

Hydraulic Swing Clamp

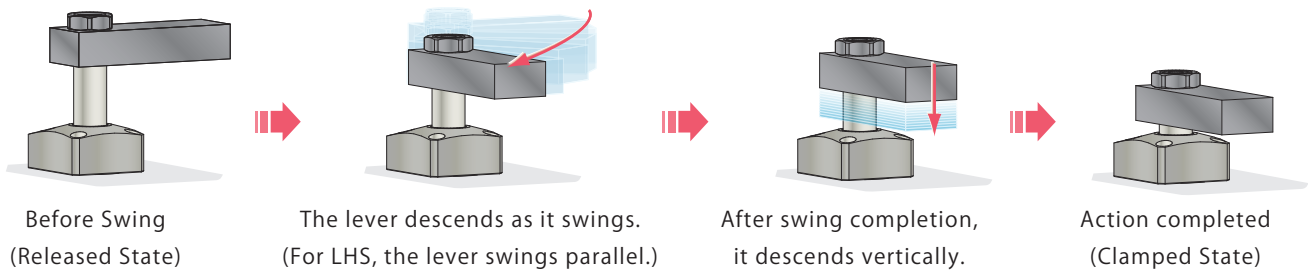
- | | |
|-----------|-------------|
| Model LHA | Model LG/LT |
| Model LHC | Model TLA-2 |
| Model LHS | Model TLA-1 |
| Model LHW | Model TLB-2 |



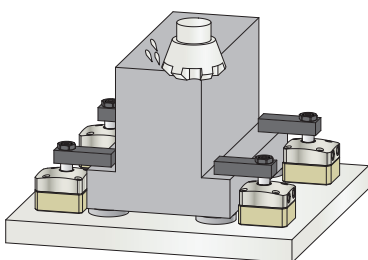
High Rigidity • Long Life • High Accuracy

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

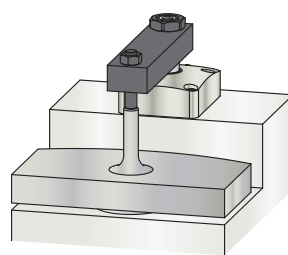
Action Description



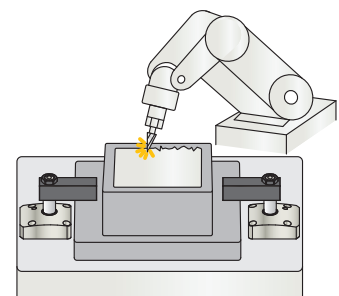
Application Examples



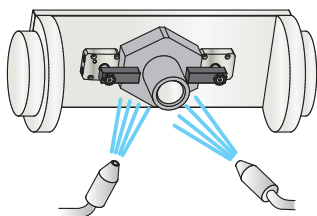
Machining



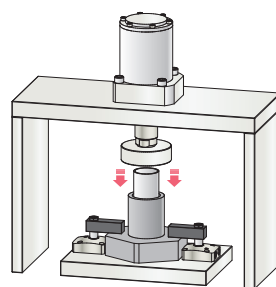
For the applications which require
clamp position repeatability



Deburring



Cleaning



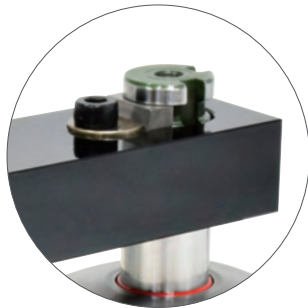
Press Fitting



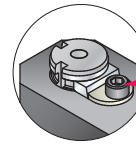
Swing Clamp Quick Change Lever Option A

Model **LHA-A**

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



The Fastest Lever Change,
with Only One Bolt



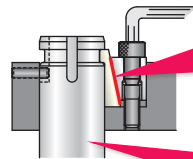
Only One Bolt for
Lever Change!

Remove the Lever
with One Wrench



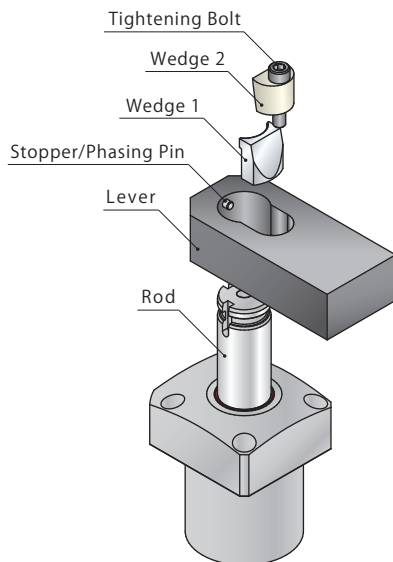
No Special Tools Required!
Use One Wrench
for Removal!

Secure Lever Tightening
Even with Small Torque



Wedge Mechanism for
Lever Tightening with
Small Torque

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

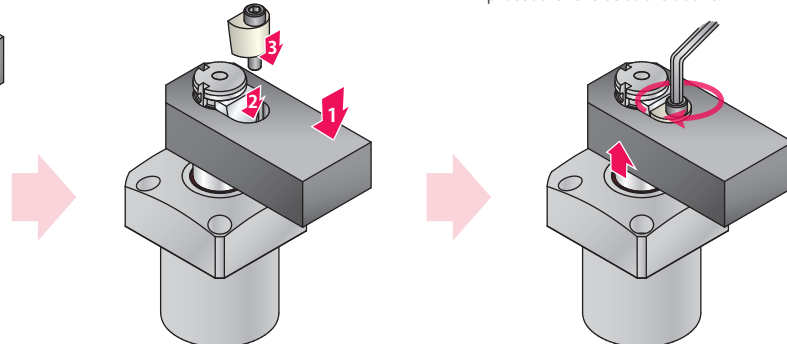


Install the Lever, Wedge 1 and 2

- Set Wedge 1 to the slot of the rod.

Tighten the Lever with Tightening Bolt

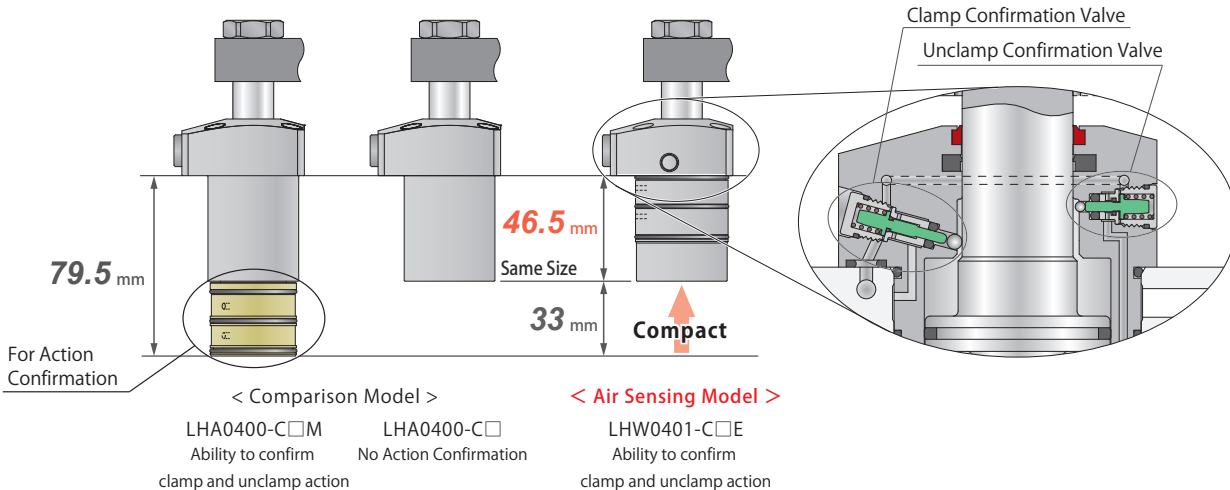
- Pull the lever towards the wedge side and tighten the tightening bolt with the specified torque.
- When removing the lever, follow the installation procedure reverse to the above.



Air Sensing Swing Clamp

Model **LHW**

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



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

- Hole Clamp
 - SFA
 - SFC

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

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

- Work Support
 - LD
 - LC
 - TNC
 - TC

- Air Sensing Lift Cylinder
 - LLW

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

- Block Cylinder
 - DBA/DBC

- Centering Vise
 - FVA
 - FVD
 - FVC

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
















- Pallet Clamp
 - VS/VT

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











- Pull Stud Clamp
 - FP
 - FQ






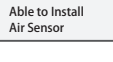








- Customized Spring Cylinder
 - DWA/DWB

Swing Clamp


Low Pressure Model MAX. 7MPa		 Model LHA → P.429	 Model LHC → P.463	 Model LHS → P.477	 Model LHD
Classification		Double Action	Double Action Compact	Double Action Parallel Swing Action	Double Action Double Piston
Operating Pressure Range		1.5 ~ 7MPa	1.5 ~ 7MPa	1.5 ~ 7MPa	1.5 ~ 6MPa
Standard Model		External Dimensions → P.437	External Dimensions → P.471	External Dimensions → P.485	
Action Confirmation	Double End Rod Option for Dog  Able to Install Dog	External Dimensions → P.439	—	★	Further information on the website.
	Air Sensing Manifold Option 	External Dimensions → P.441	—	★	
	Air Sensing Piping Option  Able to Install Air Sensor	External Dimensions → P.443	—	★	
	Built-in Sensing Valve Model	—	—	—	
Option	Quick Change Lever Option A 	External Dimensions → P.445	External Dimensions → P.473	External Dimensions → P.487	
	Quick Change Lever Option F 	External Dimensions → P.447	★	External Dimensions → P.489	
	Balance Lever Option 	External Dimensions → P.449	★	External Dimensions → P.491	
	Long Stroke Option  Long	External Dimensions → P.451	—	★	
	Swing Angle Selectable Option  30° 45° 60°	External Dimensions → P.455	★	External Dimensions → P.493	
Accessories	Lever 	LZH-T, LZH-F, LZH-B LZH-A, LZH-W → P.461	LZH-T LZH-A, LZH-W → P.476	LZH-T, LZH-F, LZH-B LZH-A, LZH-W → P.497	
	Manifold Block 	LZY-MD		→ P.1335	
	Speed Control Valve Plug 	BZL, BZX, JZG, BZS		→ P.947	

※ Please contact us for detail dimension at ★ part.

High Pressure Model MAX. 35MPa		 Model TLA-2 → P.545	 Model TLB-2 → P.571	 Model TLA-1 → P.589	 Model TLV-2
Classification		Double Action Top Flange	Double Action Bottom Flange	Single Action (Spring Release) Top Flange	Double Action with Action Confirmation
Operating Pressure Range		7 ~ 35MPa	7 ~ 35MPa	7 ~ 35MPa	7 ~ 35MPa
Standard Model		External Dimensions → P.553	External Dimensions → P.579	External Dimensions → P.597	
Option	Balance Lever Option 	External Dimensions → P.557	External Dimensions → P.581	—	Further information on the website.
	Long Stroke Option  Long	External Dimensions → P.561	External Dimensions → P.583	—	
	Swing Angle Selectable Option  30° 45° 60°	External Dimensions → P.565	External Dimensions → P.585	—	
Accessories	Lever 	TLZ-L2, TLZ-LB → P.569	TLZ-L2, TLZ-LB → P.587	TLZ-L2, TLZ-LB → P.601	
	Speed Control Valve Plug 	BZT, JZG		→ P.947	
	G-Thread Fitting 	G-Thread Fitting (Made by Ihara Science)			

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

※ Please contact us for detail dimension at ★ part.



High-Power Swing Clamp Hydraulic Double Action

Model **LHE**

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

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

Hydraulic Single-Acting Swing Clamp

Model TLA-1

High Pressure (7 ~ 35MPa)

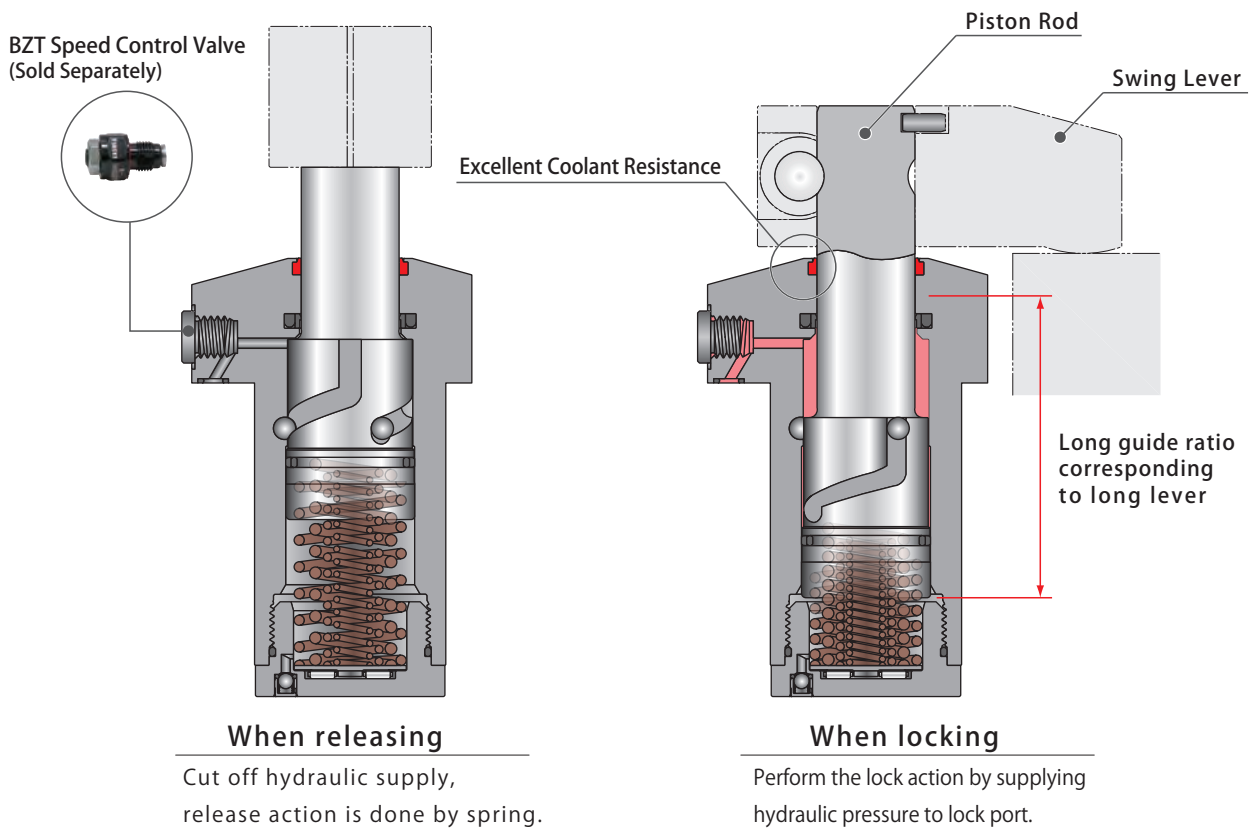
Top Flange



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• Notes on Handling • Maintenance/Inspection • Warranty	

Action Description

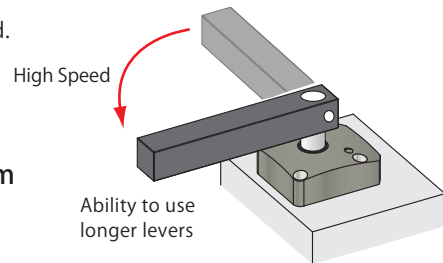


• Able to Use Longer Levers

The long guide ratio allows for longer clamping levers by supporting the rod. The guide is located between the flange and at the edge of the rod.

• High Speed and High Endurance with Rotation Mechanism

High endurance is achieved by enlarging rod diameter which decreases torque and by using bigger steel balls and making the lead groove.



• Excellent Coolant Resistance

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

• Able to Attach Speed Control Valve Directly

When fitting the gasket (-C option), it is able to attach BZT speed control valve with air venting function. (Speed control valve is sold separately.)

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

Hole Clamp
SFA
SFC

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

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

Work Support
LD
LC
TNC
TC

Air Sensing Lift Cylinder
LLW

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

Block Cylinder
DBA/DBC

Centering Vise
FVA
FVD
FVC

Control Valve
BZL
BZT
BZX/JZG
BZS

Pallet Clamp
VS/VT

Expansion Locating Pin
VFL/VFM
VFJ/VFK

Pull Stud Clamp
FP
FQ

Customized Spring Cylinder
DWA/DWB

Model No. Indication

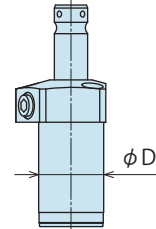
TLA **080** **2** - **1** **C** **R**

1 2 3 4

1 Body Size (Clamping Force)

040 : $\phi D=28.5\text{mm}$	160 : $\phi D=46\text{mm}$
060 : $\phi D=33\text{mm}$	200 : $\phi D=56\text{mm}$
080 : $\phi D=36\text{mm}$	250 : $\phi D=63\text{mm}$
100 : $\phi D=43\text{mm}$	400 : $\phi D=90\text{mm}$

※ Outer diameter (ϕD) of the cylinder.



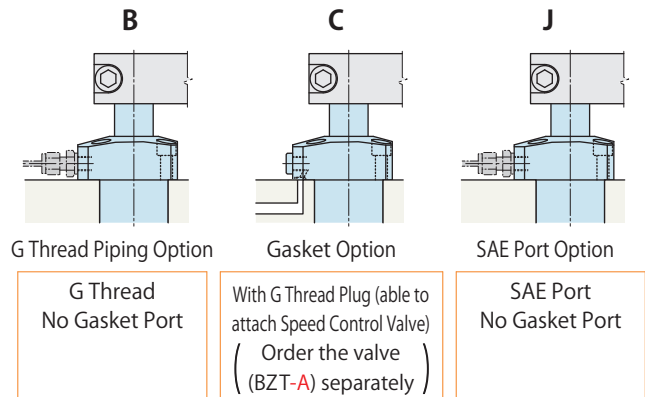
2 Design No.

2 : Revision Number

3 Piping Method

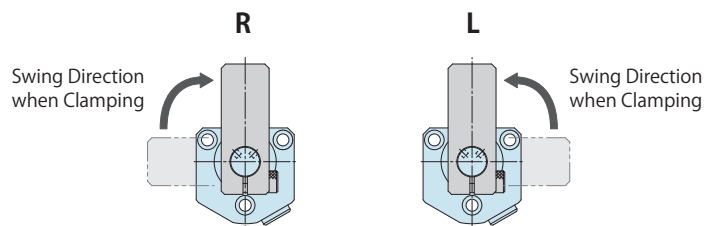
B : G Thread Piping Option (No Gasket Port)
C : Gasket Option (With G Thread Plug)
J : SAE Port Option (No Gasket Port)

※ Speed control valve (BZT-A) is sold separately.
Please use a meter-in speed control valve for TLA-1.
In case of using Kosmek model, select BZT□-A.
 Refer to P.947 for detail.



4 Swing Direction when Clamping

R : Clockwise
L : Counter-Clockwise



Specifications

Model No.	TLA0402-1□□	TLA0602-1□□	TLA0802-1□□	TLA1002-1□□	
Cylinder Area for Locking	cm ²	1.005	1.453	1.979	2.804
Clamping Force (Calculation Formula) ※1	kN	$F = \frac{P-1.88}{10.95+0.0426 \times L}$	$F = \frac{P-1.83}{7.57+0.0276 \times L}$	$F = \frac{P-2.19}{5.53+0.0178 \times L}$	$F = \frac{P-2.48}{3.91+0.0113 \times L}$
Full Stroke	mm	16	17.5	17.5	18.5
Swing Stroke (90°)	mm	8	9.5	7.5	8.5
Vertical Stroke	mm	8	8	10	10
Return Spring Force	kN	0.13~0.21	0.17~0.29	0.31~0.48	0.51~0.76
Return Swing Torque ※2	N·m	0.13	0.21	0.39	0.67
Swing Angle Accuracy		90° ±3°			
Swing Completion Position Repeatability		±0.5°			
Max. Operating Pressure	MPa	35.0			
Min. Operating Pressure ※3	MPa	7.0			
Withstanding Pressure	MPa	42.0			
Operating Temperature	°C	0 ~ 70			
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32			

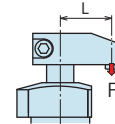
Model No.	TLA1602-1□□	TLA2002-1□□	TLA2502-1□□	TLA4002-1□□	
Cylinder Area for Locking	cm ²	4.170	6.134	8.198	12.37
Clamping Force (Calculation Formula) ※1	kN	$F = \frac{P-2.00}{2.60+0.0059 \times L}$	$F = \frac{P-2.01}{1.77+0.0036 \times L}$	$F = \frac{P-1.99}{1.32+0.0021 \times L}$	$F = \frac{P-2.09}{0.87+0.0012 \times L}$
Full Stroke	mm	22.5	25	29.5	33
Swing Stroke (90°)	mm	9.5	12	13.5	17
Vertical Stroke	mm	13	13	16	16
Return Spring Force	kN	0.58~0.94	0.88~1.46	1.15~1.82	1.83~2.83
Return Swing Torque ※2	N·m	0.94	1.36	1.94	4.17
Swing Angle Accuracy		90° ±3°			
Swing Completion Position Repeatability		±0.5°			
Max. Operating Pressure	MPa	35.0			
Min. Operating Pressure ※3	MPa	7.0			
Withstanding Pressure	MPa	42.0			
Operating Temperature	°C	0 ~ 70			
Usable Fluid		General Hydraulic Oil Equivalent to ISO-VG-32			

Notes: ※1. F : Clamping Force (kN), P : Supply Hydraulic Pressure (MPa), L : Distance between the piston center and the clamping point (mm).

※2. Reference value when clamps are mounted horizontally.
(Variables include number of clamps in the circuit and piping conditions.)

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

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



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

Hole Clamp

- SFA
- SFC

Swing Clamp

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

Link Clamp

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

Work Support

- LD
- LC
- TNC
- TC

Air Sensing Lift Cylinder

- LLW

Linear Cylinder / Compact Cylinder

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

Block Cylinder

- DBA/DBC

Centering Vise

- FVA
- FVD
- FVC

Control Valve

- BZL
- BZT
- BZX/JZG
- BZS

Pallet Clamp

- VS/VT

Expansion Locating Pin

- VFL/VFM
- VFJ/VFK

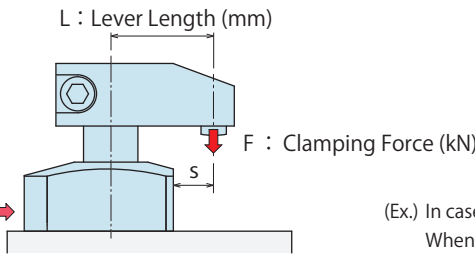
Pull Stud Clamp

- FP
- FQ

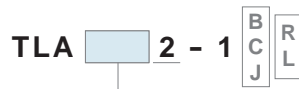
Customized Spring Cylinder

- DWA/DWB

Clamping Force Curve



Applicable Model



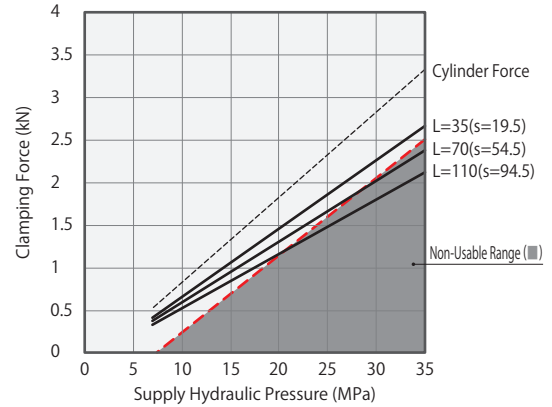
1 Body Size (Clamping Force)

(Ex.) In case of TLA1602-1□□ :

When supply hydraulic pressure P is 25.0MPa and lever length L is 50mm, clamping force becomes about 8.0 kN.

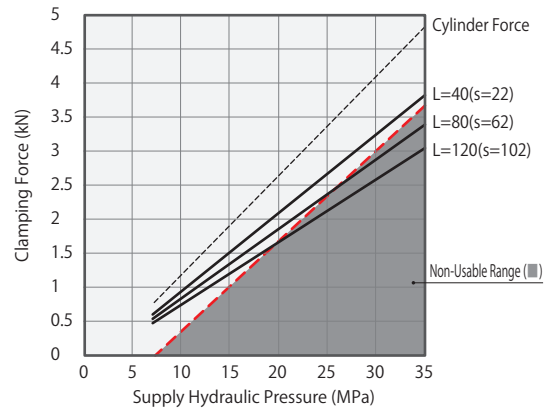
TLA0402-1 Clamping Force Calculation Formula^{*1} (kN) $F = (P - 1.88) / (10.95 + 0.0426 \times L)$

Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm)									Max. Lever Length (L) (mm)
		L=35	L=40	L=50	L=60	L=70	L=80	L=90	L=110		
35	3.32	2.7	2.7	2.6						53	
32.5	3.07	2.5	2.5	2.4						58	
30	2.82	2.3	2.3	2.2	2.1					64	
27.5	2.57	2.1	2.1	2.0	1.9	1.9				72	
25	2.32	1.9	1.9	1.8	1.8	1.7	1.7			83	
22.5	2.07	1.7	1.7	1.6	1.6	1.5	1.5	1.4		96	
20	1.81	1.5	1.5	1.4	1.4	1.4	1.3	1.3	1.2	116	
17.5	1.56	1.3	1.3	1.2	1.2	1.2	1.1	1.1	1.0	145	
15	1.31	1.1	1.1	1.1	1.0	1.0	1.0	0.9	0.9	150	
12.5	1.06	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.7	150	
10	0.81	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6	150	
7	0.51	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	150	
Max. Operating Pressure (MPa)		35.0	35.0	35.0	31.6	28.2	25.6	23.6	20.6		



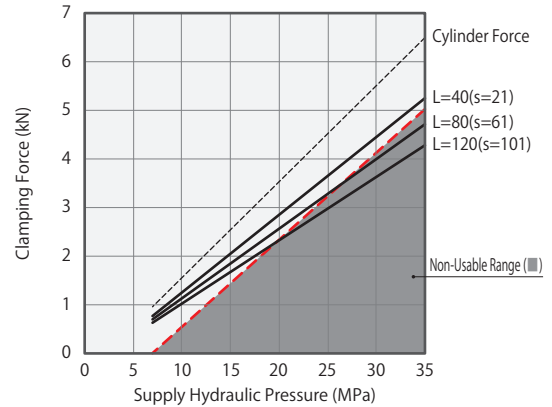
TLA0602-1 Clamping Force Calculation Formula^{*1} (kN) $F = (P - 1.83) / (7.57 + 0.0276 \times L)$

Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm)								Max. Lever Length (L) (mm)
		L=40	L=50	L=60	L=70	L=80	L=90	L=100	L=120	
35	4.81	3.9	3.8							54
32.5	4.45	3.6	3.5							59
30	4.08	3.3	3.2	3.1						66
27.5	3.72	3.0	2.9	2.8	2.8					74
25	3.36	2.7	2.6	2.6	2.5	2.4				84
22.5	2.99	2.4	2.4	2.3	2.2	2.2	2.1			98
20	2.63	2.1	2.1	2.0	2.0	1.9	1.9	1.8		117
17.5	2.27	1.9	1.8	1.7	1.7	1.6	1.6	1.5	1.4	146
15	1.90	1.6	1.5	1.5	1.4	1.4	1.4	1.3	1.3	193
12.5	1.54	1.3	1.2	1.2	1.2	1.1	1.1	1.1	1.0	200
10	1.18	1.0	1.0	0.9	0.9	0.9	0.9	0.8	0.8	200
7	0.74	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	200
Max. Operating Pressure (MPa)		35.0	35.0	32.1	28.6	25.9	23.8	22.2	19.7	



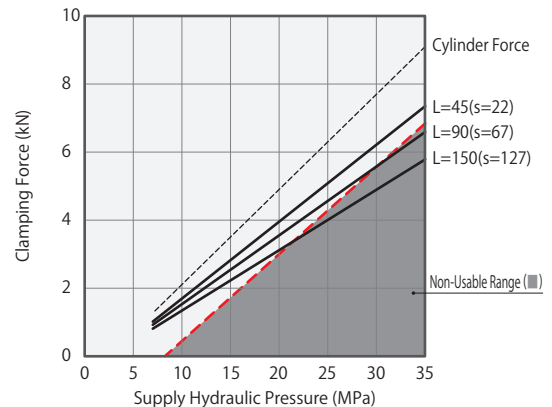
TLA0802-1 Clamping Force Calculation Formula^{*1} (kN) $F = (P - 2.19) / (5.53 + 0.0178 \times L)$

Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm)								Max. Lever Length (L) (mm)
		L=40	L=50	L=60	L=70	L=80	L=90	L=100	L=120	
35	6.48	5.3	5.2							56
32.5	5.99	4.9	4.8	4.6						61
30	5.49	4.5	4.4	4.3						68
27.5	5.00	4.1	4.0	3.9	3.8					76
25	4.50	3.7	3.6	3.5	3.4	3.3				87
22.5	4.01	3.3	3.2	3.1	3.0	3.0	2.9	2.8		101
20	3.51	2.9	2.8	2.7	2.7	2.6	2.5	2.5	2.4	121
17.5	3.02	2.5	2.4	2.4	2.3	2.3	2.2	2.1	2.0	150
15	2.52	2.1	2.0	2.0	1.9	1.9	1.8	1.8	1.7	198
12.5	2.03	1.7	1.7	1.6	1.6	1.5	1.5	1.5	1.4	230
10	1.53	1.3	1.3	1.2	1.2	1.2	1.1	1.1	1.1	230
7	0.94	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	230
Max. Operating Pressure (MPa)		35.0	35.0	33.0	29.3	26.6	24.4	22.7	20.1	



TLA1002-1 Clamping Force Calculation Formula^{*1} (kN) $F = (P - 2.48) / (3.91 + 0.0113 \times L)$

Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm)								Max. Lever Length (L) (mm)
		L=45	L=50	L=60	L=70	L=90	L=110	L=130	L=150	
35	9.11	7.4	7.3	7.1	7.0					75
32.5	8.41	6.8	6.8	6.6	6.4					83
30	7.71	6.3	6.2	6.0	5.9	5.6				92
27.5	7.01	5.7	5.6	5.5	5.4	5.1				104
25	6.30	5.1	5.1	5.0	4.8	4.6	4.4			120
22.5	5.60	4.6	4.5	4.4	4.3	4.1	3.9	3.8		141
20	4.90	4.0	4.0	3.9	3.8	3.6	3.4	3.3	3.2	171
17.5	4.20	3.4	3.4	3.3	3.2	3.1	3.0	2.8	2.7	217
15	3.50	2.9	2.8	2.8	2.7	2.6	2.5	2.4	2.3	250
12.5	2.80	2.3	2.3	2.2	2.2	2.1	2.0	1.9	1.8	250
10	2.10	1.8	1.7	1.7	1.6	1.6	1.5	1.4	1.4	250
7	1.26	1.1	1.1	1.0	1.0	1.0	0.9	0.9	0.9	250
Max. Operating Pressure (MPa)		35.0	35.0	35.0	35.0	30.5	26.5	23.7	21.6	

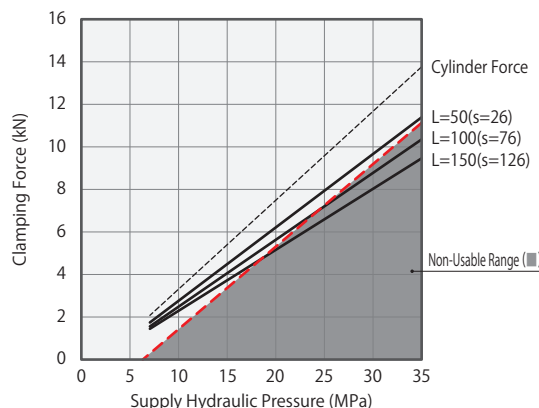


Notes :

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

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

TLA1602-1		Clamping Force Calculation Formula※1 (kN) $F = (P - 2.00) / (2.60 + 0.0059 \times L)$									
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm)								Non-Usable Range (mm)	Max. Lever Length (L) (mm)
		L=50	L=60	L=70	L=80	L=90	L=100	L=120	L=150		
35	13.73	11.4	11.2								68
32.5	12.69	10.6	10.4	10.2							75
30	11.64	9.7	9.5	9.3	9.2						83
27.5	10.60	8.9	8.7	8.5	8.4	8.2					93
25	9.56	8.0	7.8	7.7	7.5	7.4	7.3				105
22.5	8.52	7.1	7.0	6.9	6.7	6.6	6.5	6.2			122
20	7.47	6.3	6.1	6.0	5.9	5.8	5.7	5.5			144
17.5	6.43	5.4	5.3	5.2	5.1	5.0	4.9	4.7	4.5		177
15	5.39	4.5	4.5	4.4	4.3	4.2	4.1	4.0	3.8		228
12.5	4.35	3.7	3.6	3.5	3.5	3.4	3.3	3.2	3.1		250
10	3.30	2.8	2.8	2.7	2.7	2.6	2.6	2.5	2.3		250
7	2.05	1.8	1.7	1.7	1.7	1.6	1.6	1.6	1.5		250
Max. Operating Pressure (MPa)		35.0	35.0	34.4	30.9	28.1	26.0	22.7	19.5		



- Hole Clamp
 - SFA
 - SFC
- Swing Clamp**
 - LHA
 - LHC
 - LHS
 - LHW
 - LG/LT
 - TLA-2
 - TLB-2
 - TLA-1**

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

- Work Support
 - LD
 - LC
 - TNC
 - TC

- Air Sensing Lift Cylinder
 - LLW

- Linear Cylinder / Compact Cylinder
 - LL
 - LLR
 - LLU

- DP
 - DR
 - DS
 - DT

- Block Cylinder
 - DBA/DBC

- Centering Vise
 - FVA
 - FVD
 - FVC

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

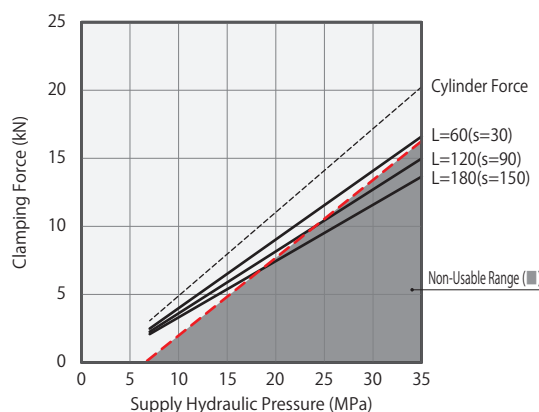
- Pallet Clamp
 - VS/VT

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

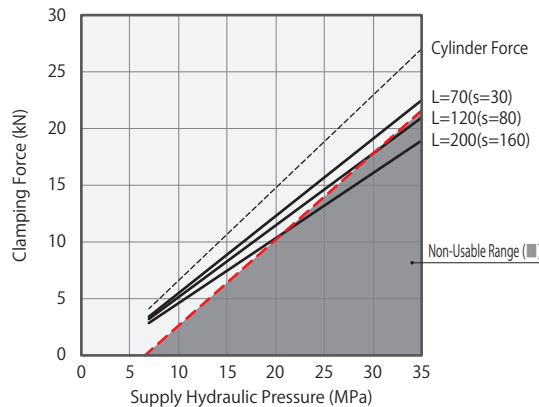
- Pull Stud Clamp
 - FP
 - FQ

- Customized Spring Cylinder
 - DWA/DWB

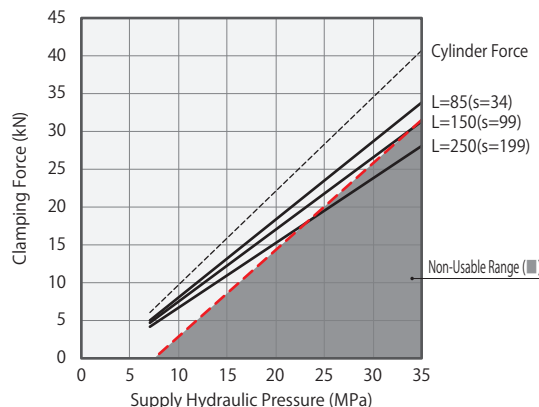
TLA2002-1		Clamping Force Calculation Formula※1 (kN) $F = (P - 2.01) / (1.77 + 0.0036 \times L)$							
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm)						Non-Usable Range (mm)	Max. Lever Length (L) (mm)
		L=60	L=70	L=80	L=100	L=120	L=140		
35	20.11	16.7	16.4	16.1					81
32.5	18.58	15.4	15.1	14.9					89
30	17.05	14.1	13.9	13.7					99
27.5	15.51	12.9	12.7	12.4	12.0				110
25	13.98	11.6	11.4	11.2	10.8	10.5			126
22.5	12.45	10.4	10.2	10.0	9.7	9.4	9.1		145
20	10.91	9.1	8.9	8.8	8.5	8.2	8.0	7.7	173
17.5	9.38	7.8	7.7	7.6	7.3	7.1	6.9	6.7	213
15	7.85	6.6	6.5	6.4	6.1	5.9	5.8	5.6	277
12.5	6.31	5.3	5.2	5.1	5.0	4.8	4.7	4.5	280
10	4.78	4.1	4.0	3.9	3.8	3.7	3.6	3.5	280
7	2.94	2.6	2.5	2.5	2.4	2.3	2.2	2.2	280
Max. Operating Pressure (MPa)		35.0	35.0	35.0	29.7	25.8	23.1	21.1	19.5



TLA2502-1		Clamping Force Calculation Formula※1 (kN) $F = (P - 1.99) / (1.32 + 0.0021 \times L)$							
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm)						Non-Usable Range (mm)	Max. Lever Length (L) (mm)
		L=70	L=80	L=90	L=100	L=120	L=140		
35	27.01	22.6	22.2	21.9	21.6				100
32.5	24.96	20.8	20.6	20.3	20.0				109
30	22.91	19.1	18.9	18.6	18.4	17.9			121
27.5	20.86	17.4	17.2	17.0	16.7	16.3			135
25	18.81	15.7	15.5	15.3	15.1	14.7	14.3		154
22.5	16.76	14.0	13.8	13.6	13.5	13.1	12.8	12.4	178
20	14.71	12.3	12.2	12.0	11.8	11.5	11.2	10.9	211
17.5	12.66	10.6	10.5	10.3	10.2	9.9	9.7	9.4	258
15	10.61	8.9	8.8	8.7	8.6	8.3	8.1	7.9	300
12.5	8.56	7.2	7.1	7.0	6.9	6.7	6.6	6.4	300
10	6.51	5.5	5.4	5.4	5.3	5.1	5.0	4.9	300
7	4.05	3.5	3.4	3.4	3.3	3.2	3.2	3.1	300
Max. Operating Pressure (MPa)		35.0	35.0	35.0	35.0	30.2	26.8	24.3	20.7



TLA4002-1		Clamping Force Calculation Formula※1 (kN) $F = (P - 2.09) / (0.87 + 0.0012 \times L)$							
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm)						Non-Usable Range (mm)	Max. Lever Length (L) (mm)
		L=85	L=100	L=125	L=150	L=175	L=200		
35	40.64	33.9	33.3	32.3					138
32.5	37.55	31.3	30.8	29.9	29.0				152
30	34.45	28.8	28.2	27.4	26.6				168
27.5	31.36	26.2	25.7	25.0	24.2	23.6			189
25	28.27	23.6	23.2	22.5	21.9	21.3	20.7		216
22.5	25.18	21.0	20.7	20.1	19.5	18.9	18.4	18.0	252
20	22.08	18.5	18.1	17.6	17.1	16.6	16.2	15.8	301
17.5	18.99	15.9	15.6	15.2	14.7	14.3	13.9	13.6	350
15	15.90	13.3	13.1	12.7	12.3	12.0	11.7	11.4	350
12.5	12.81	10.8	10.6	10.3	10.0	9.7	9.4	9.2	350
10	9.71	8.2	8.0	7.8	7.6	7.4	7.2	7.0	350
7	6.00	5.1	5.0	4.9	4.7	4.6	4.5	4.4	350
Max. Operating Pressure (MPa)		35.0	35.0	35.0	32.8	29.1	26.4	24.3	22.6

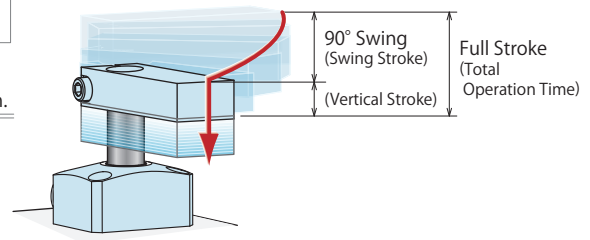


Allowable Swing Time Graph

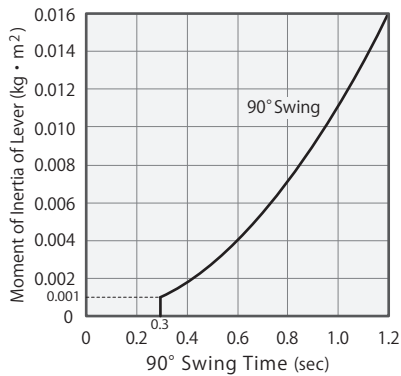
Adjustment of Swing Time

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.

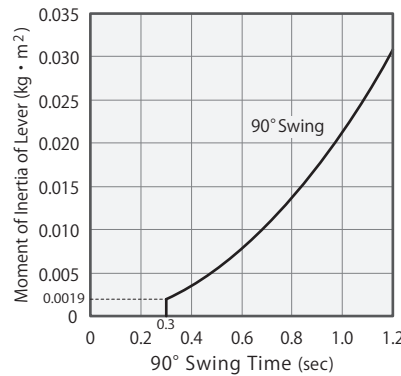
Excessive action speed can reduce stopping accuracy and damage internal components.



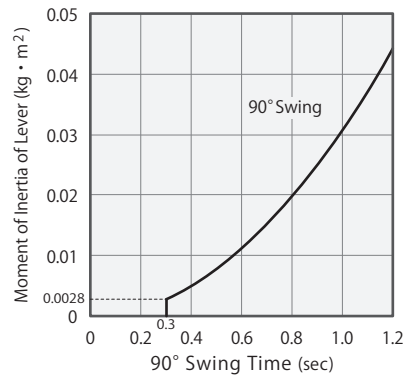
TLA0402-1



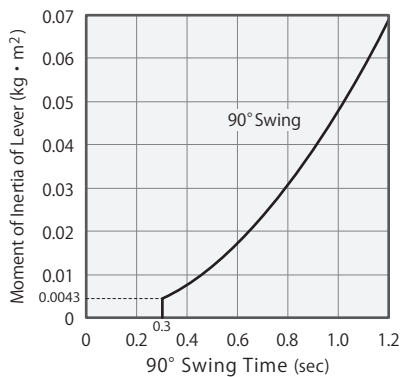
TLA0602-1



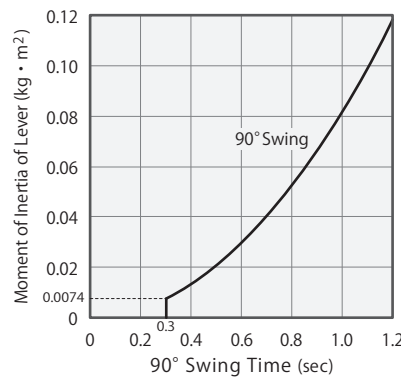
TLA0802-1



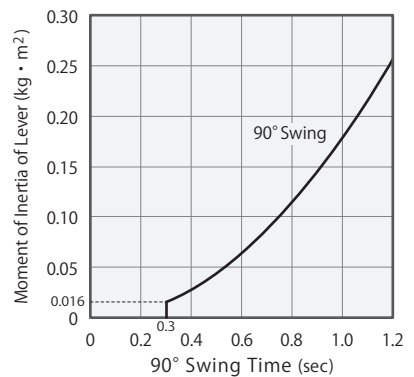
TLA1002-1



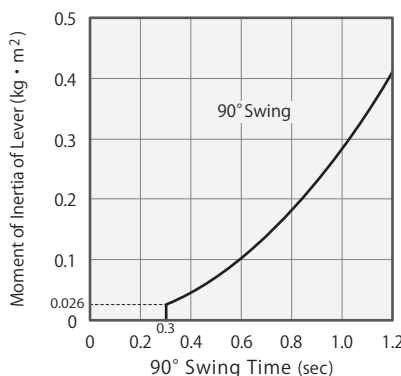
TLA1602-1



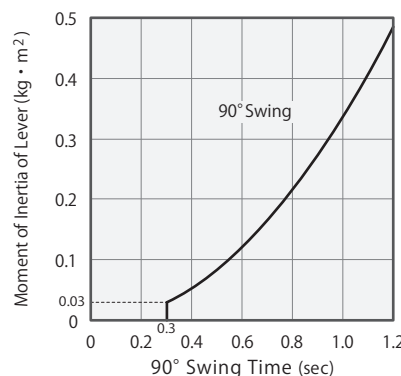
TLA2002-1



TLA2502-1



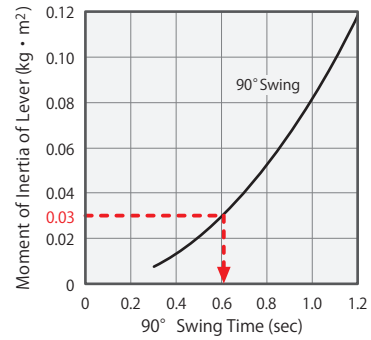
TLA4002-1



Notes:

1. The graph shows the 90° swing time in regard to the moment of inertia of lever.
2. The full stroke time is about 2~2.5 times 90° swing time. The specific value should be calculated with "Calculation Formula of Total Operation Time".
3. Lever with a large inertia sometimes does not work depending on supply hydraulic pressure, oil flow and lever mounting position.
4. Please adjust the 90° swing time against the moment of inertia of lever to be longer than the indicated time in the above graphs.
5. Excessive speed may degrade angle precision and damage internal parts.
6. The clamping force varies depending on the lever length. Select appropriate operating pressure from "Clamping force curve".
7. If the clamp is mounted horizontally the weight of the lever may increase swing speed beyond the allowable range.
If so, add a meter-out speed control valve.
8. Minimum release time should be 0.3 seconds.
9. Please contact us if operational conditions differ from those shown on the graphs.

Model → **TLA1602-1**



(How to read the allowable swing time graph)

In case of TLA1602-1

The moment of inertia of a lever : 0.03kg·m²

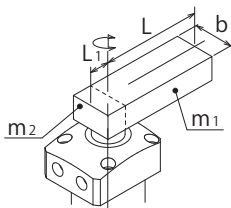
- 90° Swing Time : About 0.61 sec or more
- Total Operation Time : About 1.44 sec or more

1. The total operation time on the graph represents the allowable operation time when fully stroked.
(Swing Stroke : 9.5 mm, Full Stroke : 22.5 mm)

How to Calculate the Moment of Inertia (Estimated)

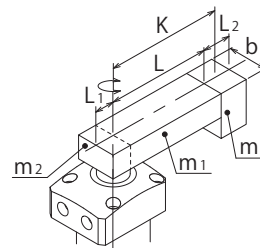
I : Moment of Inertia (kg·m²) L,L₁,L₂,K,b : Length (m) m,m₁,m₂,m₃ : Mass (kg)

- 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 The load applied is on the lever front end.



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

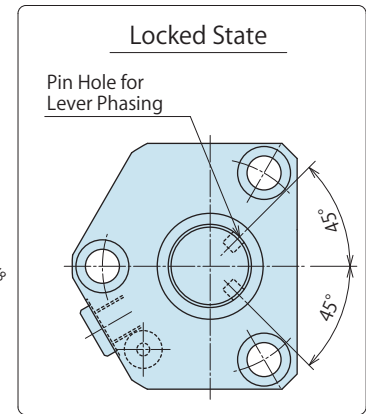
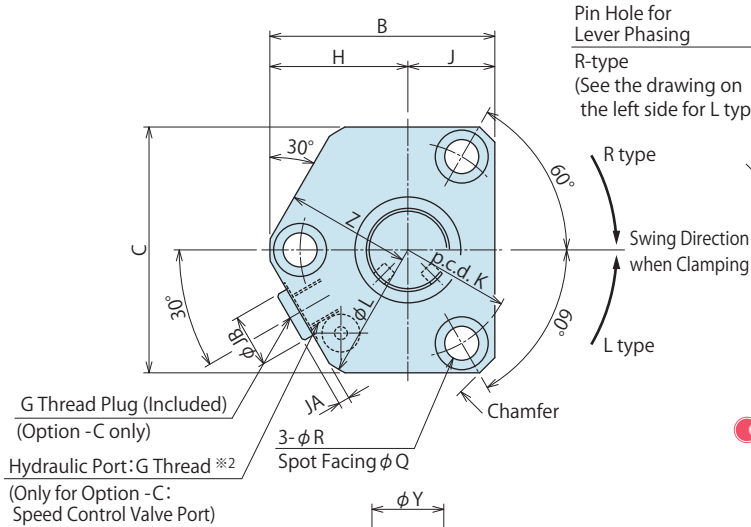
Calculation Formula of Total Operation Time

$$\text{Total Operation Time (sec)} = 90^\circ \text{ Swing Time (sec)} \times \frac{\text{Full Stroke (mm)}}{\text{Swing Stroke (mm)}}$$

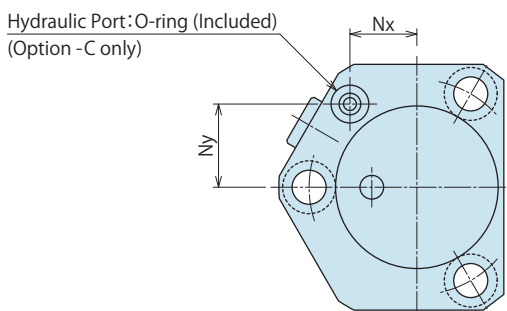
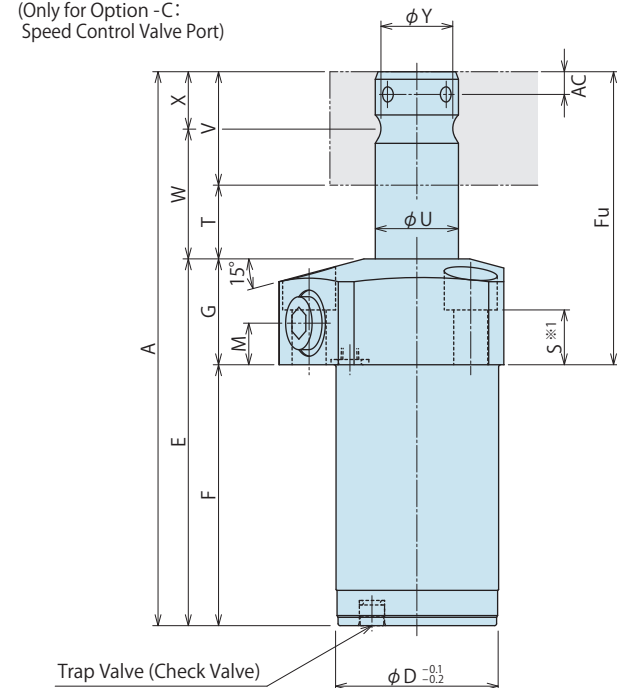
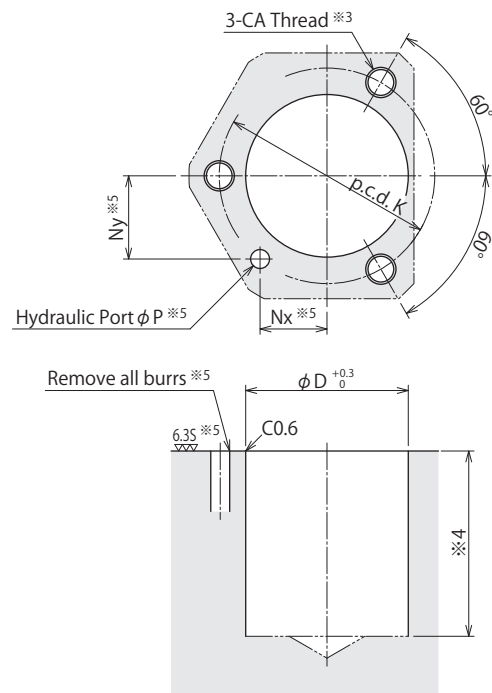
External Dimensions

C : Gasket Option (With G Thread Plug)

※The drawing shows the released state of TLA-1CL.



Machining Dimensions of Mounting Area



Notes :

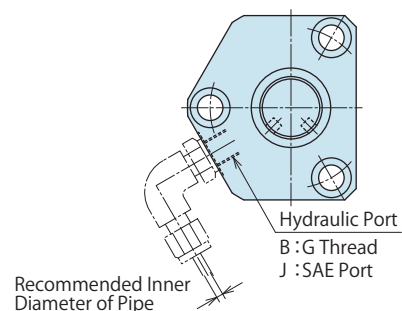
- ※3. CA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.
- ※4. The depth of the body mounting hole φD should be decided according to the mounting height referring to dimension 'F'.
- ※5. The machining dimension is for -C : Gasket option.

Piping Method

B : G Thread Piping Option

J : SAE Port Option

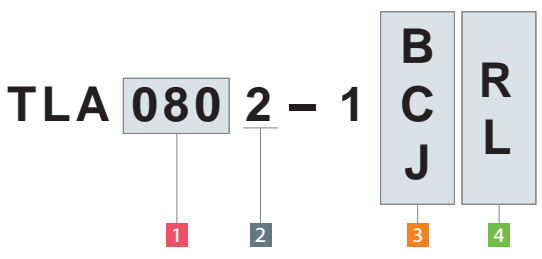
※The drawing shows the released state of TLA-1BL / TLA-1JL.



Notes :

- ※1. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.
- ※2. Speed control valve is sold separately. Please refer to P.947.
 1. Prepare swing lever and lever tightening bolts referring to P.601, P.602.

Model No. Indication



(Format Example : TLA0802-1CR, TLA1602-1BL)

- 1 Body Size (Clamping Force)
- 2 Design No.
- 3 Piping Method
- 4 Swing Direction when Clamping

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

- Hole Clamp
 - SFA
 - SFC

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

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

- Work Support
 - LD
 - LC
 - TNC
 - TC

- Air Sensing Lift Cylinder
 - LLW

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

- Block Cylinder
 - DBA/DBC

- Centering Vise
 - FVA
 - FVD
 - FVC

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

- Pallet Clamp
 - VS/VT

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

- Pull Stud Clamp
 - FP
 - FQ

- Customized Spring Cylinder
 - DWA/DWB

External Dimensions and Machining Dimensions for Mounting

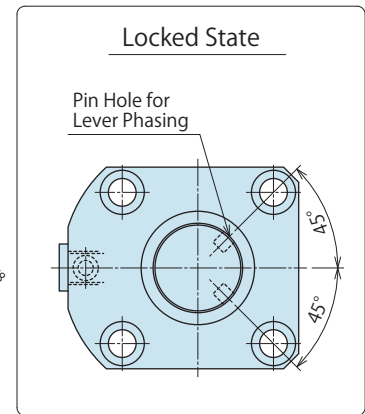
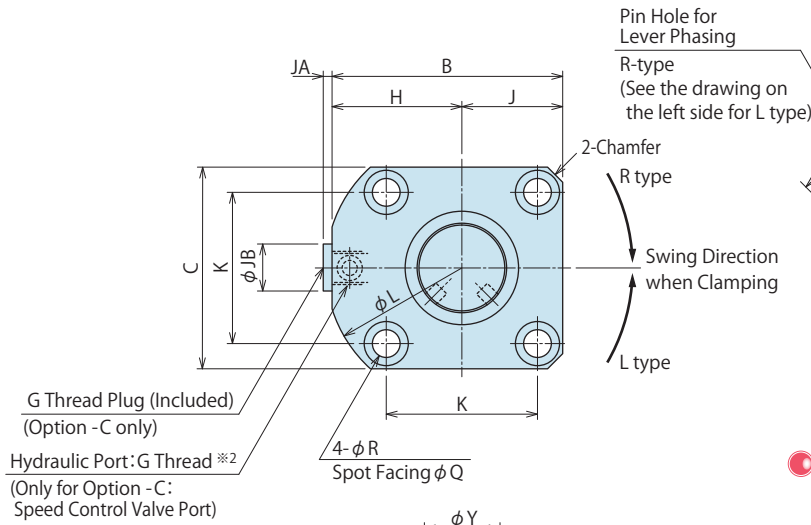
Model No.	TLA0402-1□□	TLA0602-1□□	TLA0802-1□□	TLA1002-1□□	TLA1602-1□□	TLA2002-1□□
Full Stroke	16	17.5	17.5	18.5	22.5	25
Swing Stroke (90°)	8	9.5	7.5	8.5	9.5	12
Vertical Stroke	8	8	10	10	13	13
A	114.5	123	136	149	173.5	194
B	44	48	50.5	59.5	62	76.5
C	45	52	54	65	68	83
D	28.5	33	36	43	46	56
E	77.5	81.5	91.5	98.5	115	127
F	53.5	56.5	66.5	70.5	85	90
Fu	61	66.5	69.5	78.5	88.5	104
G	24	25	25	28	30	37
H	28.5	30	31.5	36.5	38	46.5
J	15.5	18	19	23	24	30
K	40	45	48	57	60	73.5
L	57	60	63	73	76	93
M	10	10	10	10	10	13
Nx	13.5	15	16	18	20	22
Ny	16	17.5	18.5	22	22	28
P	3	3	3	3	3	5
Q	9	11	11	14	14	17.5
R	5.5	6.8	6.8	9	9	11
S	14.5	14	14	14.5	16	19.5
T	18	19.5	19.5	20.5	24.5	27
U	14	16	18	22	25	30
V	19	22	25	30	34	40
W	27.5	30.5	32	35.5	41.5	47
X	9.5	11	12.5	15	17	20
Y	12.5	14	16	19.5	22	26
Z	27	28.5	30	33	35	44
AA	3 ^{+0.014} ₀	4 ^{+0.018} ₀	4 ^{+0.018} ₀	4 ^{+0.018} ₀	4 ^{+0.018} ₀	6 ^{+0.018} ₀
AB	4	4	5	7	8.5	9
AC	3.5	4.5	4.5	4.5	5	6.5
CA (Nominal × Pitch)	M5×0.8	M6×1	M6×1	M8×1.25	M8×1.25	M10×1.5
JA	3	3	3	3	3	3.5
JB	14	14	14	14	14	19
Chamfer	3	(φ60)	(φ63)	(φ73)	(φ76)	(φ93)
Hydraulic Port	Option -B/-C	G1/8	G1/8	G1/8	G1/8	G1/4
	Option -J	SAE2	SAE2	SAE2	SAE2	SAE4
O-ring	Option -C	1BP5	1BP5	1BP5	1BP5	1BP7
Lever Phasing Pin (Included)	φ3×6 (B type)	φ4×8 (B type)	φ4×8 (B type)	φ4×8 (B type)	φ4×8 (B type)	φ6×12 (B type)
Recommended Inner Diameter of Pipe	φ6	φ6	φ6	φ6	φ6	φ8
Lock Cylinder Capacity	cm ³	1.6	2.5	3.5	5.2	15.3
Weight ※6	kg	0.5	0.7	0.9	1.4	3.1

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

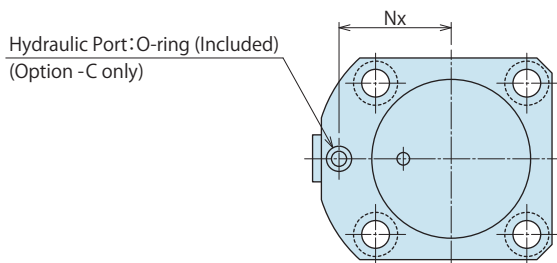
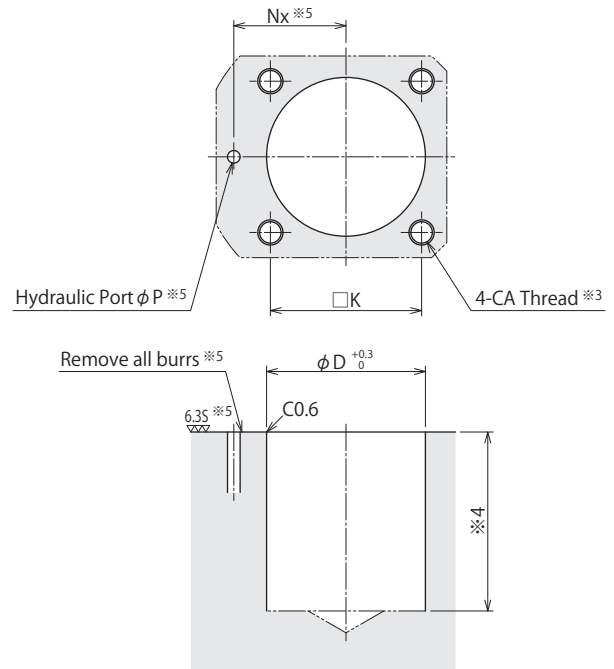
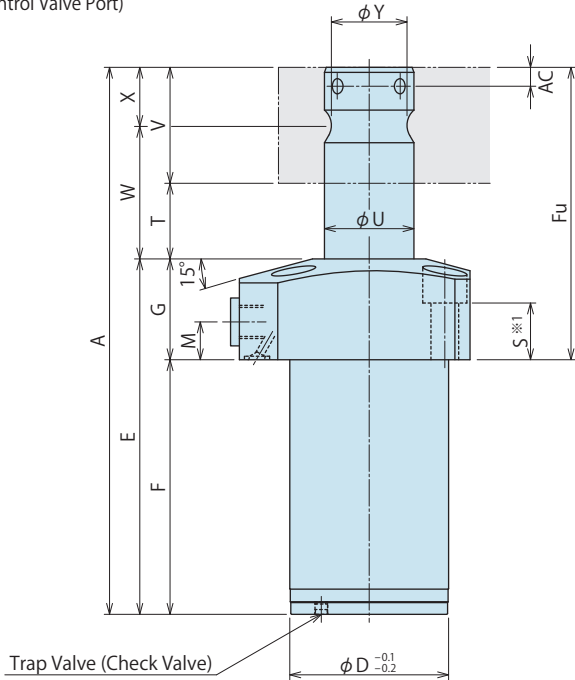
External Dimensions

C : Gasket Option (With G Thread Plug)

※The drawing shows the released state of TLA-1CL.



Machining Dimensions of Mounting Area



Notes :

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

Piping Method

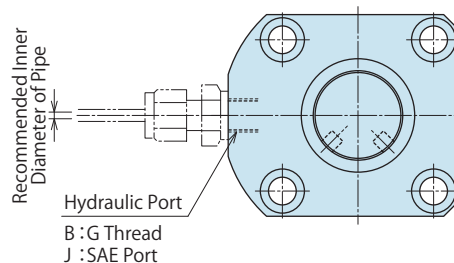
B : G Thread Piping Option

J : SAE Port Option

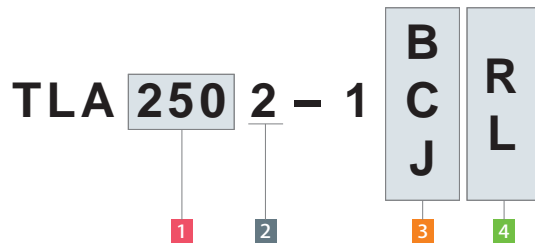
※The drawing shows the released state of TLA-1BL / TLA-1JL.

Notes :

- ※1. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.
- ※2. Speed control valve is sold separately. Please refer to P.947.
 1. Prepare swing lever and lever tightening bolts referring to P.601, P.602.



Model No. Indication



(Format Example : TLA2502-1CR, TLA4002-1BL)

- 1** Body Size (Clamping Force)
- 2** Design No.
- 3** Piping Method
- 4** Swing Direction when Clamping

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	TLA2502-1□□	TLA4002-1□□
Full Stroke	29.5	33
Swing Stroke (90°)	13.5	17
Vertical Stroke	16	16
A	224	254.5
B	92	114
C	80	102
D	63	90
E	146.5	164.5
F	106.5	114.5
Fu	117.5	140
G	40	50
H	52	63
J	40	51
K	60	80
L	108	136
M	15	17
Nx	45	56
P	5	5
Q	17.5	20
R	11	14
S	22.5	27.5
T	31.5	35
U	35.5	45
V	46	55
W	54.5	62.5
X	23	27.5
Y	31	39.5
AA	6 ^{+0.018} ₀	8 ^{+0.022} ₀
AB	11.75	14.5
AC	6.5	9
CA (Nominal × Pitch)	M10×1.5	M12×1.75
JA	3.5	3.5
JB	19	19
Chamfer	(φ 108)	(φ 136)
Hydraulic Port	Option -B/-C	G1/4
	Option -J	SAE4
O-ring	Option -C	1BP7
Lever Phasing Pin (Included)	φ 6×12 (B type)	φ 8×16 (B type)
Recommended Inner Diameter of Pipe	φ 8	φ 8
Lock Cylinder Capacity	cm ³	24.2
Weight ^{※6}	kg	4.5
		9.5

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

High-Power
Series

Pneumatic Series

Hydraulic Series

Valve / Coupler
Hydraulic Unit

Manual Operation
Accessories

Cautions / Others

Hole Clamp

SFA
SFC

Swing Clamp

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

TLA-1

Link Clamp

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

Work Support

LD
LC
TNC
TC

Air Sensing
Lift Cylinder

LLW

Linear Cylinder /
Compact Cylinder

LL
LLR
LLU
DP
DR
DS
DT

Block Cylinder

DBA/DBC

Centering Vise

FVA
FVD
FVC

Control Valve

BZL
BZT
BZX/JZG
BZS

Pallet Clamp

VS/VT

Expansion
Locating Pin

VFL/VFM
VFJ/VFK

Pull Stud Clamp

FP
FQ

Customized
Spring Cylinder

DWA/DWB

● Accessories : Material Swing Lever

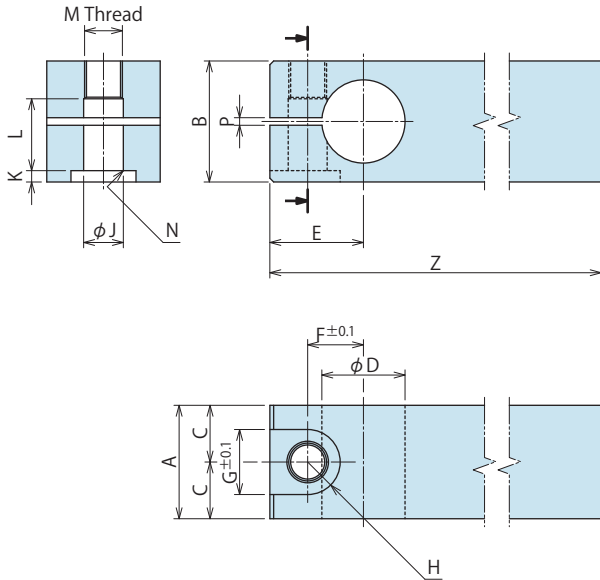
※ When designing a swing lever, please follow the mounting dimensions below. Designing with different dimensions from the following will cause malfunctions including insufficient clamping force, deformation, fluid leakage, and etc.

Model No. Indication

TLZ 080 0 - L2

Size
(Refer to the table.)

Design No.
(Revision Number)



								(mm)
Model No.	TLZ0400-L2	TLZ0600-L2	TLZ0800-L2	TLZ1000-L2	TLZ1600-L2	TLZ2000-L2	TLZ2500-L2	TLZ4000-L2
Corresponding Model No.	TLA0402-1	TLA0602-1	TLA0802-1	TLA1002-1	TLA1602-1	TLA2002-1	TLA2502-1	TLA4002-1
A	19	22	25	30	34	40	46	55
B	22	25	26	32	36	45	53	70
C	9.5	11	12.5	15	17	20	23	27.5
D	14 ⁰ _{-0.016}	16 ⁰ _{-0.016}	18 ⁰ _{-0.016}	22 ⁰ _{-0.020}	25 ⁰ _{-0.020}	30 ⁰ _{-0.020}	35.5 ⁰ _{-0.025}	45 ⁰ _{-0.025}
E	15	18	19	23	26.5	31.5	36.5	46
F	9.25	11	12	14.75	17	20	23.5	29.75
G	11	14	14	17.5	20	23	26	32
H	5.5	7	7	8.75	10	11.5	13	16
J	6.5	8.5	8.5	10.5	12.5	14.5	16.5	21
K	2	3	3	4	4	5	7	9
L	13.5	15.5	16	18	22	26.5	31	42
M	M6×1	M8×1	M8×1	M10×1.25	M12×1.5	M14×1.5	M16×1.5	M20×2
N	C0.4	C0.6	C0.6	C0.6	C1	C1	C1	C1
P	2	2	2	2	2	2	2	2
Z	105	120	145	160	170	175	185	220

Notes :

1. Material : S50CH Surface Finishing : Alkaline Blackening
2. If necessary, the front end should be additionally machined and finished.
3. If lever phasing is required, refer to "Pin Hole for Lever Phasing Additional Machining Dimensions" for additional machining.
4. Lever tightening bolt is sold separately.

● Accessories : Tightening Bolts for Quick Change Lever

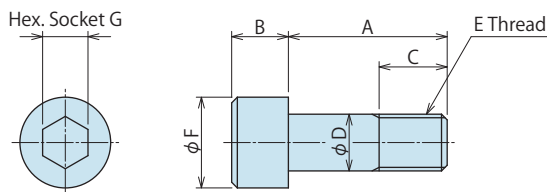
※ When designing the lever tightening bolt, follow the dimensions shown below. Strength Grade should be 12.9 or more.

Model No. Indication

TLZ 080 0 - LB

Size
(Refer to the table.)

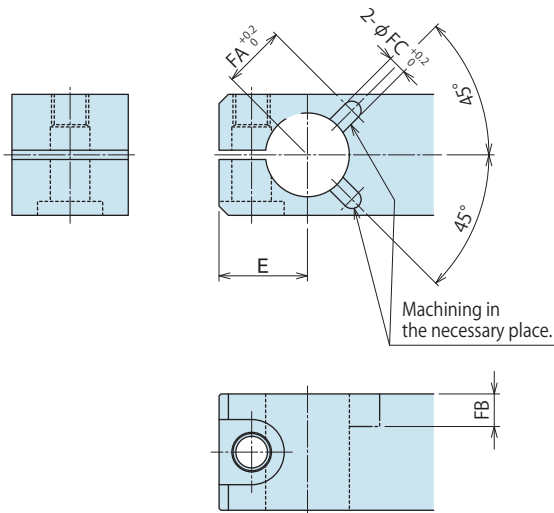
Design No.
(Revision Number)



								(mm)
Model No.	TLZ0400-LB	TLZ0600-LB	TLZ0800-LB	TLZ1000-LB	TLZ1600-LB	TLZ2000-LB	TLZ2500-LB	TLZ4000-LB
Corresponding Model No.	TLA0402-1	TLA0602-1	TLA0802-1	TLA1002-1	TLA1602-1	TLA2002-1	TLA2502-1	TLA4002-1
A	20	22	23	28	32	40	46	61
B	6	8	8	10	12	14	16	20
C	7	9	10	11	13	16	18	23
D	6	8	8	10	12	14	16	20
E	M6×1	M8×1	M8×1	M10×1.25	M12×1.5	M14×1.5	M16×1.5	M20×2
F	10	13	13	16	18	21	24	30
G	5	6	6	8	10	12	14	17

Pin Hole for Lever Phasing Additional Machining Dimensions (Reference)

※ This additional machining matches to TLA□2-1.



Corresponding Lever Model	TLZ0400-L2	TLZ0600-L2	TLZ0800-L2	TLZ1000-L2	TLZ1600-L2	TLZ2000-L2	TLZ2500-L2	TLZ4000-L2
E	15	18	19	23	26.5	31.5	36.5	46
FA	10.5	12.5	13.5	15.5	17	21.5	24.2	31
FB	5.5	7	7	7	7.5	10	10	13.5
FC	3	4	4	4	4	6	6	8

(mm)

Notes :

1. Material : S50CH
2. Machine the pin hole for lever phasing in the necessary place referring to the drawing.

High-Power Series

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others

Hole Clamp

- SFA
- SFC

Swing Clamp

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

Link Clamp

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

Work Support

- LD
- LC
- TNC
- TC

Air Sensing Lift Cylinder

- LLW

Linear Cylinder / Compact Cylinder

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

Block Cylinder

- DBA/DBC

Centering Vise

- FVA
- FVD
- FVC

Control Valve

- BZL
- BZT
- BZX/JZG
- BZS

Pallet Clamp

- VS/VT

Expansion Locating Pin

- VFL/VFM
- VFJ/VFK

Pull Stud Clamp

- FP
- FQ

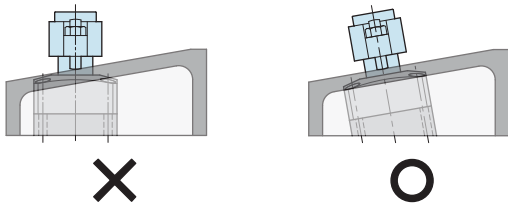
Customized Spring Cylinder

- DWA/DWB

● Cautions

● Notes for Design

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

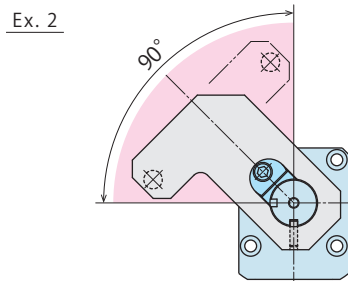
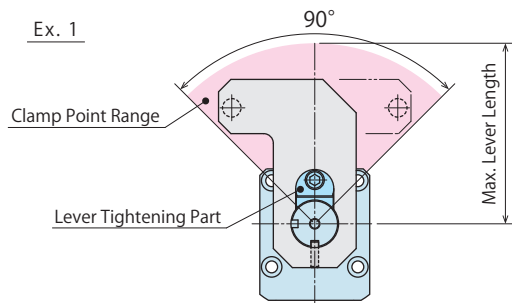


6) Notes for LHA-M/N, LHW

- When using air sensing swing clamp (LHA-M/N, LHW), make sure to check the Notes for Design • Installation • Use (Pages shown below).
 - Swing clamp with air sensing option LHA-M/N : Refer to P.457.
 - Swing clamp with air sensing valve LHW : Refer to P.503.

7) When using an offset lever for Quick Change Lever Option A.

- Clamping point should be in the range of 90° towards lever tightening part.



● Installation Notes

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

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

High-Power
Series

Pneumatic Series

Hydraulic Series

Valve / Coupler
Hydraulic UnitManual Operation
Accessories

Cautions / Others

Hole Clamp

SFA
SFC

Swing Clamp

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

Link Clamp

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

Work Support

LD
LC
TNC
TCAir Sensing
Lift Cylinder

LLW

Linear Cylinder /
Compact CylinderLL
LLR
LLU
DP
DR
DS
DT

Block Cylinder

DBA/DBC

Centering Vise

FVA
FVD
FVC

Control Valve

BZL
BZT
BZX/JZG
BZS

Pallet Clamp

VS/VT

Expansion
Locating PinVFL/VFM
VFJ/VFK

Pull Stud Clamp

FP
FQCustomized
Spring Cylinder

DWA/DWB

3) Installation / Removal of the Swing Lever

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

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

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

LHA-F/LHS-F/LG-F/LT-F : Quick Change Lever Option F,
TLA-2/TLB-2/TLA-1 : Standard

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

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

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

● Cautions

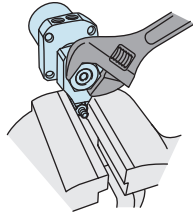
● Installation Notes

● In case of Taper Lock Lever

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

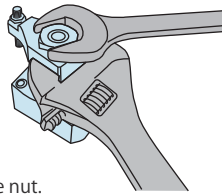
Installation Procedure

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



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

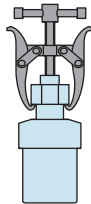
③ If tightening the nut with the clamp positioned to the jig, use a wrench to the hexagon part of piston rod, or fix the lever with a spanner. It is best to bring the lever to the middle of the swing stroke before tightening the nut.



Removal Procedure

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

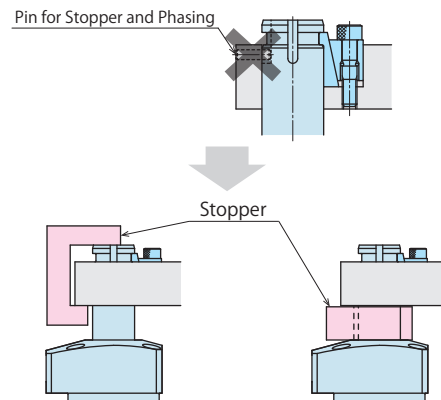
② Loosen the nut after securing the lever two or three turns then remove the lever with a puller without any rotational torque applied on the piston rod.



● In case of Quick Change Lever Option A

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

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

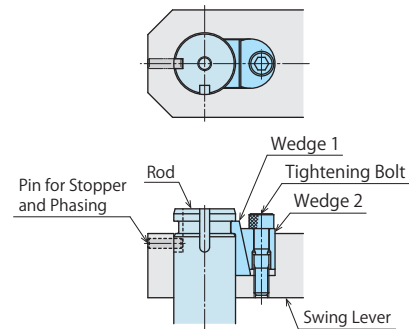


Installation Procedure

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

Removal Procedure

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



4) Swing Speed Adjustment

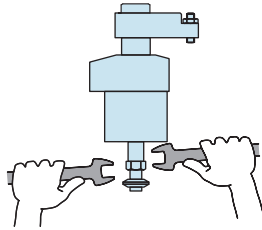
- Adjust the speed following "Allowable Swing Time Graph".
If the clamp operates too fast the parts will be worn out leading to premature damage and ultimately complete equipment failure.
- Please make sure to release air from the circuit before adjusting speed. It will be difficult to adjust the speed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

5) Checking Looseness and Retightening

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

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

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



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

High-Power Series

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others

Hole Clamp

- SFA
- SFC

Swing Clamp

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

Link Clamp

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

Work Support

- LD
- LC
- TNC
- TC

Air Sensing Lift Cylinder

- LLW

Linear Cylinder / Compact Cylinder

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

Block Cylinder

- DBA/DBC

Centering Vise

- FVA
- FVD
- FVC

Control Valve

- BZL
- BZT
- BZX/JZG
- BZS

Pallet Clamp

- VS/VT

Expansion Locating Pin

- VFL/VFM
- VFJ/VFK

Pull Stud Clamp

- FP
- FQ

Customized Spring Cylinder

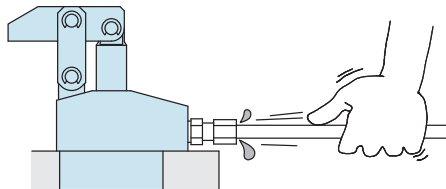
- DWA/DWB

※ 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

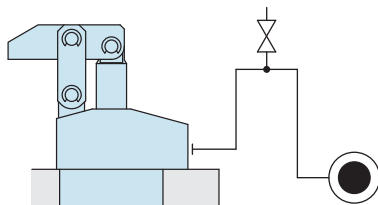
● Cautions

● 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

Maker	ISO Viscosity Grade ISO-VG-32	
	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.

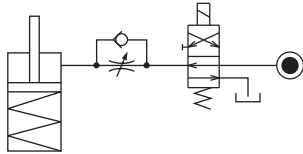
● Notes on Hydraulic Cylinder Speed Control Unit



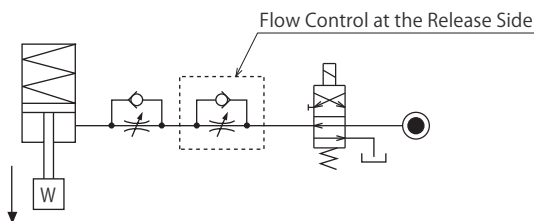
Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

● 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

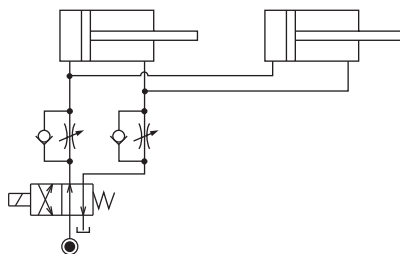
Flow control circuit for double acting cylinder should have meter-out circuits for both the lock and release sides. Meter-in control can have adverse effect by presence of air in the system.

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

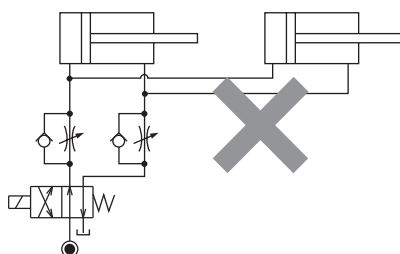
Refer to P.75 for speed adjustment of LKE.

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)

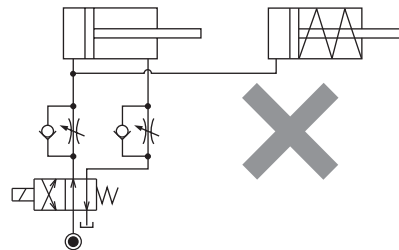


【Meter-in Circuit】 (LKE/TMA/TLA must be controlled with meter-in.)



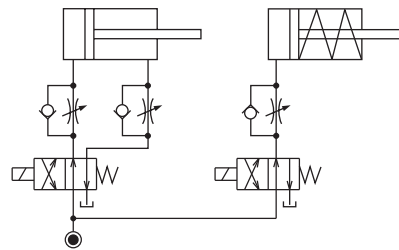
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

- 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.

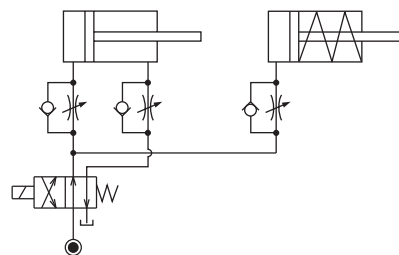


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

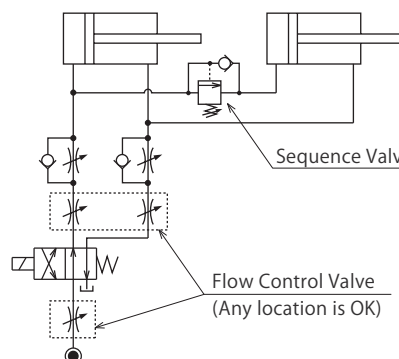
- Separate the control circuit.



- 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.



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

Cautions

- Installation Notes (For Hydraulic Series)
- Hydraulic Fluid List
- Notes on Hydraulic Cylinder Speed Control Circuit
- Notes on Handling
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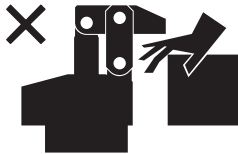
- Search by
- Alphabetical Order

Sales Offices

ⓘ Cautions

● Notes on Handling

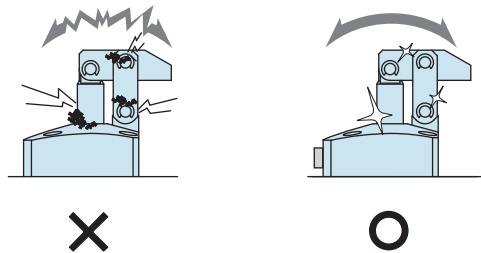
- 1) It should be operated by qualified personnel.
 - The hydraulic machine and air compressor should be operated and maintained by qualified personnel.
- 2) Do not operate or remove the product unless the safety protocols are ensured.
 - ① The machine and equipment can only be inspected or prepared 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.



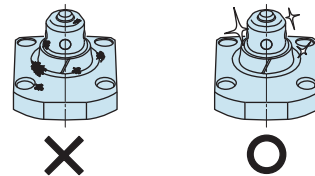
- 4) Do not disassemble or modify.
 - If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

● 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.

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Sales Offices



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 T: +49 (7584) 9238883
 F: +49 (7584) 9238887
 kosmek@wahltec.de
 www.wahltec.de

Control Valve

Model BZL

Model BZT

Model BZX

Model JZG

Model BZS

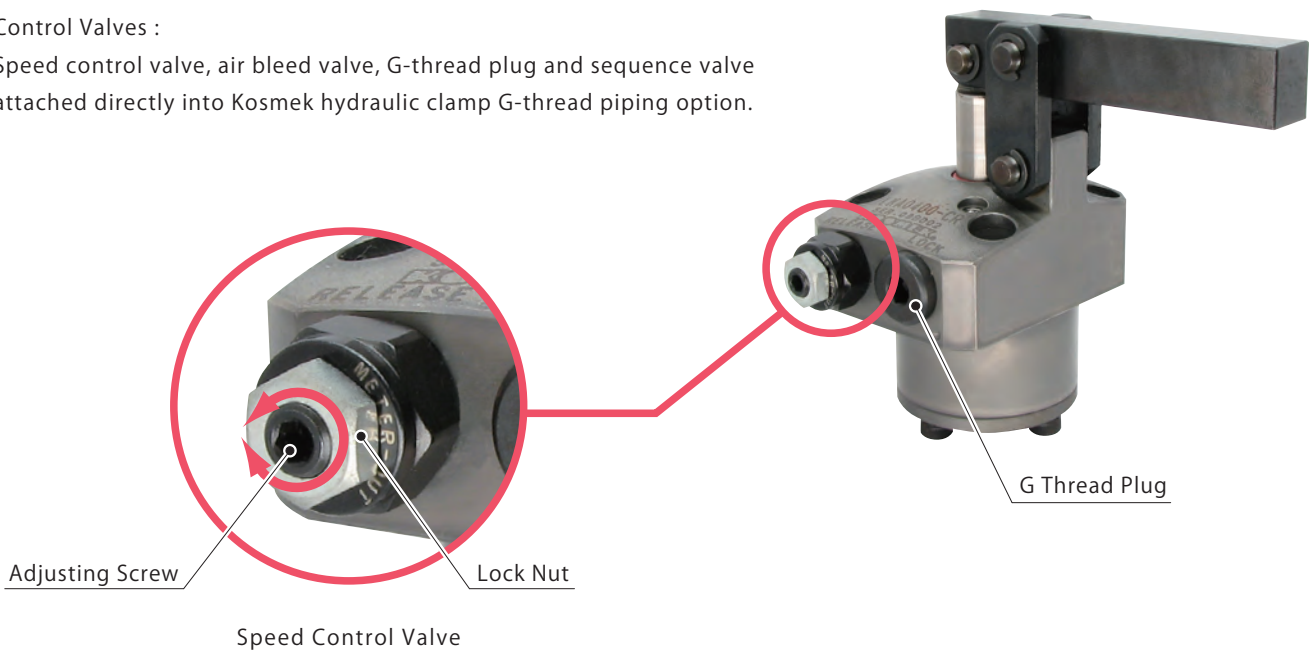


Directly-Attached Speed Control Valve, Air Bleed Valve, G-Thread Plug and Sequence Valve

- Directly Attached to Clamps

Control Valves :

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



Speed Control Valve

Model BZL
Model BZT



Air Bleed Valve

Model BZX




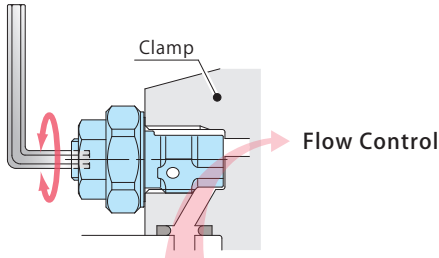
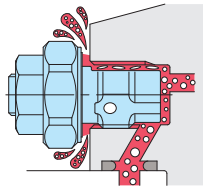

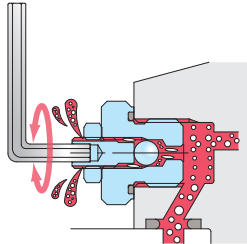

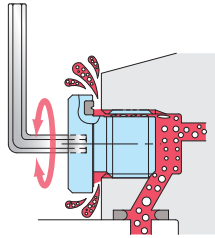

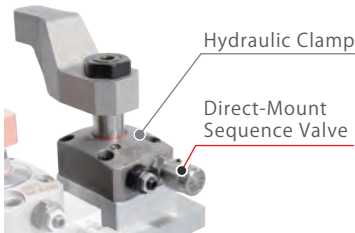
G Thread Plug

Model JZG



Direct-Mount Sequence Valve

Model BZS

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

- High-Power Series
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- Hole Clamp
 - SFA
 - SFC

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

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

- Work Support
 - LD
 - LC
 - TNC
 - TC

- Air Sensing Lift Cylinder
 - LLW

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

- Block Cylinder
 - DBA/DBC

- Centering Vise
 - FVA
 - FVD
 - FVC

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

- Pallet Clamp
 - VS/VT

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

- Pull Stud Clamp
 - FP
 - FQ

- Customized Spring Cylinder
 - DWA/DWB

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

BZT 0 **10** **1** - **A**

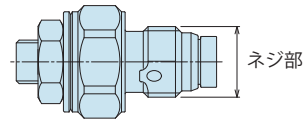
1 2 3



1 G Thread Size

10 : Thread Part G1/8A Thread

20 : Thread Part G1/4A Thread



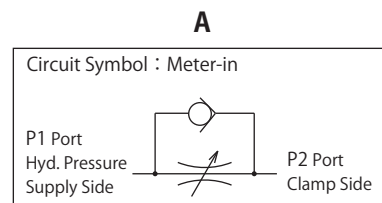
2 Design No.

1 : Revision Number

3 Control Method

A : Meter-in

※ Meter-out option is not available for BZT.



Specifications

Model No.	BZT0101-A	BZT0201-A
Max. Operating Pressure MPa	35	
Min. Operating Pressure MPa	10	
Control Method	Meter-in	
G Thread Size	G1/8A	G1/4A
Cracking Pressure MPa	0.04	
Max. Passage Area mm ²	2.6	5.0
Usable Fluid	General Hydraulic Oil Equivalent to ISO-VG-32	
Operating Temperature °C	0 ~ 70	
Tightening Torque for Main Body N·m	10	25
Weight g	12	26

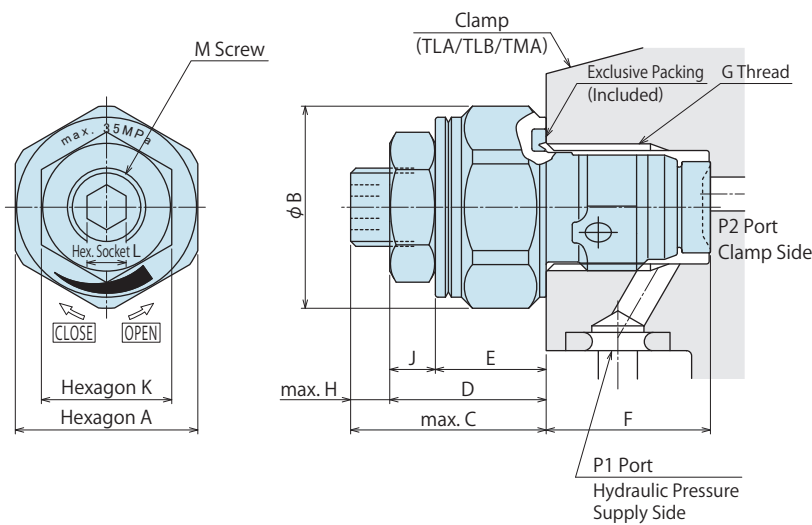
- Notes :
1. It must be mounted with recommended torque. Because of the structure of the metal seal, if mounting torque is insufficient, the flow control valve may not be able to adjust the flow rate.
 2. Do not attach a used BZT to other clamps.
Flow control will not be made because the bottom depth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

Applicable Products

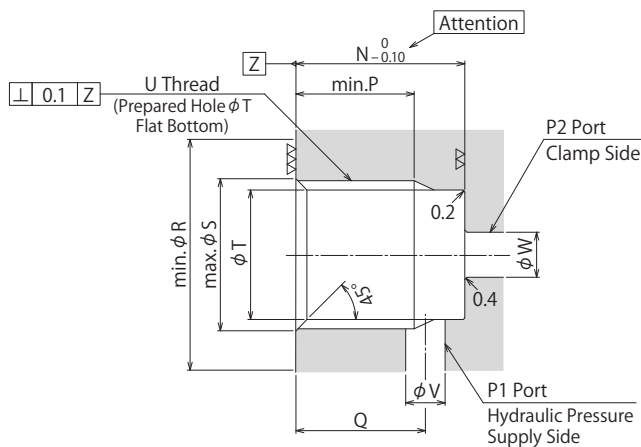
Model	TLA-2 (Double Action) Swing Clamp	TLB-2 (Double Action) Swing Clamp	TLA-1 (Single Action) Swing Clamp	TMA-2 (Double Action) Link Clamp	TMA-1 (Single Action) Link Clamp
BZT0101-A	TLA0801-2C□□	TLB0801-2C□□	TLA0802-1C□	TMA0250-2C□	TMA0250-1C□
	TLA1001-2C□□	TLB1001-2C□□	TLA1002-1C□	TMA0400-2C□	TMA0400-1C□
	TLA1601-2C□□	TLB1601-2C□□	TLA1602-1C□	TMA0600-2C□	TMA0600-1C□
				TMA1000-2C□	TMA1000-1C□
BZT0201-A	TLA2001-2C□□	TLB2001-2C□□	TLA2002-1C□	TMA1600-2C□	TMA1600-1C□
	TLA2501-2C□□	TLB2501-2C□□	TLA2502-1C□	TMA2500-2C□	TMA2500-1C□
	TLA4001-2C□□	TLB4001-2C□□	TLA4002-1C□	TMA3200-2C□	TMA3200-1C□

- Notes :
1. It is not recommended to use BZT for TL□040□ / TL□060□ since they have small cylinder capacity and it is difficult to adjust the speed.
 2. In case of controlling TMA, TLA, both lock side and release side should be meter-in circuit.
If meter-out circuit is used, abnormal high pressure is created, which causes oil leakage and damage.

External Dimensions



Machining Dimensions of Mounting Area



Model No.	(mm)	
	BZT0101-A	BZT0201-A
A	14	18
B	15.5	20
C	15	16
D	12	13
E	8.5	9.5
F	(12.6)	(16.1)
G	G1/8	G1/4
H	3	3
J	3.5	3.5
K	10	10
L	3	3
M (Nominal×Pitch)	M6×0.75	M6×0.75
N	12.5	16
P	8.5	11
Q	9.5	12
R	16	20.5
S	10	13.5
T	8.7	11.5
U	G1/8	G1/4
V	2.5 ~ 3.5	3.5 ~ 4.5
W	2.5 ~ 5	3.5 ~ 7

Notes :

1. Since the $\nabla\nabla\nabla$ area is sealing part, be careful not to damage it.
2. Since the $\nabla\nabla$ 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.

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.)
3. When the cylinder capacity is small, the speed of flow may not be controlled properly. (Recommended Cylinder Capacity : 3cm³ or more)

High-Power
Series

Pneumatic Series

Hydraulic Series

Valve / Coupler
Hydraulic UnitManual Operation
Accessories

Cautions / Others

Hole Clamp

SFA
SFC

Swing Clamp

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

Link Clamp

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

Work Support

LD
LC
TNC
TCAir Sensing
Lift Cylinder

LLW

Linear Cylinder /
Compact CylinderLL
LLR
LLU
DP
DR
DS
DT

Block Cylinder

DBA/DBC

Centering Vise

FVA
FVD
FVC

Control Valve

BZL
BZT
BZX/JZG
BZS

Pallet Clamp

VS/VT

Expansion
Locating PinVFL/VFM
VFJ/VFK

Pull Stud Clamp

FP
FQCustomized
Spring Cylinder

DWA/DWB

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

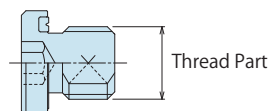
JZG0 1 0

1 2



1 G Thread Size

- 1 : Thread Part G1/8A Thread
- 2 : Thread Part G1/4A Thread
- 3 : Thread Part G3/8A Thread



2 Design No.

- 0 : Revision Number

● Specifications

Model No.	JZG010	JZG020	JZG030	
Max. Operating Pressure	MPa 35			
Withstanding Pressure	MPa 42			
G Thread Size	G1/8A	G1/4A	G3/8A	
Usable Fluid	General Hydraulic Oil Equivalent to ISO-VG-32			
Operating Temperature	°C 0 ~ 70			
Tightening Torque 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

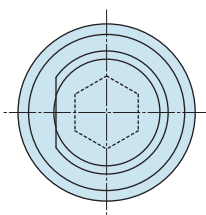
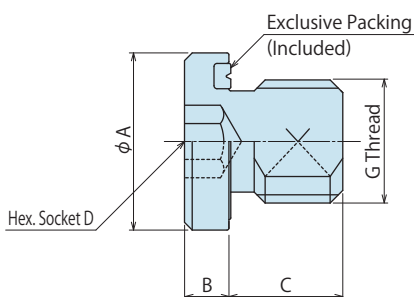
Model No.	DBA (Double Action) Block Cylinder	DBC (Double Action) Block Cylinder	FVA (Double Action) Centering Vise	FVC (Double Action) Centering Vise	FVD (Double Action) Centering Vise			
JZG010	DBA0250-C□□	DBC0250-C□□	FVA0401	FVC0630	FVD1600			
	DBA0320-C□□	DBC0320-C□□	FVA0631		FVD2500			
JZG020	DBA0400-C□□	DBC0400-C□□		FVC1000	FVD4000			
	DBA0500-C□□	DBC0500-C□□		FVC1600				

Model No.	LC (Single Action) Work Support	LHA (Double Action) Swing Clamp	LHC (Double Action) Swing Clamp	LHE (Double Action) High-Power Swing Clamp	LHS (Double Action) Swing Clamp	LHW (Double Action) Swing Clamp	LT (Single Action) Swing Clamp	LG (Single Action) Swing Clamp
JZG010	LC0262-C□□	LHA0360-C□□□	LHC0360-C□□□	LHE0300-C□□	LHS0360-C□□□	LHW040□-C□□□	LT0301-C□□□	LG0301-C□□□
	LC0302-C□□	LHA0400-C□□□	LHC0400-C□□□	LHE0360-C□□	LHS0400-C□□□	LHW048□-C□□□	LT036□-C□□□	LG036□-C□□□
	LC0362-C□□	LHA0480-C□□□	LHC0480-C□□□	LHE0400-C□□	LHS0480-C□□□	LHW055□-C□□□	LT040□-C□□□	LG040□-C□□□
	LC0402-C□□□	LHA0550-C□□□	LHC0550-C□□□	LHE0480-C□□	LHS0550-C□□□		LT048□-C□□□	LG048□-C□□□
	LC0482-C□□□			LHE0550-C□□			LT055□-C□□□	LG055□-C□□□
	LC0552-C□□□							
LC0652-C□□□								
JZG020	LC0752-C□□□	LHA0650-C□□□	LHC0650-C□□□		LHS0650-C□□□	LHW065□-C□□□	LT065□-C□□□	LG065□-C□□□
	LC0902-C□□□	LHA0750-C□□□			LHS0750-C□□□	LHW0751-C□□□	LT075□-C□□□	LG075□-C□□□
JZG030		LHA0900-C□□□			LHS0900-C□□□			LG090□-C□□□
		LHA1050-C□□□			LHS1050-C□□□			LG105□-C□□□

Model No.	LKA (Double Action) Link Clamp	LKC (Double Action) Link Clamp	LKE (Double Action) High-Power Link Clamp	LKW (Double Action) Link Clamp	LM (Single Action) Link Clamp	LJ (Single Action) Link Clamp	LL (Double Action) Linear Cylinder	LLR (Double Action) Linear Cylinder
JZG010	LKA0360-C□□□	LKC0400-C□□□	LKE0300-C□□	LKW040□-C□□□	LM0300-C□□	LJ0302-C□□	LL0360-C□□□	LLR0360-C□□□
	LKA0400-C□□□	LKC0480-C□□□	LKE0360-C□□	LKW048□-C□□□	LM0360-C□□	LJ0362-C□□	LL0400-C□□□	LLR0400-C□□□
	LKA0480-C□□□	LKC0550-C□□□	LKE0400-C□□	LKW055□-C□□□	LM0400-C□□	LJ0402-C□□	LL0480-C□□□	LLR0480-C□□□
	LKA0550-C□□□		LKE0480-C□□		LM0480-C□□	LJ0482-C□□	LL0550-C□□□	LLR0550-C□□□
			LKE0550-C□□		LM0550-C□□	LJ0552-C□□		
JZG020	LKA0650-C□□□	LKC0650-C□□□		LKW065□-C□□□	LM0650-C□□	LJ0652-C□□	LL0650-C□□□	LLR0650-C□□□
	LKA0750-C□□□			LKW0751-C□□□	LM0750-C□□	LJ0752-C□□	LL0750-C□□□	LLR0750-C□□□
JZG030	LKA0900-C□□□					LJ0902-C□□	LL0900-C□□□	LLR0900-C□□□
	LKA1050-C□□□					LJ1052-C□□	LL1050-C□□□	LLR1050-C□□□

Model No.	LLW (Double Action) Lift Cylinder	TLA-2 (Double Action) Swing Clamp	TLB-2 (Double Action) Swing Clamp	TLA-1 (Single Action) Swing Clamp	TMA-2 (Double Action) Link Clamp	TMA-1 (Double Action) Link Clamp
JZG010	LLW036□-C□□□	TLA0401-2C□□	TLB0401-2C□□	TLA0402-1C□	TMA0250-2C□	TMA0250-1C□
	LLW040□-C□□□	TLA0601-2C□□	TLB0601-2C□□	TLA0602-1C□	TMA0400-2C□	TMA0400-1C□
	LLW048□-C□□□	TLA0801-2C□□	TLB0801-2C□□	TLA0802-1C□	TMA0600-2C□	TMA0600-1C□
		TLA1001-2C□□	TLB1001-2C□□	TLA1002-1C□	TMA1000-2C□	TMA1000-1C□
JZG020		TLA1601-2C□□	TLB1601-2C□□	TLA1602-1C□		
		TLA2001-2C□□	TLB2001-2C□□	TLA2002-1C□	TMA1600-2C□	TMA1600-1C□
		TLA2501-2C□□	TLB2501-2C□□	TLA2502-1C□	TMA2500-2C□	TMA2500-1C□
	TLA4001-2C□□	TLB4001-2C□□	TLA4002-1C□	TMA3200-2C□	TMA3200-1C□	

External Dimensions



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

High-Power
Series

Pneumatic Series

Hydraulic Series

Valve / Coupler
Hydraulic UnitManual Operation
Accessories

Cautions / Others

Hole Clamp

SFA

SFC

Swing Clamp

LHA

LHC

LHS

LHW

LG/LT

TLA-2

TLB-2

TLA-1

Link Clamp

LKA

LKC

LKW

LJ/LM

TMA-2

TMA-1

Work Support

LD

LC

TNC

TC

Air Sensing

Lift Cylinder

LLW

Linear Cylinder /

Compact Cylinder

LL

LLR

LLU

DP

DR

DS

DT

Block Cylinder

DBA/DBC

Centering Vise

FVA

FVD

FVC

Control Valve

BZL

BZT

BZX/JZG

BZS

Pallet Clamp

VS/VT

Expansion

Locating Pin

VFL/VFM

VFJ/VFK

Pull Stud Clamp

FP

FQ

Customized

Spring Cylinder

DWA/DWB

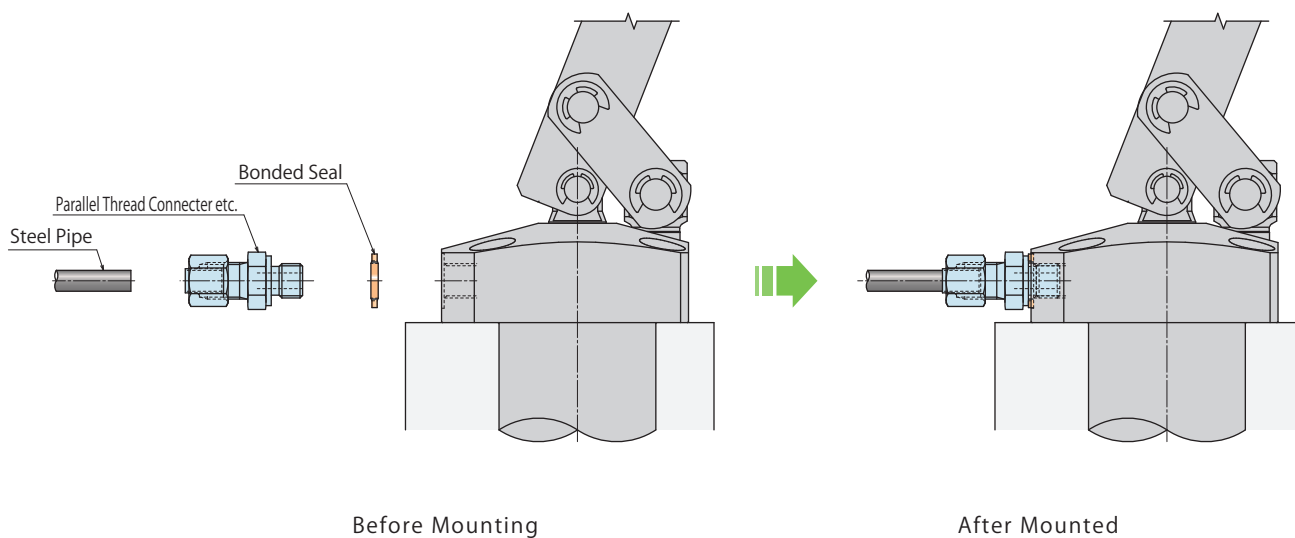
G-Thread Fitting



The products on this section are made by Ihara Science Corp.

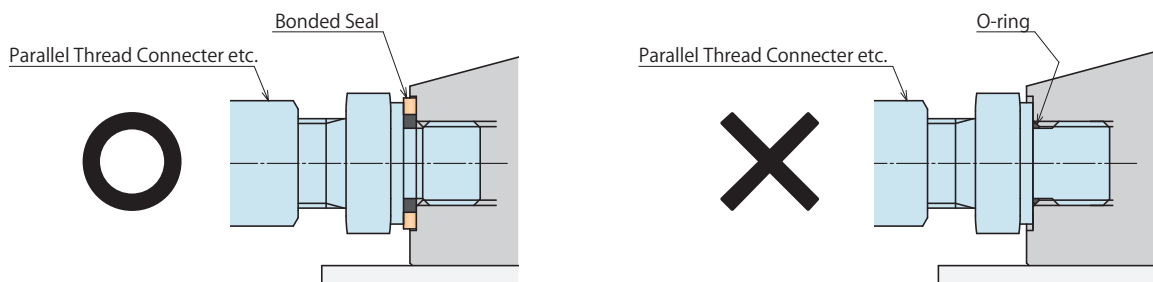
※ Appearance and specifications may be different due to the specification change made by the manufacturer.

Installataion



Note :

※ Please put bonded seal between clamp and parallel connector etc (fitting) for sealing G thread with our clamp.
It cannot be used in models with O-rings seal type.



Please put bonded seal between clamp and parallel connector etc (fitting).

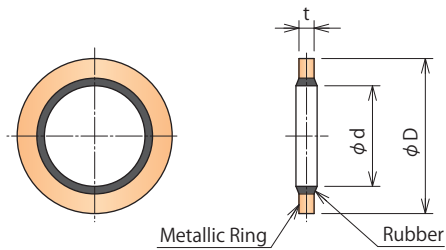
It cannot be used in models with O-rings seal type.

Bonded Seal

Model No. Indication

9UKP0C000 1

G Thread Size
(Refer to the following table.)



(mm)

Model No.	9UKP0C0001	9UKP0C0002	9UKP0C0003
Applicable Thread	G1/8	G1/4	G3/8
d	9.9	13.3	16.8
D	17	20.5	24
t	2	2	2

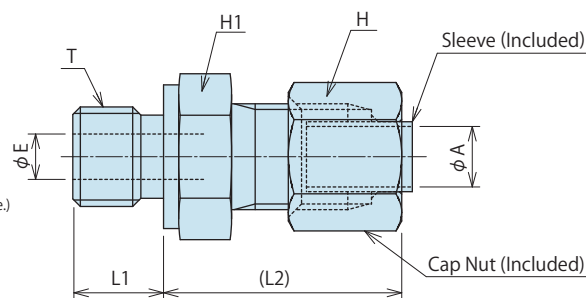
Note : 1. Rubber material is NBR, metallic ring is SPCC of JWG3141 (Cold pressure deferred steel sheet) used as standard specification. (Operating temperature -20°~120°C)

Parallel Thread Connector

Model No. Indication

9UKC0 06 0 1 E

G Thread Size
(Refer to the following table.)
Applicable Pipe External Diameter
(Refer to the following table.)



(mm)

Model No.	9UKC00601E	9UKC00801E	9UKC00602E	9UKC00802E	9UKC01203E
Applicable Pipe External Diameter φA	6	8	6	8	12
Applicable Thread T	G1/8	G1/8	G1/4	G1/4	G3/8
E	4	4	4	6	8
Hexagon Opposite Side H1	14	17	19	19	22
Hexagon Opposite Side H	14	17	14	17	22
L1	8	8	12	12	12
Tighten by Hand (L2)	(30.5)	(30.5)	(31.5)	(31.5)	(33.5)
Weight (kg)	0.030	0.042	0.048	0.053	0.087

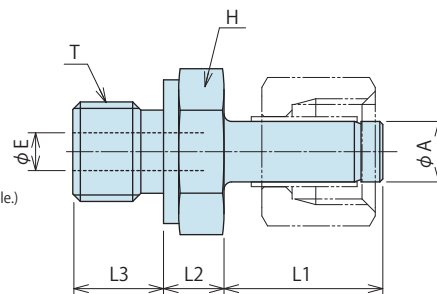
Note : 1. Bonded seal is not included to this product. Please prepare separately.

Parallel Thread Adapter

Model No. Indication

9UKHB 06 0 1 E

G Thread Size
(Refer to the following table.)
Applicable Pipe External Diameter
(Refer to the following table.)



(mm)

Model No.	9UKHB0601E	9UKHB0802E	9UKHB1203E
Applicable Pipe External Diameter φA	6	8	12
Applicable Thread T	G1/8	G1/4	G3/8
E	3	5	8
Hexagon Opposite Side H	14	19	22
L1	21	21	22.5
L2	7	8	9.5
L3	8	12	12
Weight (kg)	0.016	0.033	0.051

Note : 1. Bonded seal is not included to this product. Please prepare separately.

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

Screw Locator

VXF/VXE

Manual Expansion Locating Pin

VX

Manifold Block

WHZ-MD

LZY-MD

LZ-MS

LZ-MP

TMZ-1MB

TMZ-2MB

DZ-M

Manifold Block / Nut

DZ-R

DZ-C

DZ-P

DZ-B

LZ-S

LZ-SQ

WNZ-SQ

TNZ-S

TNZ-SQ

Pressure Switch

JBA

Pressure Gauge

JGA/JGB

Manifold

JX

Coupler Switch

PS

G-Thread Fitting

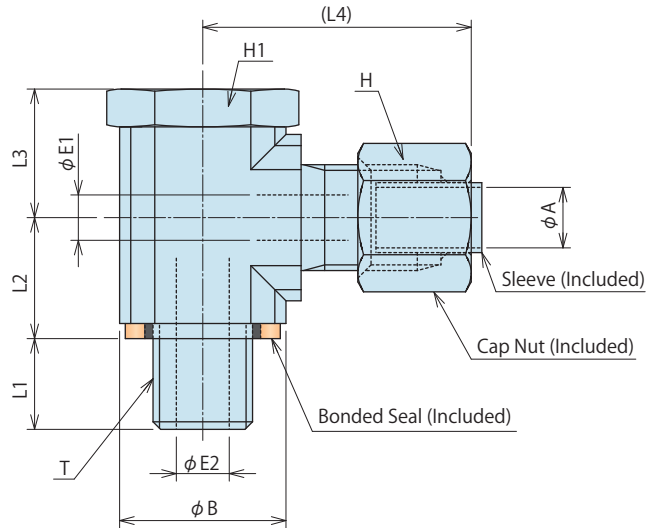
Stud Elbow Fitting

Model No. Indication

9UKMB 06 0 1 E

G Thread Size
(Refer to the following table.)
Applicable Pipe External Diameter
(Refer to the following table.)

Model No.	9UKMB0601E	9UKMB0802E	9UKMB1203E
Applicable Pipe External Diam. ϕA	6	8	12
Applicable Thread T	G1/8	G1/4	G3/8
E1	4	6	10
E2	4	7	9
Hexagon Opposite Side H1	17	22	27
Hexagon Opposite Side H	14	17	22
L1	8	12	12
L2	13	16	19
L3	14	17	22
Tighten by Hand (L4)	(33.5)	(35.5)	(40.5)
Weight (kg)	0.078	0.127	0.232



Note: 1. Do not use it as an alternative one of swivel fitting to make a turn.

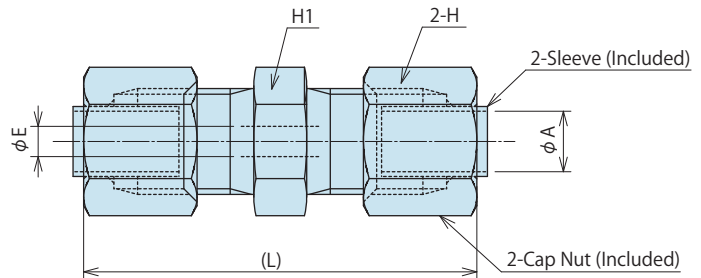
Union Fitting

Model No. Indication

9UKUA 06 00E

Applicable Pipe External Diameter
(Refer to the following table.)

Model No.	9UKUA0600E	9UKUA0800E	9UKUA1200E
Pipe External Diam. ϕA	6	8	12
E	4	6	10
Hex. Opposite Side H1	14	17	19
Hex. Opposite Side H	14	17	22
Tighten by Hand (L)	(51)	(52)	(54)
Weight (kg)	0.042	0.059	0.093



Union Fitting (Elbow)

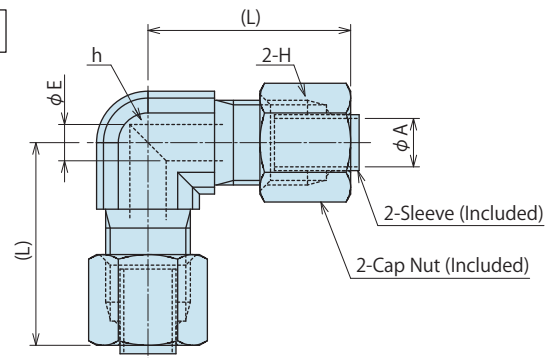
Model No. Indication

9UKLA 06 00E

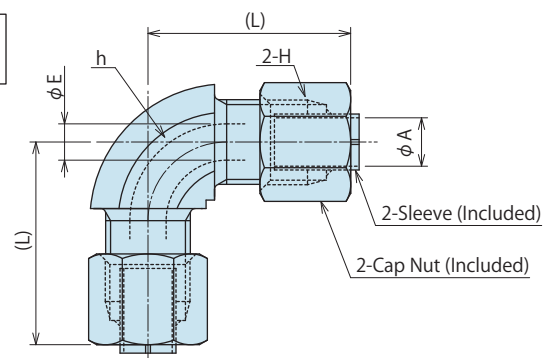
Applicable Pipe External Diameter
(Refer to the following table.)

Model No.	9UKLA0600E	9UKLA0800E	9UKLA1200E
Pipe External Diam. ϕA	6	8	12
E	4	6	10
Width across Flats h	14	17	19
Hex. Opposite Side H	14	17	22
Tighten by Hand (L)	(30.5)	(33.5)	(35.5)
Weight (kg)	0.048	0.081	0.116

9UKLA0600E



9UKLA0800E
9UKLA1200E



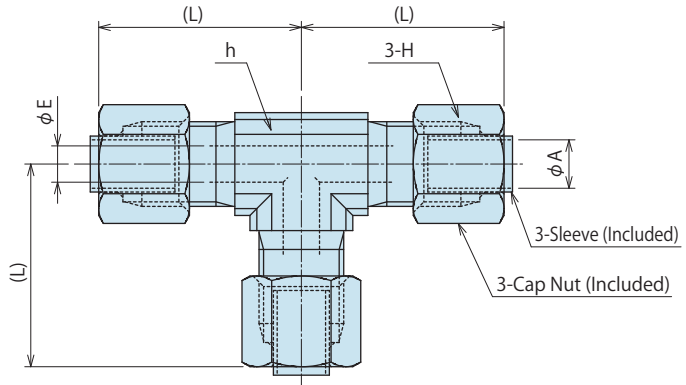
Union Fitting (Tee-Union Fitting)

Model No. Indication

9UKTA 06 00E

Applicable Pipe External Diameter.
(Refer to the following table.)

Model No.	9UKTA0600E	9UKTA0800E	9UKTA1200E
Applicable Pipe External Diam. ϕA	6	8	12
E	4	6	10
Width across Flats h	14	17	19
Hexagon Opposite Side H	14	17	22
Tighten by Hand (L)	(30.5)	(33.5)	(35.5)
Weight (kg)	0.069	0.122	0.172

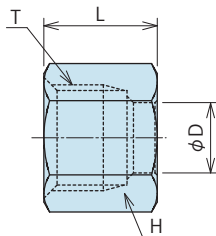


Cap Nut

Model No. Indication

9UKKN 06 00E

Applicable Pipe External Diameter.
(Refer to the following table.)



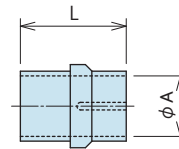
Model No.	9UKKN0600E	9UKKN0800E	9UKKN1200E
Applicable Pipe External Diam. ϕA	6	8	12
D	7.3	9.3	13.3
T	M12 \times 1.5	M14 \times 1.5	M18 \times 1.5
Hexagon Opposite Side H	14	17	22
L	15	15	16
Weight (kg)	0.010	0.015	0.026

Sleeve

Model No. Indication

9UKK0 06 00E

Applicable Pipe External Diameter.
(Refer to the following table.)



Model No.	9UKK00600E	9UKK00800E	9UKK01200E
Applicable Pipe External Diam. ϕA	6	8	12
L	14	14	15
Weight (kg)	0.002	0.003	0.004

High-Power Series

Pneumatic Series

Hydraulic Series

Valve / Coupler Hydraulic Unit

Manual Operation Accessories

Cautions / Others

Screw Locator

VXF/VXE

Manual Expansion Locating Pin

VX

Manifold Block

WHZ-MD

LZY-MD

LZ-MS

LZ-MP

TMZ-1MB

TMZ-2MB

DZ-M

Manifold Block / Nut

DZ-R

DZ-C

DZ-P

DZ-B

LZ-S

LZ-SQ

WNZ-SQ

TNZ-S

TNZ-SQ

Pressure Switch

JBA

Pressure Gauge

JGA/JGB

Manifold

JX

Coupler Switch

PS

G-Thread Fitting

Sales Offices

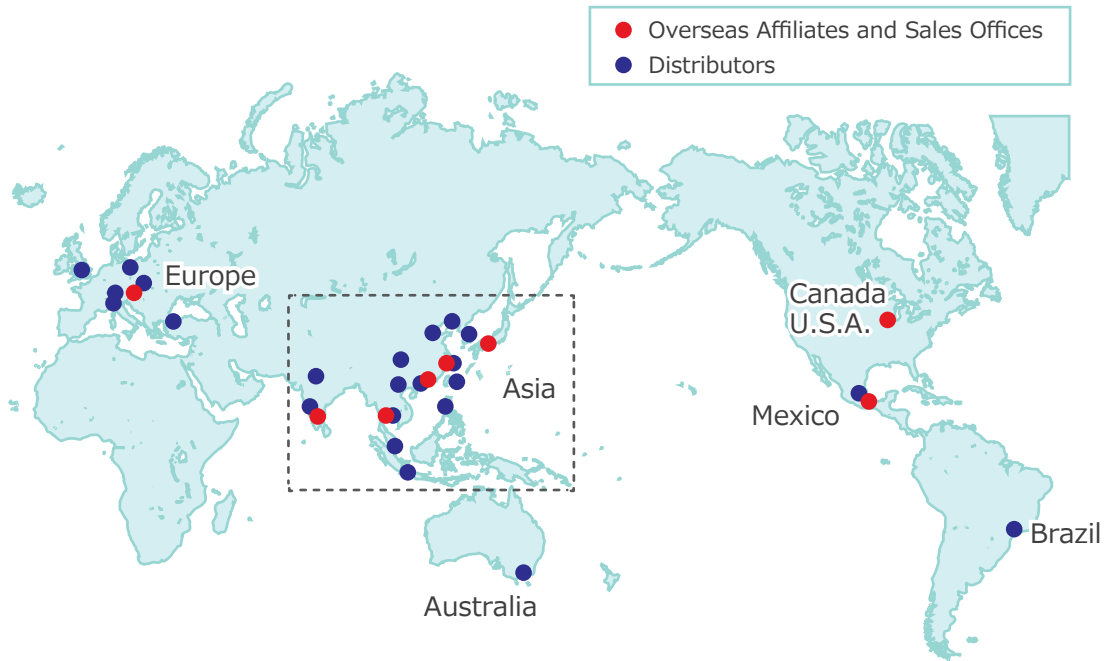
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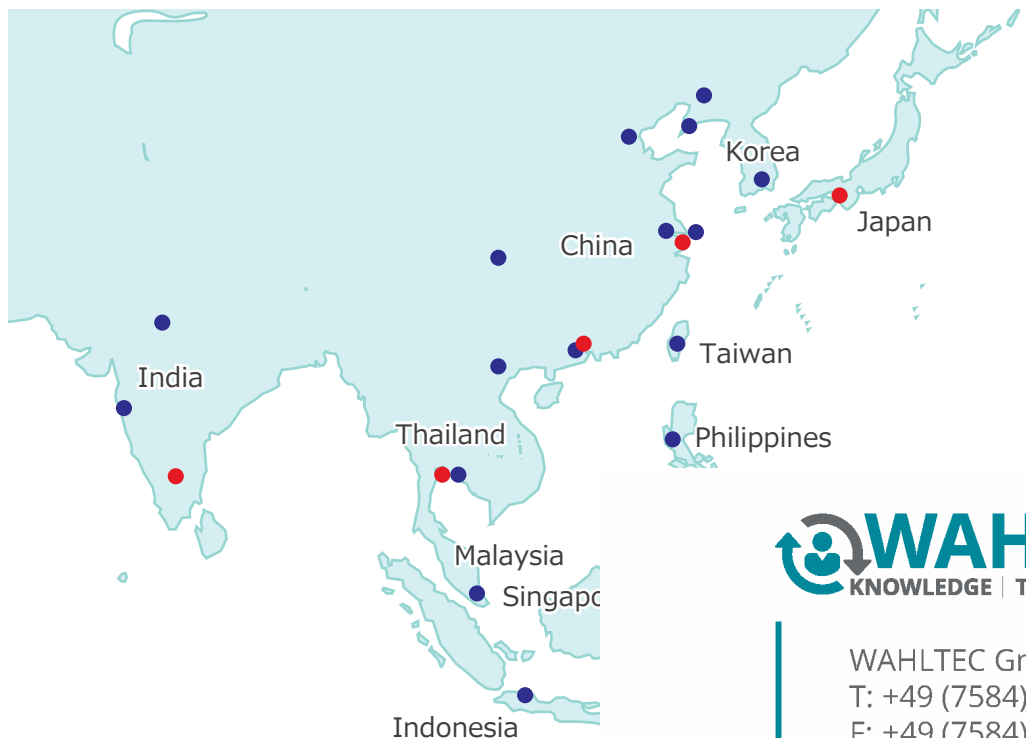
Sales Offices in Japan

Head Office Osaka Sales Office Overseas Sales	TEL. 078-991-5162	FAX. 078-991-8787
	〒651-2241 兵庫県神戸市西区室谷2丁目1番5号	
Tokyo Sales Office	TEL. 048-652-8839	FAX. 048-652-8828
	〒331-0815 埼玉県さいたま市北区大成町4丁目81番地	
Nagoya Sales Office	TEL. 0566-74-8778	FAX. 0566-74-8808
	〒446-0076 愛知県安城市美園町2丁目10番地1	
Fukuoka Sales Office	TEL. 092-433-0424	FAX. 092-433-0426
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Global Network



Asia Detailed Map



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