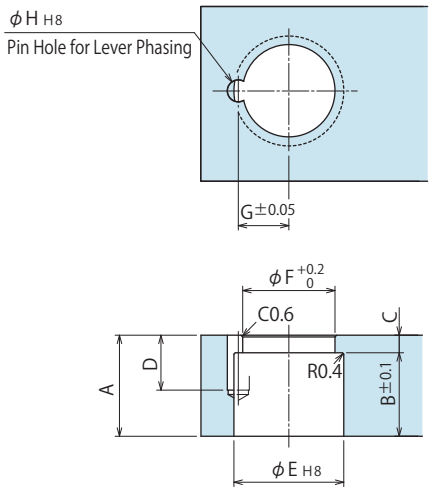
Taper Lock Lever Design Dimension

※ Reference for designing swing lever of taper lock type.

Corresponding Model No.

LHW □ 1 - C [R / L] [E / H / J]

1 Body Size



(mm)

Corresponding Model No.	LHW0401	LHW0481	LHW0551	LHW0651	LHW0751
A	19	23	26	29	35
B	16	19	22	25	31
C	3	4	4	4	4
D	10.5	12.5	14.5	16.5	17.5
E	$20^{+0.033}_{0}$	$25^{+0.033}_{0}$	$28^{+0.033}_{0}$	$34^{+0.039}_{0}$	$40^{+0.039}_{0}$
F	17	21	23.5	29	33
G	9	11.5	13	15.5	18
H	$4^{+0.018}_{0}$	$5^{+0.018}_{0}$	$6^{+0.018}_{0}$	$6^{+0.018}_{0}$	$8^{+0.022}_{0}$
Phasing Pin (Reference)	ϕ4(h8)×10	ϕ5(h8)×12	ϕ6(h8)×14	ϕ6(h8)×16	ϕ8(h8)×16

Notes:

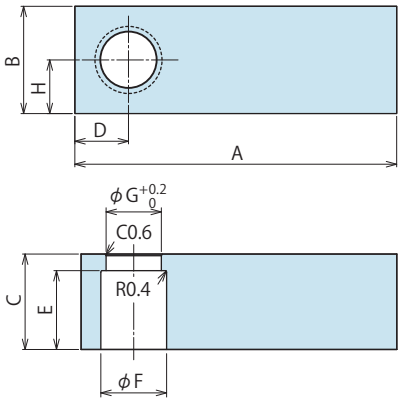
1. Swing lever should be designed with its length according to performance graph shown on P.9.
2. If the swing lever is not in accordance with the dimensions shown above, performance may be degraded and damage can occur.
3. The pin hole for lever phasing (ϕH) should be added if necessary.

Accessory：Material Swing Lever for Taper Lock Option

Model No. Indication

LZH 048 0 – T

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



(mm)

Model No.	LZH0400 -T	LZH0480 -T	LZH0550 -T	LZH0650 -T	LZH0750 -T
Corresponding Model No.	LHW0401	LHW0481	LHW0551	LHW0651	LHW0751
A	145	160	170	175	185
B	32	40	45	50	58
C	19	23	26	29	35
D	16	20	23	25	29
E	16	19	22	25	31
F	20	25	28	34	40
G	17	21	23.5	29	33
H	16	20	22.5	25	29

Notes:

1. Material : S50CH
2. If necessary, the front end should be additionally machined.
3. When determining the phase, refer to the taper lock lever design dimensions for each model for additional machining.

Cautions

Notes for Design

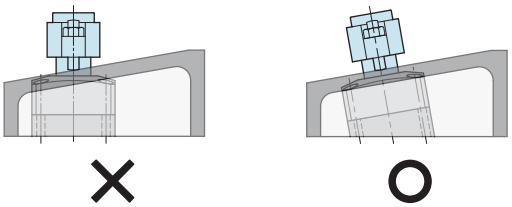
1) Check Specifications
- Please use each product according to the specifications.

2) Notes for Circuit Design
- Please read "Notes on Hydraulic Cylinder Speed Control Circuit" on P. 64 to assist with proper hydraulic circuit designing.
- Ensure there is no possibility of supplying hydraulic pressure to the clamp and unclamp ports simultaneously.

3) Swing lever should be designed so that the inertia moment is small.
- Large moment of inertia will degrade the lever's stopping accuracy and cause undue wear to the clamp.
  Additionally, the clamp may not function, depending on supplied hydraulic pressure and lever mounting position.
- Please set the allowable operating time after the inertia moment is calculated.
  Please make sure that let the clamps work within allowable operating time referring to the allowable operating time graph.

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

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



6) Notes on Sensing Valve
- Please refer to the notes for design, installation and use on P. 5.

Installation Notes

1) Check the Usable Fluid
- Please use the appropriate fluid by referring to the Hydraulic Fluid List (P. 63).

2) Mounting the clamp
- When mounting the clamp, use hexagon socket bolts as multiple bolt holes for mounting (with tensile strength of 12.9) and tighten them with the torque shown in the chart below. Tightening with greater torque than recommended can depress the seating surface or break the bolt.

Model No.		Thread Size	Tightening Torque (N·m)
LHW	LHW0401	M5×0.8	8.0
	LHW0481	M5×0.8	8.0
	LHW0551	M6×1	14
	LHW0651	M6×1	14
	LHW0751	M8×1.25	33

3) Mounting and removing the swing lever.

- Oil or debris on the mating surfaces of the lever, taper sleeve or piston rod can cause the rod to loosen. Clean carefully before assembly.
- Lever arm mounting bolt torques are shown below.

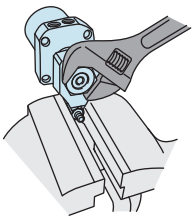
LHW Standard：Taper Lock Lever

Model No.		Thread Size	Tightening Torque (N·m)
LHW	LHW0401	M16×1.5	33～40
	LHW0481	M20×1.5	54～65
	LHW0551	M22×1.5	84～100
	LHW0651	M27×1.5	120～145
	LHW0751	M30×1.5	175～210

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

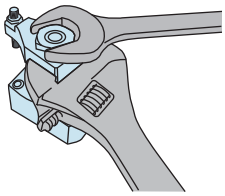
During mounting

① When the clamp is positioned with fixture, determine the lever position, and temporarily tighten the nut for fixing the lever.



②Remove the clamp from a fixture, fix the lever by machine vise etc., and tighten the nut.

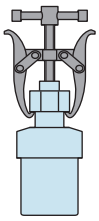
③If clamp can't be removed from fixture for final tightening, secure the lever while tightening the nut.
It is best to bring the lever to the middle of the swing stroke before tightening the nut.



During removal

① While the clamp is in the fixture or vise, use a hex wrench to bring the arm to the middle of the swing stroke and then loosen the nut.

② Loosen the taper sleeve nut two or three turns then remove the lever with puller. Do not put any rotating torque on the piston rod.



4) Swinging Speed Adjustment

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

5) Checking looseness and retightening

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

※ Please refer to P.63 for common cautions.
・Installation Notes ・Hydraulic Fluid List ・Notes on Hydraulic Cylinder Speed Control Circuit
・Notes on Handling ・Maintenance/Inspection ・Warranty

Cautions

Installation Notes (For Hydraulic Series)

1) Check the Usable Fluid

- Please use the appropriate fluid by referring to the Hydraulic Fluid List.

2) Procedure before Piping

- The pipeline, piping connector and fixture circuits should be cleaned by thorough flushing.
- The dust and cutting chips in the circuit may lead to fluid leakage and malfunction.
- There is no filter provided with Kosmek' s product except for a part of valves which prevents foreign materials and contaminants from getting into the circuit.

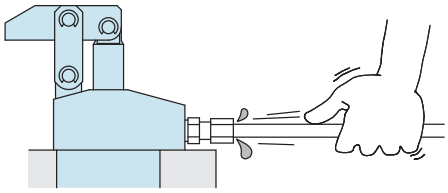
3) Applying Sealing Tape

- Wrap with tape 1 to 2 times following the screw direction.
- Pieces of the sealing tape can lead to oil leakage and malfunction.
- In order to prevent a foreign substance from going into the product during the piping work, it should be carefully cleaned before working.

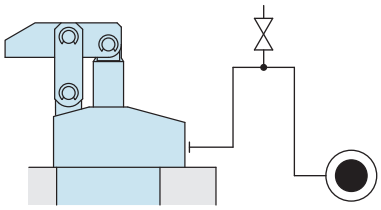
4) Air Bleeding of the Hydraulic Circuit

- If the hydraulic circuit has excessive air, the action time may become very long. If air enters the circuit after connecting the hydraulic port or under the condition of no air in the oil tank, please perform the following steps.

① Reduce hydraulic pressure to less than 2MPa.
② Loosen the cap nut of pipe fitting closest to the clamp by one full turn.
③ Wiggle the pipeline to loosen the outlet of pipe fitting.
Hydraulic fluid mixed with air comes out.



④ Tighten the cap nut after bleeding.
⑤ It is more effective to bleed air at the highest point inside the circuit or at the end of the circuit.
(Set an air bleeding valve at the highest point inside the circuit.)



5) Checking Looseness and Retightening

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

Hydraulic Fluid List

ISO Viscosity Grade ISO-VG-32

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

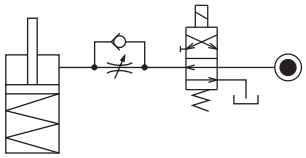
Note As it may be difficult to purchase the products as shown in the table from overseas, please contact the respective manufacturer.

Notes on Hydraulic Cylinder Speed Control Unit

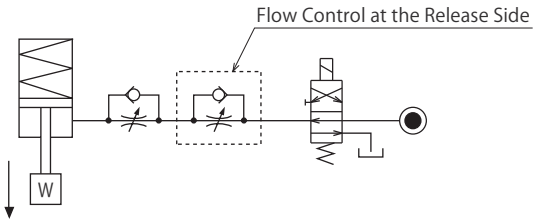
Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

Flow Control Circuit for Single Acting Cylinder

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



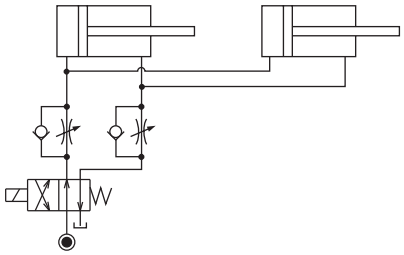
Accelerated clamping speed by excessive hydraulic flow to the cylinder may sustain damage. In this case add flow control to regulate flow. (Please add flow control to release flow if the lever weight is put on at the time of release action when using swing clamps.)



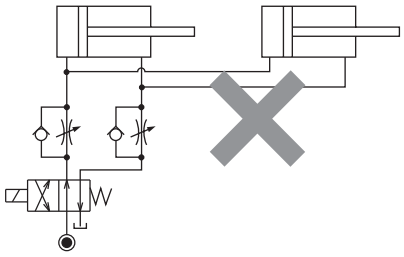
Flow Control Circuit for Double Acting Cylinder

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

【Meter-out Circuit】

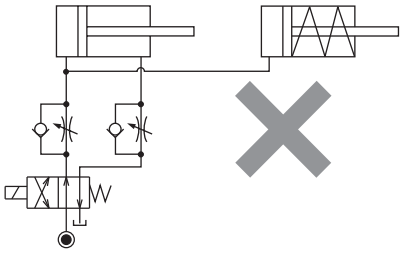


【Meter-in Circuit】



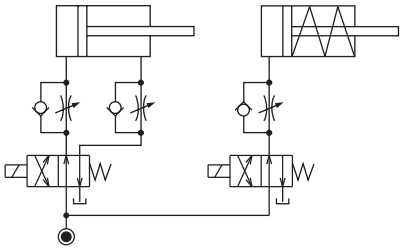
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

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

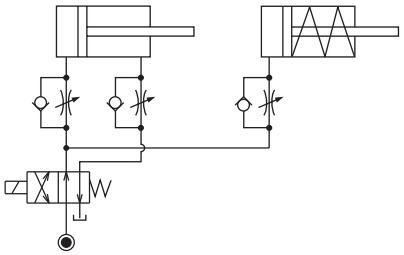


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

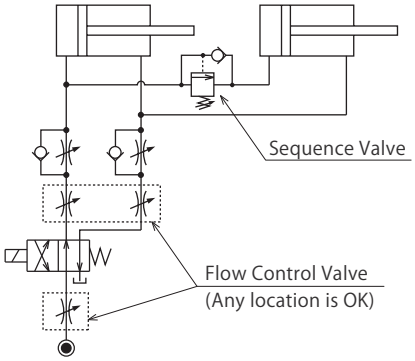
○ Separate the control circuit.



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



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



Cautions

Notes on Handling

1) It should be handled by qualified personnel.
- The hydraulic machine and air compressor should be handled and maintained by qualified personnel.

2) Do not handle or remove the machine unless the safety protocols are ensured.

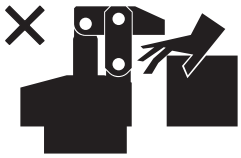
① The machine and equipment can only be inspected or prepared when it is confirmed that the preventive devices are in place.

② Before the machine is removed, make sure that the above-mentioned safety measures are in place. Shut off the air of hydraulic source and make sure no pressure exists in the hydraulic and air circuit.

③ After stopping the machine, do not remove until the temperature cools down.

④ Make sure there is no abnormality in the bolts and respective parts before restarting the machine or equipment.

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

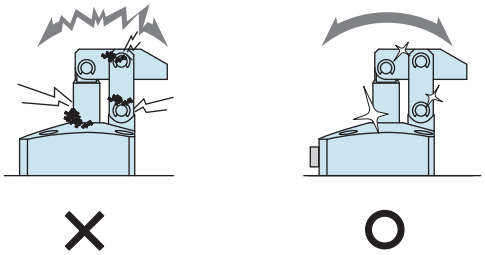


4) Do not disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

Maintenance and Inspection

1) Removal of the Product and Shut-off of Pressure Source
- Before the product is removed, make sure that the above-mentioned safety measures are in place. Shut off the air of hydraulic source and make sure no pressure exists in the hydraulic and air circuit.
- Make sure there is no abnormality in the bolts and respective parts before restarting.

2) Regularly clean the area around the piston rod and plunger.
- If it is used when the surface is contaminated with dirt, it may lead to packing seal damage, malfunctioning , fluid leakage and air leaks.



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

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

5) Make sure the hydraulic fluid has not deteriorated.

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

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

8) Please contact us for overhaul and repair.

Warranty

1) Warranty Period

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

2) Warranty Scope

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

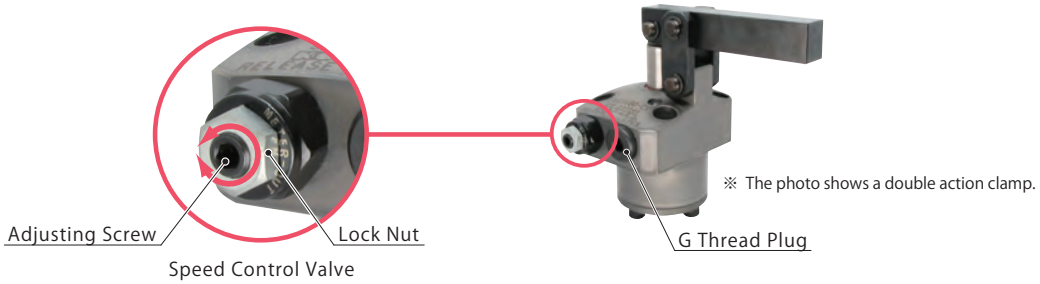
① If the stipulated maintenance and inspection are not carried out.
② If the product is used while it is not suitable for use based on the operator' s judgment, resulting in defect.
③ If it is used or handled in inappropriate way by the operator. (Including damage caused by the misconduct of the third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

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

Speed Control Valve for Low Pressure PAT.

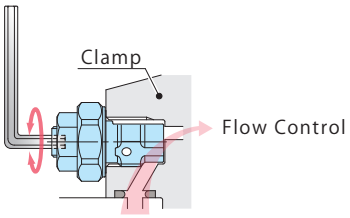
Directly Mounted to Clamps

Flow control valve (model BZL) can be directly mounted to hydraulic clamps/work supports with G-thread (-C option).

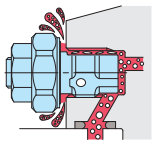


Action Description

Adjust the flow by wrench.
It can adjust the clamping action speed individually.



Air bleeding in the circuit is possible by loosening flow control valve.



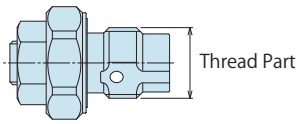
Model No. Indication (Speed Control Valve for Low Pressure)

BZL 0 10 0 - B

1 2 3

1 G Thread Size

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



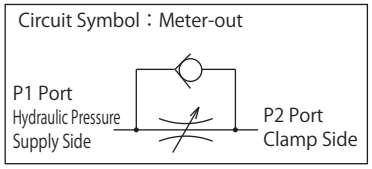
2 Design No.

0 : Revision Number

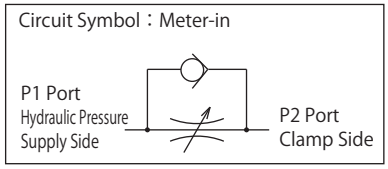
3 Control Method

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

B



A



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

Specifications

Model No.		BZL0100-B	BZL0200-B	BZL0100-A	BZL0200-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		General Hydraulic Oil Equivalent to ISO-VG-32			
Operating Temperature	℃	0 ~ 70			
Tightening Torque for Main Body	N·m	10	25	10	25

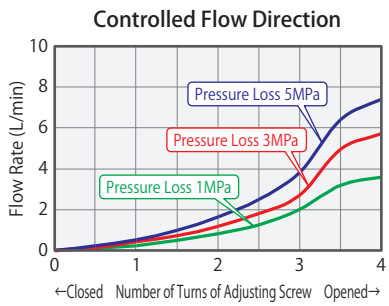
Notes:
1. Minimum passage area when fully opened is the same as the maximum passage area in the table above.
2. It must be mounted with recommended torque. Because of the structure of the metal seal, if mounting torque is insufficient, the flow control valve may not be able to adjust the flow rate.
3. Don't use used BZL to other clamps. Flow control will not be made because the bottom depth difference of G thread makes metal seal insufficient.

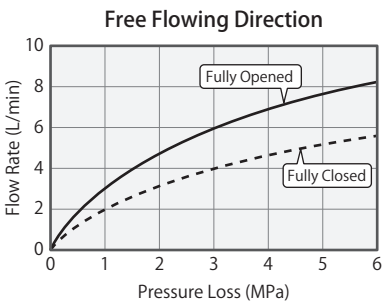
Applicable Products

Model No.	LHW (Double Action) Swing Clamp	LKW (Double Action) Link Clamp	LLW (Double Action) Lift Cylinder
BZL0100-B	LHW0401-C□□-□	LKW0401-C□□-□	LLW0361-C□□-□
	LHW0481-C□□-□	LKW0481-C□□-□	LLW0401-C□□-□
	LHW0551-C□□-□	LKW0551-C□□-□	LLW0481-C□□-□
BZL0100-A	(LHW0401-C□□-□)	(LKW0401-C□□-□)	(LLW0361-C□□-□)
	(LHW0481-C□□-□)	(LKW0481-C□□-□)	(LLW0401-C□□-□)
	(LHW0551-C□□-□)	(LKW0551-C□□-□)	(LLW0481-C□□-□)
BZL0200-B	LHW0651-C□□-□	LKW0651-C□□-□	
	LHW0751-C□□-□	LKW0751-C□□-□	
BZL0200-A	(LHW0651-C□□-□)	(LKW0651-C□□-□)	
	(LHW0751-C□□-□)	(LKW0751-C□□-□)	

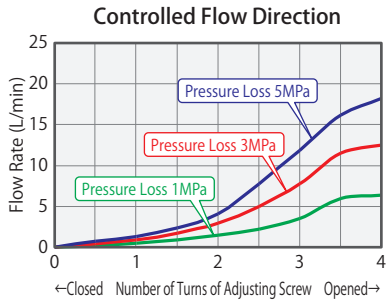
Flow Rate Graph <Hydraulic Fluids ISO-VG32 (25～35℃)>

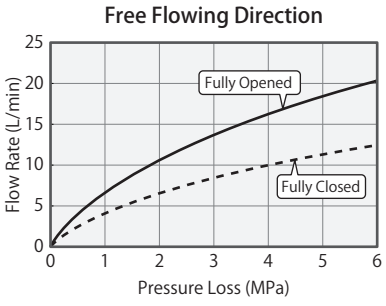
BZL0100-B：Meter-out



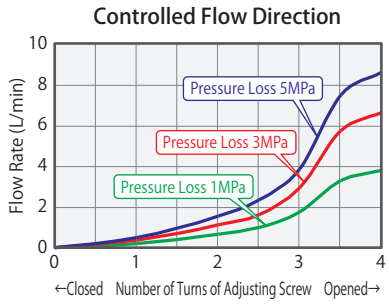


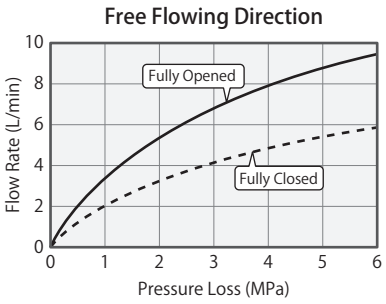
BZL0200-B：Meter-out



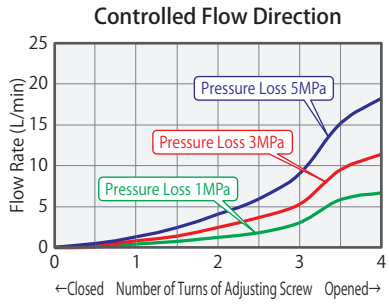


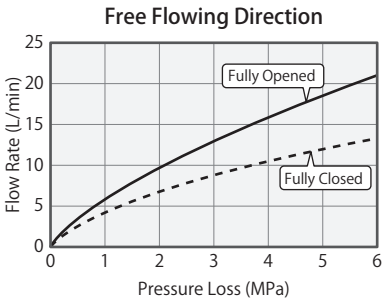
BZL0100-A：Meter-in



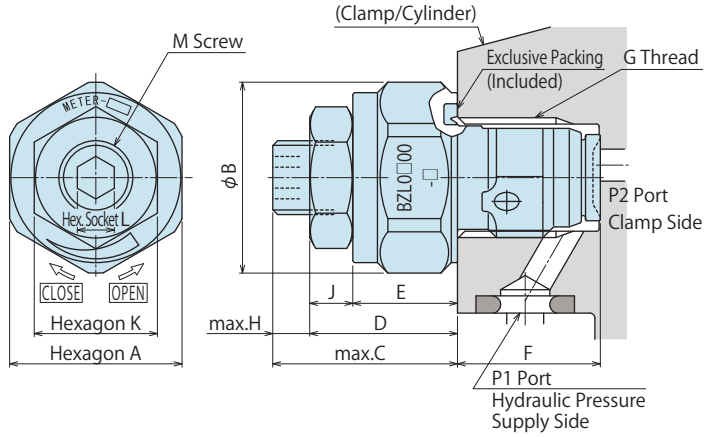


BZL0200-A：Meter-in

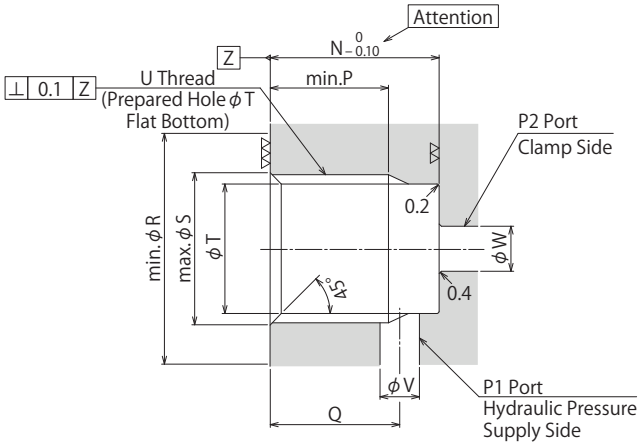




External Dimensions



Machining Dimensions of Mounting Area



(mm)

Model No.	BZL0100-□	BZL0200-□
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	M6×0.75	M6×0.75
N	11.5	15
P	8.5	11※1
Q	9	11.5
R (Flat Surface Area)	16	20.5
S	10	13.5
T	8.7	11.5
U	G1/8	G1/4
V	2～3	3～4
W	2.5～5	3.5～7

Notes:

1. Since the ▽▽▽ area is sealing part, be careful not to damage it.
2. Since the ▽▽ area is the metal sealing part of BZL, be careful not to damage it. (Especially when deburring)
3. No cutting chips or burr should be at the tolerance part of machining hole.
4. As shown in the drawing, P1 port is used as the hydraulic supply and P2 port as the clamp side.
5. If mounting plugs or fittings with G thread specification available in the market, the dimension '※1' should be 12.5.

Notes

1. Please read "Notes on Hydraulic Cylinder Speed Control Circuit" to assist with proper hydraulic circuit design.
   If there is something wrong with the circuit design, it leads to the applications malfunction and damage. (Refer to P.64)
2. It is dangerous to air bleed during operation under high pressure. It must be done under lower pressure.
   (For reference: the minimum operating range of the product within the circuit.)
3. Flow control circuit for double action cylinder both should have meter-out circuits for the lock side and release side except model LKE/TLA/TMA. Meter-in controls can be adversely affected by any air in the system.

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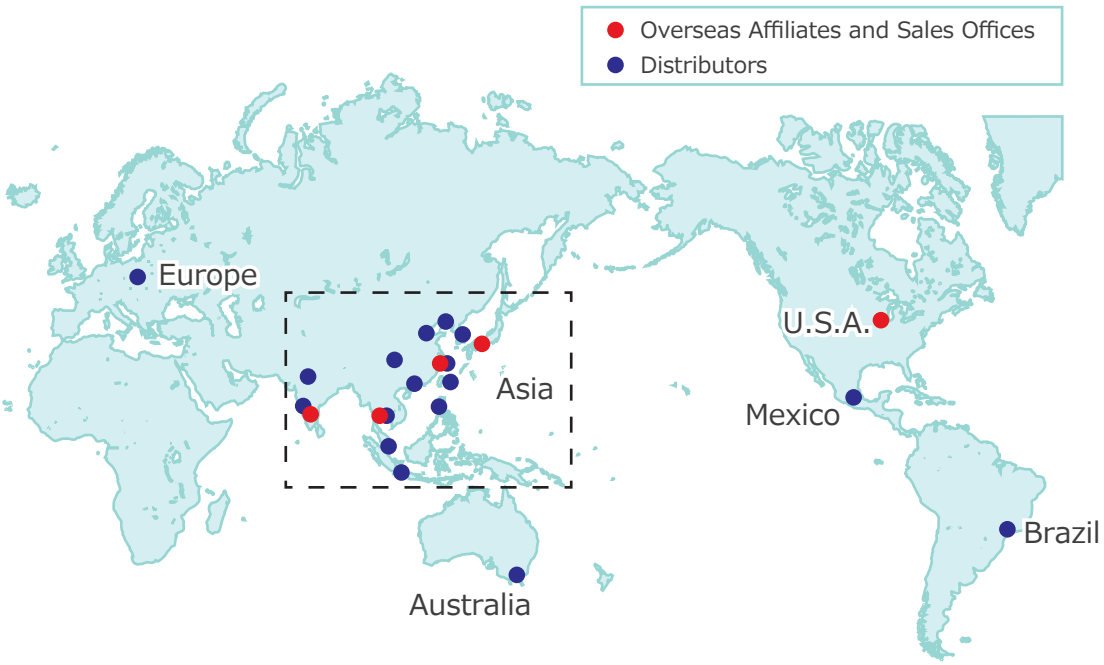

Asia Detailed Map

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