

New

High-Power Pneumatic Link Clamp -Retracting Model-



Model WFE

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Model WFE



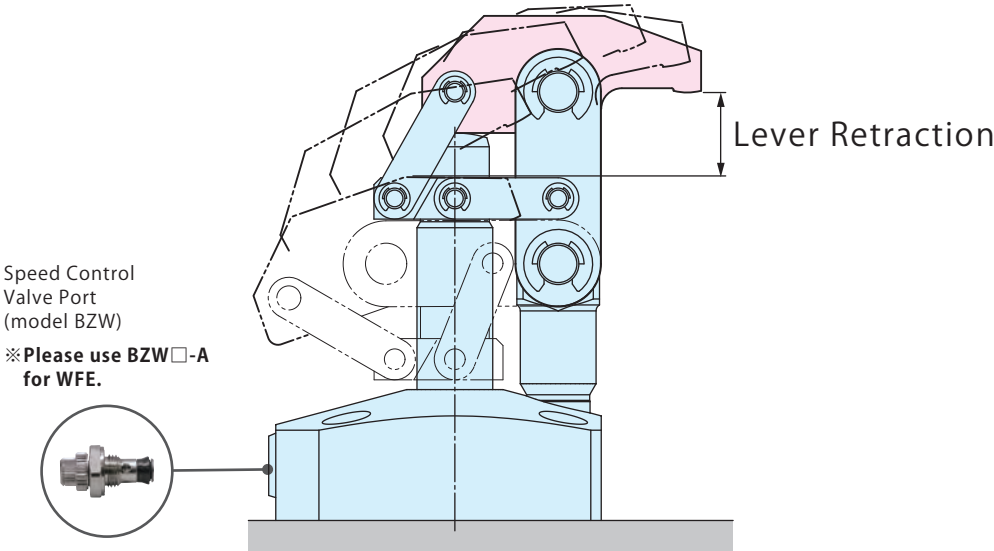
Lever Retracted to Avoid Interference during Workpiece Loading/Unloading

Compact Lever Movement, with Powerful Clamping force Equivalent to Hydraulic Clamps PAT.

Features

Lever Retracted Lower than the Clamping Point

Large lever retraction allows for wide angle of loading and unloading workpieces between operations.



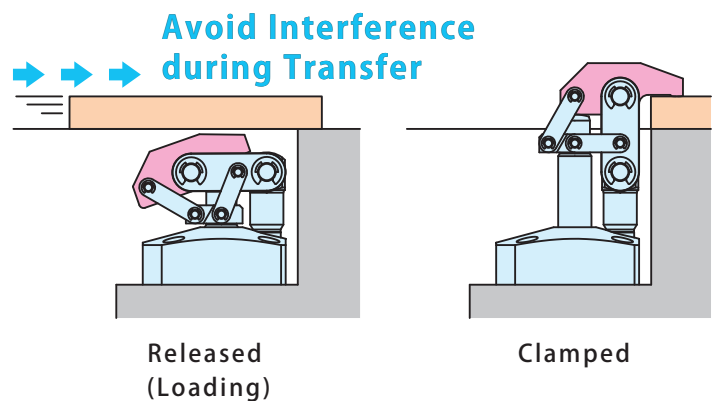
Model No.	WFE1600	WFE2500	WFE4000
Lever Retraction mm	16	16	24

※ It shows the lever retraction when using KOSMEK option lever(WCZ□0-F).
Refer to P.16 for the link lever.

Application Examples

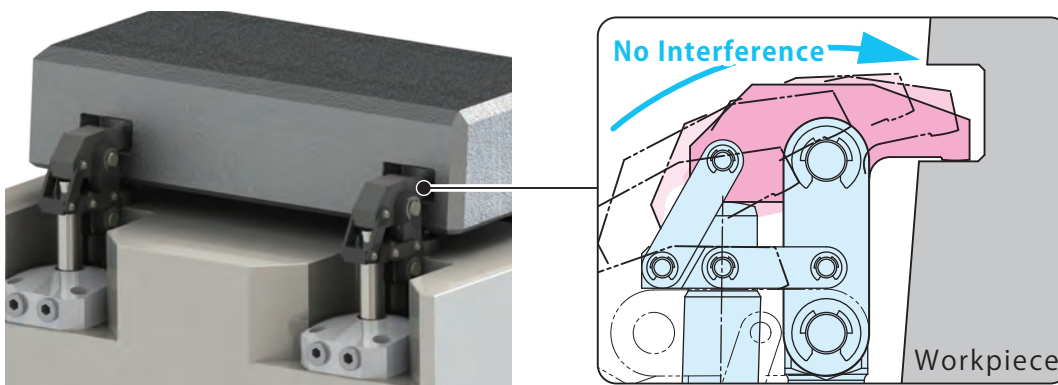
- **Avoid interference with a workpiece when loading and unloading**

Large lever retraction allows for wide angle of loading and unloading workpieces between operations.



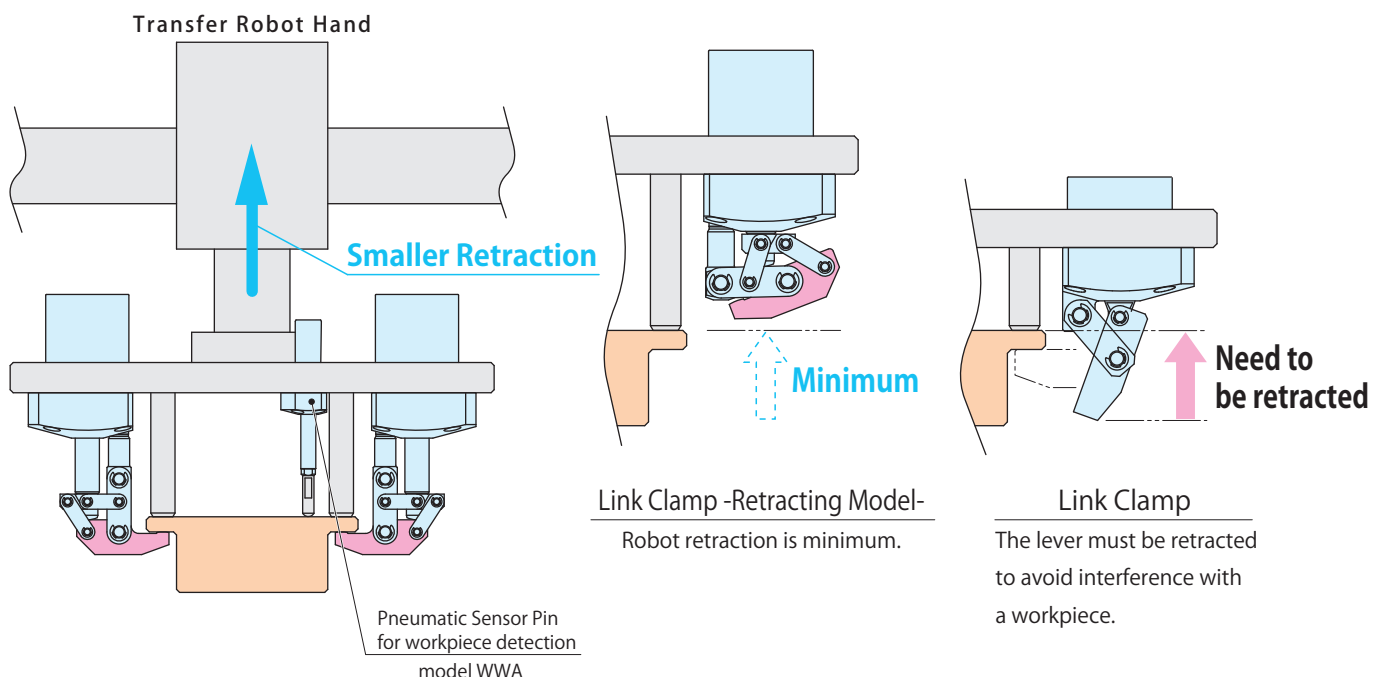
- **Enables to clamp difficult clamping points**

The compact lever-operating range enables to clamp difficult clamping points.

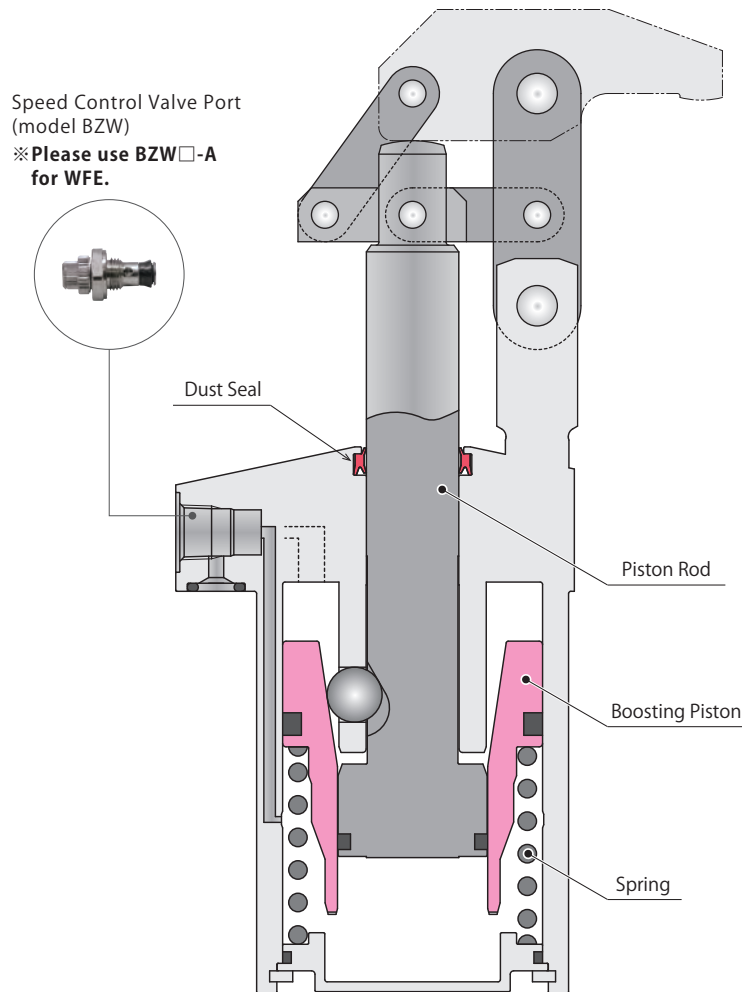


- **For Robot Hands**

The largely retracted lever minimises robot retraction.



● **Action Description • Cross Section** ※ This is a simplified drawing. Actual components are different.



● **Strong Clamping Force and Holding Force with Mechanical Lock**

The mechanical locking system and pneumatic pressure allows the model WFE to exert about 2.5 times higher clamping force than cylinders of the same diameter size. The high holding force enables heavy load machining and high accurate machining.

● **Compact**

The dimension below flange is shortened even with built-in mechanical lock.

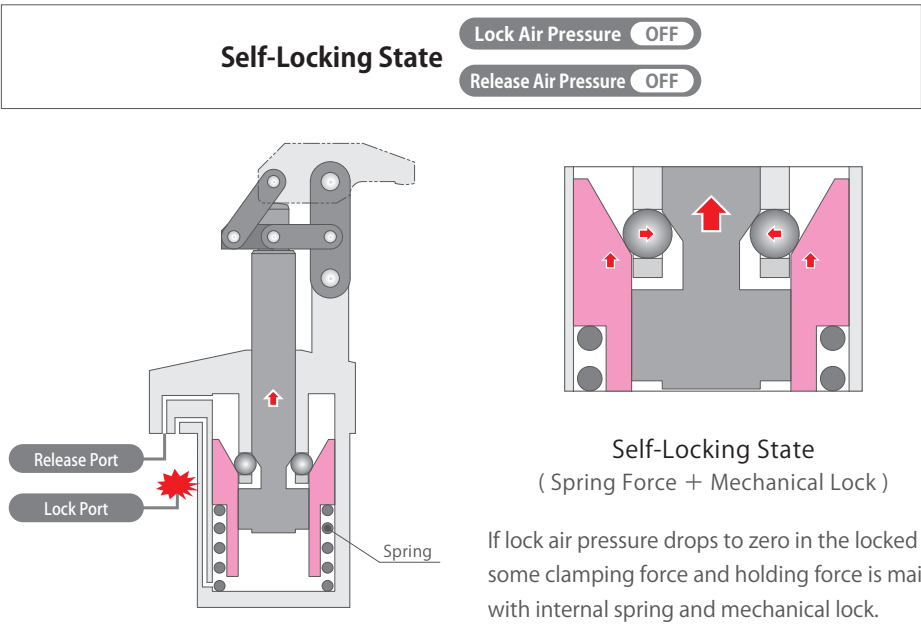
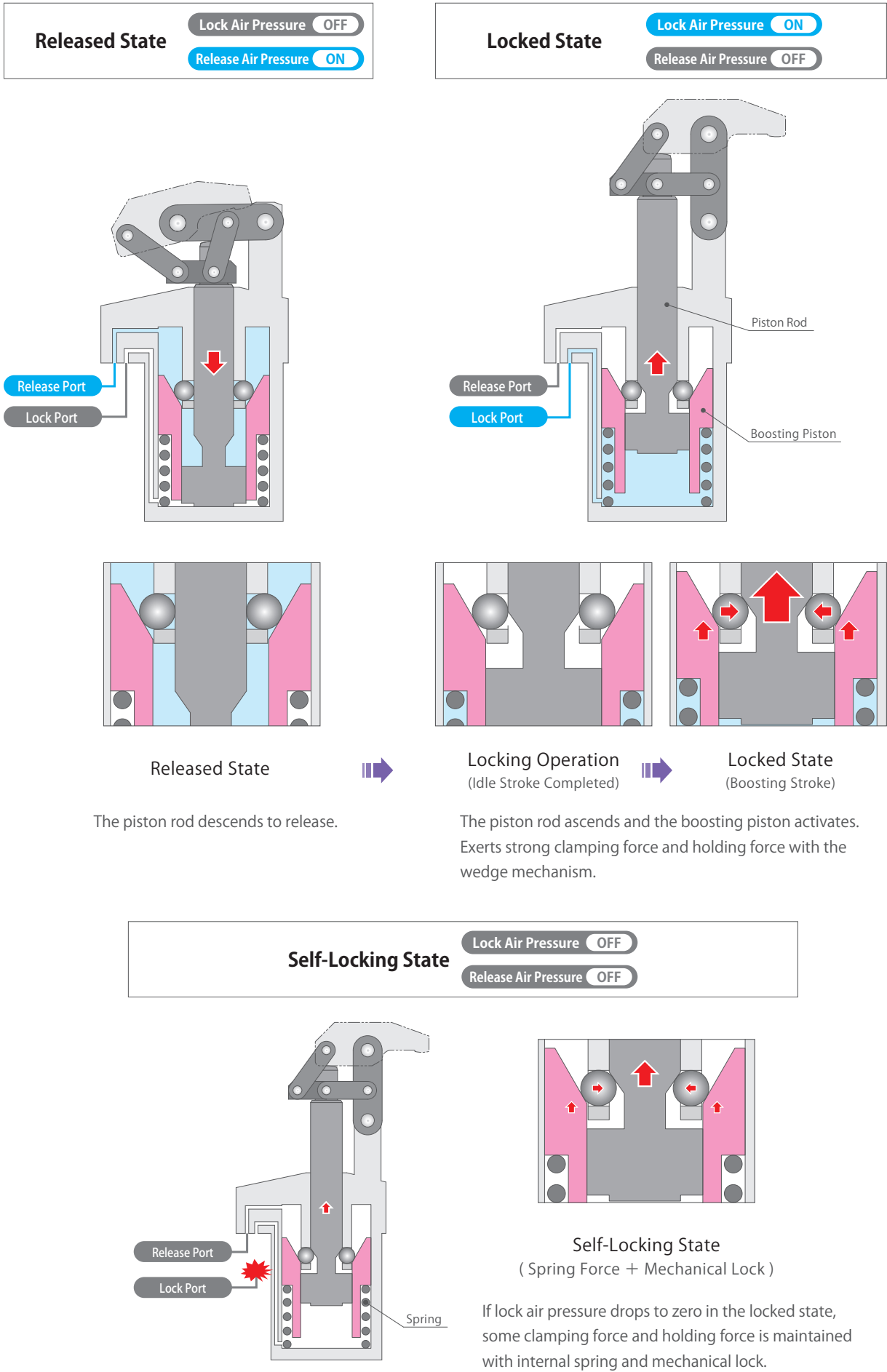
● **Excellent Coolant Resistance**

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**

It is able to attach the speed control valve (BZW□-A : sold separately) directly to the clamp when selecting the gasket option : WFE-2A□.

Action Description ※ This is a simplified drawing. Actual components are different.



Model No. Indication

WFE **160** **0** - 2 **A** **C**

1
2
3
4

1 Cylinder Force

160 : Cylinder Force 1.6kN (at Air Pressure 0.5MPa)

250 : Cylinder Force 2.5kN (at Air Pressure 0.5MPa)

400 : Cylinder Force 3.9kN (at Air Pressure 0.5MPa)

※ Cylinder force differs from clamping force and holding force.

2 Design No.

0 : Revision Number

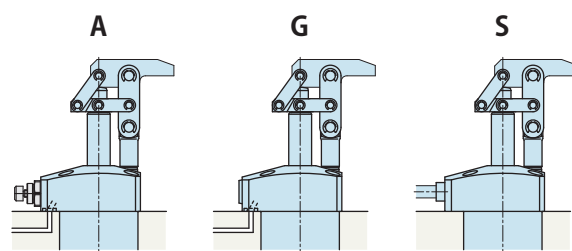
3 Piping Method

A : Gasket Option (with Ports for Speed Controller)

G : Gasket Option (with R Thread Plug)

S : Piping Option (Rc Thread)

※ Speed control valve (BZW-A) is sold separately.
Please use a meter-in speed control valve for WFE.
In case of using Kosmek model, select BZW -A.
 Refer to P.17 for detail.



Gasket Option

Piping Option

with R Thread Plug (able to
attach Speed Control Valve)
 (Order the valve
 (BZW-A) separately)

with R Thread Plug

Rc Thread
No Gasket Port

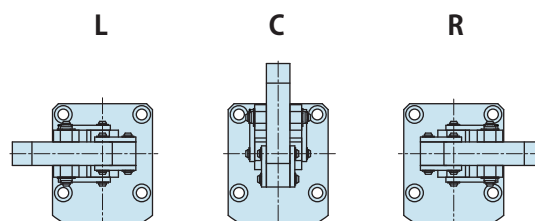
4 Lever Direction

L : Left

C : Center

R : Right

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



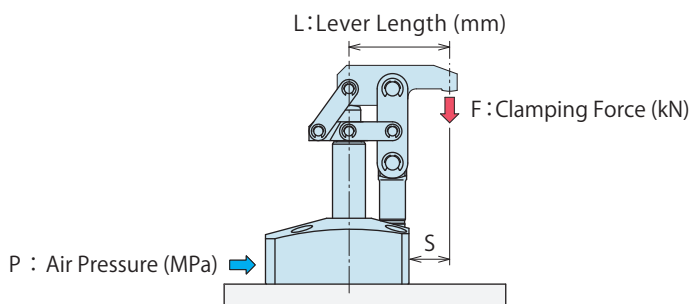
Specifications

Model No.		WFE1600-2□□	WFE2500-2□□	WFE4000-2□□	
Cylinder Force (at 0.5MPa)	kN	1.6	2.5	3.9	
Clamping Force		Refer to “Clamping Force Curve” on P.7			
Holding Force		Refer to “Holding Force Curve” on P.9			
Clamping Force and Holding Force at 0MPa		Refer to “Clamping Force and Holding Force Curve at 0 MPa” on P.11			
(Break down):	Full Stroke	mm	33.5	37.5	43
	Idle Stroke	mm	29.5	33.5	39
	Lock Stroke ※ ¹	mm	4	4	4
Cylinder	Lock	41.6	64.0	106.8	
Capacity cm ³	Release	35.7	55.4	91.6	
Spring Force		N	83.5 ~ 140.9	146.5 ~ 218.8	234.1 ~ 334.6
Max. Operating Pressure		MPa	0.5		
Min. Operating Pressure ※ ²		MPa	0.2		
Withstanding Pressure		MPa	0.75		
Operating Temperature		℃	0 ~ 70		
Usable Fluid		Dry Air			
Weight ※ ³		kg	1.1	1.8	2.9

Notes :

- ※1. The specification value of cylinder force, clamping force and holding force is fulfilled only when clamping within the lock stroke range.
(The specification value is not fulfilled when clamping within the range of idle stroke.)
- ※2. Minimum pressure to operate the clamp without load.
- ※3. It shows the weight of single clamp without the link lever.

Clamping Force Curve



(How to read the clamping force curve)

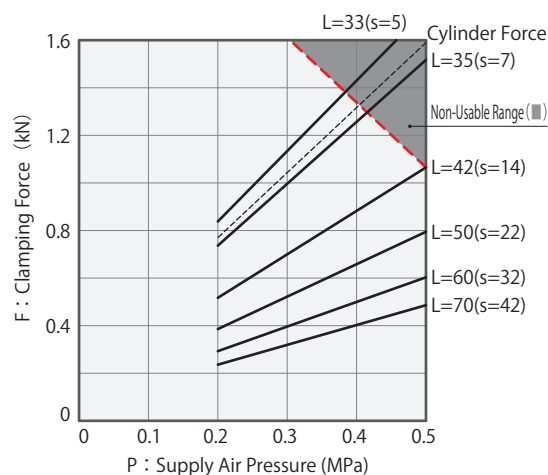
In case of WFE1600 : When supply air pressure P is 0.3MPa and lever length L is 42mm, clamping force becomes about 0.70kN.

Notes:

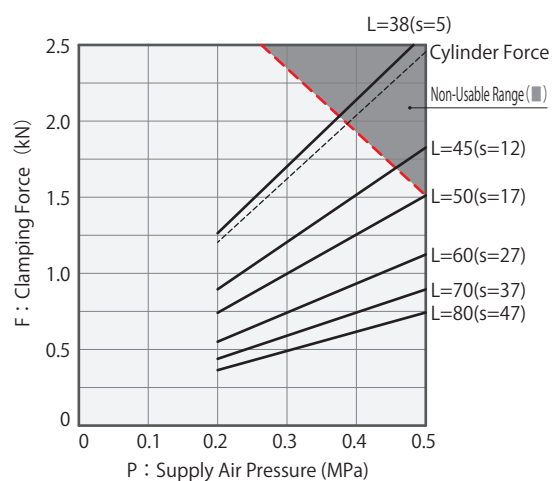
※ 1. F : Clamping Force (kN), P : Supply Air Pressure (MPa), L : Lever Length (mm).

1. Tables and graphs show the relationship between the clamping force (kN) and supply air pressure (MPa).
2. Values in below charts indicate clamping force when the lever locks a workpiece in horizontal position.
3. Cylinder force (When $L=0$) cannot be calculated from the calculation formula of clamping force.
4. The clamping force varies depending on the lever length. Set the suitable supply air pressure based on the lever length.
5. Clamping force in the non-usable range may cause damage and fluid leakage.

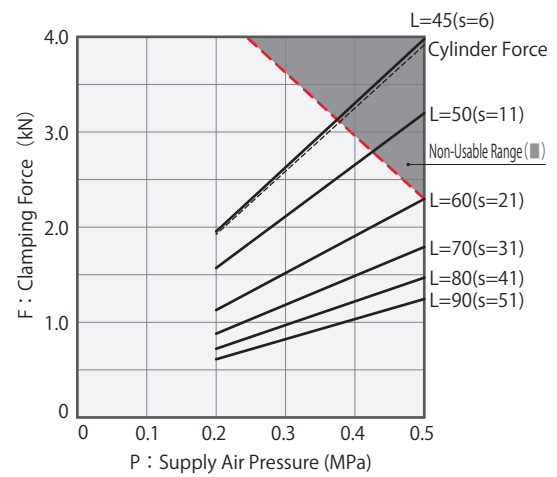
WFE1600		Clamping Force Calculation Formula※1 (kN) $F = \frac{42.9 \times P + 3.6}{L - 18.5}$						
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) (■ =Non-Usable Range)						Min.
		Lever Length L (mm)						Lever Length
		L=33	L=35	L=42	L=50	L=60	L=70	(mm)
0.5	1.59	■	■	1.07	0.79	0.60	0.49	42
0.4	1.32	■	1.26	0.88	0.66	0.50	0.40	34
0.3	1.05	1.13	1.00	0.70	0.52	0.40	0.32	29
0.2	0.77	0.84	0.74	0.52	0.39	0.29	0.24	28
Max. Operating Pressure (MPa)		0.38	0.41	0.50	0.50	0.50	0.50	



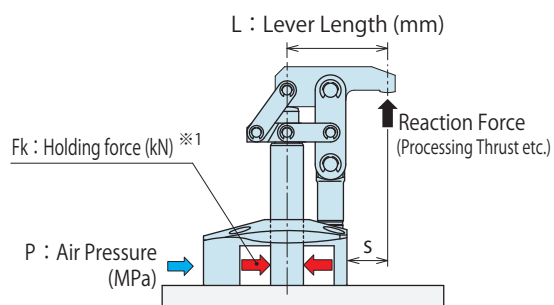
WFE2500		Clamping Force Calculation Formula※1(kN) $F = \frac{74.5 \times P + 6.6}{L - 21}$						
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) (■=Non-Usable Range)						Min.
		Lever Length L (mm)						Lever Length
		L=38	L=45	L=50	L=60	L=70	L=80	(mm)
0.5	2.46	■	■	1.51	1.12	0.89	0.74	50
0.4	2.04	■	1.52	1.25	0.93	0.74	0.62	40
0.3	1.62	1.70	1.21	1.00	0.74	0.59	0.49	34
0.2	1.20	1.26	0.90	0.74	0.55	0.44	0.36	33
Max. Operating Pressure (MPa)		0.37	0.45	0.50	0.50	0.50	0.50	



WFE4000		Clamping Force Calculation Formula※1 (kN) $F = \frac{138.3 \times P + 12.4}{L - 24.5}$						
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) (■ =Non-Usable Range)						Min. Lever Length (mm)
		Lever Length L (mm)						
		L=45	L=50	L=60	L=70	L=80	L=90	
0.5	3.92	■	■	2.30	1.79	1.47	1.24	60
0.4	3.25	■	2.66	1.91	1.49	1.22	1.03	48
0.3	2.59	2.63	2.11	1.52	1.18	0.97	0.82	40
0.2	1.92	1.95	1.57	1.13	0.88	0.72	0.61	39
Max. Operating Pressure (MPa)		0.37	0.42	0.50	0.50	0.50	0.50	



Holding Force Curve



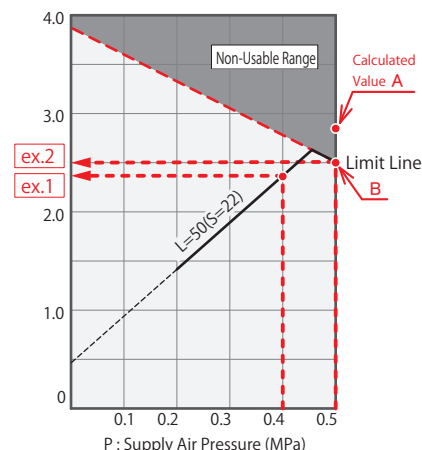
(How to read the holding force curve)

(Ex.1) In case of WFE1600 :

When supply air pressure P is 0.4MPa and lever length L is 50mm, holding force becomes about 2.37kN.

(Ex.2) In case of WFE1600 :

When supply air pressure P is 0.5MPa and lever length L is 50mm, the calculated value is at the point A but it is in the non-usable range. In this case, the value of intersection B becomes the holding force that counters the reaction force, and it is about 2.51kN.



Notes:

※1. Holding force is the force that counters the reaction force in the clamping state, and differs from clamping force.

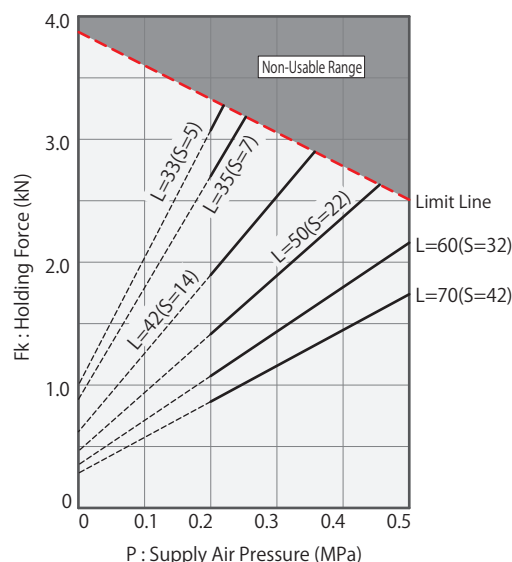
Please keep in mind that it can produce displacement depending on lever rigidity even if the reaction force is lower than holding force. (If slight displacement is also not allowed, please keep the reaction force beyond clamping force from being applied.)

※2. Fk: Holding force (kN), P: Supply air pressure (MPa), L: Lever length (mm).

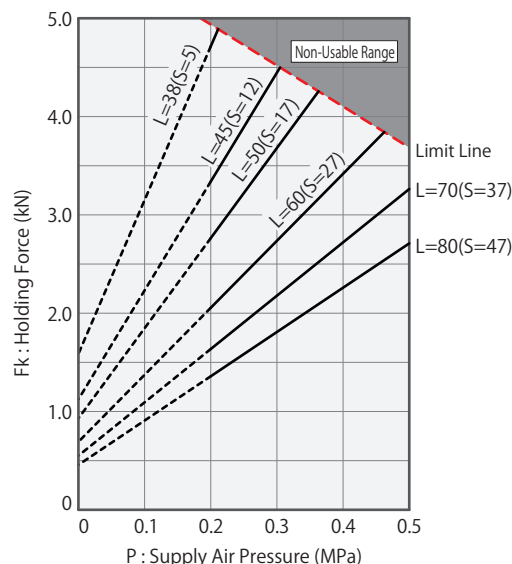
When a holding force calculated value exceeds the value of a limit line, holding force becomes a value of a limit line.

1. Tables and graphs show the relationship between the holding force (kN) and supply air pressure (MPa).
2. Values in below charts indicate holding force when the lever locks a workpiece in horizontal position.
3. The holding force varies depending on the lever length. Set the suitable supply air pressure based on the lever length.
4. Holding force in the non-usable range may cause damage and fluid leakage.

WFE1600		Holding Force Formula※2 (Fk ≦ Limit Line Value) (kN)				Fk = $\frac{150 \times P + 14.6}{L - 18.5}$	
Supply Air Pressure (MPa)	Holding Force (kN) (■=Non-Usable Range)						Non-Usable Range
	Lever Length L (mm)						Limit Line Value
	L=33	L=35	L=42	L=50	L=60	L=70	(kN)
0.5	■	■	2.51	2.51	2.16	1.74	2.51
0.4	■	2.78	2.78	2.37	1.80	1.45	2.78
0.3	3.05	3.05	2.53	1.89	1.44	1.16	3.05
0.2	3.07	2.70	1.90	1.42	1.07	0.87	3.33



WFE2500		Holding Force Formula ※2 (Fk ≦ Limit Line Value) (kN)				Fk = $\frac{265.8 \times P + 27}{L - 21}$	
Supply Air Pressure (MPa)	Holding Force (kN) (■ =Non-Usable Range)						Non-Usable Range
	Lever Length L (mm)						Limit Line Value
	L=38	L=45	L=50	L=60	L=70	L=80	(kN)
0.5	■	■	3.68	3.68	3.26	2.71	3.68
0.4	■	4.10	4.10	3.42	2.72	2.26	4.10
0.3	4.52	4.45	3.68	2.74	2.18	1.81	4.52
0.2	4.71	3.34	2.76	2.05	1.64	1.36	4.94



WFE4000
 Holding Force Formula ※2
 (Fk ≤ Limit Line Value) (kN)

$$Fk = \frac{530.1 \times P + 53.9}{L - 24.5}$$

 Supply Air Pressure
 (MPa)

Holding Force (kN) (■ = Non-Usable Range)

Non-Usable Range

Lever Length L (mm)

Limit Line Value

L=45

L=50

L=60

L=70

L=80

L=90

(kN)

0.5

■

■

5.28

5.28

5.28

4.87

5.28

0.4

■

5.95

5.95

5.84

4.79

4.06

5.95

0.3

6.61

6.61

6.00

4.68

3.84

3.25

6.61

0.2

7.28

6.27

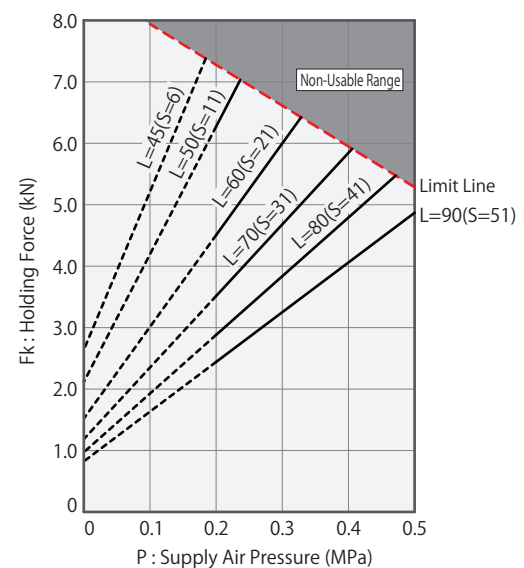
4.51

3.52

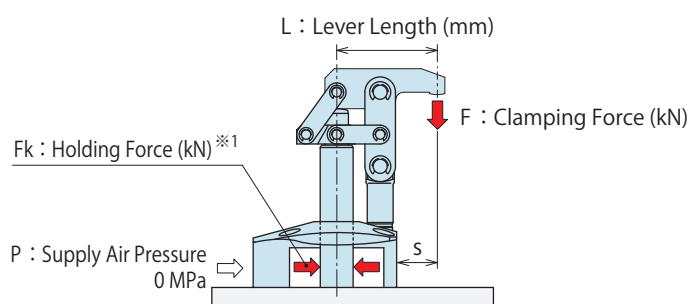
2.88

2.44

7.28



Clamping Force and Holding Force Curve at 0MPa



(Reading of the clamping force and holding force curve at 0MPa air pressure)

In case of WFE1600

When air supply is shut off at clamped state:

Supply Air Pressure = 0MPa

Lever Length L= 50mm

Clamping force becomes about 0.11kN.

Holding force becomes about 0.46kN.

Notes:

※1. Holding force shows the force which can counter to the reaction force in the clamping state, and differ from clamping force.

Moreover, keep in mind that it may produce displacement depending on lever rigidity even if it is the reaction force below holding force.

(When slight displacement is also not allowed, please keep the reaction force beyond clamping force from being applied.)

※2. F : Clamping force (kN) , Fk : Holding force (kN) , L : Lever length (mm).

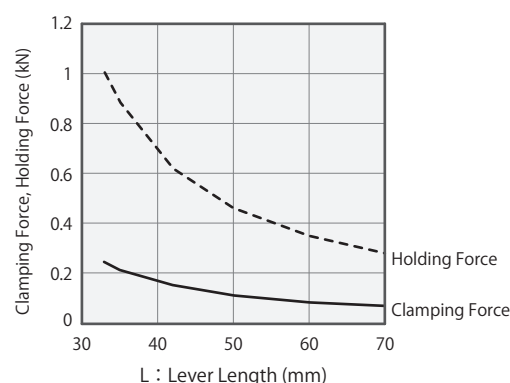
1. The tables and the graphs show the relationship between lever length (mm) and the clamping force (kN) and holding force (kN) at the time of 0MPa.

2. The clamping force and holding force at the time of zero air pressure show capability when a lever locks in a level position.

3. Clamping force and holding force vary depending on lever length.

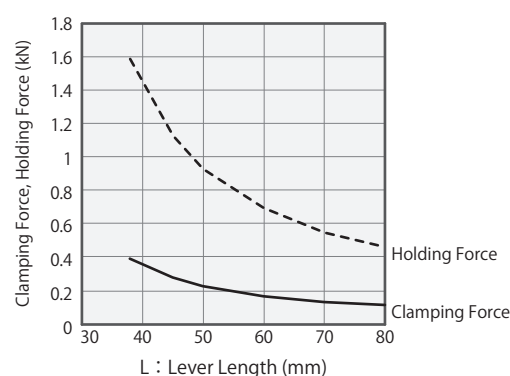
WFE1600

Clamping Force Formula at 0MPa Air Pressure ※2 (kN)	$F = \frac{3.6}{L - 18.5}$					
Holding Force Formula at 0MPa Air Pressure ※2 (kN)	$Fk = \frac{14.6}{L - 18.5}$					
Lever Length L (mm)	L=33	L=35	L=42	L=50	L=60	L=70
Clamping Force Reference Value at 0MPa (kN)	0.25	0.22	0.15	0.11	0.09	0.07
Holding Force Reference Value at 0MPa (kN)	1.01	0.88	0.62	0.46	0.35	0.28



WFE2500

Clamping Force Formula at 0MPa Air Pressure ※2 (kN)	$F = \frac{6.6}{L - 21}$					
Holding Force Formula at 0MPa Air Pressure ※2 (kN)	$Fk = \frac{27}{L - 21}$					
Lever Length L (mm)	L=38	L=45	L=50	L=60	L=70	L=80
Clamping Force Reference Value at 0MPa (kN)	0.39	0.28	0.23	0.17	0.13	0.11
Holding Force Reference Value at 0MPa (kN)	1.59	1.12	0.93	0.69	0.55	0.46



WFE4000

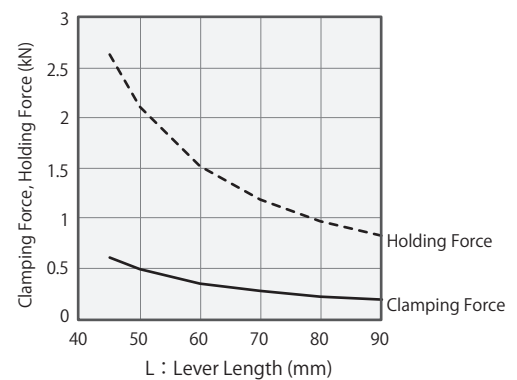
Clamping Force Formula at OMPa Air Pressure ※2 (kN)

$$F = \frac{12.4}{L - 24.5}$$

Holding Force Formula at OMPa Air Pressure ※2 (kN)

$$Fk = \frac{53.9}{L - 24.5}$$

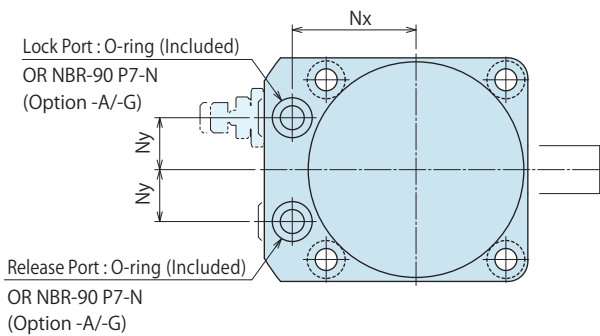
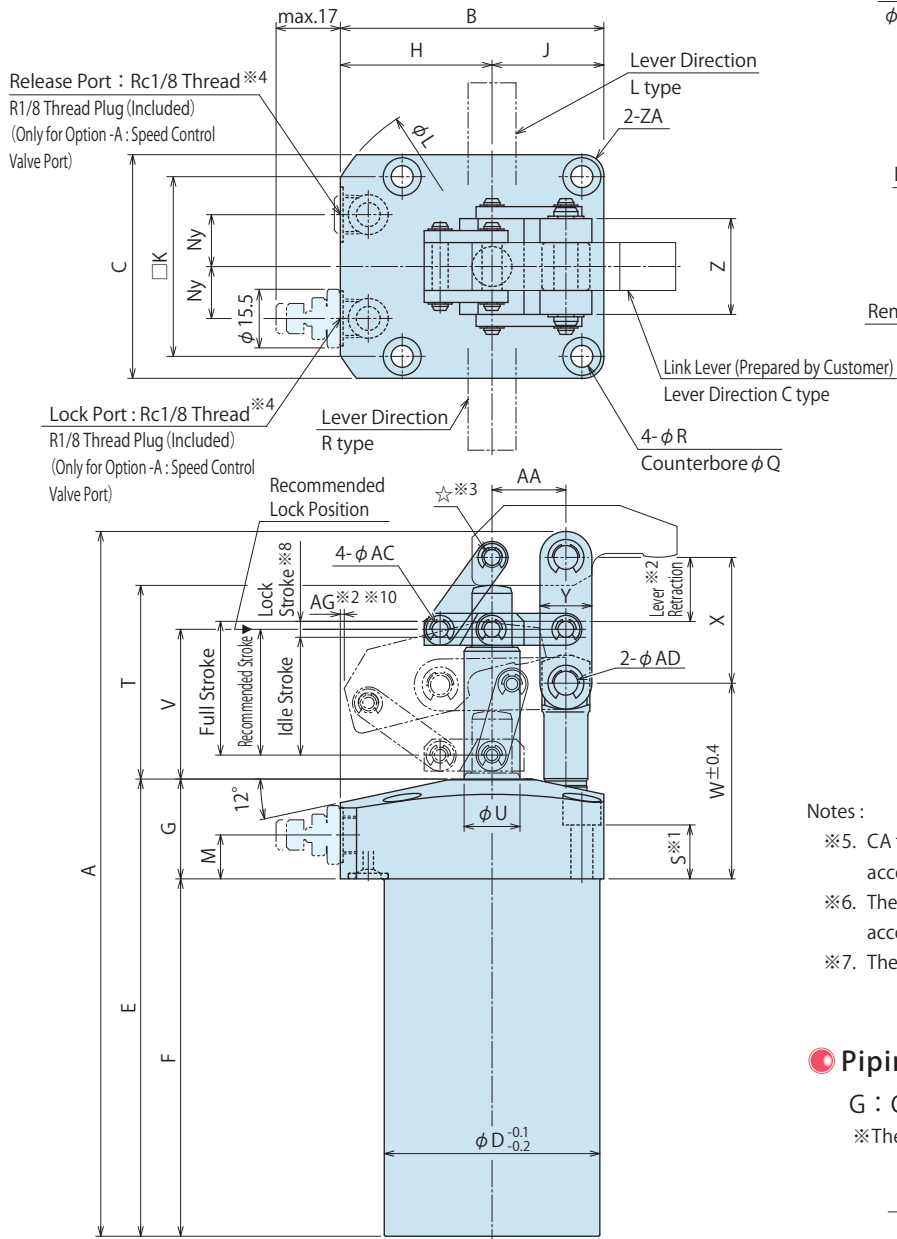
Lever Length L (mm)	L=45	L=50	L=60	L=70	L=80	L=90
Clamping Force Reference Value at OMPa (kN)	0.61	0.49	0.35	0.27	0.22	0.19
Holding Force Reference Value at OMPa (kN)	2.63	2.12	1.52	1.19	0.97	0.82



External Dimensions

A : Gasket Option
(Speed Control Valve Corresponding Option, Include R Thread Plug)

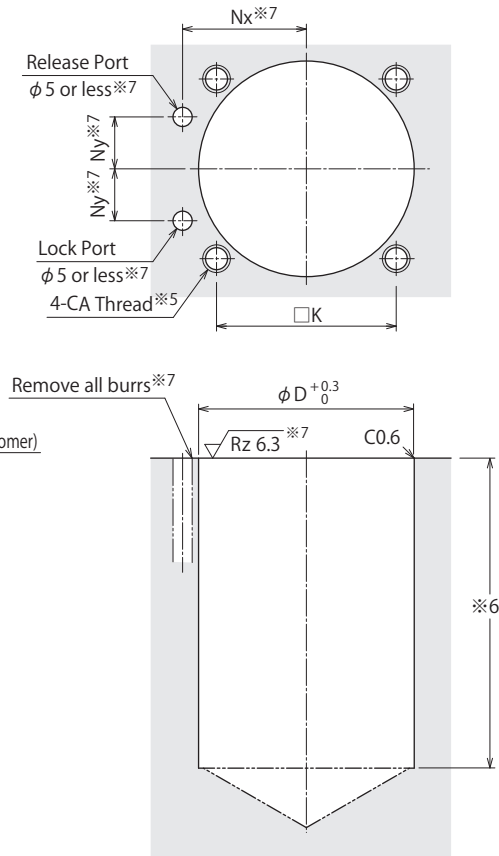
※The drawing shows the locked state of WFE-2AC.



Notes :

- ※ 1. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.
- ※ 2. It shows the dimension in case of KOSMEK option lever (WCZ□-F).
- ※ 3. Due to the clamp structure, there is a 1mm-diameter gap between the lever hole and the pin (☆ part only).
- ※ 4. Speed control valve is sold separately. Please refer to P. 17.
 1. Please use the provided pin (equivalent to ϕ ACf6, ϕ ADf6, HRC60) as mounting pin for lever.

Machining Dimensions of Mounting Area



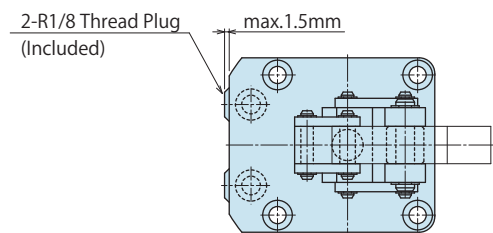
Notes :

- ※ 5. CA tapping depth of the mounting bolt should be decided according to the mounting height referring to dimension 'S'.
- ※ 6. The depth of the body mounting hole ϕ D should be decided according to the mounting height referring to dimension 'F'.
- ※ 7. The machining dimension is for -A/-G : Gasket Option.

Piping Method

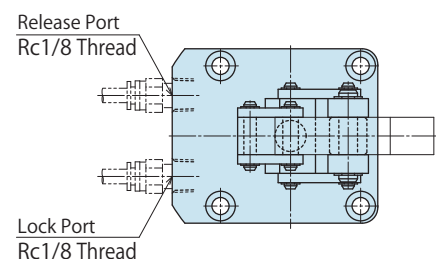
G : Gasket Option (with R Thread Plug)

※The drawing shows the locked state of WFE-2GC.

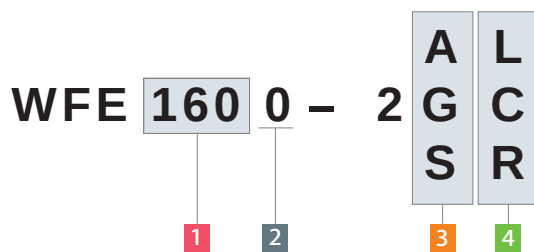


S : Piping Option (Rc Thread)

※The drawing shows the locked state of WFE-2SC.



Model No. Indication



(Model No. Example : WFE1600-2GC, WFE4000-2AL)

- 1** Body Size
- 2** Design No.
- 3** Piping Method
- 4** Lever Direction

External Dimensions and Machining Dimensions for Mounting

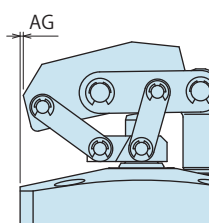
(mm)

Model No.	WFE1600-2□□	WFE2500-2□□	WFE4000-2□□
Full Stroke	33.5	37.5	43
(Break down) Idle Stroke	29.5	33.5	39
Lock Stroke※8	4	4	4
Recommended Stroke	31.5	35.5	41
Lever Retraction ※10	16	16	24
A	176.5	200	231.5
B	66	76	87
C	56	66	78
D	54	64	77
E	114.5	129.5	144.5
F	89.5	99.5	114.5
G	25	30	30
H	38	43	48
J	28	33	39
K	45	53	65
L	88	98	113
M	11	11	11
Nx	31	36	41
Ny	13	15	20
Q	9.5	11	11
R	5.5	6.8	6.8
S	13.5	16	15
T	48.5	54.5	67.5
U	14	16	20
V	37.5	42.5	49.5
W	49	57.5	62
X	31.5	35	45.5
Y	13	16	19
Z	24	28	37
AA	18.5	21	24.5
AC	4	5	6
AD	6	8	10
AG ※10	1	1.8	4.2 ※11
CA(Nominal×Pitch)	M5×0.8	M6×1	M6×1
ZA(Chamfer)	R5	R6	R6
Weight※9 kg	1.1	1.8	2.9

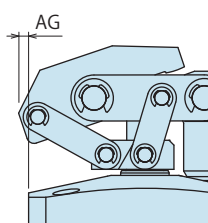
Notes:

- ※8. The specification value of cylinder force, clamping force and holding force is fulfilled only when clamping within the lock stroke range.
(The specification value is not fulfilled when clamping within the range of idle stroke.)
- ※9. It shows the weight of single clamp without the link lever.
- ※10. It shows the dimension in case of KOSMEK option lever (WCZ□-F).
- ※11. For WFE4000 only, the dimension AG protrudes 4.2 mm from the edge of the body.

WFE1600/2500

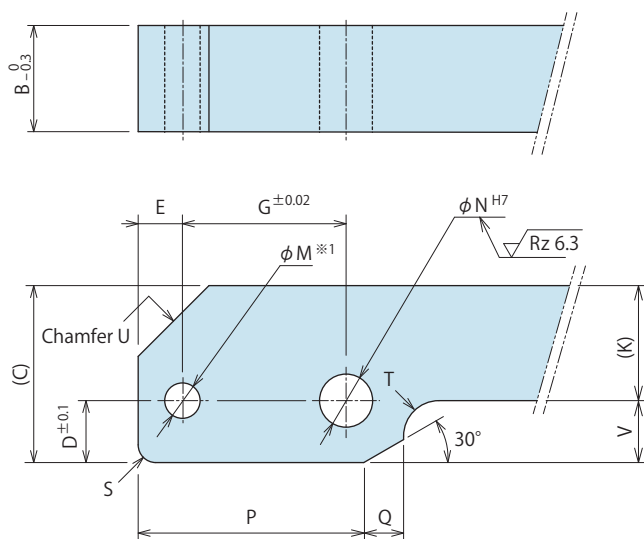


WFE4000



Link Lever Design Dimension

※ Reference for designing link lever.



Applicable Model No. Indication

WFE 0 - 2 A L
S R
1 Body Size

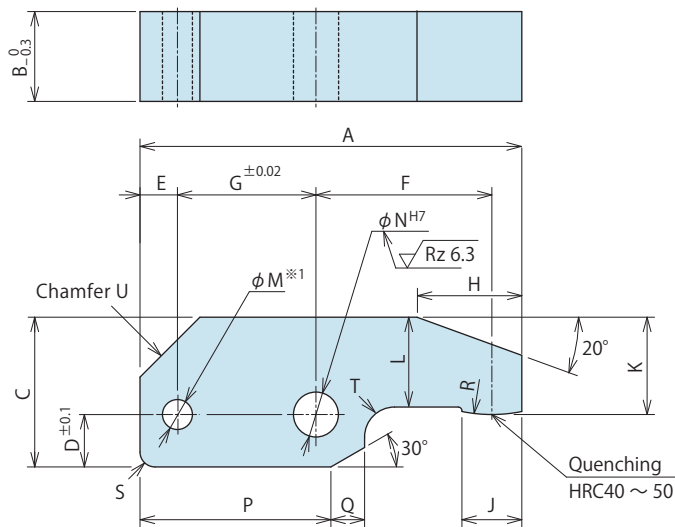
Link Lever Design Dimension List

Corresponding Model No.	WFE1600	WFE2500	WFE4000
B	12	16	19
C	20	23	28
D	7	8	10
E	5	7	7
G	18.5	21	24.5
K	12	14	17
M	5	6	7
N	$6^{+0.012}_0$	$8^{+0.015}_0$	$10^{+0.015}_0$
P	25.5	31	35.5
Q	4.5	5	5.5
S	R2	R2	R3
T	R4	R5	R6
U	C8	C12	C14
V	8	9	11

Notes :

- ※1. Due to the clamp structure, there is a 1mm-diameter gap between the lever hole and the pin.
- 1. Please design the link lever length according to the performance curve.
- 2. If the link lever is not in accordance with the dimensions shown above, performance may be degraded and damage can occur.
- 3. Use the attached pin (equivalent to $\phi AC6$, $\phi AD6$, HRC60) as the lever mounting pin.
(Refer to the external dimensions of the clamp body for the dimensions of ϕAC , ϕAD .)

● Accessory : Link Lever



Model No. Indication

WCZ 160 0 - F

Size (Refer to the table.)

Design No. (Revision Number)

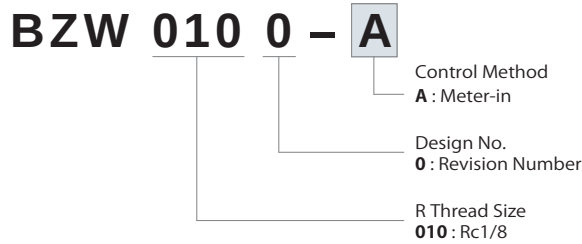
Model No.	WCZ1600-F	WCZ2500-F	WCZ4000-F
Corresponding Model No.	WFE1600	WFE2500	WFE4000
A	51	61	71
B	12	16	19
C	20	23	28
D	7	8	10
E	5	7	7
F	23.5	29	35.5
G	18.5	21	24.5
H	14	18	25.5
J	8	8	8
K	13	15	18
L	12	14	17
M	5	6	7
N	6 ^{+0.012} ₀	8 ^{+0.015} ₀	10 ^{+0.015} ₀
P	25.5	31	35.5
Q	4.5	5	5.5
R	R20	R20	R25
S	R2	R2	R3
T	R4	R5	R6
U	C8	C12	C14
Weight	kg	0.07	0.12

Notes :

- ※1. Due to the clamp structure, there is a 1mm-diameter gap between the lever hole and the pin.
- 1. Material : S50C Surface Finishing : Alkaline Blackening
- 2. Use the attached pin (equivalent to φACf6, φADf6, HRC60) as the lever mounting pin.
(Refer to the external dimensions of the clamp body for the dimensions of φAC, φAD.)

● Accessory : Air Flow Control Valve

● Model No. Indication

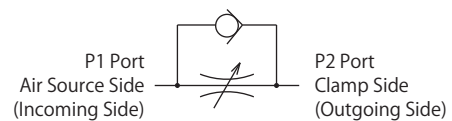


● Specifications

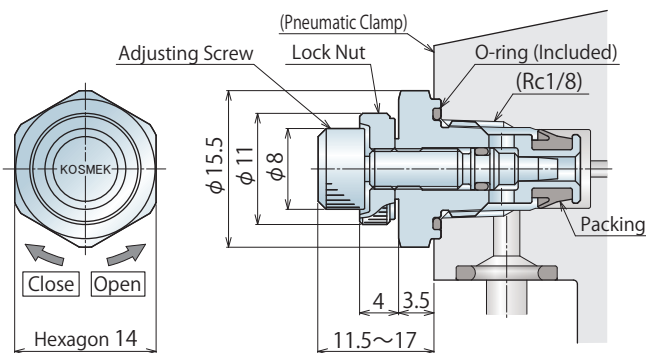
Model No.	BZW0100-A
Control Method	Meter-in
Operating Pressure MPa	0.1 ~ 1.0
Withstanding Pressure MPa	1.5
Adjusting Screw Number of Rotations	10
Tightning Torque N·m	5 ~ 7
Weight g	13
Coresponding Model No.	WFE □ 0-2A □

● Circuit Symbol

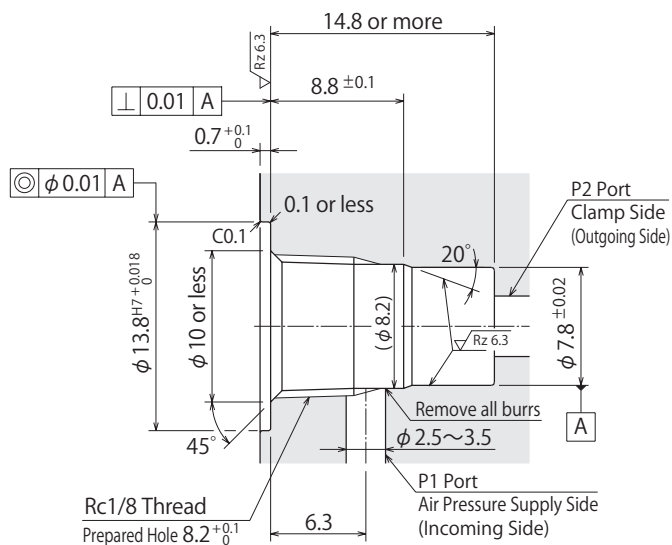
BZW0100-A : Meter-in



● External Dimensions



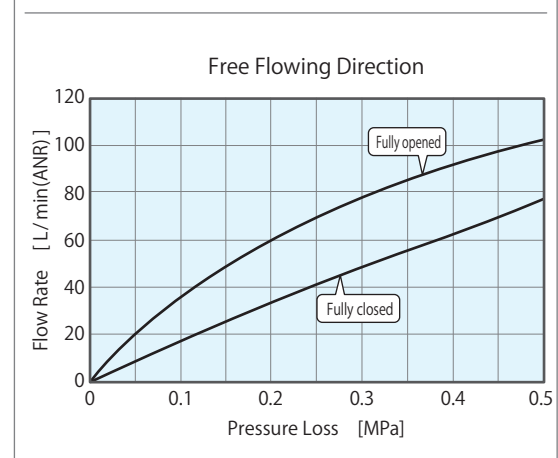
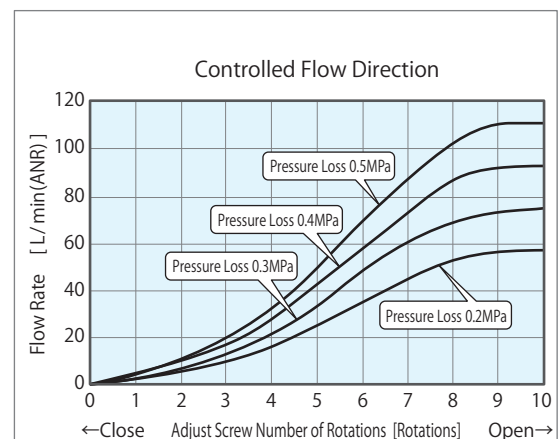
Machining Dimensions of Mounting Area



Notes :

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

● Flow Rate Graph



	Features / App. Ex.	Action Description	Model No. / Specifications	Performance Curve	External Dimensions	Lever Design Dimensions	Accessory	Cautions
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MEMO

Cautions

Notes for Design

1) Check Specifications

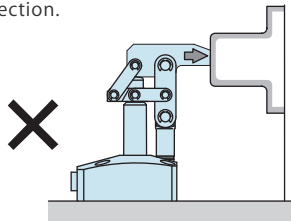
- Please use each product according to the specifications.
The mechanical lock mechanism of this clamp has the clamping force and holding force even when air pressure drops to 0MPa.
(Refer to "Clamping Force and Holding Force Curve at 0MPa" on P.11.)

2) Notes for Circuit Design

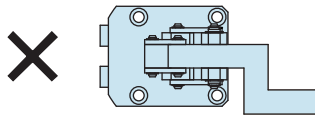
- Ensure there is no possibility of supplying hydraulic pressure to the lock port and the release port simultaneously. Improper circuit design may lead to malfunctions and damages.

3) Notes for Link Lever Design

- Make sure no force is applied to the piston rod except from the axial direction.



- Offset lever cannot be used. Offset load may damage the product.

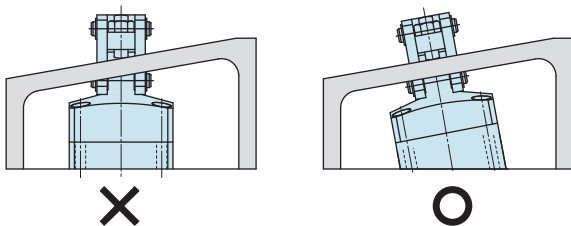


4) Protect the exposed area of the piston rod and the link plate when using on a welding fixture.

- 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

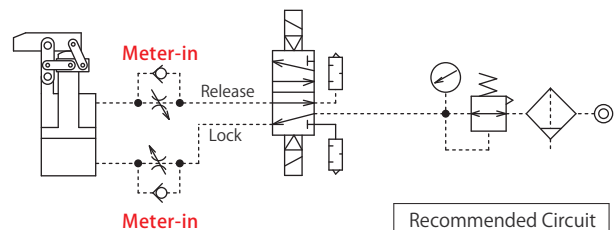
- The link pin can be dried out. Grease it periodically or use a special pin. Contact us for the specifications of special pins.

7) Protective Cover Installation

- If the moving parts of the cylinder may endanger human life, please install the protection cover.

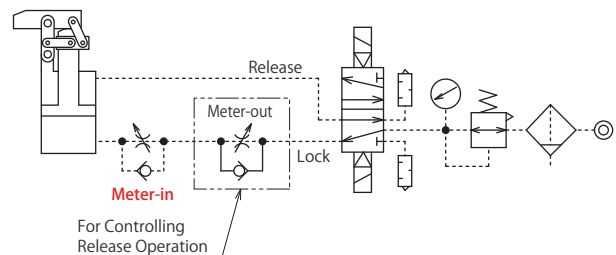
8) Speed Adjustment

- If the clamp operates too fast, the parts will be worn out and become damaged more quickly leading to equipment failure. Do not adjust with a meter-out valve outside the cylinder because there is an orifice of meter-out connected internally. (The operating time of mechanical locking mechanism will be very long if there is back pressure in the circuit.)
Install a meter-in speed controller and adjust the operating time to within 0.5 seconds.
If the operating time is slower than this, pressure rising will slow down taking more time to achieve the clamping force corresponding to the catalog data.
Even if there is stiff or sudden movement under low pressure and small volume of air, it is not a malfunction.
(Please note that the above condition will occur when you have to adjust operating time over 1.0 second.)



Please set one speed controller (meter-in) to each clamp when operating multiple clamps simultaneously.

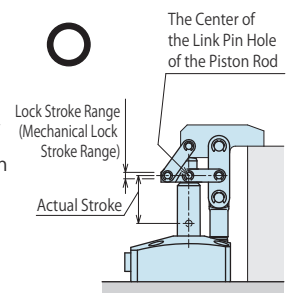
When large thrust force is applied to the releasing direction in releasing action, install a meter-out speed controller to the lock port side for speed adjustment.



9) The specification value will not be fulfilled when clamping out of the lock stroke (mechanical lock stroke) range.

- When the center of link pin hole of piston rod clamps out of the lock stroke range, the mechanical lock function does not work. As a result, the specification value of clamping force and holding force will not be fulfilled. Moreover, there will be no clamping or holding force at 0MPa air pressure.

Make sure the actual stroke to be ± 2 mm of recommended lock position. (The specification value will be fulfilled since the center of link pin hole of piston rod is within the lock stroke (mechanical lock stroke) range.

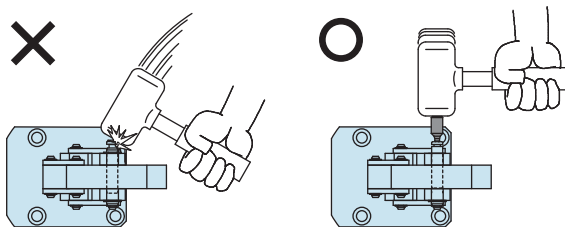


● Installation Notes

- 1) Check the fluid to use.
 - Please supply filtered clean dry air. (Install a drain removing device.)
 - Oil supply with a lubricator etc. is unnecessary.
Oil supply with a lubricator may cause loss of the initial lubricant.
The operation under low pressure and low speed may be unstable.
(When using lubricant, please supply lubricant oil continuously.
Otherwise, the initial grease applied by KOSMEK will be removed.)
- 2) Procedure before Piping
 - The pipeline, piping connector and fixture circuits should be cleaned and flushed thoroughly.
Dust and cutting chips in the circuit can lead to air leakage and malfunction.
 - There is no filter provided with this product for prevention of contaminants in the air circuit.
- 3) Applying Sealing Tape
 - Wrap with tape 1 to 2 times following the screwing direction.
 - Pieces of the sealing tape can lead to air leakage and malfunction.
 - When piping, be careful that contaminants such as sealing tape do not enter into products.
- 4) Installation of the Product
 - When mounting the product, use four hexagonal socket bolts (with tensile strength of 12.9) and tighten them with the torque shown in the list below. Tightening with greater torque than recommended can dent the seating surface or break the bolt.

Model No.	Mounting Bolt Size	Tightening Torque (N·m)
WFE1600	M5×0.8	6.3
WFE2500	M6×1	10
WFE4000	M6×1	10

- 5) Installation of the Speed Control Valve
 - Tightening torque for speed control valve: 5 to 7 N·m.
- 6) Installation / Removal of the Link Lever
 - When inserting a 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.



- 7) Speed Adjustment
 - Adjust the speed so that the operating time is within 0.5 sec.
If the clamp operates too fast the parts will be worn out leading to premature damage and ultimately complete equipment failure.
 - Turn the speed control valve gradually from the low-speed side (small flow) to the high-speed side (large flow) to adjust the speed.
- 8) Checking Looseness and Retightening
 - At the beginning of the machine installation, bolts may be tightened lightly. Check looseness and re-tighten as required.

9) Do Not Operate the Clamp Manually

- At the time of not supplying air pressure, when a piston rod is raised by manual operation and it goes into the lock stroke range, the mechanical lock will be activated by built-in spring and the clamp will be locked (the piston rod at the lock end). Clamping force at 0MPa will be generated as well. Since this will cause an injury and accident, never operate the clamp manually.

In order to avoid such accidents, the product is set in the locked state (with mechanical lock activated) before shipping.

It is recommended to set the clamp in locked state (with mechanical lock activated) when shipping to a user after installing the clamp to a fixture or system.

In the locked state, clamps cannot be operated manually because of the mechanical lock. Supplying release air pressure is required to conduct release action.



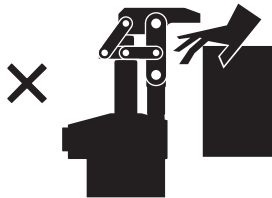
10) Cautions for Trial Operation

- If air pressure with large flow rate is supplied just after installation, operating time will be extremely fast leading to severe damage on the clamp. Install a meter-in speed controller near the air source and supply air pressure gradually.

● Cautions

● Notes on Handling

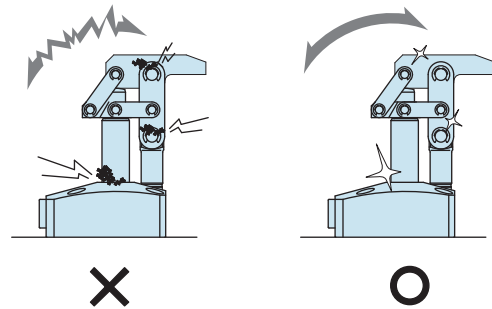
- 1) It should be operated by qualified personnel.
- The hydraulic machine and air compressor should be operated and maintained by qualified personnel.
- 2) Do not operate or remove the product unless the safety protocols are ensured.
 - ① The machine and equipment can only be inspected or prepared when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



- 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) Regularly tighten pipe line, mounting bolt, snap ring and others to ensure proper use.
- 4) 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.
- 5) The products should be stored in the cool and dark place without direct sunshine or moisture.
- 6) Please contact us for overhaul and repair.

● Warranty

1) Warranty Period

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

2) Warranty Scope

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

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

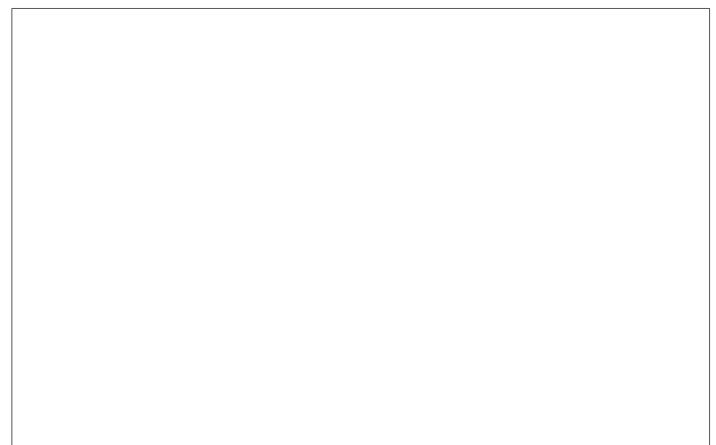


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- For Further Information on Unlisted Specifications and Sizes, Please call us.
- Specifications in this Leaflet are Subject to Change without Notice.



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