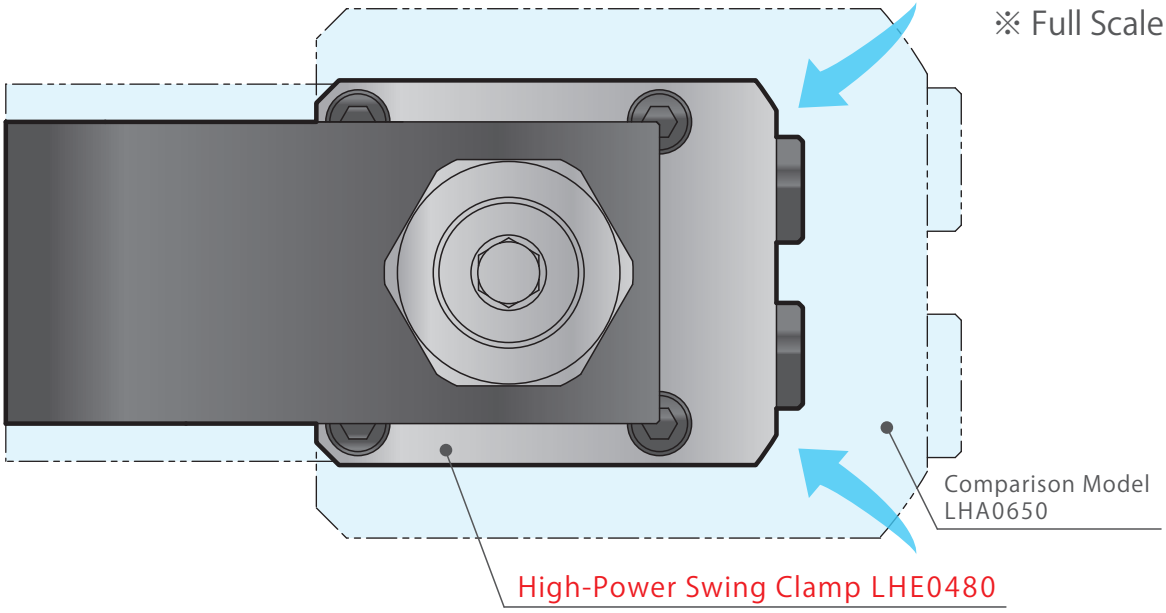
High-Power Swing Clamp

Hydraulic Double Action

Model **LHE**

Mechanical Locking System with Hydraulic Force PAT.

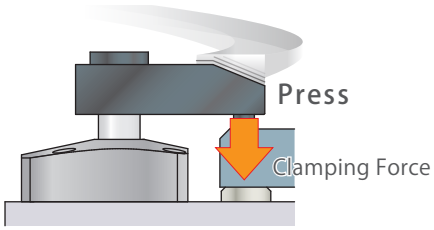
Equivalent clamping force, **2** sizes smaller!!



	Hydraulic Swing Clamp (Comparison Model) Model LHA0650		High-Power Swing Clamp Model LHE0480
Clamping Force ※ Hydraulic Pressure at 4MPa	4.5 kN (Lever Length：56.5mm)	Clamping Force + Holding Force	4.2 kN (Lever Length：42mm) (Holding Force 9.1 kN)
Weight ※ Weight of the clamp without clamp lever	2.8 kg	43% Lighter	1.6 kg
Projected Area	5670 mm² (81×70mm)	45% Smaller	3111 mm² (61×51mm)
Cylinder Capacity	Lock Side 26.7 cm³ Release Side 40.9 cm³	40% Less Volume	Lock Side 16.2 cm³ Release Side 22.7 cm³
Cylinder Outer Diameter	65.0 mm	26% Smaller	48.0 mm

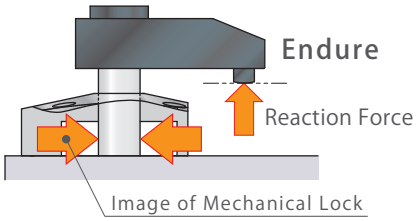
• Strong Clamping Force with Mechanical Lock

The mechanical locking system and hydraulic force allows the LHE model to exert **a maximum of 2.1times** greater clamping force than the same size as the comparison model LHA.



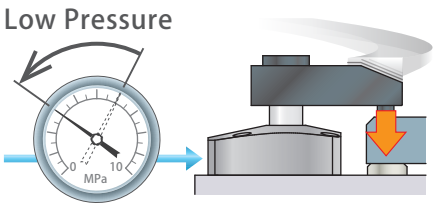
• Holding Force

Holding force is the force that endures reaction force (load), not the force that presses a workpiece. The high holding force enables heavy load machining and high accurate machining.



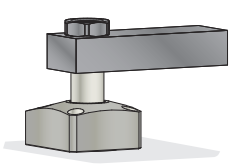
• Energy-Saving

LHE exerts high output force even with low pressure. The compact cylinder enables energy-saving by using less amount of oil.



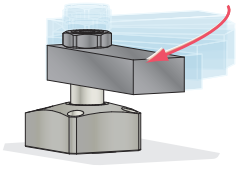
Action Description

Release Hydraulic Pressure : ON
Lock Hydraulic Pressure : OFF

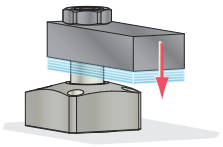


Before swing (Released State)

Release Hydraulic Pressure : OFF
Lock Hydraulic Pressure : ON (Pressure rising)

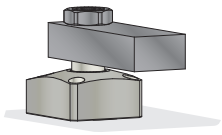


The lever descends as it swings.



After swing completion, it descends vertically.

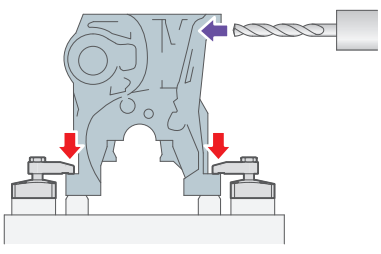
Release Hydraulic Pressure : OFF
Lock Hydraulic Pressure : ON (Pressurization completed)



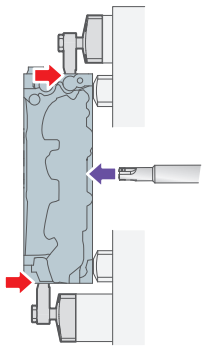
Action completed (Clamped State)

After clamping the workpiece, clamping force and holding force will be generated by mechanical locking system and hydraulic force. (Workpiece should be clamped within the lock stroke range.)

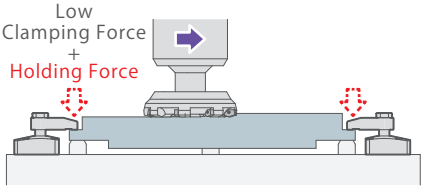
Application Examples



< For Space-Saving • Heavy Load Machining >



< For Backside Machining >



< For High Accurate Machining of Thin Workpiece >
Holding force enables machining workpiece without deformation.

Model No. Indication

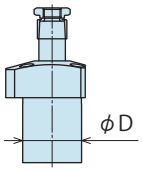
LHE 040 0 - C R ☐ - ☐

1 2 3 4 5 6

1 Body Size

030 : ϕD=30mm
036 : ϕD=36mm
040 : ϕD=40mm
048 : ϕD=48mm
055 : ϕD=55mm

※ Outer diameter (ϕD) of the cylinder.



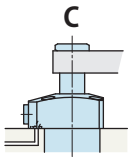
2 Design No.

0 : Revision Number

3 Piping Method

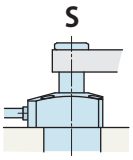
C : Gasket Option (With G Thread Plug)
S : Piping Option (With Rc Thread Port)

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



Gasket Option

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

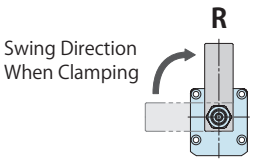


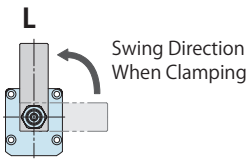
Piping Option

Rc Thread Port
No Gasket Port

4 Swing Direction When Clamping

R : Clockwise
L : Counter-Clockwise





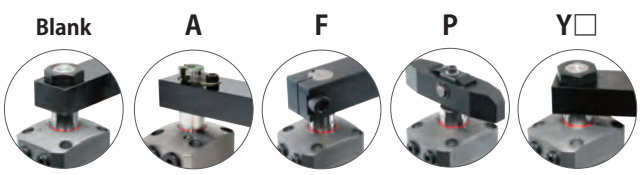
5 Action Confirmation Method

Blank : None (Standard)
M : Air Sensing Manifold Option
N : Air Sensing Piping Option

Only when selecting 1 Body Size **040/048/055**.

6 Options

Blank : None (Standard : Taper Lock Lever Option)
A : Quick Change Lever Option A
F : Quick Change Lever Option F
P : Balance Lever Option
Y☐ : Swing Angle Selectable Option
(**Y30** : 30° / **Y45** : 45° / **Y60** : 60°)



※ Please contact us for a combination of the action confirmation and the option.

Specifications

Model No.			LHE0300-□□□-□			LHE0360-□□□-□			LHE0400-□□□-□			LHE0480-□□□-□		
Cylinder Force (at 5MPa)		kN	2.3			3.5			5.1			6.7		
Cylinder Inner Diameter ※1		mm	20			26			31			37		
Rod Diameter ※1		mm	12			15			18			22		
Clamping Force (Calculation Formula)※2 kN	6 Option **Blank/A/F/Y□**		$F=\frac{P}{2.34+0.0118\times L}$			$F=\frac{P}{1.59+0.0076\times L}$			$F=\frac{P}{1.07+0.0044\times L}$			$F=\frac{P}{0.82+0.0030\times L}$		
	6 Option **P**		$F_1=(L_2/L_3)\times 0.46\times P$ $F_2=(L_1/L_3)\times 0.46\times P$			$F_1=(L_2/L_3)\times 0.69\times P$ $F_2=(L_1/L_3)\times 0.69\times P$			$F_1=(L_2/L_3)\times 1.03\times P$ $F_2=(L_1/L_3)\times 1.03\times P$			$F_1=(L_2/L_3)\times 1.33\times P$ $F_2=(L_1/L_3)\times 1.33\times P$		
Holding Force (Calculation Formula)※2 kN	6 Option **Blank/A/F/Y□**		$Fk=\frac{0.76\times P}{1-0.0044\times L}$			$Fk=\frac{1.03\times P}{1-0.0042\times L}$			$Fk=\frac{1.60\times P}{1-0.0036\times L}$			$Fk=\frac{1.98\times P}{1-0.0032\times L}$		
	6 Option **P**		$Fk_1=(L_2/L_3)\times 0.76\times P$ $Fk_2=(L_1/L_3)\times 0.76\times P$			$Fk_1=(L_2/L_3)\times 1.03\times P$ $Fk_2=(L_1/L_3)\times 1.03\times P$			$Fk_1=(L_2/L_3)\times 1.60\times P$ $Fk_2=(L_1/L_3)\times 1.60\times P$			$Fk_1=(L_2/L_3)\times 1.98\times P$ $Fk_2=(L_1/L_3)\times 1.98\times P$		
6 Option **Blank/A/F/P**	Full Stroke	mm	12			13			15			17		
	Swing Stroke (90°)	mm	7.5			8			9			11		
	Vertical Stroke	mm	4.5			5			6			6		
	(Breakdown) Idle Stroke	mm	2			2			2.5			2.5		
	(Breakdown) Lock Stroke※3	mm	2.5			3			3.5			3.5		
	Swing Angle Accuracy		90° ±3°											
	Swing Completion Position Repeatability		±0.75°			±0.5°								
6 Option **Y□**	Option		Y30	Y45	Y60	Y30	Y45	Y60	Y30	Y45	Y60	Y30	Y45	Y60
	Full Stroke	mm	7.8	8.9	9.9	9	10	11	10.7	11.7	12.8	11.7	13	14.3
	Swing Stroke	mm	3.3	4.4	5.4	4	5	6	4.7	5.7	6.8	5.7	7	8.3
	Vertical Stroke	mm	4.5			5			6			6		
	(Breakdown) Idle Stroke	mm	2			2			2.5			2.5		
	(Breakdown) Lock Stroke※3	mm	2.5			3			3.5			3.5		
	Swing Angle Accuracy		30° ±3°	45° ±3°	60° ±3°	30° ±3°	45° ±3°	60° ±3°	30° ±3°	45° ±3°	60° ±3°	30° ±3°	45° ±3°	60° ±3°
	Swing Completion Position Repeatability		±0.75°			±0.5°								
Max. Operating Pressure		MPa	6.0											
Min. Operating Pressure ※4 MPa	5 **Blank** Selected		1.5											
	5 **M/N** Selected		-						2.0					
Withstanding Pressure		MPa	9.0											
Operating Temperature		℃	0 ~ 70											
Usable Fluid			General Hydraulic Oil Equivalent to ISO-VG-32											

Model No.			LHE0550-□□□-□		
Cylinder Force (at 5MPa)		kN	10.3		
Cylinder Inner Diameter ※1		mm	44		
Rod Diameter ※1		mm	25		
Clamping Force (Calculation Formula)※2 kN	6 Option **Blank/A/F/Y□**		$F=\frac{P}{0.53+0.0017\times L}$		
	6 Option **P**		$F_1=(L_2/L_3)\times 2.06\times P$ $F_2=(L_1/L_3)\times 2.06\times P$		
Holding Force (Calculation Formula)※2 kN	6 Option **Blank/A/F/Y□**		$Fk=\frac{3.18\times P}{1-0.0026\times L}$		
	6 Option **P**		$Fk_1=(L_2/L_3)\times 3.18\times P$ $Fk_2=(L_1/L_3)\times 3.18\times P$		
6 Option **Blank/A/F/P**	Full Stroke	mm	18.5		
	Swing Stroke (90°)	mm	12.5		
	Vertical Stroke	mm	6		
	(Breakdown) Idle Stroke	mm	2		
	(Breakdown) Lock Stroke※3	mm	4		
	Swing Angle Accuracy		90° ±3°		
	Swing Completion Position Repeatability		±0.5°		
6 Option **Y□**	Option		Y30	Y45	Y60
	Full Stroke	mm	12.5	14	15.5
	Swing Stroke	mm	6.5	8	9.5
	Vertical Stroke	mm	6		
	(Breakdown) Idle Stroke	mm	2		
	(Breakdown) Lock Stroke※3	mm	4		
	Swing Angle Accuracy		30° ±3°	45° ±3°	60° ±3°
	Swing Completion Position Repeatability		±0.5°		
Max. Operating Pressure		MPa	6.0		
Min. Operating Pressure ※4 MPa	5 **Blank** Selected		1.5		
	5 **M/N** Selected		2.0		
Withstanding Pressure		MPa	9.0		
Operating Temperature		℃	0 ~ 70		
Usable Fluid			General Hydraulic Oil Equivalent to ISO-VG-32		

Notes:

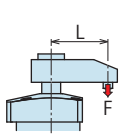
※1. Clamping force cannot be calculated from the cylinder inner diameter and rod diameter. Please refer to the clamping force curve.

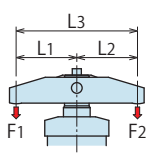
※2. F , F1, F2 : Clamping Force (kN), Fk , Fk1 , Fk2 : Holding Force (kN), P : Supply Hydraulic Pressure (MPa), L , L1 ,L2 : Distance between the piston center and the clamping point (mm), L3 :L1+L2(mm). It might be within the non-usable range depending on the value of P and L, please check the clamping force curve on P.15 and holding force curve on P.17.

※3. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range. (Please refer to "The specification value is not fulfilled when clamping out of the lock stroke range." on P.51.)

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

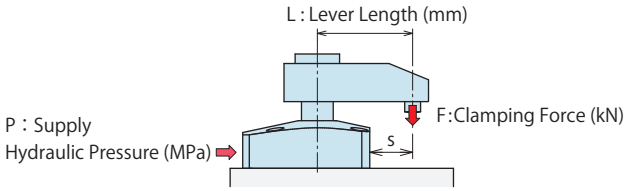
1. Please refer to External Dimensions for the cylinder capacity and the product weight.





Clamping Force Curve

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



Applicable Model

LHE [1 Body Size] 0 - [C S / R L / Blank M N] - [Blank A F Y□ 6 Option]

Blank/A/F/Y□ Selected

(Example)
In case of LHE0360 : When supply hydraulic pressure P is 3.0MPa and lever length L is 40mm, clamping force becomes about 1.6kN.

Notes：

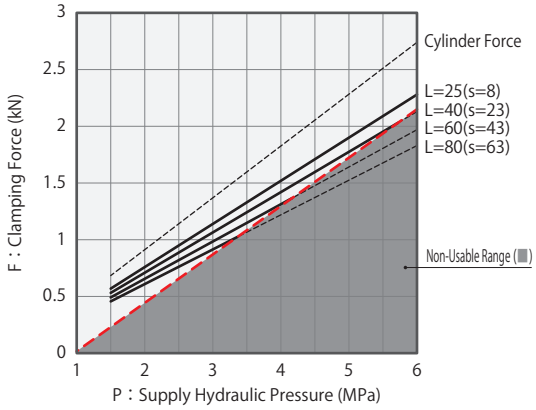
※1. F：Clamping Force (kN), P：Supply Hydraulic Pressure (MPa), L：Lever Length (mm).

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 with 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 clamping within the lock stroke range (not the value for the idle stroke range). (Please refer to "The specification value is not fulfilled when clamping out of the lock stroke range." on P.51)
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.

LHE0300

Clamping Force Calculation Formula ※1 (kN) $F = P / (2.34 + 0.0118 \times L)$

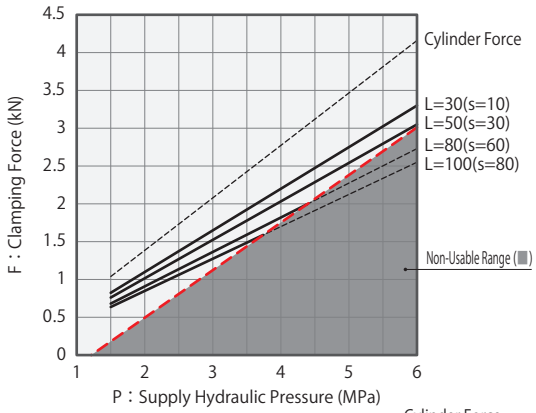
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm) L=25	L=30	L=35	L=40	L=50	L=60	L=70	L=80	Non-Usable Range(■) Max. Lever Length (L) (mm)
6	2.7	2.3	2.2	2.2						38
5.5	2.5	2.1	2.0	2.0	2.0					42
5	2.3	1.9	1.9	1.8	1.8					47
4.5	2.1	1.7	1.7	1.6	1.6	1.5				54
4	1.8	1.5	1.5	1.5	1.4	1.4	1.3			63
3.5	1.6	1.3	1.3	1.3	1.2	1.2	1.1	1.1		75
3	1.4	1.1	1.1	1.1	1.1	1.0	1.0	0.9	0.9	90
2.5	1.1	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	90
2	0.9	0.8	0.7	0.7	0.7	0.7	0.7	0.6	0.6	90
1.5	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	90
Max. Operating Pressure (MPa)		6.0	6.0	6.0	5.7	4.8	4.1	3.7	3.3	



LHE0360

Clamping Force Calculation Formula ※1 (kN) $F = P / (1.59 + 0.0076 \times L)$

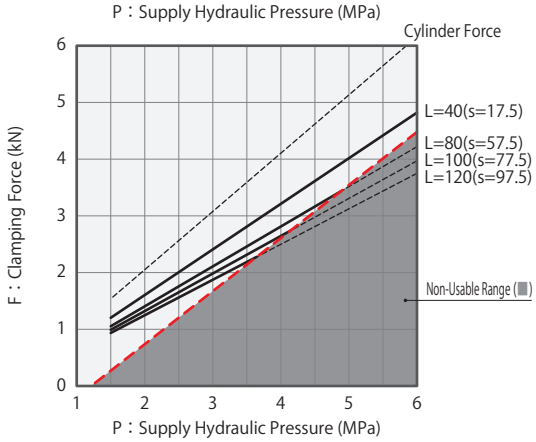
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm) L=30	L=40	L=50	L=60	L=70	L=80	L=90	L=100	Non-Usable Range(■) Max. Lever Length (L) (mm)
6	4.2	3.3	3.2	3.0						53
5.5	3.8	3.0	2.9	2.8						59
5	3.5	2.8	2.6	2.5	2.4					67
4.5	3.1	2.5	2.4	2.3	2.2	2.1				77
4	2.8	2.2	2.1	2.0	2.0	1.9	1.8	1.8		91
3.5	2.4	1.9	1.8	1.8	1.7	1.6	1.6	1.5	1.5	110
3	2.1	1.7	1.6	1.5	1.5	1.4	1.4	1.3	1.3	120
2.5	1.7	1.4	1.3	1.3	1.2	1.2	1.1	1.1	1.1	120
2	1.4	1.1	1.1	1.0	1.0	0.9	0.9	0.9	0.9	120
1.5	1.0	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.6	120
Max. Operating Pressure (MPa)		6.0	6.0	6.0	5.4	4.8	4.4	4.0	3.7	



LHE0400

Clamping Force Calculation Formula ※1 (kN) $F = P / (1.07 + 0.0044 \times L)$

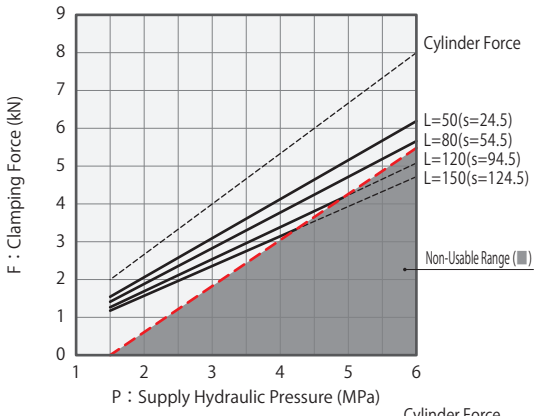
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm) L=40	L=50	L=60	L=70	L=80	L=90	L=100	L=120	Non-Usable Range(■) Max. Lever Length (L) (mm)
6	6.2	4.8	4.7	4.5						61
5.5	5.6	4.4	4.3	4.1						69
5	5.1	4.0	3.9	3.7	3.6					78
4.5	4.6	3.6	3.5	3.4	3.3	3.2				89
4	4.1	3.2	3.1	3.0	2.9	2.8	2.7	2.6		105
3.5	3.6	2.8	2.7	2.6	2.5	2.5	2.4	2.3	2.2	128
3	3.1	2.4	2.3	2.2	2.2	2.1	2.0	2.0	1.9	145
2.5	2.6	2.0	1.9	1.9	1.8	1.8	1.7	1.7	1.6	145
2	2.1	1.6	1.6	1.5	1.5	1.4	1.4	1.3	1.3	145
1.5	1.5	1.2	1.2	1.1	1.1	1.1	1.0	1.0	0.9	145
Max. Operating Pressure (MPa)		6.0	6.0	6.0	5.4	4.9	4.4	4.1	3.7	



LHE0480

Clamping Force Calculation Formula ※1 (kN) $F = P / (0.82 + 0.0030 \times L)$

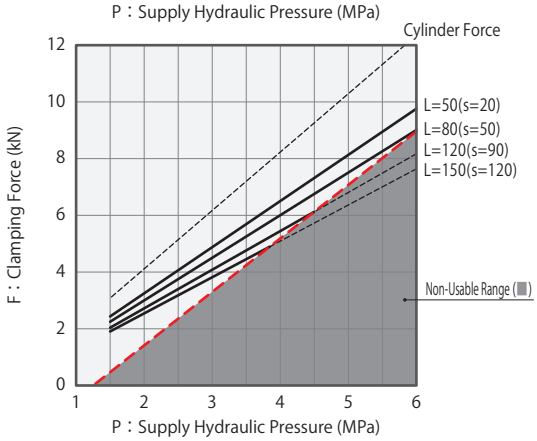
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm) L=50	L=60	L=70	L=80	L=90	L=100	L=120	L=150	Max. Lever Length (L) (mm)
6	8.0	6.2	6.0	5.8	5.7	5.5				92
5.5	7.3	5.7	5.5	5.3	5.2	5.0	4.9			103
5	6.7	5.2	5.0	4.9	4.7	4.6	4.5			118
4.5	6.0	4.6	4.5	4.4	4.2	4.1	4.0	3.8		137
4	5.3	4.1	4.0	3.9	3.8	3.7	3.6	3.4	3.1	160
3.5	4.7	3.6	3.5	3.4	3.3	3.2	3.1	3.0	2.8	160
3	4.0	3.1	3.0	2.9	2.8	2.8	2.7	2.5	2.4	160
2.5	3.3	2.6	2.5	2.4	2.4	2.3	2.2	2.1	2.0	160
2	2.7	2.1	2.0	1.9	1.9	1.8	1.8	1.7	1.6	160
1.5	2.0	1.5	1.5	1.5	1.4	1.4	1.3	1.3	1.2	160
Max. Operating Pressure (MPa)		6.0	6.0	6.0	6.0	6.0	5.6	4.9	4.2	



LHE0550

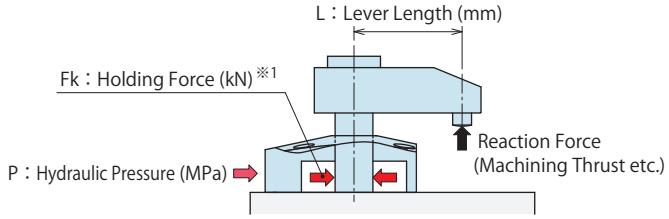
Clamping Force Calculation Formula ※1 (kN) $F = P / (0.53 + 0.0017 \times L)$

Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm) L=50	L=60	L=70	L=80	L=90	L=100	L=120	L=150	Max. Lever Length (L) (mm)
6	12.4	9.8	9.5	9.2	9.0					82
5.5	11.3	8.9	8.7	8.5	8.3	8.1				92
5	10.3	8.1	7.9	7.7	7.5	7.3	7.1			104
4.5	9.3	7.3	7.1	6.9	6.8	6.6	6.4	6.1		120
4	8.2	6.5	6.3	6.2	6.0	5.9	5.7	5.4		142
3.5	7.2	5.7	5.5	5.4	5.3	5.1	5.0	4.8	4.5	170
3	6.2	4.9	4.7	4.6	4.5	4.4	4.3	4.1	3.8	170
2.5	5.1	4.1	4.0	3.9	3.8	3.7	3.6	3.4	3.2	170
2	4.1	3.3	3.2	3.1	3.0	2.9	2.9	2.7	2.5	170
1.5	3.1	2.4	2.4	2.3	2.3	2.2	2.1	2.0	1.9	170
Max. Operating Pressure (MPa)		6.0	6.0	6.0	6.0	5.6	5.2	4.5	3.9	



Holding Force Curve

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



Applicable Model

LHE [1] 0 - [C S / R L] [Blank / M / N] - [Blank / A / F / Y□]

1 Body Size

6 Option Blank/A/F/Y□ Selected

Notes：

※1. Holding force is the force that counters the reaction force in the clamping state, and differs from clamping force.
Please keep in mind that it can produce displacement depending on lever rigidity even if the reaction force is lower than holding force.
(If slight displacement is also not allowed, please keep the reaction force beyond clamping force from being applied.)

※2. Fk : Holding Force (kN), P : Supply Hydraulic Pressure (MPa), L : Lever Length (mm)
The non-usable range is when the calculated holding force exceeds the max. rated value. The max. holding force becomes the rated value.

1. Tables and graphs show the relationship between the holding force (kN) and lever length (mm).
2. Values in below charts indicate holding force when clamping within the lock stroke range (not the value for the idle stroke range).
(Please refer to "The specification value is not fulfilled when clamping out of the lock stroke range." on P.51.)
3. The holding force varies depending on the lever length. Set the suitable supply hydraulic pressure based on the lever length.
4. The reaction force beyond holding force shown in the graph may cause deformation, seizure and fluid leakage etc.
5. Repetitive use at the range of instant maximum rated value will shorten the product life.
It should be designed with allowance fully taken into consideration.

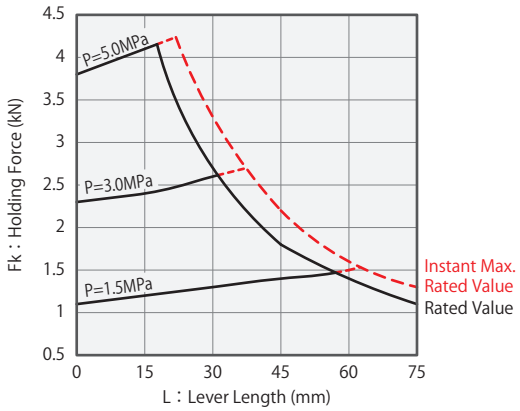
LHE0300

Holding Force Calculation Formula ※2 (kN) (Fk ≦ Rated Value)

$$Fk = \frac{0.76 \times P}{1 - 0.0044 \times L}$$

Hydraulic Pressure (MPa)	Holding Force(kN) Lever Length L(mm) L=25	L=30	L=35	L=40	L=50	L=60	L=70	L=80
6	3.3	2.7	2.3					
5.5	3.3	2.7	2.3	2.0				
5	3.3	2.7	2.3	2.0				
4.5	3.3	2.7	2.3	2.0	1.6			
4	3.3	2.7	2.3	2.0	1.6	1.4		
3.5	3.0	2.7	2.3	2.0	1.6	1.4	1.2	
3	2.6	2.6	2.3	2.0	1.6	1.4	1.2	1.0
2.5	2.1	2.2	2.3	2.0	1.6	1.4	1.2	1.0
2	1.7	1.8	2.3	2.0	1.6	1.4	1.2	1.0
1.5	1.3	1.3	1.3	1.4	1.5	1.4	1.2	1.0

Non-Usable Range(■)



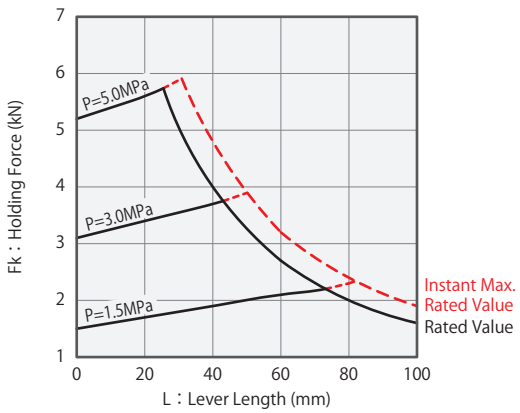
LHE0360

Holding Force Calculation Formula ※2 (kN) (Fk ≦ Rated Value)

$$Fk = \frac{1.03 \times P}{1 - 0.0042 \times L}$$

Hydraulic Pressure (MPa)	Holding Force(kN) Lever Length L(mm) L=30	L=40	L=50	L=60	L=70	L=80	L=90	L=100
6	5.3	4.0	3.2					
5.5	5.3	4.0	3.2					
5	5.3	4.0	3.2	2.7				
4.5	5.3	4.0	3.2	2.7	2.3			
4	4.7	4.0	3.2	2.7	2.3	2.0	1.8	
3.5	4.1	4.0	3.2	2.7	2.3	2.0	1.8	1.6
3	3.5	3.7	3.2	2.7	2.3	2.0	1.8	1.6
2.5	2.9	3.1	3.2	2.7	2.3	2.0	1.8	1.6
2	2.4	2.5	2.6	2.7	2.3	2.0	1.8	1.6
1.5	1.8	1.9	2.0	2.1	2.2	2.0	1.8	1.6

Non-Usable Range(■)



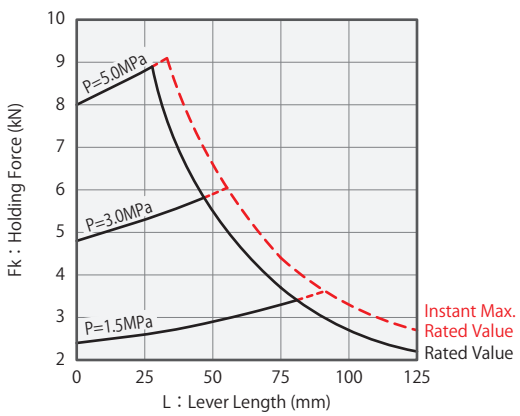
LHE0400

Holding Force Calculation Formula ※2 (kN) (Fk ≦ Rated Value)

$$Fk = \frac{1.60 \times P}{1 - 0.0036 \times L}$$

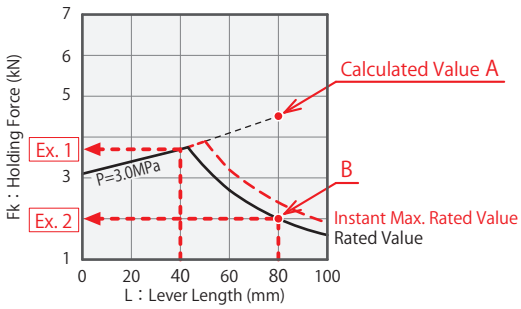
Hydraulic Pressure (MPa)	Holding Force(kN) Lever Length L(mm) L=40	L=50	L=60	L=70	L=80	L=90	L=100	L=120
6	6.9	5.5	4.6					
5.5	6.9	5.5	4.6					
5	6.9	5.5	4.6	3.9				
4.5	6.9	5.5	4.6	3.9	3.4			
4	6.9	5.5	4.6	3.9	3.4	3.1	2.7	
3.5	6.5	5.5	4.6	3.9	3.4	3.1	2.7	2.3
3	5.6	5.5	4.6	3.9	3.4	3.1	2.7	2.3
2.5	4.7	4.9	4.6	3.9	3.4	3.1	2.7	2.3
2	3.7	3.9	4.1	3.9	3.4	3.1	2.7	2.3
1.5	2.8	2.9	3.1	3.2	3.4	3.1	2.7	2.3

Non-Usable Range(■)



(Ex.1) In case of LHE0360 :
When supply hydraulic pressure P is 3.0MPa and lever length L is 40mm, holding force becomes about 3.7kN.

(Ex.2) In case of LHE0360 :
When supply hydraulic pressure P is 3.0MPa and lever length L is 80mm, the calculated value is at the point A but it is in the non-usable range. In this case, the value of intersection B becomes the holding force that counters the reaction force, and it is about 2.0kN.

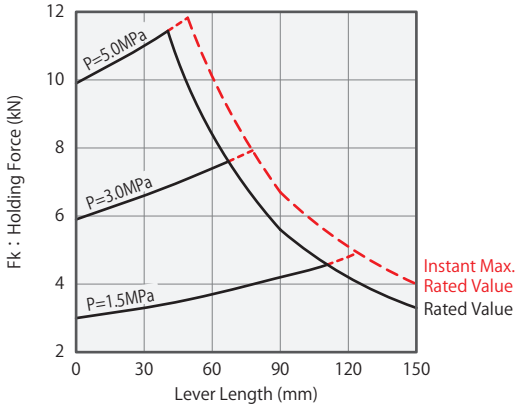


LHE0480

Holding Force Calculation Formula ※2 (kN) (Fk ≦ Rated Value)

$$Fk = \frac{1.98 \times P}{1 - 0.0032 \times L}$$

Hydraulic Pressure (MPa)	Holding Force(kN) Lever Length L(mm) Non-Usable Range(■)							
	L=50	L=60	L=70	L=80	L=90	L=100	L=120	L=150
6	10.0	8.4	7.2	6.3	5.6			
5.5	10.0	8.4	7.2	6.3	5.6	5.0		
5	10.0	8.4	7.2	6.3	5.6	5.0		
4.5	10.0	8.4	7.2	6.3	5.6	5.0	4.2	
4	9.4	8.4	7.2	6.3	5.6	5.0	4.2	3.3
3.5	8.3	8.4	7.2	6.3	5.6	5.0	4.2	3.3
3	7.1	7.4	7.2	6.3	5.6	5.0	4.2	3.3
2.5	5.9	6.1	6.4	6.3	5.6	5.0	4.2	3.3
2	4.7	4.9	5.1	5.3	5.6	5.0	4.2	3.3
1.5	3.5	3.7	3.8	4.0	4.2	4.4	4.2	3.3

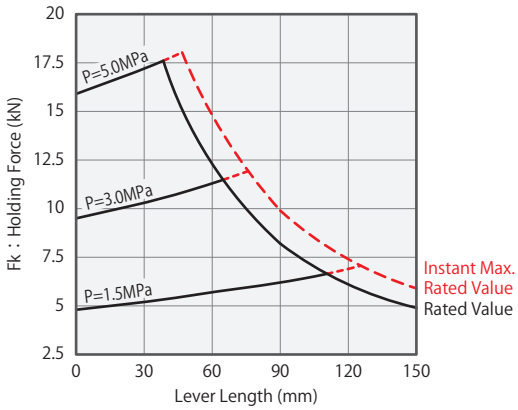


LHE0550

Holding Force Calculation Formula ※2 (kN) (Fk ≦ Rated Value)

$$Fk = \frac{3.18 \times P}{1 - 0.0026 \times L}$$

Hydraulic Pressure (MPa)	Holding Force(kN) Lever Length L(mm) Non-Usable Range(■)							
	L=50	L=60	L=70	L=80	L=90	L=100	L=120	L=150
6	14.7	12.3	10.5	9.2				
5.5	14.7	12.3	10.5	9.2	8.2			
5	14.7	12.3	10.5	9.2	8.2	7.4		
4.5	14.7	12.3	10.5	9.2	8.2	7.4	6.1	
4	14.6	12.3	10.5	9.2	8.2	7.4	6.1	
3.5	12.8	12.3	10.5	9.2	8.2	7.4	6.1	4.9
3	11.0	11.3	10.5	9.2	8.2	7.4	6.1	4.9
2.5	9.1	9.4	9.7	9.2	8.2	7.4	6.1	4.9
2	7.3	7.5	7.8	8.0	8.2	7.4	6.1	4.9
1.5	5.5	5.7	5.8	6.0	6.2	6.4	6.1	4.9

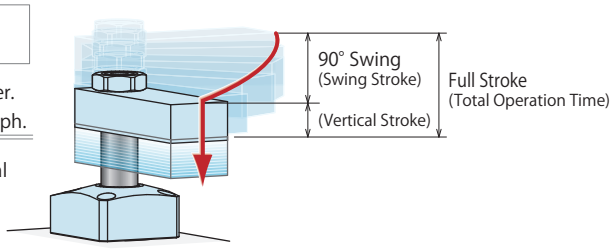


Allowable Swing Time Graph

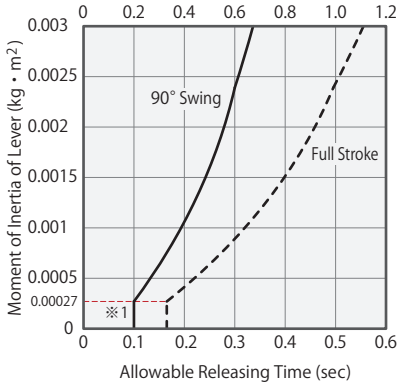
Adjustment of Swing Time

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.

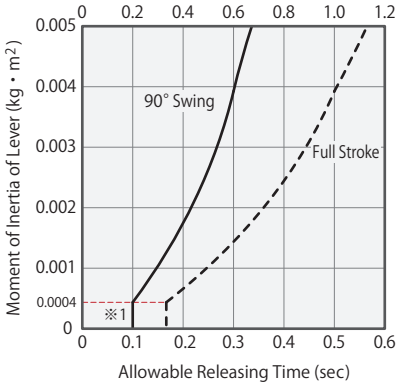
Excessive action speed can reduce stopping accuracy and damage internal components.



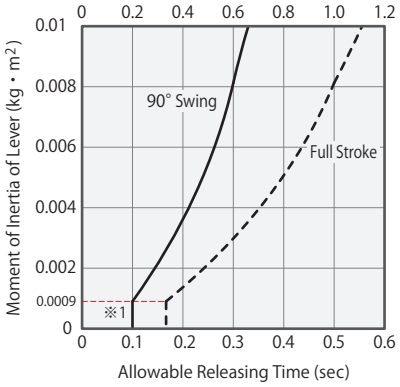
LHE0300 Allowable Locking Time (sec)



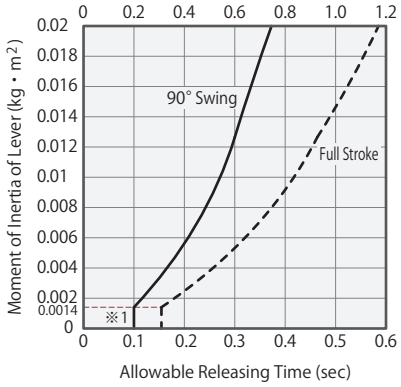
LHE0360 Allowable Locking Time (sec)



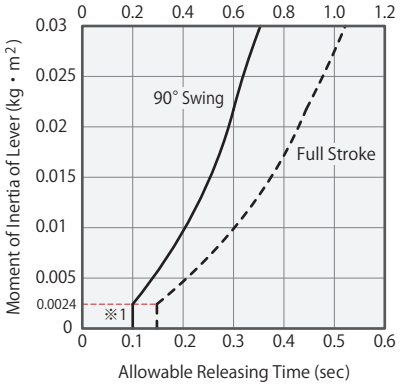
LHE0400 Allowable Locking Time (sec)



LHE0480 Allowable Locking Time (sec)



LHE0550 Allowable Locking Time (sec)



Notes:

※1. For any moment of inertia of a lever, the minimum 90° swing time should be 0.2 sec for locking and 0.1 sec for releasing or more.

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

(How to read the allowable swing time graph)

In case of LHE0360

The moment of inertia of a lever : 0.0027kg・m²

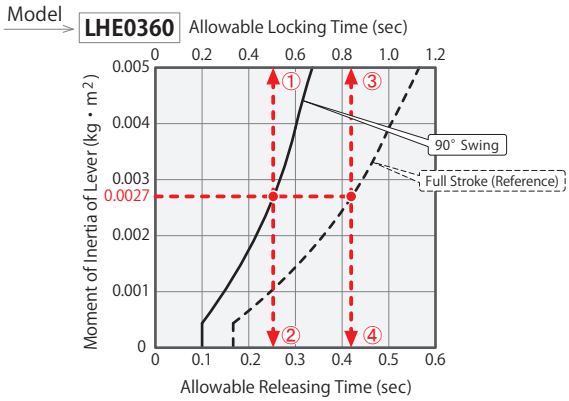
① 90° Swing Time when Locking : About 0.5 sec or more

② 90° Swing Time when Releasing : About 0.25 sec or more

③ Total Lock Operation Time : About 0.84 sec or more

④ Total Release Operation Time : About 0.42 sec or more

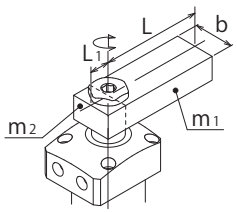
1. The total operation time on the graph represents the allowable operation time when fully stroked.



How to Calculate the Moment of Inertia (Estimated)

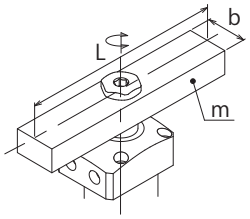
I : Moment of Inertia (kg・m²) L,L₁,L₂,K,b : Length (m) m,m₁,m₂,m₃ : Mass (kg)

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



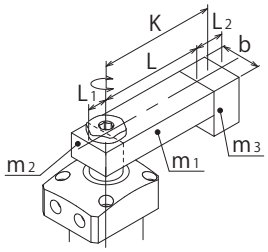
$$I = m_1 \frac{4L^2+b^2}{12} + m_2 \frac{4L_1^2+b^2}{12}$$

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.

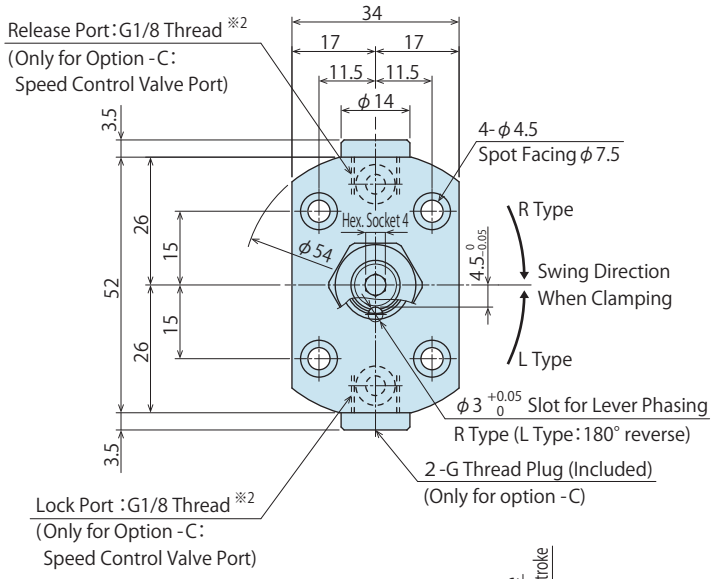


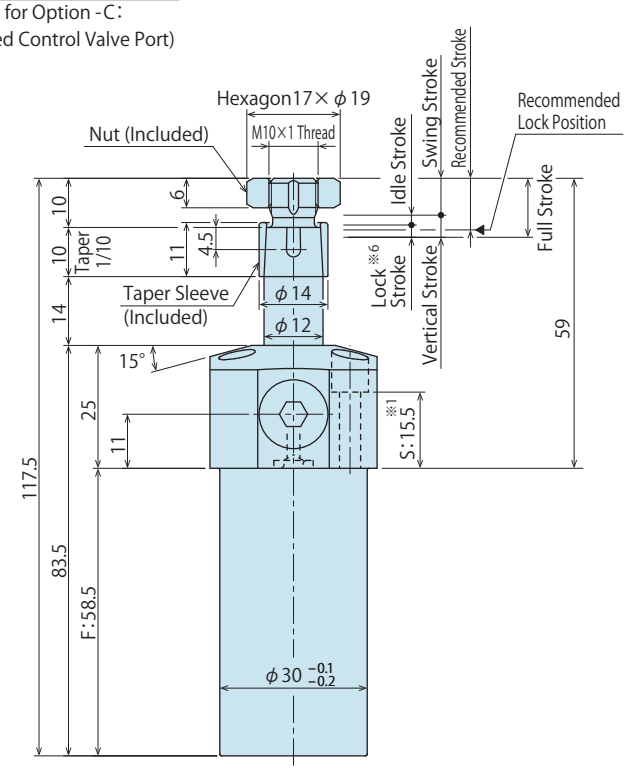
$$I = m_1 \frac{4L^2+b^2}{12} + m_2 \frac{4L_1^2+b^2}{12} + m_3K^2 + m_3 \frac{L_2^2+b^2}{12}$$

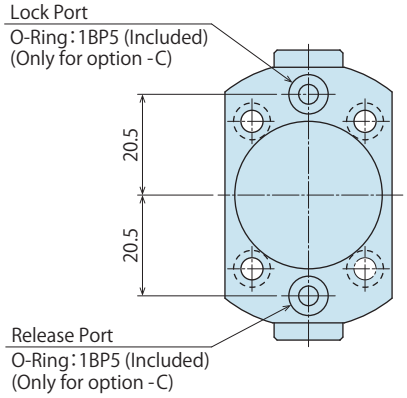
External Dimensions (LHE0300-□□)

C：Gasket Option (With G Thread Plug)

※ The drawing shows the released state of LHE0300-CR.



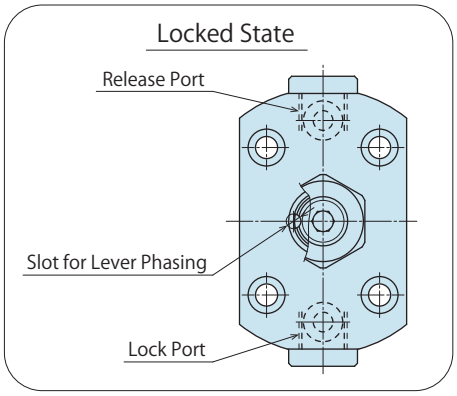




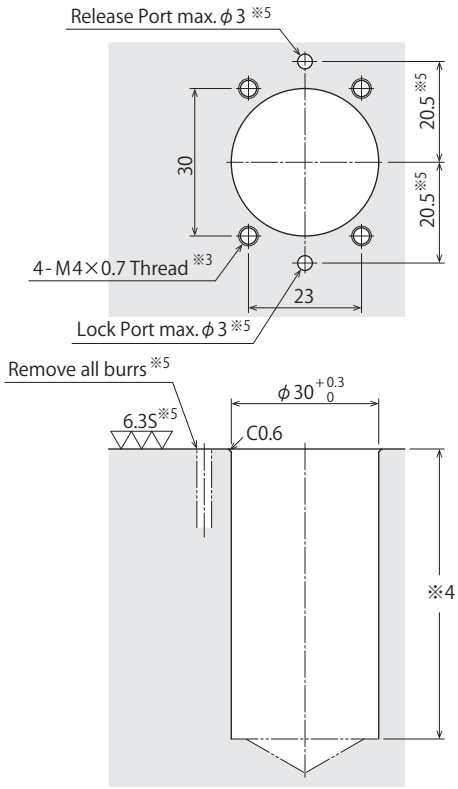
Notes：

※1. Mounting bolts are not provided with the product. Please prepare them according to the mounting height referring to dimension 'S' : 15.5.

※2. Speed control valve is sold separately. Please refer to P.947.



Machining Dimensions of Mounting Area



Notes：

※3. M4×0.7 tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S': 15.5.

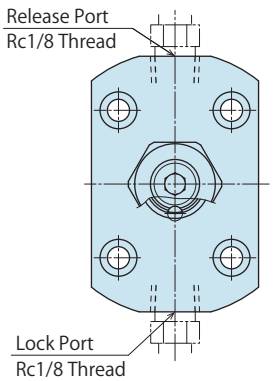
※4. The depth of the body mounting hole φ30 +0.3 0 should be decided according to the mounting height referring to dimension 'F': 58.5.

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

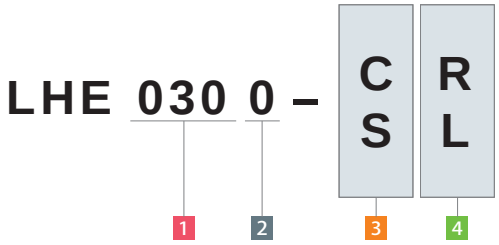
Piping Method

S：Piping Option (Rc Thread)

※ The drawing shows the released state of LHE0300-SR.



Model No. Indication



(Format Example：LHE0300-CR, LHE0300-SL)

1 Body Size
2 Design No.
3 Piping Method
4 Swing Direction When Clamping
5 Action Confirmation Method (When selecting Blank)
6 Options (When selecting Blank)

Dimensions

(mm)

Model No.		LHE0300-□□
Full Stroke		12
Swing Stroke (90°)		7.5
Vertical Stroke		4.5
(Break down)	Idle Stroke	2
	Lock Stroke ※6	2.5
Recommended Stroke		10.5
Cylinder Capacity cm³	Lock	3.5
	Release	4.9
Weight ※7 kg		0.6

Notes：

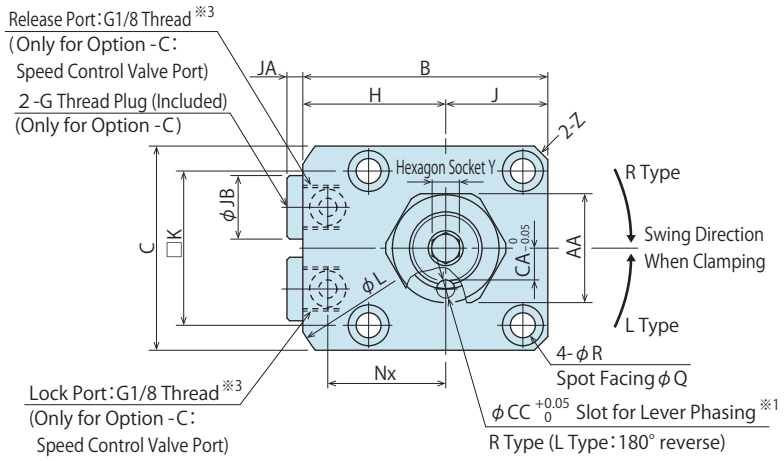
※6. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range.
(The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)

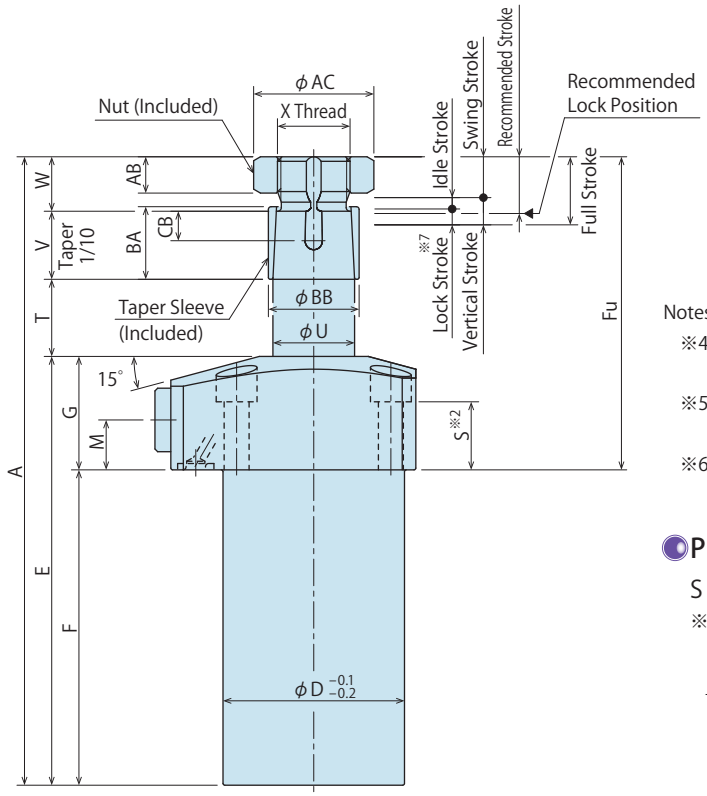
※7. It shows the weight of single swing clamp including taper sleeve and nut.

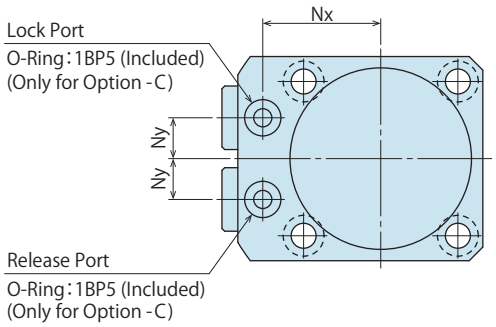
External Dimensions (LHE0360/0400/0480/0550-□□)

C：Gasket Option (With G Thread Plug)

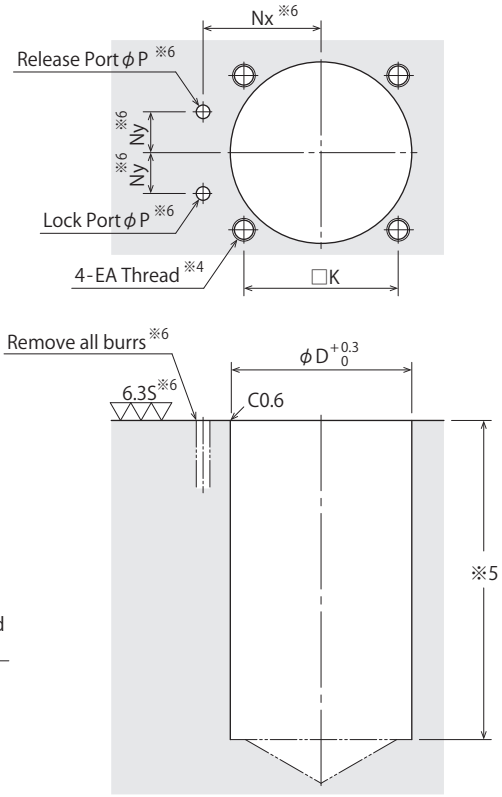
※ The drawing shows the released state of LHE□-CR.







Machining Dimensions of Mounting Area



Notes：

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

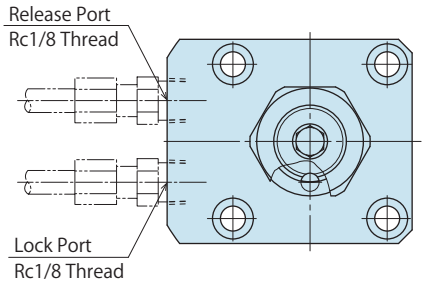
※5. The depth of the body mounting hole ϕD should be decided according to the mounting height referring to dimension 'F'.

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

Piping Method

S：Piping Option (Rc Thread)

※ The drawing shows the released state of LHE□-SR.



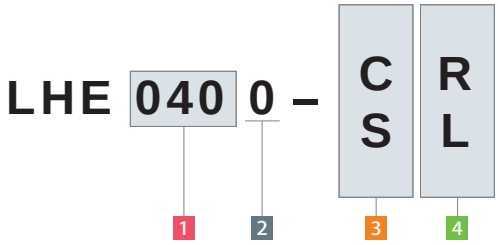
Notes：

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

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

※3. Speed control valve is sold separately. Please refer to P.947.

Model No. Indication



(Format Example：LHE0360-CR, LHE0550-SL)

1 Body Size
2 Design No.
3 Piping Method
4 Swing Direction When Clamping
5 Action Confirmation Method (When selecting Blank)
6 Options (When selecting Blank)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.		LHE0360-□□	LHE0400-□□	LHE0480-□□	LHE0550-□□
Full Stroke		13	15	17	18.5
Swing Stroke (90°)		8	9	11	12.5
Vertical Stroke		5	6	6	6
(Breakdown)	Idle Stroke	2	2.5	2.5	2
	Lock Stroke ※7	3	3.5	3.5	4
Recommended Stroke		11	12.5	14.5	15.5
A		124.5	138.5	154	170.5
B		49	54	61	69
C		40	45	51	60
D		36	40	48	55
E		85.5	94.5	103	114
F		60.5	69.5	75	84
Fu		64	69	79	86.5
G		25	25	28	30
H		29	31.5	35.5	39
J		20	22.5	25.5	30
K		31.4	34	40	47
L		66	73	83	88
M		11	11	13	12
Nx		23.5	26	30	33.5
Ny		8	9	11	12
P		max.3	max.3	max.3	max.3
Q		7.5	9	9	11
R		4.5	5.5	5.5	6.8
S		16	15	17.5	17
T		15	17	19	20.5
U		15	18	22	25
V		13	15	18	21
W		11	12	14	15
X (Nominal×Pitch)		M14×1.5	M16×1.5	M20×1.5	M22×1.5
Y		5	6	8	8
Z (Chamfer)		C2	C3	C3	C3
AA		22	24	30	32
AB		7	8	9	10
AC		24.5	26.5	33	35.5
BA		14	16	19	22
BB		17	20	25	28
CA		6	7	9	10
CB		6.5	6.5	7.5	9.5
CC		4	4	5	6
EA (Nominal×Pitch)		M4×0.7	M5×0.8	M5×0.8	M6×1
JA		3.5	3.5	3.5	3.5
JB		14	14	14	14
Cylinder Capacity cm³	Lock	6.5	11.1	16.2	27.2
	Release	8.8	14.9	22.7	36.3
Weight ※8 kg		0.8	1.1	1.6	2.3

Notes：

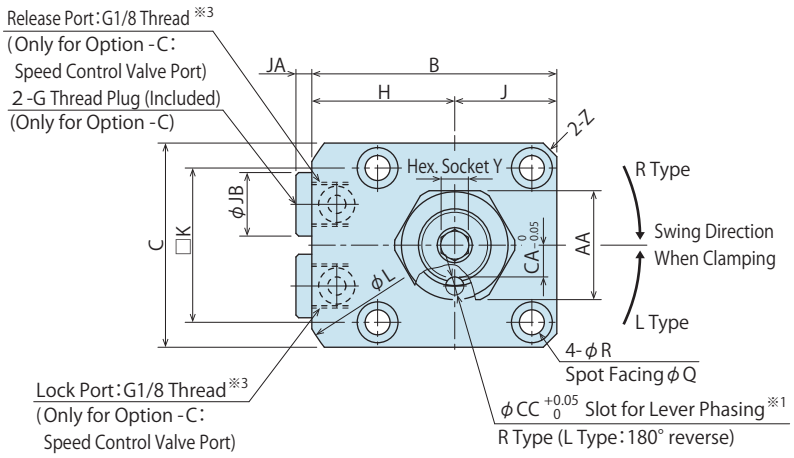
※7. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range. (The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)

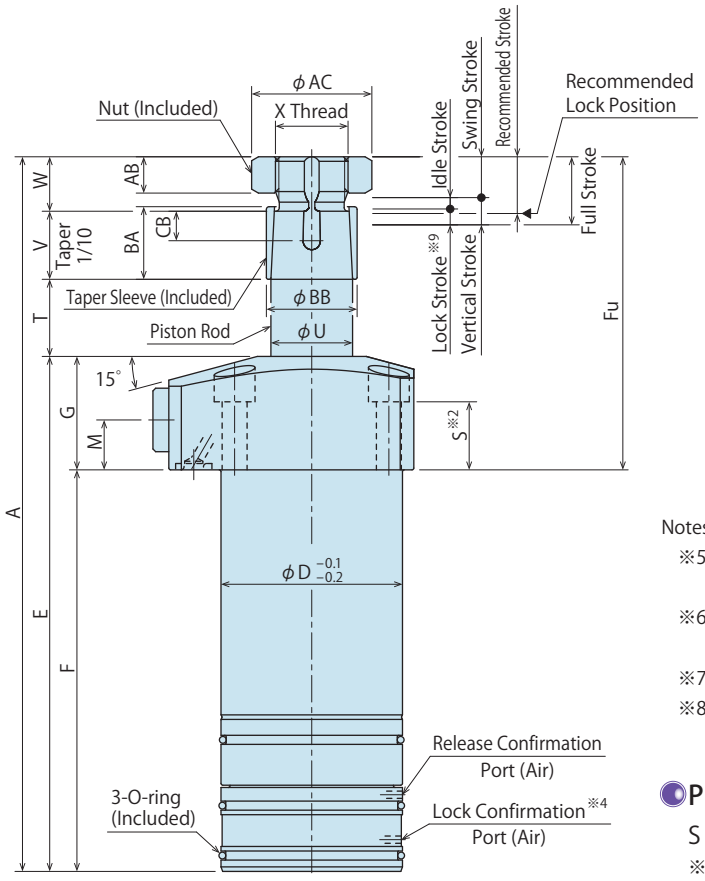
※8. It shows the weight of single swing clamp including taper sleeve and nut.

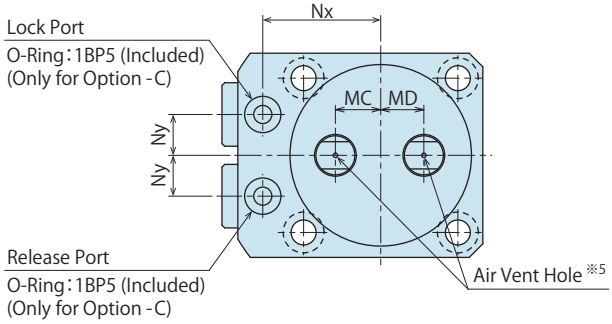
External Dimensions (LHE0400/0480/0550-□□M)

C：Gasket Option (With G Thread Plug)

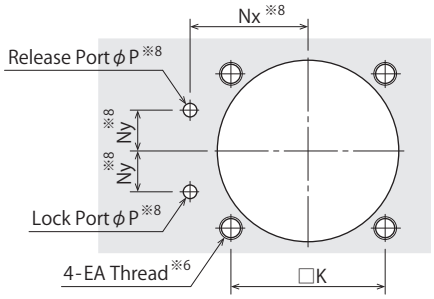
※ The drawing shows the released state of LHE□-CRM.

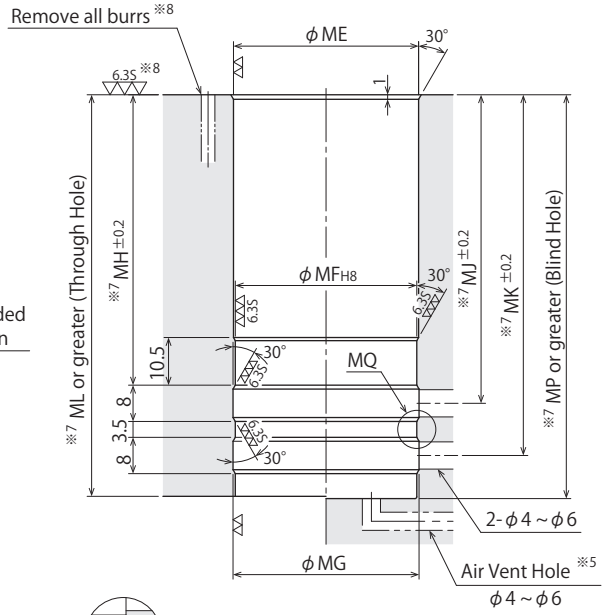






Machining Dimensions of Mounting Area





Notes：

※5. Please keep clear condition at the air vent hole, and prevent coolant and chips from entering the hole.

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

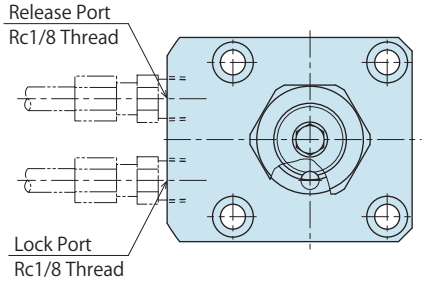
※7. The dimensions indicate those under the flange.

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

Piping Method

S：Piping Option (Rc Thread)

※ The drawing shows the released state of LHE□-SRM.



Notes：

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

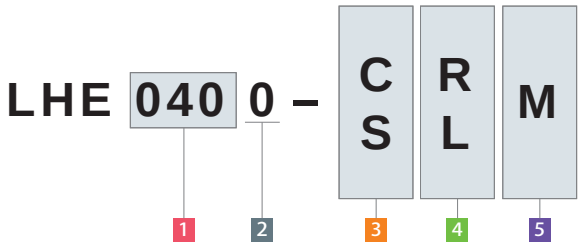
※2. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.

※3. Speed control valve is sold separately. Please refer to P.947.

※4. Lock confirmation is not the stroke check of piston rod, but rather the action check of internal mechanical lock.

1. Please contact us for a combination with other options.
2. Please refer to P.45 for Air Sensing Chart.

Model No. Indication



(Format Example：LHE0400-CRM, LHE0550-SLM)

1 Body Size
2 Design No.
3 Piping Method
4 Swing Direction When Clamping
5 Action Confirmation Method (When selecting M)
6 Options (When selecting Blank)

External Dimensions and Machining Dimensions for Mounting (mm)

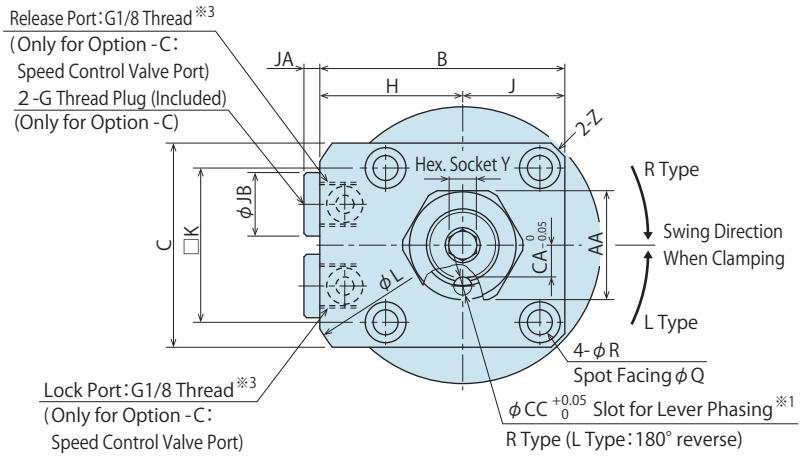
Model No.		LHE0400-□□M	LHE0480-□□M	LHE0550-□□M
Full Stroke		15	17	18.5
Swing Stroke (90°)		9	11	12.5
Vertical Stroke		6	6	6
(Breakdown)	Idle Stroke	2.5	2.5	2
	Lock Stroke ※9	3.5	3.5	4
Recommended Stroke		12.5	14.5	15.5
A		157.5	173	189.5
B		54	61	69
C		45	51	60
D		40	48	55
E		113.5	122	133
F		88.5	94	103
Fu		69	79	86.5
G		25	28	30
H		31.5	35.5	39
J		22.5	25.5	30
K		34	40	47
L		73	83	88
M		11	13	12
Nx		26	30	33.5
Ny		9	11	12
P		max.3	max.3	max.3
Q		9	9	11
R		5.5	5.5	6.8
S		15	17.5	17
T		17	19	20.5
U		18	22	25
V		15	18	21
W		12	14	15
X (Nominal×Pitch)		M16×1.5	M20×1.5	M22×1.5
Y		6	8	8
Z (Chamfer)		C3	C3	C3
AA		24	30	32
AB		8	9	10
AC		26.5	33	35.5
BA		16	19	22
BB		20	25	28
CA		7	9	10
CB		6.5	7.5	9.5
CC		4	5	6
EA (Nominal×Pitch)		M5×0.8	M5×0.8	M6×1
MC		10	12	14.5
MD		9.5	9.5	9.5
ME		40.8	49	56
MF		$40^{+0.039}_{0}$	$48^{+0.039}_{0}$	$55^{+0.046}_{0}$
MG		40.6	48.6	55.6
MH		64	69.5	78.5
MJ		68	73.5	82.5
MK		79.5	85	94
ML		88.5	94	103
MP		89	94.5	103.5
JA		3.5	3.5	3.5
JB		14	14	14
3-O-ring		36×1.5 (Internal Diameter ×Wire Diameter)	AS568-031(70)	AS568-033(70)
Cylinder Capacity cm³	Lock	11.1	16.2	27.2
	Release	14.9	22.7	36.3
Weight ※10	kg	1.3	1.9	2.7

Notes：※9. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range. (The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)
※10. It shows the weight of single swing clamp including taper sleeve and nut.

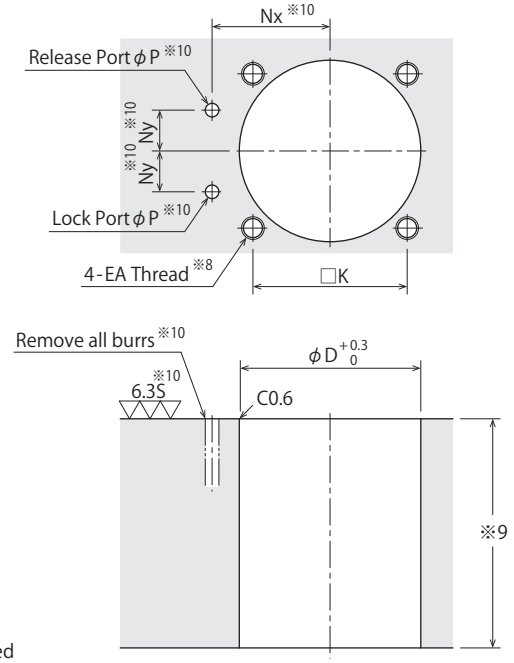
External Dimensions (LHE0400/0480/0550-□□N)

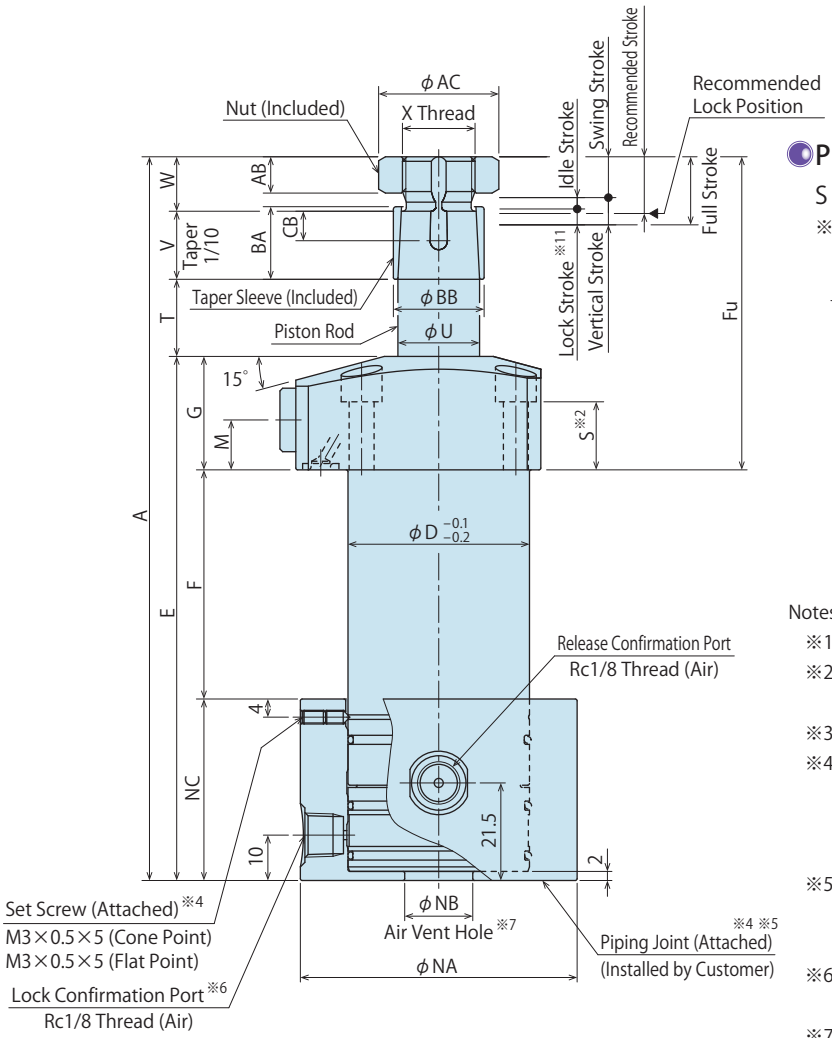
C：Gasket Option (With G Thread Plug)

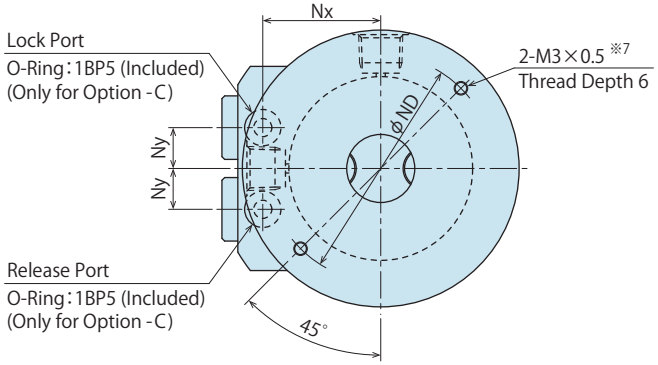
※ The drawing shows the released state of LHE□-CRN.



Machining Dimensions of Mounting Area



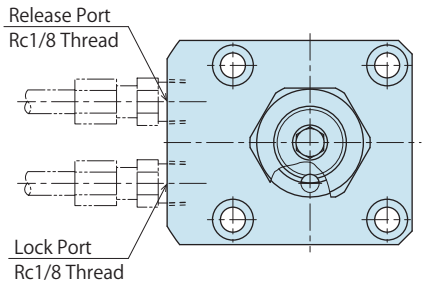




Piping Method

S：Piping Option (Rc Thread)

※ The drawing shows the released state of LHE□-SRN.



Notes：

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

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

※3. Speed control valve is sold separately. Please refer to P.947.

※4. Piping joint and set screw will be shipped as attachments. Make sure not to damage O-ring and insert the piping joint from the bottom of the cylinder and fix it with set screw. Mount the set screw with cone point first, and then flat point.

※5. For mounting piping joint, follow the longitudinal direction dimension as indicated in this drawing. If failed (not pushed enough), it causes air leakage, etc.

※6. Lock confirmation is not the stroke check of piston rod, but rather the action check of internal mechanical lock.

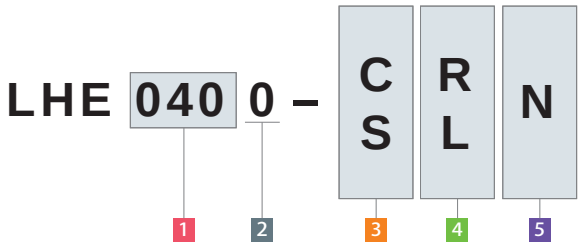
※7. Please keep clear condition at the air vent hole, and prevent coolant and chips from entering the hole. If exposed to coolant and chips, use M3 thread of the bottom and install an attachment to prevent contamination, but do not block the air vent hole.

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

※9. The depth of the body mounting hole ϕD should be less than 'Dimension F -1'.

※10. The machining dimension is for -C : Gasket Option.
1. Please contact us for a combination with other options.
2. Please refer to P.45 for Air Sensing Chart.

Model No. Indication



(Format Example：LHE0400-CRN, LHE0550-SLN)

1 Body Size
2 Design No.
3 Piping Method
4 Swing Direction When Clamping
5 Action Confirmation Method (When selecting N)
6 Options (When selecting Blank)

External Dimensions and Machining Dimensions for Mounting (mm)

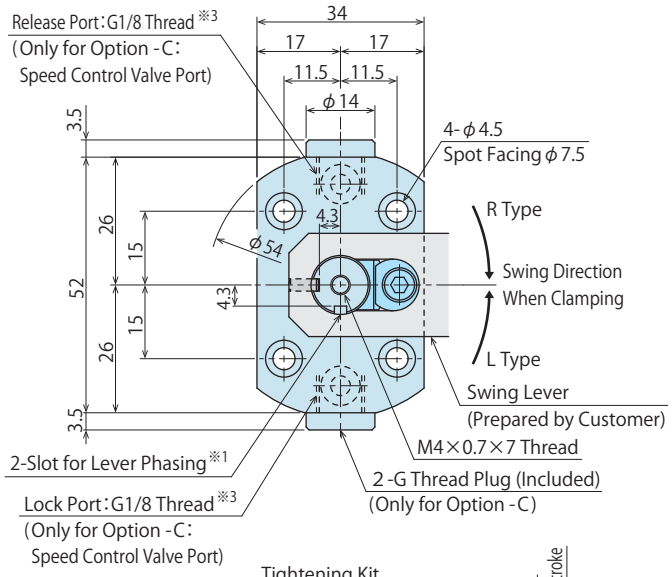
Model No.		LHE0400-□□N	LHE0480-□□N	LHE0550-□□N
Full Stroke		15	17	18.5
Swing Stroke (90°)		9	11	12.5
Vertical Stroke		6	6	6
(Breakdown)	Idle Stroke	2.5	2.5	2
	Lock Stroke ※11	3.5	3.5	4
Recommended Stroke		12.5	14.5	15.5
A		159.5	175	191.5
B		54	61	69
C		45	51	60
D		40	48	55
E		115.5	124	135
F		50.5	55	64
Fu		69	79	86.5
G		25	28	30
H		31.5	35.5	39
J		22.5	25.5	30
K		34	40	47
L		73	83	88
M		11	13	12
Nx		26	30	33.5
Ny		9	11	12
P		max.3	max.3	max.3
Q		9	9	11
R		5.5	5.5	6.8
S		15	17.5	17
T		17	19	20.5
U		18	22	25
V		15	18	21
W		12	14	15
X (Nominal×Pitch)		M16×1.5	M20×1.5	M22×1.5
Y		6	8	8
Z (Chamfer)		C3	C3	C3
AA		24	30	32
AB		8	9	10
AC		26.5	33	35.5
BA		16	19	22
BB		20	25	28
CA		7	9	10
CB		6.5	7.5	9.5
CC		4	5	6
EA (Nominal×Pitch)		M5×0.8	M5×0.8	M6×1
NA		61	69	76
NB		15	18	22
NC		40	41	41
ND		50	60	66
JA		3.5	3.5	3.5
JB		14	14	14
Cylinder Capacity cm³	Lock	11.1	16.2	27.2
	Release	14.9	22.7	36.3
Weight ※12	kg	1.5	2.1	2.9

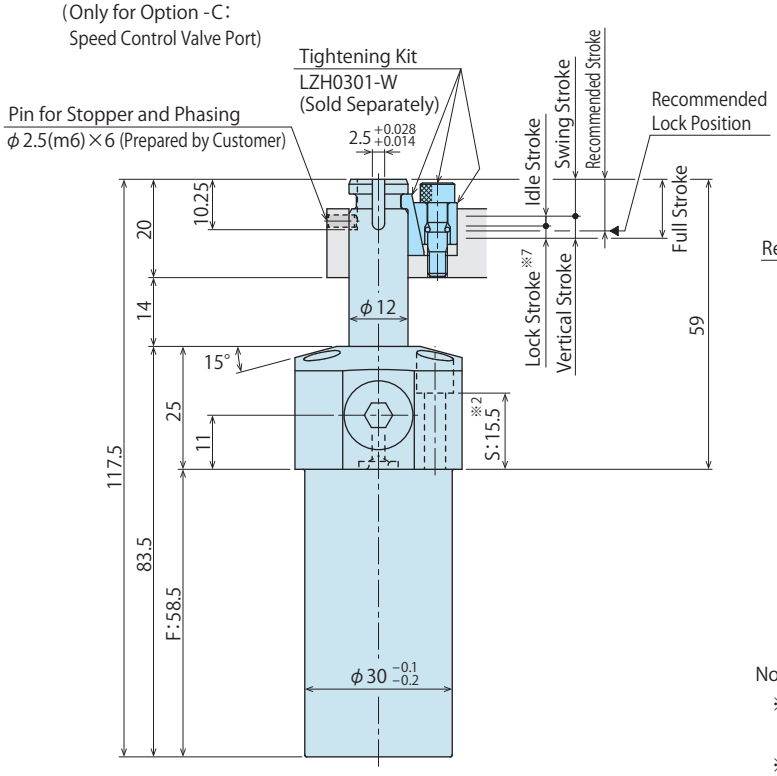
Notes：※11. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range. (The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)
※12. It shows the weight of single swing clamp including taper sleeve and nut.

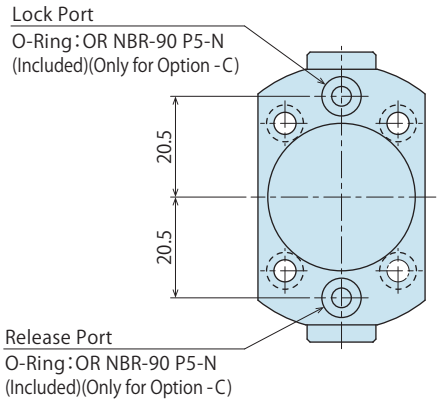
External Dimensions (LHE0300-□-A)

C：Gasket Option (With G Thread Plug)

The drawing shows the released state of LHE0300-CR-A.







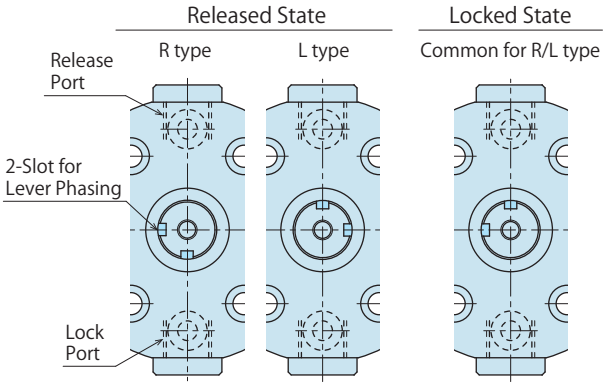
Notes：

※2. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'：15.5.

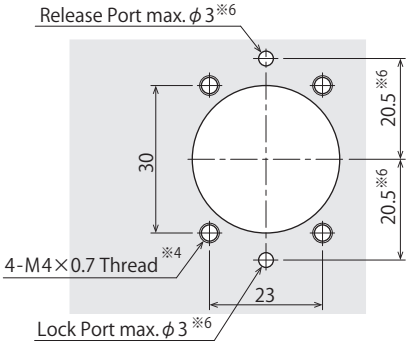
※3. Speed control valve is sold separately. Please refer to P.947.

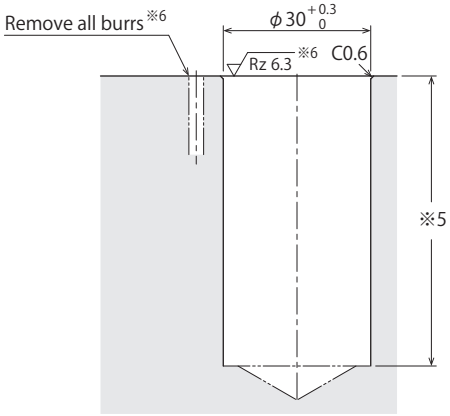
1. Please contact us for a combination with other options.

※1. Slot for Lever Phasing



Machining Dimensions of Mounting Area





Notes：

※4. M4×0.7 tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'：15.5.

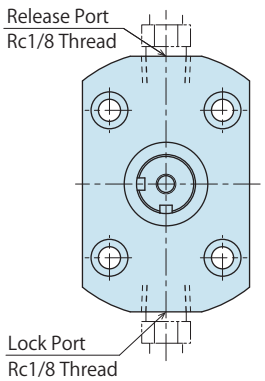
※5. The depth of the body mounting hole φ30 +0.3 0 should be decided according to the mounting height referring to dimension 'F'：58.5.

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

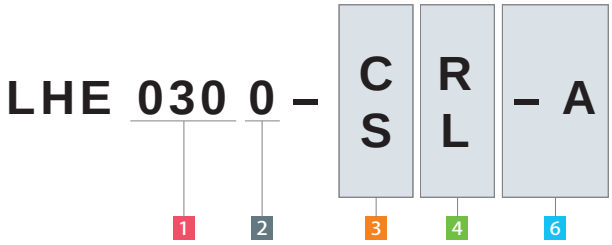
Piping Method

S：Piping Option (Rc Thread)

※ The drawing shows the released state of LHE0300-SR-A.



Model No. Indication



(Format Example：LHE0300-CR-A, LHE0300-SL-A)

1 Body Size
2 Design No.
3 Piping Method
4 Swing Direction When Clamping
5 Action Confirmation Method (When selecting Blank)
6 Options (When selecting A)

Dimensions

(mm)

Model No.		LHE0300-□□-A
Full Stroke		12
Swing Stroke (90°)		7.5
Vertical Stroke		4.5
(Breakdown)	Idle Stroke	2
	Lock Stroke ※7	2.5
Recommended Stroke		10.5
Cylinder Capacity cm³	Lock	3.5
	Release	4.9
Weight ※8 kg		0.6

Notes：

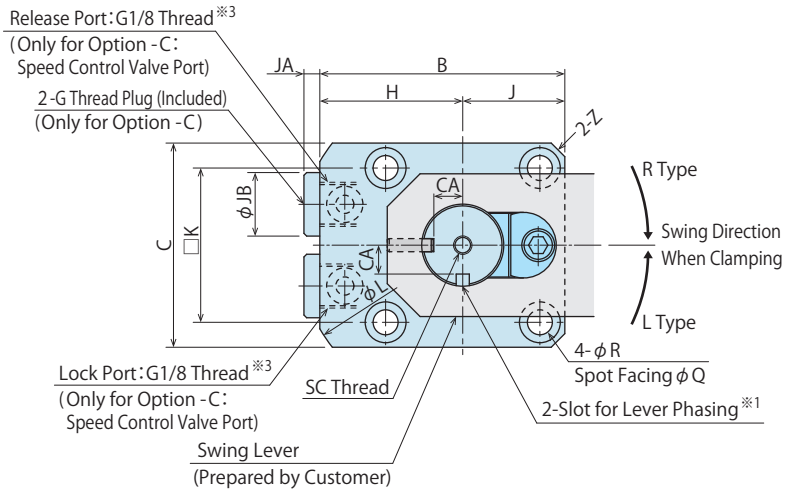
※7. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range. (The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)

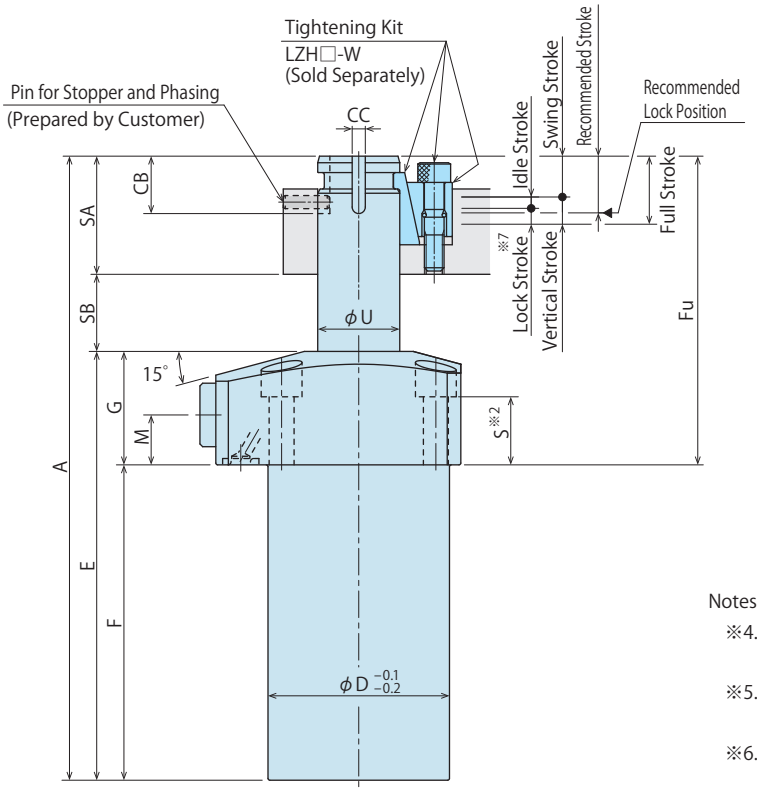
※8. It shows the weight of single swing clamp.

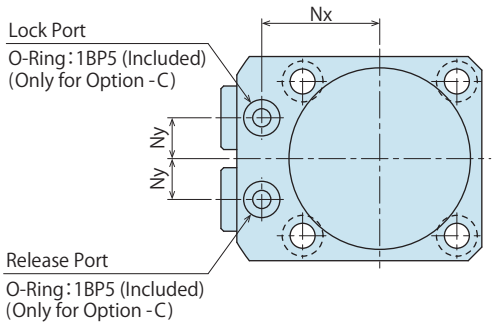
External Dimensions (LHE0360/0400/0480/0550-□□-A)

C：Gasket Option (With G Thread Plug)

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







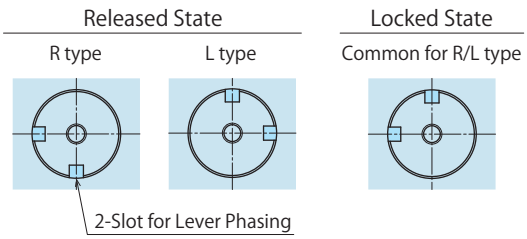
Notes：

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

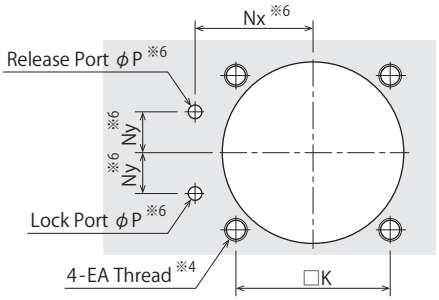
※3. Speed control valve is sold separately. Please refer to P.947.

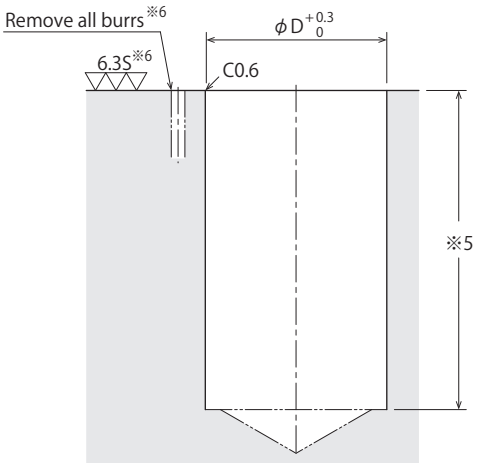
1. Please contact us for a combination with other options.

※1. Slot for Lever Phasing



Machining Dimensions of Mounting Area





Notes：

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

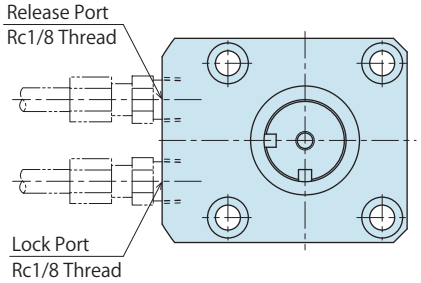
※5. The depth of the body mounting hole φD should be decided according to the mounting height referring to dimension 'F'.

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

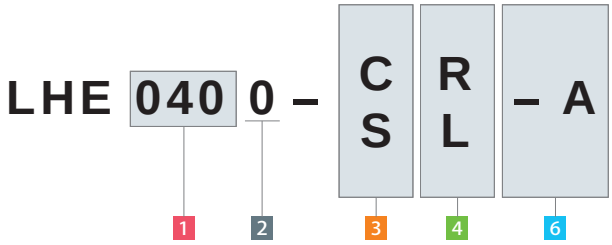
Piping Method

S：Piping Option (Rc Thread)

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



Model No. Indication



(Format Example：LHE0360-CR-A, LHE0550-SL-A)

1 Body Size
2 Design No.
3 Piping Method
4 Swing Direction When Clamping
5 Action Confirmation Method (When selecting Blank)
6 Options (When selecting A)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.		LHE0360-□□-A	LHE0400-□□-A	LHE0480-□□-A	LHE0550-□□-A
Full Stroke		13	15	17	18.5
Swing Stroke (90°)		8	9	11	12.5
Vertical Stroke		5	6	6	6
(Breakdown)	Idle Stroke	2	2.5	2.5	2
	Lock Stroke ※7	3	3.5	3.5	4
Recommended Stroke		11	12.5	14.5	15.5
A		124.5	138.5	154	170.5
B		49	54	61	69
C		40	45	51	60
D		36	40	48	55
E		85.5	94.5	103	114
F		60.5	69.5	75	84
Fu		64	69	79	86.5
G		25	25	28	30
H		29	31.5	35.5	39
J		20	22.5	25.5	30
K		31.4	34	40	47
L		66	73	83	88
M		11	11	13	12
Nx		23.5	26	30	33.5
Ny		8	9	11	12
P		max.3	max.3	max.3	max.3
Q		7.5	9	9	11
R		4.5	5.5	5.5	6.8
S		16	15	17.5	17
U		15	18	22	25
Z (Chamfer)		C2	C3	C3	C3
CA		4.8	5.8	7.8	8.8
CB		12	15	16	17.5
CC		$3^{+0.028}_{+0.014}$	$4^{+0.038}_{+0.020}$	$4^{+0.038}_{+0.020}$	$4^{+0.038}_{+0.020}$
EA (Nominal×Pitch)		M4×0.7	M5×0.8	M5×0.8	M6×1
SA		24	27	32	36
SB		15	17	19	20.5
SC (Nominal×Pitch×Depth)		M4×0.7×7	M5×0.8×8	M5×0.8×8	M6×1×11
JA		3.5	3.5	3.5	3.5
JB		14	14	14	14
Cylinder Capacity cm³	Lock	6.5	11.1	16.2	27.2
	Release	8.8	14.9	22.7	36.3
Weight ※8	kg	0.8	1.1	1.6	2.3

Notes：

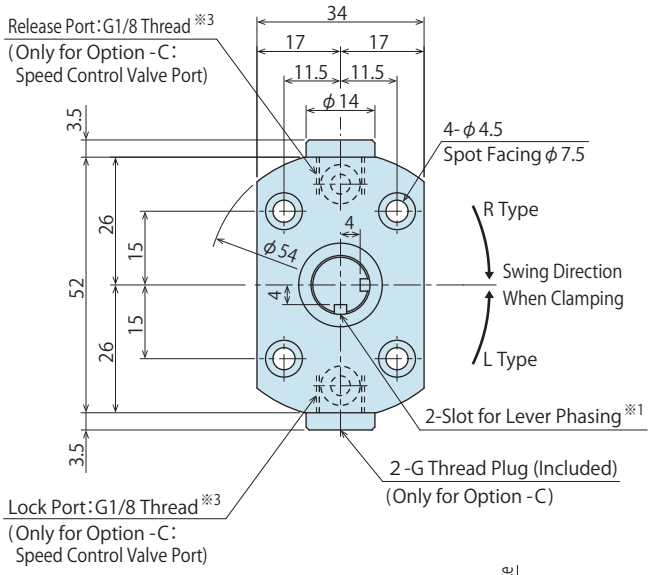
※7. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range. (The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)

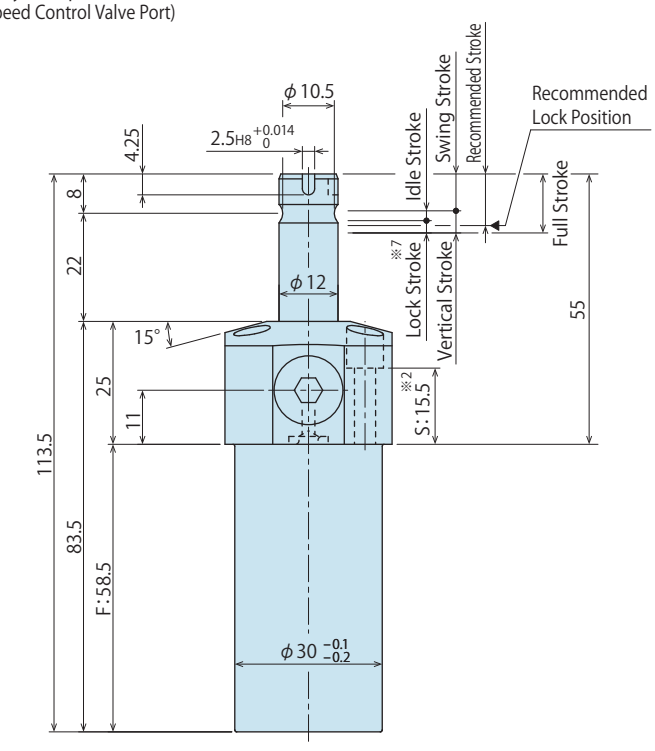
※8. It shows the weight of single swing clamp.

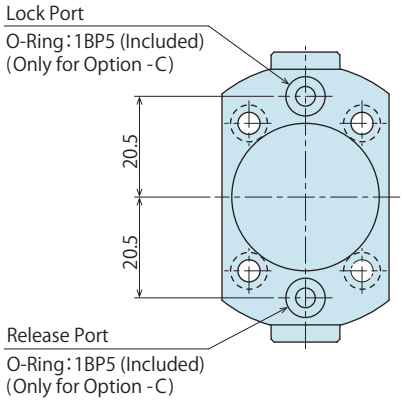
External Dimensions (LHE0300-□□-F)

C：Gasket Option (With G Thread Plug)

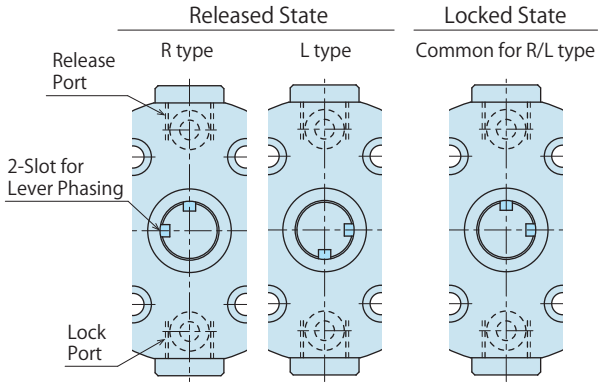
※ The drawing shows the released state of LHE0300-CL-F.



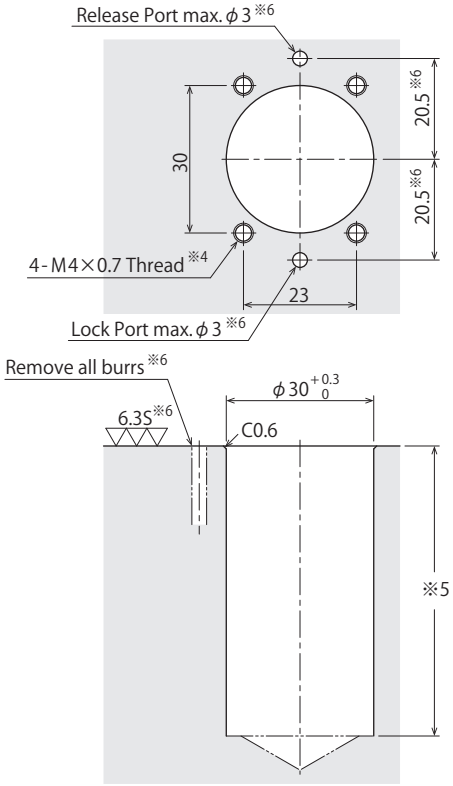




※1. Slot for Lever Phasing



Machining Dimensions of Mounting Area



Notes：

※4. M4×0.7 tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'：15.5.

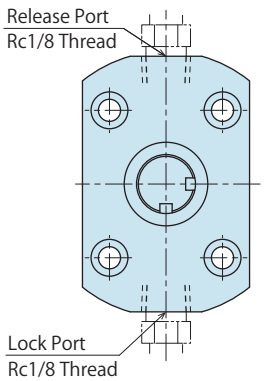
※5. The depth of the body mounting hole φ30 +0.3 0 should be decided according to the mounting height referring to dimension 'F'：58.5.

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

Piping Method

S：Piping Option (Rc Thread)

※ The drawing shows the released state of LHE0300-SL-F.



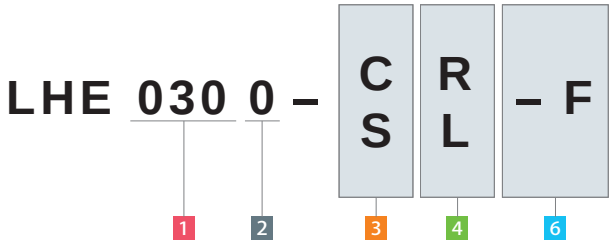
Notes：

※2. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'：15.5.

※3. Speed control valve is sold separately. Please refer to P.947.

1. Please contact us for a combination with other options.

Model No. Indication



(Format Example：LHE0300-CR-F, LHE0300-SL-F)

1 Body Size
2 Design No.
3 Piping Method
4 Swing Direction When Clamping
5 Action Confirmation Method (When selecting Blank)
6 Options (When selecting F)

Dimensions

(mm)

Model No.		LHE0300-□□-F
Full Stroke		12
Swing Stroke (90°)		7.5
Vertical Stroke		4.5
(Breakdown)	Idle Stroke	2
	Lock Stroke ※7	2.5
Recommended Stroke		10.5
Cylinder Capacity cm³	Lock	3.5
	Release	4.9
Weight ※8 kg		0.6

Notes：

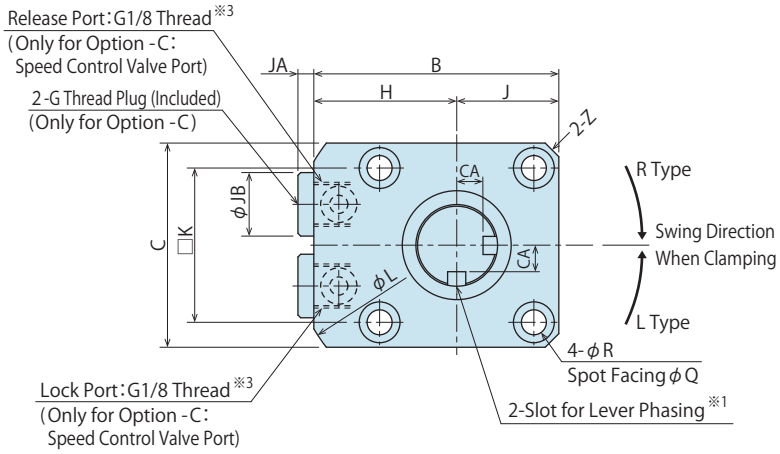
※7. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range. (The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)

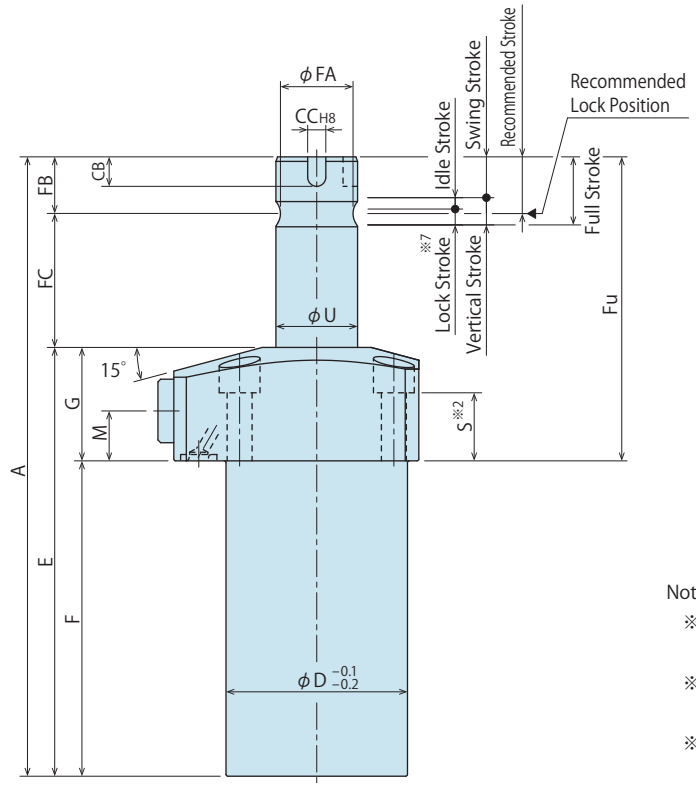
※8. It shows the weight of single swing clamp.

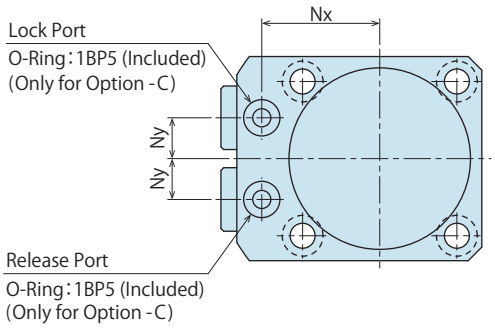
External Dimensions (LHE0360/0400/0480/0550-□□-F)

C：Gasket Option (With G Thread Plug)

※The drawing shows the released state of LHE□-CL-F.







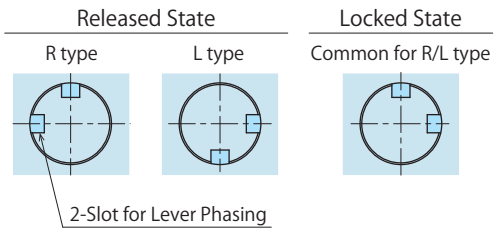
Notes：

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

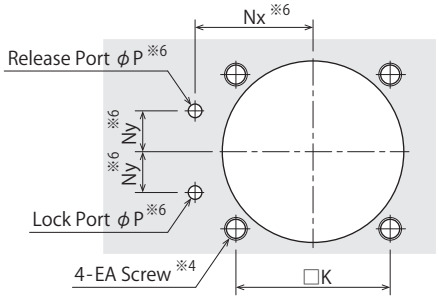
※3. Speed control valve is sold separately. Please refer to P.947.

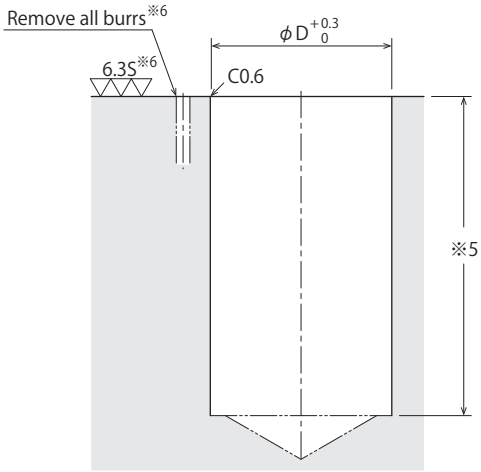
1. Please contact us for a combination with other options.

※1. Slot for Lever Phasing



Machining Dimensions of Mounting Area





Notes：

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

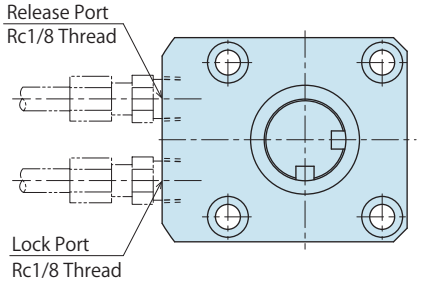
※5. The depth of the body mounting hole φD should be decided according to the mounting height referring to dimension 'F'.

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

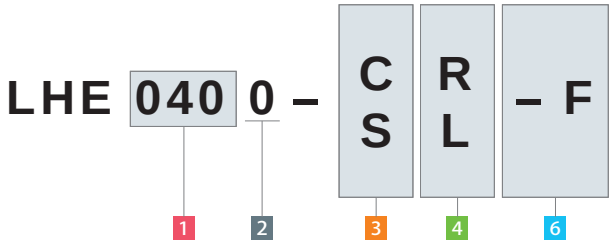
Piping Method

S：Piping Option (Rc Thread)

※ The drawing shows the released state of LHE□-SL-F.



Model No. Indication



(Format Example：LHE0360-CR-F, LHE0550-SL-F)

1 Body Size
2 Design No.
3 Piping Method
4 Swing Direction When Clamping
5 Action Confirmation Method (When selecting Blank)
6 Options (When selecting F)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.		LHE0360-□□-F	LHE0400-□□-F	LHE0480-□□-F	LHE0550-□□-F
Full Stroke		13	15	17	18.5
Swing Stroke (90°)		8	9	11	12.5
Vertical Stroke		5	6	6	6
(Breakdown)	Idle Stroke	2	2.5	2.5	2
	Lock Stroke ※7	3	3.5	3.5	4
Recommended Stroke		11	12.5	14.5	15.5
A		122.5	136.5	152	168.5
B		49	54	61	69
C		40	45	51	60
D		36	40	48	55
E		85.5	94.5	103	114
F		60.5	69.5	75	84
Fu		62	67	77	84.5
G		25	25	28	30
H		29	31.5	35.5	39
J		20	22.5	25.5	30
K		31.4	34	40	47
L		66	73	83	88
M		11	11	13	12
Nx		23.5	26	30	33.5
Ny		8	9	11	12
P		max.3	max.3	max.3	max.3
Q		7.5	9	9	11
R		4.5	5.5	5.5	6.8
S		16	15	17.5	17
U		15	18	22	25
Z (Chamfer)		C2	C3	C3	C3
CA		5	5.8	7.8	9
CB		5	6.5	6.5	7
CC		$3^{+0.014}_{0}$	$4^{+0.018}_{0}$	$4^{+0.018}_{0}$	$4^{+0.018}_{0}$
EA (Nominal×Pitch)		M4×0.7	M5×0.8	M5×0.8	M6×1
FA		13.5	16	19.5	22
FB		11	12.5	15	17
FC		26	29.5	34	37.5
JA		3.5	3.5	3.5	3.5
JB		14	14	14	14
Cylinder Capacity cm³	Lock	6.5	11.1	16.2	27.2
	Release	8.8	14.9	22.7	36.3
Weight ※8 kg		0.8	1.1	1.6	2.3

Notes：

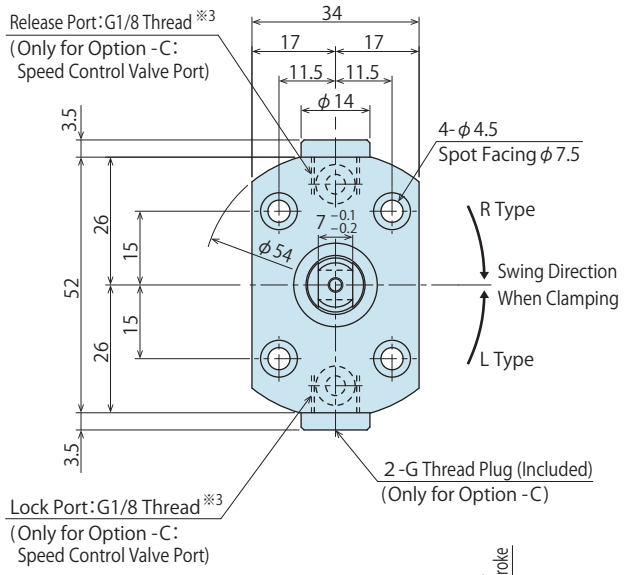
※7. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range. (The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)

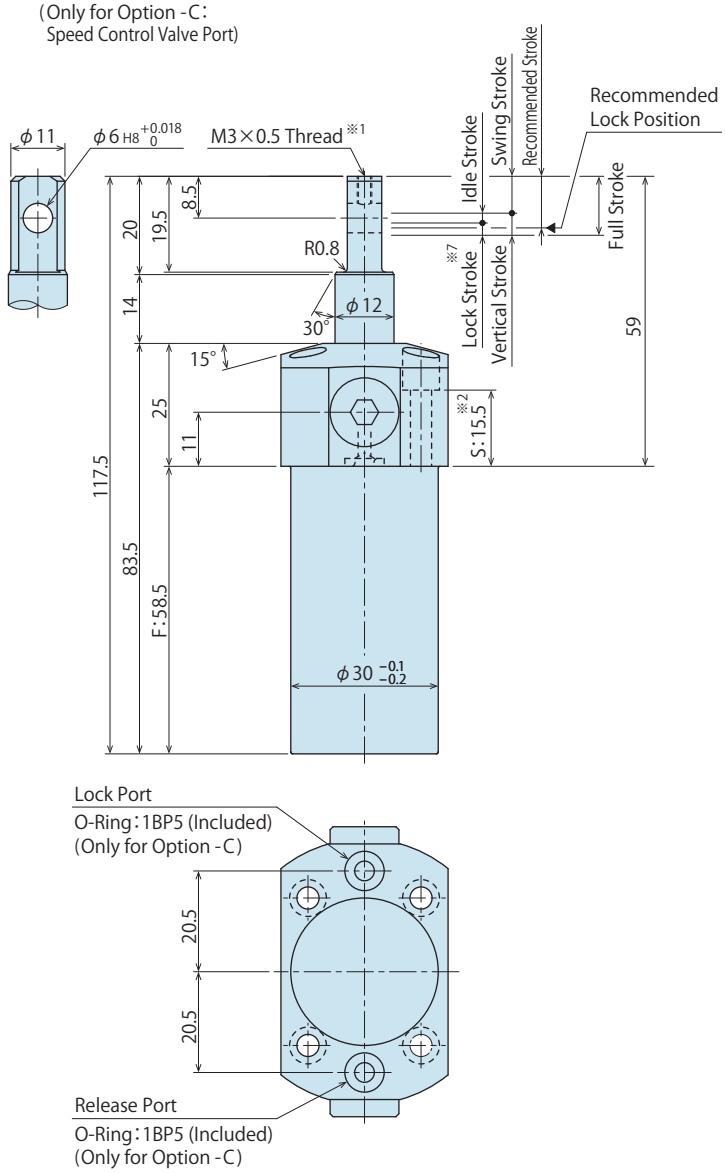
※8. It shows the weight of single swing clamp.

External Dimensions (LHE0300-□□-P)

C：Gasket Option (With G Thread Plug)

※ The drawing shows the released state of LHE0300-C□-P.





Notes：

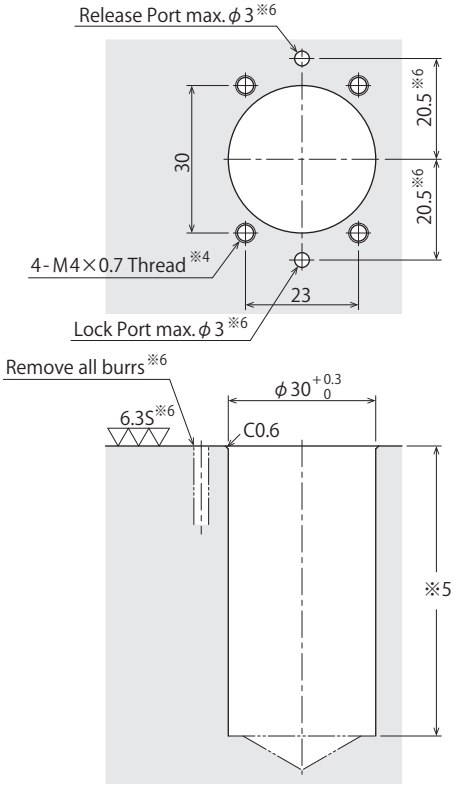
※1. For maintaining the position of the lever, use M3×0.5 thread on the top of the rod.

※2. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'：15.5.

※3. Speed control valve is sold separately. Please refer to P.947.

1. Please contact us for a combination with other options.

Machining Dimensions of Mounting Area



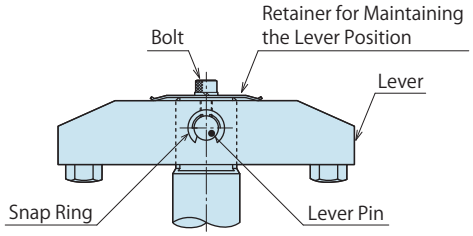
Notes：

※4. M4×0.7 tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'：15.5.

※5. The depth of the body mounting hole φ30 +0.3 0 should be decided according to the mounting height referring to dimension 'F'：58.5.

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

Balance Lever Reference Drawing



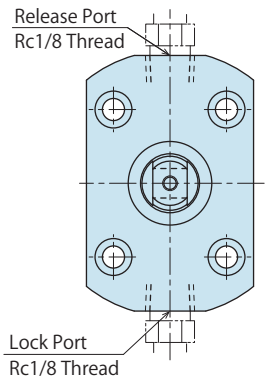
Note :

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

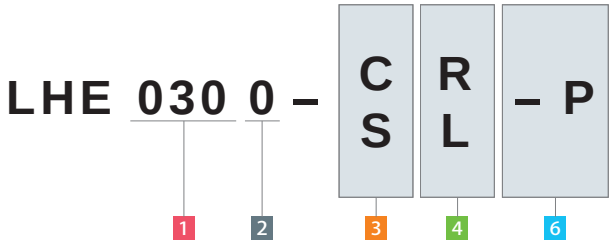
Piping Method

S：Piping Option (Rc Thread)

※ The drawing shows the released state of LHE0300-S□-P.



Model No. Indication



(Format Example：LHE0300-CR-P, LHE0300-SL-P)

1 Body Size
2 Design No.
3 Piping Method
4 Swing Direction When Clamping
5 Action Confirmation Method (When selecting Blank)
6 Options (When selecting P)

Dimensions

(mm)

Model No.		LHE0300-□□-P
Full Stroke		12
Swing Stroke (90°)		7.5
Vertical Stroke		4.5
(Breakdown)	Idle Stroke	2
	Lock Stroke ※7	2.5
Recommended Stroke		10.5
Cylinder Capacity cm³	Lock	3.5
	Release	4.9
Weight ※8 kg		0.6

Notes：

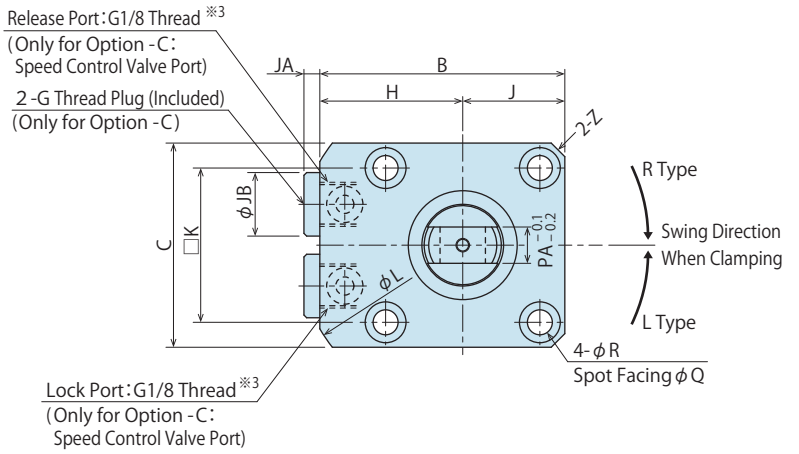
※7. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range. (The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)

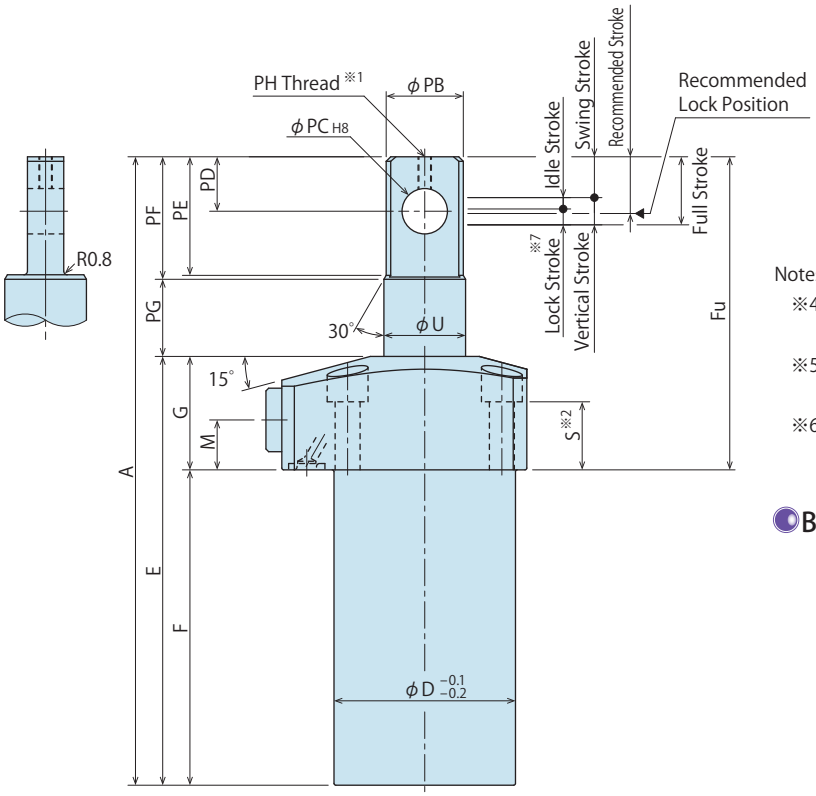
※8. It shows the weight of single swing clamp.

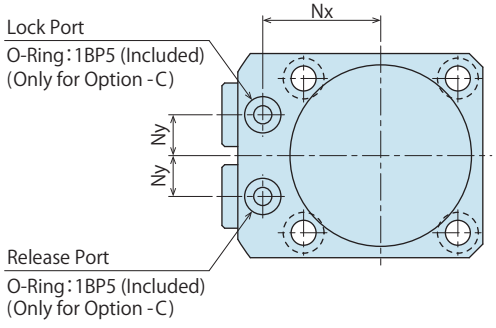
External Dimensions (LHE0360/0400/0480/0550-□□-P)

C：Gasket Option (With G Thread Plug)

※ The drawing shows the released state of LHE□-C□-P.







Notes：

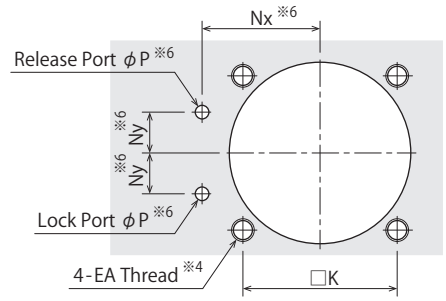
※1. For maintaining the position of the lever, use the thread (PH Thread) on the top of the rod.

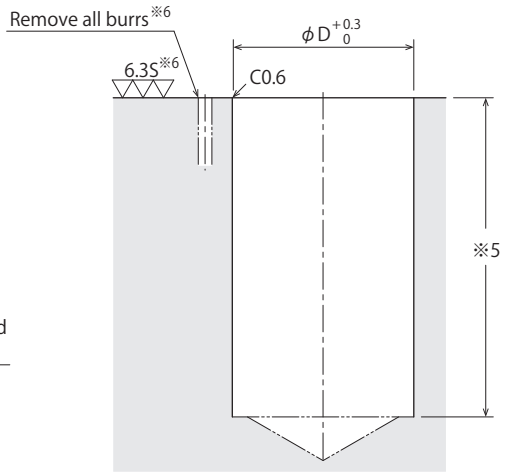
※2. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.

※3. Speed control valve is sold separately. Please refer to P.947.

1. Please contact us for a combination with other options.

Machining Dimensions of Mounting Area





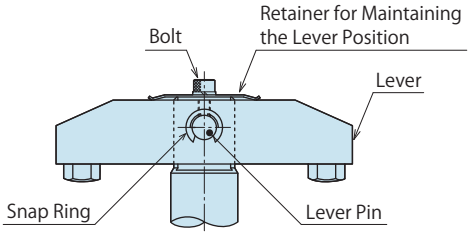
Notes：

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

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

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

Balance Lever Reference Drawing



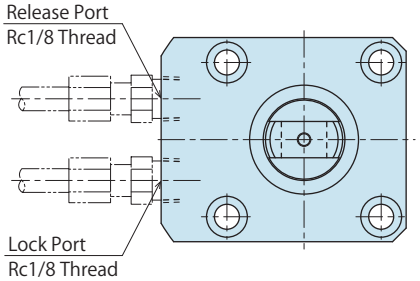
Note :

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

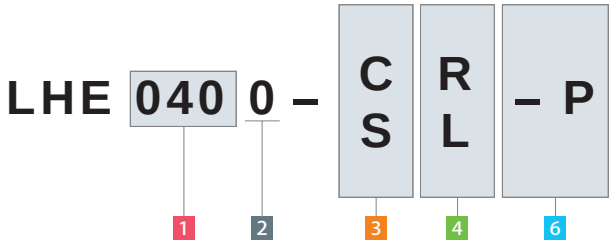
Piping Method

S：Piping Option (Rc Thread)

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



Model No. Indication



(Format Example：LHE0360-CR-P, LHE0550-SL-P)

1 Body Size
2 Design No.
3 Piping Method
4 Swing Direction When Clamping
5 Action Confirmation Method (When selecting Blank)
6 Options (When selecting P)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.		LHE0360-□-P	LHE0400-□-P	LHE0480-□-P	LHE0550-□-P
Full Stroke		13	15	17	18.5
Swing Stroke (90°)		8	9	11	12.5
Vertical Stroke		5	6	6	6
(Breakdown)	Idle Stroke	2	2.5	2.5	2
	Lock Stroke ※7	3	3.5	3.5	4
Recommended Stroke		11	12.5	14.5	15.5
A		124.5	138.5	154	170.5
B		49	54	61	69
C		40	45	51	60
D		36	40	48	55
E		85.5	94.5	103	114
F		60.5	69.5	75	84
Fu		64	69	79	86.5
G		25	25	28	30
H		29	31.5	35.5	39
J		20	22.5	25.5	30
K		31.4	34	40	47
L		66	73	83	88
M		11	11	13	12
Nx		23.5	26	30	33.5
Ny		8	9	11	12
P		max.3	max.3	max.3	max.3
Q		7.5	9	9	11
R		4.5	5.5	5.5	6.8
S		16	15	17.5	17
U		15	18	22	25
Z (Chamfer)		C2	C3	C3	C3
EA (Nominal×Pitch)		M4×0.7	M5×0.8	M5×0.8	M6×1
PA		8	8	10	13
PB		14	17	20	23
PC		$8^{+0.022}_{0}$	$10^{+0.022}_{0}$	$10^{+0.022}_{0}$	$12^{+0.027}_{0}$
PD		10.5	12	14	15.5
PE		23.5	26.5	30.5	34.5
PF		24	27	32	36
PG		15	17	19	20.5
PH (Nominal×Pitch)		M3×0.5	M3×0.5	M4×0.7	M5×0.8
JA		3.5	3.5	3.5	3.5
JB		14	14	14	14
Cylinder Capacity cm³	Lock	6.5	11.1	16.2	27.2
	Release	8.8	14.9	22.7	36.3
Weight ※8 kg		0.8	1.1	1.6	2.3

Notes：

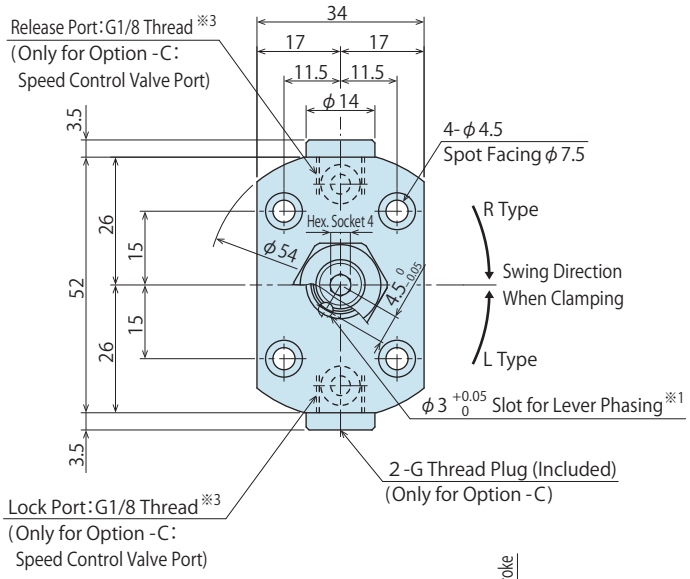
※7. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range. (The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)

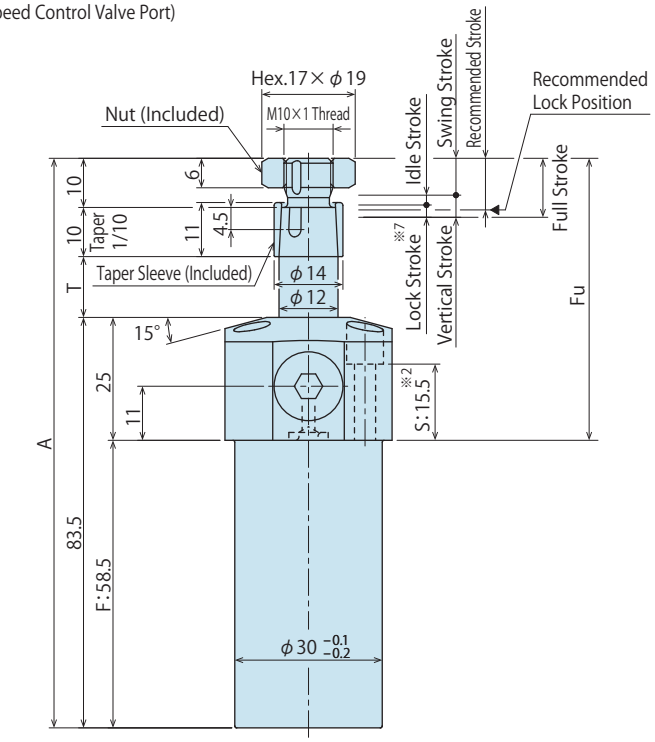
※8. It shows the weight of single swing clamp.

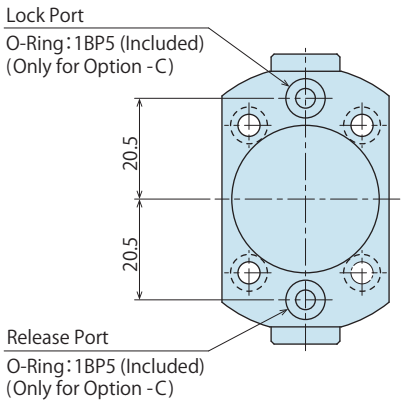
External Dimensions (LHE0300-□□-Y□)

C：Gasket Option (With G Thread Plug)

※ The drawing shows the released state of LHE0030□-CR-Y□.







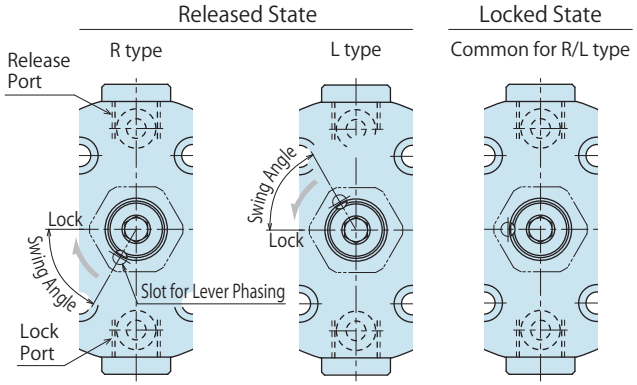
Notes：

※2. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'：15.5.

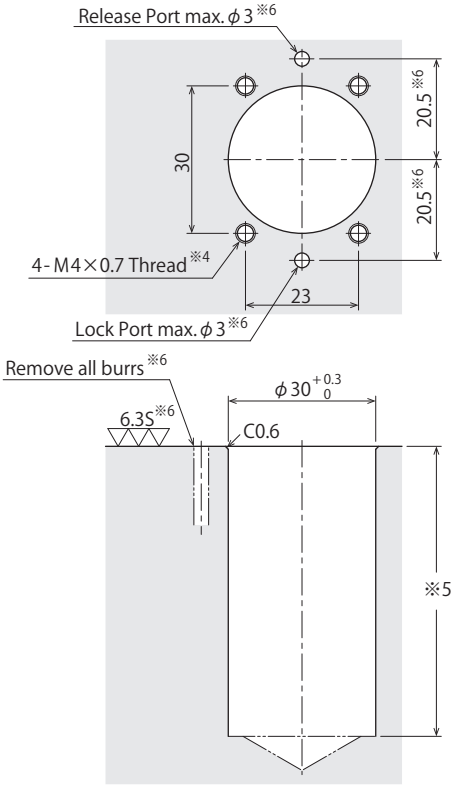
※3. Speed control valve is sold separately. Please refer to P.947.

※1. Slot for Lever Phasing

The slot position depends on the swing direction and the angle when clamping.



Machining Dimensions of Mounting Area



Notes：

※4. M4×0.7 tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'：15.5.

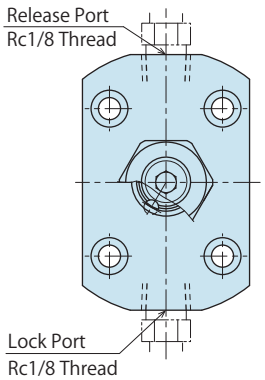
※5. The depth of the body mounting hole φ30 +0.3 0 should be decided according to the mounting height referring to dimension 'F'：58.5.

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

Piping Method

S：Piping Option (Rc Thread)

※ The drawing shows the released state of LHE0300□-SR-Y□.



Model No. Indication

LHE 030 0 – C S R L – Y□

(Format Example：LHE0300-CR-Y45, LHE0300-SL-Y60)

1 Body Size
2 Design No.
3 Piping Method
4 Swing Direction When Clamping
5 Action Confirmation Method (When selecting Blank)
6 Options (When selecting Y)

Dimensions

(mm)

Model No.		LHE0300-□□-Y□		
Option Model No.		Y30	Y45	Y60
Swing Angle		30°	45°	60°
Full Stroke		7.8	8.9	9.9
Swing Stroke		3.3	4.4	5.4
Vertical Stroke		4.5		
(Breakdown)	Idle Stroke	2		
	Lock Stroke ※7	2.5		
Recommended Stroke		6.3	7.4	8.4
A		113.3	114.4	115.4
Fu		54.8	55.9	56.9
T		9.8	10.9	11.9
Cylinder Capacity cm³	Lock	2.7	2.9	3.1
	Release	3.5	3.9	4.2
Weight ※8	kg	0.6		

Notes：

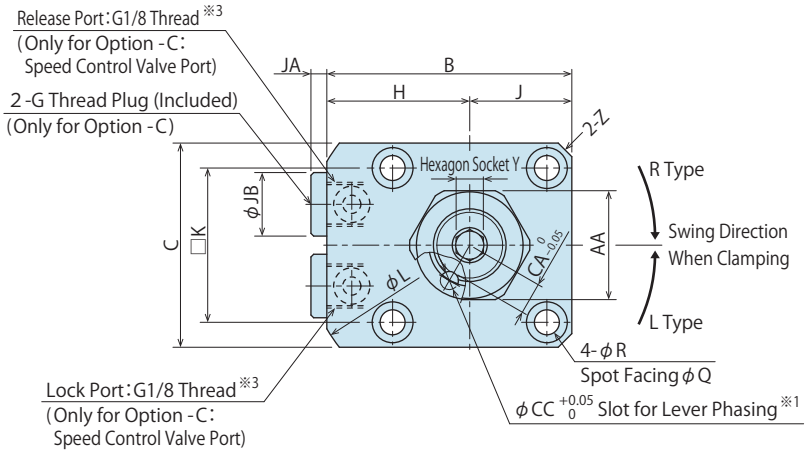
※7. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range. (The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)

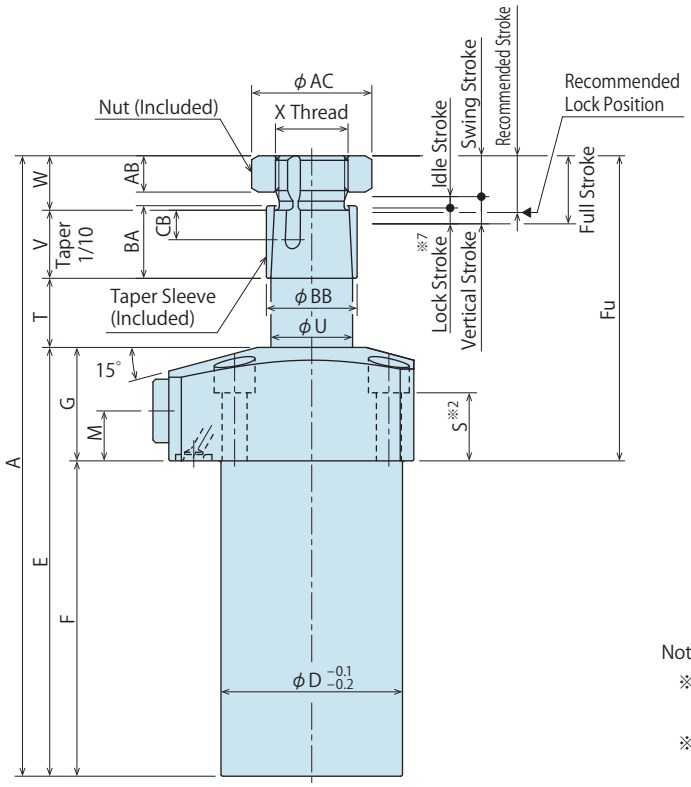
※8. It shows the weight of single swing clamp including taper sleeve and nut.

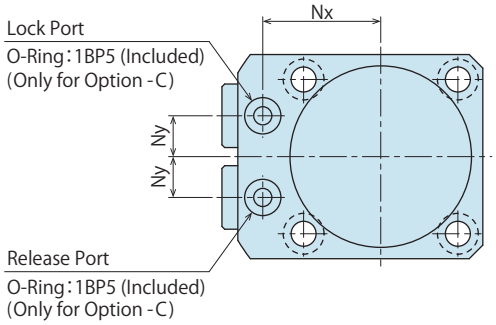
External Dimensions (LHE0360/0400/0480/0550-□□-Y□)

C：Gasket Option (With G Thread Plug)

※ The drawing shows the released state of LHE□-CR-Y□.







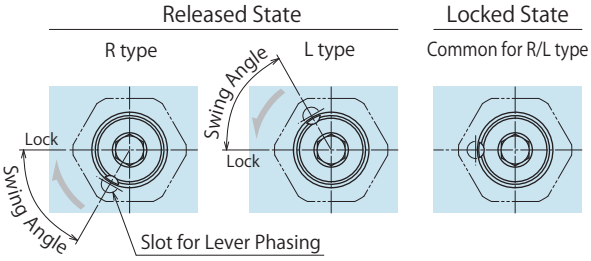
Notes：

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

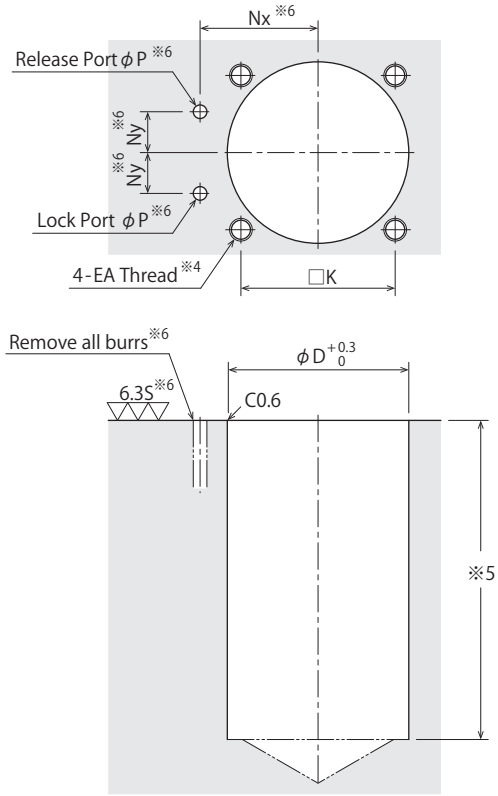
※3. Speed control valve is sold separately. Please refer to P.947.

※1. Slot for Lever Phasing

The slot position depends on the swing direction and the angle when clamping.



Machining Dimensions of Mounting Area



Notes：

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

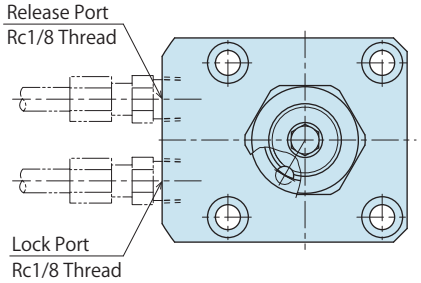
※5. The depth of the body mounting hole ϕD should be decided according to the mounting height referring to dimension 'F'.

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

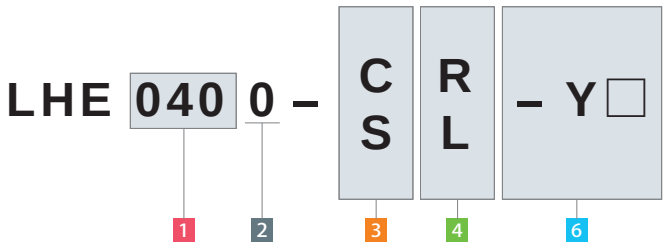
Piping Method

S：Piping Option (Rc Thread)

※ The drawing shows the released state of LHE□-SR-Y□.



Model No. Indication



(Format Example：LHE0360-CR-Y45, LHE0550-SL-Y60)

1 Body Size
2 Design No.
3 Piping Method
4 Swing Direction When Clamping
5 Action Confirmation Method (When selecting Blank)
6 Options (When selecting Y)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.		LHE0360-□-Y□			LHE0400-□-Y□			LHE0480-□-Y□			LHE0550-□-Y□		
Option Model No.		Y30	Y45	Y60	Y30	Y45	Y60	Y30	Y45	Y60	Y30	Y45	Y60
Swing Angle		30°	45°	60°	30°	45°	60°	30°	45°	60°	30°	45°	60°
Full Stroke		9	10	11	10.7	11.7	12.8	11.7	13	14.3	12.5	14	15.5
Swing Stroke		4	5	6	4.7	5.7	6.8	5.7	7	8.3	6.5	8	9.5
Vertical Stroke		5			6			6			6		
(Breakdown)	Idle Stroke	2			2.5			2.5			2		
	Lock Stroke ※7	3			3.5			3.5			4		
Recommended Stroke		7	8	9	8.2	9.2	10.3	9.2	10.5	11.8	9.5	11	12.5
A		120.5	121.5	122.5	134.2	135.2	136.3	148.7	150	151.3	164.5	166	167.5
B		49			54			61			69		
C		40			45			51			60		
D		36			40			48			55		
E		85.5			94.5			103			114		
F		60.5			69.5			75			84		
Fu		60	61	62	64.7	65.7	66.8	73.7	75	76.3	80.5	82	83.5
G		25			25			28			30		
H		29			31.5			35.5			39		
J		20			22.5			25.5			30		
K		31.4			34			40			47		
L		66			73			83			88		
M		11			11			13			12		
Nx		23.5			26			30			33.5		
Ny		8			9			11			12		
P		max. 3			max. 3			max. 3			max. 3		
Q		7.5			9			9			11		
R		4.5			5.5			5.5			6.8		
S		16			15			17.5			17		
T		11	12	13	12.7	13.7	14.8	13.7	15	16.3	14.5	16	17.5
U		15			18			22			25		
V		13			15			18			21		
W		11			12			14			15		
X (Nominal×Pitch)		M14×1.5			M16×1.5			M20×1.5			M22×1.5		
Y		5			6			8			8		
Z (Chamfer)		C2			C3			C3			C3		
AA		22			24			30			32		
AB		7			8			9			10		
AC		24.5			26.5			33			35.5		
BA		14			16			19			22		
BB		17			20			25			28		
CA		6			7			9			10		
CB		6.5			6.5			7.5			9.5		
CC		4			4			5			6		
EA (Nominal×Pitch)		M4×0.7			M5×0.8			M5×0.8			M6×1		
JA		3.5			3.5			3.5			3.5		
JB		14			14			14			14		
Cylinder Capacity cm³	Lock	5.0	5.4	5.8	8.9	9.4	10.0	12.5	13.4	14.3	21.1	22.6	24.1
	Release	6.6	7.2	7.7	11.6	12.4	13.2	17.0	18.4	19.8	27.2	29.5	31.8
Weight ※8 kg		0.8			1.1			1.6			2.3		

Notes：

※7. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range. (The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)

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

Action Description (Air Sensing Chart Explanation)

Action confirmation can be conducted by detecting differential pressure with the air catch sensor.
Release confirmation is the action confirmation of piston rod.
Lock confirmation is not the stroke confirmation of piston rod, but the action confirmation of internal mechanical lock.

Applicable Model

LHE 040 0 - C S R L **M N**

5 Action Confirmation Method : When selecting M/N

About Air Catch Sensor

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

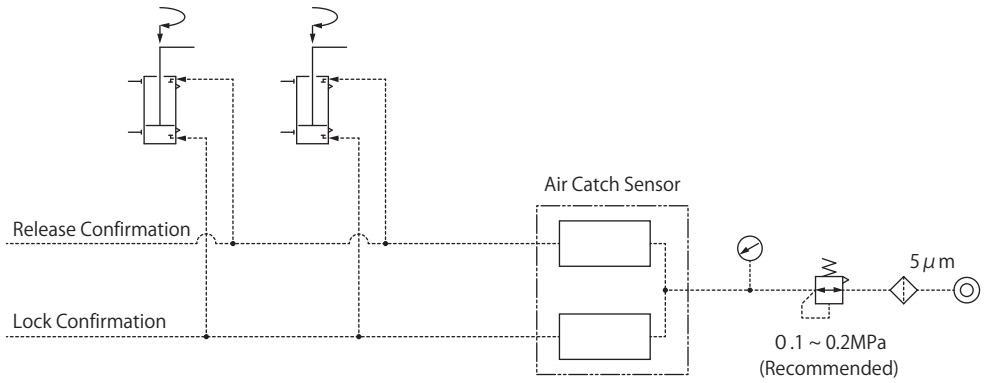
  Sensing can be done by the air catch sensor with small air flow (recommended models are in the chart below).

  Recommended Operating Air Pressure：0.1 ~ 0.2MPa

Recommended Air Catch Sensor

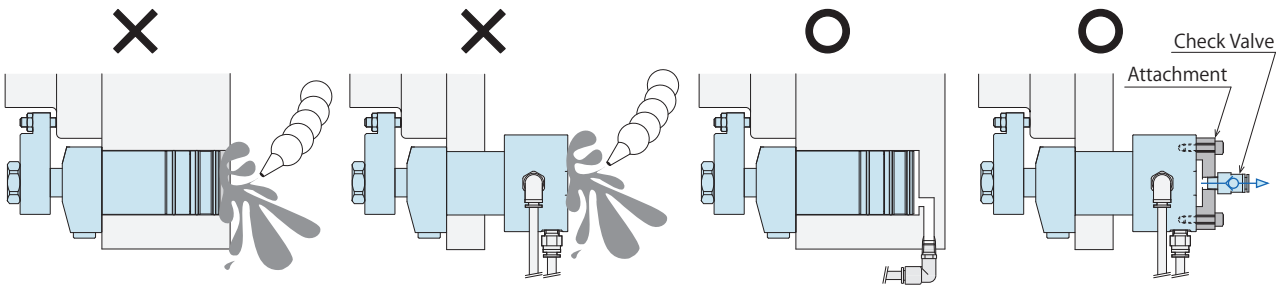
Maker	SMC	CKD
Name	Air Catch Sensor	Gap Switch
Model No.	ISA3-G	GPS3-E

- Please refer to manufacturer's catalog or other documents for the details about the air catch sensor.
- The air pressure to the air catch sensor should be 0.1 ~ 0.2MPa.
- Please keep supplying air pressure when in use.
- Refer to the drawing below for the air circuit structure.



Notes for Design・Use・Installation

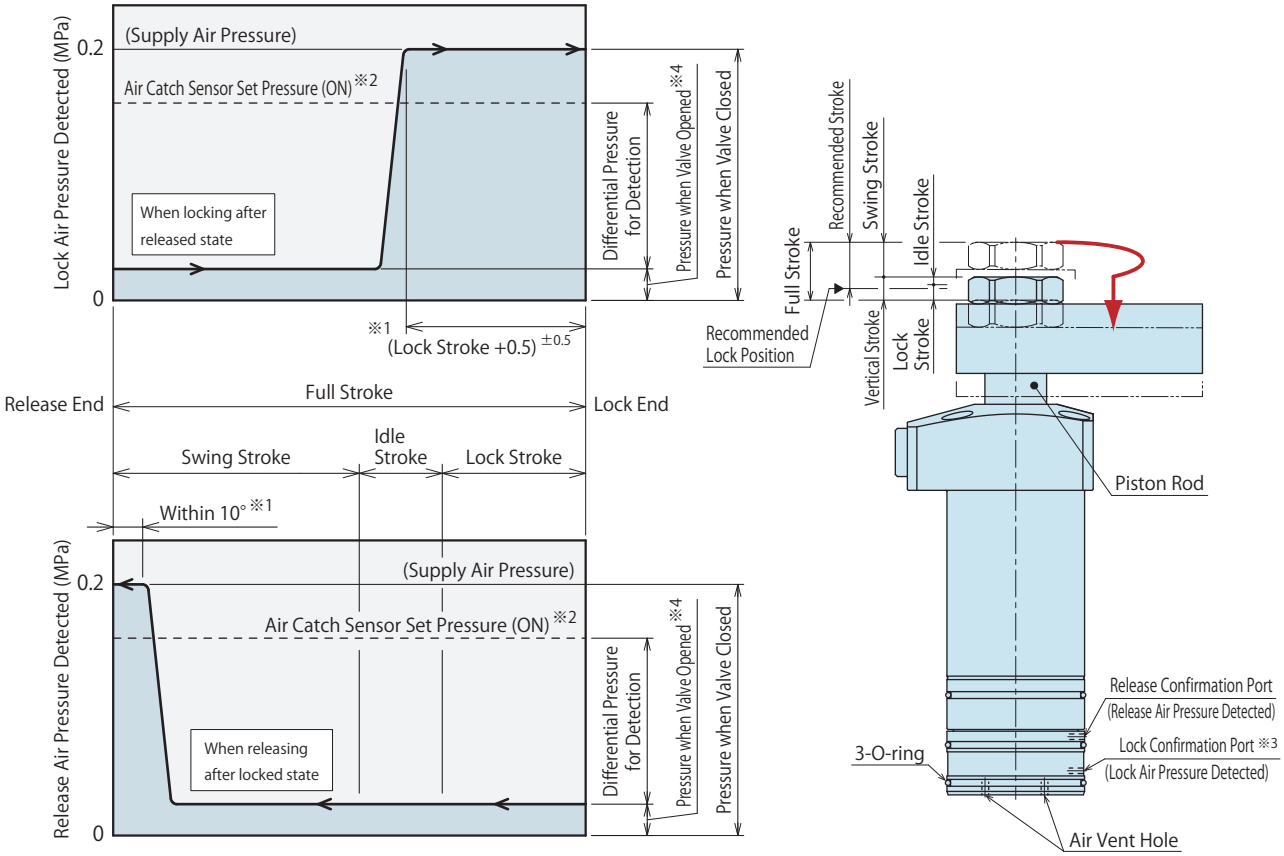
- Please keep clear condition at the air vent hole, and prevent coolant and chips from entering the hole.
  The air catch sensor can malfunction if the air vent hole is blocked.
- Prevention of Contaminants to the Air Vent Hole
  Coolant and chips can be prevented by setting a check valve with low cracking pressure.
  (Recommended check valve : SMC-made series AKH, cracking pressure: 0.005MPa)



- Keep supplying air pressure to the air port when in use.
- Apply adequate amounts of grease on O-ring of the clamp before installation.
  The O-ring can be twisted or damaged when in a dry state.
  If too much grease is applied, the air catch sensor can malfunction due to overflow grease blocking the detection port.

Air Sensing Chart

Number Directly Connected to Clamp : 1



Notes :

1. The sensing chart shows the relationship between the stroke and detection circuit air pressure.
2. The specifications may vary depending on the air circuit. The length of hose should be as short as possible. (Suggest shorter than 5m)

※1. There is a certain tolerance with regard to the position where the pressure for closing the valve is reached depending on the clamp structure. (Refer to the sensing chart.)
※2. The location of a signal from air sensor output varies depending on the sensor setting.
※3. Lock confirmation is an action confirmation of the mechanical lock. The air catch sensor pressure increase may be behind piston rod action.
※4. 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.

(mm)

Model No.		LHE0400-□□M/N	LHE0480-□□M/N	LHE0550-□□M/N
Full Stroke		15	17	18.5
Swing Stroke (90°)		9	11	12.5
Vertical Stroke		6	6	6
(Breakdown)	Idle Stroke	2.5	2.5	2
	Lock Stroke	3.5	3.5	4
Recommended Stroke		12.5	14.5	15.5

Taper Lock Lever Design Dimensions

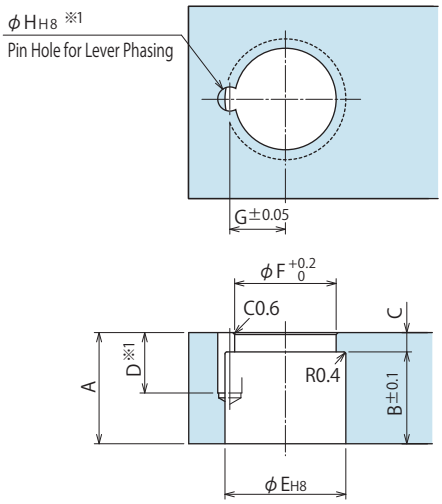
※ Reference for designing a taper lock swing lever.

Corresponding Model No.

LHE □ 0 - [C S] [R L] - [Blank M N] - [Blank Y□]

1 Body Size

6 Option When selecting Blank/Y□



(mm)

Corresponding Model No. ※3	LHE0300-□□□ LHE0300-□□□-Y□	LHE0360-□□□ LHE0360-□□□-Y□	LHE0400-□□□ LHE0400-□□□-Y□	LHE0480-□□□ LHE0480-□□□-Y□	LHE0550-□□□ LHE0550-□□□-Y□
A	14	17	19	23	26
B	11	14	16	19	22
C	3	3	3	4	4
D	8.5	10.5	10.5	12.5	14.5
E	14 +0.027 0	17 +0.027 0	20 +0.033 0	25 +0.033 0	28 +0.033 0
F	11	15	17	21	23.5
G	6	8.1	9.1	11.6	13.1
H	3 +0.014 0	4 +0.018 0	4 +0.018 0	5 +0.018 0	6 +0.018 0
Phasing Pin ※2 (Reference)	ϕ3(h8)×8	ϕ4(h8)×10	ϕ4(h8)×10	ϕ5(h8)×12	ϕ6(h8)×14

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.
※3. Refer to Design Dimensions of Quick Change Lever Option A for -A (Quick Change Lever Option A).
Refer to Design Dimensions of Quick Change Lever Option F for -F (Quick Change Lever Option F).
For -P (Balance Lever Option), it should be designed by customer.

Quick Change Lever Option A Design Dimensions

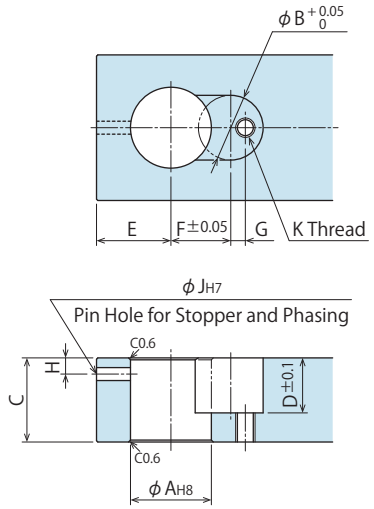
※ Reference for designing Quick Change Swing Lever Option A.

Corresponding Model No.

LHE □ 0 - [C S] [R L] - [Blank M N] - [A]

1 Body Size

6 Option When selecting A



(mm)

Corresponding Model No.	LHE0300-□□□-A	LHE0360-□□□-A	LHE0400-□□□-A	LHE0480-□□□-A	LHE0550-□□□-A
A	12 +0.027 0	15 +0.027 0	18 +0.027 0	22 +0.033 0	25 +0.033 0
B	10.5	12	15	18	20
C	14	17	19	23	26
D	9.5	11	13	15.5	17
E	10.5	13	16	20	23
F	10.75	12.5	15	16.5	18.5
G	1.25	2	2.5	4	4.5
H	2.5	3	4	4	4
J	2.5 +0.010 0	3 +0.010 0	4 +0.012 0	4 +0.012 0	4 +0.012 0
K	M4×0.7	M4×0.7	M5×0.8	M5×0.8	M6×1
Pin for Stopper and Phasing	ϕ2.5 (m6) ×6	ϕ3 (m6) ×8	ϕ4 (m6) ×10	ϕ4 (m6) ×12	ϕ4 (m6) ×14

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.
3. The pin hole for stopper and phasing (ϕJ) should be appropriately machined according to the slot for lever phasing on the clamp body. Pin for stopper and phasing (prepared by customer) is used as phasing when mounting the lever and as stopper when removing the lever. If you are not using a pin for stopper and phasing, a stopper is required to remove the lever.
4. Tightening Kit (LZH□-W) for Quick Change Lever Option A is sold separately.

Quick Change Lever Option F Design Dimensions

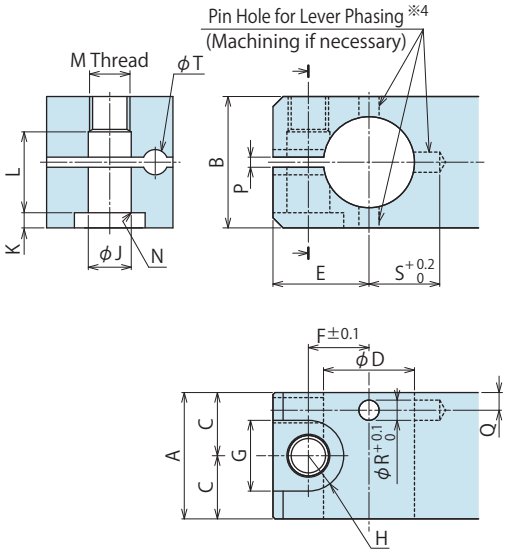
※ Reference for designing Quick Change Swing Lever Option F.

Corresponding Model No.

LHE □ 0 - C S / R L / Blank M N - F

1 Body Size

6 Option When selecting F



(mm)

Corresponding Model No.	LHE0300-□□□-F	LHE0360-□□□-F	LHE0400-□□□-F	LHE0480-□□□-F	LHE0550-□□□-F
A	16	22	25	30	34
B	19	22	26	32	36
C	8	11	12.5	15	17
D	12 $^{0}_{-0.016}$	15 $^{0}_{-0.016}$	18 $^{0}_{-0.016}$	22 $^{0}_{-0.020}$	25 $^{0}_{-0.020}$
E	13	15	19	23	26.5
F	7.75	9.75	12	14.75	17
G	10	11	14	17.5	20
H	R5	R5.5	R7	R8.75	R10
J	5.5	6.5	8.5	10.5	12.5
K	1.5	2	3	4	4
L	11.5	13.5	16	18	22
M	M5×0.8	M6×1	M8×1	M10×1.25	M12×1.5
N	C0.4	C0.4	C0.6	C0.6	C1
P	2	2	2	2	2
Q	2.25	2.5	3.5	3.5	4
R	2.5	3	4	4	4
S	10.5	13.5	14	18	19.5
T	2.9	3.4	4.5	4.5	4.5
Phasing Pin ※5 (Reference)	φ2.5×6	φ3×8	φ4×8	φ4×10	φ4×10

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.
3. Tightening Bolt (LZH□-B) for Quick Change Lever Option F is sold separately.

※4. The pin hole (φR) for determining the lever phase should be added, if necessary.

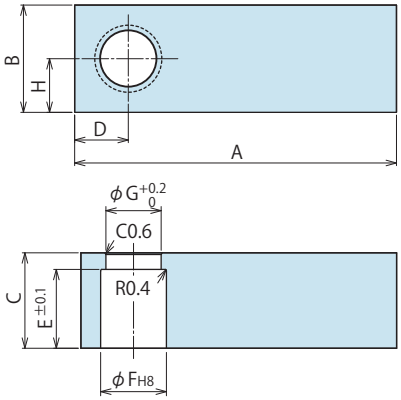
※5. Phasing pin is not included. Prepare it separately.

Accessories：Material Swing Lever for Taper Lock Option

Model No. Indication

LZH 040 0 – T

040: Size (Refer to the table.)
0 – T: Design No. (Revision Number)



(mm)

Model No.	LZH0300-T	LZH0360-T	LZH0400-T	LZH0480-T	LZH0550-T
Corresponding Model No. ※6	LHE0300-□□□ LHE0300-□□□-Y□	LHE0360-□□□ LHE0360-□□□-Y□	LHE0400-□□□ LHE0400-□□□-Y□	LHE0480-□□□ LHE0480-□□□-Y□	LHE0550-□□□ LHE0550-□□□-Y□
A	90	120	145	160	170
B	21	26	32	40	45
C	14	17	19	23	26
D	10.5	13	16	20	23
E	11	14	16	19	22
F	$14^{+0.027}_{0}$	$17^{+0.027}_{0}$	$20^{+0.033}_{0}$	$25^{+0.033}_{0}$	$28^{+0.033}_{0}$
G	11	15	17	21	23.5
H	10.5	13	16	20	22.5

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.

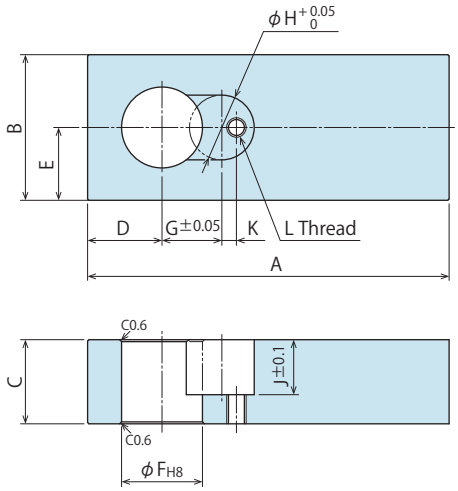
※6. Refer to Accessory of Quick Change Lever Option A for -A (Quick Change Lever Option A). Refer to Accessory of Quick Change Lever Option F for -F (Quick Change Lever Option F). For -P (Balance Lever Option), it should be designed by customer.

Accessories：Material Swing Lever for Quick Change Lever Option A

Model No. Indication

LZH 040 0 – A

040: Size (Refer to the table.)
0 – A: Design No. (Revision Number)



(mm)

Model No.	LZH0300-A	LZH0360-A	LZH0400-A	LZH0480-A	LZH0550-A
Corresponding Model No.	LHE0300-□□□-A	LHE0360-□□□-A	LHE0400-□□□-A	LHE0480-□□□-A	LHE0550-□□□-A
A	90	120	145	160	170
B	21	26	32	40	45
C	14	17	19	23	26
D	10.5	13	16	20	23
E	10.5	13	16	20	22.5
F	$12^{+0.027}_{0}$	$15^{+0.027}_{0}$	$18^{+0.027}_{0}$	$22^{+0.033}_{0}$	$25^{+0.033}_{0}$
G	10.75	12.5	15	16.5	18.5
H	10.5	12	15	18	20
J	9.5	11	13	15.5	17
K	1.25	2	2.5	4	4.5
L	M4×0.7	M4×0.7	M5×0.8	M5×0.8	M6×1

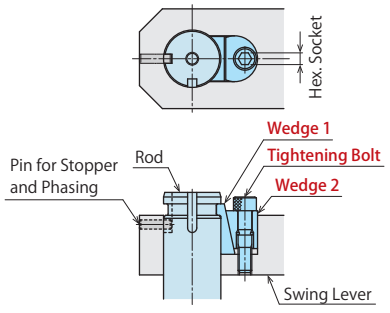
Notes：
1. Material : S50CH　Surface Finishing：Alkaline Blackening
2. If necessary, the front end should be additionally machined and finished.
3. The pin hole for stopper and lever phasing should be additionally machined by referring to Quick Change Lever Option A Design Dimensions.
4. Tightening Kit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

Accessories：Tightening Kit for Quick Change Lever Option A

Model No. Indication

LZH 040 1 – W

040: Size (Refer to the table.)
1 – W: Design No. (Revision Number)



Tightening Kit for mounting Quick Change Lever Option A.
Sold separately from clamp body.

【Contents of Tightening Kit】
・Wedge 1　・Wedge 2　・Tightening Bolt

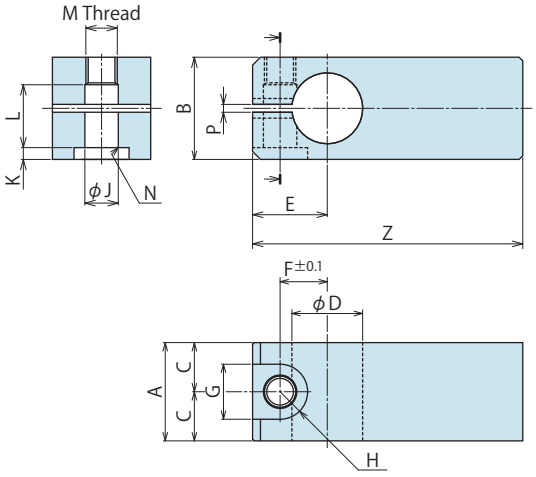
Model No.	LZH0301-W	LZH0361-W	LZH0401-W	LZH0481-W	LZH0551-W
Corresponding Model No.	LHE0300 -□□□-A	LHE0360 -□□□-A	LHE0400 -□□□-A	LHE0480 -□□□-A	LHE0550 -□□□-A
Nominal×Pitch of Tightening Bolt	M4×0.7	M4×0.7	M5×0.8	M5×0.8	M6×1
Hex. Socket mm	2.5	2.5	3	3	4
Tightening Torque N·m	2.5	2.5	5.0	5.0	8.0

Accessories：Material Swing Lever for Quick Change Lever Option F

Model No. Indication

LZH 040 0 – F

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



(mm)

Model No.	LZH0300-F	LZH0360-F	LZH0400-F	LZH0480-F	LZH0550-F
Corresponding Model No.	LHE0300-□□□-F	LHE0360-□□□-F	LHE0400-□□□-F	LHE0480-□□□-F	LHE0550-□□□-F
A	16	22	25	30	34
B	19	22	26	32	36
C	8	11	12.5	15	17
D	$12^{\ 0}_{-0.016}$	$15^{\ 0}_{-0.016}$	$18^{\ 0}_{-0.016}$	$22^{\ 0}_{-0.020}$	$25^{\ 0}_{-0.020}$
E	13	15	19	23	26.5
F	7.75	9.75	12	14.75	17
G	10	11	14	17.5	20
H	R5	R5.5	R7	R8.75	R10
J	5.5	6.5	8.5	10.5	12.5
K	1.5	2	3	4	4
L	11.5	13.5	16	18	22
M	M5×0.8	M6×1	M8×1	M10×1.25	M12×1.5
N	C0.4	C0.4	C0.6	C0.6	C1
P	2	2	2	2	2
Z	100	120	145	160	170

Notes：

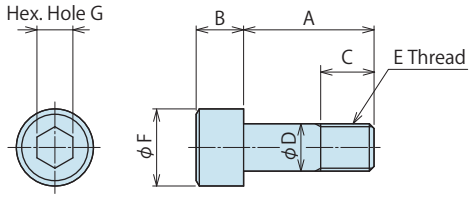
1. Material : S50CH　Surface Finishing：Alkaline Blackening
2. If necessary, the front end should be additionally machined and finished.
3. When determining the phase, refer to Quick Change Lever Option F Design Dimensions for the additional machining.
4. Tightening Bolt (LZH□-B) for Quick Change Lever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

Accessories：Tightening Bolts for Quick Change Lever Option F

Model No. Indication

LZH 040 0 – B

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



(mm)

Model No.	LZH0300-B	LZH0360-B	LZH0400-B	LZH0480-B	LZH0550-B
Corresponding Model No.	LHE0300-□□□-F	LHE0360-□□□-F	LHE0400-□□□-F	LHE0480-□□□-F	LHE0550-□□□-F
A	17.5	20	23	28	32
B	5	6	8	10	12
C	6.5	7	10	11	13
D	5	6	8	10	12
E	M5×0.8	M6×1	M8×1	M10×1.25	M12×1.5
F	8.5	10	13	16	18
G	4	5	6	8	10

Cautions

Notes for Design

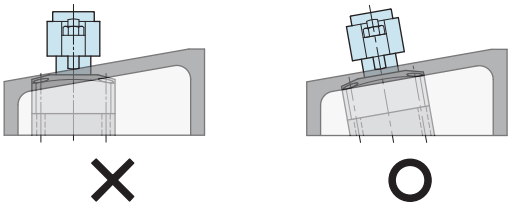
1) Check Specifications
- Please use each product according to the specifications.

2) Notes for Circuit Design
- Please read "Notes on Hydraulic Cylinder Speed Control Unit" for proper hydraulic circuit design. Improper circuit design may lead to malfunctions and damages. (Refer to P.1356)
- Ensure there is no possibility of supplying hydraulic pressure to the lock port and the release port simultaneously.

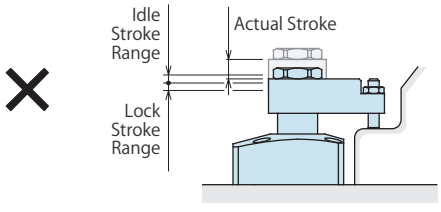
3) Swing lever should be designed to make the moment of inertia small.
- Large moment of inertia will degrade the lever's stopping accuracy and cause undue wear to the clamp.
  Additionally, the clamp may not function, depending on supplied hydraulic pressure and lever mounting position.
- Please set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

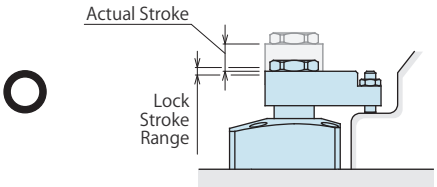
4) Protect the exposed area of the piston rod when using on a welding fixture.
- If spatter attaches to the sliding surface it could lead to malfunction and fluid leakage.

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



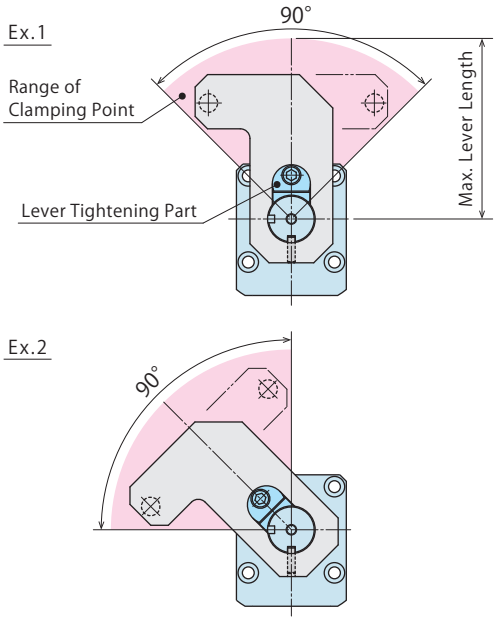
6) The specification value is not fulfilled when clamping out of the lock stroke range.
- The mechanical lock function will not work when clamping within the range of swing stroke and idle stroke, and the specification value of cylinder force, clamping force, holding force and swing completion position repeatability will not be fulfilled.





7) Notes for LHE-M/N (Air Sensing Option)
- Make sure to check the Notes for Design・Installation・Use on P.45.

8) When using an offset lever for (WHE-A) Quick Change Lever Option A.
- Clamping point should be within the range of 90° towards the lever tightening part.



Installation Notes

1) Check the fluid to use.
- Please use the appropriate fluid by referring to the Hydraulic Fluid List (P.1355).

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

Model No.	Thread Size	Tightening Torque (N·m)
LHE0300	M4×0.7	4.0
LHE0360	M4×0.7	4.0
LHE0400	M5×0.8	8.0
LHE0480	M5×0.8	8.0
LHE0550	M6×1	14

3) Installation / Removal of the Swing Lever

- Oil or debris on the tightened part of the lever, taper sleeve or piston rod may cause the rod to loosen. Please clean them thoroughly before installation.
- Tighten it with the torque shown in the table below.

LHE Standard：Taper Lock Lever Option

Model No.	Thread Size	Tightening Torque (N·m)
LHE0300-□□□	M10×1	13
LHE0360-□□□	M14×1.5	25
LHE0400-□□□	M16×1.5	40
LHE0480-□□□	M20×1.5	65
LHE0550-□□□	M22×1.5	100

LHE-F：Quick Change Lever Option F

Model No.	Tightening Bolt Size	Tightening Torque (N·m)
LHE0300-□□□-F	M5×0.8	7.5
LHE0360-□□□-F	M6×1	14
LHE0400-□□□-F	M8×1	33
LHE0480-□□□-F	M10×1.25	65
LHE0550-□□□-F	M12×1.5	114

LHE-A：Quick Change Lever Option A

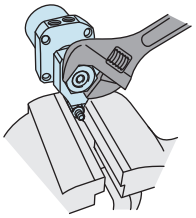
Model No.	Tightening Bolt Size	Tightening Torque (N·m)
LHE0300-□□□-A	M4×0.7	2.5
LHE0360-□□□-A	M4×0.7	2.5
LHE0400-□□□-A	M5×0.8	5.0
LHE0480-□□□-A	M5×0.8	5.0
LHE0550-□□□-A	M6×1	8.0

- In case of LHE 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.

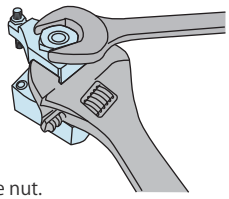
Installation Procedure

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.

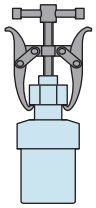
③ If tightening the nut with the clamp positioned to the jig, use a wrench to the hexagon part of piston rod, or fix the lever with a spanner. It is best to bring the lever to the middle of the swing stroke before tightening the nut.



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.

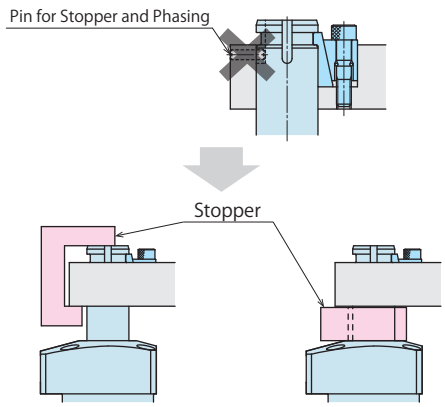
② Loosen the nut after securing the lever two or three turns then remove the lever with a puller without any rotational torque applied on the piston rod.



- In case of LHE-A (Quick Change Lever Option A)

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

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

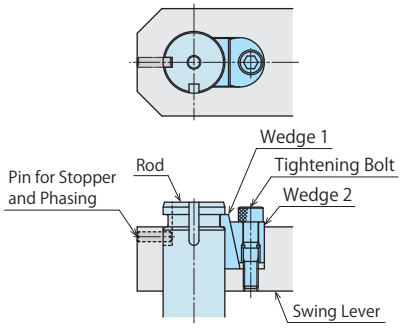


Installation Procedure

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

Removal Procedure

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



4) Swing Speed Adjustment

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

※ Please refer to P.1355 for common cautions. ・Installation Notes ・Hydraulic Fluid List ・Notes on Hydraulic Cylinder Speed Control Circuit ・Notes on Handling ・Maintenance/Inspection ・Warranty

Cautions

Installation Notes (For Hydraulic Series)

1) Check the Usable Fluid

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

2) Procedure before Piping

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

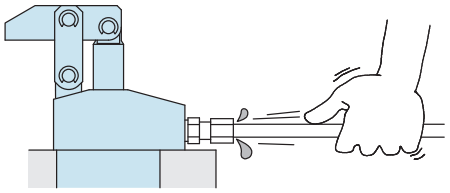
3) Applying Sealing Tape

- Wrap with tape 1 to 2 times following the screw direction.
- Pieces of the sealing tape can lead to oil leakage and malfunction.
- Please implement piping construction in a clear environment to prevent anything getting in products.

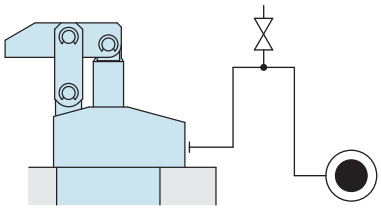
4) Air Bleeding of the Hydraulic Circuit

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

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



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



5) Checking Looseness and Retightening

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

Hydraulic Fluid List

ISO Viscosity Grade ISO-VG-32

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

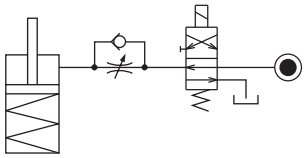
Note : Please contact manufacturers when customers require products in the list above.

Notes on Hydraulic Cylinder Speed Control Unit

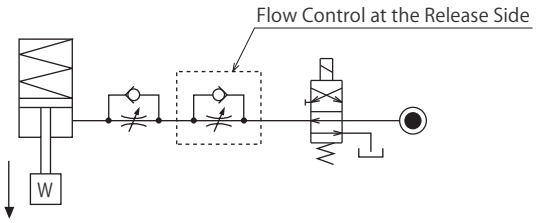
Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

Flow Control Circuit for Single Acting Cylinder

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



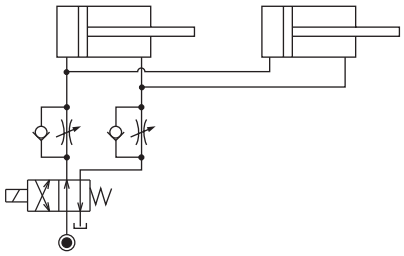
Accelerated clamping speed by excessive hydraulic flow to the cylinder may sustain damage. In this case add flow control to regulate flow. (Please add flow control to release flow if the lever weight is put on at the time of release action when using swing clamps.)



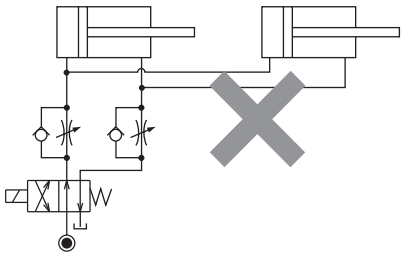
Flow Control Circuit for Double Acting Cylinder

Flow control circuit for double acting cylinder should have meter-out circuits for both the lock and release sides. Meter-in control can have adverse effect by presence of air in the system.
However, in the case of controlling LKE, TMA, TLA, both lock side and release side should be meter-in circuit.
Refer to P.75 for speed adjustment of LKE.
For TMA and TLA, if meter-out circuit is used, abnormal high pressure is created, which causes oil leakage and damage.

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

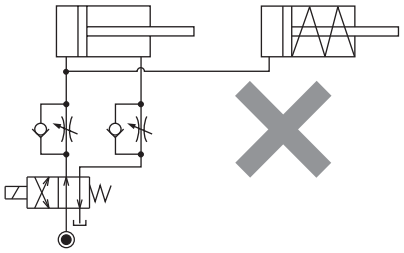


【Meter-in Circuit】(LKE/TMA/TLA must be controlled with meter-in.)



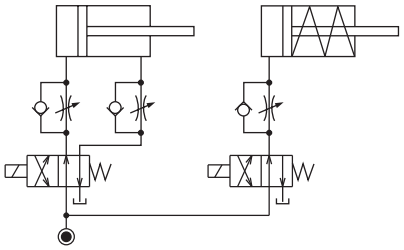
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

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

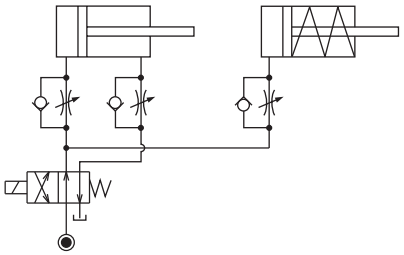


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

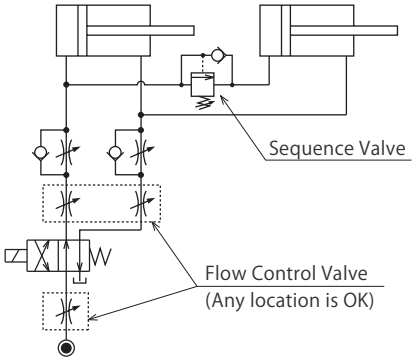
○ Separate the control circuit.



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



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



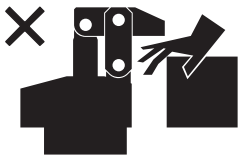
Cautions

Notes on Handling

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

2) Do not operate or remove the product unless the safety protocols are ensured.
① The machine and equipment can only be inspected or prepared when it is confirmed that the safety devices are in place.
② Before the product is removed, make sure that the above-mentioned safety devices are in place. Shut off the pressure and power source, and make sure no pressure exists in the air and hydraulic circuits.
③ After stopping the product, do not remove until the temperature drops.
④ Make sure there is no abnormality in the bolts and respective parts before restarting the machine or equipment.

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

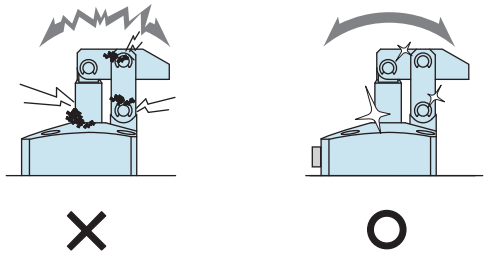


4) Do not disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

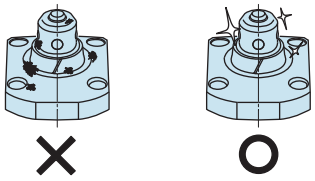
Maintenance and Inspection

1) Removal of the Machine and Shut-off of Pressure Source
- Before the machine is removed, make sure that safety devices and preventive devices are in place. Shut off the pressure and power source, and make sure no pressure exists in the air and hydraulic circuits.
- Make sure there is no abnormality in the bolts and respective parts before restarting.

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



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



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

5) Regularly tighten nut, bolt, pin, cylinder, pipe line and others to ensure proper use.

6) Make sure the hydraulic fluid has not deteriorated.

7) Make sure there is a smooth action without an irregular noise.
- Especially when it is restarted after left unused for a long period, make sure it can be operated correctly.

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

9) Please contact us for overhaul and repair.

Warranty

1) Warranty Period

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

2) Warranty Scope

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

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

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

Control Valve

Model BZL
Model BZT
Model BZX
Model JZG
Model BZS

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

● Directly Attached to Clamps

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

Speed Control Valve

Speed Control Valve

Model BZL
Model BZT

Air Bleed Valve

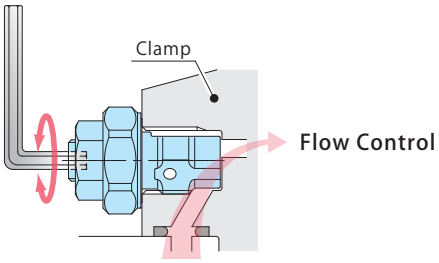
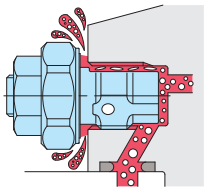
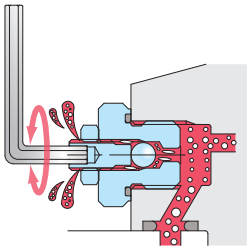
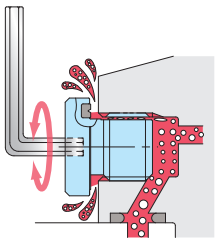
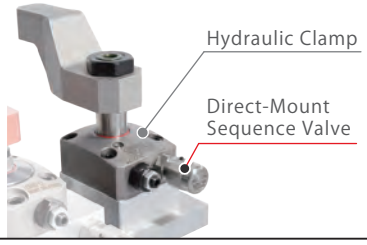
Model BZX

G Thread Plug

Model JZG

Direct-Mount Sequence Valve

Model BZS

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

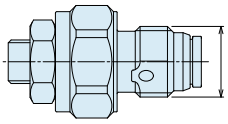
Model No. Indication (Speed Control Valve for Low Pressure)

BZL 0 10 1 - B

1 2 3

1 G Thread Size

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



2 Design No.

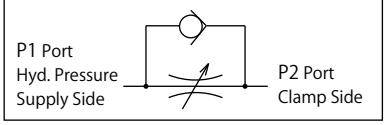
1 : Revision Number

3 Control Method

A : Meter-in
B : Meter-out

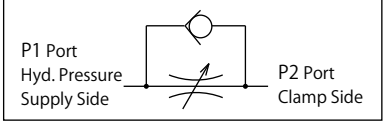
A

Circuit Symbol : Meter-in



B

Circuit Symbol : Meter-out



Specifications

Model No.		BZL0101-A	BZL0201-A	BZL0301-A	BZL0101-B	BZL0201-B	BZL0301-B
Max. Operating Pressure	MPa	7					
Withstanding Pressure	MPa	10.5					
Control Method		Meter-in			Meter-out		
G Thread Size		G1/8A	G1/4A	G3/8A	G1/8A	G1/4A	G3/8A
Cracking Pressure	MPa	0.04			0.12		
Max. Passage Area	mm^2	2.6	5.0	11.6	2.6	5.0	10.2
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32					
Operating Temperature	℃	0 ~ 70					
Tightening Torque for Main Body	N·m	10	25	35	10	25	35
Weight	g	12	26	48	12	26	48

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

Applicable Products

Model No.	DBA (Double Action) Block Cylinder	DBC (Double Action) Block Cylinder	FVA (Double Action) Centering Vise	FVC (Double Action) Centering Vise	FVD (Double Action) Centering Vise	LC (Single Action) Work Support	LCW (Single Action) Work Support
BZL0101-A	(DBA0250-C□) (DBA0320-C□)	(DBC0250-C□) (DBC0320-C□)	(FVA0401) (FVA0631) (FVA1001)	(FVC0630)	(FVD1600) (FVD2500)	LC0263-C□-□ LC0303-C□□-□ LC0363-C□□-□ LC0403-C□□-□ LC0483-C□□-□ LC0553-C□□-□ LC0653-C□□-□	LCW0363-C□ LCW0403-C□ LCW0483-C□ LCW0553-C□ LCW0653-C□
BZL0101-B	DBA0250-C□ DBA0320-C□	DBC0250-C□ DBC0320-C□	FVA0401 FVA0631 FVA1001	FVC0630	FVD1600 FVD2500		
BZL0201-A	(DBA0400-C□) (DBA0500-C□)	(DBC0400-C□) (DBC0500-C□)		(FVC1000) (FVC1600)	(FVD4000)	LC0753-C□□-□ LC0903-C□□-□	
BZL0201-B	DBA0400-C□ DBA0500-C□	DBC0400-C□ DBC0500-C□		FVC1000 FVC1600	FVD4000		

Applicable Products

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

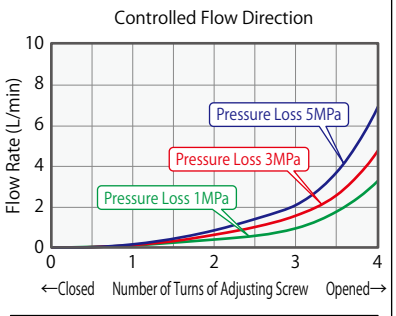
Model No.	LGV (Single Action) Swing Clamp	LKA (Double Action) Link Clamp	LKC (Double Action) Link Clamp	LKE (Double Action) High-Power Link Clamp	LKK (Double Action) Universal Clamp	LKV (Double Action) Link Clamp	LKW (Double Action) Link Clamp	LM (Single Action) Link Clamp	LJ (Single Action) Link Clamp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

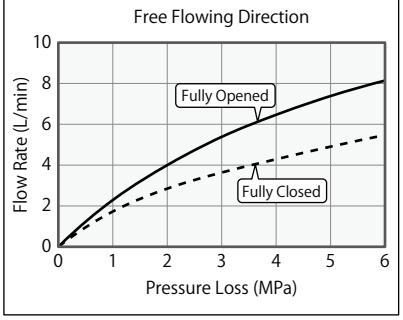
Model No.	LJV (Single Action) Link Clamp	LFW (Double Action) Link Clamp	LFA (Double Action) Link Clamp	LSA (Double Action) Side Clamp	LSE (Double Action) High-Power Side Clamp	LL (Double Action) Linear Cylinder	LLR (Double Action) Linear Cylinder	LLV (Double Action) Lift Cylinder	LLW (Double Action) Lift Cylinder
BZL0101-A	LJV0400-C□□ LJV0480-C□□ LJV0550-C□□	(LFW0480-C□J) (LFW0550-C□J)	(LFA0480-C□□) (LFA0550-C□□)	(LSA0360-C-□)	LSE0360-C-□	(LL0360-C□□-□) (LL0400-C□□-□) (LL0480-C□□-□) (LL0550-C□□-□)	(LLR0360-C□□-□-□) (LLR0400-C□□-□-□) (LLR0480-C□□-□-□) (LLR0550-C□□-□-□)	(LLV0360-C□E-□) (LLV0400-C□E-□) (LLV0480-C□E-□)	(LLW0361-C□□-□) (LLW0401C□□-□) (LLW0481-C□□-□)
BZL0101-B		LFW0480-C□J LFW0550-C□J	LFA0480-C□□ LFA0550-C□□	LSA0360-C-□		LL0360-C□□-□ LL0400-C□□-□ LL0480-C□□-□ LL0550-C□□-□	LLR0360-C□□-□-□ LLR0400-C□□-□-□ LLR0480-C□□-□-□ LLR0550-C□□-□-□	LLV0360-C□E-□ LLV0400-C□E-□ LLV0480-C□E-□	LLW0361-C□□-□ LLW0401-C□□-□ LLW0481-C□□-□
BZL0201-A	LJV0650-C□□ LJV0750-C□□	(LFW0650-C□J) (LFW0750-C□J)	(LFA0650-C□□) (LFA0750-C□□)			(LL0650-C□□-□) (LL0750-C□□-□)	(LLR0650-C□□-□-□) (LLR0750-C□□-□-□)		
BZL0201-B		LFW0650-C□J LFW0750-C□J	LFA0650-C□□ LFA0750-C□□			LL0650-C□□-□ LL0750-C□□-□	LLR0650-C□□-□-□ LLR0750-C□□-□-□		
BZL0301-A						(LL0900-C□□-□) (LL1050-C□□-□)	(LLR0900-C□□-□-□) (LLR1050-C□□-□-□)		
BZL0301-B						LL0900-C□□-□ LL1050-C□□-□	LLR0900-C□□-□-□ LLR1050-C□□-□-□		

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

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

BZL0101-A：Meter-in





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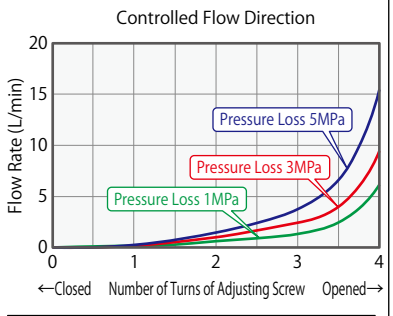

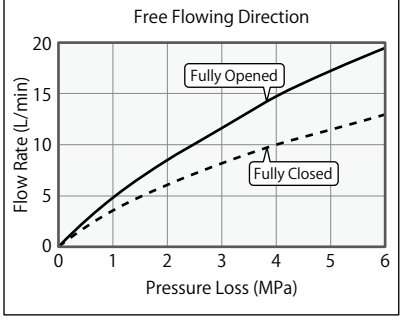

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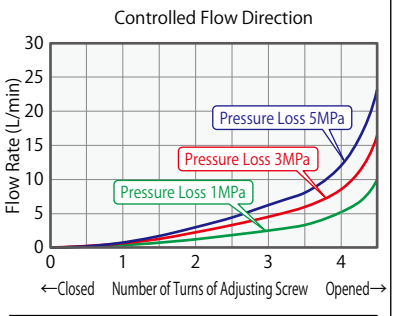
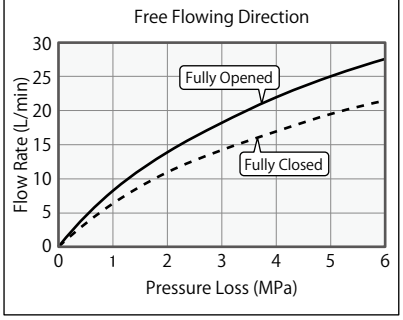
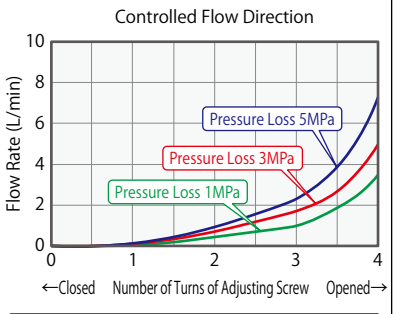
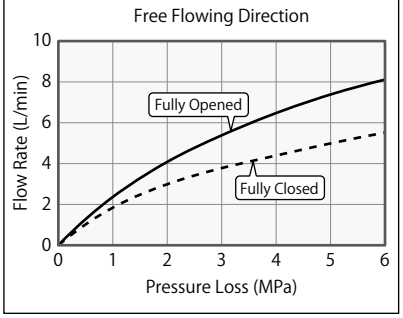




BZL0101-B：Meter-out





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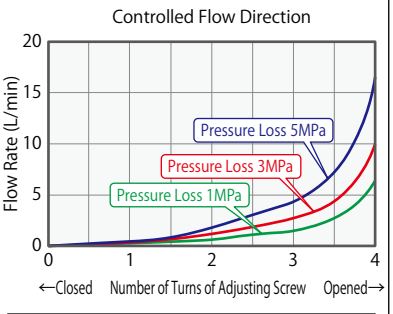
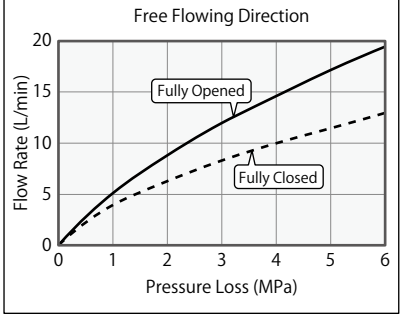
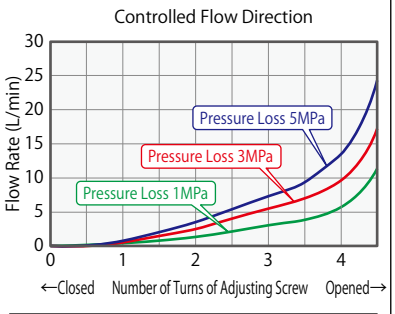
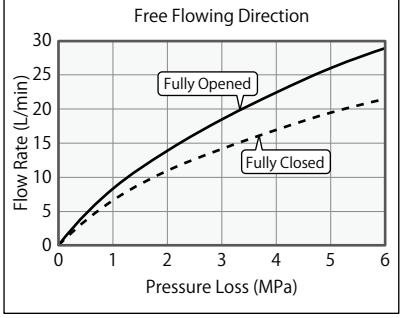


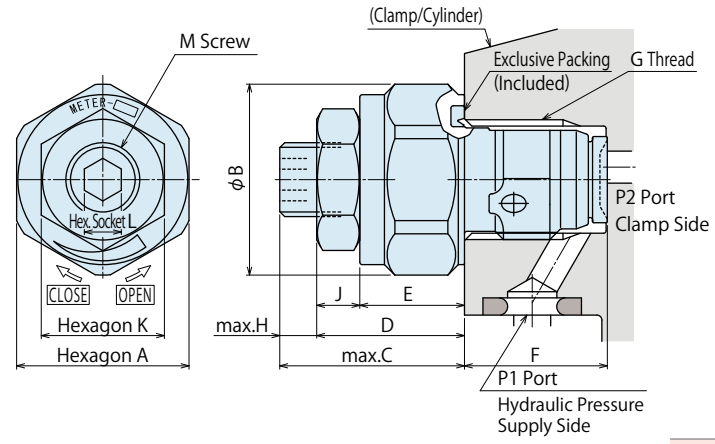


BZL0301-B：Meter-out

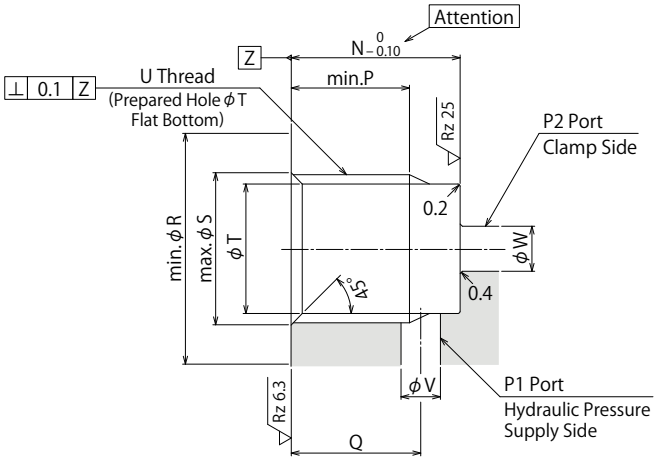




External Dimensions



Machining Dimensions of Mounting Area



(mm)

Model No.	BZL0101-□	BZL0201-□	BZL0301-□
A	14	18	22
B	15.5	20	24
C	15	16	19
D	12	13	16
E	8.5	9.5	11
F	(11.6)	(15.1)	(17.6)
G	G1/8	G1/4	G3/8
H	3	3	3
J	3.5	3.5	5
K	10	10	13
L	3	3	4
M (Nominal×Pitch)	M6×0.75	M6×0.75	M8×0.75
N	11.5	15	17.5
P	8.5	11※1	13
Q	9	11.5	13
R (Flat Surface Area)	16	20.5	24.5
S	10	13.5	17
T	8.7	11.5	15
U	G1/8	G1/4	G3/8
V	2 ~ 3	3 ~ 4	4 ~ 5
W	2.5 ~ 5	3.5 ~ 7	4.5 ~ 9

Notes :

1. Since the ▽Rz 6.3 area is sealing part, be careful not to damage it.
2. Since the ▽Rz 12.5 area is the metal sealing part of BZL, be careful not to damage it. (Especially when deburring)
3. No cutting chips or burr should be at the tolerance part of machining hole.
4. As shown in the drawing, P1 port is used as the hydraulic supply side and P2 port as the clamp side.
5. If mounting plugs or fittings with G thread specification available in the market, the dimension '※1' should be 12.5.

Notes

1. Please read "Notes on Hydraulic Cylinder Speed Control Unit" for proper hydraulic circuit design.
   Improper circuit design may lead to malfunctions and damages. (Refer to P.1356)
2. It is dangerous to release the air under high pressure. It must be done under lower pressure.
   (For reference : the minimum operating range of the product within the circuit.)

Model No. Indication (Air Bleed Valve)

BZX0 1 0

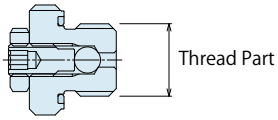
1 2

1 G Thread Size

1 : Thread Part G1/8A Thread

2 : Thread Part G1/4A Thread

3 : Thread Part G3/8A Thread



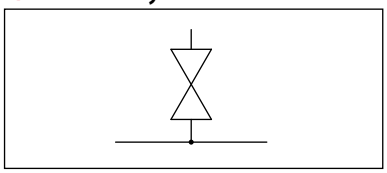
2 Design No.

0 : Revision Number

Specifications

Model No.		BZX010	BZX020	BZX030
Max. Operating Pressure	MPa	35		
Withstanding Pressure	MPa	42		
G Thread Size		G1/8A	G1/4A	G3/8A
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32		
Operating Temperature	℃	0 ~ 70		
Tightening Torque for Main Body	N·m	10	25	35
Weight	g	12	23	36

Circuit Symbol



Notes : 1. Do not over-loosen the plug during air venting.
(Do not loosen further than 2 turns from the fully closed position.)
2. Air bleeding under high pressure is dangerous. It must be done under lower pressure.
(For reference : the minimum operation pressure range of the product within the circuit)
3. Refer to the machining dimensions of BZL mounting area when installing BZX into a hydraulic circuit.

Applicable Products

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

Applicable Products

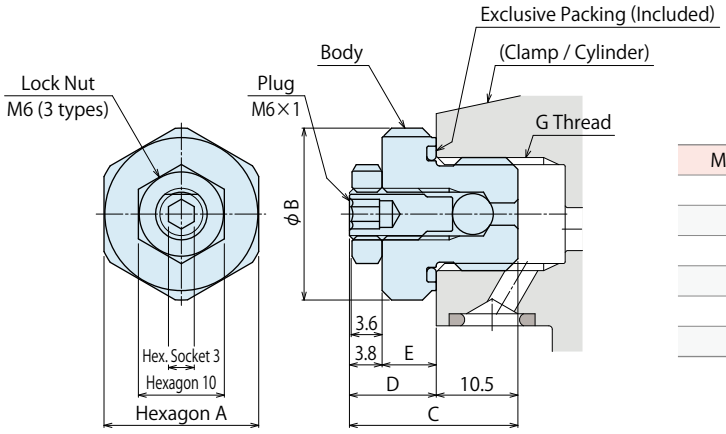
Model No.	LHA (Double Action) Swing Clamp	LHC (Double Action) Swing Clamp	LHD (Double Action) Swing Clamp	LHE (Double Action) High-Power Swing Clamp	LHS (Double Action) Swing Clamp	LHV (Double Action) Swing Clamp	LHW (Double Action) Swing Clamp	LT (Single Action) Swing Clamp	LG (Single Action) Swing Clamp
BZX010	LHA0360-C□□-□ LHA0400-C□□-□ LHA0480-C□□-□ LHA0550-C□□-□	LHC0360-C□□-□ LHC0400-C□□-□ LHC0480-C□□-□ LHC0550-C□□-□	LHD0400-C□-□ LHD0480-C□-□ LHD0550-C□-□	LHE0300-C□ LHE0360-C□ LHE0400-C□ LHE0480-C□ LHE0550-C□	LHS0360-C□□-□ LHS0400-C□□-□ LHS0480-C□□-□ LHS0550-C□□-□	LHV0400-C□E-□ LHV0480-C□E-□ LHV0550-C□E-□	LHW0401-C□□-□ LHW0481-C□□-□ LHW0551-C□□-□	LT0301-C□-□ LT0361-C□-□ LT0401-C□-□ LT0481-C□-□ LT0551-C□-□	LG0301-C□-□ LG0361-C□-□ LG0401-C□-□ LG0481-C□-□ LG0551-C□-□
BZX020	LHA0650-C□□-□ LHA0750-C□□-□	LHC0650-C□□-□			LHS0650-C□□-□ LHS0750-C□□-□	LHV0650-C□E-□ LHV0750-C□E-□	LHW0651-C□□-□ LHW0751-C□□-□	LT0651-C□-□ LT0751-C□-□	LG0651-C□-□ LG0751-C□-□
BZX030	LHA0900-C□□-□ LHA1050-C□□-□				LHS0900-C□□-□ LHS1050-C□□-□				LG0901-C□-□ LG1051-C□-□

Model No.	LGV (Single Action) Swing Clamp
BZX010	LGV0400-C□□ LGV0480-C□□ LGV0550-C□□
BZX020	LGV0650-C□□ LGV0750-C□□
BZX030	

Model No.	LKA (Double Action) Link Clamp	LKC (Double Action) Link Clamp	LKE (Double Action) High-Power Link Clamp	LKK (Double Action) Universal Clamp	LKV (Double Action) Link Clamp	LKW (Double Action) Link Clamp	LM (Single Action) Link Clamp	LJ (Single Action) Link Clamp	LJV (Single Action) Link Clamp
BZX010	LKA0360-C□□-□ LKA0400-C□□-□ LKA0480-C□□-□ LKA0550-C□□-□	LKC0400-C□-□ LKC0480-C□-□ LKC0550-C□-□	LKE0300-C□ LKE0360-C□ LKE0400-C□ LKE0480-C□ LKE0550-C□	LKK0360-C-□ LKK0400-C-□ LKK0480-C-□ LKK0550-C-□	LKV0400-C□E-□ LKV0480-C□E-□ LKV0550-C□E-□	LKW0401-C□□-□ LKW0481-C□□-□ LKW0551-C□□-□	LM0300-C□ LM0360-C□ LM0400-C□ LM0480-C□ LM0550-C□	LJ0302-C□ LJ0362-C□ LJ0402-C□ LJ0482-C□ LJ0552-C□	LJV0400-C□□ LJV0480-C□□ LJV0550-C□□
BZX020	LKA0650-C□□-□ LKA0750-C□□-□	LKC0650-C□-□		LKK0650-C-□	LKV0650-C□E-□ LKV0750-C□E-□	LKW0651-C□□-□ LKW0751-C□□-□	LM0650-C□ LM0750-C□	LJ0652-C□ LJ0752-C□	LJV0650-C□□ LJV0750-C□□
BZX030	LKA0900-C□□-□ LKA1050-C□□-□							LJ0902-C□ LJ1052-C□	

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

External Dimensions



(mm)

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

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

JZG0 1 0

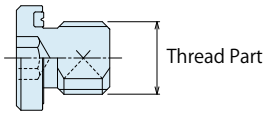
1 2

1 G Thread Size

1 : Thread Part G1/8A Thread

2 : Thread Part G1/4A Thread

3 : Thread Part G3/8A Thread



2 Design No.

0 : Revision Number

Specifications

Model No.		JZG010	JZG020	JZG030
Max. Operating Pressure	MPa	35		
Withstanding Pressure	MPa	42		
G Thread Size		G1/8A	G1/4A	G3/8A
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32		
Operating Temperature	℃	0 ~ 70		
Tightening Torque for Main Body N·m	Female Thread Side Material : Steel	10	25	35
	Female Thread Side Material : Aluminum (For LT/LM※1)	8	20	28
Weight	g	7	15	23

Notes : 1. Air bleeding under high pressure is dangerous. It must be done under lower pressure.
(For reference : the minimum operation pressure range of the product within the circuit)
2. Refer to the machining dimensions of BZL mounting area when installing JZG into a hydraulic circuit.
※1. Body material of LT/LM is aluminum alloy, so install it with the tightening torque for aluminum.

Applicable Products

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

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

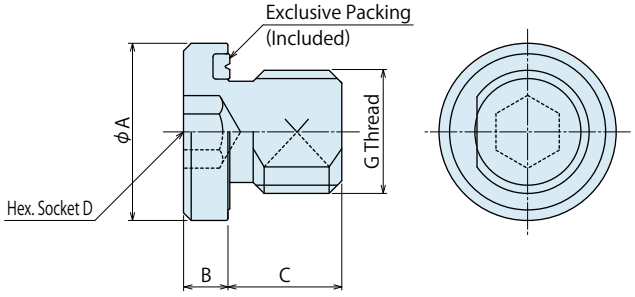
Applicable Products

Model No.	LKA (Double Action) Link Clamp	LKC (Double Action) Link Clamp	LKE (Double Action) High-Power Link Clamp	LKK (Double Action) Universal Clamp	LKV (Double Action) Link Clamp	LKW (Double Action) Link Clamp	LM (Single Action) Link Clamp	LJ (Single Action) Link Clamp	LJV (Single Action) Link Clamp
JZG010	LKA0360-C□□-□ LKA0400-C□□-□ LKA0480-C□□-□ LKA0550-C□□-□	LKC0400-C□-□ LKC0480-C□-□ LKC0550-C□-□	LKE0300-C□ LKE0360-C□ LKE0400-C□ LKE0480-C□ LKE0550-C□	LKK0360-C-□ LKK0400-C-□ LKK0480-C-□ LKK0550-C-□	LKV0400-C□E-□ LKV0480-C□E-□ LKV0550-C□E-□	LKW0401-C□□-□ LKW0481-C□□-□ LKW0551-C□□-□	LM0300-C□ LM0360-C□ LM0400-C□ LM0480-C□ LM0550-C□	LJ0302-C□ LJ0362-C□ LJ0402-C□ LJ0482-C□ LJ0552-C□	LJV0400-C□□ LJV0480-C□□ LJV0550-C□□
JZG020	LKA0650-C□□-□ LKA0750-C□□-□	LKC0650-C□-□		LKK0650-C-□	LKV0650-C□E-□ LKV0750-C□E-□	LKW0651-C□□-□ LKW0751-C□□-□	LM0650-C□ LM0750-C□	LJ0652-C□ LJ0752-C□	LJV0650-C□□ LJV0750-C□□
JZG030	LKA0900-C□□-□ LKA1050-C□□-□							LJ0902-C□ LJ1052-C□	

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

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

External Dimensions



(mm)

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

PAT.P.

Direct-Mount Sequence Valve

Model BZS

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

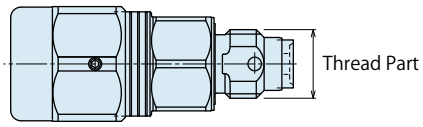
Model No. Indication

BZS 0 10 0

1 2

1 G Thread Size

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



2 Design No.

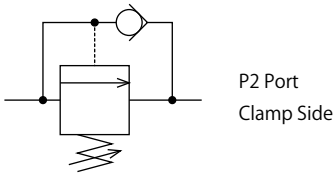
0 : Revision Number

Specifications

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

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

Circuit Symbol



※ No built-in filter provided.

What is a Sequence Valve?

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

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

Applicable Products

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

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

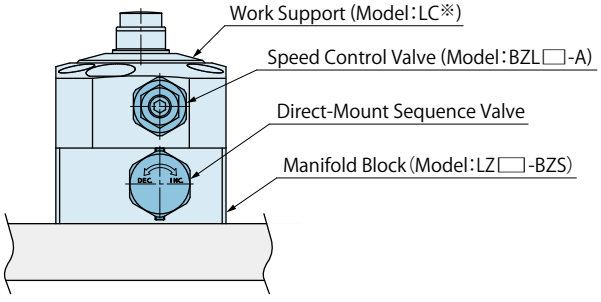
Model No.	LKK (Double Action) Universal Clamp	LKV (Double Action) Link Clamp	LKW (Double Action) Link Clamp	LM (Single Action) Link Clamp	LJ (Single Action) Link Clamp	LJV (Single Action) Link Clamp
BZS0100	LKK0360-C-□ LKK0400-C-□ LKK0480-C-□ LKK0550-C-□	LKV0400-C□E-□ LKV0480-C□E-□ LKV0550-C□E-□	LKW0401-C□□-□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

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

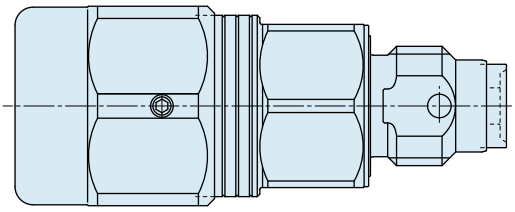
Note : ※1. It is not possible to install two BZS valves to FVC1000.

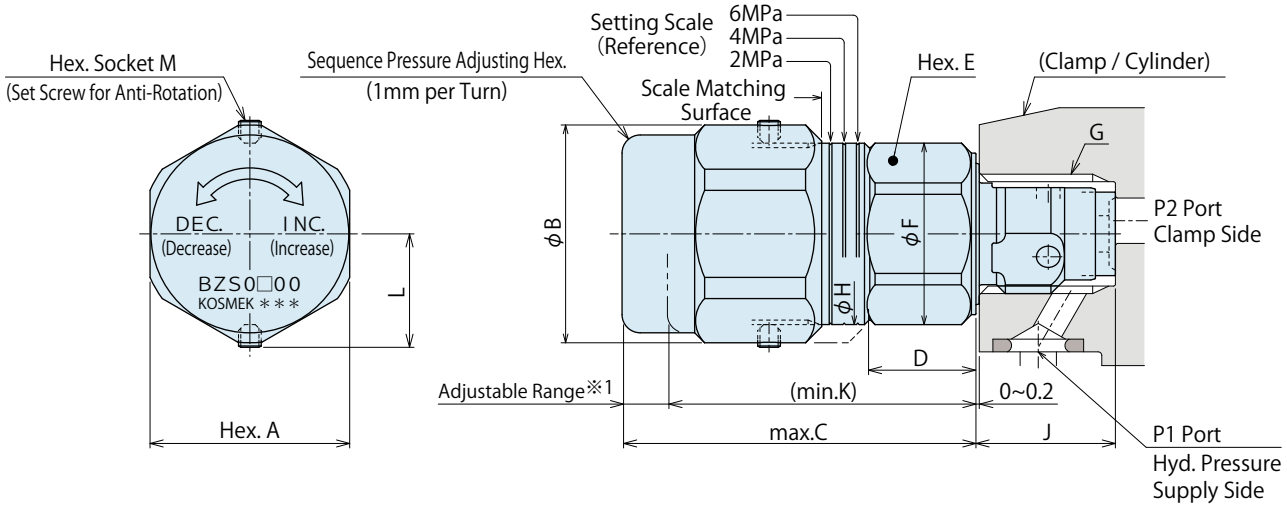
【In case of Work Support】

For using Direct-Mount Sequence Valve for Work Support (Model:LC※), mount Speed Control Valve (Model:BZL□-A) on Work Support and mount Direct-Mount Sequence Valve on the Manifold Block as shown in the drawing below.
Please refer to P.962A for Manifold Block (Model:LZ□-BZS).
※Please contact us when considering the installation to model LCW.



External Dimensions

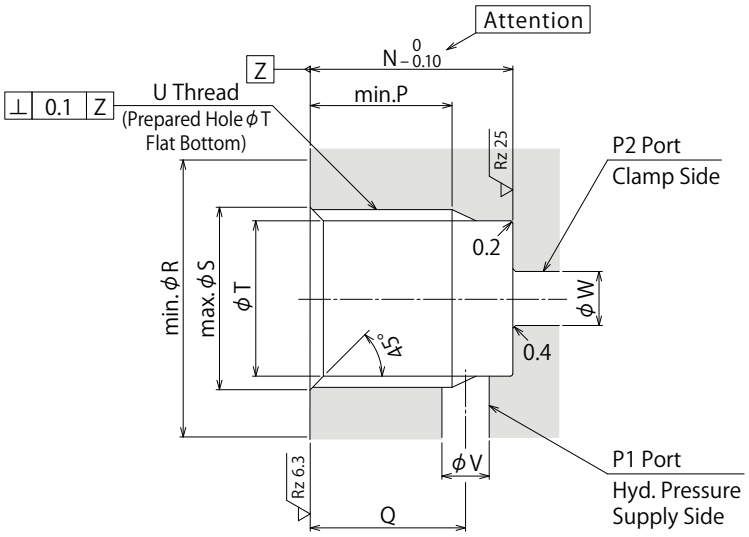




(mm)

Model No.	BZS0100	BZS0200	BZS0300
A	16	22	27
B	17.5	24	29.5
C	30.5	39	49.5
D	7.5	12	15
E	14	18	22
F	15.5	20	24
G	G1/8	G1/4	G3/8
H	13.8	20	24
J ※2	(11.6)	(15.1)	(17.6)
K	(26.5)	(34)	(44)
L	9.5	12.5	15
M	1.3	1.3	1.5
N	11.5	15	17.5
P	8.5	11※3	13
Q	9	11.5	13
R (Flat Surface Area)	16	20.5	24.5
S	10	13.5	17
T	8.7	11.5	15
U	G1/8	G1/4	G3/8
V	2 ~ 3	3 ~ 4	4 ~ 5
W	2.5 ~ 5	3.5 ~ 7	4.5 ~ 9

Machining Dimensions of Mounting Area



Notes:

1. Since the ∇ Rz 6.3 area is sealing part, be careful not to damage it.
2. Since the ∇ Rz 12.5 area is the metal sealing part at the edge of BZS, 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.

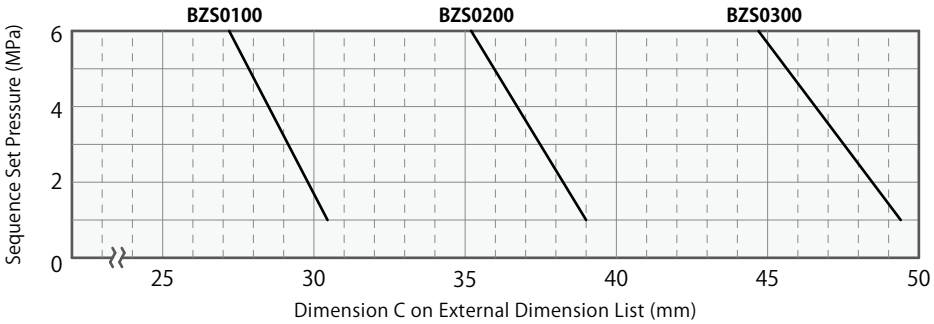
※1. Use the sequence pressure adjusting hex. within the adjustable range of ※2 (the dimensions K~C in the above).
Please note that if it is loosened further than max. C, pressure adjusting hex. part and internal spring will come off.

※2. Dimension when mounted. (+0.5mm before mounted.)

※3. If mounting plugs or fittings with G thread specification available in the market, the dimension '※3' should be 12.5.

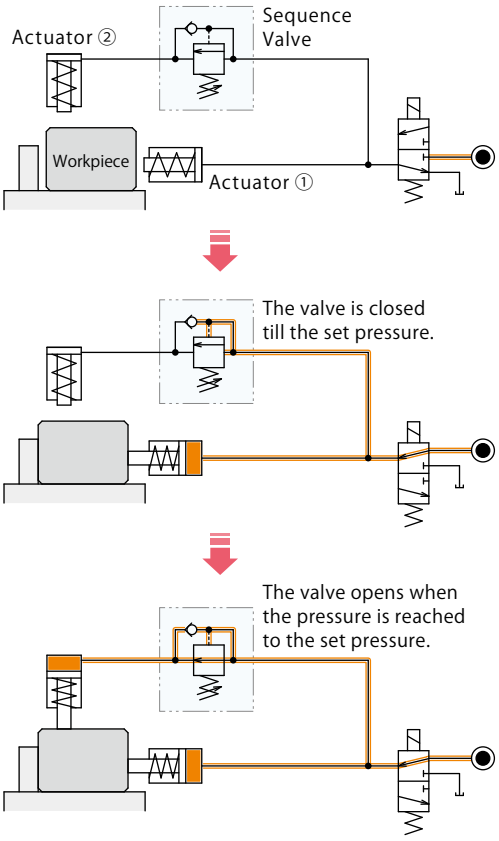
Cautions

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



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

Action Description



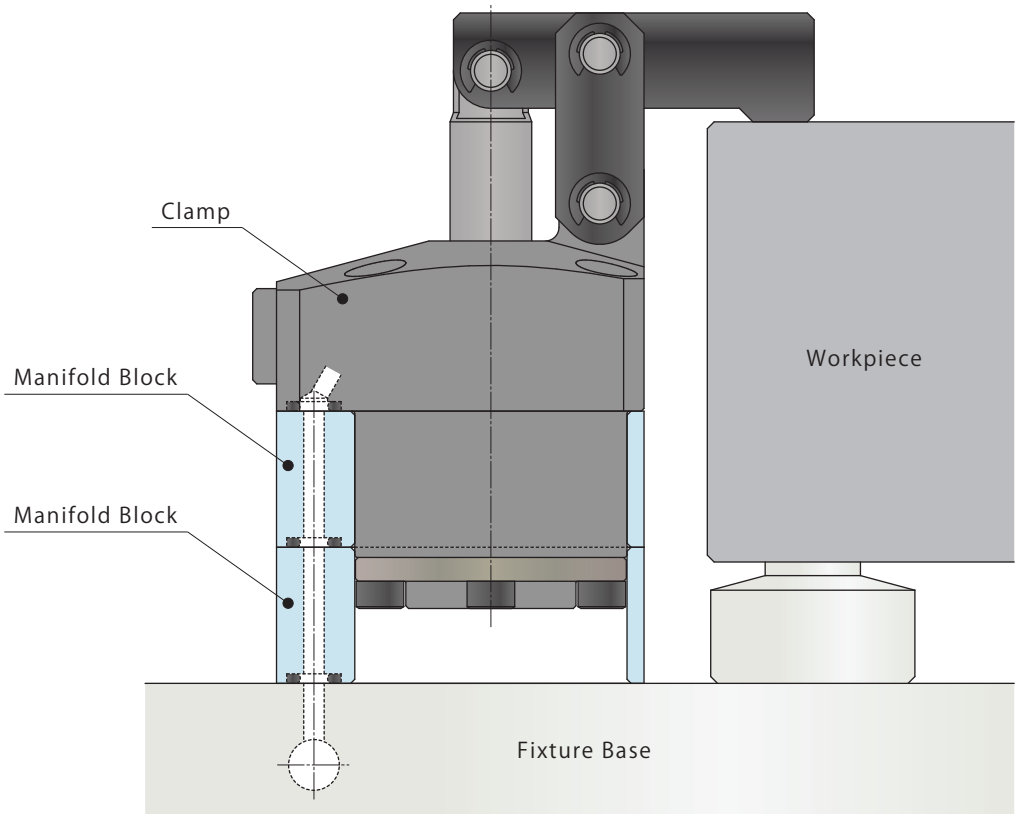
	Operating Procedure	Note
Locking	Hydraulic pressure is ON.	
	Actuator ① is activated.	
	Pressure increases to the sequence operation set pressure.	The difference between the operating pressure and the sequence operation set pressure should be 1MPa or more.
	The sequence valve circuit opens.	
	Actuator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

Manifold Block

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

Manifold Block

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

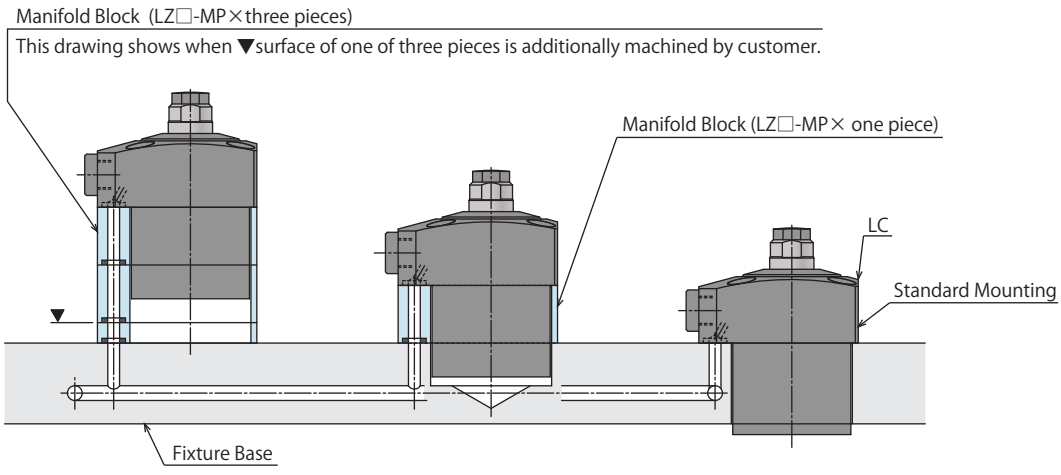


Applicable Model

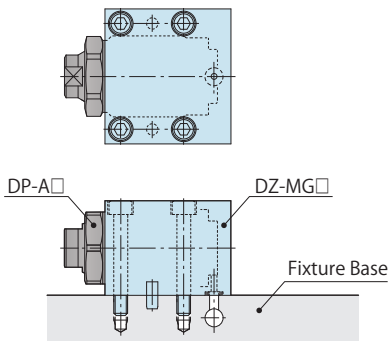
Manifold Block Model No.	Corresponding Item Model No.
Model WHZ-MD	Model WCA, Model WHA, Model WCE, Model WHE
Model LZY-MD	Model LKA, Model LKE, Model LHC, Model LHS, Model LKC, Model LHA, Model LHE, Model LL
Model LZ-MS	Model LJ, Model LG, Model LM, Model LT
Model LZ-MP	Model LC, Model TC
Model TMZ-1MB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

Application Examples

Work Support (LC) Application Example



Push Cylinder (DP) Application Example

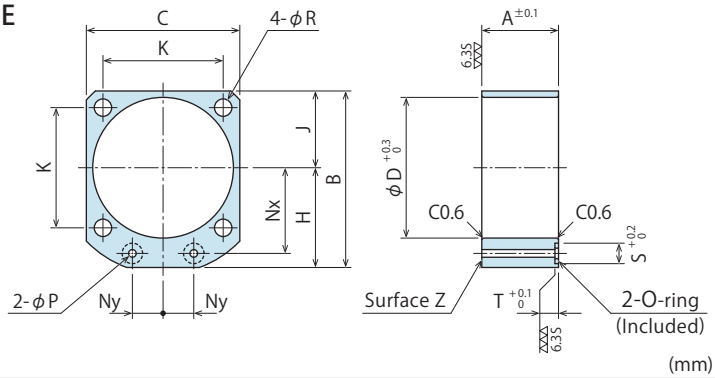


Manifold Block for WCA/WCE/WHA/WHE

Model No. Indication

WHZ 048 0 – MD

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



(mm)

Model No.	WHZ0600-MD	WHZ0320-MD	WHZ0400-MD	WHZ0500-MD	WHZ0630-MD
Corresponding Model No.	WCE0602 WHE0600	WCA0321 WCE1002 WHA0320 WHE1000	WCA0401 WCE1602 WHA0400 WHE1600	WCA0501 WCE2502 WHA0500 WHE2500	WCA0631 WCE4002 WHA0630 WHE4000
A	23	25	27	31	35
B	54	60	67	77	88.5
C	45	50	58	68	81
D	40	46	54	64	77
H	31.5	35	38	43	48
J	22.5	25	29	34	40.5
K	34	39	45	53	65
Nx	26	28	31	36	41
Ny	9	10	13	15	20
P	3	5	5	5	5
R	5.5	5.5	5.5	6.5	6.5
S	8	10	10	10	10
T	1.4	1.4	1.4	1.4	1.4
O-ring	1BP5	1BP7	1BP7	1BP7	1BP7
Weight kg	0.1	0.1	0.1	0.2	0.2

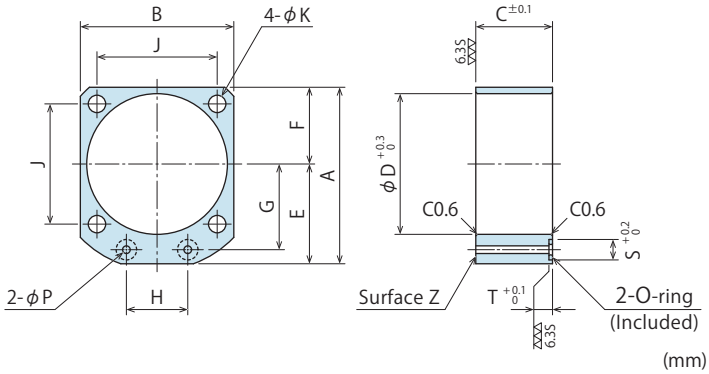
Notes : 1. Material : A2017BE-T4 Surface Finishing : Zircon Finishing (Zirconium Chemical Conversion Treatment)
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension A as a reference.
3. For other block thickness (dim. A), machine the surface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

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

Model No. Indication

LZY 048 0 – MD

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



(mm)

Model No.	LZY0360-MD	LZY0400-MD	LZY0480-MD	LZY0550-MD	LZY0650-MD	LZY0750-MD	LZY0900-MD	LZY1050-MD
Corresponding Model No.	LKA0360 / LKE0360 LHA0360 / LHC0360 LHE0360 / LHS0360 LL0360	LKA0400 / LKC0400 LKE0400 / LHA0400 LHC0400 / LHE0400 LHS0400 / LL0400	LKA0480 / LKC0480 LKE0480 / LHA0480 LHC0480 / LHE0480 LHS0480 / LL0480	LKA0550 / LKC0550 LKE0550 / LHA0550 LHC0550 / LHE0550 LHS0550 / LL0550	LKA0650 / LKC0650 LHA0650 / LHC0650 LHS0650 LL0650	LKA0750 LHA0750 LHS0750 LL0750	LKA0900 LHA0900 LHS0900 LL0900	LKA1050 LHA1050 LHS1050 LL1050
A	49	54	61	69	81	92	107	122
B	40	45	51	60	70	80	95	110
C	20	20	27	30	32	37	45	50
D	36	40	48	55	65	75	90	105
E	29	31.5	35.5	39	46	52	59.5	67
F	20	22.5	25.5	30	35	40	47.5	55
G	23.5	26	30	33.5	39.5	45	52.5	60
H	16	18	22	24	30	32	37	45
J	31.4	34	40	47	55	63	75	88
K	4.5	5.5	5.5	6.8	6.8	9	11	14
P	3	3	3	3	5	5	5	5
S	8	8	8	8	10	10	10	10
T	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
O-ring	1BP5	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7	1BP7
Weight kg	0.2	0.2	0.3	0.4	0.5	0.8	1.2	1.7

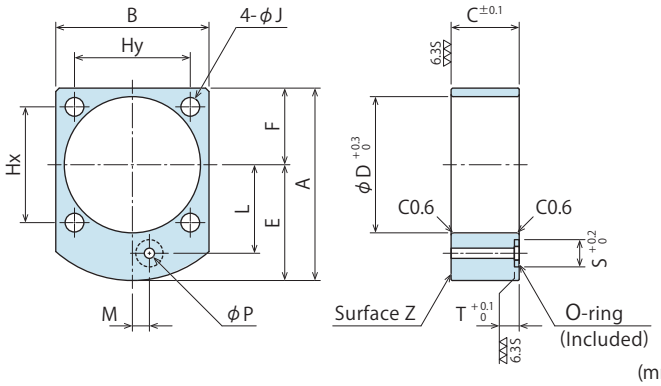
Notes : 1. Material : S45C Surface Finishing : Alkaline Blackening
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension C as a reference.
3. For other block thickness (dim. C), machine the surface Z or design a block referring to the drawing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

Manifold Block for LJ/LM/LG/LT

Model No. Indication

LZ 048 0 – MS

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



(mm)

Model No.	LZ0300-MS	LZ0360-MS	LZ0400-MS	LZ0480-MS	LZ0550-MS	LZ0650-MS	LZ0750-MS	LZ0900-MS	LZ1050-MS
Corresponding Model No.	LG0301 / LT0301 LJ0302 / LM0300	LG036□ / LT036□ LJ0362 / LM0360	LG040□ / LT040□ LJ0402 / LM0400	LG048□ / LT048□ LJ0482 / LM0480	LG055□ / LT055□ LJ0552 / LM0550	LG065□ / LT065□ LJ0652 / LM0650	LG075□ / LT075□ LJ0752 / LM0750	LG090□ LJ0902	LG105□ LJ1052
A	48	51.5	56.5	62	70	82	93	107	122
B	34	40	45	51	60	70	80	95	110
C	18	20	20	27	30	32	37	45	50
D	30	36	40	48	55	65	75	90	105
E	28.5	31.5	34	36.5	40	47	53	59.5	67
F	19.5	20	22.5	25.5	30	35	40	47.5	55
Hx	30	31.4	34	40	47	55	63	75	88
Hy	23	31.4	34	40	47	55	63	75	88
J	4.5	4.5	5.5	5.5	6.8	6.8	9	11	14
L	20.5	23.5	26	30	33.5	39.5	45	52.5	60
M	3	5	5	0	0	0	0	0	0
P	3	3	3	3	3	5	5	5	5
S	8	8	8	8	8	10	10	10	10
T	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
O-ring	1BP5	1BP5	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7	1BP7
Weight kg	0.1	0.2	0.2	0.3	0.4	0.5	0.8	1.2	1.7

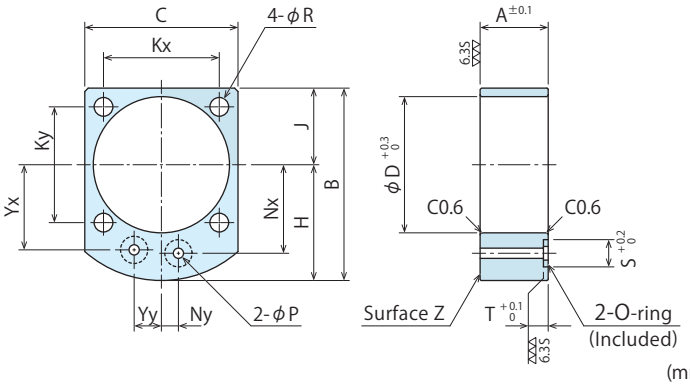
Notes : 1. Material : S45C Surface Finishing : Alkaline Blackening
2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension C as a reference.
3. For other block thickness (dim. C), machine the surface Z or design a block referring to the drawing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

Manifold Block for LC/TC

Model No. Indication

LZ 048 0 – MP

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



(mm)

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

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

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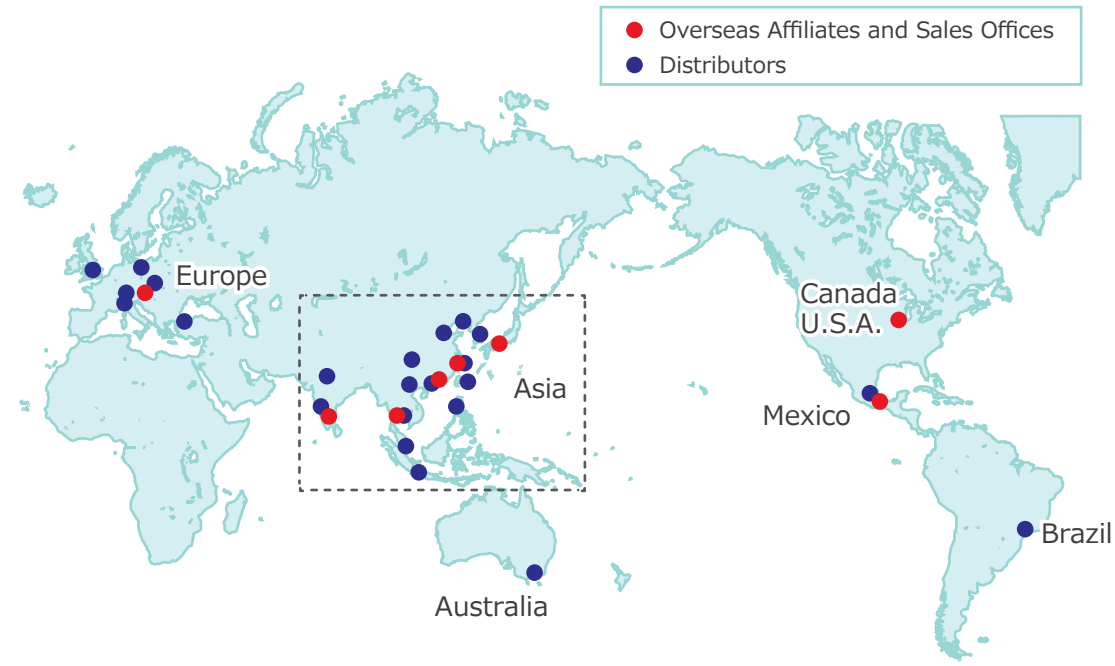

Asia Detailed Map

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