

Hydraulic Swing Clamp

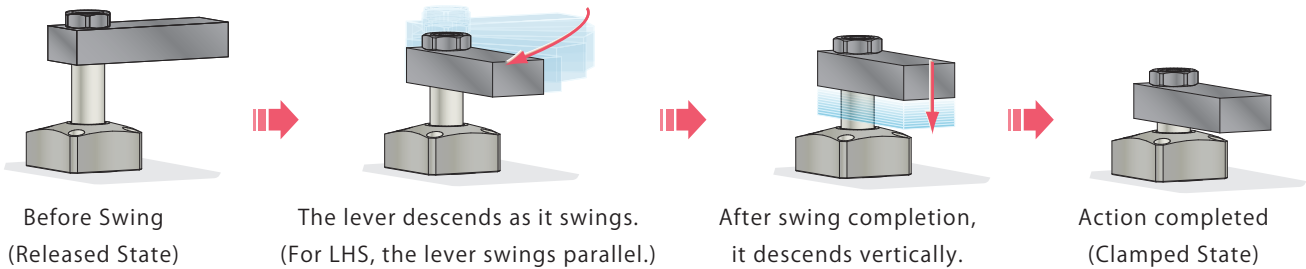
- | | |
|-----------|-------------|
| Model LHA | Model LT/LG |
| Model LHC | Model TLA-2 |
| Model LHS | Model TLA-1 |
| Model LHW | Model TLB-2 |



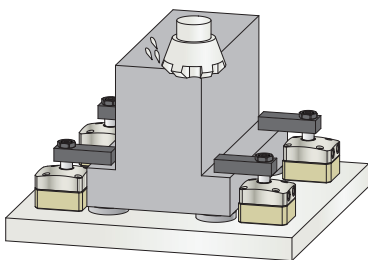
High Rigidity • Long Life • High Accuracy

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

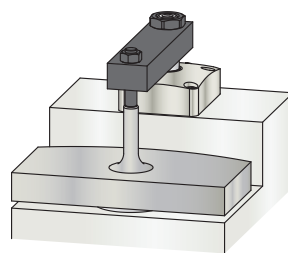
Action Description



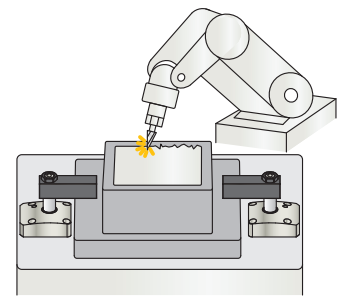
Application Examples



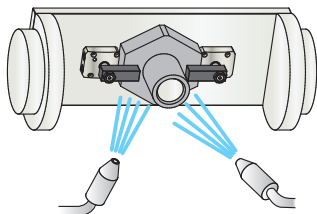
Machining



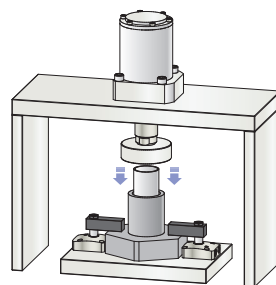
For the applications which require clamp position repeatability



Deburring

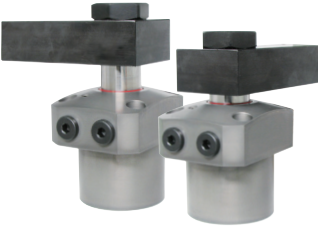


Cleaning



Press Fitting

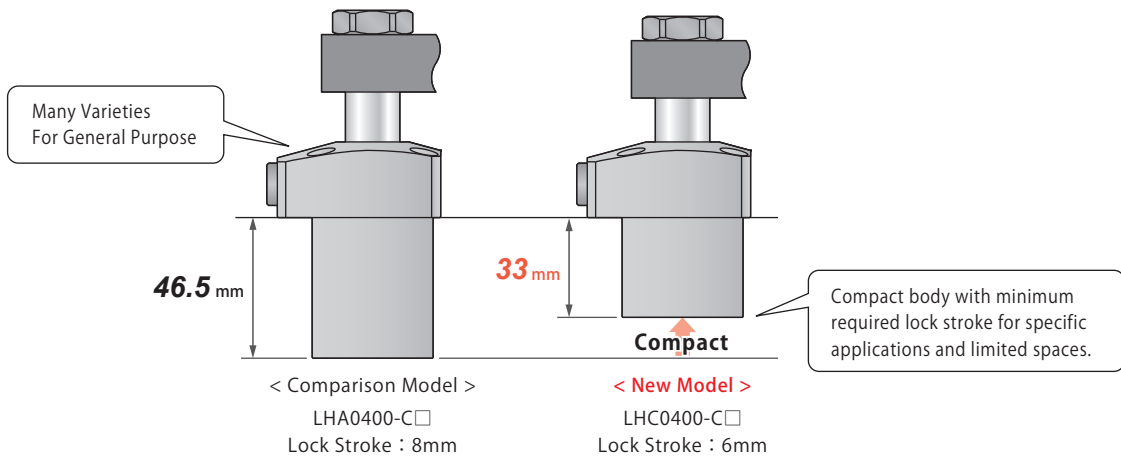
New Products



Compact Swing Clamp

Model LHC

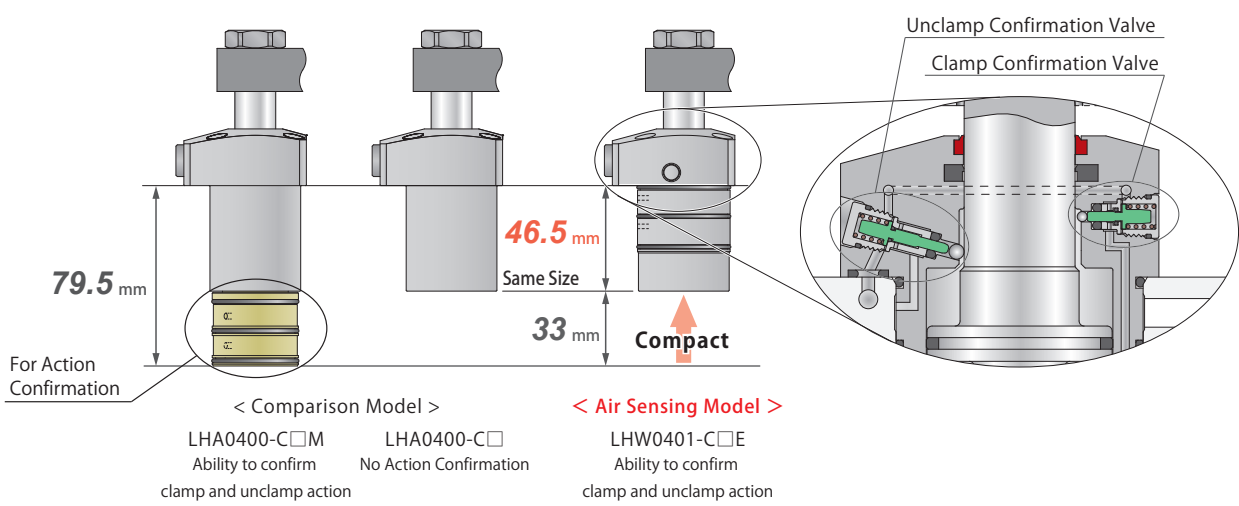
Compact swing clamps for small footprint fixtures designed with minimum required stroke.



Air Sensing Swing Clamp

Model LHW

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
















High-Power Swing Clamp Hydraulic Double Action

Model LHE





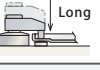
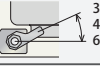



2 sizes smaller with equivalent clamping force. Mechanical lock and hydraulic pressure allow for strong clamping and holding force. Refer to P. 13 for further information.













- 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
 - LT/LG
 - TLA-2
 - TLB-2
 - TLA-1
- Link Clamp
 - LKA
 - LKC
 - LKW
 - LM/LJ
 - TMA-2
 - TMA-1
- Work Support
 - LD
 - LC
 - TNC
 - TC
- Air Sensing Lift Cylinder
 - LLW
- Compact Cylinder
 - LL
 - LLR
 - LLU
 - DP
 - DR
 - DS
 - DT
- Block Cylinder
 - DBA
 - DBC
- Control Valve
 - BZL
 - BZT
 - BZX/JZG
- Pallet Clamp
 - VS
 - VT
- Expansion Locating Pin
 - VL
 - VM
 - VJ
 - VK
- Pull Stud Clamp
 - FP
 - FQ
- Customized Spring Cylinder
 - DWA/DWB

<h2>Low Pressure Model</h2> <p>MAX. 7MPa</p>				
		Model LHA → P.289	Model LHC → P.319	Model LHS → P.331
Classification		Double Action	Double Action Compact	Double Action Parallel Swing Action
Operating Pressure Range		1.5~7MPa	1.5~7MPa	1.5~7MPa
Standard Model		External Dimensions → P.297	External Dimensions → P.327	External Dimensions → P.339
Action Confirmation	Double End Rod Option for Dog 	External Dimensions → P.299	—	★
	Air Sensing Manifold Option 	External Dimensions → P.301	—	★
	Air Sensing Piping Option 	External Dimensions → P.303	—	★
	Built-in Sensing Valve Model	—	—	—
Option	Quick Change Lever Option 	External Dimensions → P.305	★	External Dimensions → P.341
	Balance Lever Option 	External Dimensions → P.307	★	External Dimensions → P.343
	Long Stroke Option 	External Dimensions → P.309	—	★
	Swing Angle Selectable Option 	External Dimensions → P.313	★	External Dimensions → P.345
Accessories	Lever 	LZH-T, LZH-F, LZH-B → P.318	LZH-T → P.330	LZH-T, LZH-F, LZH-B → P.348
	Manifold Block 	LZY-MD		→ P.1025
	Speed Control Valve Plug 	BZL, BZX, JZG		→ P.727

※ Please contact us for detail dimension at ★ part.

<h2>High Pressure Model</h2> <p>MAX. 35MPa</p>				
		Model TLA-2 → P.387	Model TLB-2 → P.413	Model TLA-1 → P.431
Classification		Double Action Top Flange	Double Action Bottom Flange	Single Action (Spring Release) Top Flange
Operating Pressure Range		7~35MPa	7~35MPa	7~35MPa
Standard Model		External Dimensions → P.395	External Dimensions → P.421	External Dimensions → P.439
Option	Balance Lever Option 	External Dimensions → P.399	External Dimensions → P.423	—
	Long Stroke Option 	External Dimensions → P.403	External Dimensions → P.425	—
	Swing Angle Selectable Option 	External Dimensions → P.407	External Dimensions → P.427	—
Accessories	Lever 	TLZ-L2, TLZ-LB → P.412	TLZ-L2, TLZ-LB → P.429	TLZ-L2, TLZ-LB → P.443
	Speed Control Valve Plug 	BZT, JZG		→ P.727
	G-Thread Fitting 	G-Thread Fitting (Made by Ihara Science)		→ P.1039

Low Pressure Model MAX. 7MPa		 Model LHW → P.349	 Model LT/LG → P.367
Classification		Double Action Built-in Sensing Valve	Single Action (Spring Release)
Operating Pressure Range		1.5~7MPa	2.5~7MPa
Standard Model		—	External Dimensions → P.375
Action Confirmation	Double End Rod Option for Dog  Able to Install Dog	—	—
	Air Sensing Manifold Option 	—	—
	Air Sensing Piping Option  Able to Install Air Sensor	—	—
	Built-in Sensing Valve Model	External Dimensions → P.359	—
Option	Quick Change Lever Option 	★	External Dimensions → P.377
	Balance Lever Option 	★	External Dimensions → P.379
	Long Stroke Option  Long	—	—
	Swing Angle Selectable Option  30° 45° 60°	★	External Dimensions → P.381
Accessories	Lever 	LZH-T → P.366	LZ-LE1、LZ-LE2 LZH-F、LZH-B → P.384
	Manifold Block 	—	LZ-MS → P.1026
	Speed Control Valve Plug 	BZL、BZX、JZG	→ P.727



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. 13 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
LT/LG
TLA-2
TLB-2
TLA-1

Link Clamp

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

Work Support

LD
LC
TNC
TC

Air Sensing Lift Cylinder

LLW

Compact Cylinder

LL
LLR
LLU
DP
DR
DS
DT

Block Cylinder

DBA
DBC

Control Valve

BZL
BZT
BZX/JZG

Pallet Clamp

VS
VT

Expansion Locating Pin

VL
VM
VJ
VK

Pull Stud Clamp

FP
FQ

Customized Spring Cylinder

DWA/DWB

Hydraulic Double Action Swing Clamp

Model TLA-2

High Pressure (7~35MPa)

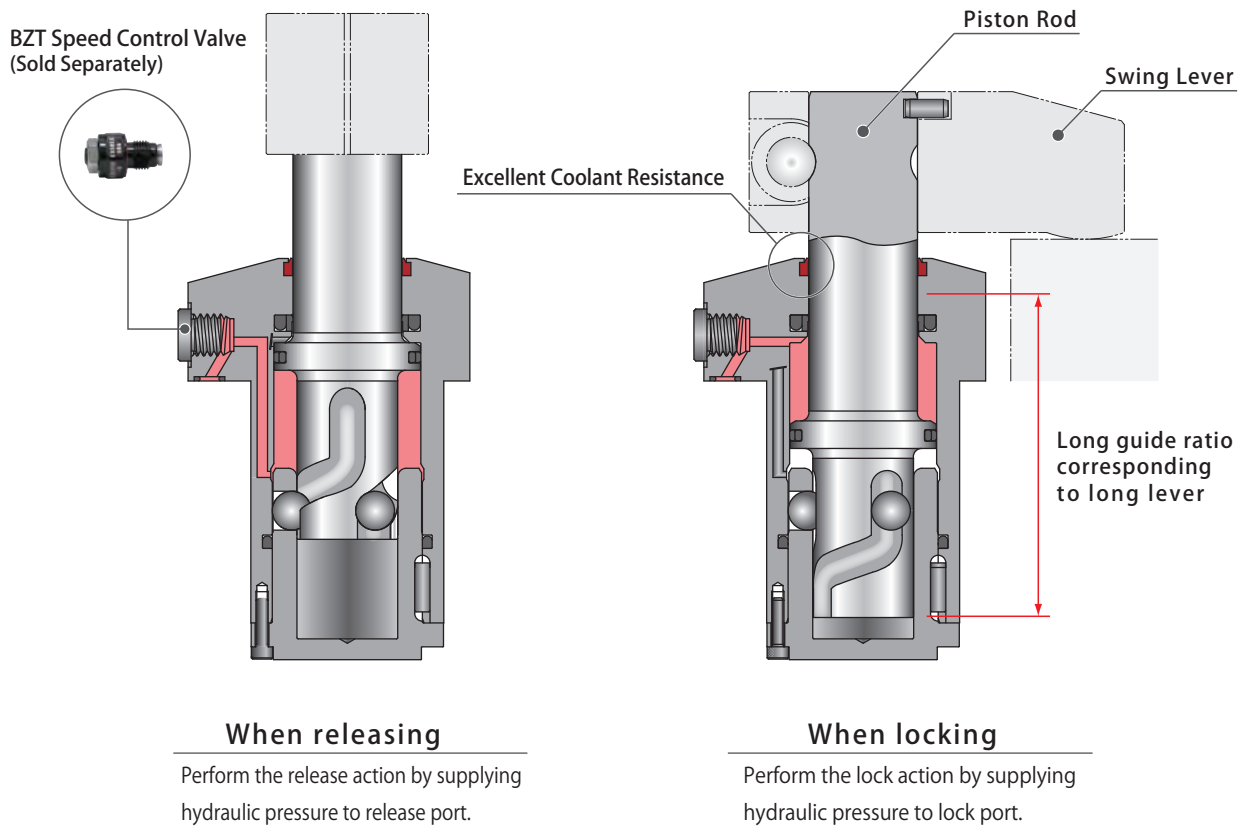
Top Flange



Index

Hydraulic Swing Clamp Digest	P.285
Action Description	P.388
Model No. Indication	P.389
Specifications	P.390
Performance Curve	
• Clamping Force Curve	P.391
• Allowable Swing Time Graph	P.393
External Dimensions	
• Top Flange/ Standard Model (TLA-2)	P.395
• Top Flange / Balance Lever Option (TLA-2-P)	P.399
• Top Flange / Long Stroke Option (TLA-2-Q)	P.403
• Top Flange / Swing Angle Selectable Option (TLA-2-Y□)	P.407
Lever Design Dimensions	P.411
Accessories	
• Material Swing Lever for TLA	P.411
• Speed Control Valve•Plug	P.727
Cautions	
• Notes for Hydraulic Swing Clamps	P.445
• Cautions (Common)	P.1043
• Installation Notes	
• Hydraulic Fluid List	
• Notes on Hydraulic Cylinder Speed Control Circuit	
• Notes on Handling	
• Maintenance/Inspection	
• Warranty	

Action Description

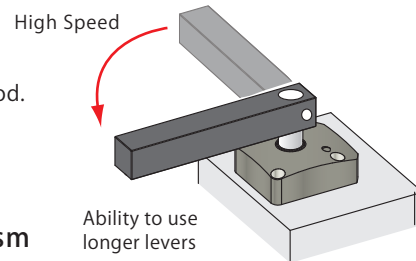


• Able to Use Longer Levers

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

LT/LG

TLA-2

TLB-2

TLA-1

Link Clamp

LKA

LKC

LKW

LM/LJ

TMA-2

TMA-1

Work Support

LD

LC

TNC

TC

Air Sensing Lift Cylinder

LLW

Compact Cylinder

LL

LLR

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Block Cylinder

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Pallet Clamp

VS

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Expansion Locating Pin

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Pull Stud Clamp

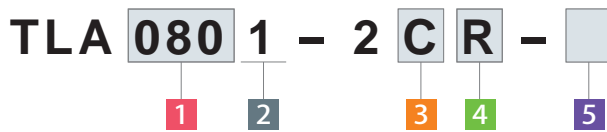
FP

FQ

Customized Spring Cylinder

DWA/DWB

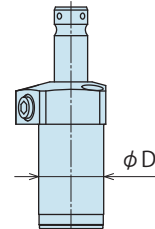
Model No. Indication



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.



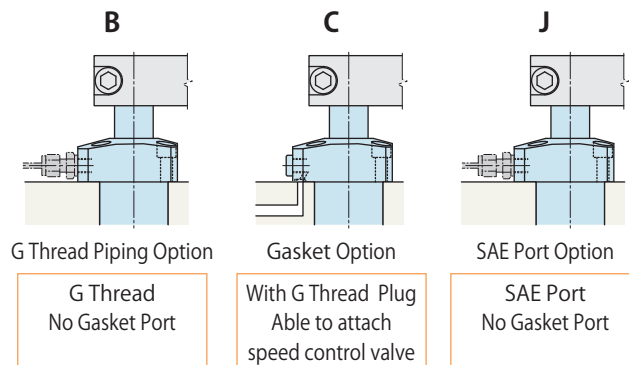
2 Design No.

1 : Revision Number

3 Piping Method

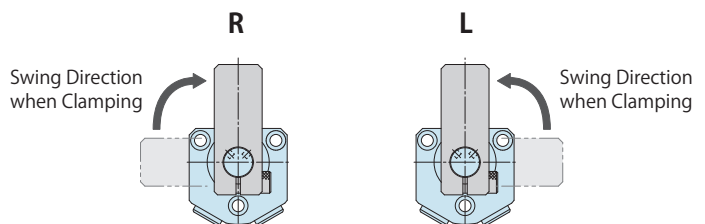
- B** : G Thread Piping Option (No Gasket Port)
- C** : Gasket Option (With G Thread Plug)
- J** : SAE Port Option (No Gasket Port)

※ Speed control valve (BZT) is sold separately.
Refer to P.727.



4 Swing Direction when Clamping

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



5 Option

- Blank** : None (Standard: Quick Change Lever Option)
- P** : Balance Lever Option
- Q** : Long Stroke Option
- Y□** : Swing Angle Selectable Option
(**Y30** : 30° / **Y45** : 45° / **Y60** : 60°)

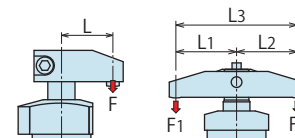


Specifications

Model No.	TLA0401-2□□-□			TLA0601-2□□-□			TLA0801-2□□-□			TLA1001-2□□-□																															
Cylinder Area for Locking	cm ²			1.005			1.453			1.979			2.804																												
Clamping Force (Calculation Formula) ^{※1} kN	5	Blank/Q/Y□ selected			$F = \frac{P}{10.94+0.036 \times L}$			$F = \frac{P}{7.57+0.024 \times L}$			$F = \frac{P}{5.53+0.0147 \times L}$			$F = \frac{P}{3.91+0.0094 \times L}$																											
		P selected			$F_1 = (L_2/L_3) \times 0.101 \times P$ $F_2 = (L_1/L_3) \times 0.101 \times P$			$F_1 = (L_2/L_3) \times 0.145 \times P$ $F_2 = (L_1/L_3) \times 0.145 \times P$			$F_1 = (L_2/L_3) \times 0.198 \times P$ $F_2 = (L_1/L_3) \times 0.198 \times P$			$F_1 = (L_2/L_3) \times 0.280 \times P$ $F_2 = (L_1/L_3) \times 0.280 \times P$																											
5	Blank/P selected	Full Stroke	mm			14			15			18			19.5																										
		Swing Stroke (90°)	mm			6			7			8			9.5																										
		Vertical Stroke	mm			8			8			10			10																										
		Swing Angle Accuracy	90° ±3°																																						
		Swing Completion Position Repeatability	±0.5°																																						
5	Q selected	Full Stroke	mm			22			23			28			29.5																										
		Swing Stroke (90°)	mm			6			7			8			9.5																										
		Vertical Stroke	mm			16			16			20			20																										
		Swing Angle Accuracy	90° ±3°																																						
		Swing Completion Position Repeatability	±0.5°																																						
5	Y□ selected	Option	Y30	Y45	Y60	Y30	Y45	Y60	Y30	Y45	Y60	Y30	Y45	Y60																											
		Full Stroke	mm			11.7			12.3			12.9			12.2			12.9			13.6			14.9			15.7			16.5			15.7			16.7			17.6		
		Swing Stroke (90°)	mm			3.7			4.3			4.9			4.2			4.9			5.6			4.9			5.7			6.5			5.7			6.7			7.6		
		Vertical Stroke	mm			8			8			8			8			8			8			10			10			10			10			10			10		
		Swing Angle Accuracy	30° ±3°			45° ±3°			60° ±3°			30° ±3°			45° ±3°			60° ±3°			30° ±3°			45° ±3°			60° ±3°			30° ±3°			45° ±3°			60° ±3°					
Swing Completion Position Repeatability	±0.5°																																								
Max. Operating Pressure	MPa			35.0																																					
Min. Operating Pressure ^{※2}	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.	TLA1601-2□□-□			TLA2001-2□□-□			TLA2501-2□□-□			TLA4001-2□□-□																															
Cylinder Area for Locking	cm ²			4.170			6.134			8.198			12.37																												
Clamping Force (Calculation Formula) ^{※1} kN	5	Blank/Q/Y□ selected			$F = \frac{P}{2.59+0.0046 \times L}$			$F = \frac{P}{1.76+0.0028 \times L}$			$F = \frac{P}{1.32+0.0018 \times L}$			$F = \frac{P}{0.87+0.0011 \times L}$																											
		P selected			$F_1 = (L_2/L_3) \times 0.417 \times P$ $F_2 = (L_1/L_3) \times 0.417 \times P$			$F_1 = (L_2/L_3) \times 0.613 \times P$ $F_2 = (L_1/L_3) \times 0.613 \times P$			$F_1 = (L_2/L_3) \times 0.820 \times P$ $F_2 = (L_1/L_3) \times 0.820 \times P$			$F_1 = (L_2/L_3) \times 1.237 \times P$ $F_2 = (L_1/L_3) \times 1.237 \times P$																											
5	Blank/P selected	Full Stroke	mm			24			26.5			32			35.5																										
		Swing Stroke (90°)	mm			11			13.5			16			19.5																										
		Vertical Stroke	mm			13			13			16			16																										
		Swing Angle Accuracy	90° ±3°																																						
		Swing Completion Position Repeatability	±0.5°																																						
5	Q selected	Full Stroke	mm			36			38.5			48			51.5																										
		Swing Stroke (90°)	mm			11			13.5			16			19.5																										
		Vertical Stroke	mm			25			25			32			32																										
		Swing Angle Accuracy	90° ±3°																																						
		Swing Completion Position Repeatability	±0.5°																																						
5	Y□ selected	Option	Y30	Y45	Y60	Y30	Y45	Y60	Y30	Y45	Y60	Y30	Y45	Y60																											
		Full Stroke	mm			19.5			20.6			21.7			21.2			22.6			23.9			26.1			27.6			29.0			27.6			29.5			31.5		
		Swing Stroke (90°)	mm			6.5			7.6			8.7			8.2			9.6			10.9			10.1			11.6			13.0			11.6			13.5			15.5		
		Vertical Stroke	mm			13			13			13			13			13			13			16			16			16			16			16					
		Swing Angle Accuracy	30° ±3°			45° ±3°			60° ±3°			30° ±3°			45° ±3°			60° ±3°			30° ±3°			45° ±3°			60° ±3°			30° ±3°			45° ±3°			60° ±3°					
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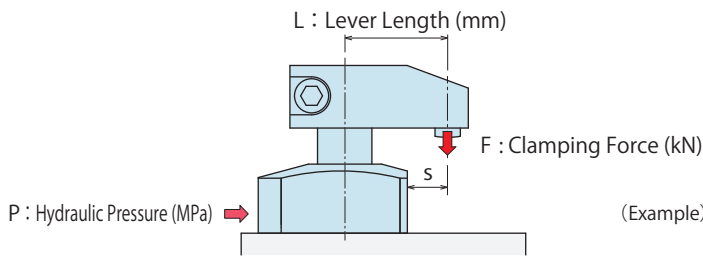
- Notes
- ※1. F, F₁, F₂ : Clamping Force (kN) P : Supply Hydraulic Pressure (MPa)
L, L₁, L₂ : Distance between the piston center and the clamping point (mm) L₃ : (mm).
 - ※2. Minimum pressure to operate the clamp with no load.
1. Please see the external dimension if you need the information of mass and cylinder volume.



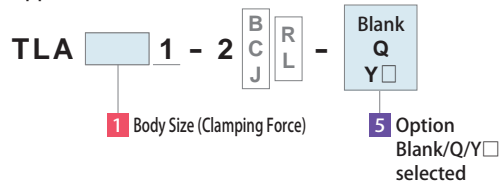
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 - TLA-2**
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 - LM/LJ
 - TMA-2
 - TMA-1
- Work Support
 - LD
 - LC
 - TNC
 - TC
- Air Sensing Lift Cylinder
 - LLW
- Compact Cylinder
 - LL
 - LLR
 - LLU
 - DP
 - DR
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- Block Cylinder
 - DBA
 - DBC
- Control Valve
 - BZL
 - BZT
 - BZX/JZG
- Pallet Clamp
 - VS
 - VT
- Expansion Locating Pin
 - VL
 - VM
 - VJ
 - VK
- Pull Stud Clamp
 - FP
 - FQ
- Customized Spring Cylinder
 - DWA/DWB

Clamping Force Curve

※ TLA□□1-2□□-P : For balance lever option, the clamping force curve is different from the graph. Please calculate it with the specification's formula.

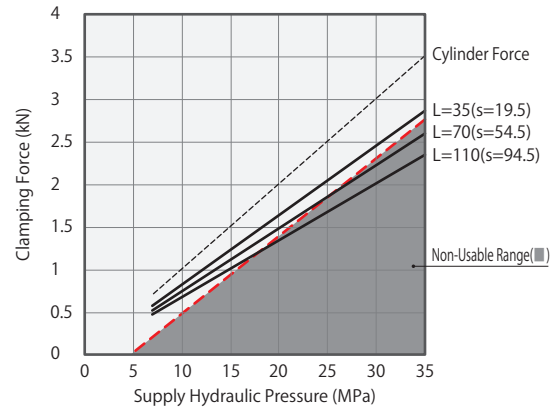


Applicable Model

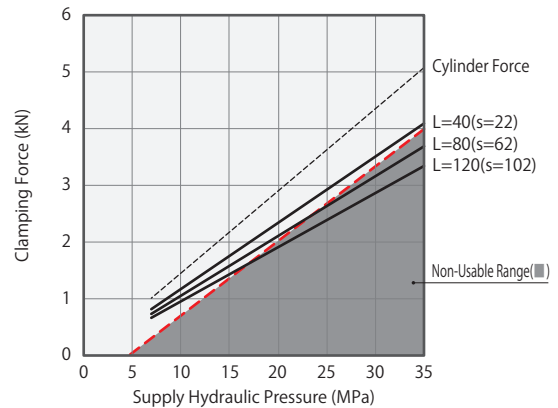


(Example) When TLA1601-2□□ is used
Supply Hydraulic Pressure 25.0MPa, Lever Length L=50 mm
Clamping force is about 8.9kN.

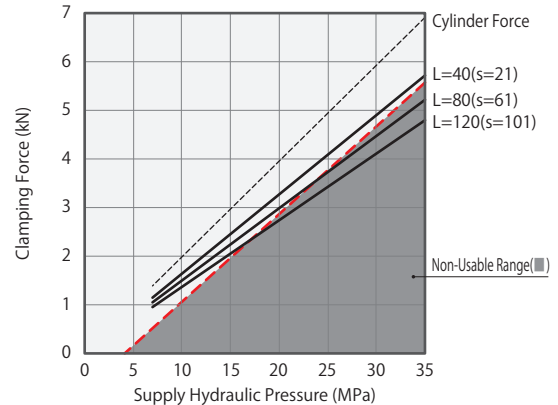
TLA0401-2		Clamping Force Calculation Formula ※1 (kN) $F = P / (10.94 + 0.036 \times L)$								Max. Lever Length (L) (mm)
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm)								
		L=35	L=40	L=50	L=60	L=70	L=80	L=90	L=110	
35	3.52	2.9	2.9							48
32.5	3.27	2.7	2.7	2.6						52
30	3.02	2.5	2.5	2.4						57
27.5	2.77	2.3	2.3	2.2	2.1					63
25	2.52	2.1	2.1	2.0	2.0	1.9				71
22.5	2.27	1.9	1.9	1.8	1.8	1.7	1.7			81
20	2.01	1.7	1.7	1.6	1.6	1.5	1.5	1.5		95
17.5	1.76	1.5	1.5	1.4	1.4	1.4	1.3	1.3	1.2	113
15	1.51	1.3	1.3	1.2	1.2	1.2	1.1	1.1	1.1	141
12.5	1.26	1.1	1.1	1.0	1.0	1.0	0.9	0.9	0.9	150
10	1.01	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.7	150
7	0.71	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	150
Max. Operating Pressure (MPa)	35.0	35.0	33.6	28.8	25.4	22.8	20.8	17.9		



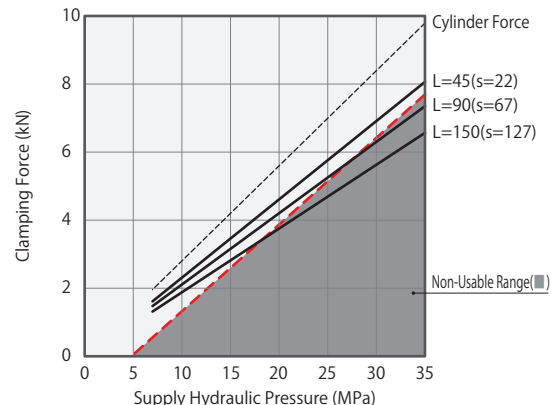
TLA0601-2		Clamping Force Calculation Formula ※1 (kN) $F = P / (7.57 + 0.024 \times L)$								Max. Lever Length (L) (mm)
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm)								
		L=40	L=50	L=60	L=70	L=80	L=90	L=100	L=120	
35	5.09	4.2								49
32.5	4.73	3.9	3.8							54
30	4.36	3.6	3.5							59
27.5	4.00	3.3	3.2	3.1						66
25	3.64	3.0	2.9	2.8	2.8					74
22.5	3.27	2.7	2.6	2.5	2.5	2.4				84
20	2.91	2.4	2.3	2.3	2.2	2.2	2.1			98
17.5	2.55	2.1	2.0	2.0	1.9	1.9	1.8	1.8		117
15	2.18	1.8	1.8	1.7	1.7	1.6	1.6	1.6	1.5	145
12.5	1.82	1.5	1.5	1.4	1.4	1.4	1.3	1.3	1.2	192
10	1.46	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.0	200
7	1.02	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.7	200
Max. Operating Pressure (MPa)	35.0	34.6	29.6	26.0	23.4	21.3	19.6	17.2		



TLA0801-2		Clamping Force Calculation Formula ※1 (kN) $F = P / (5.53 + 0.0147 \times L)$								Max. Lever Length (L) (mm)
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm)								
		L=40	L=50	L=60	L=70	L=80	L=90	L=100	L=120	
35	6.93	5.8	5.6							50
32.5	6.44	5.4	5.2							55
30	5.94	5.0	4.8	4.7						60
27.5	5.45	4.5	4.4	4.3						66
25	4.95	4.1	4.0	3.9	3.9					74
22.5	4.46	3.7	3.6	3.6	3.5	3.4				84
20	3.96	3.3	3.2	3.2	3.1	3.0	3.0			98
17.5	3.47	2.9	2.8	2.8	2.7	2.7	2.6	2.5		116
15	2.97	2.5	2.4	2.4	2.3	2.3	2.2	2.2	2.1	143
12.5	2.48	2.1	2.0	2.0	2.0	1.9	1.9	1.8	1.8	185
10	1.98	1.7	1.6	1.6	1.6	1.5	1.5	1.5	1.4	230
7	1.39	1.2	1.2	1.1	1.1	1.1	1.1	1.0	1.0	230
Max. Operating Pressure (MPa)	35.0	35.0	30.0	26.3	23.5	21.4	19.6	17.1		



TLA1001-2		Clamping Force Calculation Formula ※1 (kN) $F = P / (3.91 + 0.0094 \times L)$								Max. Lever Length (L) (mm)
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm)								
		L=45	L=50	L=60	L=70	L=90	L=110	L=130	L=150	
35	9.82	8.1	8.0	7.9						66
32.5	9.12	7.6	7.5	7.3	7.2					72
30	8.42	7.0	6.9	6.8	6.6					80
27.5	7.72	6.4	6.3	6.2	6.1					88
25	7.01	5.8	5.8	5.6	5.5	5.3				99
22.5	6.31	5.2	5.2	5.1	5.0	4.8	4.6			113
20	5.61	4.7	4.6	4.5	4.4	4.3	4.1	3.9		132
17.5	4.91	4.1	4.0	4.0	3.9	3.7	3.6	3.5	3.3	158
15	4.21	3.5	3.5	3.4	3.3	3.2	3.1	3.0	2.9	197
12.5	3.51	2.9	2.9	2.8	2.8	2.7	2.6	2.5	2.4	250
10	2.81	2.4	2.3	2.3	2.2	2.2	2.1	2.0	1.9	250
7	1.97	1.7	1.6	1.6	1.6	1.5	1.5	1.4	1.4	250
Max. Operating Pressure (MPa)	35.0	35.0	35.0	33.4	27.1	23.0	20.2	18.2		

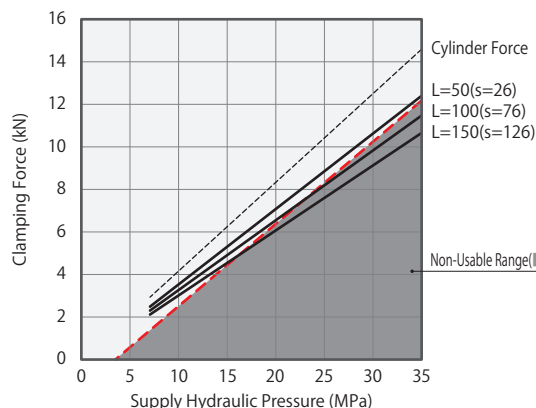


Notes

1. Tables and graphs shown are the relationships between the clamping force (kN) and supply hydraulic pressure (MPa).
2. Cylinder output (when L=0) cannot be calculated from the calculation formula of clamping force.
3. There may be no lever swing action with large inertia depending on supply hydraulic pressure or lever mounting position.
4. The clamping force is shown with lever in the locked position.
5. The clamping force varies as per the lever length. Use the hydraulic supply pressure suitable to the lever length.
6. Operation in the non-usable range can damage the clamp and lead to fluid leakage.
7. The tables and graphs are only for reference. The exact results should be calculated based on the formula in the specification column.

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

TLA1601-2		Clamping Force Calculation Formula ※1 (kN) $F = P / (2.59 + 0.0046 \times L)$								Max. Lever Length (L) (mm)
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm)								
		L=50	L=60	L=70	L=80	L=90	L=100	L=120	L=150	
35	14.60	12.5	12.3							62
32.5	13.56	11.6	11.4							67
30	12.51	10.7	10.5	10.4						73
27.5	11.47	9.8	9.6	9.5	9.3					81
25	10.43	8.9	8.8	8.6	8.5	8.4				90
22.5	9.39	8.0	7.9	7.8	7.7	7.5	7.4			102
20	8.34	7.1	7.0	6.9	6.8	6.7	6.6			118
17.5	7.30	6.3	6.2	6.1	6.0	5.9	5.8	5.6		139
15	6.26	5.4	5.3	5.2	5.1	5.0	5.0	4.8	4.6	169
12.5	5.22	4.5	4.4	4.3	4.3	4.2	4.1	4.0	3.9	215
10	4.17	3.6	3.5	3.5	3.4	3.4	3.3	3.2	3.1	250
7	2.92	2.5	2.5	2.5	2.4	2.4	2.3	2.3	2.2	250
Max. Operating Pressure (MPa)	35.0	35.0	31.3	27.8	25.1	22.9	19.7	16.4		



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

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

- Work Support
LD
LC
TNC
TC

- Air Sensing Lift Cylinder
LLW

- Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT

- Block Cylinder
DBA
DBC

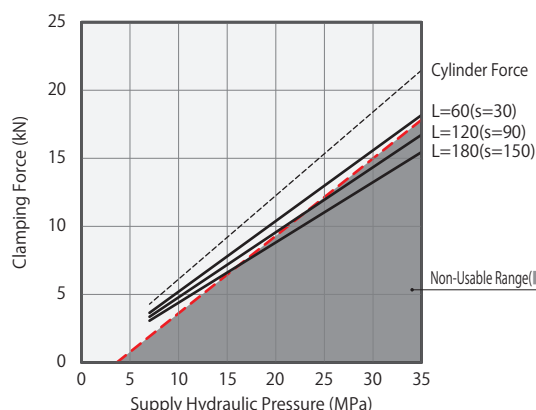
- Control Valve
BZL
BZT
BZX/JZG

- Pallet Clamp
VS
VT
Expansion Locating Pin
VL
VM
VJ
VK

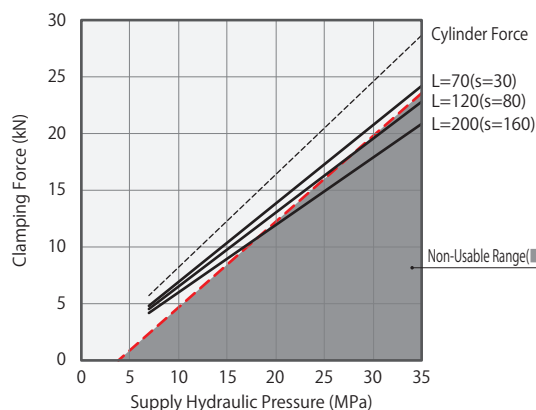
- Pull Stud Clamp
FP
FQ

- Customized Spring Cylinder
DWA/DWB

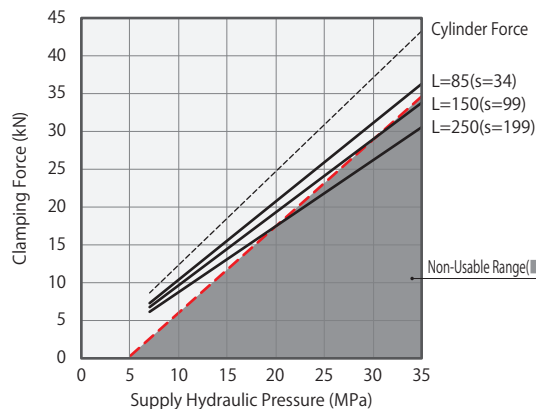
TLA2001-2		Clamping Force Calculation Formula ※1 (kN) $F = P / (1.76 + 0.0028 \times L)$							Max. Lever Length (L) (mm)	
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm)								
		L=60	L=70	L=80	L=100	L=120	L=140	L=160		L=180
35	21.47	18.2	17.9							73
32.5	19.94	16.9	16.7							79
30	18.41	15.6	15.4	15.2						87
27.5	16.87	14.3	14.1	13.9						96
25	15.34	13.0	12.8	12.7	12.3					107
22.5	13.81	11.7	11.6	11.4	11.1	10.8				121
20	12.27	10.4	10.3	10.1	9.9	9.6	9.3			140
17.5	10.74	9.1	9.0	8.9	8.6	8.4	8.2	8.0		165
15	9.21	7.8	7.7	7.6	7.4	7.2	7.0	6.8	6.7	201
12.5	7.67	6.5	6.4	6.4	6.2	6.0	5.9	5.7	5.6	258
10	6.14	5.2	5.2	5.1	5.0	4.8	4.7	4.6	4.5	280
7	4.30	3.7	3.6	3.6	3.5	3.4	3.3	3.2	3.1	280
Max. Operating Pressure (MPa)	35.0	35.0	32.2	26.5	22.7	20.0	17.9	16.3		



TLA2501-2		Clamping Force Calculation Formula ※1 (kN) $F = P / (1.32 + 0.0018 \times L)$								Max. Lever Length (L) (mm)
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm)								
		L=70	L=80	L=90	L=100	L=120	L=140	L=160	L=200	
35	28.70	24.3	24.0	23.7						91
32.5	26.65	22.5	22.2	22.0						99
30	24.60	20.8	20.5	20.3	20.0					109
27.5	22.55	19.1	18.8	18.6	18.4	18.0				120
25	20.50	17.3	17.1	16.9	16.7	16.3				134
22.5	18.45	15.6	15.4	15.2	15.0	14.7	14.4			153
20	16.40	13.9	13.7	13.5	13.4	13.1	12.8	12.5		176
17.5	14.35	12.2	12.0	11.9	11.7	11.4	11.2	10.9	10.5	208
15	12.30	10.4	10.3	10.2	10.0	9.8	9.6	9.4	9.0	255
12.5	10.25	8.7	8.6	8.5	8.4	8.2	8.0	7.8	7.5	300
10	8.20	7.0	6.9	6.8	6.7	6.6	6.4	6.3	6.0	300
7	5.74	4.9	4.8	4.8	4.7	4.6	4.5	4.4	4.2	300
Max. Operating Pressure (MPa)	35.0	35.0	35.0	32.3	27.5	24.2	21.6	18.1		



TLA4001-2		Clamping Force Calculation Formula ※1 (kN) $F = P / (0.87 + 0.0011 \times L)$								Max. Lever Length (L) (mm)
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm)								
		L=85	L=100	L=125	L=150	L=175	L=200	L=225	L=250	
35	43.30	36.4	35.8	34.8						126
32.5	40.21	33.8	33.2	32.3						138
30	37.11	31.2	30.7	29.8	29.0					151
27.5	34.02	28.6	28.1	27.3	26.6					168
25	30.93	26.0	25.6	24.9	24.2	23.6				189
22.5	27.84	23.4	23.0	22.4	21.8	21.2	20.7			216
20	24.74	20.8	20.5	19.9	19.4	18.9	18.4	17.9	17.5	251
17.5	21.65	18.2	17.9	17.4	17.0	16.5	16.1	15.7	15.3	301
15	18.56	15.6	15.4	14.9	14.5	14.2	13.8	13.5	13.2	350
12.5	15.47	13.0	12.8	12.5	12.1	11.8	11.5	11.2	11.0	350
10	12.37	10.4	10.3	10.0	9.7	9.5	9.2	9.0	8.8	350
7	8.66	7.3	7.2	7.0	6.8	6.6	6.5	6.3	6.2	350
Max. Operating Pressure (MPa)	35.0	35.0	35.0	30.2	26.6	23.9	21.8	20.1		



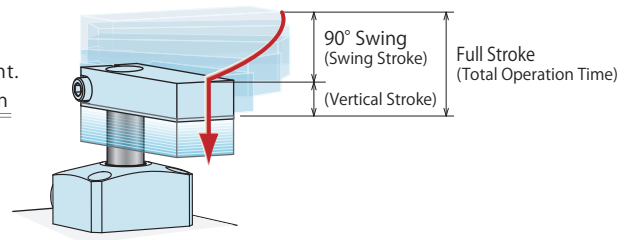
- Pallet Clamp
VS
VT
Expansion Locating Pin
VL
VM
VJ
VK
Pull Stud Clamp
FP
FQ
Customized Spring Cylinder
DWA/DWB

Allowable Swing Time Graph

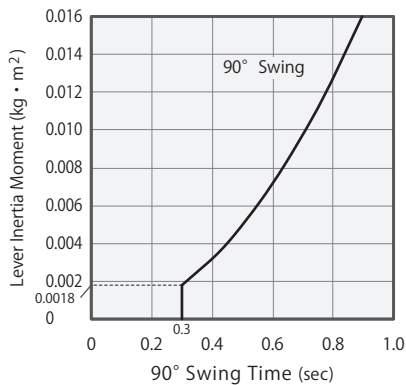
Adjustment of Swing Time

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

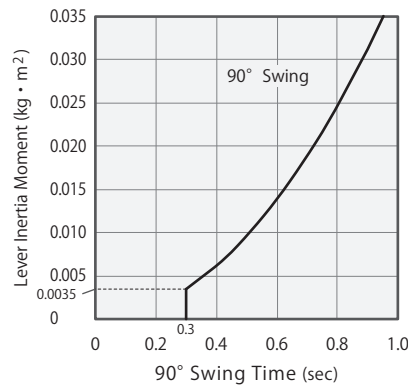
Excessive action speed can reduce stopping accuracy and damage internal parts.



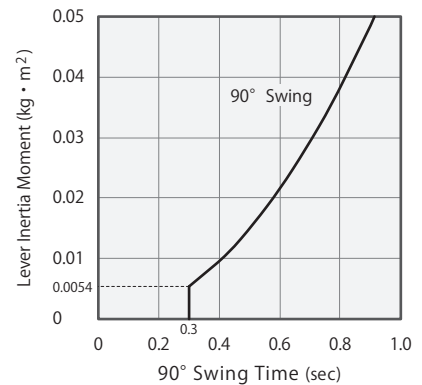
TLA0401-2



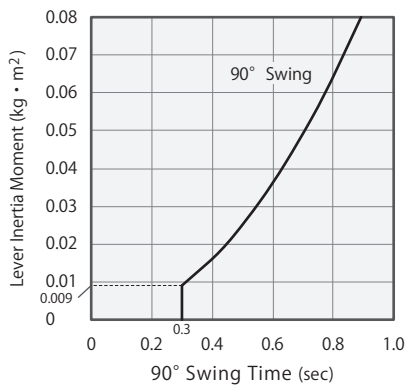
TLA0601-2



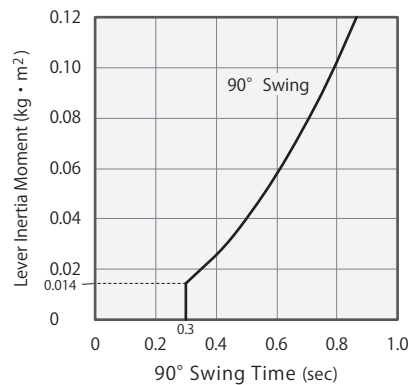
TLA0801-2



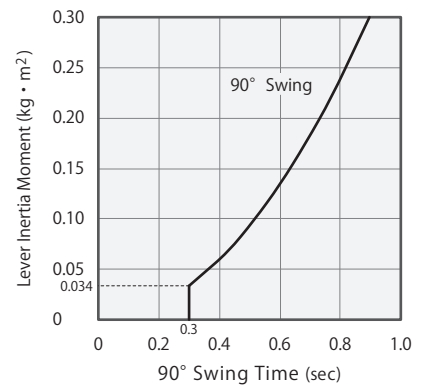
TLA1001-2



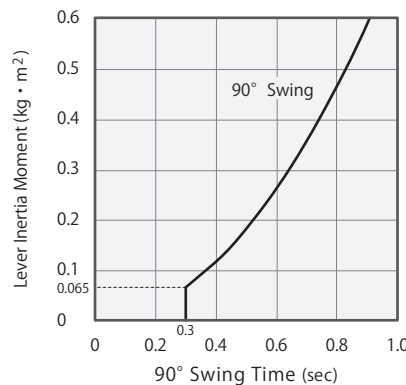
TLA1601-2



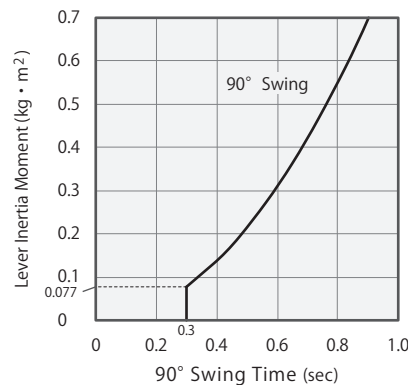
TLA2001-2



TLA2501-2



TLA4001-2



Notes

1. Graphs show 90° swing time against lever inertia moment.
2. Total swing stroke time become about 2 to 2.5 times of 90° swing time.
3. There may be no lever swing action with large inertia depending on supply hydraulic pressure, oil flow and lever mounting position.
4. Adjust swing time to be at least that shown on the graphs for the given inertia moment.
5. Excessive speed may degrade angle precision and damage internal parts.
6. The clamping force varies as per 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-in 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.

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
LT/LG

TLA-2

TLB-2
TLA-1

Link Clamp

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

Work Support

LD
LC
TNC
TC

Air Sensing Lift Cylinder

LLW

Compact Cylinder

LL
LLR
LLU
DP
DR
DS
DT

Block Cylinder

DBA
DBC

Control Valve

BZL
BZT
BZX/JZG

Pallet Clamp

VS
VT

Expansion Locating Pin

VL
VM
VJ
VK

Pull Stud Clamp

FP
FQ

Customized Spring Cylinder

DWA/DWB

Model → TLA1601-2

(How to read the allowable swing time graph)

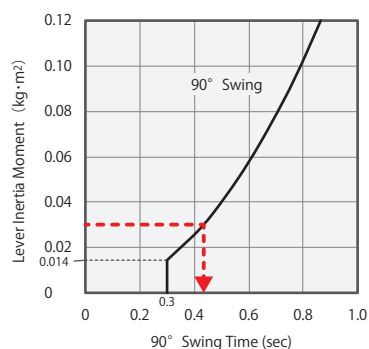
When TLA1601-2 is used

Lever Inertia Moment : 0.03kg·m²

- 90° Swing Time : About 0.43 sec or more
- Total Operation Time : About 0.95 sec or more

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

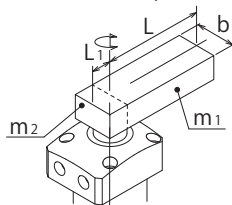
(Swing Stroke : 11 mm、Full Stroke : 24 mm)



How to calculate inertia moment (Estimated)

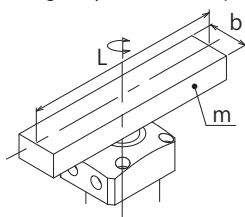
I : Inertia Moment (kg·m²) L,L₁,L₂,K,b: Length (m) m,m₁,m₂,m₃: Mass (kg)

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



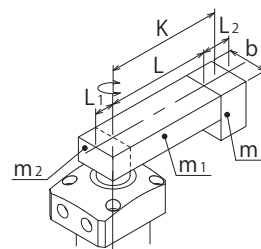
$$I = m_1 \frac{4L^2 + b^2}{12} + m_2 \frac{4L_1^2 + b^2}{12}$$

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



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

- ③ The load is applied on the lever front end.



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

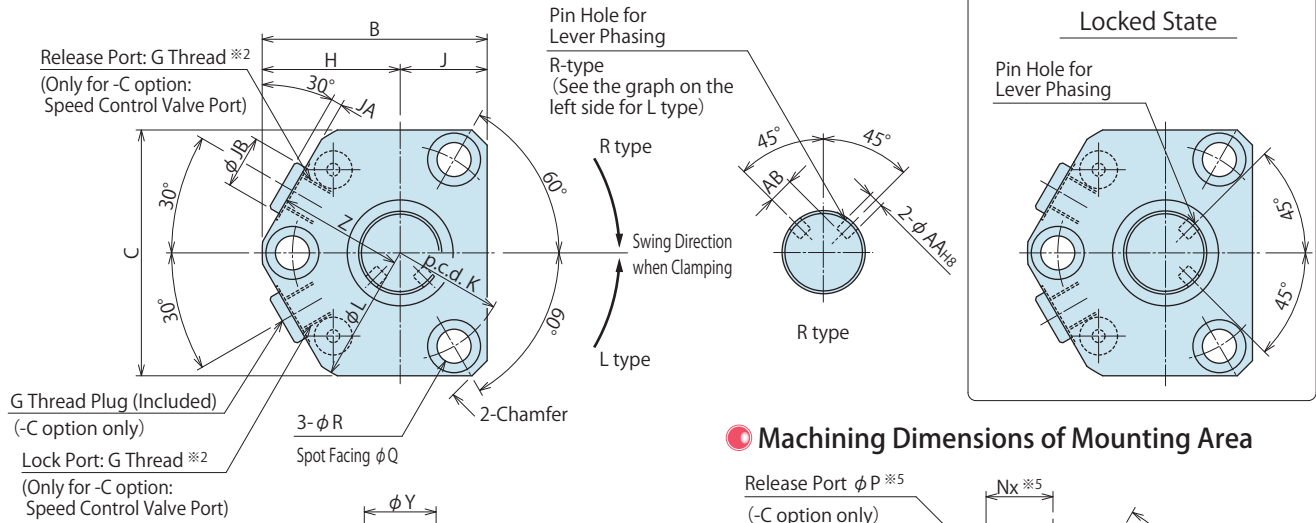
Calculation Formula of Total Operation Time

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

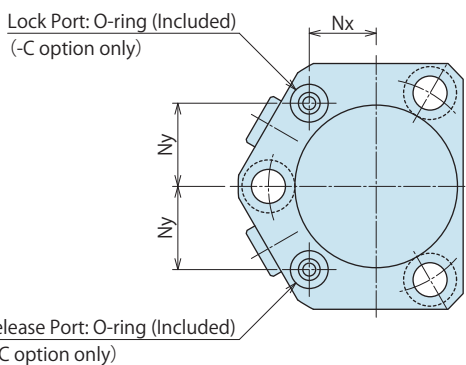
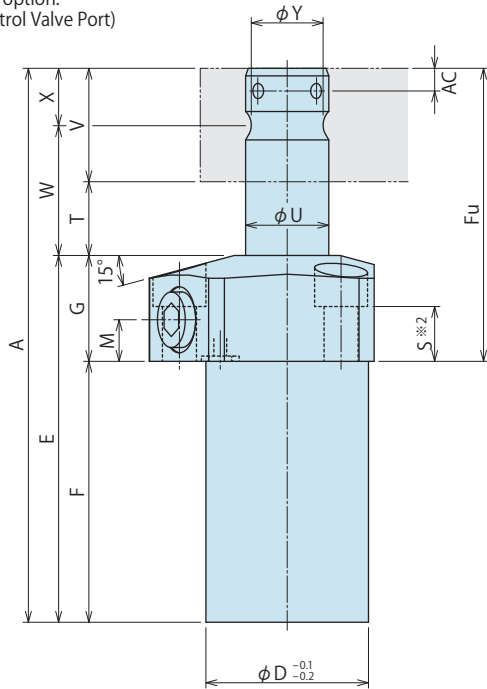
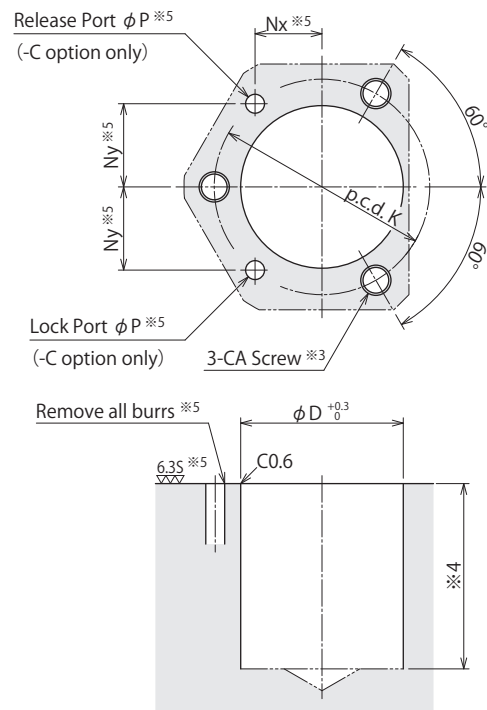
External Dimensions

C : Gasket Option (With G Thread Plug)

※The drawing shows the released state of TLA-2CL.



Machining Dimensions of Mounting Area



Notes

- ※3. CA tapping depth should be calculated so that mounting bolts engage fixture by at least 1.5 x bolt diameter.
- ※4. The φD depth of the body mounting hole should be decided from dimension F.
- ※5. This process indicates -C : Gasket option.

Notes

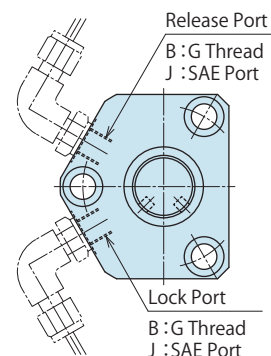
- ※1. Mounting bolts are not provided.
Prepare mounting bolts according to the mounting height. Please refer to S dimensions.
- ※2. Speed control valve is sold separately.
Please prepare using reference to P.727.
- 1. Prepare swing lever and mounting bolts as shown
P.411 ~ P.412.

Piping Method

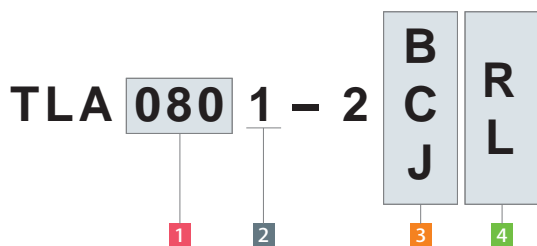
B : G Thread Piping Option

J : SAE Port Option

※The drawing shows the released state of TLA-2BL / TLA-2JL.



Model No. Indication



(Format Example : TLA0801-2CR, TLA1601-2BL)

- 1 Body Size (Clamping Force)
- 2 Design No.
- 3 Piping Method
- 4 Swing Direction when Clamping
- 5 Option (When Blank is chosen)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	TLA0401-2□□	TLA0601-2□□	TLA0801-2□□	TLA1001-2□□	TLA1601-2□□	TLA2001-2□□
Full Stroke	14	15	18	19.5	24	26.5
Swing Stroke (90°)	6	7	8	9.5	11	13.5
Vertical Stroke	8	8	10	10	13	13
A	97.5	105	119	134.5	159.5	180
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	62.5	66	74	83	99.5	111.5
F	38.5	41	49	55	69.5	74.5
Fu	59	64	70	79.5	90	105.5
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	16	17	20	21.5	26	28.5
U	14	16	18	22	25	30
V	19	22	25	30	34	40
W	25.5	28	32.5	36.5	43	48.5
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)
Lock Port/ Release Port	-B/-C option -J option	G1/8 SAE2	G1/8 SAE2	G1/8 SAE2	G1/8 SAE2	G1/4 SAE4
O-ring	-C option	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)	φ6×12 (B type)
Cylinder Capacity cm ³	Lock	1.4	2.2	3.6	5.5	10.0
	Release	3.6	5.2	8.1	12.9	35.0
Mass ^{※6}	kg	0.4	0.6	0.8	1.3	2.9

Note ※6. Mass 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
 - LT/LG
 - TLA-2
 - TLB-2
 - TLA-1

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

- Work Support
 - LD
 - LC
 - TNC
 - TC

- Air Sensing Lift Cylinder
 - LLW

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

- Block Cylinder
 - DBA
 - DBC

- Control Valve
 - BZL
 - BZT
 - BZX/JZG

- Pallet Clamp
 - VS
 - VT

- Expansion Locating Pin
 - VL
 - VM
 - VJ
 - VK

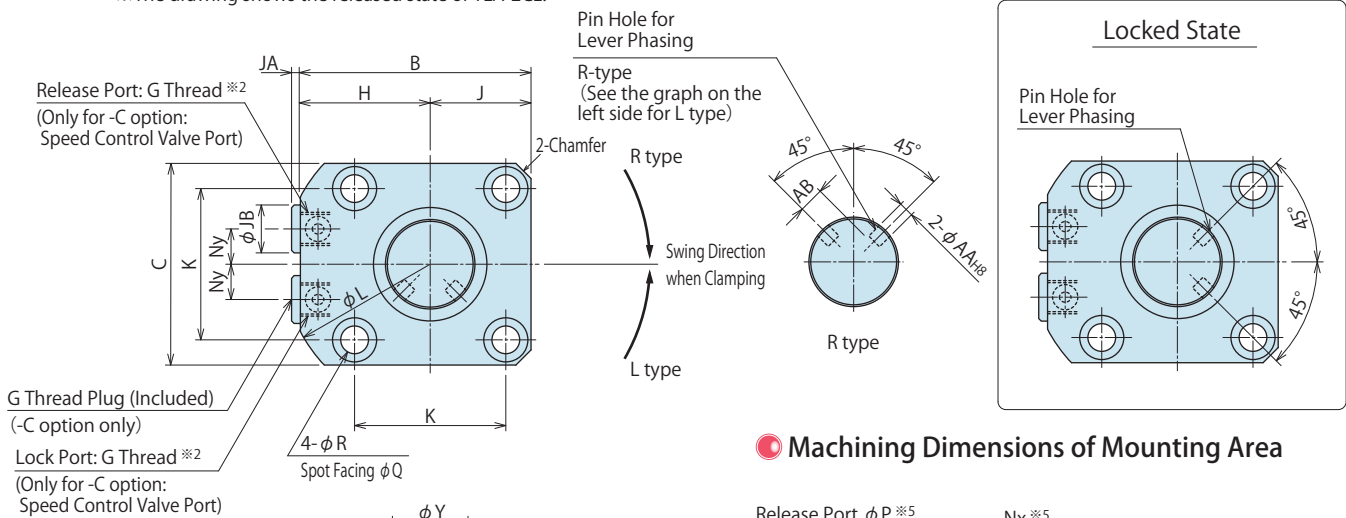
- Pull Stud Clamp
 - FP
 - FQ

- Customized Spring Cylinder
 - DWA/DWB

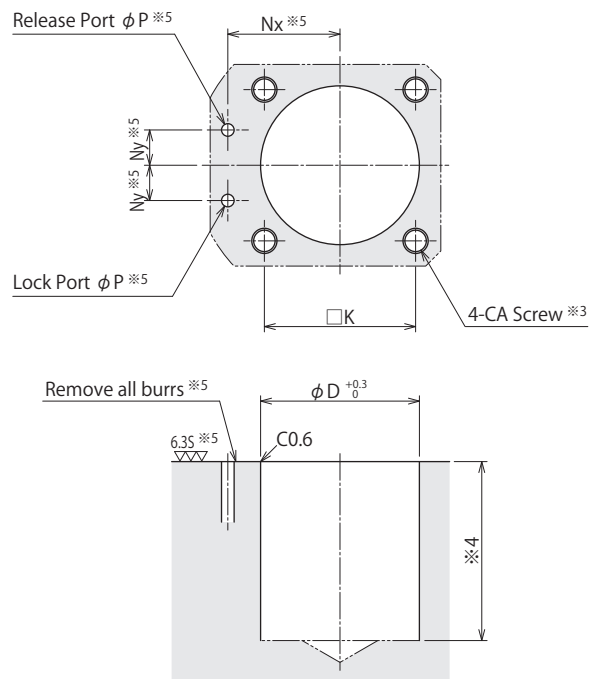
External Dimensions

C : Gasket Option (With G Thread Plug)

※The drawing shows the released state of TLA-2CL.



Machining Dimensions of Mounting Area



Notes

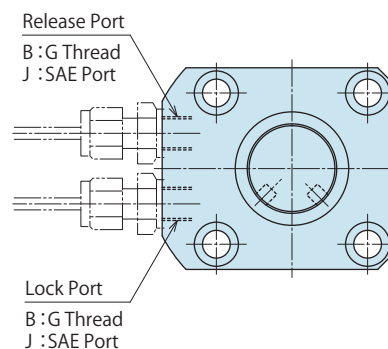
- ※3. CA tapping depth should be calculated so that mounting bolts engage fixture by at least 1.5 x bolt diameter.
- ※4. The φD depth of the body mounting hole should be decided from dimension F.
- ※5. This process indicates -C : Gasket option.

Piping Method

B : G Thread Piping Option

J : SAE Port Option

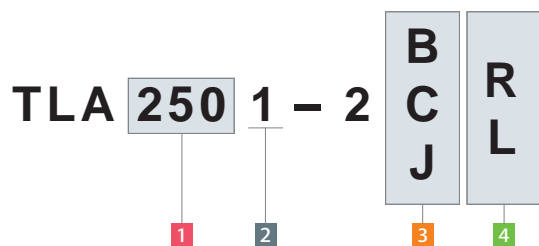
※The drawing shows the released state of TLA-2BL / TLA-2JL.



Notes

- ※1. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height. Please refer to S dimensions.
- ※2. Speed control valve is sold separately. Please prepare using reference to P.727.
 1. Prepare swing lever and mounting bolts as shown P.411 ~ P.412.

Model No. Indication



(Format Example : TLA2501-2CR, TLA4001-2BL)

- 1 Body Size (Clamping Force)
- 2 Design No.
- 3 Piping Method
- 4 Swing Direction when Clamping
- 5 Option (When Blank is chosen)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	TLA2501-2□□	TLA4001-2□□	
Full Stroke	32	35.5	
Swing Stroke (90°)	16	19.5	
Vertical Stroke	16	16	
A	211	241	
B	92	114	
C	80	102	
D	63	90	
E	131	148.5	
F	91	98.5	
Fu	120	142.5	
G	40	50	
H	52	63	
J	40	51	
K	60	80	
L	118	146	
M	15	17	
Nx	45	56	
Ny	16	21	
P	5	5	
Q	17.5	20	
R	11	14	
S	22.5	27.5	
T	34	37.5	
U	35.5	45	
V	46	55	
W	57	65	
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	C6	C6	
Lock Port/Release Port	-B/-C option	G1/4	G1/4
	-J option	SAE4	SAE4
O-ring	-C option	1BP7	1BP7
Lever Phasing Pin (Included)	φ 6×12 (B type)	φ 8×16 (B type)	
Cylinder Capacity cm ³	Lock	26.2	43.9
	Release	57.9	100.4
Mass ^{※6}	kg	4.3	9.2

Note ※6. Mass 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
- LT/LG
- TLA-2**
- TLB-2
- TLA-1

Link Clamp

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

Work Support

- LD
- LC
- TNC
- TC

Air Sensing Lift Cylinder

- LLW

Compact Cylinder

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

Block Cylinder

- DBA
- DBC

Control Valve

- BZL
- BZT
- BZX/JZG

Pallet Clamp

- VS
- VT

Expansion Locating Pin

- VL
- VM
- VJ
- VK

Pull Stud Clamp

- FP
- FQ

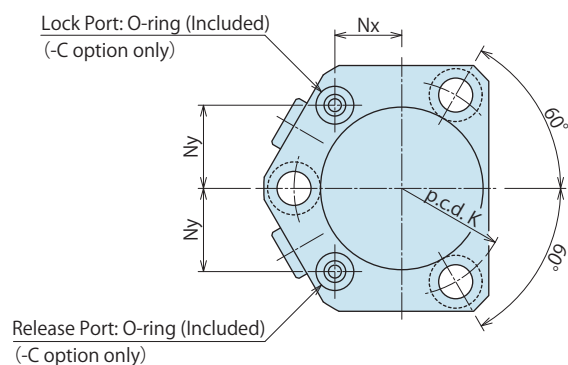
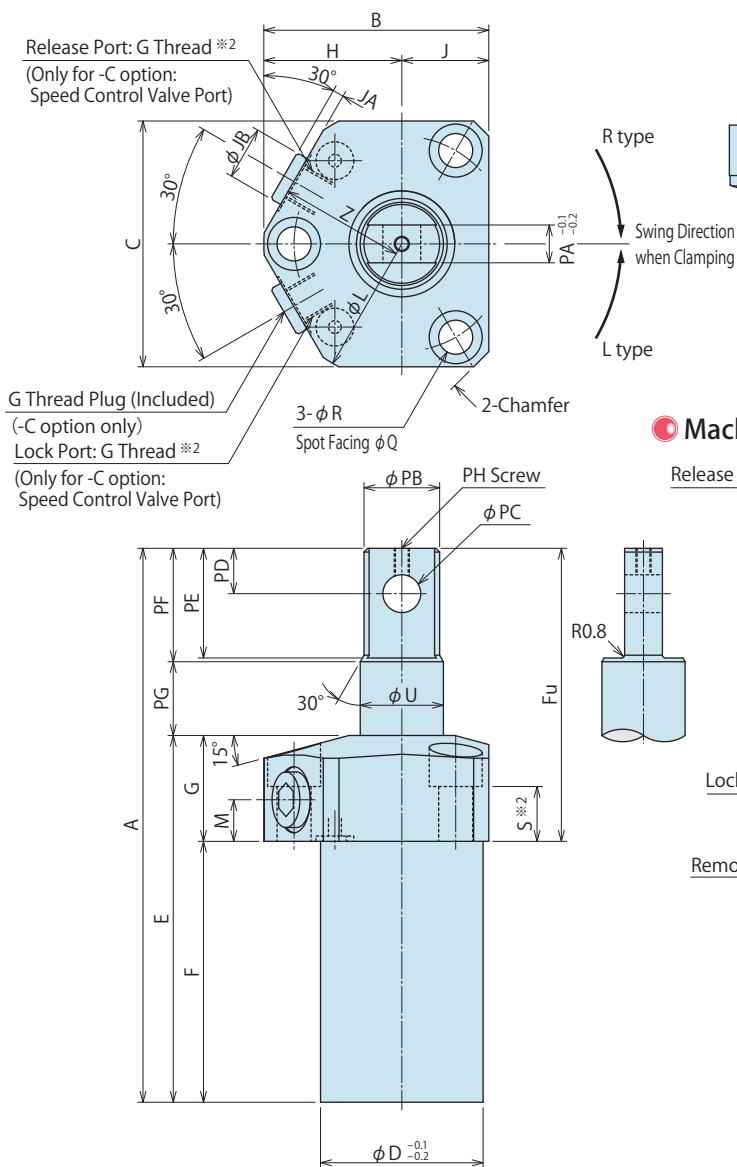
Customized Spring Cylinder

- DWA/DWB

External Dimensions

C : Gasket Option (With G Thread Plug)

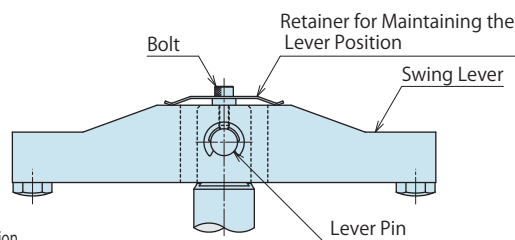
※The drawing shows the released state of TLA-2C□-P.



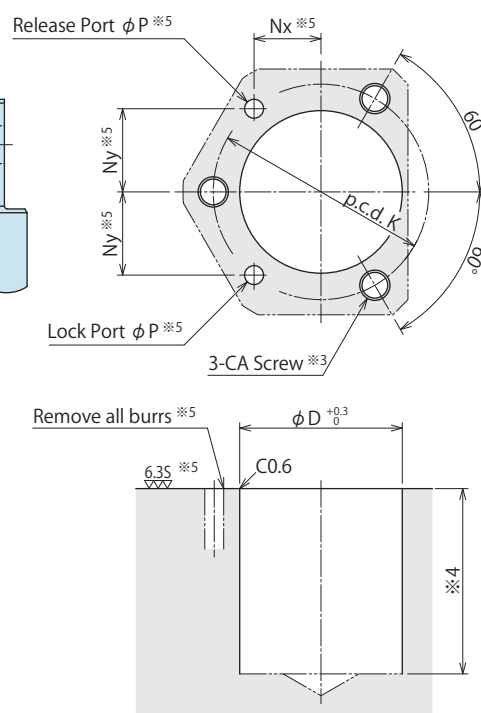
Notes

- ※1. Mounting bolts are not provided.
Prepare mounting bolts according to the mounting height. Please refer to S dimensions.
- ※2. Speed control valve is sold separately.
Please prepare using reference to P.727.

Balance Lever Reference Drawing



Machining Dimensions of Mounting Area



Notes

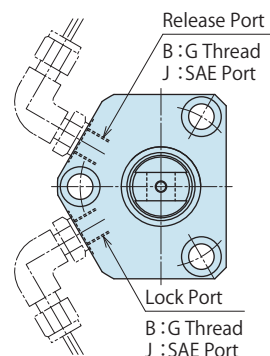
- ※3. CA tapping depth should be calculated so that mounting bolts engage fixture by at least 1.5 x bolt diameter.
- ※4. The phi D depth of the body mounting hole should be decided from dimension F.
- ※5. This process indicates -C : Gasket option.

Piping Method

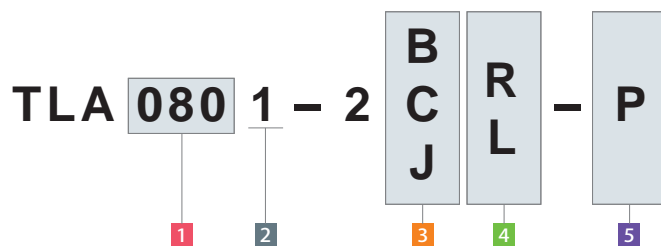
B : G Thread Piping Option

J : SAE Port Option

※The drawing shows the released state of TLA-2B□-P / TLA-2J□-P.



Model No. Indication



(Format Example : TLA0801-2CR-P, TLA1601-2BL-P)

- 1 Body Size (Clamping Force)
- 2 Design No.
- 3 Piping Method
- 4 Swing Direction when Clamping
- 5 Option (When P is chosen)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	TLA0401-2□□-P	TLA0601-2□□-P	TLA0801-2□□-P	TLA1001-2□□-P	TLA1601-2□□-P	TLA2001-2□□-P
Full Stroke	14	15	18	19.5	24	26.5
Swing Stroke (90°)	6	7	8	9.5	11	13.5
Vertical Stroke	8	8	10	10	13	13
A	97.5	105	119	134.5	159.5	180
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	62.5	66	74	83	99.5	111.5
F	38.5	41	49	55	69.5	74.5
Fu	59	64	70	79.5	90	105.5
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
U	14	16	18	22	25	30
Z	27	28.5	30	33	35	44
PA	7	8	8	10	13	16
PB	12	14	16	20	23	28
PC	6 ^{+0.018} ₀	8 ^{+0.022} ₀	8 ^{+0.022} ₀	10 ^{+0.022} ₀	12 ^{+0.027} ₀	15 ^{+0.027} ₀
PD	8.5	10	11	12	13.5	16.5
PE	18	21	24	28.5	32.5	38.5
PF	19	22	25	30	34	40
PG	16	17	20	21.5	26	28.5
PH (Nominal × Pitch)	M3×0.5	M3×0.5	M3×0.5	M4×0.7	M5×0.8	M6×1
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)
Lock Port/ Release Port	-B/-C option	G1/8	G1/8	G1/8	G1/8	G1/4
	-J option	SAE2	SAE2	SAE2	SAE2	SAE4
O-ring	-C option	1BP5	1BP5	1BP5	1BP5	1BP7
Cylinder Capacity cm ³	Lock	1.4	2.2	3.6	5.5	10.0
	Release	3.6	5.2	8.1	12.9	35.0
Mass ^{※6}	kg	0.4	0.6	0.8	1.3	1.7
					1.7	2.9

Note ※6. Mass 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
 - LT/LG
 - TLA-2
 - TLB-2
 - TLA-1

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

- Work Support
 - LD
 - LC
 - TNC
 - TC

- Air Sensing Lift Cylinder
 - LLW

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

- Block Cylinder
 - DBA
 - DBC

- Control Valve
 - BZL
 - BZT
 - BZX/JZG

- Pallet Clamp
 - VS
 - VT

- Expansion Locating Pin
 - VL
 - VM
 - VJ
 - VK

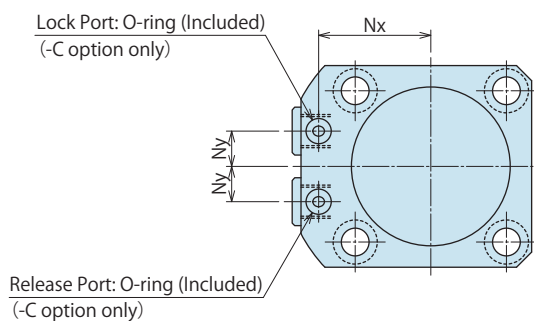
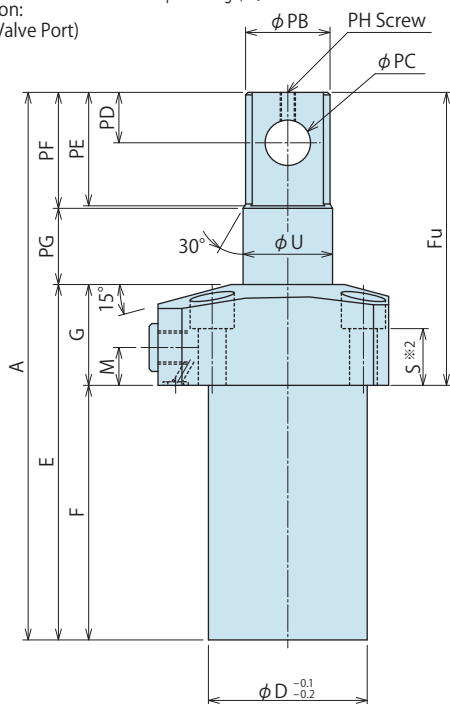
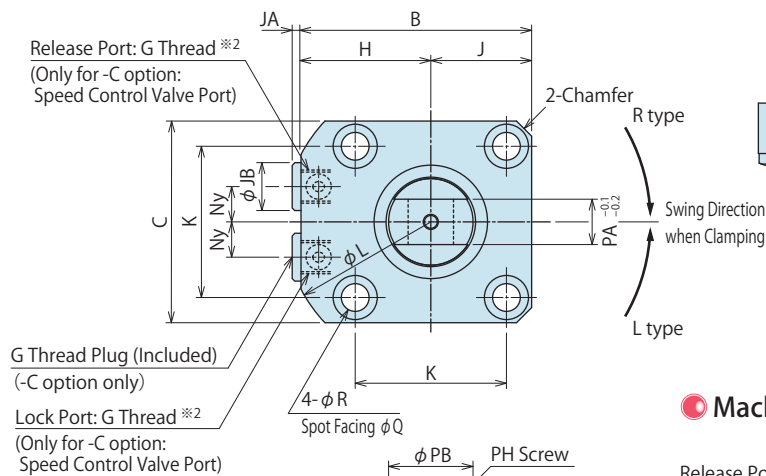
- Pull Stud Clamp
 - FP
 - FQ

- Customized Spring Cylinder
 - DWA/DWB

External Dimensions

C : Gasket Option (With G Thread Plug)

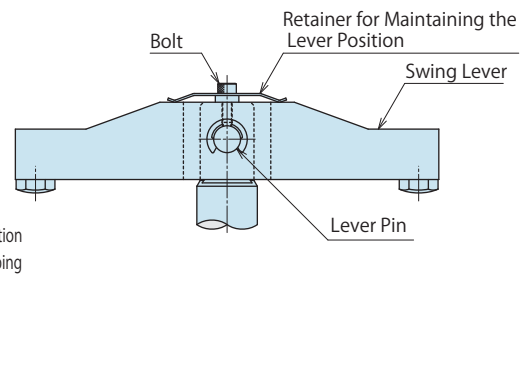
※The drawing shows the released state of TLA-2C□-P.



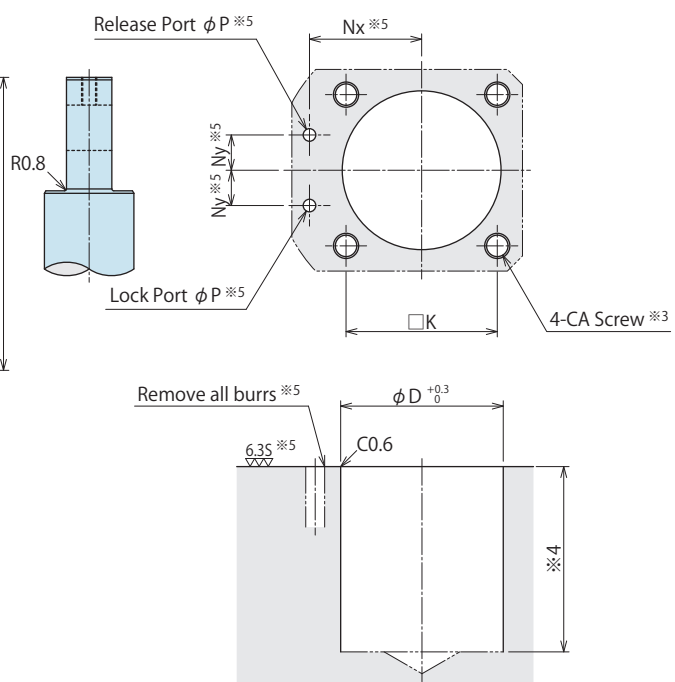
Notes

- ※1. Mounting bolts are not provided.
Prepare mounting bolts according to the mounting height. Please refer to S dimensions.
- ※2. Speed control valve is sold separately.
Please prepare using reference to P.727.

Balance Lever Reference Drawing



Machining Dimensions of Mounting Area



Notes

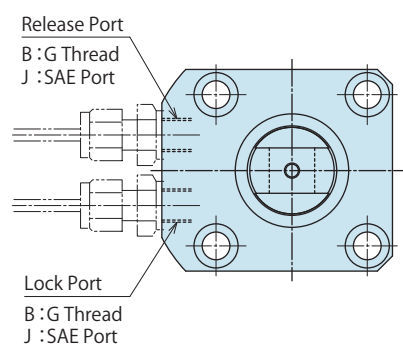
- ※3. CA tapping depth should be calculated so that mounting bolts engage fixture by at least 1.5 x bolt diameter.
- ※4. The φD depth of the body mounting hole should be decided from dimension F.
- ※5. This process indicates -C : Gasket option.

Piping Method

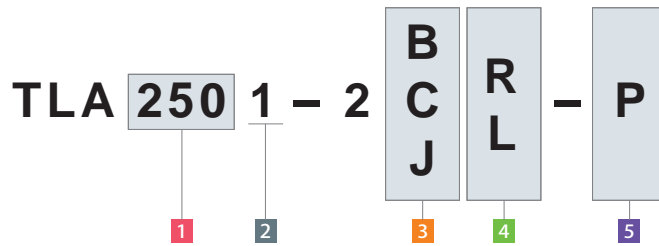
B : G Thread Piping Option

J : SAE Port Option

※The drawing shows the released state of TLA-2B□-P / TLA-2J□-P.



Model No. Indication



(Format Example : TLA2501-2CR-P, TLA4001-2BL-P)

- 1 Body Size (Clamping Force)
- 2 Design No.
- 3 Piping Method
- 4 Swing Direction when Clamping
- 5 Option (When P is chosen)

External Dimensions and Machining Dimensions for Mounting (mm)

Model No.	TLA2501-2□□-P	TLA4001-2□□-P	
Full Stroke	32	35.5	
Swing Stroke (90°)	16	19.5	
Vertical Stroke	16	16	
A	211	241	
B	92	114	
C	80	102	
D	63	90	
E	131	148.5	
F	91	98.5	
Fu	120	142.5	
G	40	50	
H	52	63	
J	40	51	
K	60	80	
L	118	146	
M	15	17	
Nx	45	56	
Ny	16	21	
P	5	5	
Q	17.5	20	
R	11	14	
S	22.5	27.5	
U	35.5	45	
PA	18	24	
PB	33.5	43	
PC	18 ^{+0.027} ₀	22 ^{+0.033} ₀	
PD	20	24.5	
PE	44.5	53.5	
PF	46	55	
PG	34	37.5	
PH (Nominal × Pitch)	M6×1	M8×1.25	
CA (Nominal × Pitch)	M10×1.5	M12×1.75	
JA	3.5	3.5	
JB	19	19	
Chamfer	C6	C6	
Lock Port/Release Port	-B/-C option	G1/4	G1/4
	-J option	SAE4	SAE4
O-ring	-C option	1BP7	1BP7
Cylinder Capacity cm ³	Lock	26.2	43.9
	Release	57.9	100.4
Mass ^{※6}	kg	4.3	9.2

Note ※6. Mass 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
- LT/LG
- TLA-2**
- TLB-2
- TLA-1

Link Clamp

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

Work Support

- LD
- LC
- TNC
- TC

Air Sensing Lift Cylinder

- LLW

Compact Cylinder

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

Block Cylinder

- DBA
- DBC

Control Valve

- BZL
- BZT
- BZX/JZG

Pallet Clamp

- VS
- VT

Expansion Locating Pin

- VL
- VM
- VJ
- VK

Pull Stud Clamp

- FP
- FQ

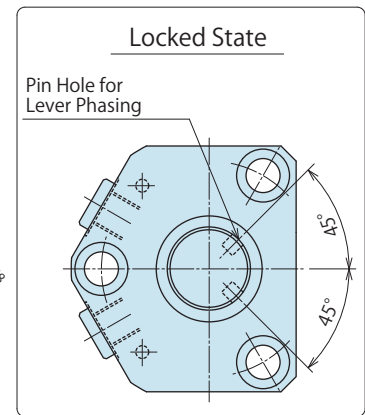
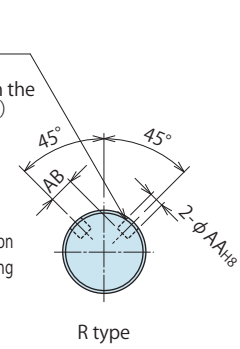
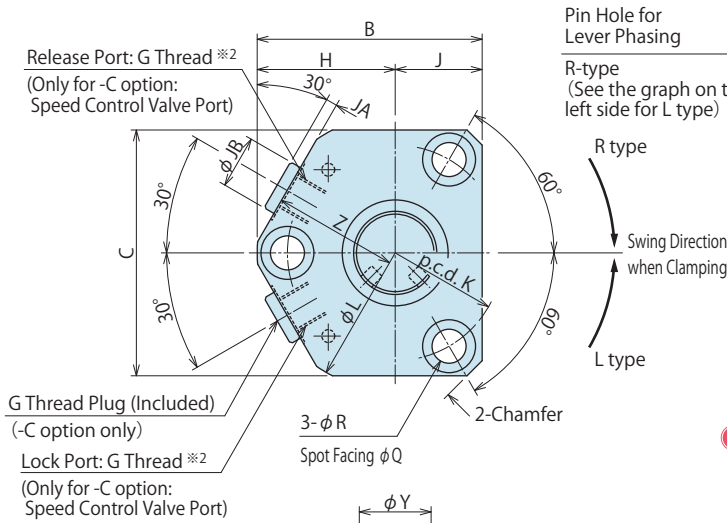
Customized Spring Cylinder

- DWA/DWB

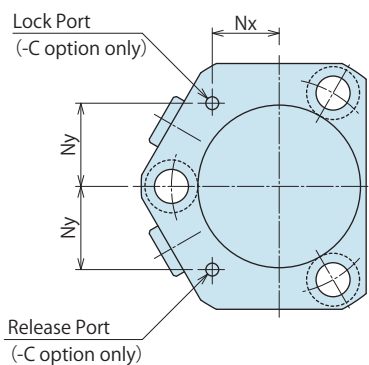
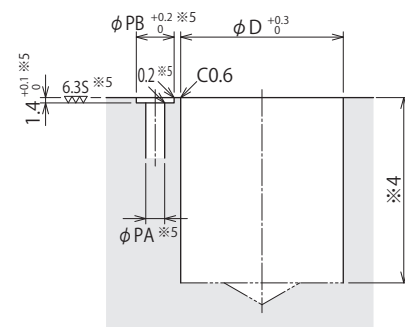
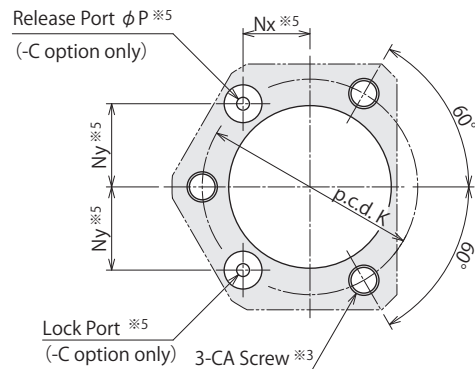
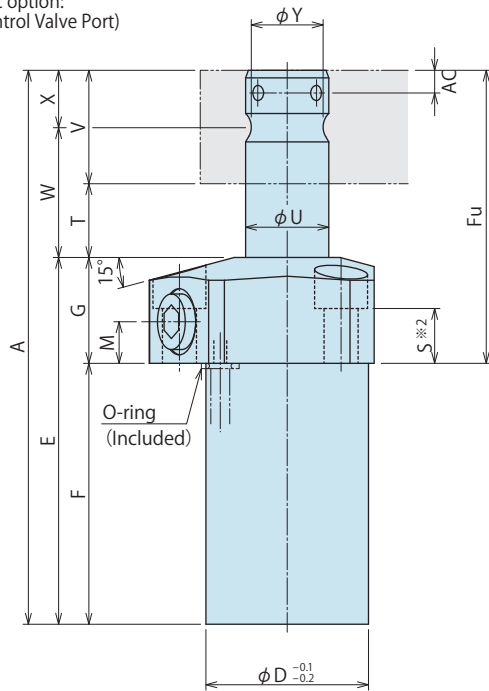
External Dimensions

C : Gasket Option (With G Thread Plug)

※The drawing shows the released state of TLA-2CL-Q.



Machining Dimensions of Mounting Area



Notes

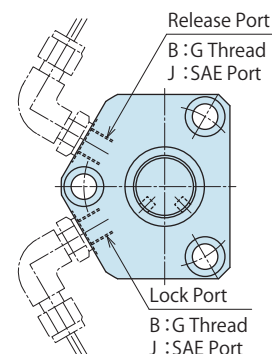
- ※3. CA tapping depth should be calculated so that mounting bolts engage fixture by at least 1.5 x bolt diameter.
- ※4. The φD depth of the body mounting hole should be decided from dimension F.
- ※5. This process indicates -C : Gasket option. Clamp body has no O-ring groove for gasket option. Therefore, O ring groove must be machined on mounting surface side. (O-ring provided.)

Piping Method

B : G Thread Piping Option

J : SAE Port Option

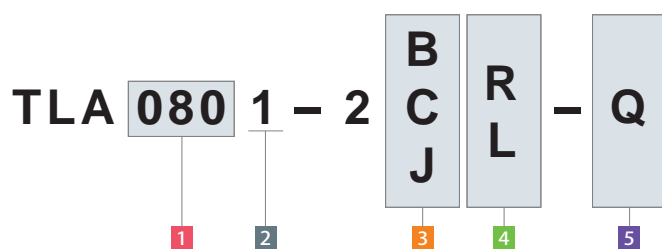
※The drawing shows the released state of TLA-2BL-Q/TLA-2JL-Q.



Notes

- ※1. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height. Please refer to S dimensions.
- ※2. Speed control valve is sold separately. Please prepare using reference to P.727.
 1. Prepare swing lever and mounting bolts as shown P.411 ~ P.412.

Model No. Indication



(Format Example : TLA0801-2CR-Q, TLA1601-2BL-Q)

- 1 Body Size (Clamping Force)
- 2 Design No.
- 3 Piping Method
- 4 Swing Direction when Clamping
- 5 Option (When Q is chosen)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	TLA0401-2□□-Q	TLA0601-2□□-Q	TLA0801-2□□-Q	TLA1001-2□□-Q	TLA1601-2□□-Q	TLA2001-2□□-Q
Full Stroke	22	23	28	29.5	36	38.5
Swing Stroke (90°)	6	7	8	9.5	11	13.5
Vertical Stroke	16	16	20	20	25	25
A	121.5	129	149	164.5	195.5	216
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	78.5	82	94	103	123.5	135.5
F	54.5	57	69	75	93.5	98.5
Fu	67	72	80	89.5	102	117.5
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
PA	3	3	3	3	3	5
PB	8	8	8	8	8	10
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	24	25	30	31.5	38	40.5
U	14	16	18	22	25	30
V	19	22	25	30	34	40
W	33.5	36	42.5	46.5	55	60.5
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)
Lock Port/ Release Port	-B/-C option	G1/8	G1/8	G1/8	G1/8	G1/4
	-J option	SAE2	SAE2	SAE2	SAE2	SAE4
O-ring	-C option	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)
Cylinder Capacity cm ³	Lock	2.2	3.4	5.6	8.3	15.0
	Release	5.7	8.0	12.6	19.5	50.8
Mass ^{※6}	kg	0.5	0.8	1.0	1.6	3.5

Note ※6. Mass 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
LT/LG
TLA-2
TLB-2
TLA-1

Link Clamp

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

Work Support

LD
LC
TNC
TC

Air Sensing Lift Cylinder

LLW

Compact Cylinder

LL
LLR
LLU
DP
DR
DS
DT

Block Cylinder

DBA
DBC

Control Valve

BZL
BZT
BZX/JZG

Pallet Clamp

VS
VT

Expansion Locating Pin

VL
VM
VJ
VK

Pull Stud Clamp

FP
FQ

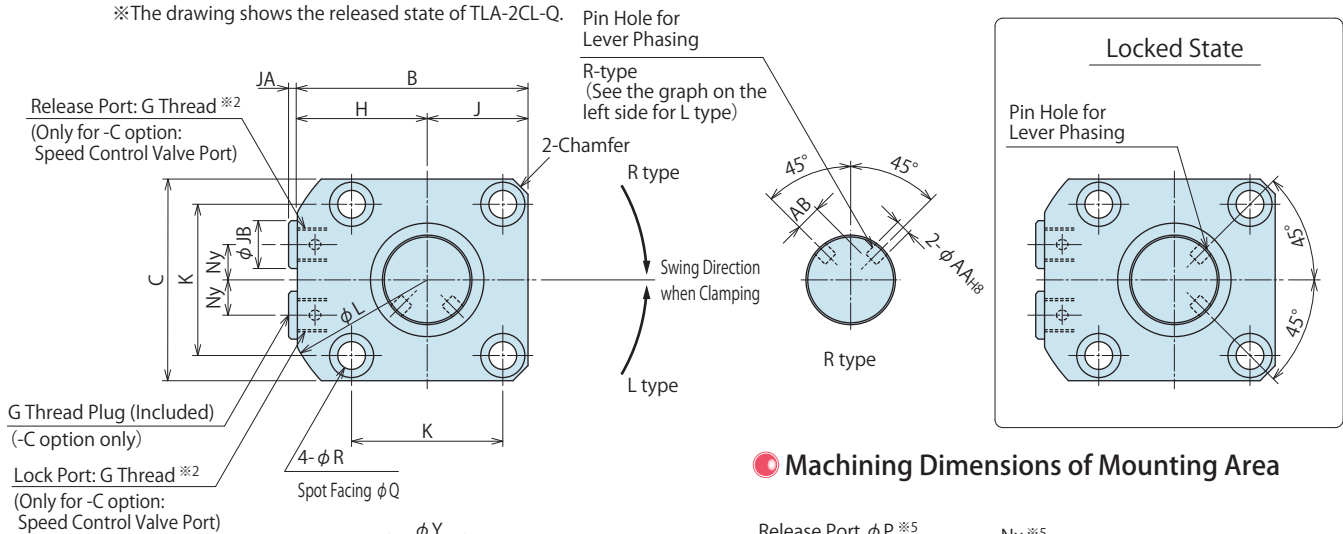
Customized Spring Cylinder

DWA/DWB

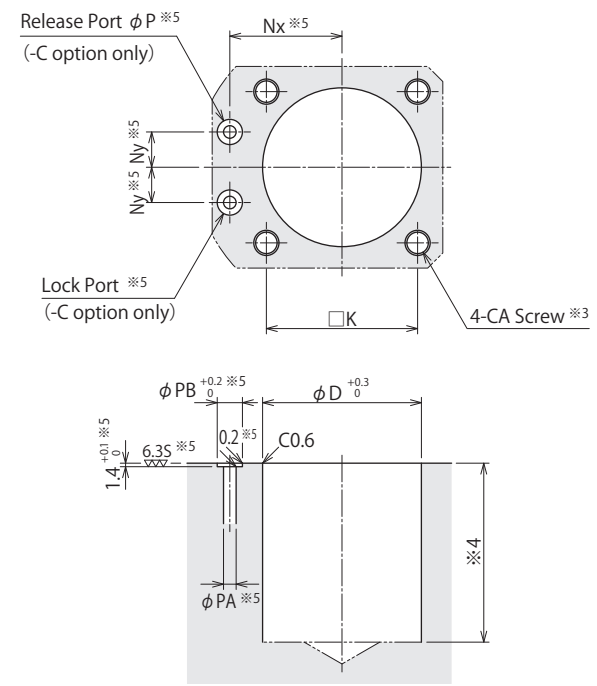
External Dimensions

C : Gasket Option (With G Thread Plug)

※The drawing shows the released state of TLA-2CL-Q.



Machining Dimensions of Mounting Area

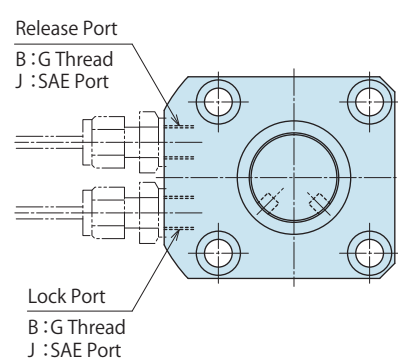


- Notes
- ※3. CA tapping depth should be calculated so that mounting bolts engage fixture by at least 1.5 x bolt diameter.
 - ※4. The ϕD depth of the body mounting hole should be decided from dimension F.
 - ※5. This process indicates -C : Gasket Type. Clamp body has no O-ring groove for gasket option. Therefore, O-ring groove must be machined on mounting surface side. (O-ring provided.)

Piping Method

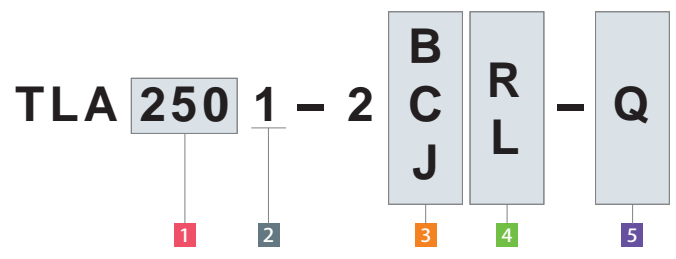
B : G Thread Piping Option
J : SAE Port Option

※The drawing shows the released state of TLA-2BL-Q/TLA-2JL-Q.



- Notes
- ※1. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height. Please refer to S dimensions.
 - ※2. Speed control valve is sold separately. Please prepare using reference to P.727.
 1. Prepare swing lever and mounting bolts as shown P.411 ~ P.412.

● Model No. Indication



(Format Example : TLA2501-2CR-Q, TLA4001-2BL-Q)

- 1 Body Size (Clamping Force)
- 2 Design No.
- 3 Piping Method
- 4 Swing Direction when Clamping
- 5 Option (When Q is chosen)

● External Dimensions and Machining Dimensions for Mounting (mm)

Model No.	TLA2501-2□□-Q	TLA4001-2□□-Q	
Full Stroke	48	51.5	
Swing Stroke (90°)	16	19.5	
Vertical Stroke	32	32	
A	259	289	
B	92	114	
C	80	102	
D	63	90	
E	163	180.5	
F	123	130.5	
Fu	136	158.5	
G	40	50	
H	52	63	
J	40	51	
K	60	80	
L	118	146	
M	15	17	
Nx	45	56	
Ny	16	21	
PA	5	5	
PB	10	10	
Q	17.5	20	
R	11	14	
S	22.5	27.5	
T	50	53.5	
U	35.5	45	
V	46	55	
W	73	81	
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	C6	C6	
Lock Port/	-B/-C option	G1/4	G1/4
Release Port	-J option	SAE4	SAE4
O-ring	-C option	1BP7	1BP7
Lever Phasing Pin (Included)	φ 6×12 (B type)	φ 8×16 (B type)	
Cylinder Capacity cm ³	Lock	39.3	63.7
	Release	86.9	145.7
Mass ※6	kg	5.3	11.0

Note ※6. Mass 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
- LT/LG
- TLA-2**
- TLB-2
- TLA-1

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

- Work Support
- LD
- LC
- TNC
- TC

- Air Sensing Lift Cylinder
- LLW

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

- Block Cylinder
- DBA
- DBC

- Control Valve
- BZL
- BZT
- BZX/JZG

- Pallet Clamp
- VS
- VT

- Expansion Locating Pin
- VL
- VM
- VJ
- VK

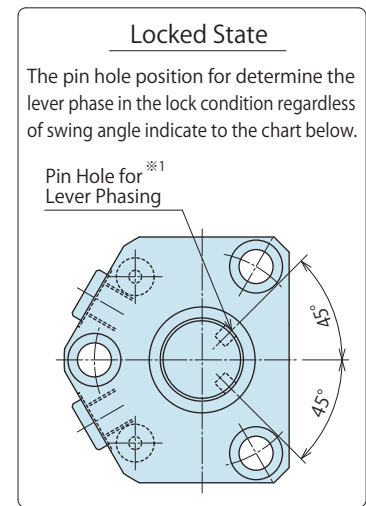
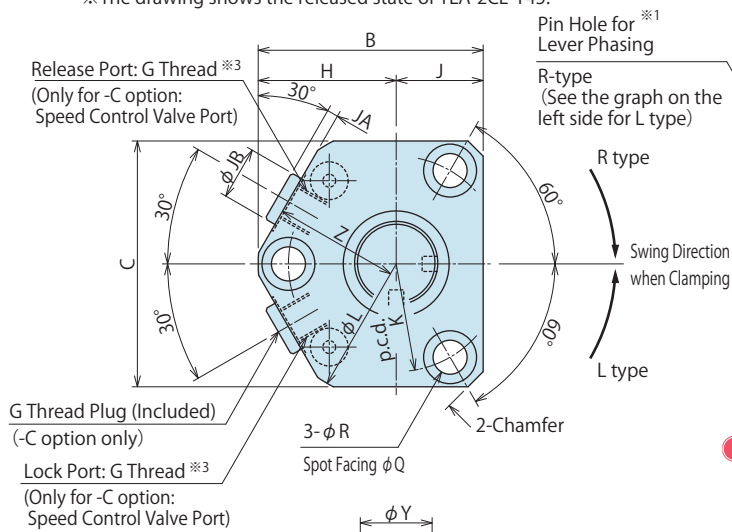
- Pull Stud Clamp
- FP
- FQ

- Customized Spring Cylinder
- DWA/DWB

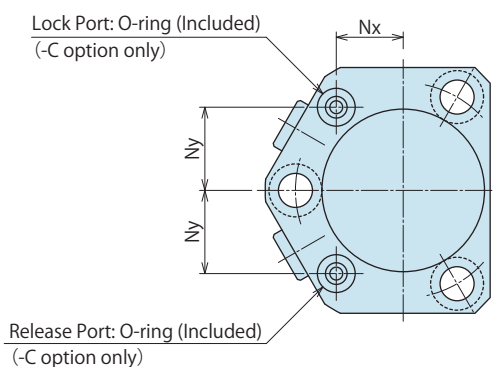
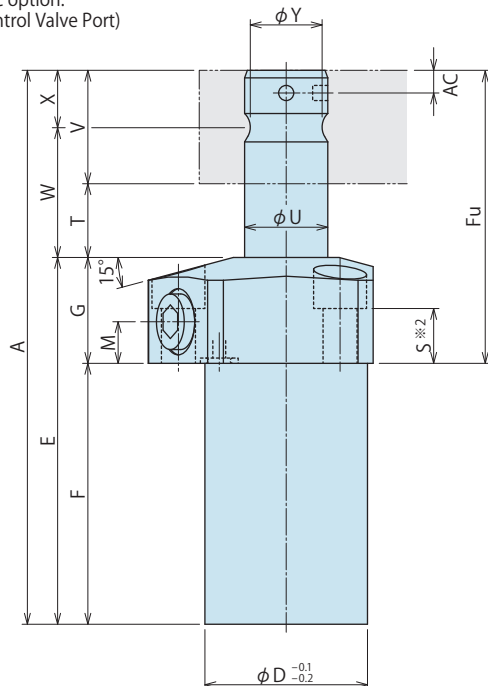
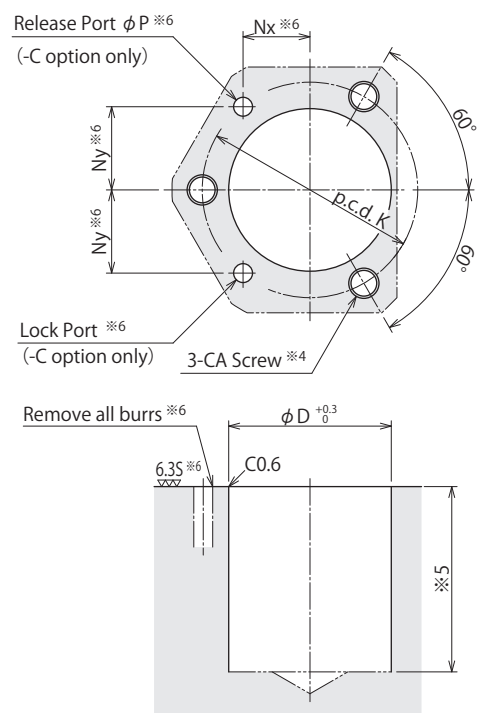
External Dimensions

C : Gasket Option (With G Thread Plug)

※The drawing shows the released state of TLA-2CL-Y45.



Machining Dimensions of Mounting Area



Notes

- ※4. CA tapping depth should be calculated so that mounting bolts engage fixture by at least 1.5 x bolt diameter.
- ※5. The φD depth of the body mounting hole should be decided from dimension F.
- ※6. This process indicates -C : Gasket option.

Notes

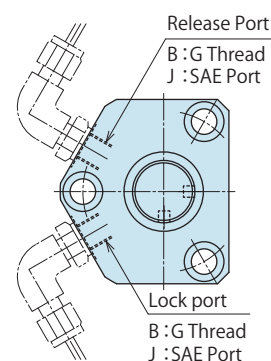
- ※1. The pin hole position for determine the lever phase in the release condition varies by a swing angle.
 - ※2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height. Please refer to S dimensions.
 - ※3. Speed control valve is sold separately. Please prepare using reference to P.727.
1. Prepare swing lever and mounting bolts as shown P.411 ~ P.412.

Piping Method

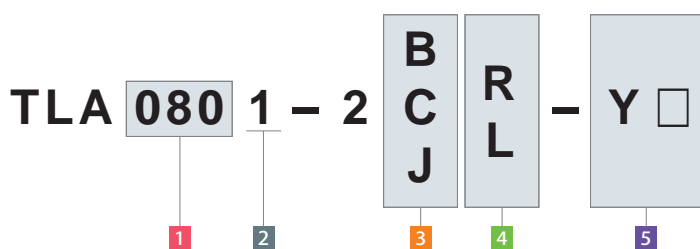
B : G Thread Piping Option

J : SAE Port Option

※The drawing shows the released state of TLA-2BL-Y45/TLA-2JL-Y45.



Model No. Indication



(Format Example : TLA0801-2CR-Y30, TLA1601-2BL-Y45)

- 1 Body Size (Clamping Force)
- 2 Design No.
- 3 Piping Method
- 4 Swing Direction when Clamping
- 5 Option (When Y□ is chosen)

- 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
 - LT/LG
 - TLA-2
 - TLB-2
 - TLA-1

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

- Work Support
 - LD
 - LC
 - TNC
 - TC

- Air Sensing Lift Cylinder
 - LLW

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

- Block Cylinder
 - DBA
 - DBC

- Control Valve
 - BZL
 - BZT
 - BZX/JZG

- Pallet Clamp
 - VS
 - VT

- Expansion Locating Pin
 - VL
 - VM
 - VJ
 - VK

- Pull Stud Clamp
 - FP
 - FQ

- Customized Spring Cylinder
 - DWA/DWB

External Dimensions and Machining Dimensions for Mounting

(mm)

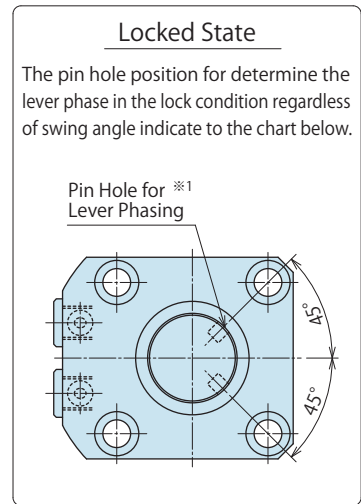
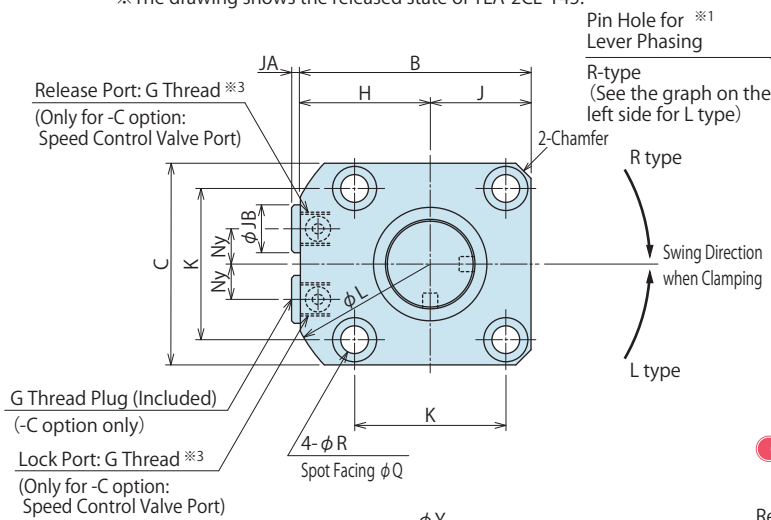
Model No.	TLA0401-2□□-Y			TLA0601-2□□-Y			TLA0801-2□□-Y			TLA1001-2□□-Y			TLA1601-2□□-Y			TLA2001-2□□-Y				
	30°	45°	60°	30°	45°	60°	30°	45°	60°	30°	45°	60°	30°	45°	60°	30°	45°	60°		
Swing Angle	30°	45°	60°	30°	45°	60°	30°	45°	60°	30°	45°	60°	30°	45°	60°	30°	45°	60°		
Full Stroke	11.7	12.3	12.9	12.2	12.9	13.6	14.9	15.7	16.5	15.7	16.7	17.6	19.5	20.6	21.7	21.2	22.6	23.9		
Swing Stroke	3.7	4.3	4.9	4.2	4.9	5.6	4.9	5.7	6.5	5.7	6.7	7.6	6.5	7.6	8.7	8.2	9.6	10.9		
Vertical Stroke	8			8			10			10			13			13				
A	95.2	95.8	96.4	102.2	102.9	103.6	115.9	116.7	117.5	130.7	131.7	132.6	155	156.1	157.2	174.7	176.1	177.4		
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	62.5			66			74			83			99.5			111.5				
F	38.5			41			49			55			69.5			74.5				
Fu	56.7	57.3	57.9	61.2	61.9	62.6	66.9	67.7	68.5	75.7	76.7	77.6	85.5	86.6	87.7	100.2	101.6	102.9		
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	13.7	14.3	14.9	14.2	14.9	15.6	16.9	17.7	18.5	17.7	18.7	19.6	21.5	22.6	23.7	23.2	24.6	25.9		
U	14			16			18			22			25			30				
V	19			22			25			30			34			40				
W	23.2	23.8	24.4	25.2	25.9	26.6	29.4	30.2	31.0	32.7	33.7	34.6	38.5	39.6	40.7	43.2	44.6	45.9		
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)				
Lock Port/Release Port	-B/-C option		G1/8	G1/8		G1/8	G1/8		G1/8	G1/8		G1/8	G1/8		G1/8	G1/4		G1/4		
	-J option		SAE2	SAE2		SAE2	SAE2		SAE2	SAE2		SAE2	SAE2		SAE2	SAE4		SAE4		
O-ring	-C option		1BP5	1BP5		1BP5	1BP5		1BP5	1BP5		1BP5	1BP5		1BP5	1BP7		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)				
Cylinder Capacity cm ³	Lock		1.2	1.2	1.3	1.8	1.9	2.0	2.9	3.1	3.3	4.4	4.7	4.9	8.1	8.6	9.0	13.0	13.9	14.7
	Release		3.0	3.2	3.3	4.3	4.5	4.7	6.7	7.1	7.4	10.4	11.0	11.6	17.7	18.7	19.7	28.0	29.8	31.6
Mass ^{※7}	kg		0.4			0.6			0.8			1.3			1.7			2.9		

Note ※7. Mass of single swing clamp without swing lever.

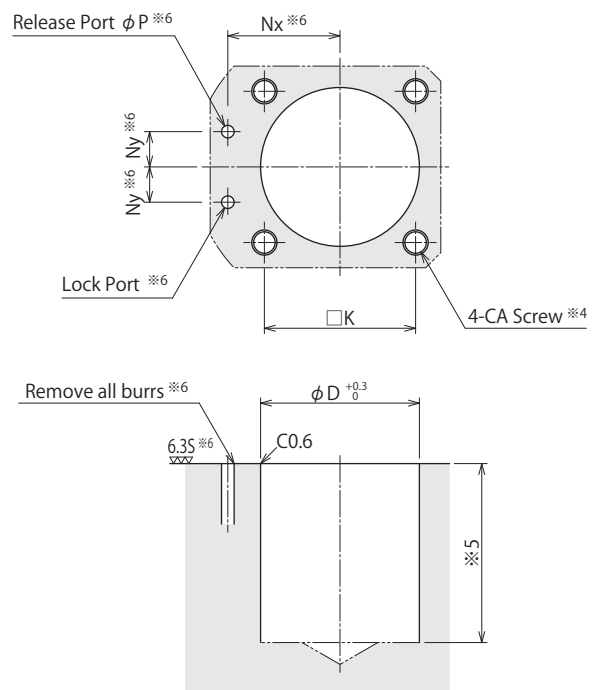
External Dimensions

C : Gasket Option (With G Thread Plug)

※The drawing shows the released state of TLA-2CL-Y45.



Machining Dimensions of Mounting Area



Notes

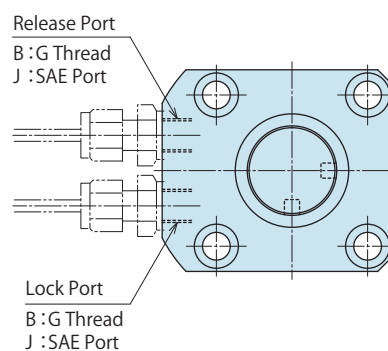
- ※4. CA tapping depth should be calculated so that mounting bolts engage fixture by at least 1.5 x bolt diameter.
- ※5. The φD depth of the body mounting hole should be decided from dimension F.
- ※6. This process indicates -C : Gasket option.

Piping Method

B : G Thread Piping Option

J : SAE Port Option

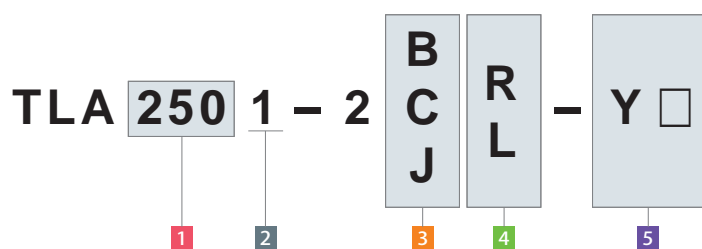
※The drawing shows the released state of TLA-2BL-Y45 / TLA-2JL-Y45.



Notes

- ※1. The pin hole position for determine the lever phase in the release condition varies by a swing angle.
 - ※2. Mounting bolts are not provided.
Prepare mounting bolts according to the mounting height. Please refer to S dimensions.
 - ※3. Speed control valve is sold separately.
Please prepare using reference to P.727.
1. Prepare swing lever and mounting bolts as shown P.411 ~ P.412.

Model No. Indication



(Format Example : TLA2501-2CR-Y30, TLA4001-2BL-Y45)

- 1 Body Size (Clamping Force)
- 2 Design No.
- 3 Piping Method
- 4 Swing Direction when Clamping
- 5 Option (When Y□ is chosen)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	TLA2501-2□□-Y			TLA4001-2□□-Y			
	30°	45°	60°	30°	45°	60°	
Swing Angle	30°	45°	60°	30°	45°	60°	
Full Stroke	26.1	27.6	29.0	27.6	29.5	31.5	
Swing Stroke	10.1	11.6	13.0	11.6	13.5	15.5	
Vertical Stroke	16			16			
A	205.1	206.6	208	233.1	235	237	
B	92			114			
C	80			102			
D	63			90			
E	131			148.5			
F	91			98.5			
Fu	114.1	115.6	117	134.6	136.5	138.5	
G	40			50			
H	52			63			
J	40			51			
K	60			80			
L	118			146			
M	15			17			
Nx	45			56			
Ny	16			21			
P	5			5			
Q	17.5			20			
R	11			14			
S	22.5			27.5			
T	28.1	29.6	31	29.6	31.5	33.5	
U	35.5			45			
V	46			55			
W	51.1	52.6	54	57.1	59	61	
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	C6			C6			
Lock Port/ Release Port	-B/-C option	G1/4		G1/4			
	-J option	SAE4		SAE4			
O-ring	-C option	1BP7		1BP7			
Lever Phasing Pin (Included)	φ 6×12 (B type)			φ 8×16 (B type)			
Cylinder Capacity cm ³	Lock	21.4	22.6	23.8	34.1	36.5	39.0
	Release	47.2	49.9	52.5	78.1	83.4	89.1
Mass ^{※7}	kg		4.3	9.2			

Note ※7. Mass 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
- LT/LG
- TLA-2**
- TLB-2
- TLA-1

Link Clamp

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

Work Support

- LD
- LC
- TNC
- TC

Air Sensing Lift Cylinder

- LLW

Compact Cylinder

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

Block Cylinder

- DBA
- DBC

Control Valve

- BZL
- BZT
- BZX/JZG

Pallet Clamp

- VS
- VT

Expansion Locating Pin

- VL
- VM
- VJ
- VK

Pull Stud Clamp

- FP
- FQ

Customized Spring Cylinder

- DWA/DWB

● Accessories : Material Swing Lever

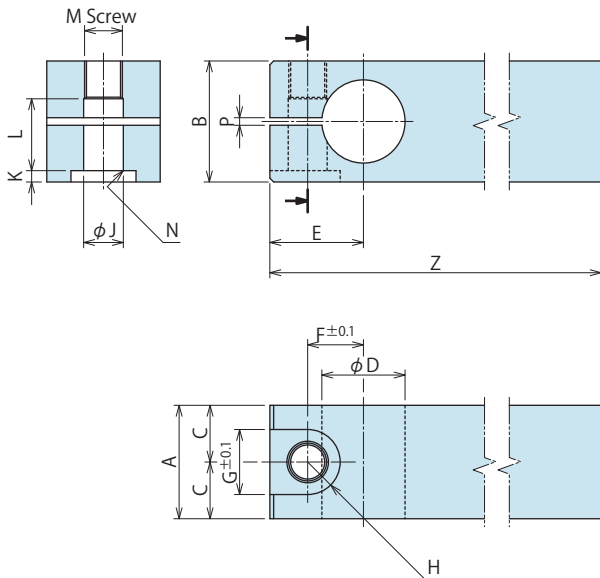
※ If you design and manufacture levers, the mounting dimensions should match below chart. If you manufacture the swing lever with different dimensions than the list above, it could lead to malfunctions, including poor clamp force not up to specification, deformation and scrapping.

Model No. Indication

TLZ 080 0 - L2

Size (Refer to the graph on the right.)

Design No. (Revision Number)



Model No.	TLZ0400-L2	TLZ0600-L2	TLZ0800-L2	TLZ1000-L2	TLZ1600-L2	TLZ2000-L2	TLZ2500-L2	TLZ4000-L2
Corresponding Model No.	TLA0401-2	TLA0601-2	TLA0801-2	TLA1001-2	TLA1601-2	TLA2001-2	TLA2501-2	TLA4001-2
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
 2. If necessary, the front end should be additionally machined.
 3. The lever phase definite decision is necessary.
Make additional machining using below chart for machining dimensions.
 4. Sells the tightening bolt for lever separately.

● Accessories : Tightening Bolts for Quick Change Lever

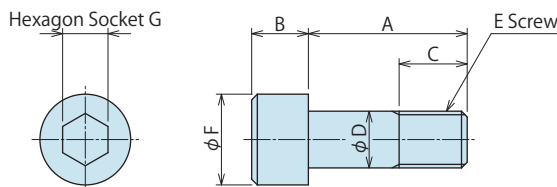
※ If you design and manufacture lever connecting bolt, machine according to above dimension chart and use class 12.9 material.

Model No. Indication

TLZ 080 0 - LB

Size (Refer to the graph on the right.)

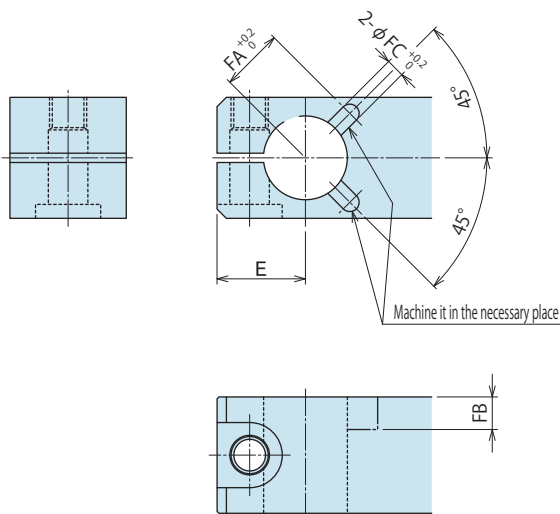
Design No. (Revision Number)



Model No.	TLZ0400-LB	TLZ0600-LB	TLZ0800-LB	TLZ1000-LB	TLZ1600-LB	TLZ2000-LB	TLZ2500-LB	TLZ4000-LB
Corresponding Model No.	TLA0401-2	TLA0601-2	TLA0801-2	TLA1001-2	TLA1601-2	TLA2001-2	TLA2501-2	TLA4001-2
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 process match to TLA□1-2.



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

- Notes
1. Material : S50CH
 2. When determining phase hole is necessary, refer to the swing lever design dimensions for each model.
If no need to determine phase, additional machining is not necessary.

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
- LT/LG
- TLA-2**
- TLB-2
- TLA-1

Link Clamp

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

Work Support

- LD
- LC
- TNC
- TC

Air Sensing Lift Cylinder

- LLW

Compact Cylinder

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

Block Cylinder

- DBA
- DBC

Control Valve

- BZL
- BZT
- BZX/JZG

Pallet Clamp

- VS
- VT

Expansion Locating Pin

- VL
- VM
- VJ
- VK

Pull Stud Clamp

- FP
- FQ

Customized Spring Cylinder

- DWA/DWB

Hydraulic Double Action Swing Clamp

Model TLB-2

High Pressure (7~35MPa)

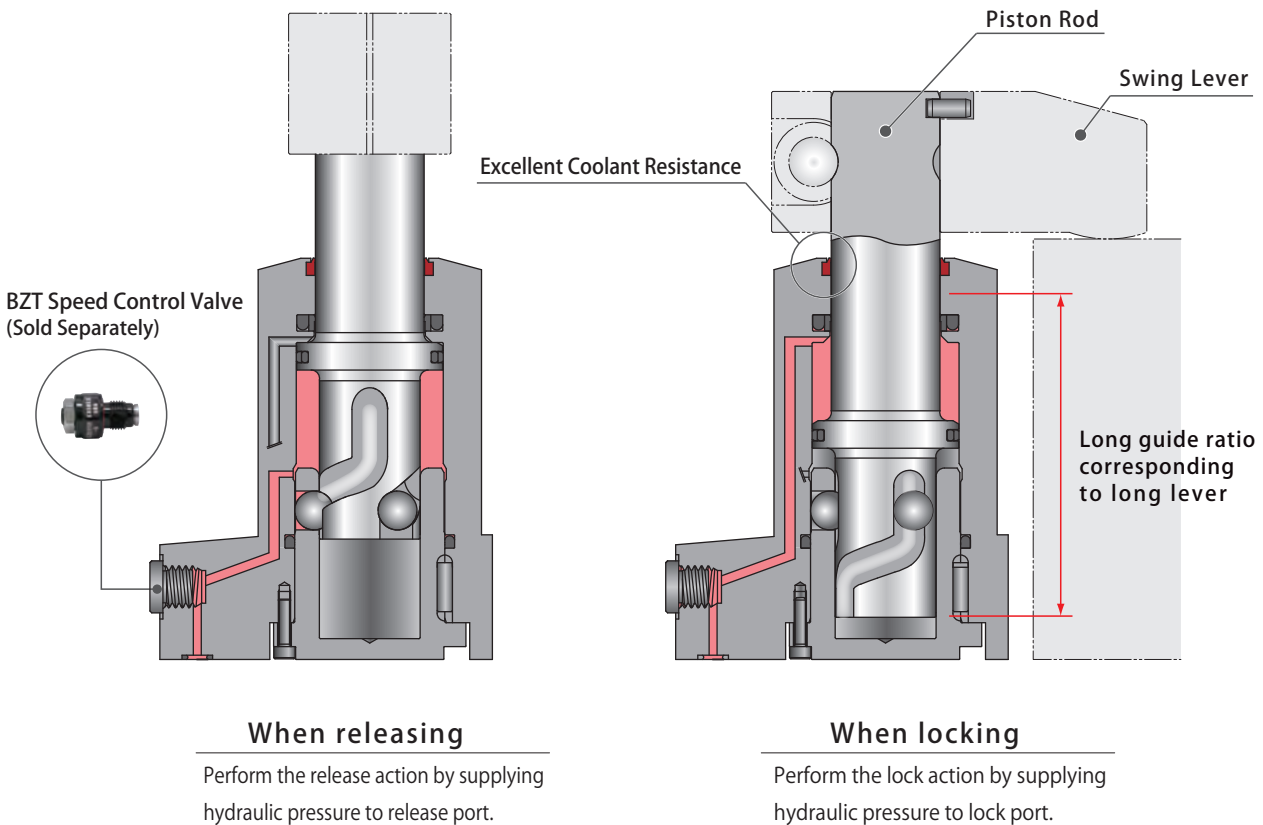
Bottom Flange



Index

Hydraulic Swing Clamp Digest	P.285
Action Description	P.414
Model No. Indication	P.415
Specifications	P.416
Performance Curve	
• Clamping Force Curve	P.417
• Allowable Swing Time Graph	P.419
External Dimensions	
• Bottom Flange/ Standard Model (TLB-2)	P.421
• Bottom Flange / Balance Lever Option (TLB-2-P)	P.423
• Bottom Flange / Long Stroke Option (TLB-2-Q)	P.425
• Bottom Flange / Swing Angle Selectable Option (TLB-2-Y□)	P.427
Lever Design Dimensions	P.429
Accessories	
• Material Swing Lever for TLB	P.429
• Speed Control Valve•Plug	P.727
Cautions	
• Notes for Hydraulic Swing Clamps	P.445
• Cautions (Common)	P.1043
• Installation Notes	
• Hydraulic Fluid List	
• Notes on Hydraulic Cylinder Speed Control Circuit	
• Notes on Handling	
• Maintenance/Inspection	
• Warranty	

Action Description

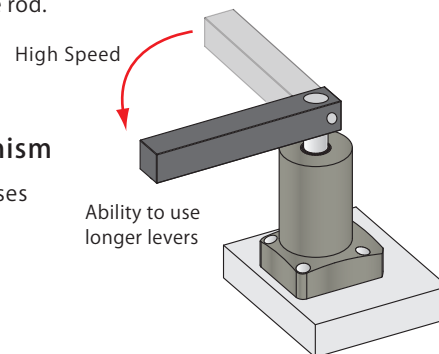


• Able to Use Longer Levers

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
LT/LG
TLA-2
TLB-2
TLA-1

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

Work Support
LD
LC
TNC
TC

Air Sensing Lift Cylinder
LLW

Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT

Block Cylinder
DBA
DBC

Control Valve
BZL
BZT
BZX/JZG

Pallet Clamp
VS
VT

Expansion Locating Pin
VL
VM
VJ
VK

Pull Stud Clamp
FP
FQ

Customized Spring Cylinder
DWA/DWB

Model No. Indication

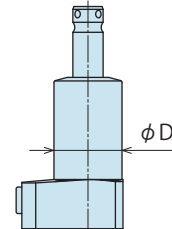
TLB **080** **1** - **2** **C** **R** -

1 2 3 4 5

1 Body Size (Clamping Force)

040 : $\phi D=32\text{mm}$	160 : $\phi D=53\text{mm}$
060 : $\phi D=36\text{mm}$	200 : $\phi D=63.5\text{mm}$
080 : $\phi D=39\text{mm}$	250 : $\phi D=71\text{mm}$
100 : $\phi D=46.5\text{mm}$	400 : $\phi D=90\text{mm}$

※ Outer diameter (ϕD) of the cylinder.



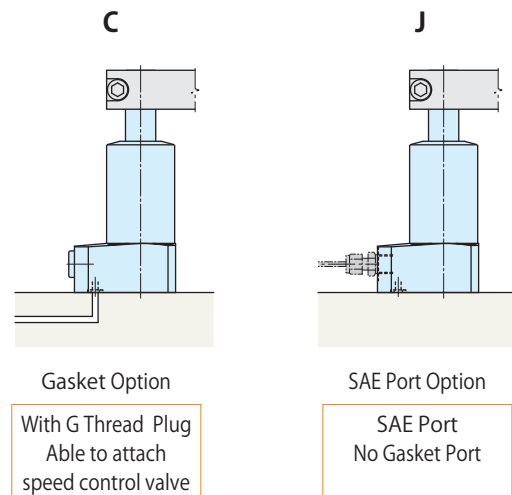
2 Design No.

1 : Revision Number

3 Piping Method

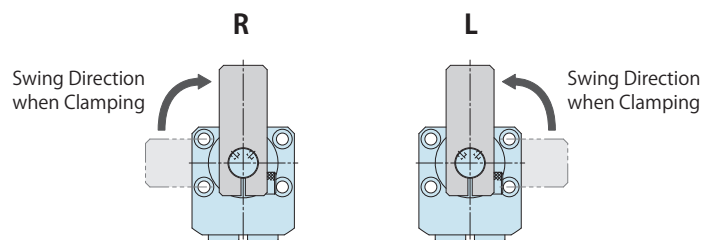
C : Gasket Option (With G Thread Plug)
J : SAE Port Option (No Gasket Port)

※ Speed control valve (BZT) is sold separately.
 Refer to P.727.



4 Swing Direction when Clamping

R : Clockwise
L : Counter-Clockwise



5 Option

Blank : None (Standard: Quick Change Lever Option)
P : Balance Lever Option
Q : Long Stroke Option
Y□ : Swing Angle Selectable Option
 (**Y30** : 30° / **Y45** : 45° / **Y60** : 60°)

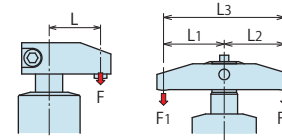


Specifications

Model No.	TLB0401-2□□-□			TLB0601-2□□-□			TLB0801-2□□-□			TLB1001-2□□-□																															
Cylinder Area for Locking	cm ²			1.005			1.453			1.979			2.804																												
Clamping Force (Calculation Formula) ^{※1} kN	5	Blank/Q/Y□ selected			$F = \frac{P}{10.94+0.036 \times L}$			$F = \frac{P}{7.57+0.024 \times L}$			$F = \frac{P}{5.53+0.0147 \times L}$			$F = \frac{P}{3.91+0.0094 \times L}$																											
		P selected			$F_1 = (L_2/L_3) \times 0.101 \times P$ $F_2 = (L_1/L_3) \times 0.101 \times P$			$F_1 = (L_2/L_3) \times 0.145 \times P$ $F_2 = (L_1/L_3) \times 0.145 \times P$			$F_1 = (L_2/L_3) \times 0.198 \times P$ $F_2 = (L_1/L_3) \times 0.198 \times P$			$F_1 = (L_2/L_3) \times 0.280 \times P$ $F_2 = (L_1/L_3) \times 0.280 \times P$																											
5	Blank/P selected	Full Stroke	mm			14			15			18			19.5																										
		Swing Stroke (90°)	mm			6			7			8			9.5																										
		Vertical Stroke	mm			8			8			10			10																										
		Swing Angle Accuracy	90° ±3°																																						
		Swing Completion Position Repeatability	±0.5°																																						
5	Q selected	Full Stroke	mm			22			23			28			29.5																										
		Swing Stroke (90°)	mm			6			7			8			9.5																										
		Vertical Stroke	mm			16			16			20			20																										
		Swing Angle Accuracy	90° ±3°																																						
		Swing Completion Position Repeatability	±0.5°																																						
5	Y□ selected	Option	Y30	Y45	Y60	Y30	Y45	Y60	Y30	Y45	Y60	Y30	Y45	Y60																											
		Full Stroke	mm			11.7			12.3			12.9			13.6			14.9			15.7			16.5			15.7			16.7			17.6								
		Swing Stroke (90°)	mm			3.7			4.3			4.9			4.2			4.9			5.6			4.9			5.7			6.5			5.7			6.7			7.6		
		Vertical Stroke	mm			8			8			8			8			8			8			10			10			10			10			10			10		
		Swing Angle Accuracy	30° ±3°			45° ±3°			60° ±3°			30° ±3°			45° ±3°			60° ±3°			30° ±3°			45° ±3°			60° ±3°			30° ±3°			45° ±3°			60° ±3°					
		Swing Completion Position Repeatability	±0.5°																																						
Max. Operating Pressure	MPa			35.0																																					
Min. Operating Pressure ^{※2}	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.	TLB1601-2□□-□			TLB2001-2□□-□			TLB2501-2□□-□			TLB4001-2□□-□																															
Cylinder Area for Locking	cm ²			4.170			6.134			8.198			12.37																												
Clamping Force (Calculation Formula) ^{※1} kN	5	No mark/Q/Y□ selected			$F = \frac{P}{2.59+0.0046 \times L}$			$F = \frac{P}{1.76+0.0028 \times L}$			$F = \frac{P}{1.32+0.0018 \times L}$			$F = \frac{P}{0.87+0.0011 \times L}$																											
		P selected			$F_1 = (L_2/L_3) \times 0.417 \times P$ $F_2 = (L_1/L_3) \times 0.417 \times P$			$F_1 = (L_2/L_3) \times 0.613 \times P$ $F_2 = (L_1/L_3) \times 0.613 \times P$			$F_1 = (L_2/L_3) \times 0.820 \times P$ $F_2 = (L_1/L_3) \times 0.820 \times P$			$F_1 = (L_2/L_3) \times 1.237 \times P$ $F_2 = (L_1/L_3) \times 1.237 \times P$																											
5	Blank/P selected	Full Stroke	mm			24			26.5			32			35.5																										
		Swing Stroke (90°)	mm			11			13.5			16			19.5																										
		Vertical Stroke	mm			13			13			16			16																										
		Swing Angle Accuracy	90° ±3°																																						
		Swing Completion Position Repeatability	±0.5°																																						
5	Q selected	Full Stroke	mm			36			38.5			48			51.5																										
		Swing Stroke (90°)	mm			11			13.5			16			19.5																										
		Vertical Stroke	mm			25			25			32			32																										
		Swing Angle Accuracy	90° ±3°																																						
		Swing Completion Position Repeatability	±0.5°																																						
5	Y□ selected	Option	Y30	Y45	Y60	Y30	Y45	Y60	Y30	Y45	Y60	Y30	Y45	Y60																											
		Full Stroke	mm			19.5			20.6			21.7			21.2			22.6			23.9			26.1			27.6			29.0			27.6			29.5			31.5		
		Swing Stroke (90°)	mm			6.5			7.6			8.7			8.2			9.6			10.9			10.1			11.6			13.0			11.6			13.5			15.5		
		Vertical Stroke	mm			13			13			13			13			13			13			16			16			16			16			16			16		
		Swing Angle Accuracy	30° ±3°			45° ±3°			60° ±3°			30° ±3°			45° ±3°			60° ±3°			30° ±3°			45° ±3°			60° ±3°			30° ±3°			45° ±3°			60° ±3°					
		Swing Completion Position Repeatability	±0.5°																																						
Max. Operating Pressure	MPa			35.0																																					
Min. Operating Pressure ^{※2}	MPa			7.0																																					
Withstanding Pressure	MPa			42.0																																					
Operating Temperature	°C			0 ~ 70																																					
Usable Fluid	General Hydraulic Oil Equivalent to ISO-VG-32																																								

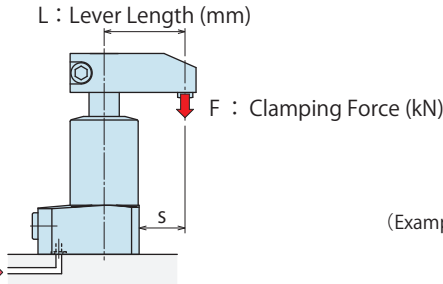
Notes ※1. F, F₁, F₂ : Clamping Force (kN) P : Supply Hydraulic Pressure (MPa)
L, L₁, L₂ : Distance between the piston center and the clamping point (mm) L₃ : (mm).
※2. Minimum pressure to operate the clamp with no load.
1. Please see the external dimension if you need the information of mass and cylinder volume.



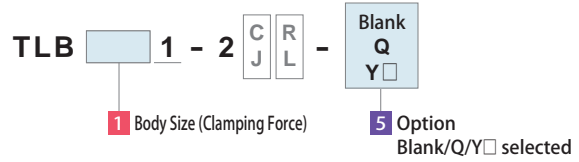
- High-Power Series
- Pneumatic Series
- Hydraulic Series
- Valve / Coupler Hydraulic Unit
- Manual Operation Accessories
- Cautions / Others
- Hole Clamp
 - SFA
 - SFC
- Swing Clamp
 - LHA
 - LHC
 - LHS
 - LHW
 - LT/LG
 - TLA-2
 - TLB-2**
 - TLA-1
- Link Clamp
 - LKA
 - LKC
 - LKW
 - LM/LJ
 - TMA-2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

Clamping Force Curve

※ TLB□□1-2□□-P : For balance lever option, the clamping force curve is different from the graph. Please calculate it with the specification's formula.



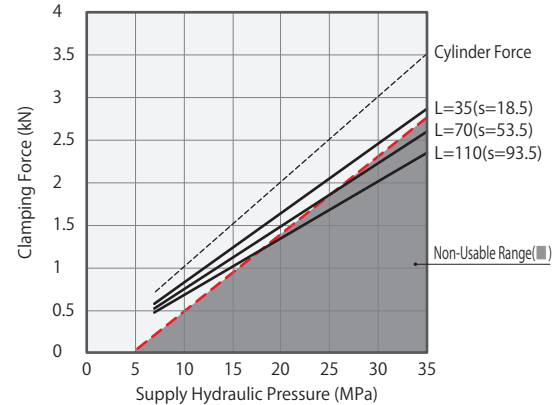
Applicable Model



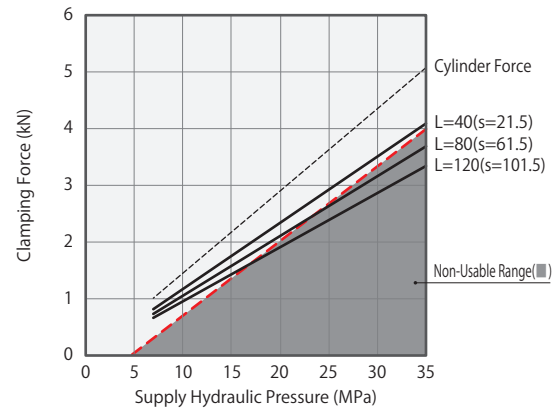
(Example) When using TLB1601-2□□

Supply Hydraulic Pressure 25.0MPa, Lever Length L=50 mm
Clamping force is about 8.9kN.

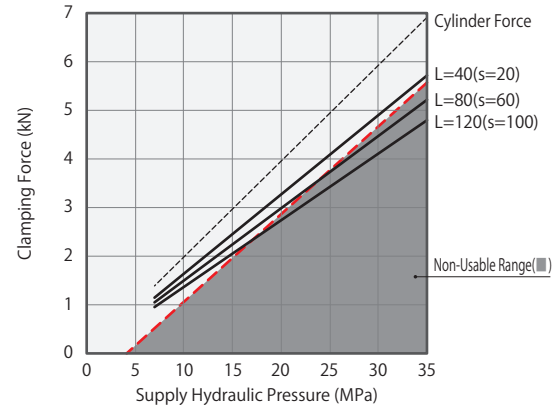
TLB0401-2		Clamping Force Calculation Formula ※1 (kN) $F = P / (10.94 + 0.036 \times L)$								
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) / Lever Length L (mm)								Max. Lever Length (L) (mm)
		L=35	L=40	L=50	L=60	L=70	L=80	L=90	L=110	
35	3.52	2.9	2.9							48
32.5	3.27	2.7	2.7	2.6						52
30	3.02	2.5	2.5	2.4						57
27.5	2.77	2.3	2.3	2.2	2.1					63
25	2.52	2.1	2.1	2.0	2.0	1.9				71
22.5	2.27	1.9	1.9	1.8	1.8	1.7	1.7			81
20	2.01	1.7	1.7	1.6	1.6	1.5	1.5	1.5		95
17.5	1.76	1.5	1.5	1.4	1.4	1.4	1.3	1.3	1.2	113
15	1.51	1.3	1.3	1.2	1.2	1.2	1.1	1.1	1.1	141
12.5	1.26	1.1	1.1	1.0	1.0	1.0	1.0	0.9	0.9	150
10	1.01	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.7	150
7	0.71	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	150
Max. Operating Pressure (MPa)		35.0	35.0	33.6	28.8	25.4	22.8	20.8	17.9	



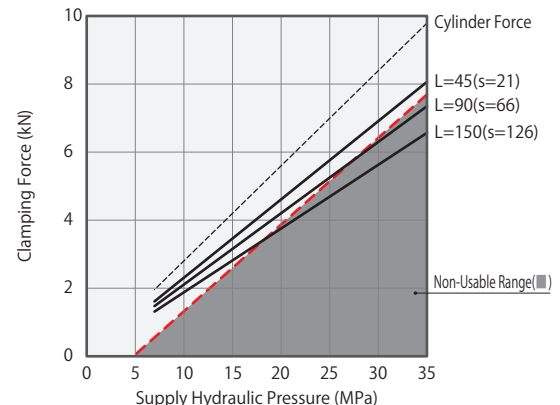
TLB0601-2		Clamping Force Calculation Formula ※1 (kN) $F = P / (7.57 + 0.024 \times L)$								
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) / Lever Length L (mm)								Max. Lever Length (L) (mm)
		L=40	L=50	L=60	L=70	L=80	L=90	L=100	L=120	
35	5.09	4.2								49
32.5	4.73	3.9	3.8							54
30	4.36	3.6	3.5							59
27.5	4.00	3.3	3.2	3.1						66
25	3.64	3.0	2.9	2.8	2.8					74
22.5	3.27	2.7	2.6	2.5	2.5	2.4				84
20	2.91	2.4	2.3	2.3	2.2	2.2	2.1			98
17.5	2.55	2.1	2.0	2.0	1.9	1.9	1.8	1.8		117
15	2.18	1.8	1.8	1.7	1.7	1.6	1.6	1.6	1.5	145
12.5	1.82	1.5	1.5	1.4	1.4	1.4	1.3	1.3	1.2	192
10	1.46	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.0	200
7	1.02	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.7	200
Max. Operating Pressure (MPa)		35.0	34.6	29.6	26.0	23.4	21.3	19.6	17.2	



TLB0801-2		Clamping Force Calculation Formula ※1 (kN) $F = P / (5.53 + 0.0147 \times L)$								
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	6.93	5.8	5.6							50
32.5	6.44	5.4	5.2							55
30	5.94	5.0	4.8	4.7						60
27.5	5.45	4.5	4.4	4.3						66
25	4.95	4.1	4.0	3.9	3.9					74
22.5	4.46	3.7	3.6	3.6	3.5	3.4				84
20	3.96	3.3	3.2	3.2	3.1	3.0	3.0			98
17.5	3.47	2.9	2.8	2.8	2.7	2.7	2.6	2.5		116
15	2.97	2.5	2.4	2.4	2.3	2.3	2.2	2.2	2.1	143
12.5	2.48	2.1	2.0	2.0	2.0	1.9	1.9	1.8	1.8	185
10	1.98	1.7	1.6	1.6	1.6	1.5	1.5	1.5	1.4	230
7	1.39	1.2	1.2	1.1	1.1	1.1	1.1	1.0	1.0	230
Max. Operating Pressure (MPa)		35.0	35.0	30.0	26.3	23.5	21.4	19.6	17.1	



TLB1001-2		Clamping Force Calculation Formula ※1 (kN) $F = P / (3.91 + 0.0094 \times L)$								
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	9.82	8.1	8.0	7.9						66
32.5	9.12	7.6	7.5	7.3	7.2					72
30	8.42	7.0	6.9	6.8	6.6					80
27.5	7.72	6.4	6.3	6.2	6.1					88
25	7.01	5.8	5.8	5.6	5.5	5.3				99
22.5	6.31	5.2	5.2	5.1	5.0	4.8	4.6			113
20	5.61	4.7	4.6	4.5	4.4	4.3	4.1	3.9		132
17.5	4.91	4.1	4.0	4.0	3.9	3.7	3.6	3.5	3.3	158
15	4.21	3.5	3.5	3.4	3.3	3.2	3.1	3.0	2.9	197
12.5	3.51	2.9	2.9	2.8	2.8	2.7	2.6	2.5	2.4	250
10	2.81	2.4	2.3	2.3	2.2	2.2	2.1	2.0	1.9	250
7	1.97	1.7	1.6	1.6	1.6	1.5	1.5	1.4	1.4	250
Max. Operating Pressure (MPa)		35.0	35.0	35.0	33.4	27.1	23.0	20.2	18.2	

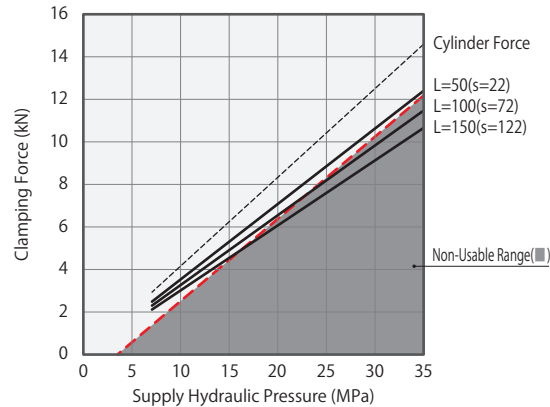


Notes

1. Tables and graphs shown are the relationships between the clamping force (kN) and supply hydraulic pressure (MPa).
2. Cylinder output (when L=0) cannot be calculated from the calculation formula of clamping force.
3. There may be no lever swing action with large inertia depending on supply hydraulic pressure or lever mounting position.
4. The clamping force is shown with lever in the locked position.
5. The clamping force varies as per the lever length. Use the hydraulic supply pressure suitable to the lever length.
6. Operation in the non-usable range can damage the clamp and lead to fluid leakage.
7. The tables and graphs are only for reference. The exact results should be calculated based on the formula in the specification column.

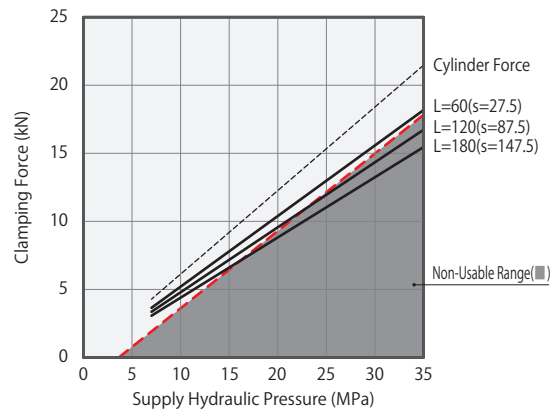
※1. F : Clamping Force (kN) , P : Supply Hydraulic Pressure (MPa) , L : Lever Length (mm).

TLB1601-2		Clamping Force Calculation Formula ※1 (kN) $F = P / (2.59 + 0.0046 \times L)$								Max. Lever Length (L) (mm)
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm)								
		L=50	L=60	L=70	L=80	L=90	L=100	L=120	L=150	
35	14.60	12.5	12.3							62
32.5	13.56	11.6	11.4							67
30	12.51	10.7	10.5	10.4						73
27.5	11.47	9.8	9.6	9.5	9.3					81
25	10.43	8.9	8.8	8.6	8.5	8.4				90
22.5	9.39	8.0	7.9	7.8	7.7	7.5	7.4			102
20	8.34	7.1	7.0	6.9	6.8	6.7	6.6			118
17.5	7.30	6.3	6.2	6.1	6.0	5.9	5.8	5.6		139
15	6.26	5.4	5.3	5.2	5.1	5.0	5.0	4.8	4.6	169
12.5	5.22	4.5	4.4	4.3	4.3	4.2	4.1	4.0	3.9	215
10	4.17	3.6	3.5	3.5	3.4	3.4	3.3	3.2	3.1	250
7	2.92	2.5	2.5	2.5	2.4	2.4	2.3	2.3	2.2	250
Max. Operating Pressure (MPa)	35.0	35.0	31.3	27.8	25.1	22.9	19.7	16.4		



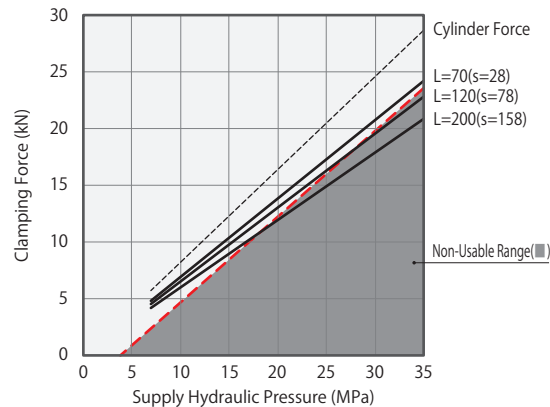
- Hole Clamp
SFA
SFC
- Swing Clamp**
LHA
LHC
LHS
LHW
LT/LG
TLA-2
TLB-2
TLA-1

TLB2001-2		Clamping Force Calculation Formula ※1 (kN) $F = P / (1.76 + 0.0028 \times L)$								Max. Lever Length (L) (mm)
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm)								
		L=60	L=70	L=80	L=100	L=120	L=140	L=160	L=180	
35	21.47	18.2	17.9							73
32.5	19.94	16.9	16.7							79
30	18.41	15.6	15.4	15.2						87
27.5	16.87	14.3	14.1	13.9						96
25	15.34	13.0	12.8	12.7	12.3					107
22.5	13.81	11.7	11.6	11.4	11.1	10.8				121
20	12.27	10.4	10.3	10.1	9.9	9.6	9.3			140
17.5	10.74	9.1	9.0	8.9	8.6	8.4	8.2	8.0		165
15	9.21	7.8	7.7	7.6	7.4	7.2	7.0	6.8	6.7	201
12.5	7.67	6.5	6.4	6.4	6.2	6.0	5.9	5.7	5.6	258
10	6.14	5.2	5.2	5.1	5.0	4.8	4.7	4.6	4.5	280
7	4.30	3.7	3.6	3.6	3.5	3.4	3.3	3.2	3.1	280
Max. Operating Pressure (MPa)	35.0	35.0	32.2	26.5	22.7	20.0	17.9	16.3		



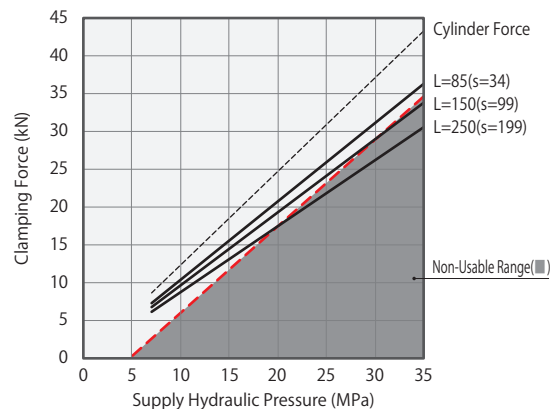
- Link Clamp
LKA
LKC
LKW
LM/LJ
TMA-2
TMA-1
- Work Support
LD
LC
TNC
TC
- Air Sensing Lift Cylinder
LLW

TLB2501-2		Clamping Force Calculation Formula ※1 (kN) $F = P / (1.32 + 0.0018 \times L)$								Max. Lever Length (L) (mm)
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm)								
		L=70	L=80	L=90	L=100	L=120	L=140	L=160	L=200	
35	28.70	24.3	24.0	23.7						91
32.5	26.65	22.5	22.2	22.0						99
30	24.60	20.8	20.5	20.3	20.0					109
27.5	22.55	19.1	18.8	18.6	18.4	18.0				120
25	20.50	17.3	17.1	16.9	16.7	16.3				134
22.5	18.45	15.6	15.4	15.2	15.0	14.7	14.4			153
20	16.40	13.9	13.7	13.5	13.4	13.1	12.8	12.5		176
17.5	14.35	12.2	12.0	11.9	11.7	11.4	11.2	10.9	10.5	208
15	12.30	10.4	10.3	10.2	10.0	9.8	9.6	9.4	9.0	255
12.5	10.25	8.7	8.6	8.5	8.4	8.2	8.0	7.8	7.5	300
10	8.20	7.0	6.9	6.8	6.7	6.6	6.4	6.3	6.0	300
7	5.74	4.9	4.8	4.8	4.7	4.6	4.5	4.4	4.2	300
Max. Operating Pressure (MPa)	35.0	35.0	35.0	32.3	27.5	24.2	21.6	18.1		



- Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT
- Block Cylinder
DBA
DBC
- Control Valve
BZL
BZT
BZX/JZG

TLB4001-2		Clamping Force Calculation Formula ※1 (kN) $F = P / (0.87 + 0.0011 \times L)$								Max. Lever Length (L) (mm)
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm)								
		L=85	L=100	L=125	L=150	L=175	L=200	L=225	L=250	
35	43.30	36.4	35.8	34.8						126
32.5	40.21	33.8	33.2	32.3						138
30	37.11	31.2	30.7	29.8	29.0					151
27.5	34.02	28.6	28.1	27.3	26.6					168
25	30.93	26.0	25.6	24.9	24.2	23.6				189
22.5	27.84	23.4	23.0	22.4	21.8	21.2	20.7			216
20	24.74	20.8	20.5	19.9	19.4	18.9	18.4	17.9	17.5	251
17.5	21.65	18.2	17.9	17.4	17.0	16.5	16.1	15.7	15.3	301
15	18.56	15.6	15.4	14.9	14.5	14.2	13.8	13.5	13.2	350
12.5	15.47	13.0	12.8	12.5	12.1	11.8	11.5	11.2	11.0	350
10	12.37	10.4	10.3	10.0	9.7	9.5	9.2	9.0	8.8	350
7	8.66	7.3	7.2	7.0	6.8	6.6	6.5	6.3	6.2	350
Max. Operating Pressure (MPa)	35.0	35.0	35.0	30.2	26.6	23.9	21.8	20.1		



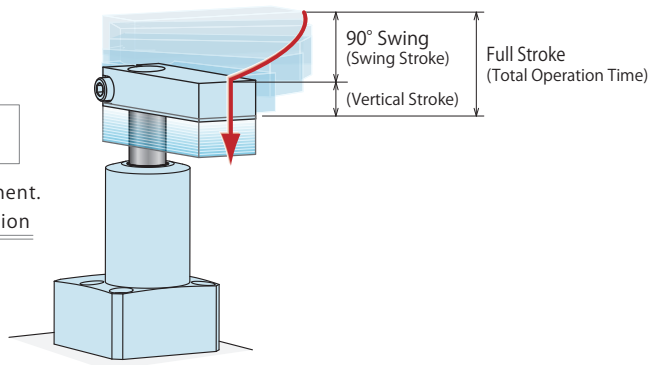
- Pallet Clamp
VS
VT
- Expansion Locating Pin
VL
VM
VJ
VK
- Pull Stud Clamp
FP
FQ
- Customized Spring Cylinder
DWA/DWB

Allowable Swing Time Graph

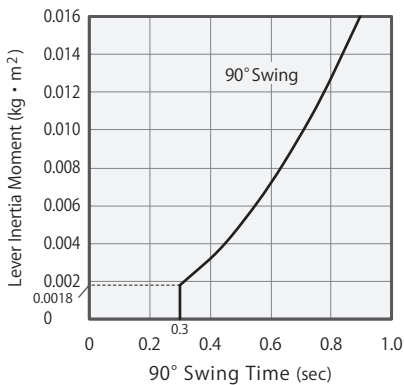
Adjustment of Swing Time

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

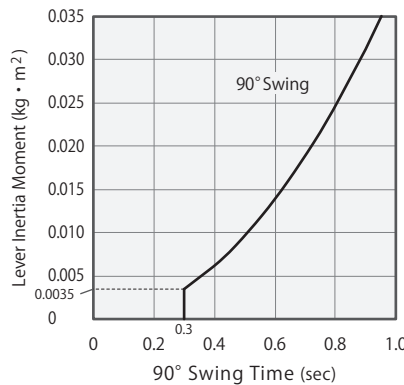
Excessive action speed can reduce stopping accuracy and damage internal parts.



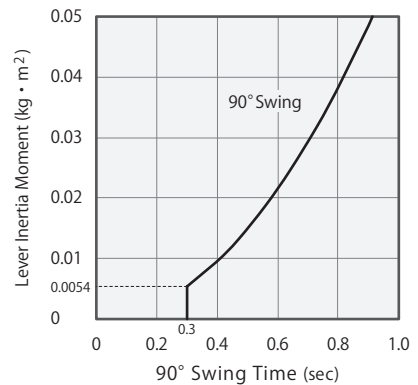
TLB0401-2



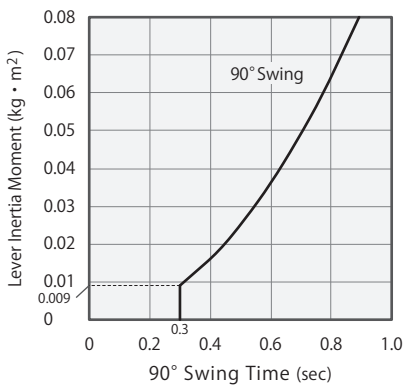
TLB0601-2



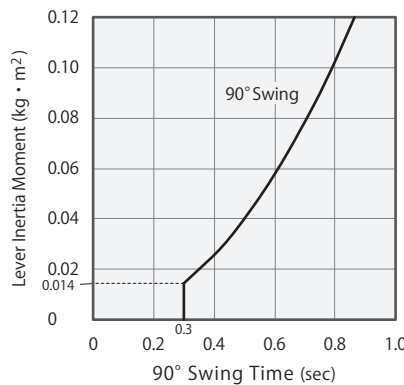
TLB0801-2



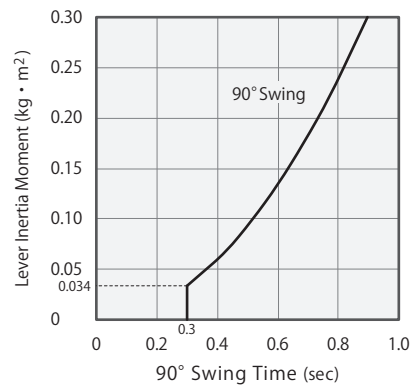
TLB1001-2



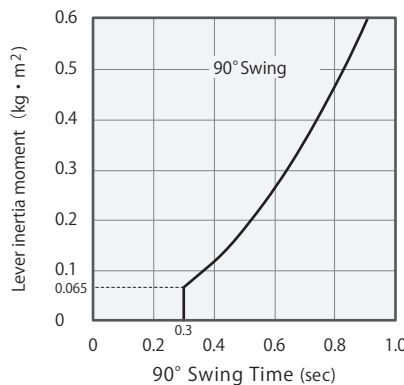
TLB1601-2



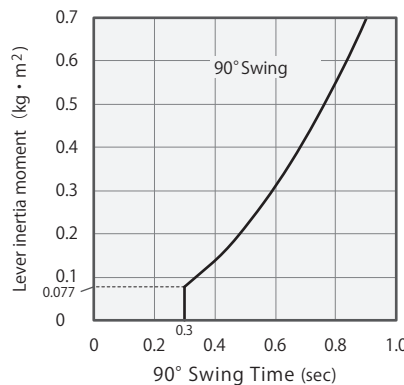
TLB2001-2



TLB2501-2



TLB4001-2



Notes

1. Graphs show 90° swing time against lever inertia moment.
2. Total swing stroke time become about 2 to 2.5 times of 90° swing time.
3. There may be no swinging action for the lever with large inertia based on different hydraulic supply pressure, flow and lever mounting position.
4. Adjust swing time to be at least that shown on the graphs for the given moment of inertia.
5. Excessive speed may degrade angle precision and damage internal parts.
6. The clamping force varies as per 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-in 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.

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
LT/LG
TLA-2
TLB-2
TLA-1
Link Clamp
LKA
LKC
LKW
LM/LJ
TMA-2
TMA-1
Work Support
LD
LC
TNC
TC
Air Sensing Lift Cylinder
LLW
Compact Cylinder
LL
LLR
LLU
DP
DR
DS
DT
Block Cylinder
DBA
DBC
Control Valve
BZL
BZT
BZX/JZG
Pallet Clamp
VS
VT
Expansion Locating Pin
VL
VM
VJ
VK
Pull Stud Clamp
FP
FQ
Customized Spring Cylinder
DWA/DWB

Model → **TLB1601-2**

(How to read the allowable swing time graph)

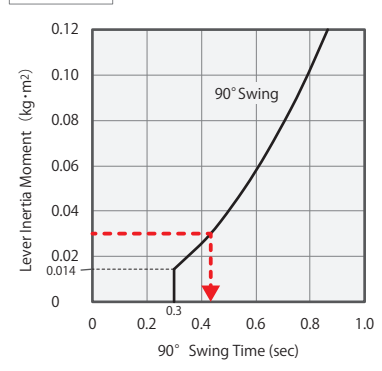
When TLB1601-2 is used

Lever Inertia Moment : 0.03kg·m²

- 90° Swing Time : About 0.43 sec or more
- Total Operation Time : About 0.95 sec or more

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

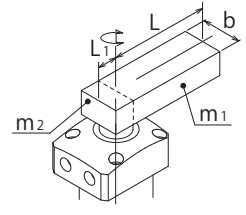
(Swing Stroke : 11 mm、Full Stroke : 24 mm)



How to calculate inertia moment (Estimated)

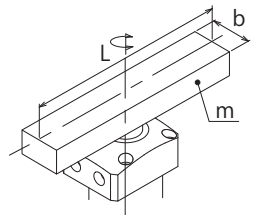
I : Inertia Moment (kg·m²) L,L₁,L₂,K,b: Length (m) m,m₁,m₂,m₃: Mass (kg)

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



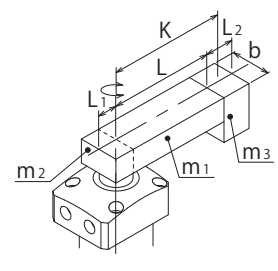
$$I = m_1 \frac{4L^2 + b^2}{12} + m_2 \frac{4L_1^2 + b^2}{12}$$

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



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

③ The load is applied on the lever front end.



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

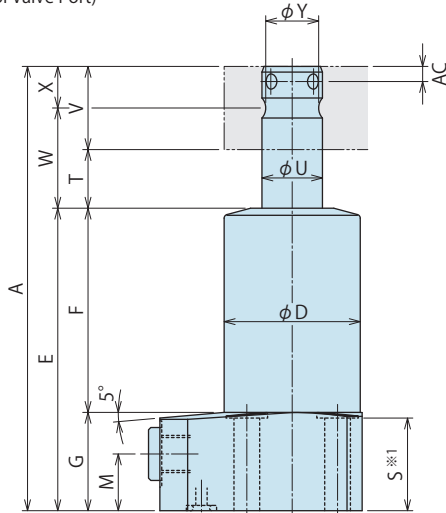
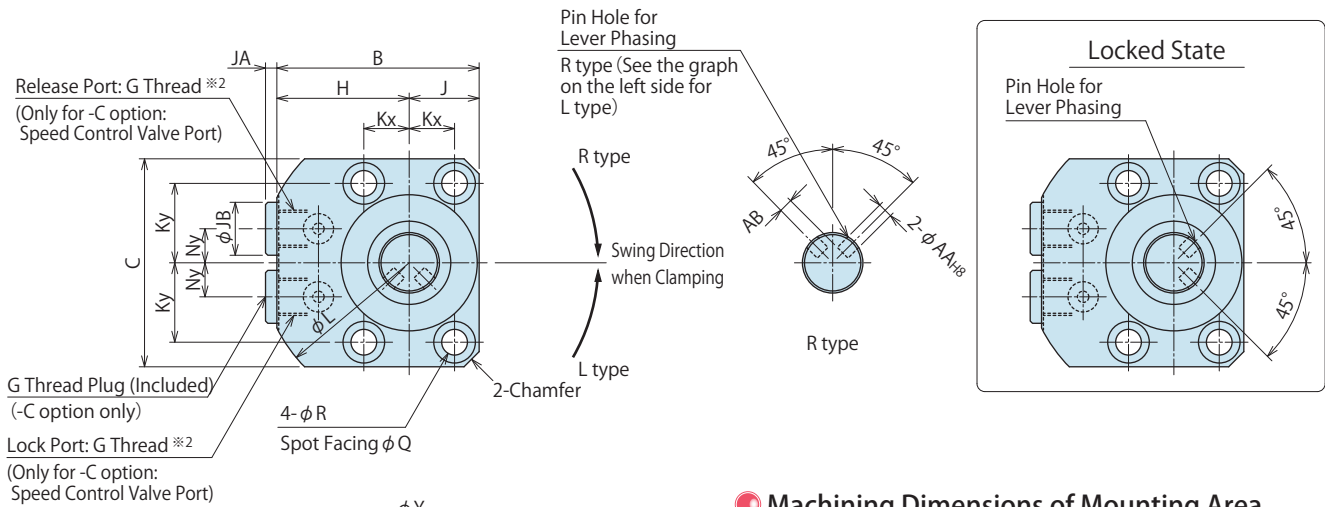
Calculation Formula of Total Operation Time

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

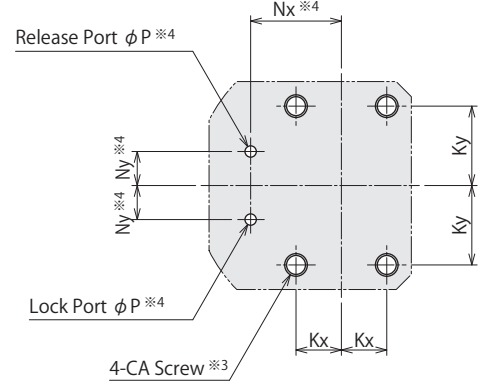
External Dimensions

C : Gasket Option (With G Thread Plug)

※The drawing shows the released state of TLB-2CL.

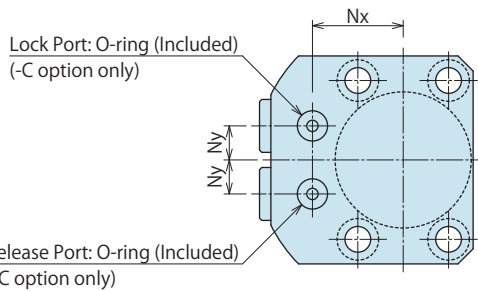


Machining Dimensions of Mounting Area



Notes

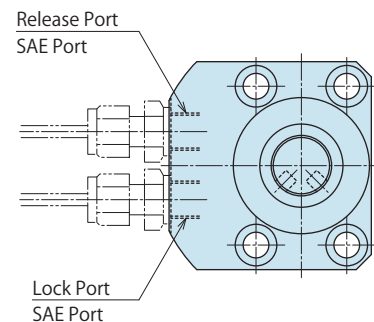
- ※3. CA tapping depth should be calculated so that mounting bolts engage fixture by at least 1.5 x bolt diameter.
- ※4. This process indicates -C: Gasket option. Roughness of mounting surface (O-ring seal surface) should be $\frac{6.35}{\sqrt{\Delta\Delta\Delta}}$ or less.



Piping Method

J : SAE Port Option

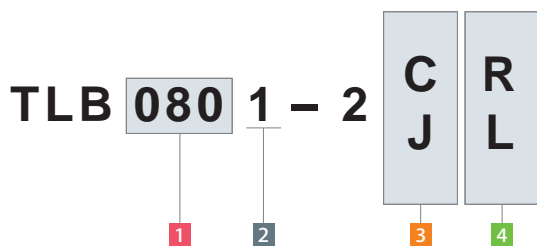
※The drawing shows the released state of TLB-2JL.



Notes

- ※1. Mounting bolts are not provided. Customer should prepare based on dimension "S".
- ※2. Speed control valve is sold separately. Please prepare using reference to P.727.
 1. Prepare swing lever and mounting bolts as shown P.429,P.430.

Model No. Indication



(Format Example: TLB0801-2CR, TLB4001-2JL)

- 1 Body Size (Clamping Force)
- 2 Design No.
- 3 Piping Method
- 4 Swing Direction when Clamping
- 5 Option (When Blank is chosen)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	TLB0401-2□□	TLB0601-2□□	TLB0801-2□□	TLB1001-2□□	TLB1601-2□□	TLB2001-2□□	TLB2501-2□□	TLB4001-2□□	
Full Stroke	14	15	18	19.5	24	26.5	32	35.5	
Swing Stroke (90°)	6	7	8	9.5	11	13.5	16	19.5	
Vertical Stroke	8	8	10	10	13	13	16	16	
A	97.5	105	119	134.5	159.5	180	211	241	
B	49.5	53.5	56.5	64	71.5	84.5	99.5	118	
C	47	55	57	70	71	90	84	102	
D	32	36	39	46.5	53	63.5	71	90	
E	62.5	66	74	83	99.5	111.5	131	148.5	
F	36.5	40	48	57	72.5	81.5	101	112.5	
G	26	26	26	26	27	30	30	36	
H	33	35	36.5	40	43.5	52	57.5	67	
J	16.5	18.5	20	24	28	32.5	42	51	
Kx	11	12	13.5	16	20	22.5	32	40	
Ky	18	21	22	27	27.5	35	32	40	
L	76	78	83	93	98	118	132	148	
M	15	15	15	15	16	16.5	16.5	22.5	
Nx	22	24	25.5	29	32.5	38	43.5	53	
Ny	9	9	10	12	14	17	19	20	
P	3	3	3	3	3	5	5	5	
Q	9	11	11	14	14	17.5	17.5	20	
R	5.5	6.8	6.8	9	9	11	11	14	
S	24	24	24	24	25	28	28	33	
T	16	17	20	21.5	26	28.5	34	37.5	
U	14	16	18	22	25	30	35.5	45	
V	19	22	25	30	34	40	46	55	
W	25.5	28	32.5	36.5	43	48.5	57	65	
X	9.5	11	12.5	15	17	20	23	27.5	
Y	12.5	14	16	19.5	22	26	31	39.5	
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	6 ^{+0.018} ₀	8 ^{+0.022} ₀	
AB	4	4	5	7	8.5	9	11.75	14.5	
AC	3.5	4.5	4.5	4.5	5	6.5	6.5	9	
CA (Nominal × Pitch)	M5×0.8	M6×1	M6×1	M8×1.25	M8×1.25	M10×1.5	M10×1.5	M12×1.75	
JA	3	3	3	3	3	3.5	3.5	3.5	
JB	14	14	14	14	14	19	19	19	
Chamfer	3	4	4	4	4	5	6	6	
Lock Port / Release Port	-C option	G1/8	G1/8	G1/8	G1/8	G1/8	G1/4	G1/4	
	-J option	SAE2	SAE2	SAE2	SAE2	SAE2	SAE4	SAE4	
O-ring	-C option	1BP5	1BP5	1BP5	1BP5	1BP5	1BP7	1BP7	
Lever Phasing Pin (Included)		φ 3×6 (B class)	φ 4×8 (B class)	φ 4×8 (B class)	φ 4×8 (B class)	φ 4×8 (B class)	φ 6×12 (B class)	φ 6×12 (B class)	φ 8×16 (B class)
Cylinder Capacity	Lock	1.4	2.2	3.6	5.5	10.0	16.3	26.2	43.9
	Release	3.6	5.2	8.1	12.9	21.8	35.0	57.9	100.4
Mass ^{※5}	kg	0.6	0.8	1.1	1.6	2.7	3.5	5.5	8.1

Note ※5. Mass of single swing clamp including taper sleeve and nut.

- 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
 - LT/LG
 - TLA-2
 - TLB-2
 - TLA-1

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

- Work Support
 - LD
 - LC
 - TNC
 - TC

- Air Sensing Lift Cylinder
 - LLW

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

- Block Cylinder
 - DBA
 - DBC

- Control Valve
 - BZL
 - BZT
 - BZX/JZG

- Pallet Clamp
 - VS
 - VT

- Expansion Locating Pin
 - VL
 - VM
 - VJ
 - VK

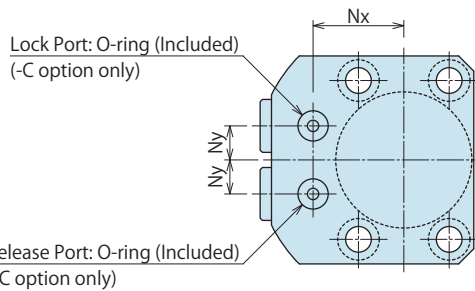
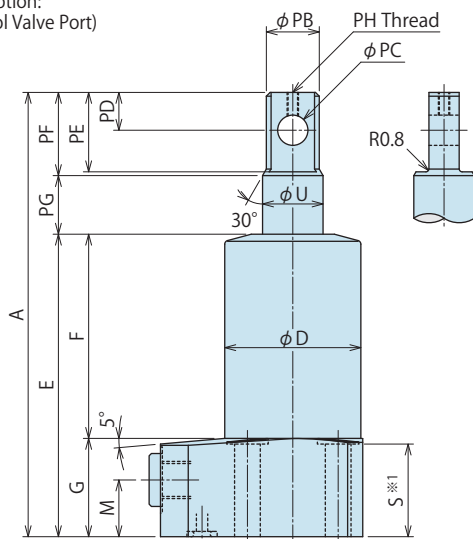
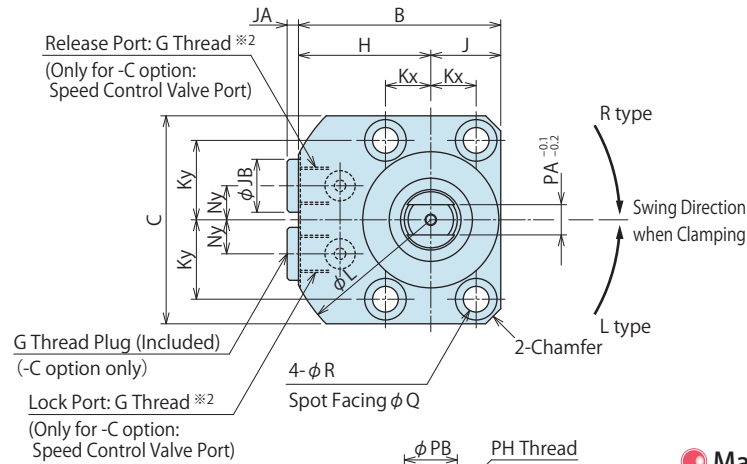
- Pull Stud Clamp
 - FP
 - FQ

- Customized Spring Cylinder
 - DWA/DWB

External Dimensions

C: Gasket Option (With G Thread Plug)

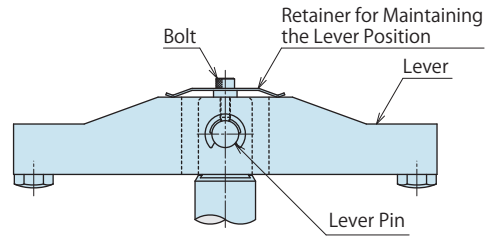
※The drawing shows the released state of TLB-2C□-P.



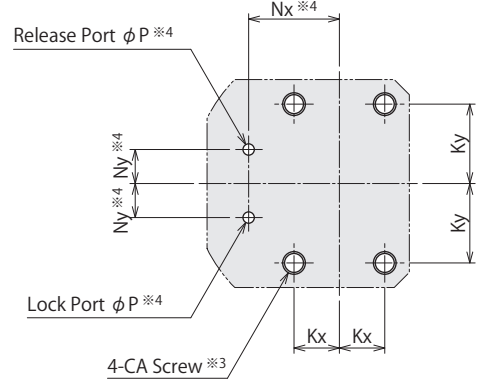
Notes

- ※1. Mounting bolts are not provided.
Customer should prepare based on dimension "S".
- ※2. Speed control valve is sold separately.
Please prepare using reference to P.727.

Balance Lever Reference Dimensions



Machining Dimensions of Mounting Area



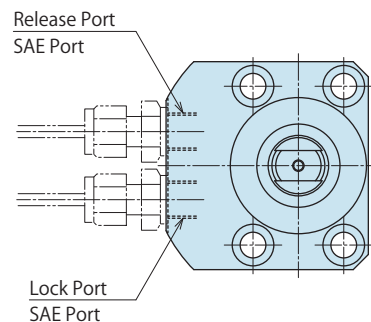
Notes

- ※3. CA tapping depth should be calculated so that mounting bolts engage fixture by at least 1.5 x bolt diameter.
- ※4. This process indicates -C: Gasket option.
Roughness of mounting surface (O-ring seal surface) should be $\sqrt{6.35}$ or less.

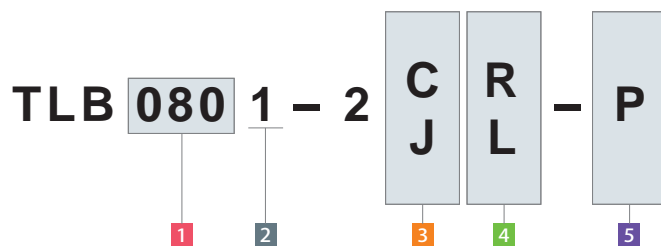
Piping Method

J : SAE Port Option

※The drawing shows the released state of TLB-2J□-P.



Model No. Indication



(Format Example: TLB0801-2CR-P, TLB4001-2JL-P)

- 1 Body Size (Clamping Force)
- 2 Design No.
- 3 Piping Method
- 4 Swing Direction when Clamping
- 5 Option (When P is chosen)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	TLB0401-2□□-P	TLB0601-2□□-P	TLB0801-2□□-P	TLB1001-2□□-P	TLB1601-2□□-P	TLB2001-2□□-P	TLB2501-2□□-P	TLB4001-2□□-P
Full Stroke	14	15	18	19.5	24	26.5	32	35.5
Swing Stroke (90°)	6	7	8	9.5	11	13.5	16	19.5
Vertical Stroke	8	8	10	10	13	13	16	16
A	97.5	105	119	134.5	159.5	180	211	241
B	49.5	53.5	56.5	64	71.5	84.5	99.5	118
C	47	55	57	70	71	90	84	102
D	32	36	39	46.5	53	63.5	71	90
E	62.5	66	74	83	99.5	111.5	131	148.5
F	36.5	40	48	57	72.5	81.5	101	112.5
G	26	26	26	26	27	30	30	36
H	33	35	36.5	40	43.5	52	57.5	67
J	16.5	18.5	20	24	28	32.5	42	51
Kx	11	12	13.5	16	20	22.5	32	40
Ky	18	21	22	27	27.5	35	32	40
L	76	78	83	93	98	118	132	148
M	15	15	15	15	16	16.5	16.5	22.5
Nx	22	24	25.5	29	32.5	38	43.5	53
Ny	9	9	10	12	14	17	19	20
P	3	3	3	3	3	5	5	5
Q	9	11	11	14	14	17.5	17.5	20
R	5.5	6.8	6.8	9	9	11	11	14
S	24	24	24	24	25	28	28	33
U	14	16	18	22	25	30	35.5	45
PA	7	8	8	10	13	16	18	24
PB	12	14	16	20	23	28	33.5	43
PC	6 ^{+0.018} ₀	8 ^{+0.022} ₀	8 ^{+0.022} ₀	10 ^{+0.022} ₀	12 ^{+0.027} ₀	15 ^{+0.027} ₀	18 ^{+0.027} ₀	22 ^{+0.033} ₀
PD	8.5	10	11	12	13.5	16.5	20	24.5
PE	18	21	24	28.5	32.5	38.5	44.5	53.5
PF	19	22	25	30	34	40	46	55
PG	16	17	20	21.5	26	28.5	34	37.5
PH (Nominal × Pitch)	M3×0.5	M3×0.5	M3×0.5	M4×0.7	M5×0.8	M6×1	M6×1	M8×1.25
CA (Nominal × Pitch)	M5×0.8	M6×1	M6×1	M8×1.25	M8×1.25	M10×1.5	M10×1.5	M12×1.75
JA	3	3	3	3	3	3.5	3.5	3.5
JB	14	14	14	14	14	19	19	19
Chamfer	3	4	4	4	4	5	6	6
Lock Port / Release Port	-C option	G1/8	G1/8	G1/8	G1/8	G1/8	G1/4	G1/4
	-J option	SAE2	SAE2	SAE2	SAE2	SAE2	SAE4	SAE4
O-ring	-C option	1BP5	1BP5	1BP5	1BP5	1BP5	1BP7	1BP7
Cylinder Capacity cm ³	Lock	1.4	2.2	3.6	5.5	10.0	16.3	26.2
	Release	3.6	5.2	8.1	12.9	21.8	35.0	100.4
Mass※5	kg	0.6	0.8	1.1	1.6	2.7	3.5	5.5

Note ※5. Mass of single swing clamp including taper sleeve and nut.

- 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
 - LT/LG
 - TLA-2
 - TLB-2**
 - TLA-1

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

- Work Support
 - LD
 - LC
 - TNC
 - TC

- Air Sensing Lift Cylinder
 - LLW

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

- Block Cylinder
 - DBA
 - DBC

- Control Valve
 - BZL
 - BZT
 - BZX/JZG

- Pallet Clamp
 - VS
 - VT

- Expansion Locating Pin
 - VL
 - VM
 - VJ
 - VK

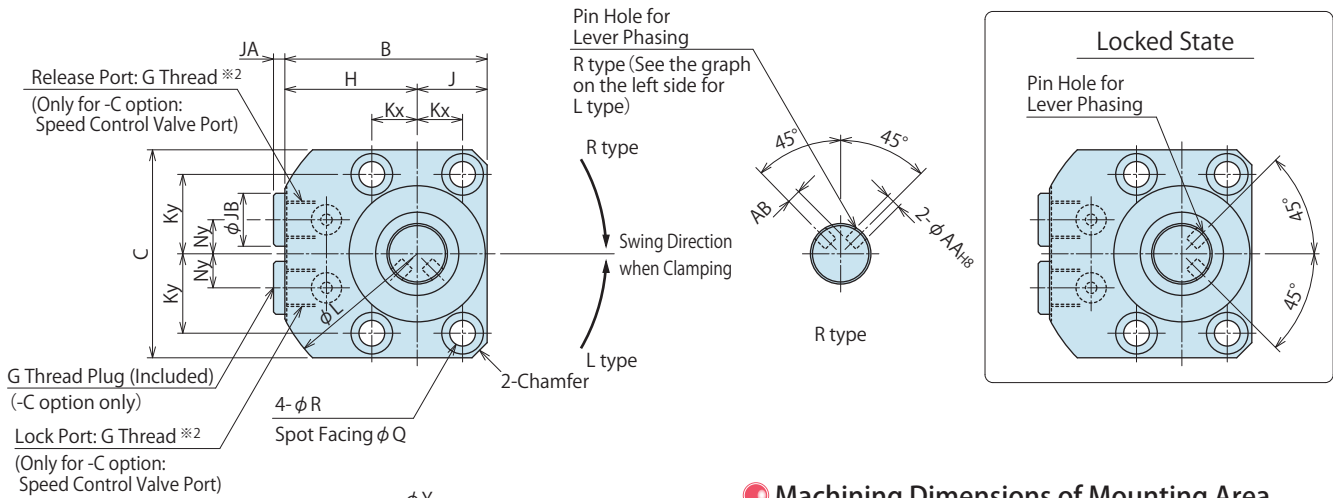
- Pull Stud Clamp
 - FP
 - FQ

- Customized Spring Cylinder
 - DWA/DWB

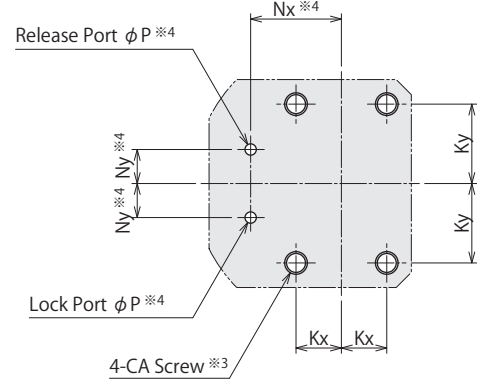
External Dimensions

C: Gasket Option (With G Thread Plug)

※The drawing shows the released state of TLB-2CL-Q.



Machining Dimensions of Mounting Area



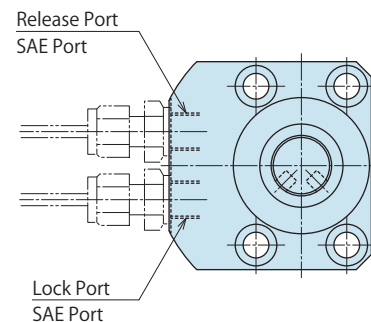
Notes

- ※3. CA tapping depth should be calculated so that mounting bolts engage fixture by at least 1.5 x bolt diameter.
- ※4. This process indicates -C: Gasket option.
Roughness of mounting surface (O-ring seal surface) should be $\frac{6.35}{\sqrt{\Delta\Delta\Delta}}$ or less.

Piping Method

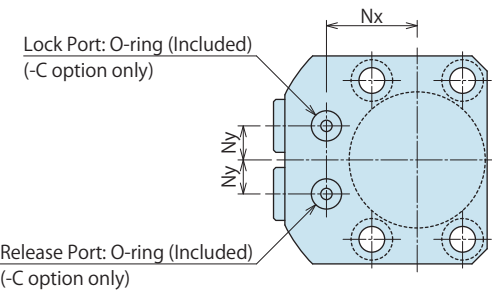
J : SAE Port Option

※The drawing shows the released state of TLB-2JL-Q.



Notes

- ※1. Mounting bolts are not provided.
Customer should prepare based on dimension "S".
 - ※2. Speed control valve is sold separately.
Please prepare using reference to P.727.
1. Prepare swing lever and mounting bolts as shown P.429,P.430.



- 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
 - LT/LG
 - TLA-2
 - TLB-2**
 - TLA-1

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

- Work Support
 - LD
 - LC
 - TNC
 - TC

- Air Sensing Lift Cylinder
 - LLW

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

- Block Cylinder
 - DBA
 - DBC

- Control Valve
 - BZL
 - BZT
 - BZX/JZG

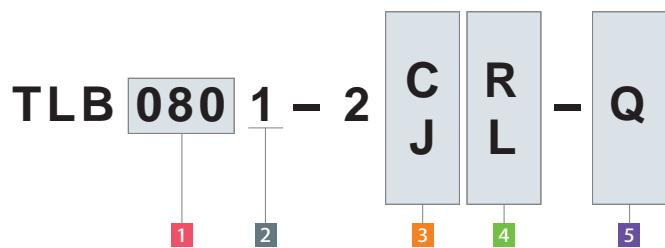
- Pallet Clamp
 - VS
 - VT

- Expansion Locating Pin
 - VL
 - VM
 - VJ
 - VK

- Pull Stud Clamp
 - FP
 - FQ

- Customized Spring Cylinder
 - DWA/DWB

Model No. Indication



(Format Example: TLB0801-2CR-Q, TLB4001-2JL-Q)

- 1 Body Size (Clamping Force)
- 2 Design No.
- 3 Piping Method
- 4 Swing Direction when Clamping
- 5 Option (When Q is chosen)

External Dimensions and Machining Dimensions for Mounting

(mm)

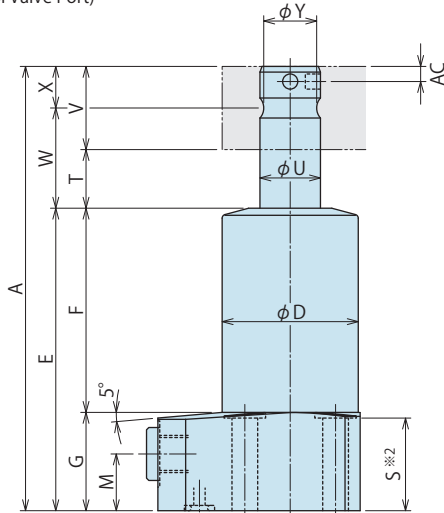
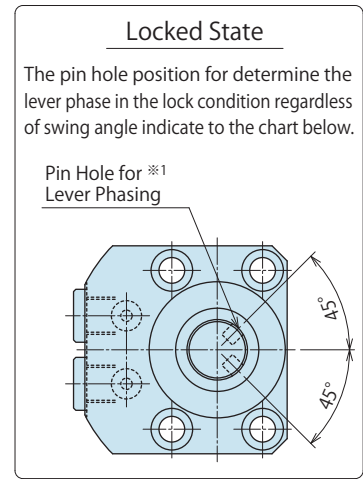
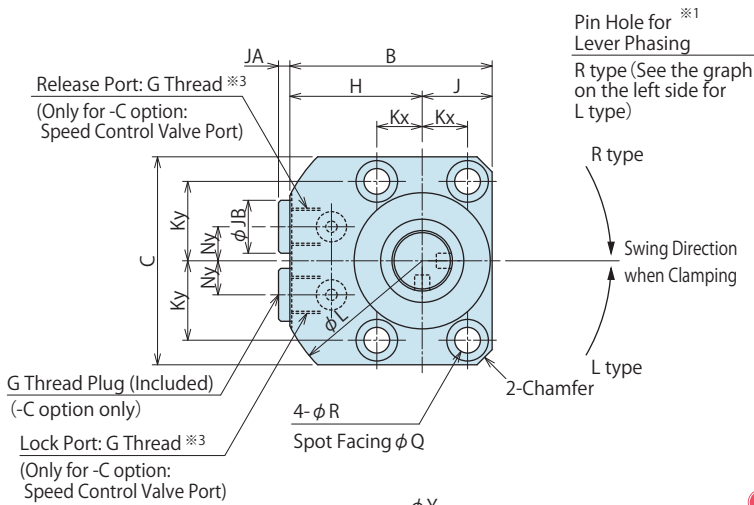
Model No.	TLB0401-2□□-Q	TLB0601-2□□-Q	TLB0801-2□□-Q	TLB1001-2□□-Q	TLB1601-2□□-Q	TLB2001-2□□-Q	TLB2501-2□□-Q	TLB4001-2□□-Q	
Full Stroke	22	23	28	29.5	36	38.5	48	51.5	
Swing Stroke (90°)	6	7	8	9.5	11	13.5	16	19.5	
Vertical Stroke	16	16	20	20	25	25	32	32	
A	121.5	129	149	164.5	195.5	216	259	289	
B	49.5	53.5	56.5	64	71.5	84.5	99.5	118	
C	47	55	57	70	71	90	84	102	
D	32	36	39	46.5	53	63.5	71	90	
E	78.5	82	94	103	123.5	135.5	163	180.5	
F	52.5	56	68	77	96.5	105.5	133	144.5	
G	26	26	26	26	27	30	30	36	
H	33	35	36.5	40	43.5	52	57.5	67	
J	16.5	18.5	20	24	28	32.5	42	51	
Kx	11	12	13.5	16	20	22.5	32	40	
Ky	18	21	22	27	27.5	35	32	40	
L	76	78	83	93	98	118	132	148	
M	15	15	15	15	16	16.5	16.5	22.5	
Nx	22	24	25.5	29	32.5	38	43.5	53	
Ny	9	9	10	12	14	17	19	20	
P	3	3	3	3	3	5	5	5	
Q	9	11	11	14	14	17.5	17.5	20	
R	5.5	6.8	6.8	9	9	11	11	14	
S	24	24	24	24	25	28	28	33	
T	24	25	30	31.5	38	40.5	50	53.5	
U	14	16	18	22	25	30	35.5	45	
V	19	22	25	30	34	40	46	55	
W	33.5	36	42.5	46.5	55	60.5	73	81	
X	9.5	11	12.5	15	17	20	23	27.5	
Y	12.5	14	16	19.5	22	26	31	39.5	
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	6 ^{+0.018} ₀	8 ^{+0.022} ₀	
AB	4	4	5	7	8.5	9	11.75	14.5	
AC	3.5	4.5	4.5	4.5	5	6.5	6.5	9	
CA (Nominal × Pitch)	M5×0.8	M6×1	M6×1	M8×1.25	M8×1.25	M10×1.5	M10×1.5	M12×1.75	
JA	3	3	3	3	3	3.5	3.5	3.5	
JB	14	14	14	14	14	19	19	19	
Chamfer	3	4	4	4	4	5	6	6	
Lock Port / Release Port	-C option	G1/8	G1/8	G1/8	G1/8	G1/8	G1/4	G1/4	
	-J option	SAE2	SAE2	SAE2	SAE2	SAE2	SAE4	SAE4	
O-ring	-C option	1BP5	1BP5	1BP5	1BP5	1BP5	1BP7	1BP7	
Lever Phasing Pin (Included)		φ3×6 (B class)	φ4×8 (B class)	φ4×8 (B class)	φ4×8 (B class)	φ4×8 (B class)	φ6×12 (B class)	φ6×12 (B class)	φ8×16 (B class)
Cylinder Capacity	Lock	2.2	3.4	5.6	8.3	15.0	23.4	39.3	63.7
	Release	5.7	8.0	12.6	19.5	32.7	50.8	86.9	145.7
Mass ^{※5}	kg	0.7	1.0	1.3	1.9	3.2	4.2	6.6	9.7

Note ※5. Mass of single swing clamp including taper sleeve and nut.

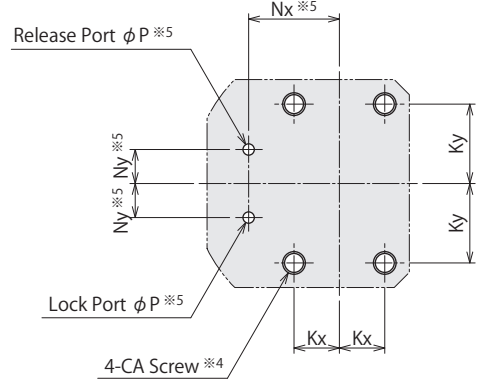
External Dimensions

C: Gasket Option (With G Thread Plug)

※The drawing shows the released state of TLB-2CL-Y45.

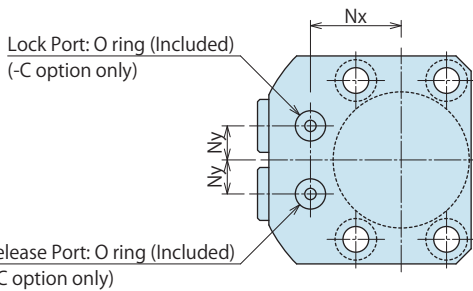


Machining Dimensions of Mounting Area



Notes

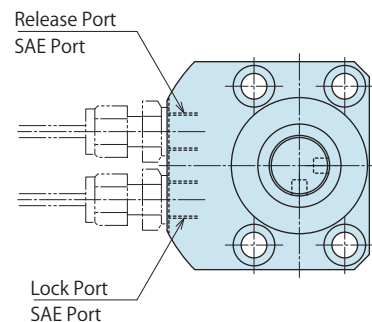
- ※4. CA tapping depth should be calculated so that mounting bolts engage fixture by at least 1.5 x bolt diameter.
- ※5. This process indicates -C: Gasket option. Roughness of mounting surface (O-ring seal surface) should be $\frac{6.35}{\sqrt{\Delta}}$ or less.



Piping Method

J : SAE Port Option

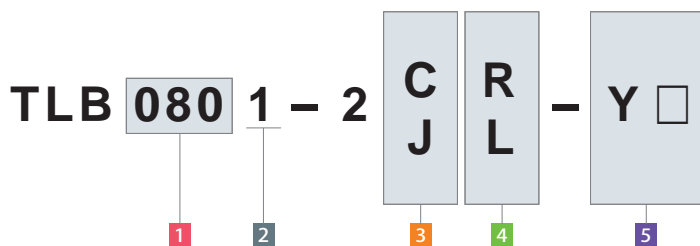
※The drawing shows the released state of TLB-2JL-Y45.



Notes

- ※1. The pin hole position for determine the lever phase in the release condition varies by a swing angle.
- ※2. Mounting bolts are not provided. Customer should prepare based on dimension "S".
- ※3. Speed control valve is sold separately. Please prepare using reference to P.727.
- 1. Prepare swing lever and mounting bolts as shown P.429,P.430.

Model No. Indication



(Format Example: TLB0801-2CR-Y30, TLB1601-2JL-Y45)

- 1 Body Size (Clamping Force)
- 2 Design No.
- 3 Piping Method
- 4 Swing Direction when Clamping
- 5 Option (When Y□ is chosen)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	TLB0401-2□□-Y			TLB0601-2□□-Y			TLB0801-2□□-Y			TLB1001-2□□-Y			TLB1601-2□□-Y			TLB2001-2□□-Y			TLB2501-2□□-Y			TLB4001-2□□-Y			
Swing Angle	30°	45°	60°	30°	45°	60°	30°	45°	60°	30°	45°	60°	30°	45°	60°	30°	45°	60°	30°	45°	60°	30°	45°	60°	
Full Stroke	11.7	12.3	12.9	12.2	12.9	13.6	14.9	15.7	16.5	15.7	16.7	17.6	19.5	20.6	21.7	21.2	22.6	23.9	26.1	27.6	29.0	27.6	29.5	31.5	
Swing Stroke (90°)	3.7	4.3	4.9	4.2	4.9	5.6	4.9	5.7	6.5	5.7	6.7	7.6	6.5	7.6	8.7	8.2	9.6	10.9	10.1	11.6	13.0	11.6	13.5	15.5	
Vertical Stroke	8			8			10			10			13			13			16			16			
A	95.2	95.8	96.4	102.2	102.9	103.6	115.9	116.7	117.5	130.7	131.7	132.6	155	156.1	157.2	174.7	176.1	177.4	205.1	206.6	208	233.1	235	237	
B	49.5			53.5			56.5			64			71.5			84.5			99.5			118			
C	47			55			57			70			71			90			84			102			
D	32			36			39			46.5			53			63.5			71			90			
E	62.5			66			74			83			99.5			111.5			131			148.5			
F	36.5			40			48			57			72.5			81.5			101			112.5			
G	26			26			26			26			27			30			30			36			
H	33			35			36.5			40			43.5			52			57.5			67			
J	16.5			18.5			20			24			28			32.5			42			51			
Kx	11			12			13.5			16			20			22.5			32			40			
Ky	18			21			22			27			27.5			35			32			40			
L	76			78			83			93			98			118			132			148			
M	15			15			15			15			16			16.5			16.5			22.5			
Nx	22			24			25.5			29			32.5			38			43.5			53			
Ny	9			9			10			12			14			17			19			20			
P	3			3			3			3			3			5			5			5			
Q	9			11			11			14			14			17.5			17.5			20			
R	5.5			6.8			6.8			9			9			11			11			14			
S	24			24			24			24			25			28			28			33			
T	13.7	14.3	14.9	14.2	14.9	15.6	16.9	17.7	18.5	17.7	18.7	19.6	21.5	22.6	23.7	23.2	24.6	25.9	28.1	29.6	31	29.6	31.5	33.5	
U	14			16			18			22			25			30			35.5			45			
V	19			22			25			30			34			40			46			55			
W	23.2	23.8	24.4	25.2	25.9	26.6	29.4	30.2	31.0	32.7	33.7	34.6	38.5	39.6	40.7	43.2	44.6	45.9	51.1	52.6	54	57.1	59	61	
X	9.5			11			12.5			15			17			20			23			27.5			
Y	12.5			14			16			19.5			22			26			31			39.5			
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			6 ^{+0.018} ₀			8 ^{+0.022} ₀			
AB	4			4			5			7			8.5			9			11.75			14.5			
AC	3.5			4.5			4.5			4.5			5			6.5			6.5			9			
CA (Nominal × Pitch)	M5×0.8			M6×1			M6×1			M8×1.25			M8×1.25			M10×1.5			M10×1.5			M12×1.75			
JA	3			3			3			3			3			3.5			3.5			3.5			
JB	14			14			14			14			14			19			19			19			
Chamfer	3			4			4			4			4			5			6			6			
Lock Port / Release Port	-C option	G1/8		G1/8		G1/8		G1/8		G1/8		G1/8		G1/8		G1/4		G1/4		G1/4		G1/4			
	-J option	SAE2		SAE2		SAE2		SAE2		SAE2		SAE2		SAE2		SAE4		SAE4		SAE4		SAE4			
O-ring	-C option	1BP5		1BP5		1BP5		1BP5		1BP5		1BP5		1BP5		1BP7		1BP7		1BP7		1BP7			
Lever Phasing Pin (Included)	φ3×6 (B class)		φ4×8 (B class)		φ4×8 (B class)		φ4×8 (B class)		φ4×8 (B class)		φ4×8 (B class)		φ4×8 (B class)		φ6×12 (B class)		φ6×12 (B class)		φ6×12 (B class)		φ8×16 (B class)				
Cylinder Capacity	Lock	1.2	1.2	1.3	1.8	1.9	2.0	2.9	3.1	3.3	4.4	4.7	4.9	8.1	8.6	9.0	13.0	13.9	14.7	21.4	22.6	23.8	34.1	36.5	39.0
	Release	3.0	3.2	3.3	4.3	4.5	4.7	6.7	7.1	7.4	10.4	11.0	11.6	17.7	18.7	19.7	28.0	29.8	31.6	47.2	49.9	52.5	78.1	83.4	89.1
Mass ^{※6}	kg	0.6		0.8		1.1		1.6		2.7		3.5		5.5		8.1									

Note ※6. Mass of single swing clamp including taper sleeve and nut.

- 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
 - LT/LG
 - TLA-2
 - TLB-2**
 - TLA-1
- Link Clamp
 - LKA
 - LKC
 - LKW
 - LM/LJ
 - TMA-2
 - TMA-1
- Work Support
 - LD
 - LC
 - TNC
 - TC
- Air Sensing Lift Cylinder
 - LLW
- Compact Cylinder
 - LL
 - LLR
 - LLU
 - DP
 - DR
 - DS
 - DT
- Block Cylinder
 - DBA
 - DBC
- Control Valve
 - BZL
 - BZT
 - BZX/JZG
- Pallet Clamp
 - VS
 - VT
- Expansion Locating Pin
 - VL
 - VM
 - VJ
 - VK
- Pull Stud Clamp
 - FP
 - FQ
- Customized Spring Cylinder
 - DWA/DWB

Accessories : Material Swing Lever

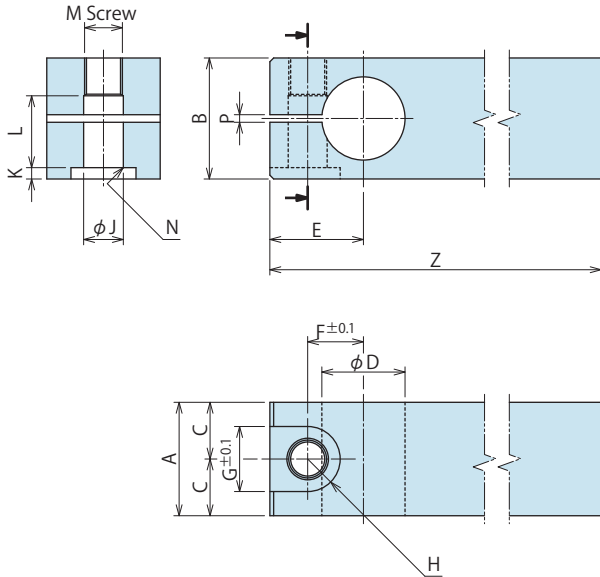
※ If you design and manufacture levers, the mounting dimensions should match below chart. If you manufacture the swing lever with different dimensions than the list above, it could lead to malfunctions, including poor clamp force not up to specification, deformation and scrapping.

Model No. Indication

TLZ 080 0 - L2

Size (Refer to the graph on the right.)

Design No. (Revision Number)



	(mm)							
Model	TLZ0400-L2	TLZ0600-L2	TLZ0800-L2	TLZ1000-L2	TLZ1600-L2	TLZ2000-L2	TLZ2500-L2	TLZ4000-L2
Corresponding Model No.	TLB0401-2	TLB0601-2	TLB0801-2	TLB1001-2	TLB1601-2	TLB2001-2	TLB2501-2	TLB4001-2
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
 2. If necessary, the front end should be additionally machined.
 3. The lever phase definite decision is necessary.
Make additional machining using below chart for machining dimensions.
 4. Sells the tightening bolt for lever separately.

Accessories : Tightening Bolts for Quick Change Lever

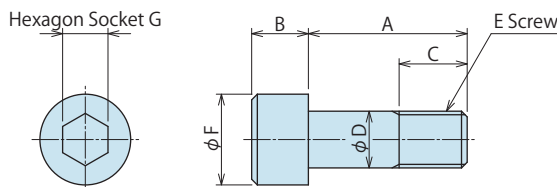
※ If you design and manufacture lever connecting bolt, machine according to above dimension chart and use class 12.9 material.

Model No. Indication

TLZ 080 0 - LB

Size (Refer to the graph on the right.)

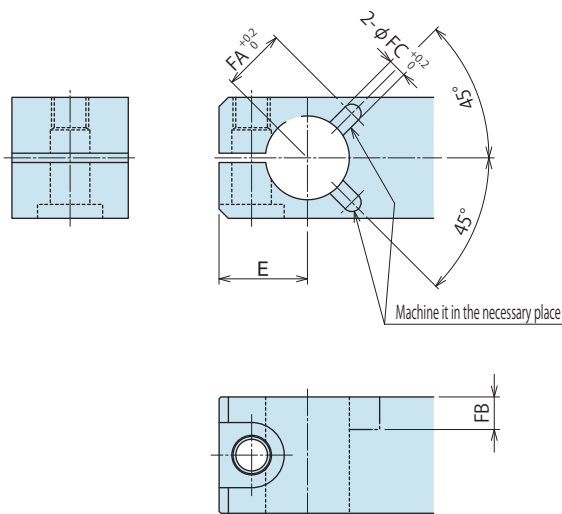
Design No. (Revision Number)



	(mm)							
Model	TLZ0400-LB	TLZ0600-LB	TLZ0800-LB	TLZ1000-LB	TLZ1600-LB	TLZ2000-LB	TLZ2500-LB	TLZ4000-LB
Corresponding Model No.	TLB0401-2	TLB0601-2	TLB0801-2	TLB1001-2	TLB1601-2	TLB2001-2	TLB2501-2	TLB4001-2
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 process match to TLB□1-2.



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

- Notes
1. Material : S50CH
 2. When determining phase hole is necessary, refer to the swing lever design dimensions for each model.
If no need to determine phase, additional machining is not necessary.

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
LT/LG
TLA-2
TLB-2
TLA-1

Link Clamp

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

Work Support

LD
LC
TNC
TC

Air Sensing Lift Cylinder

LLW

Compact Cylinder

LL
LLR
LLU
DP
DR
DS
DT

Block Cylinder

DBA
DBC

Control Valve

BZL
BZT
BZX/JZG

Pallet Clamp

VS
VT

Expansion Locating Pin

VL
VM
VJ
VK

Pull Stud Clamp

FP
FQ

Customized Spring Cylinder

DWA/DWB

Hydraulic Single Action Swing Clamp

Model TLA-1

High Pressure (7~35MPa)

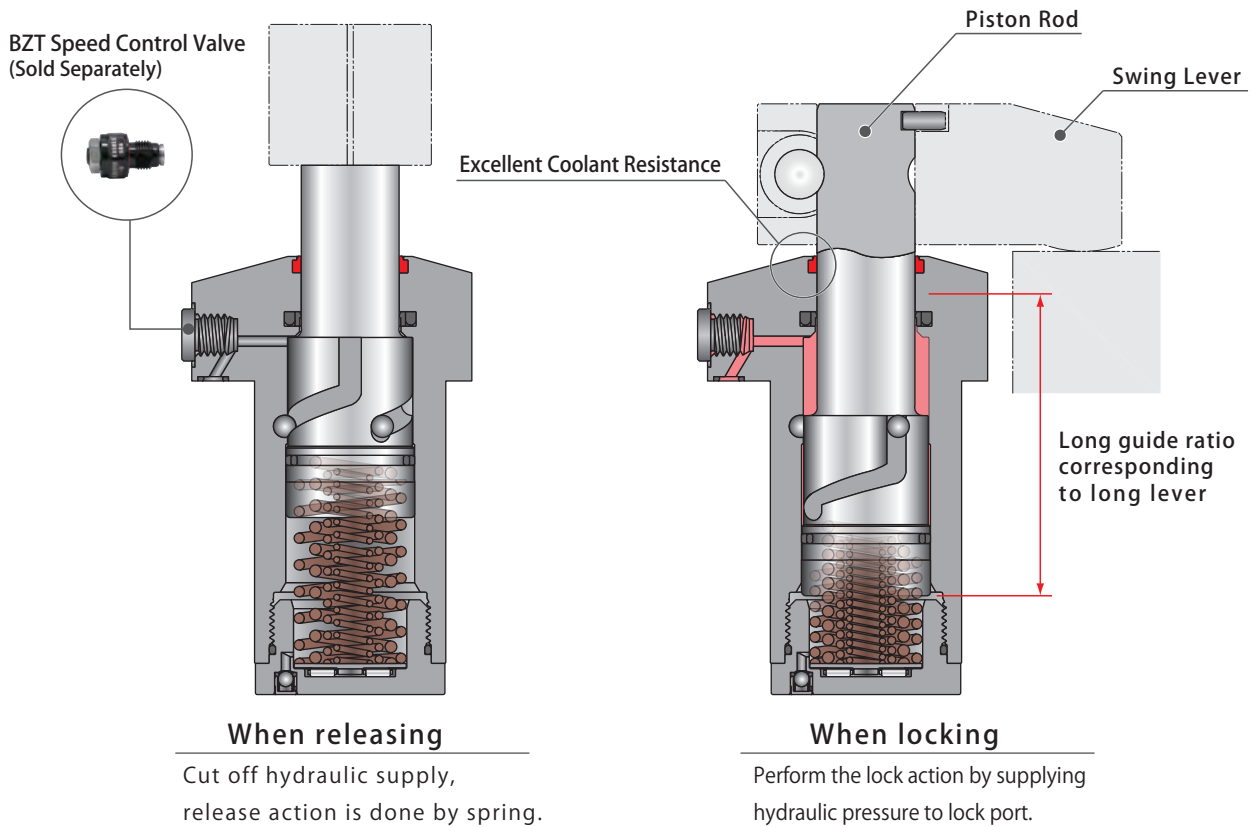
Top Flange



Index

Hydraulic Swing Clamp Digest	P.285
Action Description	P.432
Model No. Indication	P.433
Specifications	P.434
Performance Curve	
• Clamping Force Curve	P.435
• Allowable Swing Time Graph	P.437
External Dimensions	
• Top Flange/ Standard Model (TLA-1)	P.439
Lever Design Dimensions	P.443
Accessories	
• Material Swing Lever for TLA	P.443
• Speed Control Valve•Plug	P.727
Cautions	
• Notes for Hydraulic Swing Clamps	P.445
• Cautions (Common)	P.1043
• Installation Notes	
• Hydraulic Fluid List	
• Notes on Hydraulic Cylinder Speed Control Circuit	
• Notes on Handling	
• Maintenance/Inspection	
• Warranty	

Action Description



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

LT/LG

TLA-2

TLB-2

TLA-1

Link Clamp

LKA

LKC

LKW

LM/LJ

TMA-2

TMA-1

Work Support

LD

LC

TNC

TC

Air Sensing Lift Cylinder

LLW

Compact Cylinder

LL

LLR

LLU

DP

DR

DS

DT

Block Cylinder

DBA

DBC

Control Valve

BZL

BZT

BZX/JZG

Pallet Clamp

VS

VT

Expansion Locating Pin

VL

VM

VJ

VK

Pull Stud Clamp

FP

FQ

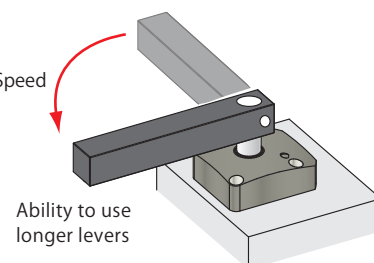
Customized Spring Cylinder

DWA/DWB

• 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



• 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.)

● Model No. Indication

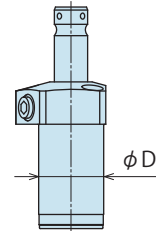
TLA **080** **2** - **1** **C** **R**

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.



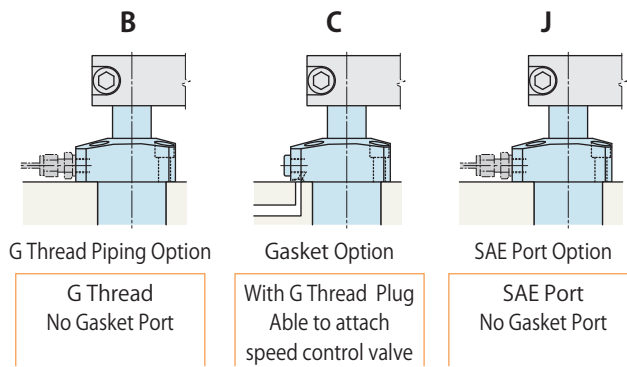
2 Design No.

2 : Revision Number

3 Piping Method

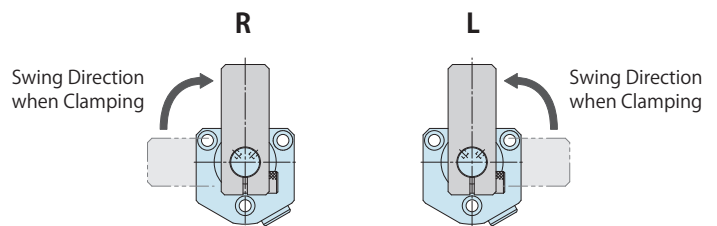
- B** : G Thread Piping Option (No Gasket Port)
- C** : Gasket Option (With G Thread Plug)
- J** : SAE Port Option (No Gasket Port)

※ Speed control valve (BZT) is sold separately. Refer to P.727.



4 Swing Direction when Clamping

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



Specifications

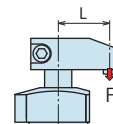
Model No.	TLA0402-1□□	TLA0602-1□□	TLA0802-1□□	TLA1002-1□□	
Cylinder Area for Locking	cm ²	1.005	1.453	1.979	2.804
Clamping Force (Calculation Formula) ※ ¹	kN	$F = \frac{P-1.88}{10.95+0.0426 \times L}$	$F = \frac{P-1.83}{7.57+0.0276 \times L}$	$F = \frac{P-2.19}{5.53+0.0178 \times L}$	$F = \frac{P-2.48}{3.91+0.0113 \times L}$
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).

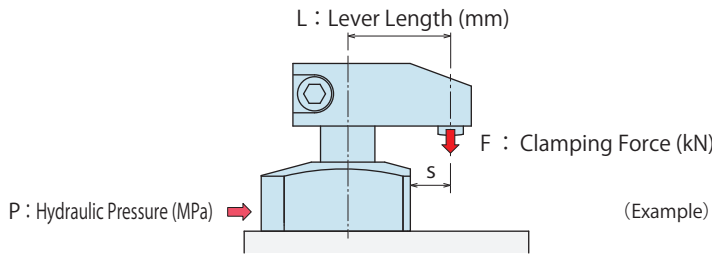
※2. Reference number only, when clamps are mounted horizontally.
(Variables include number of clamps in the circuit and piping conditions.)

※3. Minimum pressure to operate the clamp with no load.
1. Please see the external dimension if you need the information of mass and cylinder volume.



- 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
 - LT/LG
 - TLA-2
 - TLB-2
 - TLA-1**
- Link Clamp
 - LKA
 - LKC
 - LKW
 - LM/LJ
 - TMA-2
 - TMA-1
- Work Support
 - LD
 - LC
 - TNC
 - TC
- Air Sensing Lift Cylinder
 - LLW
- Compact Cylinder
 - LL
 - LLR
 - LLU
 - DP
 - DR
 - DS
 - DT
- Block Cylinder
 - DBA
 - DBC
- Control Valve
 - BZL
 - BZT
 - BZX/JZG
- Pallet Clamp
 - VS
 - VT
- Expansion Locating Pin
 - VL
 - VM
 - VJ
 - VK
- Pull Stud Clamp
 - FP
 - FQ
- Customized Spring Cylinder
 - DWA/DWB

Clamping Force Curve



Applicable Model

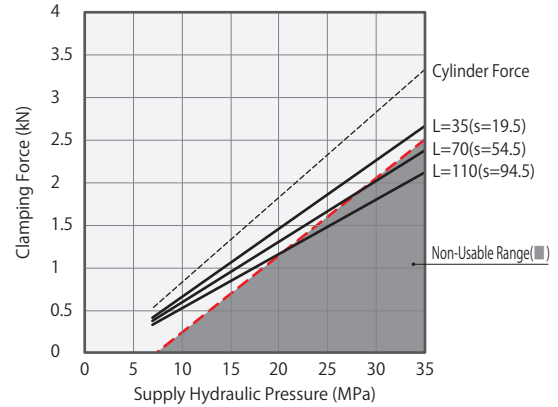
TLA 2 - 1 B C J R L

1 Body Size (Clamping Force)

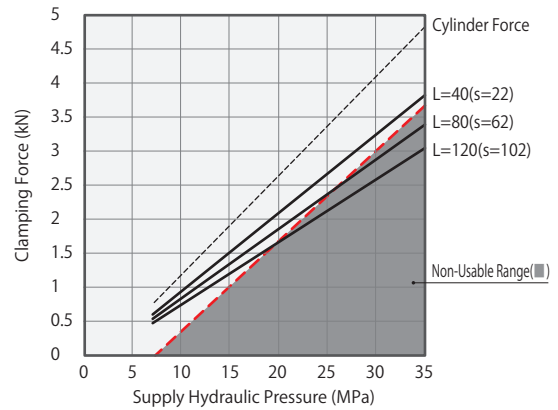
(Example) When using TLA1602-1□□

Supply Hydraulic Pressure 25.0MPa, Lever Length L=50 mm
 Clamping force is about 8.0kN.

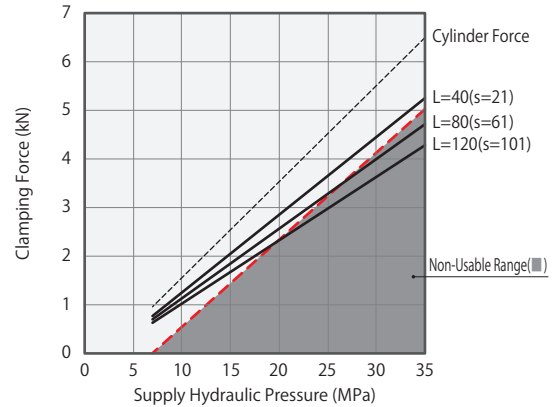
TLA0402-1	Clamping Force Calculation Formula ^{※1} (kN) $F = (P - 1.88) / (10.95 + 0.0426 \times L)$											
	Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN)								Non-Usable Range (mm)	Max. Lever Length (L) (mm)
			Lever Length L (mm)									
			L=35	L=40	L=50	L=60	L=70	L=80	L=90	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	1.0		145
15	1.31	1.1	1.1	1.1	1.0	1.0	1.0	0.9	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	0.7		150
10	0.81	0.7	0.7	0.7	0.7	0.6	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	0.4		150
Max. Operating Pressure (MPa)		35.0	35.0	35.0	31.6	28.2	25.6	23.6	20.6			



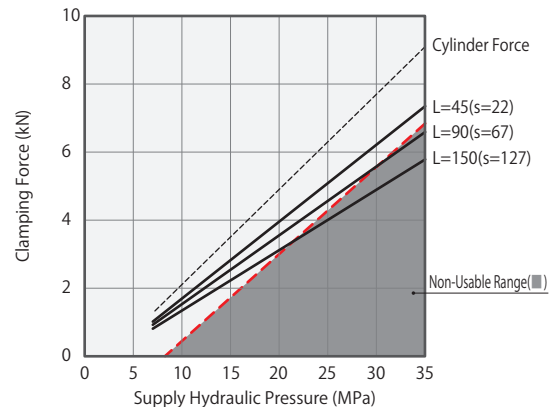
TLA0602-1	Clamping Force Calculation Formula ^{※1} (kN) $F = (P - 1.83) / (7.57 + 0.0276 \times L)$											
	Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN)								Non-Usable Range (mm)	Max. Lever Length (L) (mm)
			Lever Length L (mm)									
			L=40	L=50	L=60	L=70	L=80	L=90	L=100	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	1.3	1.3	146
15	1.90	1.6	1.5	1.5	1.4	1.4	1.3	1.3	1.3	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	1.0	1.0	200
10	1.18	1.0	1.0	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	200
7	0.74	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	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)								Non-Usable Range (mm)	Max. Lever Length (L) (mm)
			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	1.9	1.9	150
15	2.52	2.1	2.0	2.0	1.9	1.9	1.8	1.8	1.7	1.7	1.7	198
12.5	2.03	1.7	1.7	1.6	1.6	1.5	1.5	1.5	1.4	1.4	1.4	230
10	1.53	1.3	1.3	1.2	1.2	1.2	1.1	1.1	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	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)								Non-Usable Range (mm)	Max. Lever Length (L) (mm)
			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	2.7		217
15	3.50	2.9	2.8	2.8	2.7	2.6	2.5	2.4	2.3	2.3		250
12.5	2.80	2.3	2.3	2.2	2.2	2.1	2.0	1.9	1.8	1.8		250
10	2.10	1.8	1.7	1.7	1.6	1.6	1.5	1.4	1.4	1.4		250
7	1.26	1.1	1.1	1.0	1.0	1.0	0.9	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			

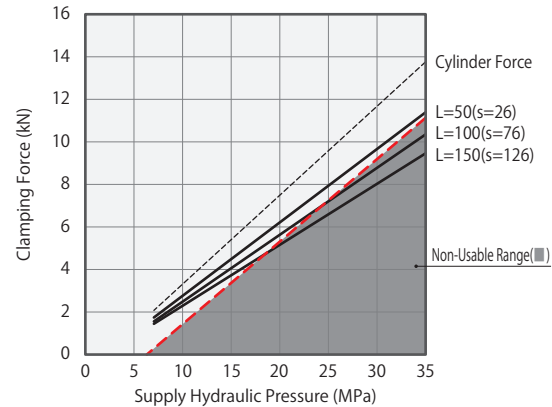


Notes

1. Tables and graphs shown are the relationships between the clamping force (kN) and supply hydraulic pressure (MPa).
2. Cylinder output (when L=0) cannot be calculated from the calculation formula of clamping force.
3. There may be no lever swing action with large inertia depending on supply hydraulic pressure or lever mounting position.
4. The clamping force is shown with lever in the locked position.
5. The clamping force varies as per the lever length. Use the hydraulic supply pressure suitable to the lever length.
6. Operation in the non-usable range can damage the clamp and lead to fluid leakage.
7. The tables and graphs are only for reference. The exact results should be calculated based on the formula in the specification column.

※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		



- 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
 - LT/LG
 - TLA-2
 - TLB-2
 - TLA-1**

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

- Work Support
 - LD
 - LC
 - TNC
 - TC

- Air Sensing Lift Cylinder
 - LLW

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

- Block Cylinder
 - DBA
 - DBC

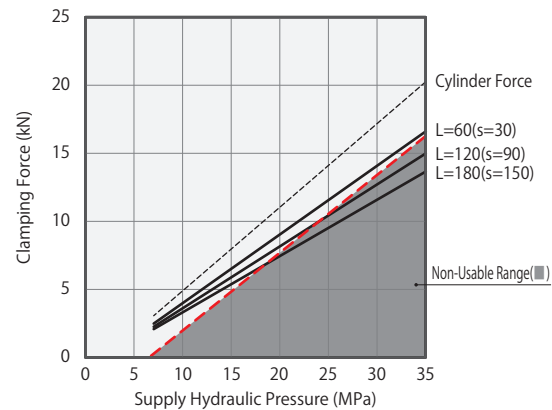
- Control Valve
 - BZL
 - BZT
 - BZX/JZG

- Pallet Clamp
 - VS
 - VT
- Expansion Locating Pin
 - VL
 - VM
 - VJ
 - VK

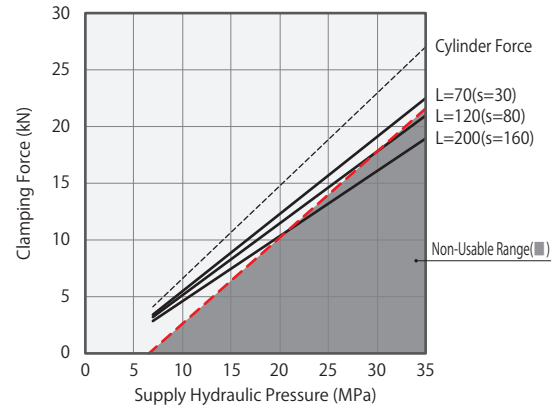
- Pull Stud Clamp
 - FP
 - FQ

- Customized Spring Cylinder
 - DWA/DWB

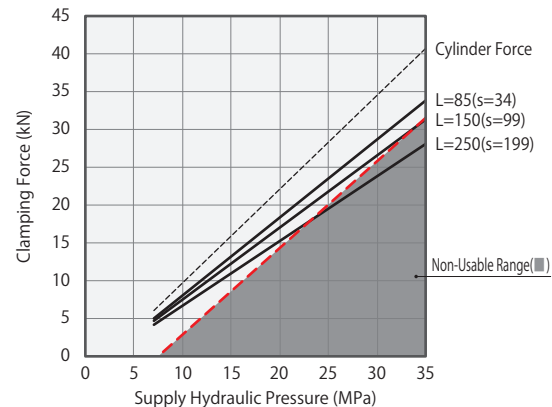
TLA2002-1		Clamping Force Calculation Formula ※1 (kN) $F = (P - 2.01) / (1.77 + 0.0036 \times L)$							
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm)						Non-Usable Range (mm)	Max. Lever Length (L) (mm)
		L=60	L=70	L=80	L=100	L=120	L=140		
35	20.11	16.7	16.4	16.1					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

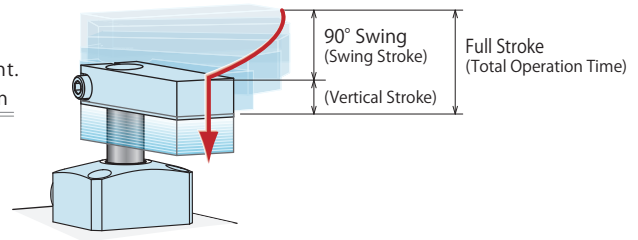


● Allowable Swing Time Graph

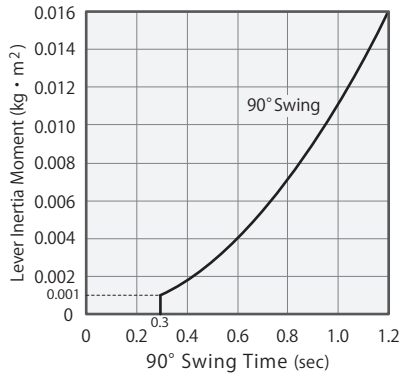
Adjustment of Swing Time

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

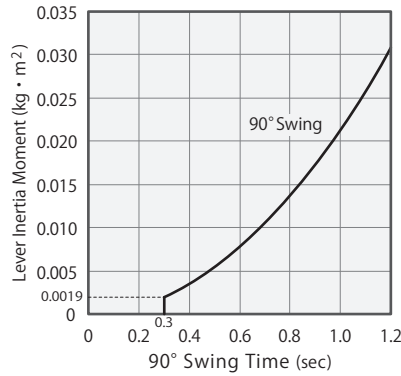
Excessive action speed can reduce stopping accuracy and damage internal parts.



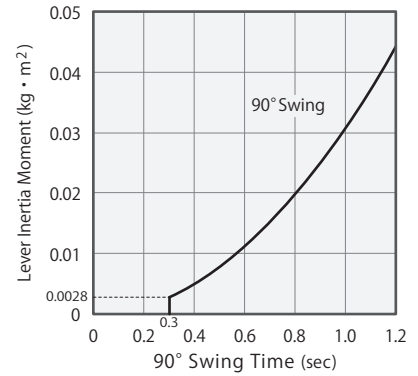
TLA0402-1



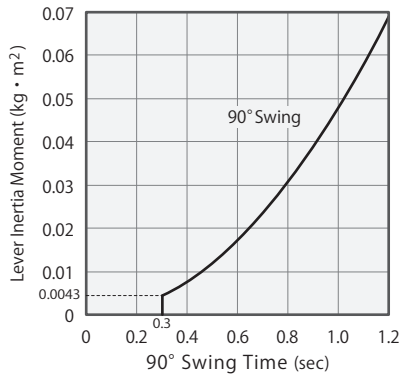
TLA0602-1



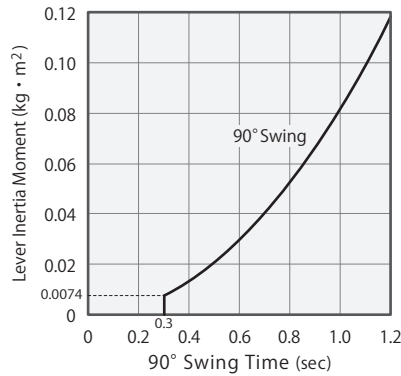
TLA0802-1



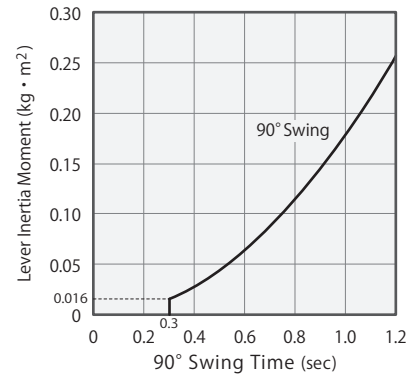
TLA1002-1



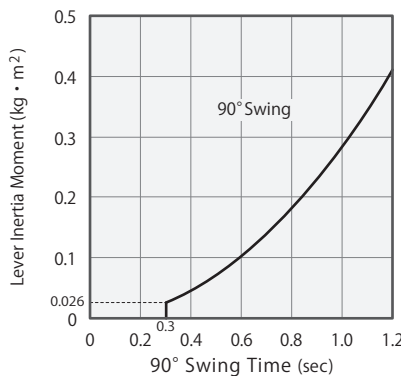
TLA1602-1



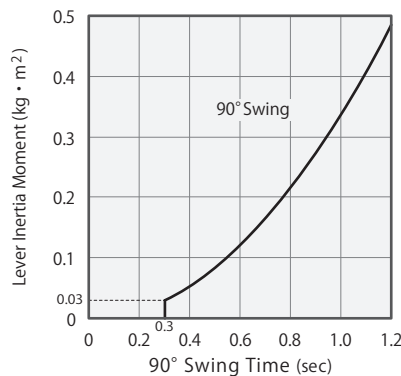
TLA2002-1



TLA2502-1



TLA4002-1



Notes

1. Graphs show 90° swing time against lever inertia moment.
2. Total swing stroke time become about 2 to 2.5 times of 90° swing time.
3. There may be no swinging action for the lever with large inertia based on different hydraulic supply pressure, flow and lever mounting position.
4. Adjust swing time to be at least that shown on the graphs for the given moment of inertia.
5. Excessive speed may degrade angle precision and damage internal parts.
6. The clamping force varies as per 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 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.

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
LT/LG
TLA-2
TLB-2

TLA-1

Link Clamp

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

Work Support

LD
LC
TNC
TC

Air Sensing Lift Cylinder

LLW

Compact Cylinder

LL
LLR
LLU
DP
DR
DS
DT

Block Cylinder

DBA
DBC

Control Valve

BZL
BZT
BZX/JZG

Pallet Clamp

VS
VT

Expansion Locating Pin

VL
VM
VJ
VK

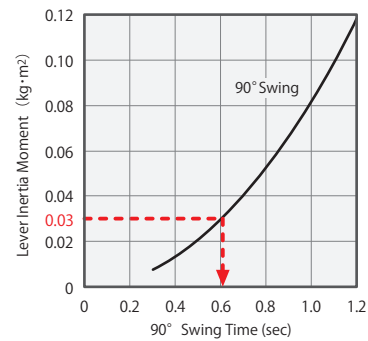
Pull Stud Clamp

FP
FQ

Customized Spring Cylinder

DWA/DWB

Model → TLA1602-1



(How to read the allowable swing time graph)

When TLA1602-1 is used

Lever Inertia Moment : 0.03kg·m²

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

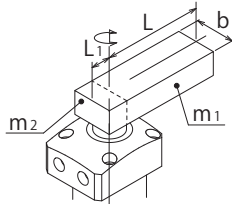
1. The total operation time on the graph represents the allowable operation time when fully stroked.

(Swing Stroke : 9.5 mm, Full Stroke : 22.5 mm)

How to calculate inertia moment (Estimated)

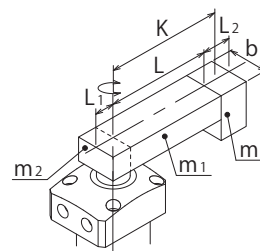
I : Inertia Moment (kg·m²) L, L₁, L₂, K, b : Length (m) m₁, m₂, m₃ : Mass (kg)

- 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.



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

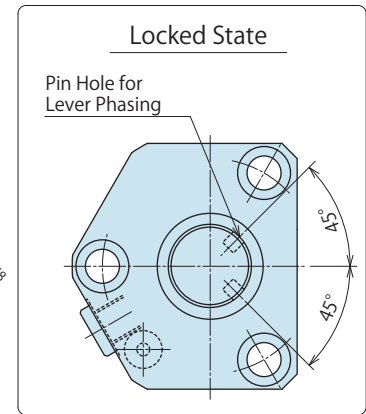
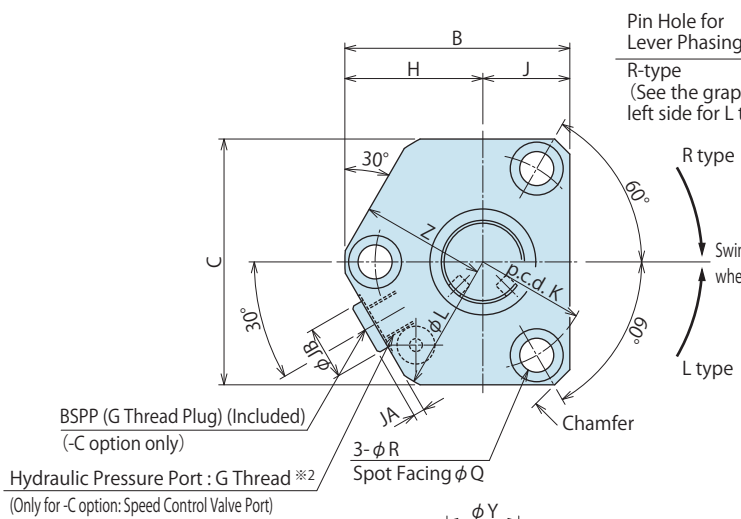
Calculation Formula of Total Operation Time

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

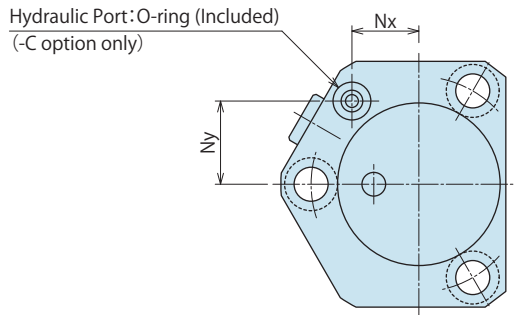
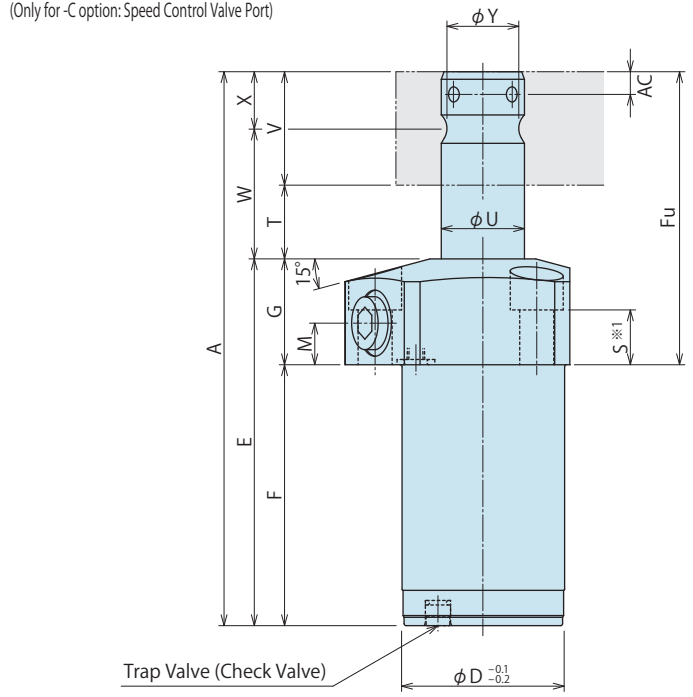
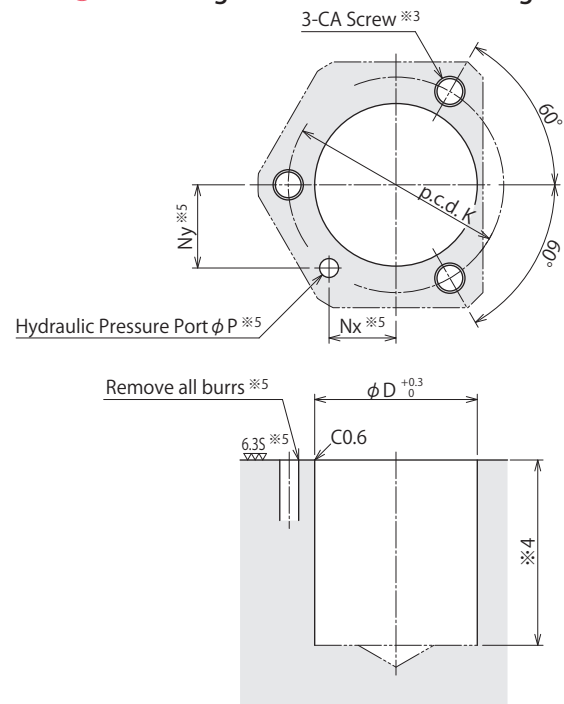
External Dimensions

C : Gasket Option (With G Thread Plug)

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



Machining Dimensions of Mounting Area



Notes

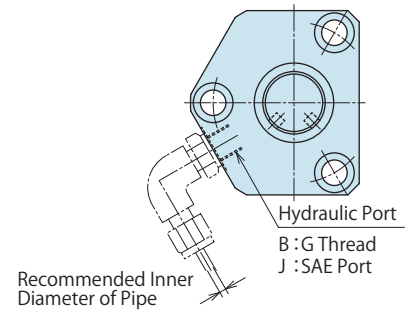
- ※3. CA tapping depth should be calculated so that mounting bolts engage fixture by at least 1.5 x bolt diameter.
- ※4. The φD depth of the body mounting hole should be decided from dimension F.
- ※5. This process indicates -C: Gasket option.

Piping Method

B : G Thread Piping Option

J : SAE Port Option

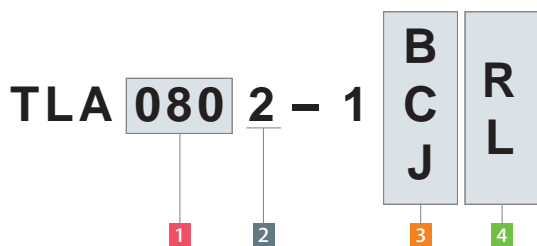
※The drawing shows the released state of TLA-1BL / TLA-1JL.



Notes

- ※1. Mounting bolts are not provided. Customer should prepare based on dimension "S".
- ※2. Speed control valve is sold separately. Please prepare using reference to P.727.
- 1. Prepare swing lever and mounting bolts as shown P.443, P.444.

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

External Dimensions and Machining Dimensions for Mounting

(mm)

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	-B/-C option	G1/8	G1/8	G1/8	G1/8	G1/4
	-J option	SAE2	SAE2	SAE2	SAE2	SAE4
O-ring	-C option	1BP5	1BP5	1BP5	1BP5	1BP7
Lever Phasing Pin (Included)	φ3×6 (B class)	φ4×8 (B class)	φ4×8 (B class)	φ4×8 (B class)	φ4×8 (B class)	φ6×12 (B class)
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
Mass ^{※6}	kg	0.5	0.7	0.9	1.4	3.1

Note ※6. Mass of single swing clamp including taper sleeve and nut.

- 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
 - LT/LG
 - TLA-2
 - TLB-2
 - TLA-1

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

- Work Support
 - LD
 - LC
 - TNC
 - TC

- Air Sensing Lift Cylinder
 - LLW

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

- Block Cylinder
 - DBA
 - DBC

- Control Valve
 - BZL
 - BZT
 - BZX/JZG

- Pallet Clamp
 - VS
 - VT

- Expansion Locating Pin
 - VL
 - VM
 - VJ
 - VK

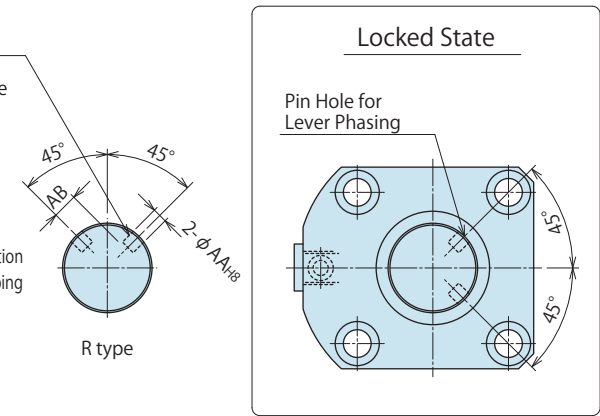
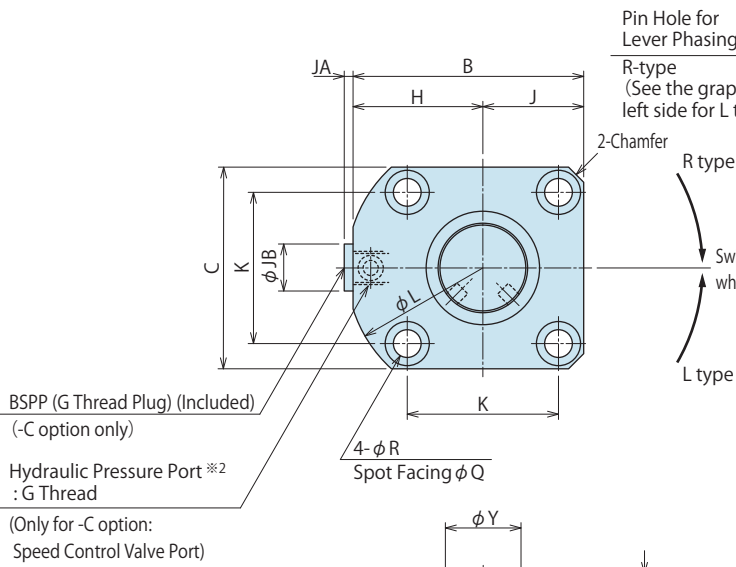
- Pull Stud Clamp
 - FP
 - FQ

- Customized Spring Cylinder
 - DWA/DWB

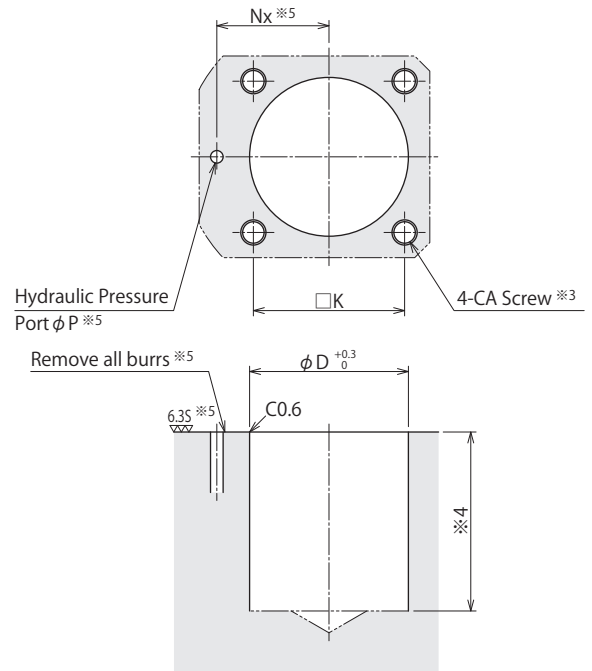
External Dimensions

C: Gasket Option (With G Thread Plug)

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



Machining Dimensions of Mounting Area



Notes

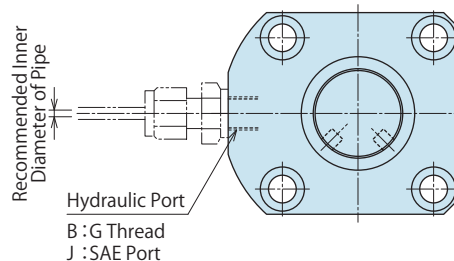
- ※3. CA tapping depth should be calculated so that mounting bolts engage fixture by at least 1.5 x bolt diameter.
- ※4. The φD depth of the body mounting hole should be decided from dimension F.
- ※5. This process indicates -C: Gasket option.

Piping Method

B : G Thread Piping Option

J : SAE Port Option

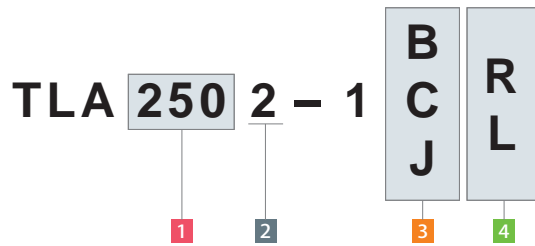
※The drawing shows the released state of TLA-1BL / TLA-1JL.



Notes

- ※1. Mounting bolts are not provided. Customer should prepare based on dimension "S".
- ※2. Speed control valve is sold separately. Please prepare using reference to P.727.
- 1. Prepare swing lever and mounting bolts as shown P.443, P.444.

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	-B/-C option	G1/4
	-J option	SAE4
O-ring	-C option	1BP7
Lever Phasing Pin (Included)	φ 6×12 (B class)	φ 8×16 (B class)
Recommended Inner Diameter of Pipe	φ 8	φ 8
Lock Cylinder Capacity	cm ³	24.2
Mass ^{※6}	kg	4.5
		9.5

Note ※6. Mass of single swing clamp including taper sleeve and nut.

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
LT/LG
TLA-2
TLB-2

TLA-1

Link Clamp

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

Work Support

LD
LC
TNC
TC

Air Sensing
Lift Cylinder

LLW

Compact Cylinder

LL
LLR
LLU
DP
DR
DS
DT

Block Cylinder

DBA
DBC

Control Valve

BZL
BZT
BZX/JZG

Pallet Clamp

VS
VT

Expansion
Locating Pin

VL
VM
VJ
VK

Pull Stud Clamp

FP
FQ

Customized
Spring Cylinder

DWA/DWB

● Accessories : Material Swing Lever

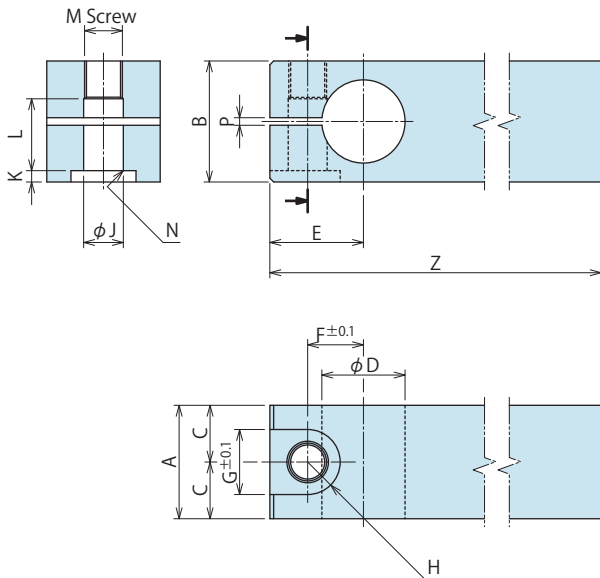
※ If you design and manufacture levers, the mounting dimensions should match below chart. If you manufacture the swing lever with different dimensions than the list above, it could lead to malfunctions, including poor clamp force not up to specification, deformation and scrapping.

Model No. Indication

TLZ 080 0 - L2

Size (Refer to the graph on the right.)

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
 2. If necessary, the front end should be additionally machined.
 3. The lever phase definite decision is necessary.
Make additional machining using below chart for machining dimensions.
 4. Sells the tightening bolt for lever separately.

● Accessories : Tightening Bolts for Quick Change Lever

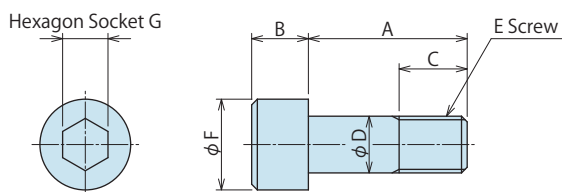
※ If you design and manufacture lever connecting bolt, machine according to above dimension chart and use class 12.9 material.

Model No. Indication

TLZ 080 0 - LB

Size (Refer to the graph on the right.)

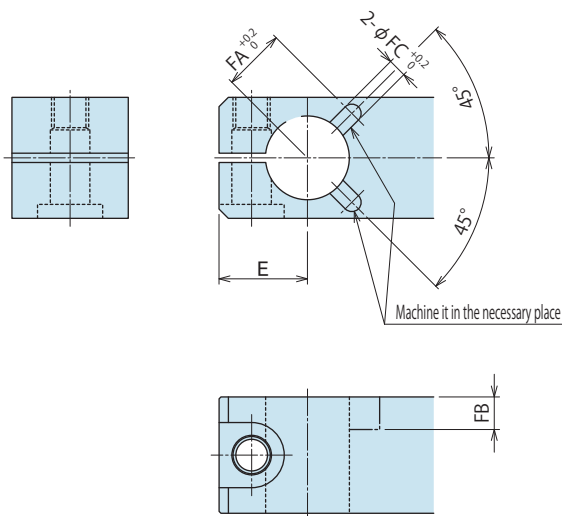
Design No. (Revision Number)



								(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 process match 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

- Notes
1. Material : S50CH
 2. When determining phase hole is necessary, refer to the swing lever design dimensions for each model.
If no need to determine phase, additional machining is not necessary.

- 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
 - LT/LG
 - TLA-2
 - TLB-2
 - TLA-1**

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

- Work Support
 - LD
 - LC
 - TNC
 - TC

- Air Sensing Lift Cylinder
 - LLW

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

- Block Cylinder
 - DBA
 - DBC

- Control Valve
 - BZL
 - BZT
 - BZX/JZG

- Pallet Clamp
 - VS
 - VT

- Expansion Locating Pin
 - VL
 - VM
 - VJ
 - VK

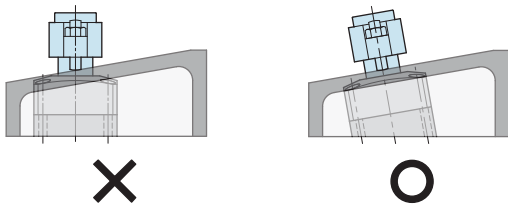
- Pull Stud Clamp
 - FP
 - FQ

- 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 Circuit" on P. 1044 to assist with proper hydraulic circuit designing.
 - Ensure there is no possibility of supplying hydraulic pressure to the lock and release ports simultaneously.
- 3) Swing lever should be designed so that the inertia moment is small.
 - Large moment of inertia will degrade the lever's stopping accuracy and cause undue wear to the clamp. Additionally, the clamp may not function, depending on supplied hydraulic pressure and lever mounting position.
 - Please set the allowable operating time after the inertia moment is calculated. Please make sure that let the clamps work within allowable operating time referring to the allowable operating time graph.
- 4) When using on a welding fixture, the exposed area of piston rod should be protected.
 - If spatter gets onto the sliding surface it could lead to malfunction and fluid leakage.
- 5) When clamping on a sloped surface of the workpiece
 - Make sure the clamp surface and mounting surface of the clamp are parallel.



6) Notes 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.315.
 - Swing clamp with air sensing valve LHW: Refer to P.353.

● Installation Notes

- 1) Check the Usable Fluid
 - Please use the appropriate fluid by referring to the Hydraulic Fluid List (P.1043).
- 2) Mounting the clamp
 - When mounting the clamp, use hexagon socket bolts as multiple bolt holes for mounting (with tensile strength of 12.9) and tighten them with the torque shown in the chart below. Tightening with greater torque than recommended can depress the seating surface or break the bolt.

	Model No.	Thread Size	Tightening Torque (N·m)	
LHA LHC LHS LHW	LHA0360 / LHS0360	M4×0.7	4.0	
	LHA0400 / LHC0400 LHS0400 / LHW040□	M5×0.8	8.0	
	LHA0480 / LHC0480 LHS0480 / LHW048□	M5×0.8	8.0	
	LHA0550 / LHC0550 LHS0550 / LHW055□	M6×1	14	
	LHA0650 / LHC0650 LHS0650 / LHW065□	M6×1	14	
	LHA0750 / LHS0750 LHW0751	M8×1.25	33	
	LHA0900 / LHS0900	M10×1.5	65	
	LHA1050 / LHS1050	M12×1.75	114	
	LT/LG	LT0301 / LG0301	M4×0.7	3.2
		LT036□ / LG036□	M4×0.7	3.2
LT040□ / LG040□		M5×0.8	6.3	
LT048□ / LG048□		M5×0.8	6.3	
LT055□ / LG055□		M6×1	10	
LT065□ / LG065□		M6×1	10	
LT075□ / LG075□		M8×1.25	25	
LG090□		M10×1.5	58.8	
LG105□		M12×1.75	98	
TLA-2 TLB-2 TLA-1		TL□040□-□	M5×0.8	6.9
	TL□060□-□	M6×1	11.8	
	TL□080□-□	M6×1	11.8	
	TL□100□-□	M8×1.25	25	
	TL□160□-□	M8×1.25	25	
	TL□200□-□	M10×1.5	58.8	
	TL□250□-□	M10×1.5	58.8	
	TL□400□-□	M12×1.75	98	

3) Mounting and removing the swing lever.

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

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

	形式	Thread Size	Tightening Torque (N·m)
LHA LHC LHS LHW	LHA0360 / LHS0360	M14×1.5	21 ~ 25
	LHA0400 / LHC0400 LHS0400 / LHW040□	M16×1.5	33 ~ 40
	LHA0480 / LHC0480 LHS0480 / LHW048□	M20×1.5	54 ~ 65
	LHA0550 / LHC0550 LHS0550 / LHW055□	M22×1.5	84 ~ 100
	LHA0650 / LHC0650 LHS0650 / LHW065□	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
	LT/LG	LT0301 / LG0301	M8×1
LT036□ / LG036□		M10×1	15 ~ 18
LT040□ / LG040□		M12×1.5	24 ~ 29
LT048□ / LG048□		M16×1.5	37 ~ 45
LT055□ / LG055□		M18×1.5	59 ~ 71
LT065□ / LG065□		M22×1.5	93 ~ 112
LT075□ / LG075□		M28×1.5	147 ~ 177
LG090□		M36×1.5	235 ~ 282
LG105□		M45×1.5	300 ~ 360

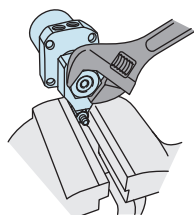
LHA/LHS-F Quick Change Lever, TLA-2/TLB-2/TLA-1 Standard

	Model No.	Thread Size	Tightening Torque (N·m)	
LHA-F LHS-F LT-F LG-F	LT0301-F / LG0301-F	M5×0.8	7.5	
	LHA0360-F / LHS0360-F LT036□-F / LG036□-F	M6	14	
	LHA0400-F / LHS0400-F LT040□-F / LG040□-F	M8×1	33	
	LHA0480-F / LHS0480-F LT048□-F / LG048□-F	M10×1.25	65	
	LHA0550-F / LHS0550-F LT055□-F / LG055□-F	M12×1.5	100 ~ 114	
	LHA0650-F / LHS0650-F LT065□-F / LG065□-F	M14×1.5	160 ~ 180	
	LHA0750-F / LHS0750-F LT075□-F / LG075□-F	M16×1.5	250 ~ 280	
	LHA0900-F / LHS0900-F LG090□-F	M20×2	500 ~ 540	
	LHA1050-F / LHS1050-F LG105□-F	M24×2	760 ~ 810	
	TLA-2 TLB-2 TLA-1	TL□040□-□	M6	13
		TL□060□-□	M8×1	32
		TL□080□-□	M8×1	32
		TL□100□-□	M10×1.25	63
		TL□160□-□	M12×1.5	100
TL□200□-□		M14×1.5	160	
	TL□250□-□	M16×1.5	250	
	TL□400□-□	M20×2	500	

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

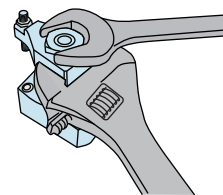
During mounting

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



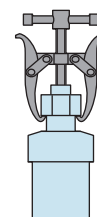
② Remove the clamp from a fixture, fix the lever by machine vise etc., and tighten the nut.

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



During removal

- ① While the clamp is in the fixture or vise, use a hex wrench to bring the arm to the middle of the swing stroke and then loosen the nut.
- ② Loosen the taper sleeve nut two or three turns then remove the lever with puller. Do not put any rotating torque on the piston rod.



4) Swinging Speed Adjustment

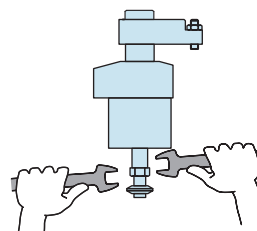
- Adjust the speed following "Allowable Swing Time Graph". If the clamp operates too fast the parts will wear out leading to premature damage and ultimately complete equipment failure.
- Please make sure to release air from the circuit before adjusting speed. It will be difficult to adjust the speed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

5) Checking looseness and retightening

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

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. Torque values for the mounting screw are 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

※ Please refer to P.1043 for common cautions.

• Installation Notes • Hydraulic Fluid List • Notes on Hydraulic Cylinder Speed Control Circuit
• Notes on Handling • Maintenance/Inspection • Warranty

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
LT/LG
TLA-2
TLB-2
TLA-1

Link Clamp

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

Work Support

LD
LC
TNC
TC

Air Sensing Lift Cylinder

LLW

Compact Cylinder

LL
LLR
LLU
DP
DR
DS
DT

Block Cylinder

DBA
DBC

Control Valve

BZL
BZT
BZX/JZG

Pallet Clamp

VS
VT

Expansion Locating Pin

VL
VM
VJ
VK

Pull Stud Clamp

FP
FQ

Customized Spring Cylinder

DWA/DWB

● Cautions

● Installation Notes (For Hydraulic Series)

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

- 2) Procedure before Piping

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

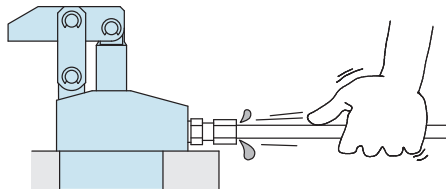
- 3) Applying Sealing Tape

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

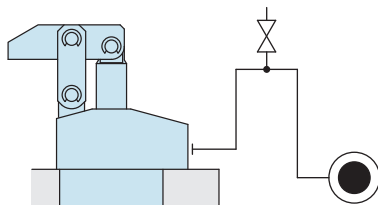
- 4) Air Bleeding of the Hydraulic Circuit

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

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



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



- 5) Checking Looseness and Retightening

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

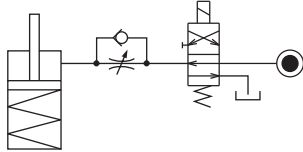
● Notes on Hydraulic Cylinder Speed Control Unit



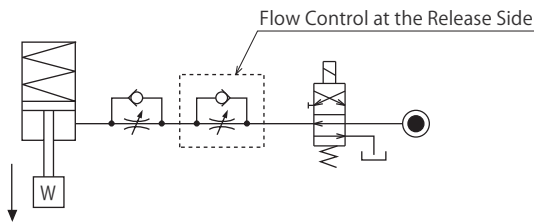
Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

● Flow Control Circuit for Single Acting Cylinder

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



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



● Flow Control Circuit for Double Acting Cylinder

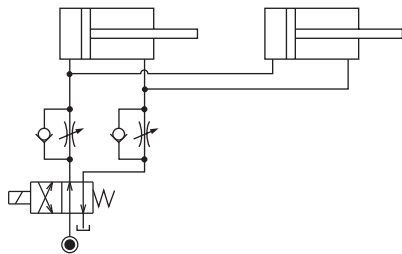
Flow control circuit for double acting cylinder should have meter-out circuits for both the lock and release sides. Meter-in control can have adverse effect by presence of air in the system.

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

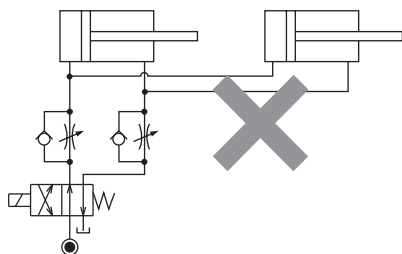
Refer to P.47 for speed adjustment of LKE.

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)

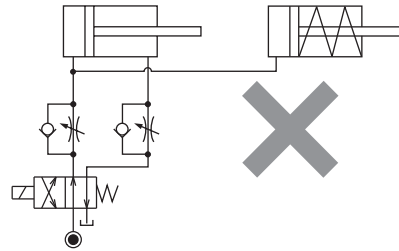


【Meter-in Circuit】 (LKE/TMA/TLA must be controlled with meter-in.)



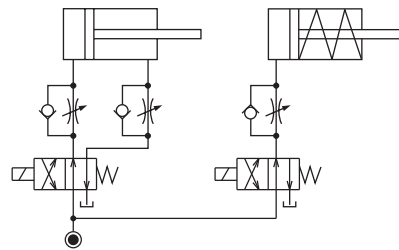
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

- 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.

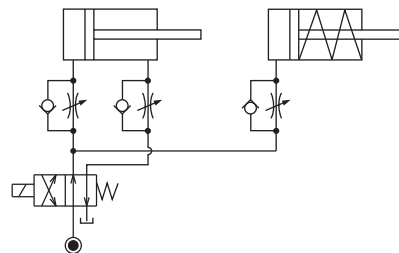


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

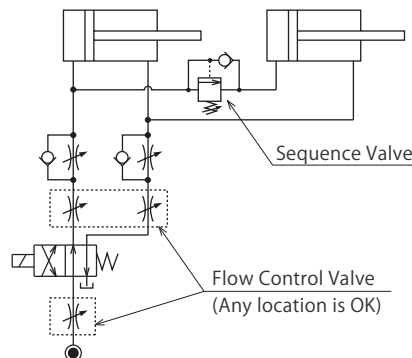
- Separate the control circuit.



- 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
- Maintenance/Inspection
- Warranty

Company Profile

- Company Profile
- Our Products
- History

Index

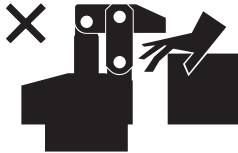
- Search by Alphabetical Order

Sales Offices

● Cautions

● Notes on Handling

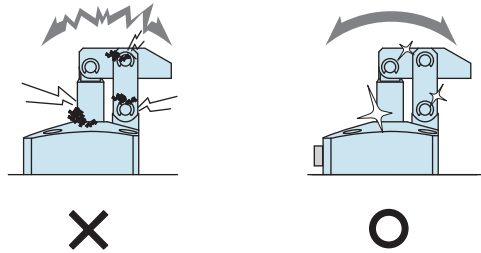
- 1) It should be handled by qualified personnel.
 - The hydraulic machine and air compressor should be handled and maintained by qualified personnel.
- 2) Do not handle or remove the machine unless the safety protocols are ensured.
 - ① The machine and equipment can only be inspected or prepared when it is confirmed that the preventive devices are in place.
 - ② Before the machine is removed, make sure that the above-mentioned safety measures are in place. Shut off the air of hydraulic source and make sure no pressure exists in the hydraulic and air circuit.
 - ③ After stopping the machine, do not remove until the temperature cools down.
 - ④ Make sure there is no abnormality in the bolts and respective parts before restarting the machine or equipment.
- 3) Do not touch clamps (cylinder) while clamps (cylinder) is working. Otherwise, your hands may be injured due to clinching.



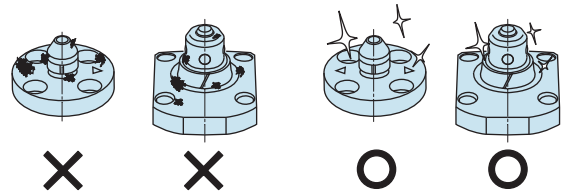
- 4) Do not disassemble or modify.
 - If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

● Maintenance and Inspection

- 1) Removal of the Machine and Shut-off of Pressure Source
 - Before the machine is removed, make sure that the above-mentioned safety measures are in place. Shut off the air of hydraulic source and make sure no pressure exists in the hydraulic and air circuit.
 - Make sure there is no abnormality in the bolts and respective parts before restarting.
- 2) Regularly clean the area around the piston rod and plunger.
 - If it is used when the surface is contaminated with dirt, it may lead to packing seal damage, malfunctioning, fluid leakage and air leaks.



- 3) Please clean out the reference surface regularly (taper reference surface and seating surface) of locating machine. (VS/VT/VL/VM/VJ/VK/WVS/WM/WK/VX/VXF)
 - Location products, except VX/VXF model, can remove contaminants with cleaning functions. When installing pallets make sure there is no thick sludge like substances on pallets.
 - Continuous use with dirt on components will lead to locating functions not work properly, leaking and malfunction.



- 4) If disconnecting by couplers on a regular basis, air bleeding should be carried out daily to avoid air mixed in the circuit.
- 5) Regularly tighten nuts, bolts, pins, cylinders and pipe line to ensure proper use.
- 6) Make sure the hydraulic fluid has not deteriorated.
- 7) Make sure there is smooth action and no abnormal noise.
 - Especially when it is restarted after left unused for a long period, make sure it can be operated correctly.
- 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 handled in inappropriate way by the operator.
(Including damage caused by the misconduct of the third party.)
- ④ If the defect is caused by reasons other than our responsibility.
- ⑤ If repair or modifications are carried out by anyone other than Kosmek, or without our approval and confirmation, it will void warranty.
- ⑥ Other caused by natural disasters or calamities not attributable to our company.
- ⑦ Parts or replacement expenses due to parts consumption and deterioration.
(Such as rubber, plastic, seal material and some electric components.)

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

Control Valve

Model BZL

Model BZT

Model BZX

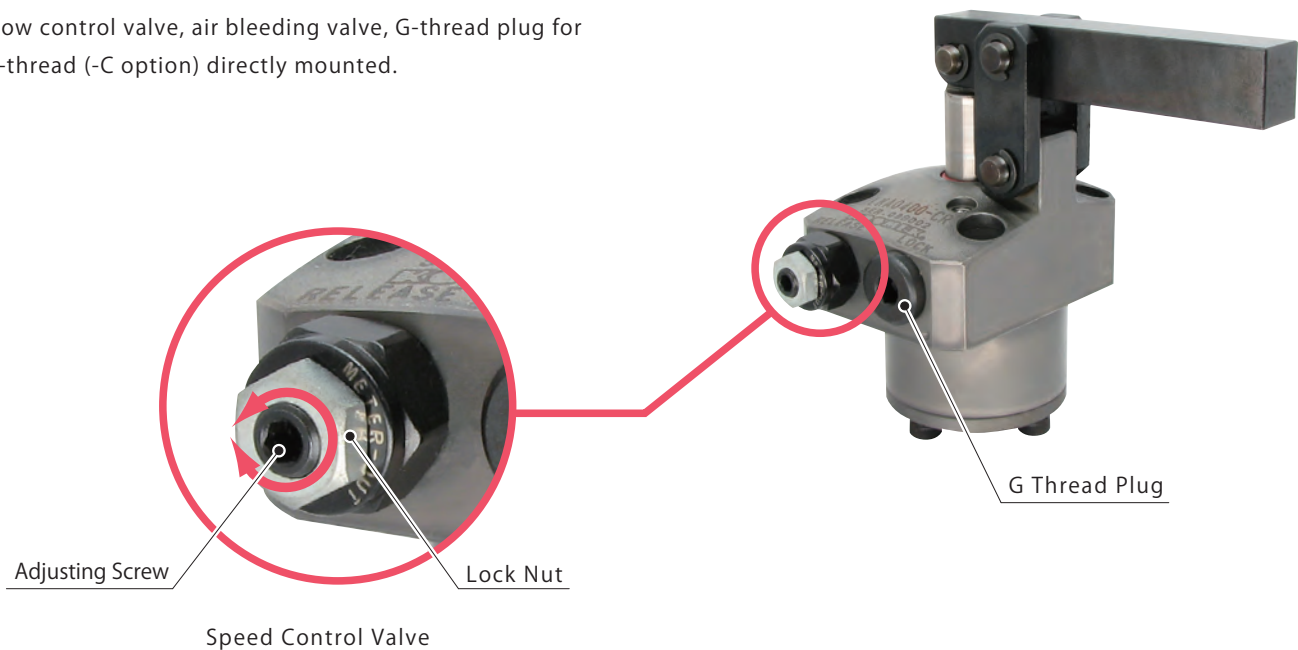
Model JZG



Directly mounted to clamps, flow control valve • Air bleeding • plug

- Directly mounted to clamps


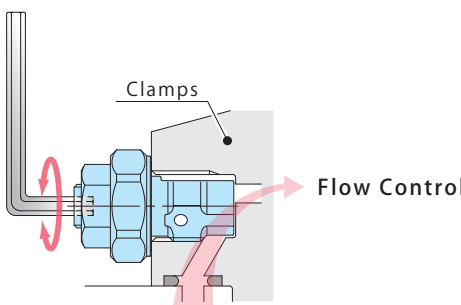
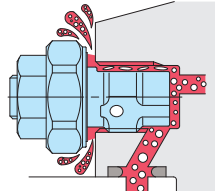

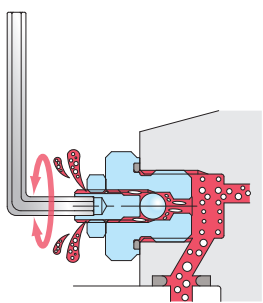

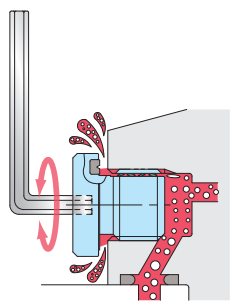
Flow control valve, air bleeding valve, G-thread plug for G-thread (-C option) directly mounted.



Speed Control Valve
 Model BZL
 Model BZT

Air Bleed Valve
 Model BZX

G Thread Plug
 Model JZG

	Operating Pressure Range	Action Description
<p>Speed Control Valve (For Low Pressure)</p> <p>Model BZL → P.729</p> 	7MPa or less	<p>Adjust the flow by wrench. It can adjust the clamping action speed individually.</p> 
<p>Speed Control Valve (For High Pressure)</p> <p>Model BZT → P.733</p>	35MPa or less	<p>Air bleeding in the circuit is possible by loosening flow control valve.</p> 
<p>Air Bleed Valve</p> <p>Model BZX → P.735</p> 	25MPa or less	<p>Air bleeding in the circuit is possible by wrench.</p> 
<p>G Thread Plug</p> <p>Model JZG → P.737</p> 	35MPa or less	<p>Air bleeding in the circuit is possible by loosening G thread plug.</p> 

- 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
- LT/LG
- TLA-2
- TLB-2
- TLA-1

Link Clamp

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

Work Support

- LD
- LC
- TNC
- TC

Air Sensing Lift Cylinder

- LLW

Compact Cylinder

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

Block Cylinder

- DBA
- DBC

Control Valve

- BZL**
- BZT**
- BZX/JZG**

Pallet Clamp

- VS
- VT

Expansion Locating Pin

- VL
- VM
- VJ
- VK

Pull Stud Clamp

- FP
- FQ

Customized Spring Cylinder

- DWA/DWB

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

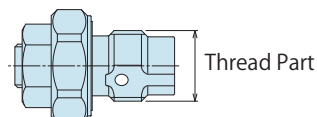
BZT 0 **10** **0** - **A**

1
2
3



1 G Thread Size

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



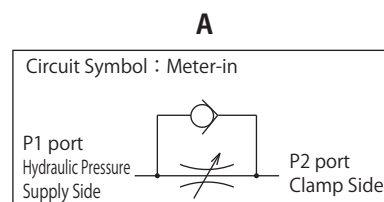
2 Design No.

- 0** : Revision Number

3 Control Method

- A** : Meter-in

※BZT doesn't have meter-out specification.



Specifications

Model No.	BZT0100-A	BZT0200-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
Min. Passage Area (P2→P1:Free Flowing Direction)	mm ²	3.1
Max. Passage Area	mm ²	5.0
Usable Fluid	General Hydraulic Oil Equivalent to ISO-VG-32	
Operating Temperature	°C 0 ~ 70	
Tightening Torque for Main Body	N·m	25

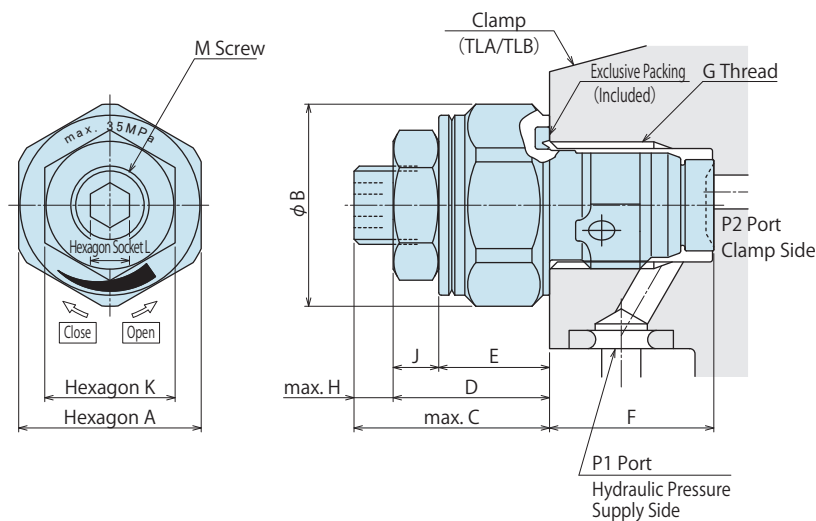
- Notes
- Minimum passage area when fully opened is the same as the maximum passage area in the table above.
 - It must be mounted with recommended torque. Because of the structure of the metal seal, if mounting torque is insufficient, the flow control valve may not be able to adjust the flow rate.
 - Don't use 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
BZT0100-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□
BZT0200-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
- It is not recommended that using flow control valve for TL□040□, TL□060□ because it is difficult to adjust the speed.
 - In the 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



(mm)		
Model	BZT0100-A	BZT0200-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	M6×0.75	M6×0.75

Notes

- Please mount it directly to the clamps made by KOSMEK (Model : TLA,TLB,TMA).
(This cannot be used for other actuators such as our low pressure series.)
- Contact us if it is used in the hydraulic circuit for a different purpose.

Notes

- Please read "Notes on Hydraulic Cylinder Speed Control Circuit" to assist with proper hydraulic circuit design.
If there is something wrong with the circuit design, it leads to the applications malfunction and damage. (Refer to P.1044)
- It is dangerous to air bleed during operation under high pressure. It must be done under lower pressure.
(For reference: the minimum operating range of the product within the circuit.)
- When the cylinder capacity is small, it is highly possible that the speed of flow cannot 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
LT/LG
TLA-2
TLB-2
TLA-1

Link Clamp

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

Work Support

LD
LC
TNC
TCAir Sensing
Lift Cylinder

LLW

Compact Cylinder

LL
LLR
LLU
DP
DR
DS
DT

Block Cylinder

DBA
DBC
Control Valve
BZL
BZT
BZX/JZG

Pallet Clamp

VS
VTExpansion
Locating PinVL
VM
VJ
VK

Pull Stud Clamp

FP
FQCustomized
Spring Cylinder

DWA/DWB

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

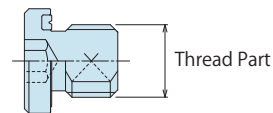
JZG0 1 0

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	10	25	35

- Notes
- It is dangerous to have air venting operation under high pressure. It must be done under lower pressure. (For reference: the minimum operation pressure range of the product within the circuit)
 - Refer to the processing dimensions for BZL mounting area.

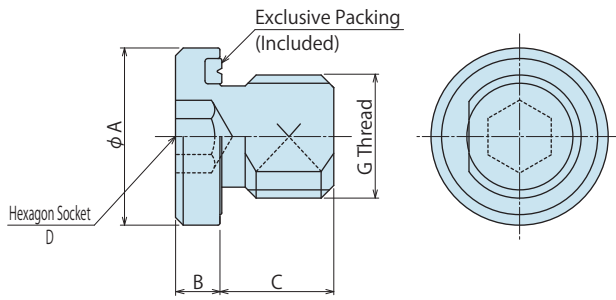
Applicable Products

Model No.	DBA (Single Action) Block Cylinder	DBC (Single Action) Block Cylinder	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
JZG010	DBA0250-C□ DBA0320-C□	DBC0250-C□ DBC0320-C□	LC0402-C□□□ LC0482-C□□□ LC0552-C□□□ LC0652-C□□□	LHA0360-C□□□ LHA0400-C□□□ LHA0480-C□□□ LHA0550-C□□□	LHC0360-C□□□ LHC0400-C□□□ LHC0480-C□□□ LHC0550-C□□□	LHE0300-C□ LHE0360-C□ LHE0400-C□ LHE0480-C□ LHE0550-C□	LHS0360-C□□□ LHS0400-C□□□ LHS0480-C□□□ LHS0550-C□□□	LHW0400-C□□□ LHW0480-C□□□ LHW0550-C□□□
JZG020	DBA0400-C□ DBA0500-C□	DBC0400-C□ DBC0500-C□	LC0752-C□□□ LC0902-C□□□	LHA0650-C□□□ LHA0750-C□□□	LHC0650-C□□□		LHS0650-C□□□ LHS0750-C□□□	LHW0650-C□□□
JZG030				LHA0900-C□□□ LHA1050-C□□□			LHS0900-C□□□ LHS1050-C□□□	

Model No.	LT/LG (Single Action) Swing Clamp	LKA (Double Action) Link Clamp	LKC (Double Action) Link Clamp	LKE (Double Action) High-Power Link Clamp	LKW (Double Action) Link Clamp	LM/LJ (Single Action) Link Clamp	LL (Double Action) Linear Cylinder	LLR (Double Action) Linear Cylinder
JZG010	LT0360-C□ LT0400-C□ LT0480-C□ LT0550-C□	LKA0360-C□□□ LKA0400-C□□□ LKA0480-C□□□ LKA0550-C□□□	LKC0400-C□□□ LKC0480-C□□□ LKC0550-C□□□	LKE0300-C□ LKE0360-C□ LKE0400-C□ LKE0480-C□ LKE0550-C□	LKW0400-C□□□ LKW0480-C□□□ LKW0550-C□□□	LM0360-C□ LM0400-C□ LM0480-C□ LM0550-C□	LL0360-C□□□ LL0400-C□□□ LL0480-C□□□ LL0550-C□□□	LLR0360-C□□□□□ LLR0400-C□□□□□ LLR0480-C□□□□□ LLR0550-C□□□□□
JZG020	LT0650-C□ LT0750-C□	LKA0650-C□□□ LKA0750-C□□□	LKC0650-C□□□		LKW0650-C□□□	LM0650-C□ LM0750-C□	LL0650-C□□□ LL0750-C□□□	LLR0650-C□□□□□ LLR0750-C□□□□□
JZG030	LG0900-C□ LG1050-C□	LKA0900-C□□□ LKA1050-C□□□				LJ0902-C□ LJ1052-C□	LL0900-C□□□ LL1050-C□□□	LLR0900-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 (Single Action) Link Clamp
JZG010	LLW0360-C□□□□□ LLW0400-C□□□□□ LLW0480-C□□□□□	TLA0401-2C□□□ TLA0601-2C□□□ TLA0801-2C□□□ TLA1001-2C□□□ TLA1601-2C□□□	TLB0401-2C□□□ TLB0601-2C□□□ TLB0801-2C□□□ TLB1001-2C□□□ TLB1601-2C□□□	TLA0402-1C□ TLA0602-1C□ TLA0802-1C□ TLA1002-1C□ TLA1602-1C□	TMA0250-2C□ TMA0400-2C□ TMA0600-2C□ TMA1000-2C□	TMA0250-1C□ TMA0400-1C□ TMA0600-1C□ TMA1000-1C□
JZG020		TLA2001-2C□□□ TLA2501-2C□□□ TLA4001-2C□□□	TLB2001-2C□□□ TLB2501-2C□□□ TLB4001-2C□□□	TLA2002-1C□ TLA2502-1C□ TLA4002-1C□	TMA1600-2C□ TMA2500-2C□ TMA3200-2C□	TMA1600-1C□ TMA2500-1C□ 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

(mm)

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
LT/LG
TLA-2
TLB-2
TLA-1

Link Clamp

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

Work Support

LD
LC
TNC
TC

Air Sensing Lift Cylinder

LLW

Compact Cylinder

LL
LLR
LLU
DP
DR
DS
DT

Block Cylinder

DBA
DBC

Control Valve

BZL
BZT

BZX/JZG

Pallet Clamp

VS
VT

Expansion Locating Pin

VL
VM
VJ
VK

Pull Stud Clamp

FP
FQ

Customized Spring Cylinder

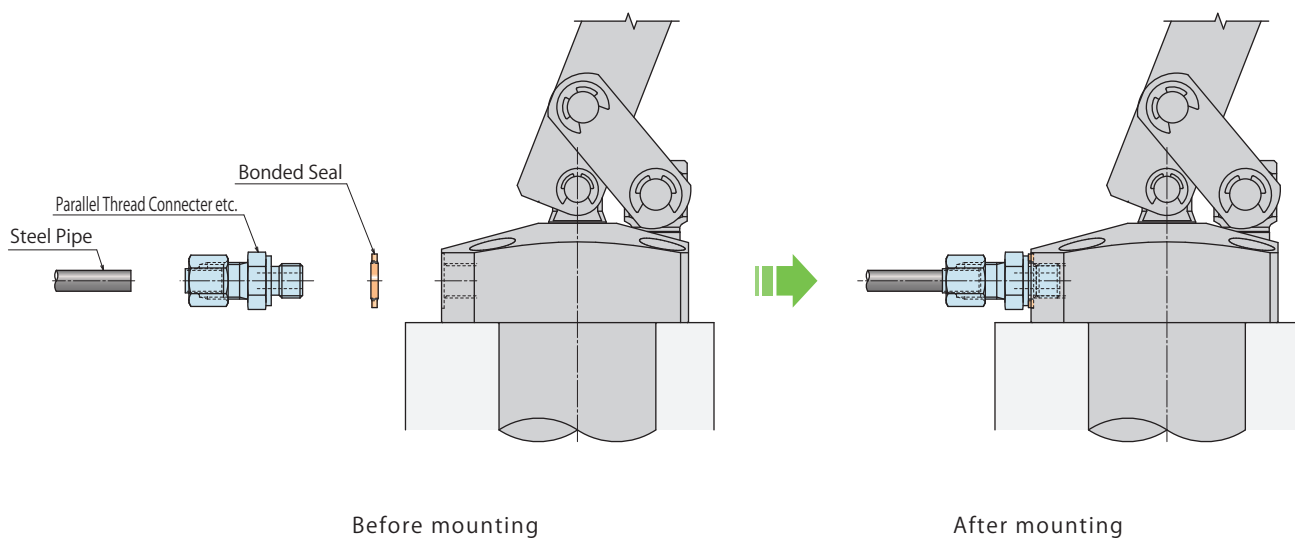
DWA/DWB

G-Thread Fitting



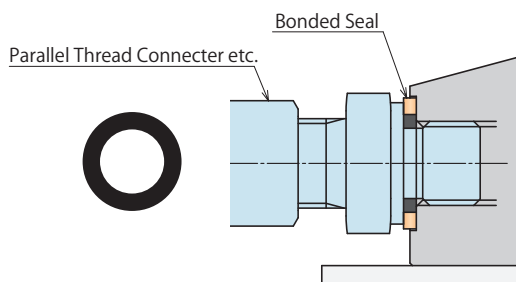
The fitting as shown is made by Ihara Science Corp.

Mounting

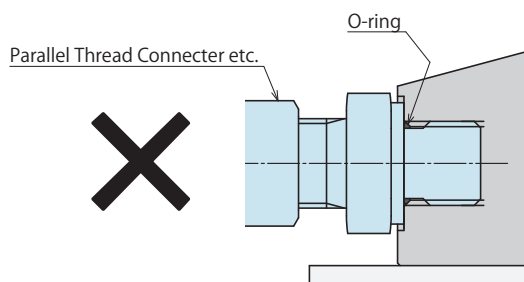


Notes

- ※ 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).



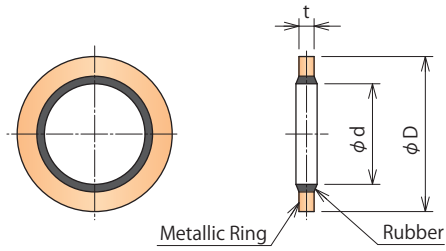
It cannot be used in models with O-rings seal type.

Bonded Seal

Model No. Indication

9UKP0C000 1

BSPP Thread (G-Thread) Size
(Refer to 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

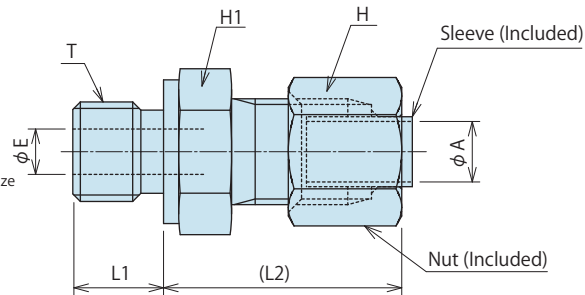
Note 1. Rubber material is NBR, metallic ring is SPCC of JWG3141 (Cold pressure deferred steel sheet) used as standard specification.(Operating temperature -20°~120°C)

Parallel Thread Connector

Model No. Indication

9UKC0 06 0 1 E

BSPP Thread (G-Thread) Size
(Refer to following table)
Applicable Pipe External Diameter
(Refer to 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)
Mass (kg)	0.030	0.042	0.048	0.053	0.087

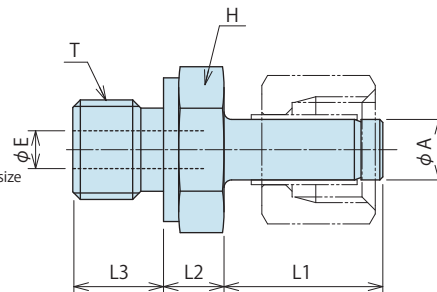
Note 1. Bonded seal is not included to this product. Please prepare separately.

Parallel Thread Adapter

Model No. Indication

9UKHB 06 0 1 E

BSPP Thread (G-Thread) size
(Refer to following table)
Applicable Pipe External Diameter
(Refer to 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
Mass (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

- 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
- TNZ-S
- TNZ-SQ

- Pressure Switch
- JB

- Pressure Gauge
- JGA/JGB

- Manifold
- JX

- Coupler Switch
- PS

G-Thread Fitting

Stud Elbow Fitting

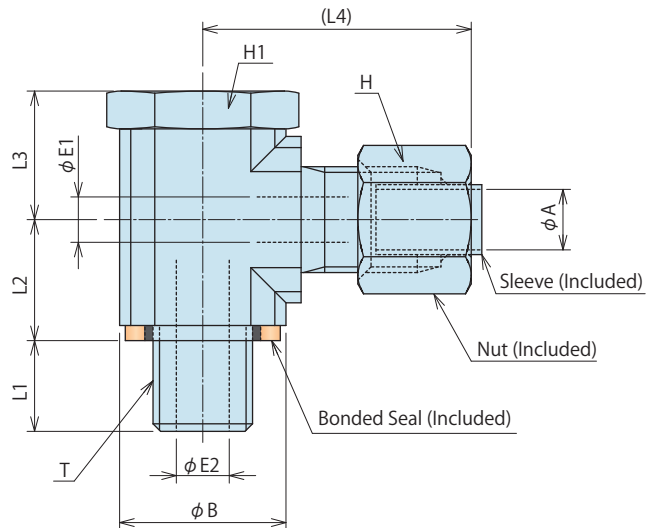
Model No. Indication

9UKMB 06 0 1 E

BSPP Thread (G-Thread) Size
(Refer to following table)

Applicable Pipe External Diameter
(Refer to following table)

Model No.	9UKMB0601E	9UKMB0802E	9UKMB1203E
Applicable Pipe External Diameter 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)
Mass (kg)	0.078	0.127	0.232



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

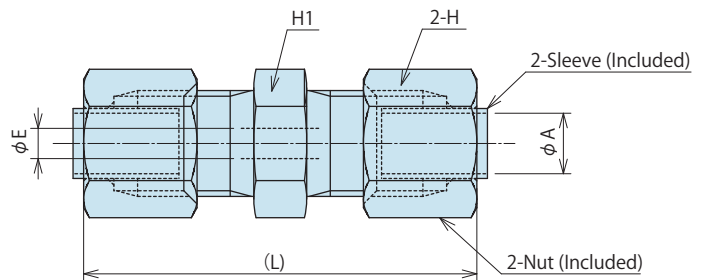
Union Fitting

Model No. Indication

9UKUA 06 00E

Applicable Pipe External Diameter
(Refer to following table)

Model No.	9UKUA0600E	9UKUA0800E	9UKUA1200E
Pipe External Diameter 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)
Mass (kg)	0.042	0.059	0.093



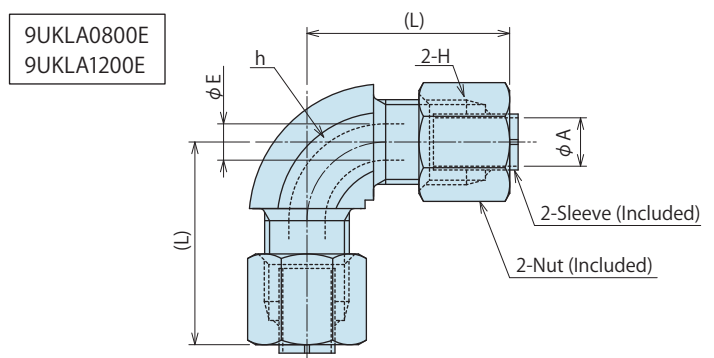
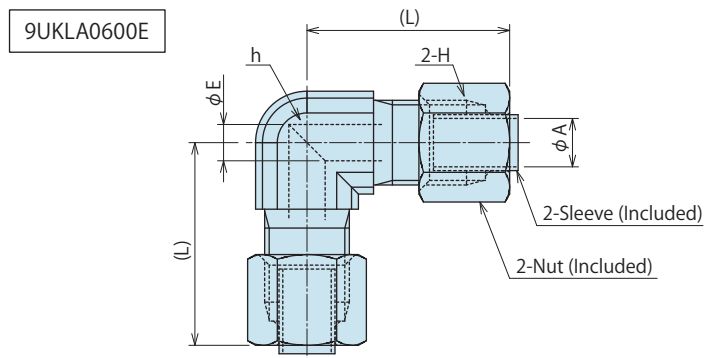
Union Fitting (Elbow)

Model No. Indication

9UKLA 06 00E

Applicable Pipe External Diameter
(Refer to following table)

Model No.	9UKLA0600E	9UKLA0800E	9UKLA1200E
Pipe External Diameter 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)
Mass (kg)	0.048	0.081	0.116



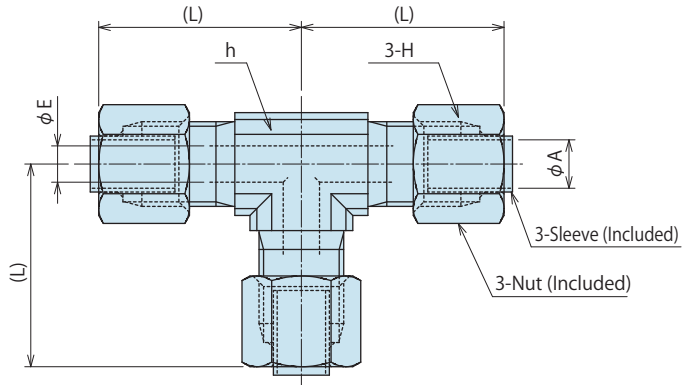
Union Fitting (Tee-Union Fitting)

Model No. Indication

9UKTA 06 00E

Applicable Pipe External Diameter.
(Refer to following table)

Model No.	9UKTA0600E	9UKTA0800E	9UKTA1200E
Applicable Pipe External Diameter 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)
Mass kg	0.069	0.122	0.172

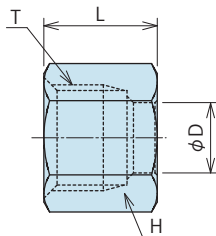


Nut

Model No. Indication

9UKKN 06 00E

Applicable Pipe External Diameter
(Refer to following table)



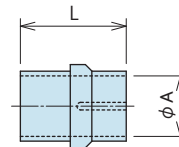
Model No.	9UKKN0600E	9UKKN0800E	9UKKN1200E
Applicable Pipe External Diameter ϕA	6	8	12
D	7.3	9.3	13.3
T	M12×1.5	M14×1.5	M18×1.5
Hexagon Opposite Side H	14	17	22
L	15	15	16
Mass kg	0.010	0.015	0.026

Sleeve

Model No. Indication

9UKK0 06 00E

Applicable Pipe External Diameter
(Refer to following table)



Model No.	9UKK00600E	9UKK00800E	9UKK01200E
Applicable Pipe External Diameter ϕA	6	8	12
L	14	14	15
Mass 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

- 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
 - TNZ-S
 - TNZ-SQ

- Pressure Switch
 - JB

- Pressure Gauge
 - JGA/JGB

- Manifold
 - JX

- Coupler Switch
 - PS

G-Thread Fitting

Sales Offices

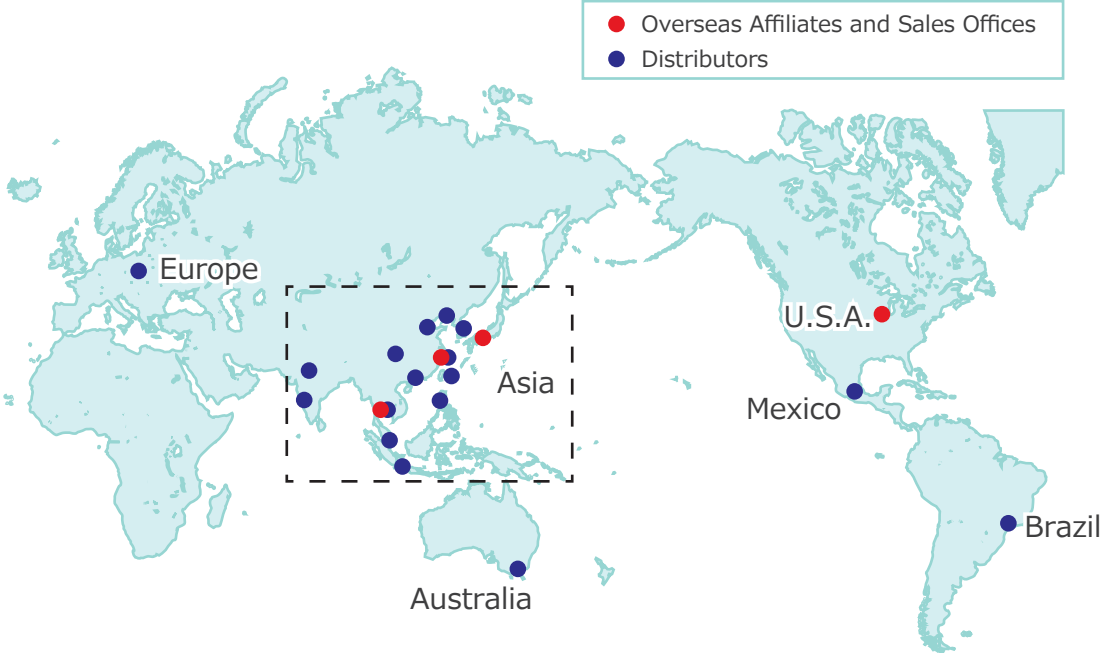
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Indonesia (Indonesia Exclusive Distributor)	TEL. +62-21-5818632	FAX. +62-21-5814857
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Global Network



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