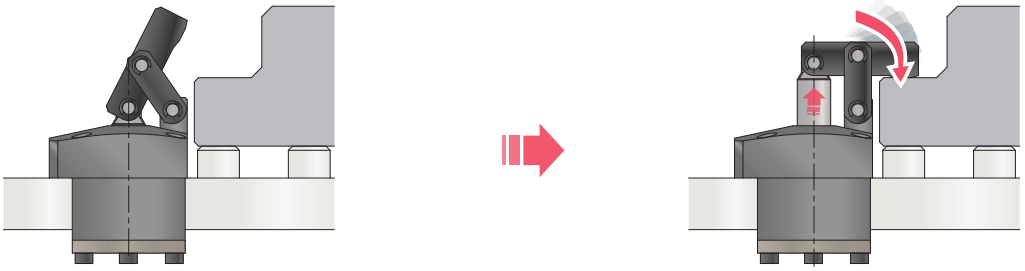
Hydraulic Link Clamp

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

Compact Cylinder with Built-in Link Mechanism

Link design is not required.

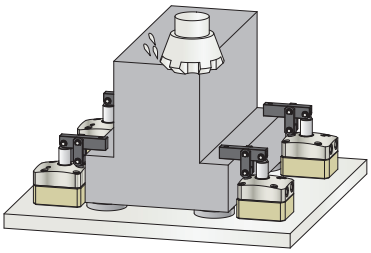
Action Description



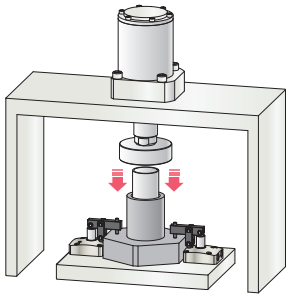
Released State

Locked State

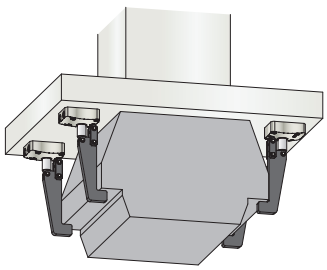
Application Examples



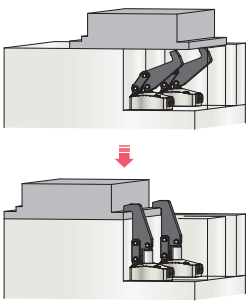
Machining



Press Fitting



Transfer • Gantry Loader



Interference Prevention

Link Clamp
Quick Change Lever Option A

Model LKA-A / LKC-A / LKW-A / LJ-A / LM-A

Quickest Lever Setup Time Possible by One Bolt Exchange

● Quick Change Lever Option A is Suitable for Frequent Lever Change

When changing a standard lever, a special tool is required to install/remove a snap ring which fixes the lever pin and rod pin. Installation/Removal of the snap ring takes time and there is a possibility of deformation/loss of the snap ring.
Option A, however, does not require snap rings or special tools, but only one wrench and bolt which is suitable especially for frequent lever change.

● Lever Removal Procedure

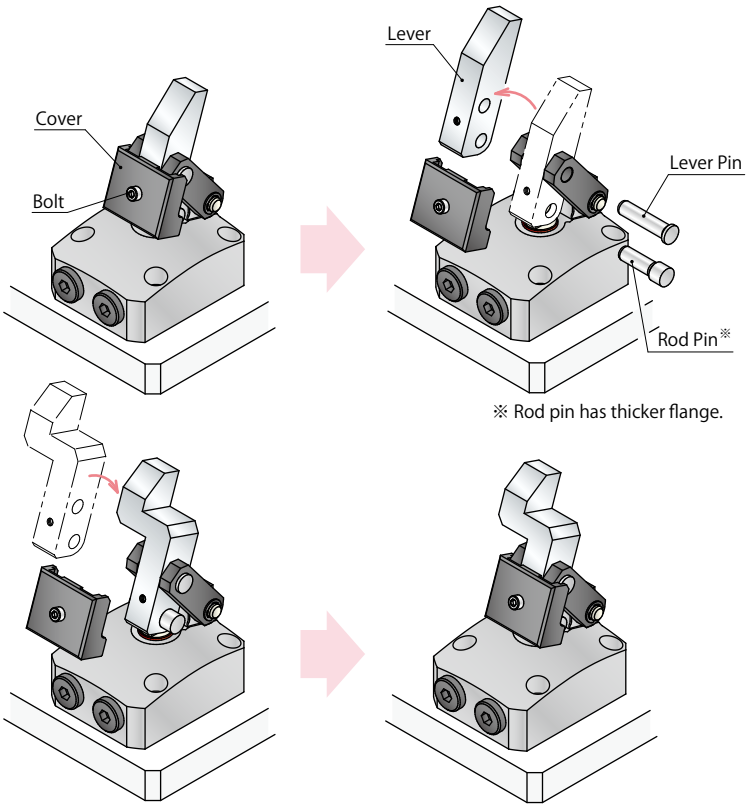
Loosen the bolt on the cover top and remove the cover.
(The bolt does not fall from the cover.)

Pull out the rod pin and the lever pin, and remove the cover.

● Lever Installation Procedure

Set another lever and insert the rod pin and the lever pin. (The pins can also be inserted from the other side.)

Set the cover and tighten the bolt.
Lever installation is now completed.

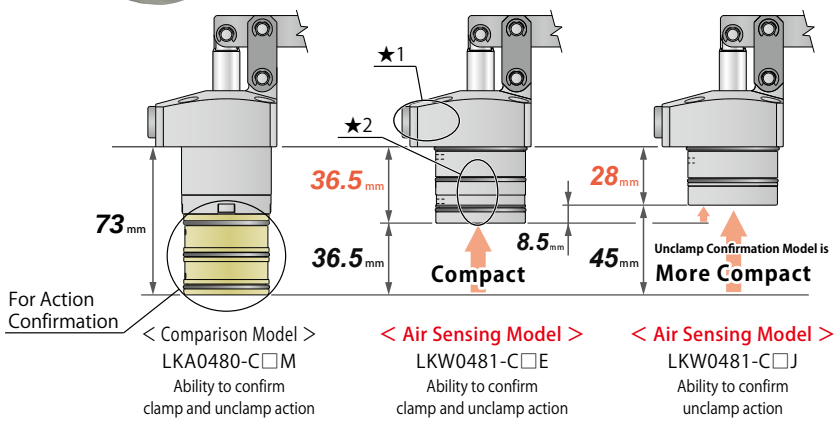


※ Rod pin has thicker flange.

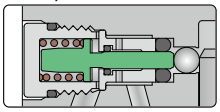
Air Sensing Link Clamp

Model LKW

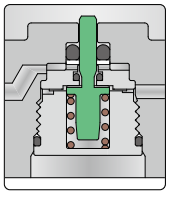
Clamp-unclamp confirmation with built-in air catch sensor for smaller footprint fixtures.



★1
Clamp Confirmation Valve



★2
Unclamp Confirmation Valve



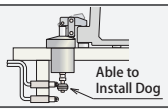
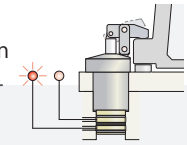
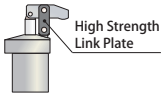
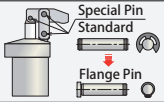
Low Pressure Model

MAX. 7MPa

Model LKA → P.611

Model LKC → P.637

Model LKW → P.651

Classification		Double Action	Double Action Compact	Double Action Built-in Sensing Valve
Operating Pressure Range		0.5 ~ 7MPa	0.5 ~ 7MPa	0.5 ~ 7MPa
Standard Model		External Dimensions → P.623	External Dimensions → P.645	–
Action Confirmation	Double End Rod Option for Dog 	External Dimensions → P.625	–	–
	Air Sensing Manifold Option 	External Dimensions → P.627	–	–
	Air Sensing Piping Option	External Dimensions → P.629	–	–
	Built-in Sensing Valve Model	–	–	External Dimensions → P.665
Option	Quick Change Lever Option A 	External Dimensions → P.631	External Dimensions → P.647	External Dimensions → P.671
	High Strength Link Plate Option 	Allowable offset increases. (External dimension is the same as standard model.)	Allowable offset increases. (External dimension is the same as standard model.)	Allowable offset increases. (External dimension is the same as standard model.)
	Flange Pin with C-type Circlip 	★	★	★
Accessories	Lever 	LZK-L LZK-W → P.636	LZK-L LZK-W → P.650	LZK-L LZK-W → P.674
	Manifold Block 	LZY-MD → P.1335		–
	Speed Control Valve Plug 	BZL, BZX, JZG, BZS → P.947		

※ Please contact us for detail dimension at ★ part.

High Pressure Model

MAX. 35MPa

Model TMA-2 → P.691

Model TMA-1 → P.703

Model TMV-2

Classification		Double Action	Single Action (Spring Release)	Double Action with Action Confirmation
Operating Pressure Range		3.5 ~ 35MPa	3.5 ~ 35MPa	3.5 ~ 35MPa
Accessories	Lever 	LZ-LJ3 LZ-LJ2 → P.702	LZ-LJ3 LZ-LJ2 → P.714	Further information on the website.
	Manifold Block 	TMZ-2MB → P.1337	TMZ-1MB → P.1337	
	Speed Control Valve Plug 	BZT, JZG → P.947		
	G-Thread Fitting 	G-Thread Fitting (Made by Ihara Science) → P.1351		

Low Pressure Model

MAX. 7MPa

		Model LJ/LM → P.675	Model LKK	Model LKV
Classification		Single Action (Spring Release)	Double Action 360° Rotatable Lever	Double Action 1-Port Sensing
Operating Pressure Range		2.5 ~ 7MPa	0.5 ~ 7MPa	1 ~ 7MPa
Standard Model		External Dimensions → P.683	Further information on the website.	Further information on the website.
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	–		
Option	Quick Change Lever Option A	External Dimensions → P.685		
	High Strength Link Plate Option (High Strength Link Plate)	–		
	Flange Pin with C-type Circlip (Special Pin Standard, Flange Pin)	–		
Accessories	Lever	LZ-LJ1, LZ-LJ2 LZK-W → P.688		
	Manifold Block	LZ-MS → P.1336		
	Speed Control Valve Plug	BZL, BZX, JZG, BZS → P.947		

※ Please contact us for detail dimension at ★ part.

High-Power Link Clamp Hydraulic Double Action

Model **LKE**

2 sizes smaller with equivalent clamping force. Mechanical lock and hydraulic pressure allow for strong clamping and holding force.
Refer to P. 53 for further information.

Hydraulic Double Action Link Clamp

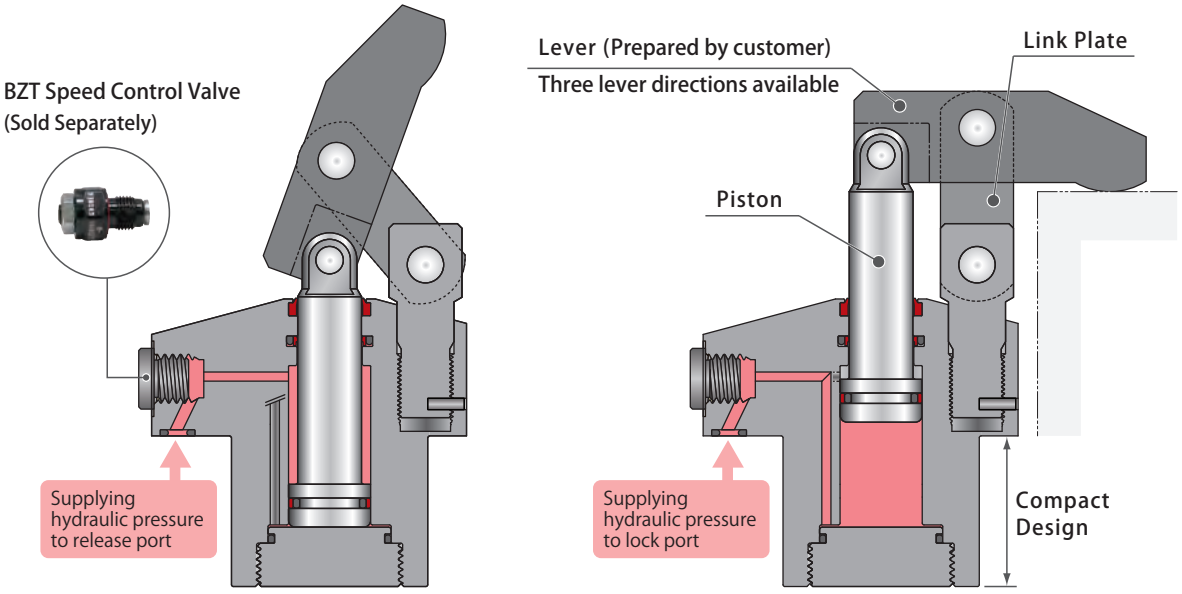
Model TMA-2

High Pressure (3.5～35MPa)

High Power・Compact Clamp

Index

Action Description



When releasing

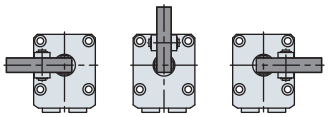
Perform the release action by supplying hydraulic pressure to release port.

When locking

Perform the lock action by supplying hydraulic pressure to lock port.

Lever in Three Directions Available

Lever positioning is available in three directions; L: Left, C: Center, R: Right. As seen from the port side.



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 (Piping Option -C), it is able to attach the speed control valve with air venting function. (Speed control valve is sold separately.)

Model No. Indication

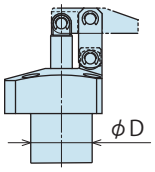
Double Action Model

TMA 040 0 - 2 C C

1 2 3 4

1 Body Size (Clamping Force)

025 : ϕD=33mm
040 : ϕD=36mm
060 : ϕD=43mm
100 : ϕD=48mm
160 : ϕD=60mm
250 : ϕD=70mm
320 : ϕD=85mm



2 Design No.

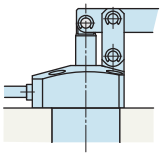
0 : Revision Number

3 Piping Method

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

※ Speed control valve (BZT-A) is sold separately.
Please use a meter-in speed control valve for TMA-2.
In case of using Kosmek model, select BZT□-A.
Refer to P.947 for detail.

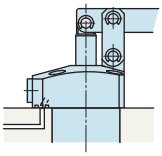
B



Piping Option

G Thread
No Gasket Port

C



Gasket Option

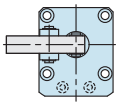
With G Thread Plug (able to attach Speed Control Valve)
(Order the valve (BZT-A) separately)

4 Lever Direction

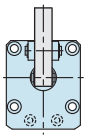
L : Left
C : Center
R : Right

※ The images show the lever direction when the piping port is placed in front of you.

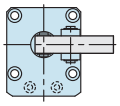
L



C



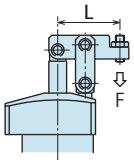
R



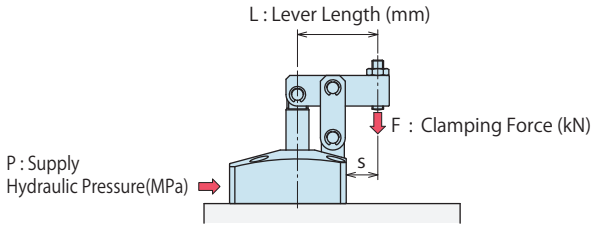
Specifications

Model No.			TMA0250-2□□	TMA0400-2□□	TMA0600-2□□	TMA1000-2□□	TMA1600-2□□	TMA2500-2□□	TMA3200-2□□
Cylinder Area for Locking		cm^2	1.039	1.539	2.545	3.801	6.158	8.042	11.341
Clamping Force (Calculation Formula) ※1		kN	$F=\frac{1.50\times P}{L-16}$	$F=\frac{2.56\times P}{L-18.5}$	$F=\frac{4.81\times P}{L-21}$	$F=\frac{8.38\times P}{L-24.5}$	$F=\frac{16.63\times P}{L-30}$	$F=\frac{26.06\times P}{L-36}$	$F=\frac{44.91\times P}{L-44}$
Full Stroke		mm	20.5	23.5	26	29.5	35	41	49
Lock Stroke		mm	17.5	20.5	23	26.5	32	38	46
Extra Stroke		mm	3	3	3	3	3	3	3
Cylinder Capacity	Lock	cm^3	2.1	3.6	6.6	11.2	21.6	33.0	55.6
	Release	cm^3	0.5	1.0	2.6	3.7	8.2	7.7	16.2
Max. Operating Pressure		MPa	35.0						
Min. Operating Pressure※2		MPa	3.5						
Operating Temperature		℃	0 ~ 70						
Weight ※3		kg	0.7	0.9	1.3	2.0	3.3	5.1	8.3

Notes : ※ 1. F : Clamping Force (kN), P : Supply Hydraulic Pressure (MPa), L : Distance between the piston center and the clamping point (mm).
※ 2. Minimum pressure to operate the clamp without load.
※ 3. It shows the weight of single clamp without link lever.



Clamping Force Curve



Applicable Model

Double-Acting Model

TMA □ 0 - 2 (B C) (L C R)

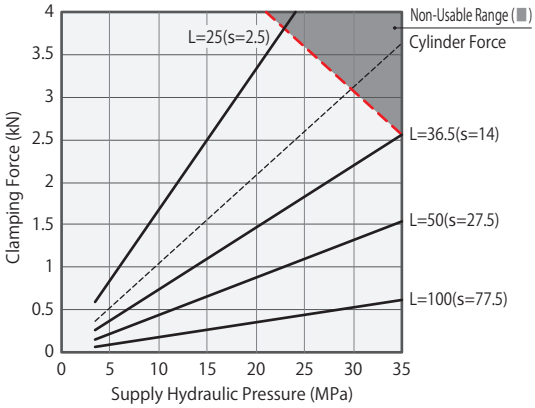
1 Body Size

(Ex.) In case of TMA1000-2 :
When supply hydraulic pressure P is 30MPa and lever length L is 56.5mm, clamping force becomes about 7.9kN.

TMA0250-2

Clamping Force Calculation Formula ※1 (kN) $F = (1.50 \times P) / (L - 16)$

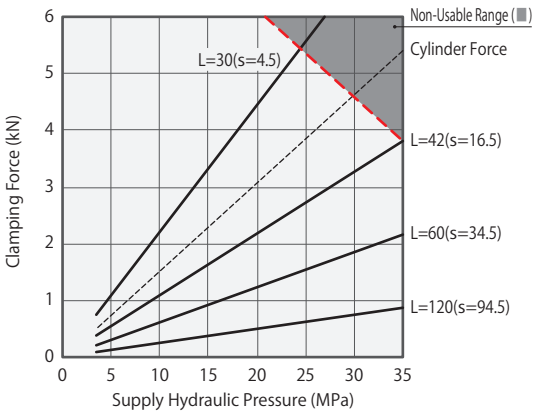
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm) L=25	L=30	L=36.5	L=40	L=50	L=60	L=80	L=100	Non-Usable Range(■) Min. Lever Length (L) (mm)
35.0	3.6			2.6	2.2	1.5	1.2	0.8	0.6	36.5
32.5	3.4			2.4	2.0	1.4	1.1	0.8	0.6	33.5
30.0	3.1			2.2	1.9	1.3	1.0	0.7	0.5	31
27.5	2.9		2.9	2.0	1.7	1.2	0.9	0.6	0.5	28.5
25.0	2.6		2.7	1.8	1.6	1.1	0.9	0.6	0.4	26.5
22.5	2.3	3.8	2.4	1.6	1.4	1.0	0.8	0.5	0.4	25
20.0	2.1	3.3	2.1	1.5	1.3	0.9	0.7	0.5	0.4	23.5
17.5	1.8	2.9	1.9	1.3	1.1	0.8	0.6	0.4	0.3	23.5
15.0	1.6	2.5	1.6	1.1	0.9	0.7	0.5	0.4	0.3	23.5
12.5	1.3	2.1	1.3	0.9	0.8	0.6	0.4	0.3	0.2	23.5
10.0	1.0	1.7	1.1	0.7	0.6	0.4	0.3	0.2	0.2	23.5
7.5	0.8	1.3	0.8	0.5	0.5	0.3	0.3	0.2	0.1	23.5
5.0	0.5	0.8	0.5	0.4	0.3	0.2	0.2	0.1	0.1	23.5
3.5	0.4	0.6	0.4	0.3	0.2	0.2	0.1	0.1	0.1	23.5
Max. Operating Pressure (MPa)		22.8	29.3	35.0	35.0	35.0	35.0	35.0	35.0	



TMA0400-2

Clamping Force Calculation Formula ※1 (kN) $F = (2.56 \times P) / (L - 18.5)$

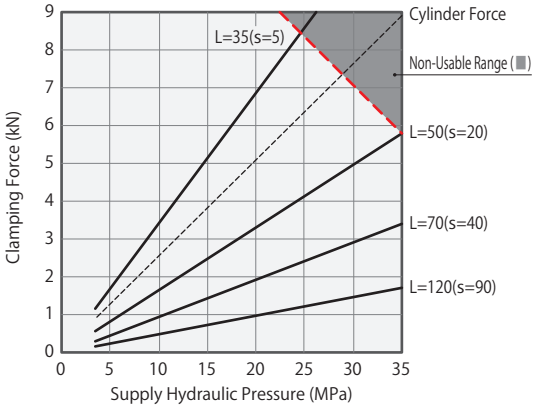
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm) L=30	L=35	L=42	L=50	L=60	L=80	L=100	L=120	Non-Usable Range(■) Min. Lever Length (L) (mm)
35.0	5.4			3.8	2.8	2.2	1.5	1.1	0.9	42
32.5	5.0			3.5	2.6	2.0	1.4	1.0	0.8	38.5
30.0	4.6			3.3	2.4	1.9	1.2	0.9	0.8	35.5
27.5	4.2		4.3	3.0	2.2	1.7	1.1	0.9	0.7	33
25.0	3.8		3.9	2.7	2.0	1.5	1.0	0.8	0.6	30.5
22.5	3.5	5.0	3.5	2.5	1.8	1.4	0.9	0.7	0.6	29
20.0	3.1	4.5	3.1	2.2	1.6	1.2	0.8	0.6	0.5	27
17.5	2.7	3.9	2.7	1.9	1.4	1.1	0.7	0.5	0.4	25.5
15.0	2.3	3.3	2.3	1.6	1.2	0.9	0.6	0.5	0.4	25.5
12.5	1.9	2.8	1.9	1.4	1.0	0.8	0.5	0.4	0.3	25.5
10.0	1.5	2.2	1.6	1.1	0.8	0.6	0.4	0.3	0.3	25.5
7.5	1.2	1.7	1.2	0.8	0.6	0.5	0.3	0.2	0.2	25.5
5.0	0.8	1.1	0.8	0.5	0.4	0.3	0.2	0.2	0.1	25.5
3.5	0.5	0.8	0.5	0.4	0.3	0.2	0.1	0.1	0.1	25.5
Max. Operating Pressure (MPa)		24.4	29.7	35.0	35.0	35.0	35.0	35.0	35.0	



TMA0600-2

Clamping Force Calculation Formula ※1 (kN) $F = (4.81 \times P) / (L - 21)$

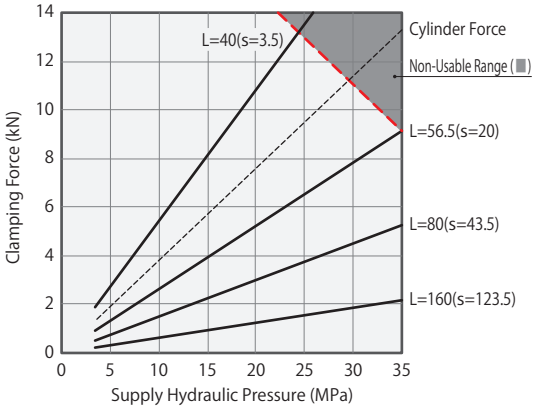
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm) L=35	L=40	L=50	L=60	L=70	L=80	L=100	L=120	Non-Usable Range(■) Min. Lever Length (L) (mm)
35.0	8.9			5.8	4.3	3.4	2.9	2.1	1.7	50
32.5	8.3			5.4	4.0	3.2	2.6	2.0	1.6	45.5
30.0	7.6			5.0	3.7	2.9	2.4	1.8	1.5	41.5
27.5	7.0		7.0	4.6	3.4	2.7	2.2	1.7	1.3	38.5
25.0	6.4		6.3	4.1	3.1	2.5	2.0	1.5	1.2	35.5
22.5	5.7	7.7	5.7	3.7	2.8	2.2	1.8	1.4	1.1	33.5
20.0	5.1	6.9	5.1	3.3	2.5	2.0	1.6	1.2	1.0	31.5
17.5	4.5	6.0	4.4	2.9	2.2	1.7	1.4	1.1	0.9	30
15.0	3.8	5.2	3.8	2.5	1.9	1.5	1.2	0.9	0.7	30
12.5	3.2	4.3	3.2	2.1	1.5	1.2	1.0	0.8	0.6	30
10.0	2.5	3.4	2.5	1.7	1.2	1.0	0.8	0.6	0.5	30
7.5	1.9	2.6	1.9	1.2	0.9	0.7	0.6	0.5	0.4	30
5.0	1.3	1.7	1.3	0.8	0.6	0.5	0.4	0.3	0.2	30
3.5	0.9	1.2	0.9	0.6	0.4	0.3	0.3	0.2	0.2	30
Max. Operating Pressure (MPa)		24.5	28.9	35.0	35.0	35.0	35.0	35.0	35.0	



TMA1000-2

Clamping Force Calculation Formula ※1 (kN) $F = (8.38 \times P) / (L - 24.5)$

Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm) L=40	L=50	L=56.5	L=80	L=100	L=120	L=140	L=160	Non-Usable Range(■) Min. Lever Length (L) (mm)
35.0	13.3			9.2	5.3	3.9	3.1	2.5	2.2	56.5
32.5	12.4			8.5	4.9	3.6	2.9	2.4	2.0	51.5
30.0	11.4		9.9	7.9	4.5	3.3	2.6	2.2	1.9	47.5
27.5	10.5		9.0	7.2	4.2	3.1	2.4	2.0	1.7	44
25.0	9.5		8.2	6.5	3.8	2.8	2.2	1.8	1.5	41
22.5	8.6	12.2	7.4	5.9	3.4	2.5	2.0	1.6	1.4	38.5
20.0	7.6	10.8	6.6	5.2	3.0	2.2	1.8	1.5	1.2	36.5
17.5	6.7	9.5	5.8	4.6	2.6	1.9	1.5	1.3	1.1	36.5
15.0	5.7	8.1	4.9	3.9	2.3	1.7	1.3	1.1	0.9	36.5
12.5	4.8	6.8	4.1	3.3	1.9	1.4	1.1	0.9	0.8	36.5
10.0	3.8	5.4	3.3	2.6	1.5	1.1	0.9	0.7	0.6	36.5
7.5	2.9	4.1	2.5	2.0	1.1	0.8	0.7	0.5	0.5	36.5
5.0	1.9	2.7	1.6	1.3	0.8	0.6	0.4	0.4	0.3	36.5
3.5	1.3	1.9	1.2	0.9	0.5	0.4	0.3	0.3	0.2	36.5
Max. Operating Pressure (MPa)		24.4	31.7	35.0	35.0	35.0	35.0	35.0	35.0	



Notes：

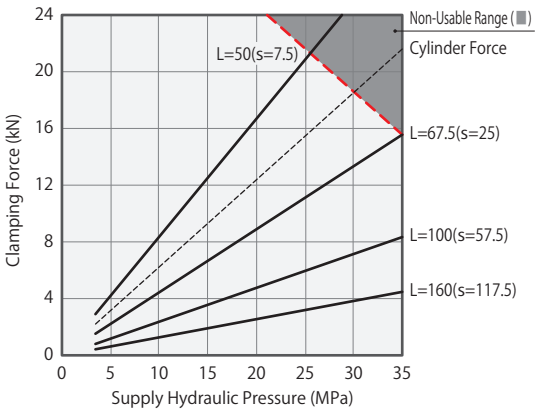
1. Tables and graphs show the relationship between the clamping force (kN) and supply hydraulic pressure (MPa).
2. Cylinder force (when L=0) cannot be calculated from the calculation formula of clamping force.
3. Clamping force in the non-usable range may cause damage and fluid leakage.

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

TMA1600-2

Clamping Force Calculation Formula ※1 (kN) $F = (16.63 \times P) / (L - 30)$

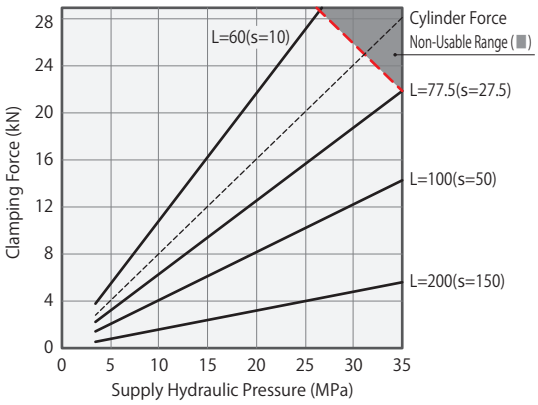
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm) L=50	L=60	L=67.5	L=80	L=100	L=120	L=140	L=160	Min. Lever Length (L) (mm)
35.0	21.6			15.5	11.6	8.3	6.5	5.3	4.5	67.5
32.5	20.0			14.4	10.8	7.7	6.0	4.9	4.2	62
30.0	18.5		16.6	13.3	10.0	7.1	5.5	4.5	3.8	57
27.5	16.9		15.2	12.2	9.1	6.5	5.1	4.2	3.5	53
25.0	15.4	20.8	13.9	11.1	8.3	5.9	4.6	3.8	3.2	49.5
22.5	13.9	18.7	12.5	10.0	7.5	5.3	4.2	3.4	2.9	46.5
20.0	12.3	16.6	11.1	8.9	6.7	4.8	3.7	3.0	2.6	43.5
17.5	10.8	14.6	9.7	7.8	5.8	4.2	3.2	2.6	2.2	42.5
15.0	9.2	12.5	8.3	6.7	5.0	3.6	2.8	2.3	1.9	42.5
12.5	7.7	10.4	6.9	5.5	4.2	3.0	2.3	1.9	1.6	42.5
10.0	6.2	8.3	5.5	4.4	3.3	2.4	1.8	1.5	1.3	42.5
7.5	4.6	6.2	4.2	3.3	2.5	1.8	1.4	1.1	1.0	42.5
5.0	3.1	4.2	2.8	2.2	1.7	1.2	0.9	0.8	0.6	42.5
3.5	2.2	2.9	1.9	1.6	1.2	0.8	0.6	0.5	0.4	42.5
Max. Operating Pressure (MPa)		25.6	31.6	35.0	35.0	35.0	35.0	35.0	35.0	



TMA2500-2

Clamping Force Calculation Formula ※1 (kN) $F = (26.06 \times P) / (L - 36)$

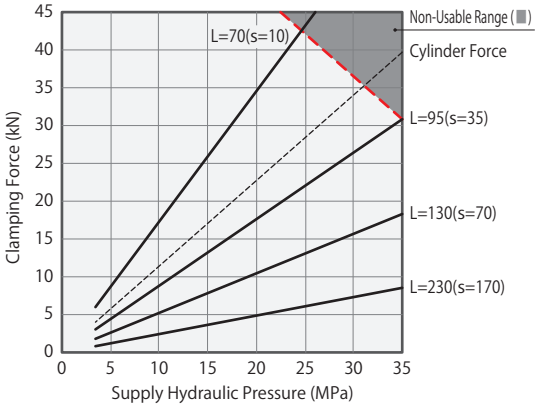
Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm) L=60	L=70	L=77.5	L=100	L=120	L=140	L=160	L=200	Min. Lever Length (L) (mm)
35.0	28.1			22.0	14.3	10.9	8.8	7.4	5.6	77.5
32.5	26.1			20.4	13.2	10.1	8.1	6.8	5.2	71.5
30.0	24.1		23.0	18.8	12.2	9.3	7.5	6.3	4.8	66.5
27.5	22.1		21.1	17.3	11.2	8.5	6.9	5.8	4.4	62
25.0	20.1	27.1	19.2	15.7	10.2	7.8	6.3	5.3	4.0	58
22.5	18.1	24.4	17.2	14.1	9.2	7.0	5.6	4.7	3.6	54.5
20.0	16.1	21.7	15.3	12.6	8.1	6.2	5.0	4.2	3.2	51.5
17.5	14.1	19.0	13.4	11.0	7.1	5.4	4.4	3.7	2.8	50
15.0	12.1	16.3	11.5	9.4	6.1	4.7	3.8	3.2	2.4	50
12.5	10.1	13.6	9.6	7.8	5.1	3.9	3.1	2.6	2.0	50
10.0	8.0	10.9	7.7	6.3	4.1	3.1	2.5	2.1	1.6	50
7.5	6.0	8.1	5.7	4.7	3.1	2.3	1.9	1.6	1.2	50
5.0	4.0	5.4	3.8	3.1	2.0	1.6	1.3	1.1	0.8	50
3.5	2.8	3.8	2.7	2.2	1.4	1.1	0.9	0.7	0.6	50
Max. Operating Pressure (MPa)		26.5	31.9	35.0	35.0	35.0	35.0	35.0	35.0	



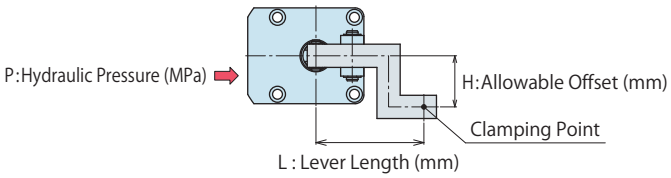
TMA3200-2

Clamping Force Calculation Formula ※1 (kN) $F = (44.91 \times P) / (L - 44)$

Hydraulic Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Lever Length L (mm) L=70	L=80	L=95	L=100	L=130	L=160	L=200	L=230	Min. Lever Length (L) (mm)
35.0	39.7			30.8	28.1	18.3	13.6	10.1	8.5	95
32.5	36.9			28.6	26.1	17.0	12.6	9.4	7.8	87.5
30.0	34.0			26.4	24.1	15.7	11.6	8.6	7.2	81
27.5	31.2		34.3	24.2	22.1	14.4	10.6	7.9	6.6	75.5
25.0	28.4		31.2	22.0	20.0	13.1	9.7	7.2	6.0	71
22.5	25.5	38.9	28.1	19.8	18.0	11.7	8.7	6.5	5.4	67
20.0	22.7	34.5	25.0	17.6	16.0	10.4	7.7	5.8	4.8	63
17.5	19.8	30.2	21.8	15.4	14.0	9.1	6.8	5.0	4.2	60
15.0	17.0	25.9	18.7	13.2	12.0	7.8	5.8	4.3	3.6	60
12.5	14.2	21.6	15.6	11.0	10.0	6.5	4.8	3.6	3.0	60
10.0	11.3	17.3	12.5	8.8	8.0	5.2	3.9	2.9	2.4	60
7.5	8.5	13.0	9.4	6.6	6.0	3.9	2.9	2.2	1.8	60
5.0	5.7	8.6	6.2	4.4	4.0	2.6	1.9	1.4	1.2	60
3.5	4.0	6.0	4.4	3.1	2.8	1.8	1.4	1.0	0.8	60
Max. Operating Pressure (MPa)		24.6	29.6	35.0	35.0	35.0	35.0	35.0	35.0	



Allowable Offset Graph



Applicable Model

Double-Acting Model

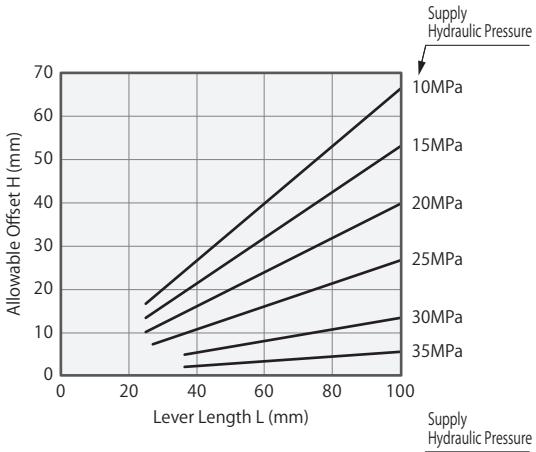
TMA □ 0 - 2 B C L C R

1 Body Size

(Ex.) In case of TMA1600 :
When supply hydraulic pressure P is 30MPa and lever length L is 140mm, allowable offset becomes about 20mm.

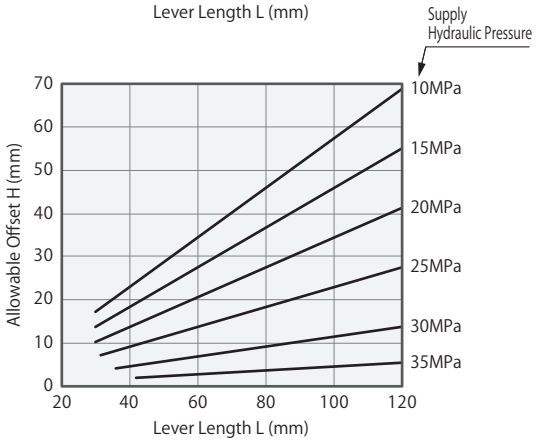
TMA0250-2

Hydraulic Pressure (MPa)	Allowable Offset H (mm) Non-Usable Range (■) Lever Length L (mm)							
	L=25	L=30	L=36.5	L=40	L=50	L=60	L=80	L=100
35	■	■	2	2	3	3	4	5
32.5	■	■	2	3	3	4	5	7
30	■	■	5	5	7	8	11	13
27.5	■	6	7	8	10	12	16	20
25	■	8	10	11	13	16	21	27
22.5	8	10	12	13	17	20	27	33
20	10	12	15	16	20	24	32	40
17.5	12	14	17	19	23	28	37	46
15	13	16	19	21	27	32	42	53
12.5	15	18	22	24	30	36	48	60
10	17	20	24	27	33	40	53	66



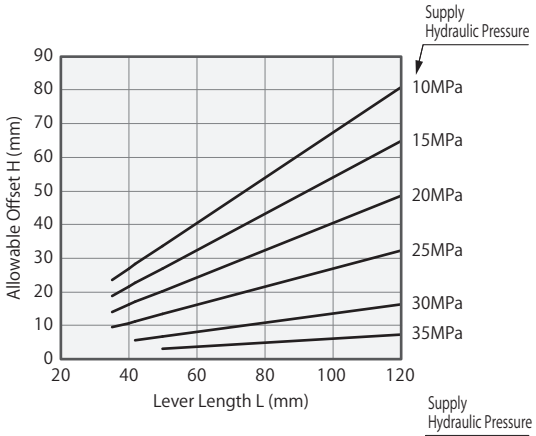
TMA0400-2

Hydraulic Pressure (MPa)	Allowable Offset H (mm) Non-Usable Range (■) Lever Length L (mm)							
	L=30	L=35	L=42	L=50	L=60	L=80	L=100	L=120
35	■	■	2	2	3	4	5	5
32.5	■	■	2	3	3	5	6	7
30	■	■	5	6	7	9	11	14
27.5	■	6	7	9	10	14	17	21
25	■	8	10	11	14	18	23	28
22.5	9	10	12	14	17	23	29	34
20	10	12	14	17	21	28	34	41
17.5	12	14	17	20	24	32	40	48
15	14	16	19	23	28	37	46	55
12.5	15	18	22	26	31	41	52	62
10	17	20	24	29	34	46	57	69



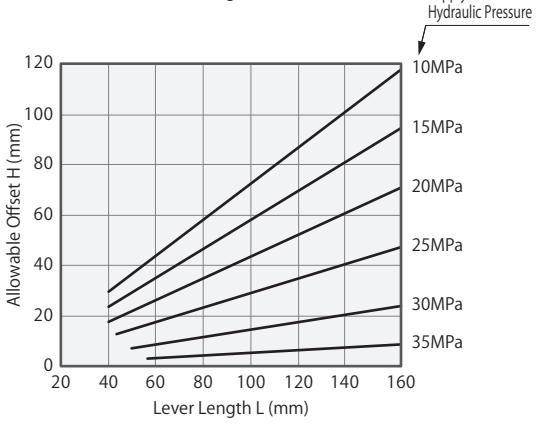
TMA0600-2

Hydraulic Pressure (MPa)	Allowable Offset H (mm) Non-Usable Range (■) Lever Length L (mm)							
	L=35	L=40	L=50	L=60	L=70	L=80	L=100	L=120
35	■	■	3	4	4	5	6	7
32.5	■	■	3	4	5	5	7	8
30	■	■	7	8	9	11	13	16
27.5	■	8	10	12	14	16	20	24
25	9	11	13	16	19	22	27	32
22.5	12	13	17	20	24	27	34	40
20	14	16	20	24	28	32	40	48
17.5	16	19	24	28	33	38	47	57
15	19	22	27	32	38	43	54	65
12.5	21	24	30	36	42	48	61	73
10	24	27	34	40	47	54	67	81



TMA1000-2

Hydraulic Pressure (MPa)	Allowable Offset H (mm) Non-Usable Range (■) Lever Length L (mm)							
	L=40	L=50	L=56.5	L=80	L=100	L=120	L=140	L=160
35	■	■	3	4	5	6	7	9
32.5	■	■	4	6	7	9	10	12
30	■	7	8	12	15	18	20	23
27.5	■	11	12	18	22	26	31	35
25	■	15	17	24	29	35	41	47
22.5	15	18	21	29	37	44	51	59
20	18	22	25	35	44	53	62	71
17.5	21	26	29	41	51	62	72	82
15	24	29	33	47	59	71	82	94
12.5	26	33	37	53	66	79	93	106
10	29	37	42	59	73	88	103	118

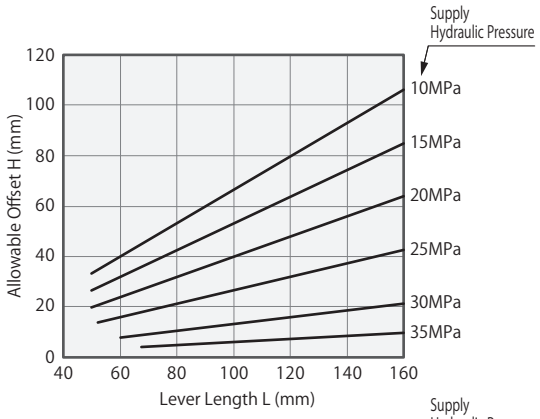


Notes :

1. Tables and graphs show the relationship between the lever length and the allowable offset according to the supply hydraulic pressure.
2. Using the lever beyond allowable offset may cause deformation, seizure and fluid leakage etc.
3. The tables and graphs are only for reference. The design should be carried out with allowance fully taken into consideration.

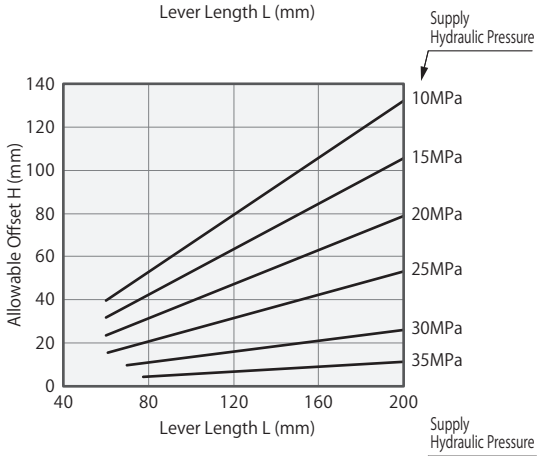
TMA1600-2

Hydraulic Pressure (MPa)	Allowable Offset H (mm) Non-Usable Range (■) Lever Length L (mm)							
	L=50	L=60	L=67.5	L=80	L=100	L=120	L=140	L=160
35			4	5	6	7	9	10
32.5			4	5	7	8	9	11
30		8	9	11	13	16	19	21
27.5		12	13	16	20	24	28	32
25		16	18	21	27	32	37	43
22.5	17	20	22	27	33	40	47	53
20	20	24	27	32	40	48	56	64
17.5	23	28	31	37	47	56	65	74
15	27	32	36	43	53	64	74	85
12.5	30	36	40	48	60	72	84	96
10	33	40	45	53	66	80	93	106



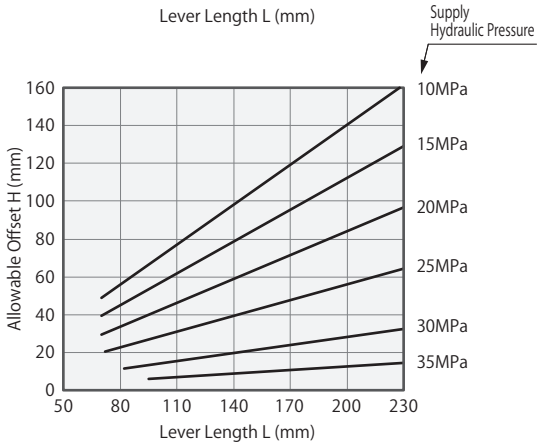
TMA2500-2

Hydraulic Pressure (MPa)	Allowable Offset H (mm) Non-Usable Range (■) Lever Length L (mm)							
	L=60	L=70	L=77.5	L=100	L=120	L=140	L=160	L=200
35			4	6	7	8	9	11
32.5			5	7	8	9	11	13
30		9	10	13	16	19	21	26
27.5		14	15	20	24	28	32	40
25		18	20	26	32	37	42	53
22.5	20	23	26	33	40	46	53	66
20	24	28	31	40	48	56	63	79
17.5	28	32	36	46	56	65	74	93
15	32	37	41	53	63	74	85	106
12.5	36	42	46	59	71	83	95	119
10	40	46	51	66	79	93	106	132



TMA3200-2

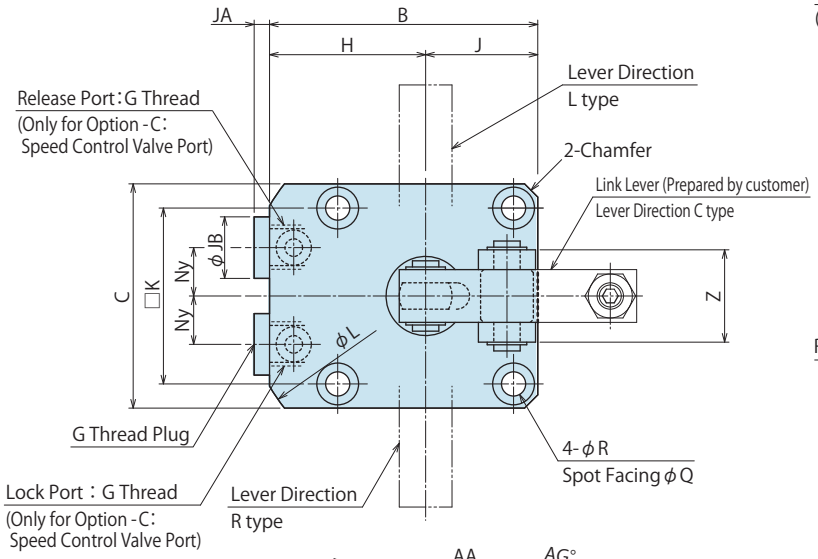
Hydraulic Pressure (MPa)	Allowable Offset H (mm) Non-Usable Range (■) Lever Length L (mm)							
	L=70	L=80	L=95	L=100	L=130	L=160	L=200	L=230
35			6	6	8	10	13	14
32.5			7	7	9	11	14	16
30			13	14	18	22	28	32
27.5		17	20	21	27	34	42	48
25		22	27	28	36	45	56	65
22.5	25	28	33	35	46	56	70	81
20	29	34	40	42	55	67	84	97
17.5	34	39	47	49	64	79	98	113
15	39	45	53	56	73	90	112	129
12.5	44	50	60	63	82	101	126	145
10	49	56	67	70	91	112	140	161

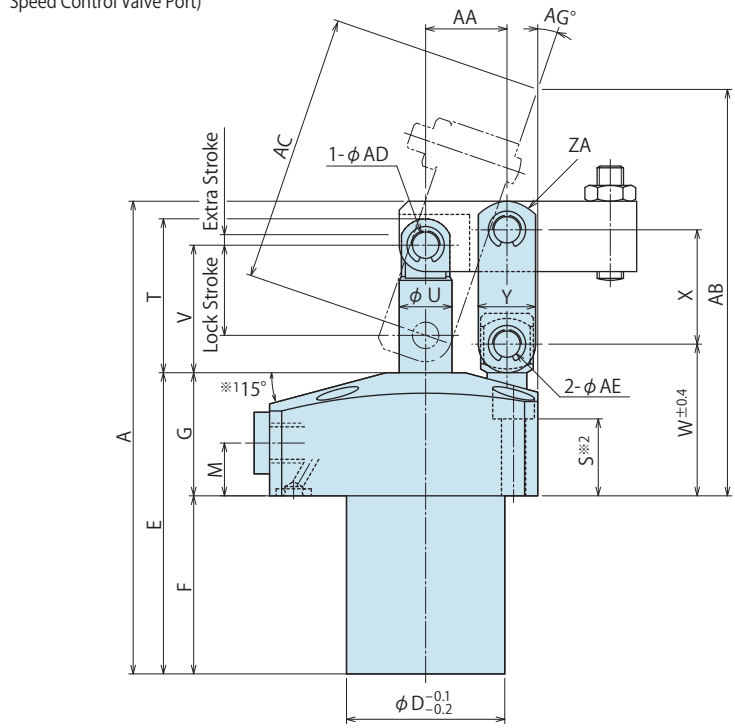


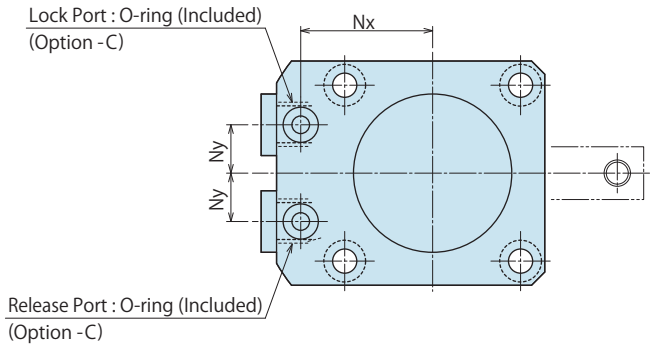
External Dimensions

C：Gasket Option (With G Thread Plug)

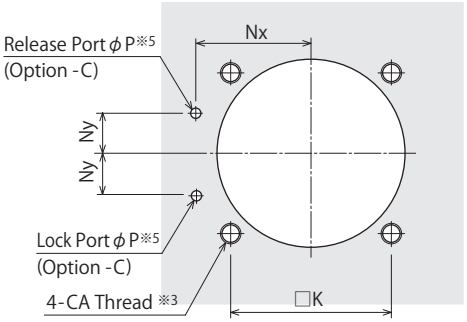
※The drawing shows the locked state of TMA-2CC.

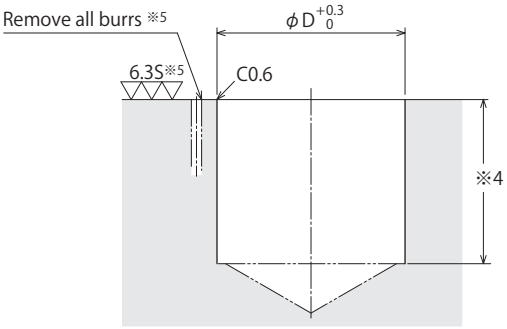






Machining Dimensions of Mounting Area





Notes：

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

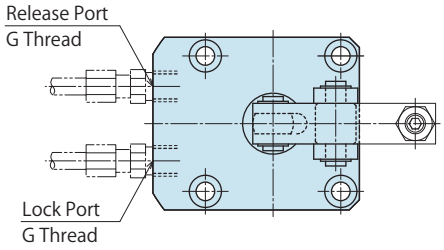
※4. The depth of the body mounting hole φD should be decided according to the mounting height referring to dimension 'F'.

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

Piping Method

B：Piping Option (G Thread)

※The drawing shows the locked state of TMA-2BC.



Notes：

※1. Flange inclination angle is 12°only for TMA1000.

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

1. Please use the provided pin (equivalent to φADf6, φAEf6, HRC60) as mounting pin for lever.
2. Please prepare speed control valve (Refer to P.947) if necessary.

External Dimensions and Machining Dimensions for Mounting

(mm)

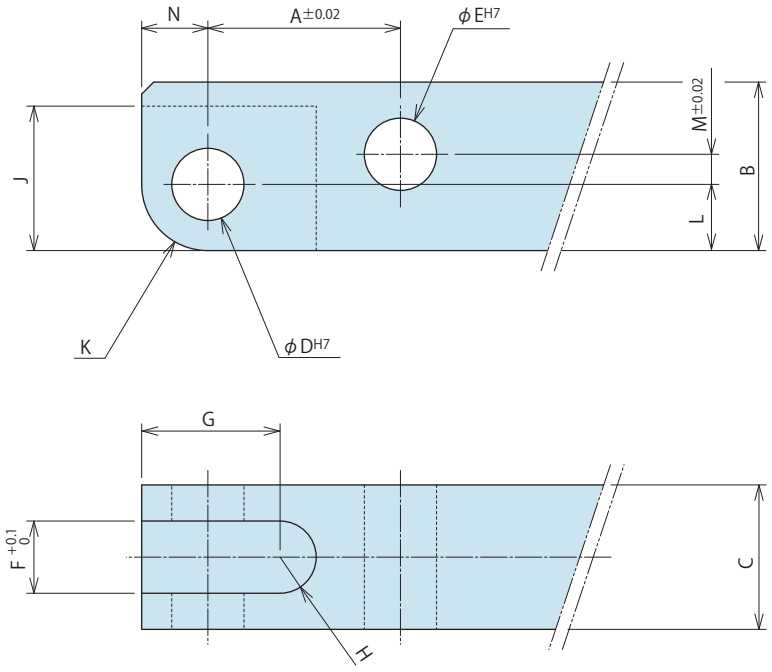
Model No.	TMA0250-2□□	TMA0400-2□□	TMA0600-2□□	TMA1000-2□□	TMA1600-2□□	TMA2500-2□□	TMA3200-2□□
Full Stroke	20.5	23.5	26	29.5	35	41	49
Lock Stroke	17.5	20.5	23	26.5	32	38	46
Extra Stroke	3	3	3	3	3	3	3
A	87	97.5	108.5	122.5	151	175.5	205
B	54	61	69	82.5	94.5	109.5	127
C	45	51	60	73	85	100	120
D	33	36	43	48	60	70	85
E	53.5	58.5	63	68.5	84	96.5	111
F	27.5	30.5	33	35.5	46	54.5	61
G	26	28	30	33	38	42	50
H	31.5	35.5	39	46	52	59.5	67
J	22.5	25.5	30	36.5	42.5	50	60
K	34	40	47	57	65	75	88
L	73	81	88	103	116	136	147
M	11	12	13	14	16	17	19
Nx	26	30	33.5	40	45	52.5	60
Ny	9	10	12	15	16	18.5	20
P	3	3	3	3	5	5	5
Q	9	9	11	14	17.5	20	20
R	5.5	5.5	6.8	9	11	14	14
S	15.5	16.5	16	17.5	17.5	18	24
T	30.5	35	37.5	45	55	64.5	77
U	10	12	14	18	22	28	32
V	25	29	31.5	37	45	52	62
W	31.5	34.5	37.5	42	49	54.5	64
X	22	26	30	35.5	43.5	52.5	64
Y	13	13	16	19	25	28	32
Z	21	21	28	37	40	49	64
ZA	R7.5	R7.5	R10	R12	R15	R16	R18
Chamfer	3	3	3	4	5	8	(ϕ147)
AA	16	18.5	21	24.5	30	36	44
AB	78.7	92.4	103.9	118.4	131.8	148.5	173.6
AC	50.2	61.2	71.7	83	90.8	104.6	122.5
AD	6	6	6	8	10	12	15
AE	6	6	8	10	12	15	18
AG	20.2	18.9	19.9	20.5	21.5	22.4	23.1
CA (Nominal × Pitch)	M5×0.8	M5×0.8	M6×1	M8×1.25	M10×1.5	M12×1.75	M12×1.75
JA	3	3	3	3	3.5	3.5	3.5
JB	14	14	14	14	19	19	19
G Thread	G1/8	G1/8	G1/8	G1/8	G1/4	G1/4	G1/4
O-ring (Option -C)	1BP5	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7

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

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

Link Lever Design Dimension

※ Reference for designing link lever.



Calculation List of Link Lever Design Dimension

(mm)

Corresponding Model No.	TMA0250	TMA0400	TMA0600	TMA1000	TMA1600	TMA2500	TMA3200
A	16	18.5	21	24.5	30	36	44
B	14	16	20	25	32	38	45
C	$12^{\ 0}_{-0.3}$	$12^{\ 0}_{-0.3}$	$16^{\ 0}_{-0.3}$	$19^{\ 0}_{-0.3}$	$22^{\ 0}_{-0.3}$	$25^{\ 0}_{-0.3}$	$32^{\ 0}_{-0.4}$
D	$6^{\ +0.012}_{\ 0}$	$6^{\ +0.012}_{\ 0}$	$6^{\ +0.012}_{\ 0}$	$8^{\ +0.015}_{\ 0}$	$10^{\ +0.015}_{\ 0}$	$12^{\ +0.018}_{\ 0}$	$15^{\ +0.018}_{\ 0}$
E	$6^{\ +0.012}_{\ 0}$	$6^{\ +0.012}_{\ 0}$	$8^{\ +0.015}_{\ 0}$	$10^{\ +0.015}_{\ 0}$	$12^{\ +0.018}_{\ 0}$	$15^{\ +0.018}_{\ 0}$	$18^{\ +0.018}_{\ 0}$
F	6	6	8	10	11	13	16
G	11.5	13	12.5	16	20	24	28
H	R3	R3	R4	R5	R5.5	R6.5	R8
J	12	13	13	17.5	22	26	30.5
K	R5.5	R6	R6	R8	R10	R11	R13
L	5.5	6	6	8	10	11	13
M	2.5	3.5	6	7.5	9.5	13	16
N	5.5	6	6	8	10	11	13

Notes :

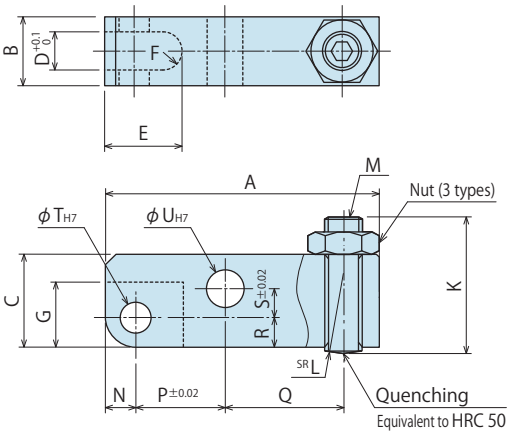
1. Please design the link lever length according to the performance curve.
2. If the link lever is not in accordance with the dimension shown above, performance may be degraded and damage can occur.
3. Please use the attached pin (equivalent to φADf6, φAEf6, HRC60) as the mounting pin for lever.
   (Please refer to each external dimension of TMA for the dimensions φAD and φAE.)

Accessories : Link Lever (LZ-LJ3)

Model No. Indication

LZ 048 0 – LJ3

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



(mm)

Model No.	LZ0400-LJ3	LZ0480-LJ3	LZ0550-LJ3	LZ0650-LJ3	LZ0750-LJ3	LZ0900-LJ3	LZ1050-LJ3
Corresponding Model No.	TMA0250	TMA0400	TMA0600	TMA1000	TMA1600	TMA2500	TMA3200
A	48	54	64	74.5	88.5	102.5	125
B	12 $^{0}_{-0.3}$	12 $^{0}_{-0.3}$	16 $^{0}_{-0.3}$	19 $^{0}_{-0.3}$	22 $^{0}_{-0.3}$	25 $^{0}_{-0.3}$	32 $^{0}_{-0.4}$
C	14	16	20	25	32	38	45
D	6	6	8	10	11	13	16
E	14.5	16	16.5	21	25.5	30.5	36
F	R3	R3	R4	R5	R5.5	R6.5	R8
G	12	13	13	17.5	22	26	30.5
K	23	26	32	39	47	56	65
L	10	10	15	20	30	45	60
M	M6×1	M6×1	M8×1.25	M10×1.5	M12×1.75	M16×2	M20×2.5
N	5.5	6	6	8	10	11	13
P	16	18.5	21	24.5	30	36	44
Q	20.5	23.5	29	32	37.5	41.5	51
R	5.5	6	6	8	10	11	13
S	2.5	3.5	6	7.5	9.5	13	16
T	6 $^{+0.012}_{0}$	6 $^{+0.012}_{0}$	6 $^{+0.012}_{0}$	8 $^{+0.015}_{0}$	10 $^{+0.015}_{0}$	12 $^{+0.018}_{0}$	15 $^{+0.018}_{0}$
U	6 $^{+0.012}_{0}$	6 $^{+0.012}_{0}$	8 $^{+0.015}_{0}$	10 $^{+0.015}_{0}$	12 $^{+0.018}_{0}$	15 $^{+0.018}_{0}$	18 $^{+0.018}_{0}$

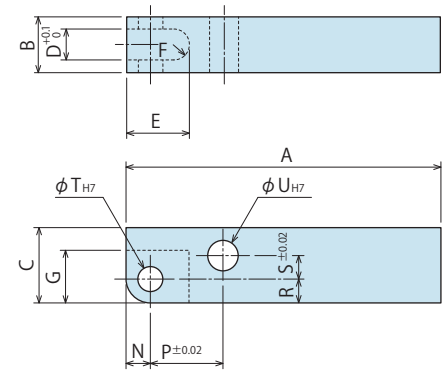
Notes : 1. Material S45C Surface Finishing : Alkaline Blackening
2. Please use the attached pin (equivalent to φADf6, φAEf6, HRC60) as the mounting pin for lever.

Accessories : Material Link Lever (LZ-LJ2)

Model No. Indication

LZ 048 0 – LJ2

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



(mm)

Model No.	LZ0400-LJ2	LZ0480-LJ2	LZ0550-LJ2	LZ0650-LJ2	LZ0750-LJ2	LZ0900-LJ2	LZ1050-LJ2
Corresponding Model No.	TMA0250	TMA0400	TMA0600	TMA1000	TMA1600	TMA2500	TMA3200
A	75	85	90	105	110	160	220
B	12 $^{0}_{-0.3}$	12 $^{0}_{-0.3}$	16 $^{0}_{-0.3}$	19 $^{0}_{-0.3}$	22 $^{0}_{-0.3}$	25 $^{0}_{-0.3}$	32 $^{0}_{-0.4}$
C	14	16	20	25	32	38	45
D	6	6	8	10	11	13	16
E	14.5	16	16.5	21	25.5	30.5	36
F	R3	R3	R4	R5	R5.5	R6.5	R8
G	12	13	13	17.5	22	26	30.5
N	5.5	6	6	8	10	11	13
P	16	18.5	21	24.5	30	36	44
R	5.5	6	6	8	10	11	13
S	2.5	3.5	6	7.5	9.5	13	16
T	6 $^{+0.012}_{0}$	6 $^{+0.012}_{0}$	6 $^{+0.012}_{0}$	8 $^{+0.015}_{0}$	10 $^{+0.015}_{0}$	12 $^{+0.018}_{0}$	15 $^{+0.018}_{0}$
U	6 $^{+0.012}_{0}$	6 $^{+0.012}_{0}$	8 $^{+0.015}_{0}$	10 $^{+0.015}_{0}$	12 $^{+0.018}_{0}$	15 $^{+0.018}_{0}$	18 $^{+0.018}_{0}$

Notes : 1. Material S45C Surface Finishing : Alkaline Blackening
2. If necessary, the front end should be additionally machined.
3. Please use the attached pin (equivalent to φADf6, φAEf6, HRC60) as the mounting pin for lever.

Cautions

Notes for Design

1) Check Specifications

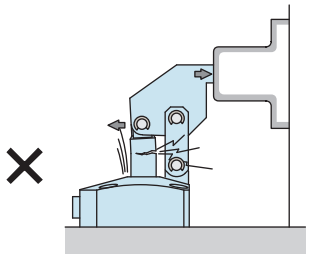
- Please use each product according to the specifications.

2) Notes for Circuit Design

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

3) Notes for Link Lever Design

- Make sure no force is applied to the piston rod except from the axial direction. The usage like the one shown in the drawing below will apply a large bending stress to the piston rod and must be avoided.



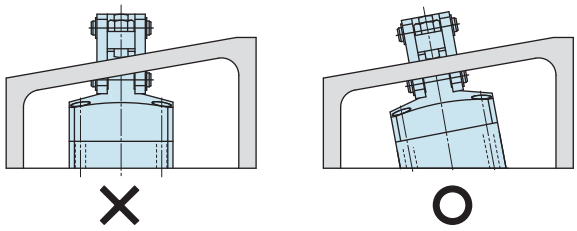
- If offset load is applied on the link part, use it within the allowable range of "Allowable Offset Graph".

4) Protect the exposed area of the piston rod when using on a welding fixture.

- If spatter attaches to the sliding surface it could lead to malfunction and fluid leakage.

5) When clamping on a sloped surface of the workpiece

- Make sure the clamping surface and the mounting surface of the clamp are parallel.



6) When using in a dry environment

- The link pin can be dried out. Grease it periodically or use a special pin. Contact us for the specifications of special pins.

7) Notes for LKA-M/N, LKW

- When using air sensing link clamp (LKA-M/N, LKW), make sure to check the Notes for Design・Installation・Use (Pages shown below).
  - ・Link clamp with air sensing option LKA-M/N：Refer to P.633.
  - ・Link clamp with air sensing valve LKW：Refer to P.655.

Installation Notes

1) Check the Usable Fluid

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

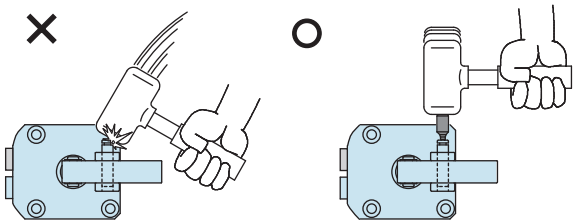
2) Installation of the Product

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

Model No.		Thread Size	Tightening Torque (N·m)
LKA LKC LKW	LKA0360	M4×0.7	4.0
	LKA0400 LKC0400/LKW0401	M5×0.8	8.0
	LKA0480 LKC0480/LKW0481	M5×0.8	8.0
	LKA0550 LKC0550/LKW0551	M6×1	14
	LKA0650 LKC0650/LKW0651	M6×1	14
	LKA0750/LKW0751	M8×1.25	33
	LKA0900	M10×1.5	65
	LKA1050	M12×1.75	114
LJ/LM	LJ0302/LM0300	M4×0.7	3.2
	LJ0362/LM0360	M4×0.7	3.2
	LJ0402/LM0400	M5×0.8	6.3
	LJ0482/LM0480	M5×0.8	6.3
	LJ0552/LM0550	M6×1	10
	LJ0652/LM0650	M6×1	10
	LJ0752/LM0750	M8×1.25	25
	LJ0902	M10×1.5	58.8
	LJ1052	M12×1.75	98
TMA	TMA0250	M5×0.8	6.9
	TMA0400	M5×0.8	6.9
	TMA0600	M6×1	11.8
	TMA1000	M8×1.25	25
	TMA1600	M10×1.5	58.8
	TMA2500	M12×1.75	98
	TMA3200	M12×1.75	98

3) Installation / Removal of the Link Lever

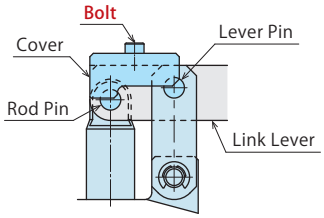
- When inserting the link pin, do not hit the pin directly with a hammer. When using a hammer to insert the pin, always use a cover plate with a smaller diameter than the spring ring groove on the pin.



- The following shows the tightening torque for the mounting bolt of the quick change lever option A.

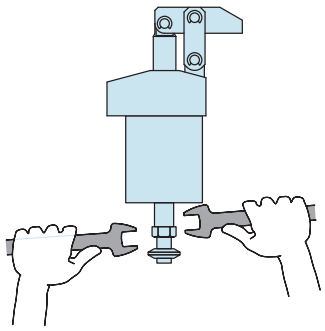
Quick Change Lever Option A

Model No.	Thread Size	Tightening Torque (N·m)
LKA0360-□□-A **LJ0362-□□-A / LM0360-□□-A**	M3×0.5	1.3
LKA0400-□□-A **LKC0400-□□-A / LKW0401-□□-A** **LJ0402-□□-A / LM0400-□□-A**	M3×0.5	1.3
LKA0480-□□-A **LKC0480-□□-A / LKW0481-□□-A** **LJ0482-□□-A / LM0480-□□-A**	M3×0.5	1.3
LKA0550-□□-A **LKC0550-□□-A / LKW0551-□□-A** **LJ0552-□□-A / LM0550-□□-A**	M3×0.5	1.3
LKA0650-□□-A **LKC0650-□□-A / LKW0651-□□-A** **LJ0652-□□-A / LM0650-□□-A**	M4×0.7	3.2
LKA0750-□□-A / LKW0751-□□-A **LJ0752-□□-A / LM0750-□□-A**	M4×0.7	3.2
LKA0900-□□-A	M5×0.8	6.3
LKA1050-□□-A	M5×0.8	6.3



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

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



Model No.		Thread Size	Tightening Torque (N·m)
LKA-D	**LKA0360-□□D**	M4×0.7	3.2
	LKA0400-□□D	M6×1	10
	LKA0480-□□D	M8×1.25	25
	LKA0550-□□D	M8×1.25	25
	LKA0650-□□D	M8×1.25	25
	LKA0750-□□D	M10×1.5	50
	LKA0900-□□D	M10×1.5	50
	LKA1050-□□D	M10×1.5	50

5) Speed Adjustment

- Adjust the speed so that the total operating time is one second or more. If the clamp operates too fast the parts will be worn out leading to premature damage and ultimately complete equipment failure.
- Please make sure to release air from the circuit before adjusting speed. It will be difficult to adjust the speed accurately with air mixed in the circuit.
- Turn the speed control valve gradually from the low-speed side (small flow) to the high-speed side (large flow) to adjust the speed.

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

Cautions

Installation Notes (For Hydraulic Series)

1) Check the Usable Fluid

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

2) Procedure before Piping

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

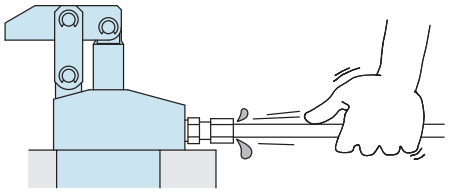
3) Applying Sealing Tape

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

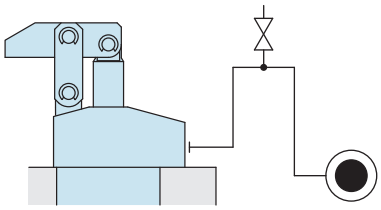
4) Air Bleeding of the Hydraulic Circuit

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

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



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



5) Checking Looseness and Retightening

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

Hydraulic Fluid List

ISO Viscosity Grade ISO-VG-32

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

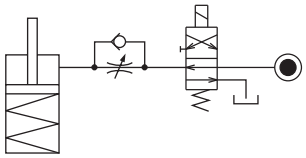
Note : Please contact manufacturers when customers require products in the list above.

Notes on Hydraulic Cylinder Speed Control Unit

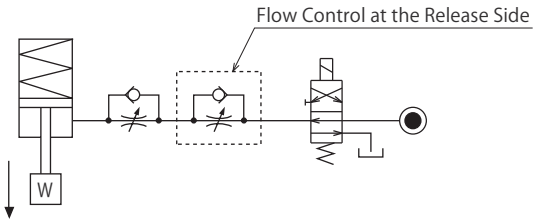
Please pay attention to the cautions below. Design the hydraulic circuit for controlling the action speed of hydraulic cylinder. Improper circuit design may lead to malfunctions and damages. Please review the circuit design in advance.

Flow Control Circuit for Single Acting Cylinder

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



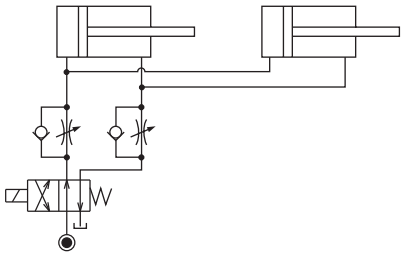
Accelerated clamping speed by excessive hydraulic flow to the cylinder may sustain damage. In this case add flow control to regulate flow. (Please add flow control to release flow if the lever weight is put on at the time of release action when using swing clamps.)



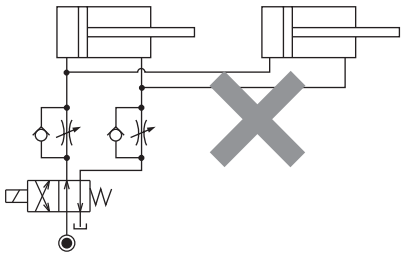
Flow Control Circuit for Double Acting Cylinder

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

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

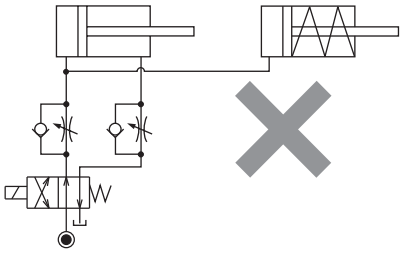


【Meter-in Circuit】(LKE/TMA/TLA must be controlled with meter-in.)



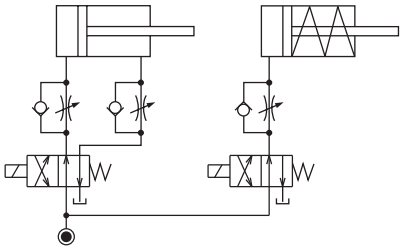
In the case of meter-out circuit, the hydraulic circuit should be designed with the following points.

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

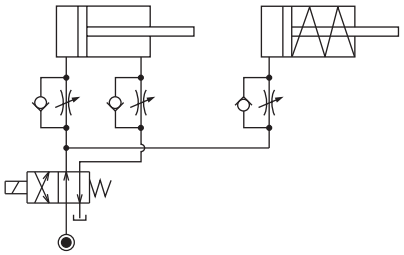


Refer to the following circuit when both the single acting cylinder and double acting cylinder are used together.

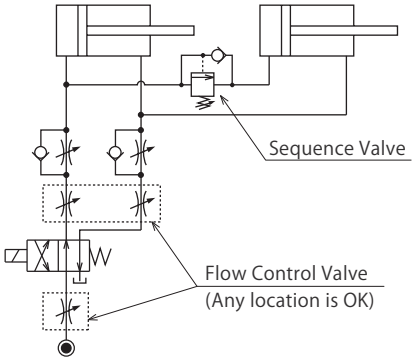
○ Separate the control circuit.



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



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



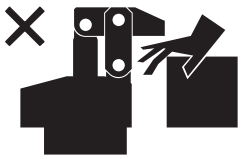
Cautions

Notes on Handling

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

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

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

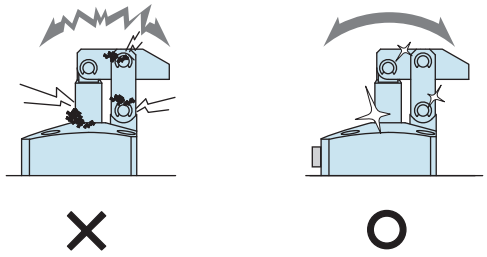


4) Do not disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

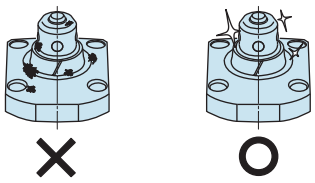
Maintenance and Inspection

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

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



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



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

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

6) Make sure the hydraulic fluid has not deteriorated.

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

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

9) Please contact us for overhaul and repair.

Warranty

1) Warranty Period

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

2) Warranty Scope

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

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

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

Control Valve

Model BZL
Model BZT
Model BZX
Model JZG
Model BZS

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

● Directly Attached to Clamps

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

Speed Control Valve

Speed Control Valve

Model BZL
Model BZT

Air Bleed Valve

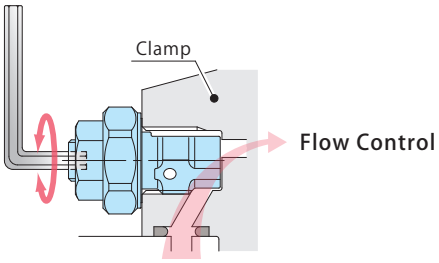
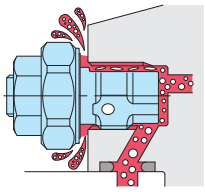
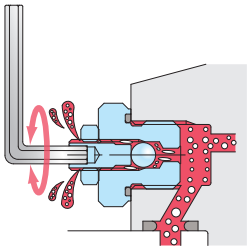
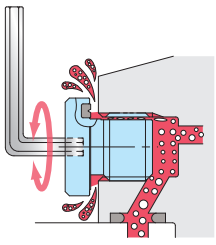
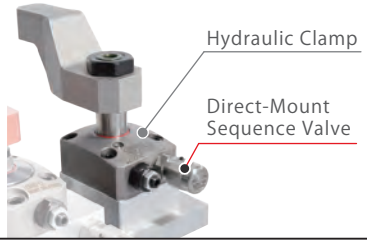
Model BZX

G Thread Plug

Model JZG

Direct-Mount Sequence Valve

Model BZS

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

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

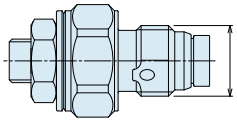
BZT 0 10 1 - A

1 2 3

1 G Thread Size

10 : Thread Part G1/8A Thread

20 : Thread Part G1/4A Thread



2 Design No.

1 : Revision Number

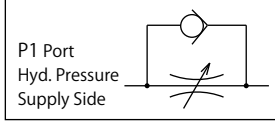
3 Control Method

A : Meter-in

※ Meter-out option is not available for BZT.

A

Circuit Symbol : Meter-in



Specifications

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

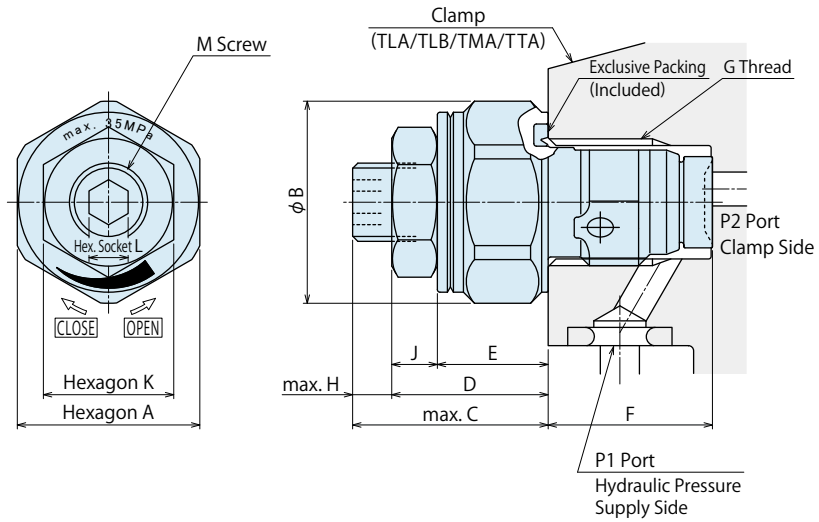
Notes : 1. It must be mounted with recommended torque. Because of the structure of the metal seal, if mounting torque is insufficient, the flow control valve may not be able to adjust the flow rate.
2. Do not attach a used BZT to other clamps. Flow control will not be made because the bottom depth difference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

Applicable Products

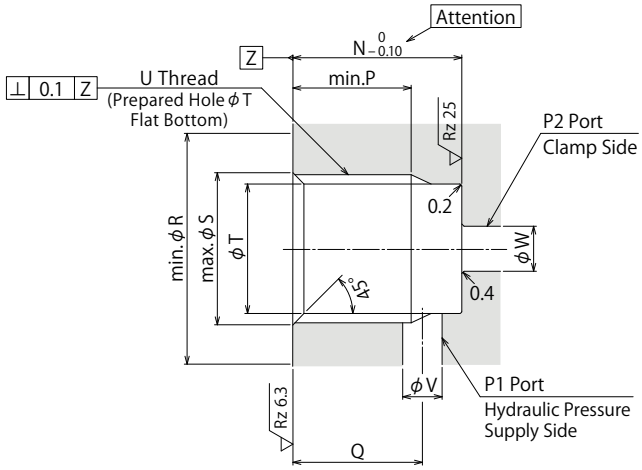
Model	TLA-2 (Double Action) Swing Clamp	TLB-2 (Double Action) Swing Clamp	TLA-1 (Single Action) Swing Clamp	TMA-2 (Double Action) Link Clamp	TMA-1 (Single Action) Link Clamp	TTA (Double Action) Linear Cylinder	TC (Single Action) Work Support
BZT0101-A	TLA0801-2C□-□	TLB0801-2C□-□	TLA0802-1C□	TMA0250-2C□	TMA0250-1C□	TTA0360-C□-□	TC0553-C□
	TLA1001-2C□-□	TLB1001-2C□-□	TLA1002-1C□	TMA0400-2C□	TMA0400-1C□	TTA0400-C□-□	TC0653-C□
	TLA1601-2C□-□	TLB1601-2C□-□	TLA1602-1C□	TMA0600-2C□	TMA0600-1C□	TTA0480-C□-□	TC0753-C□
				TMA1000-2C□	TMA1000-1C□	TTA0550-C□-□	
BZT0201-A	TLA2001-2C□-□	TLB2001-2C□-□	TLA2002-1C□	TMA1600-2C□	TMA1600-1C□	TTA0650-C□-□	
	TLA2501-2C□-□	TLB2501-2C□-□	TLA2502-1C□	TMA2500-2C□	TMA2500-1C□		
	TLA4001-2C□-□	TLB4001-2C□-□	TLA4002-1C□	TMA3200-2C□	TMA3200-1C□		

Notes : 1. It is not recommended to use BZT for TC040□ / TC048□ / TL□040□ / TL□060□ since they have small cylinder capacity and it is difficult to adjust the speed.
2. In case of controlling TMA, TLA, TTA, both lock side and release side should be meter-in circuit. If meter-out circuit is used, abnormal high pressure is created, which causes oil leakage and damage.

External Dimensions



Machining Dimensions of Mounting Area



(mm)

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

Notes :

1. Since the $\sqrt{Rz\ 6.3}$ area is sealing part, be careful not to damage it.
2. Since the $\sqrt{Rz\ 12.5}$ area is the metal sealing part of BZL, be careful not to damage it. (Especially when deburring)
3. No cutting chips or burr should be at the tolerance part of machining hole.
4. As shown in the drawing, P1 port is used as the hydraulic supply side and P2 port as the clamp side.

Notes

1. Please read "Notes on Hydraulic Cylinder Speed Control Unit" for proper hydraulic circuit design.
   Improper circuit design may lead to malfunctions and damages. (Refer to P.1356)
2. It is dangerous to release the air under high pressure. It must be done under lower pressure.
   (For reference : the minimum operating range of the product within the circuit.)
3. When the cylinder capacity is small, the speed of flow may not be controlled properly. (Recommended Cylinder Capacity : 3cm³ or more)

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

JZG0 1 0

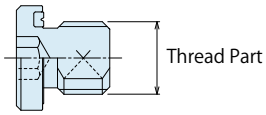
1 2

1 G Thread Size

1 : Thread Part G1/8A Thread

2 : Thread Part G1/4A Thread

3 : Thread Part G3/8A Thread



2 Design No.

0 : Revision Number

Specifications

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

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

Applicable Products

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

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

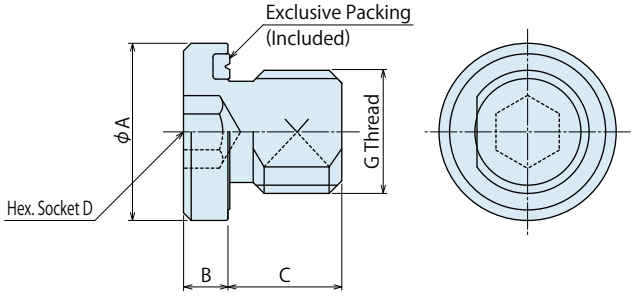
Applicable Products

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

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

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

External Dimensions



(mm)

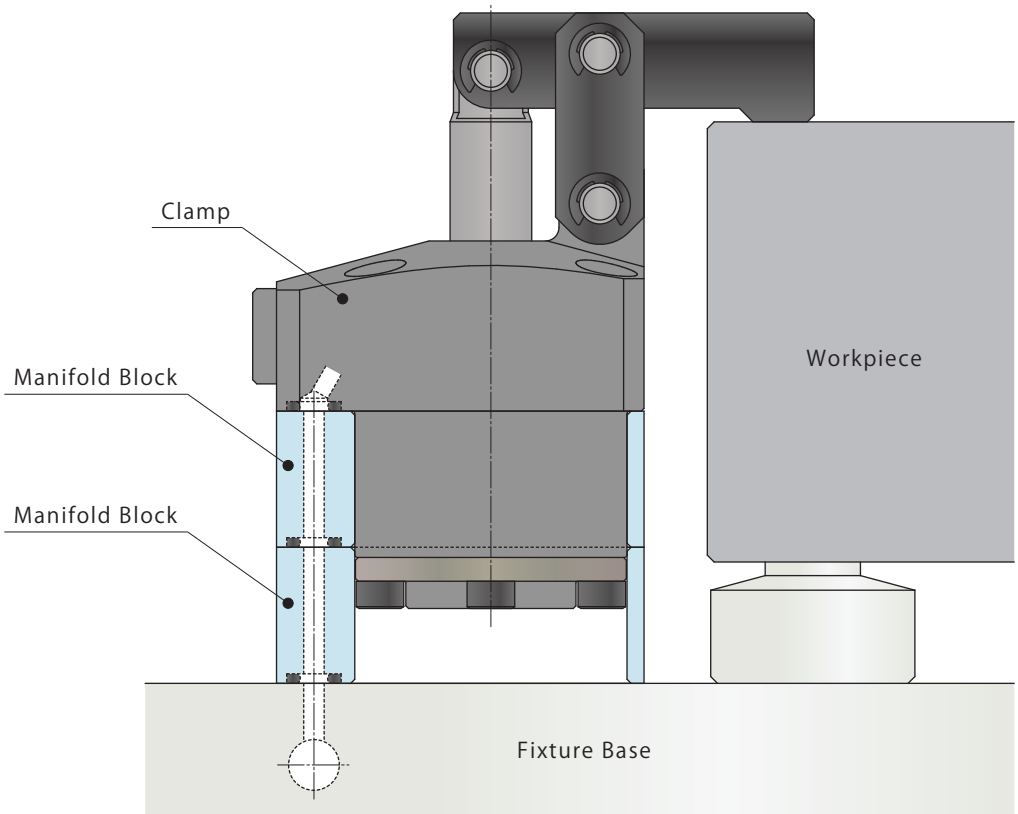
Model No.	JZG010	JZG020	JZG030
A	14	18	22
B	3.5	4.5	4.5
C	8	9	10
D	5	6	8
G	G1/8A	G1/4A	G3/8A

Manifold Block

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

Manifold Block

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

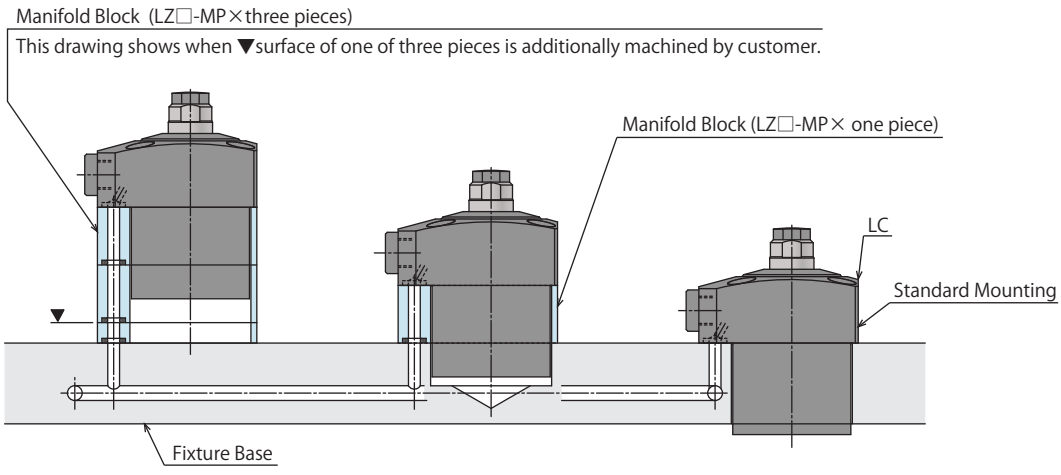


Applicable Model

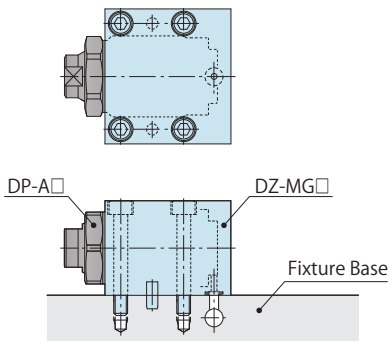
Manifold Block Model No.	Corresponding Item Model No.
Model WHZ-MD	Model WCA, Model WHA, Model WCE, Model WHE
Model LZY-MD	Model LKA, Model LKE, Model LHC, Model LHS, Model LKC, Model LHA, Model LHE, Model LL
Model LZ-MS	Model LJ, Model LG, Model LM, Model LT
Model LZ-MP	Model LC, Model TC
Model TMZ-1MB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

Application Examples

Work Support (LC) Application Example



Push Cylinder (DP) Application Example

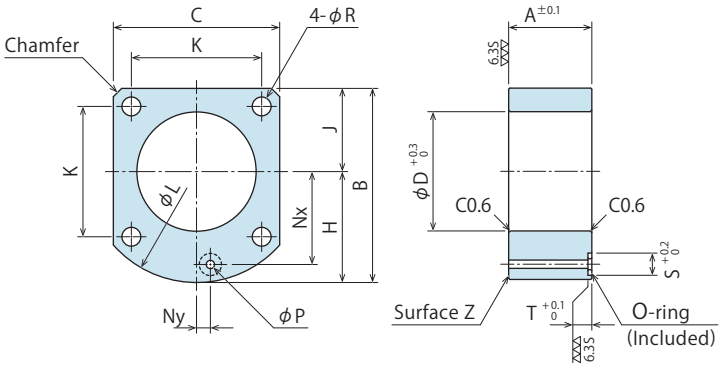


Manifold Block for TMA-1

Model No. Indication

TMZ 040 0 – 1MB

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



(mm)

Model No.	TMZ0250-1MB	TMZ0400-1MB	TMZ0600-1MB	TMZ1000-1MB	TMZ1600-1MB	TMZ2500-1MB	TMZ3200-1MB
Corresponding Model No.	TMA0250-1	TMA0400-1	TMA0600-1	TMA1000-1	TMA1600-1	TMA2500-1	TMA3200-1
A	18	21	24	28	35	42	46
B	56.5	62	69	83	95	110	122
C	45	51	60	73	85	100	110
D	33	36	43	48	60	70	85
H	34	36.5	39	46.5	52.5	60	67
J	22.5	25.5	30	36.5	42.5	50	55
K	34	40	47	57	65	75	88
L	68	73	80	97	112	129	147
Nx	26	30	33.5	40	45	52.5	60
Ny	5	0	0	0	0	0	0
R	5.5	5.5	6.8	9	11	14	14
P	3	3	3	3	5	5	5
S	8	8	8	8	10	10	10
T	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Chamfer	3	3	(ϕ80)	(ϕ97)	(ϕ112)	(ϕ129)	(ϕ147)
O-ring	1BP5	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7
Weight kg	0.2	0.3	0.5	0.9	1.4	2.2	2.6

Notes : 1. Material : S45C Surface Finishing : Alkaline Blackening

2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension A as a reference.

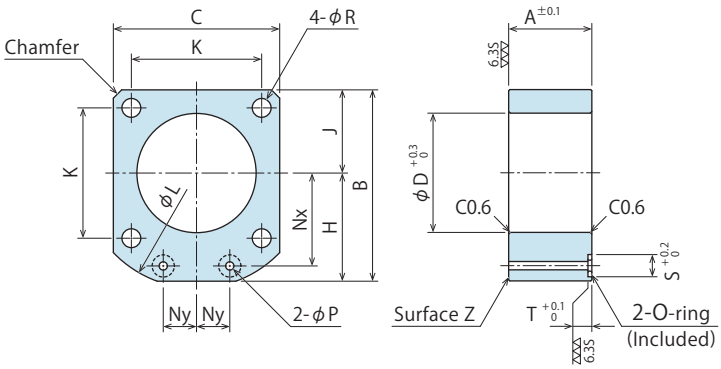
3. For other block thickness (dim. A), machine the surface Z or design a block referring to the drawing and apply surface treatment if necessary.

Manifold Block for TMA-2

Model No. Indication

TMZ 040 0 – 2MB

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



(mm)

Model No.	TMZ0250-2MB	TMZ0400-2MB	TMZ0600-2MB	TMZ1000-2MB	TMZ1600-2MB	TMZ2500-2MB	TMZ3200-2MB
Corresponding Model No.	TMA0250-2	TMA0400-2	TMA0600-2	TMA1000-2	TMA1600-2	TMA2500-2	TMA3200-2
A	15	16	18	20	24	28	32
B	54	61	69	82.5	94.5	109.5	122
C	45	51	60	73	85	100	110
D	33	36	43	48	60	70	85
H	31.5	35.5	39	46	52	59.5	67
J	22.5	25.5	30	36.5	42.5	50	55
K	34	40	47	57	65	75	88
L	68	75	83	100	113	133	147
Nx	26	30	33.5	40	45	52.5	60
Ny	9	10	12	15	16	18.5	20
R	5.5	5.5	6.8	9	11	14	14
P	3	3	3	3	5	5	5
S	8	8	8	8	10	10	10
T	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Chamfer	3	3	3	4	5	8	(ϕ147)
O-ring	1BP5	1BP5	1BP5	1BP5	1BP7	1BP7	1BP7
Weight kg	0.2	0.3	0.4	0.6	0.9	1.5	1.8

Notes : 1. Material : S45C Surface Finishing : Alkaline Blackening

2. Mounting bolts are not provided. Prepare mounting bolts according to the mounting height using the dimension A as a reference.

3. For other block thickness (dim. A), machine the surface Z or design a block referring to the drawing and apply surface treatment if necessary.

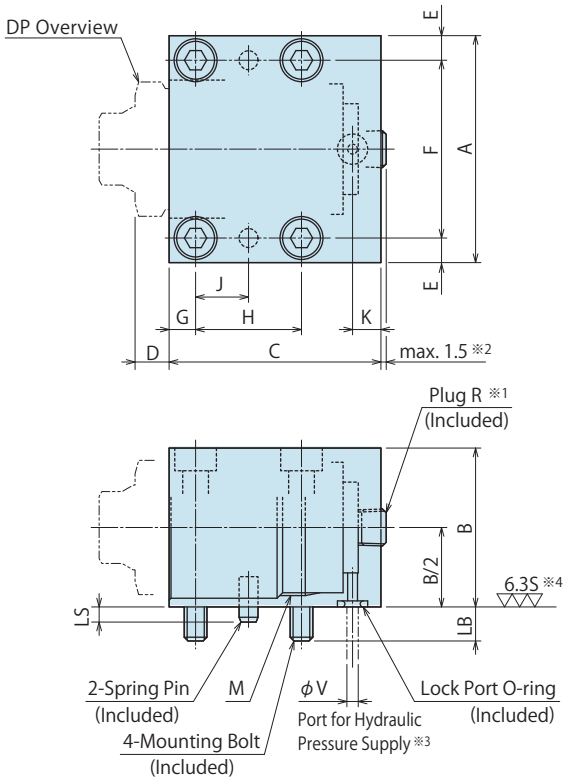
Manifold Block for DP

Model No. Indication

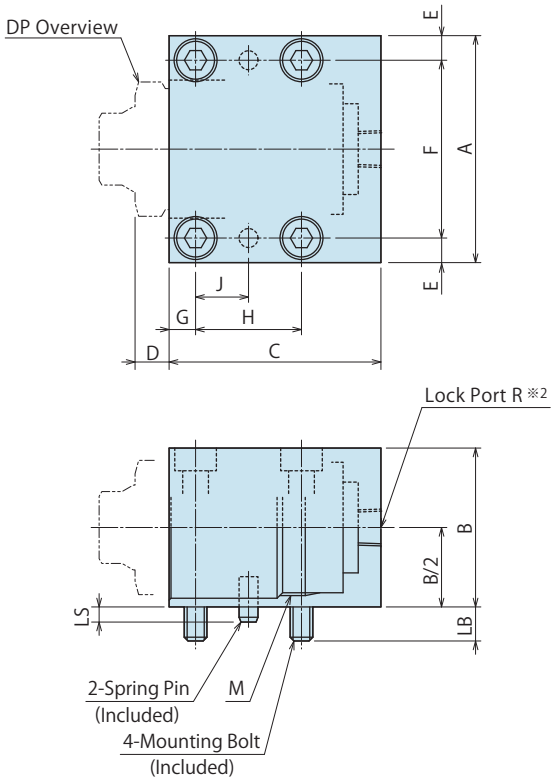
DZ 036 0 – M G S

- 036: Size (Refer to following table)
- 0: Design No. (Revision Number)
- G: Stroke Code — S : For DP□-□S; M : For DP□-□M; L : For DP□-□L
- S: Piping Method — G : Gasket Option; S : Piping Option

※The drawing below shows DZ□0-MG□ (Gasket option).



※The drawing below shows DZ□0-MS□ (Piping option).



Notes :

1. Material : S45C Surface Finishing : Alkaline Blackening

※1. G option: the R-thread plug is screwed in at shipment. There is variance in protrusion amount of the plug.

※2. Plug is not included in the S option.

※3. Recommended hole size for a hydraulic pressure supply port drilled by Customer.
Make sure there are no burrs around the connection and no cutting chips or other foreign substances inside.

※4. The surface touching the O-ring should have a roughness of 6.3S.

(mm)

Model No.	DZ0160-MG□ DZ0160-MS□			DZ0220-MG□ DZ0220-MS□			DZ0240-MG□ DZ0240-MS□			DZ0300-MG□ DZ0300-MS□			DZ0360-MG□ DZ0360-MS□			DZ0450-MG□ DZ0450-MS□			DZ0550-MG□ DZ0550-MS□			DZ0650-MG□ DZ0650-MS□			DZ0800-MG□ DZ0800-MS□		
Stroke Code	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L
Corresponding Model No. Model No.	DP0160-□			DP0221-□			DP0241-□			DP0301-□			DP0361-□			DP0451-□			DP0551-□			DP0651-□			DP0801-□		
Corresponding Model No. Stroke Code	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L	S	M	L
A	32			38			45			50			60			75			90			105			120		
B	22			28			32			38			42			52			62			72			88		
C	34	40	49	32.5	38.5	51.5	35	42.5	59	38.5	45.5	65	43	56	77	50	63	85.5	56	69.5	92	65	79	108.5	70	88	119
D	6			8			8			9			9			13			13			15			15		
E	4.5			4.5			6			6			6.5			8.5			10			11			11		
F	23			29			33			38			47			58			70			83			98		
G	5			5			6			6			7			8			9			11			11		
H	12	18		12	18		12	18		16	22		18	28		20	30		24	36		30	42		34	52	
J	6	9		6	9		6	9		8	11		9	14		10	15		12	18		15	21		17	26	
K	7.5			7.5			7.5			7.5			7.5			11.5			11.5			11.5			11.5		
LB	7			6			8			7			9			11			13			15			15		
LS	3			3			3			4			4			4			4			6			7		
M (Nominal × Pitch)	M16×1.5			M22×1.5			M24×1.5			M30×1.5			M36×1.5			M45×1.5			M55×2			M65×2			M80×2		
R	Rc1/8			Rc1/8			Rc1/8			Rc1/8			Rc1/8			Rc1/4			Rc1/4			Rc1/4			Rc1/4		
Mounting Bolt	M4×0.7×25			M4×0.7×30			M5×0.8×35			M5×0.8×40			M6×45			M8×55			M10×65			M12×75			M12×90		
O-ring	1BP5			1BP5			1BP5			1BP5			1BP5			1BP7			1BP7			1BP7			1BP7		
Spring Pin	ϕ3×8			ϕ3×8			ϕ3×8			ϕ5×12			ϕ5×12			ϕ6×12			ϕ6×12			ϕ8×16			ϕ10×20		
V	3			3			3			5			5			5			5			5			5		
Weight kg	0.15	0.15	0.2	0.2	0.2	0.3	0.3	0.4	0.5	0.4	0.5	0.6	0.6	0.7	1	1	1.2	1.7	1.5	1.8	2.5	2.2	2.8	3.8	3.2	4	5.5

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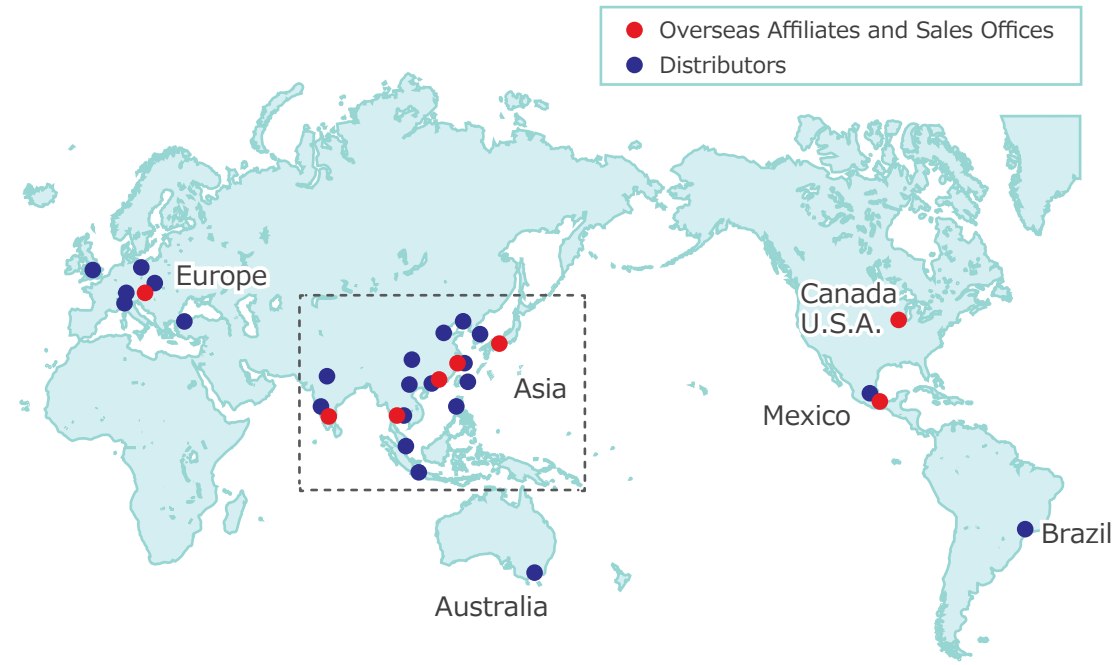

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