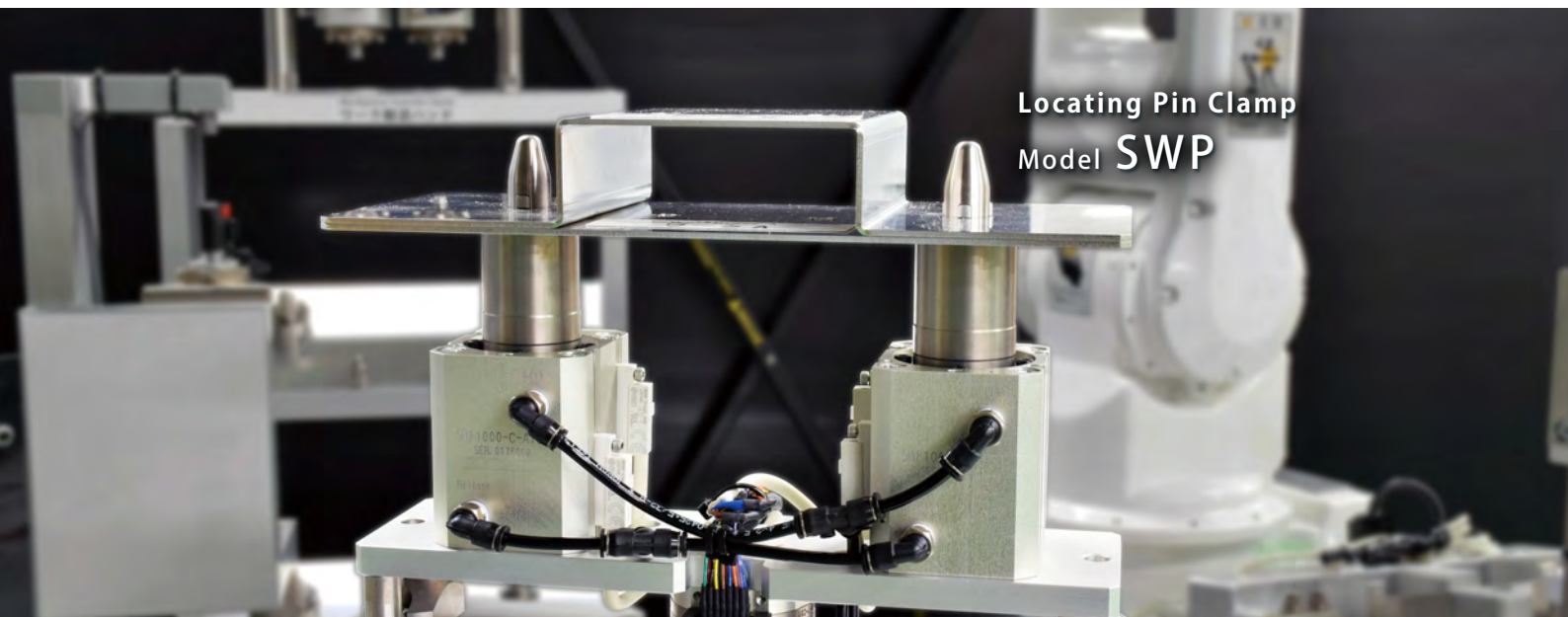New For setup improvement of welding applications

Kosmek Welding Products
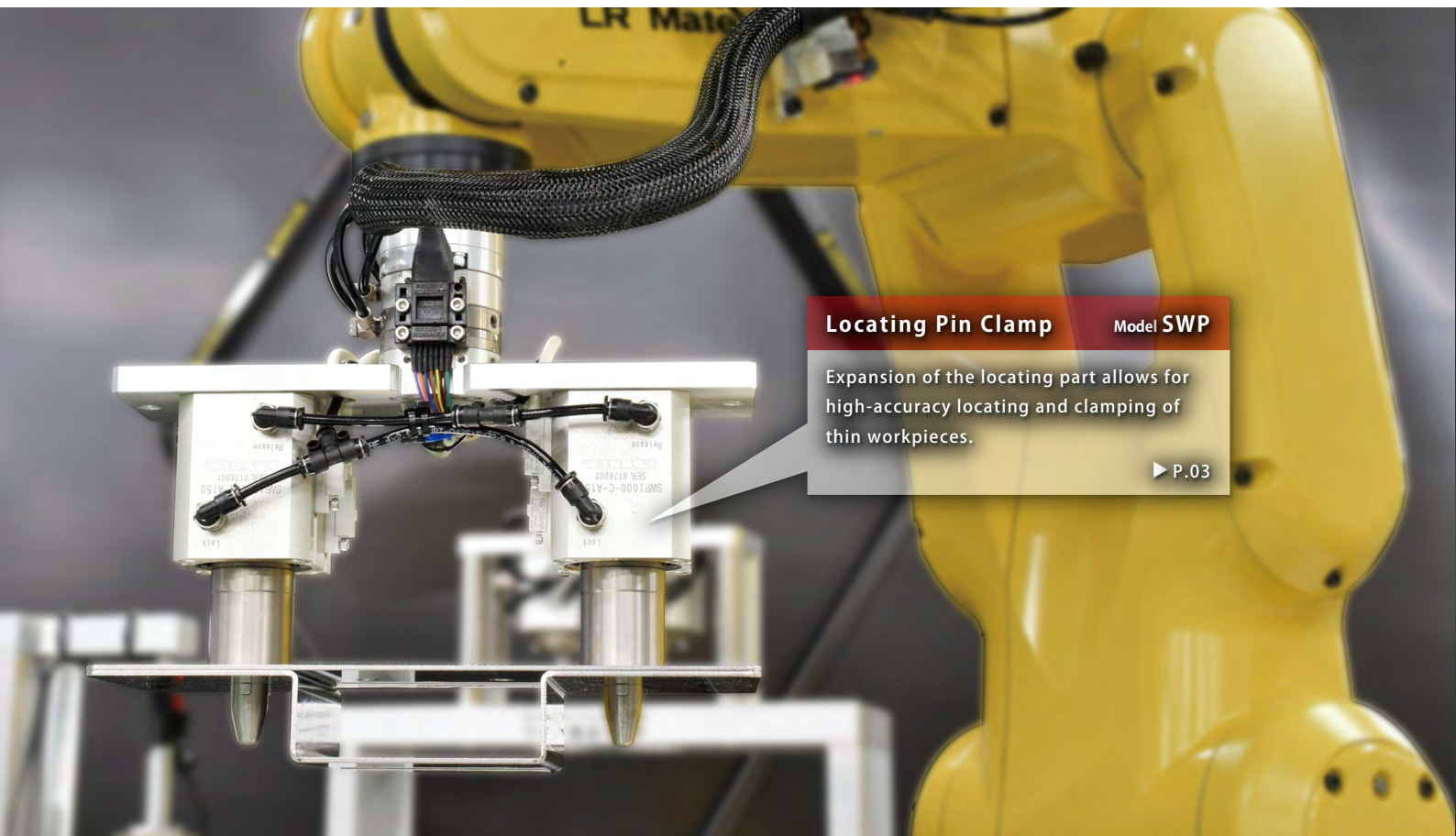
Locating Pin Clamp
Model **SWP**

High-Power Welding
Link Clamp
Model **WCG**
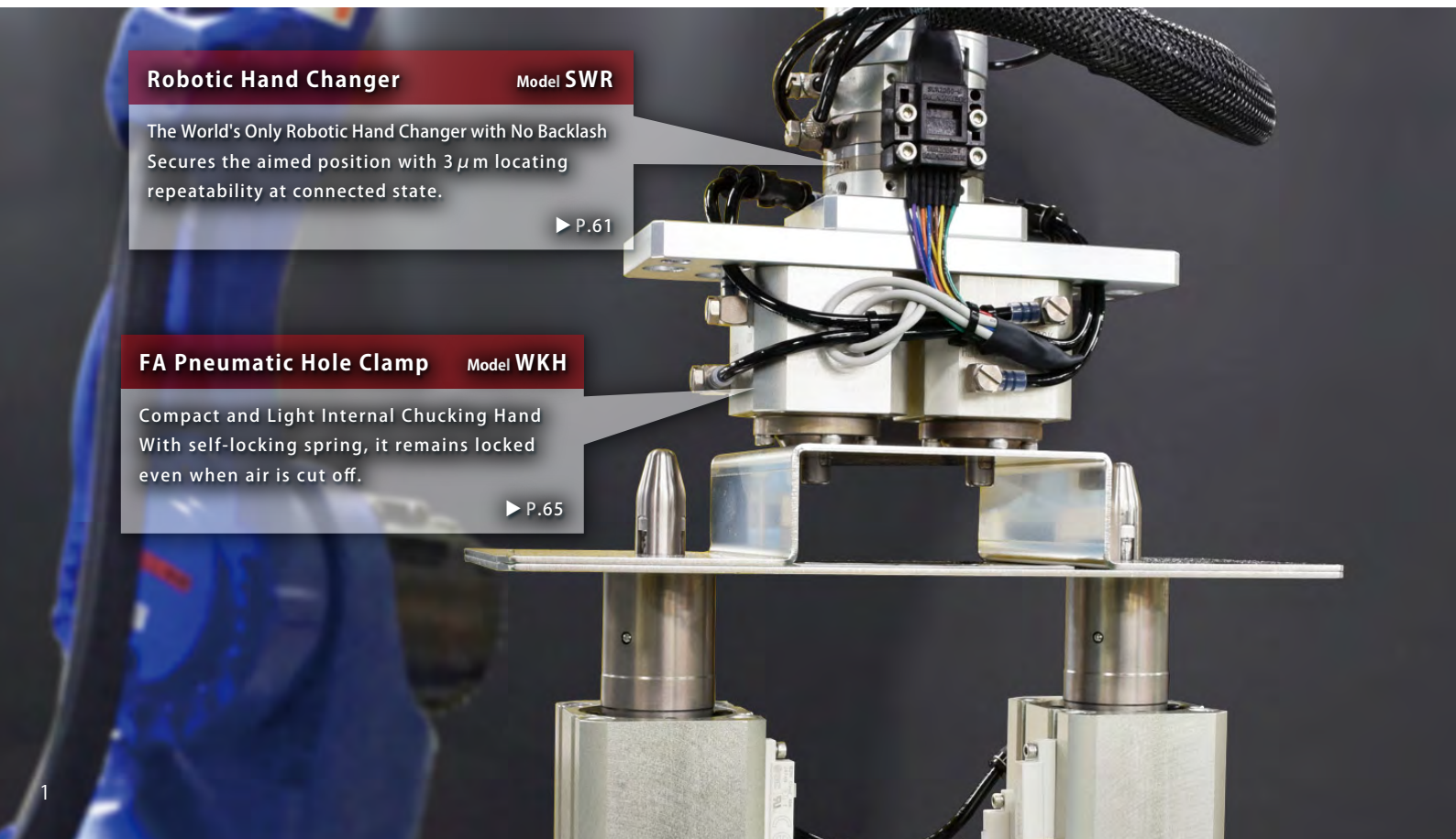
High-Power Welding
Swing Clamp
Model **WHG**

KOSMEK
Harmony in Innovation

Locating Pin Clamp Model **SWP**

Expansion of the locating part allows for high-accuracy locating and clamping of thin workpieces.

▶ P.03

Spot Welding

Robotic Hand Changer Model **SWR**

The World's Only Robotic Hand Changer with No Backlash Secures the aimed position with 3 μ m locating repeatability at connected state.

▶ P.61

FA Pneumatic Hole Clamp Model **WKH**

Compact and Light Internal Chucking Hand With self-locking spring, it remains locked even when air is cut off.

▶ P.65

High-Power Welding Swing Clamp — Model WHG

Spatter-Resistant High-Power Pneumatic Swing Clamp for Welding Application.
Special rod coating and triple protective structure prevents contamination. ▶ P.17

High-Power Welding Link Clamp — Model WCG

Spatter-Resistant High-Power Pneumatic Link Clamp for Welding Application. Special rod coating and single link plate allow for spatter resistant. Triple protective structure prevents contaminants from entering the cylinder. ▶ P.35

Arc Welding

Compact Location Clamp — Model SWQ

For Pallet Exchange Automation.
Clamping and locating simultaneously with 3 μ m locating repeatability ▶ P.69

Auto Coupler

Auto Coupler automatically connects air circuits to provide the air pressure to the pallet when the location clamp is locked. ▶ P.70

High-Power Welding Link Clamp

Model **WCG**

Spatter Resistant
High-Power Welding Link Clamp

PAT.

◎ **Features**

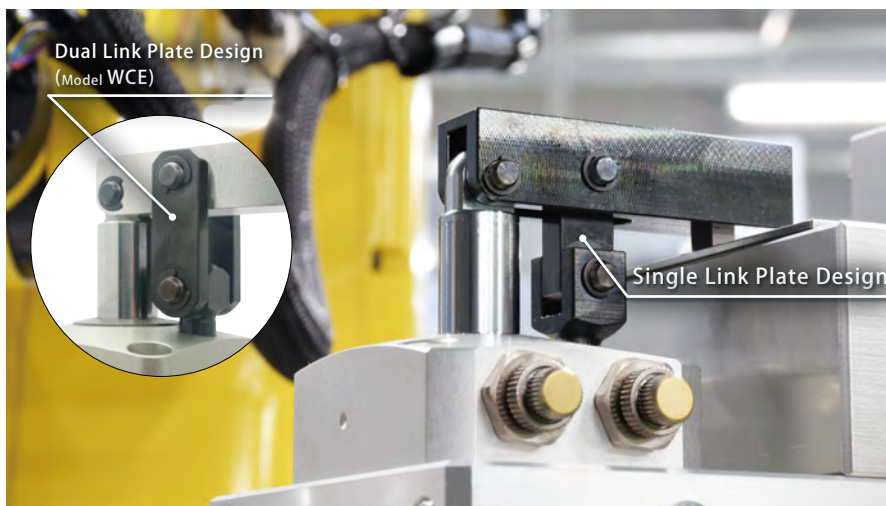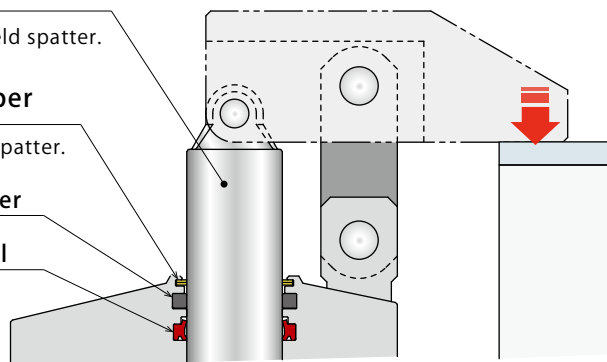| High Durability | Triple protective structure prevents contaminants from entering the cylinder. |

Special Rod Surface Finishing

Protects body surface from weld spatter.
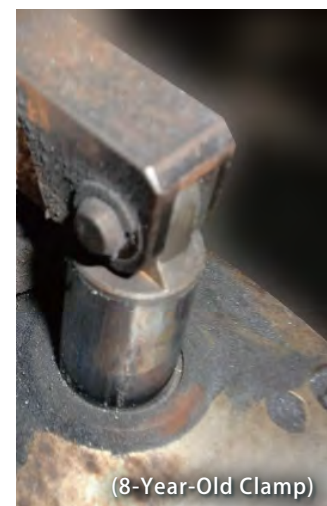
Coil Scraper

Removes weld spatter.

Soft Wiper

Dust Seal

Dual Link Plate Design
(Model **WCE**)

Single Link Plate Design

(8-Year-Old Clamp)

Link Mechanism with Single Link Plate

Compared to dual link plate design (model WCE), the link mechanism of Welding Clamp is designed to be spatter resistant with single link plate.
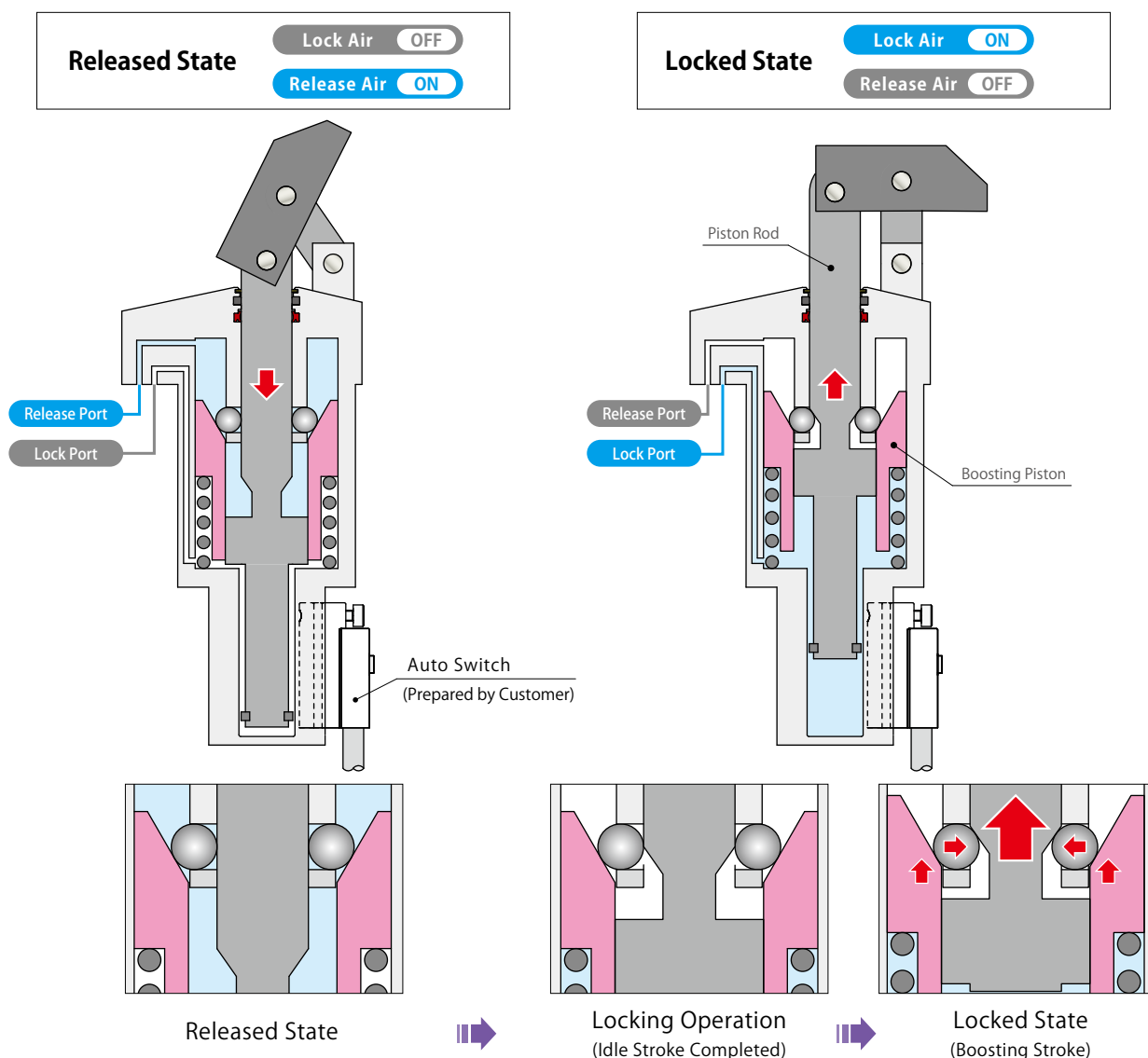
Case Study

The rod operates without failure even after exposed to spatter for a long time.
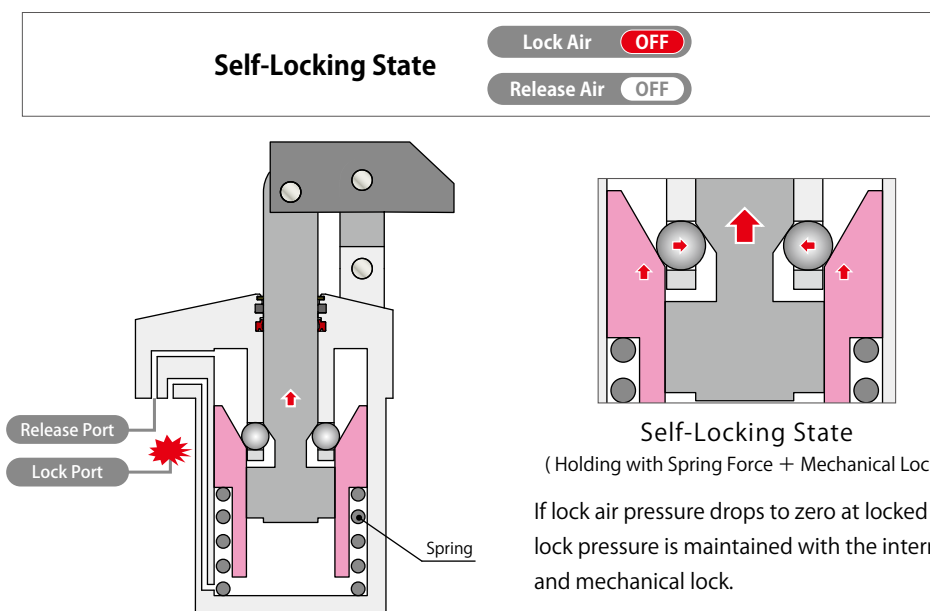
Locating
Pin Clamp

SWP

High-Power
Welding
Swing Clamp

WHG

**High-Power
Welding
Link Clamp**

WCG

Air Flow
Control Valve

BZW

Manifold
Block

WHZ-MD

General Cautions

Welding
Related Products

Quick Die
Change Systems

Company Profile
Sales Offices

The High-Power Welding Link Clamp is
a hybrid system using air pressure and a mechanical lock.

◉ Action Description

Released State — Lock Air **OFF** / Release Air **ON**

Locked State — Lock Air **ON** / Release Air **OFF**

Release Port
Lock Port

Auto Switch
(Prepared by Customer)

Piston Rod
Release Port
Lock Port
Boosting Piston

Released State

Locking Operation
(Idle Stroke Completed)

Locked State
(Boosting Stroke)

The piston rod descends to release.

The piston rod ascends and the boosting piston activates. It exerts strong clamping force and holding force with the wedge mechanism.

Self-Locking State — Lock Air **OFF** / Release Air **OFF**

Release Port
Lock Port
Spring

Self-Locking State
(Holding with Spring Force ＋ Mechanical Lock)

If lock air pressure drops to zero at locked state, lock pressure is maintained with the internal spring and mechanical lock.

36

No Hydraulic Use

Welding fixture system with high-power welding clamps exerting equivalent force to hydraulic clamps needs no hydraulic pressure.
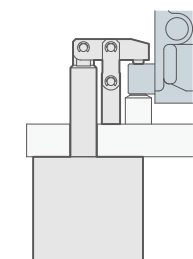
Powerful Clamping Force
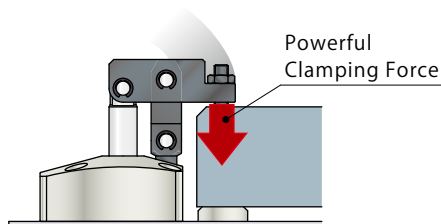
Holding Force

Minimal clamping force and powerful holding force minimize workpiece deformation. Mechanical locking allows holding force to exert 3 times the clamping force at most.

Holding Force withstands Reaction Force

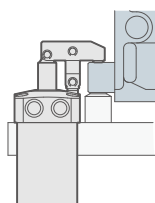Reaction Force (Welding Deformation, etc.)
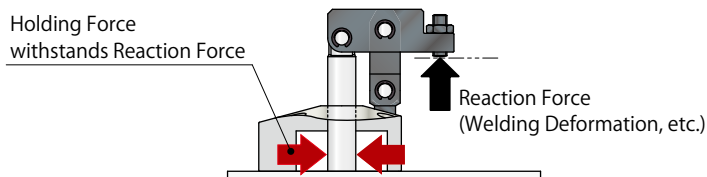
Smaller Footprint

Exerts three times clamping force compared to the same size general air cylinder. Smaller cylinder allows for more compact fixtures.
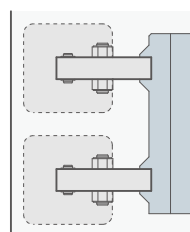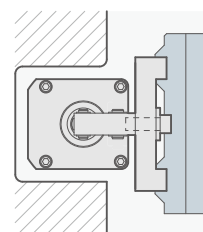
General Air Cylinder   High-Power Welding Clamp
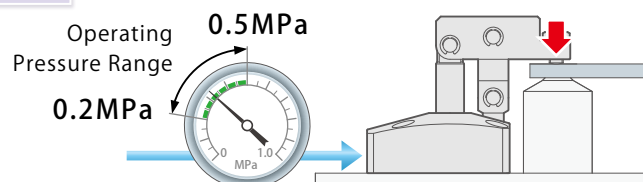
Downsized

General Air Cylinder   High-Power Welding Clamp

Reduced Number of Clamps
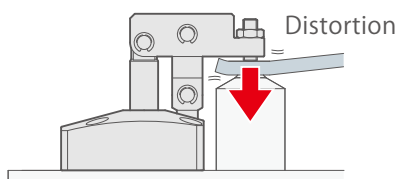
Energy Saving

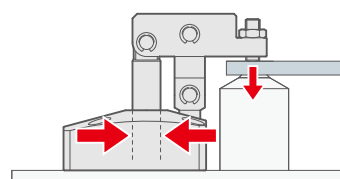Energy-saving clamp exerts high clamping force with low pressure.

Operating Pressure Range

0.5MPa

0.2MPa

0   1.0
MPa

High Quality

Optimum clamping force does not distort workpiece and holding force is strong enough to withstand welding load.
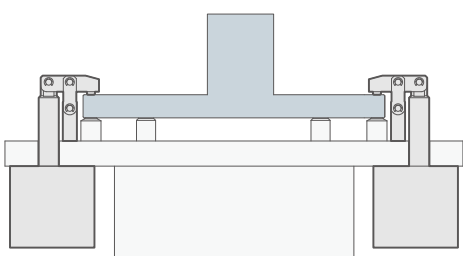
Distortion
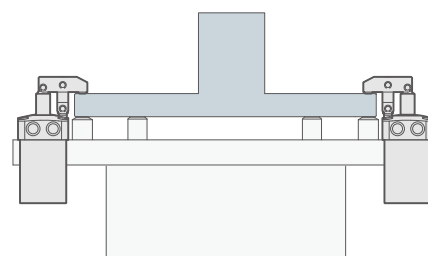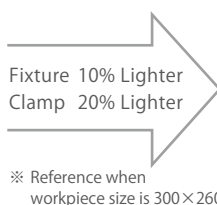
Strong clamping force distorts workpiece.

Clamping force is lowered, yet workpiece can be supported with holding force.

Light Weight

High-Power Welding Clamp allows for lighter fixture, minimizing load to the positioner.

Fixture 10% Lighter
Clamp 20% Lighter

※ Reference when workpiece size is 300×260.

General Air Cylinder   High-Power Welding Clamp

Action Confirmation

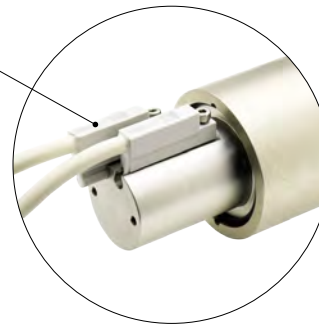## Safely used in automation systems with action confirmation of Auto Switch.

Auto Switch (Prepared by Customer)

Ability to Confirm Lock/Release Action

Recommended Auto Switch

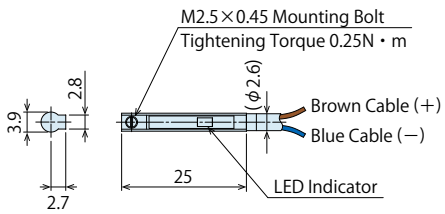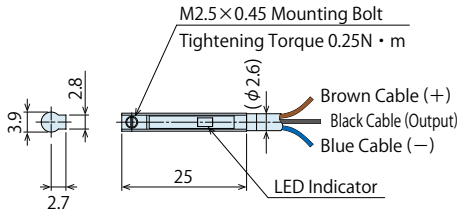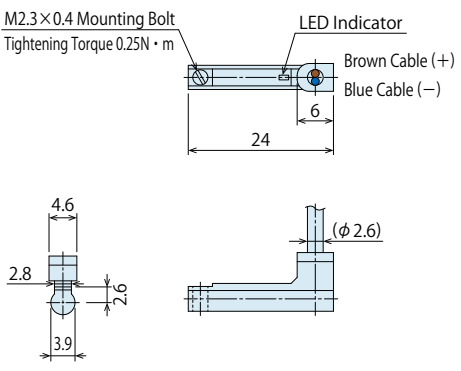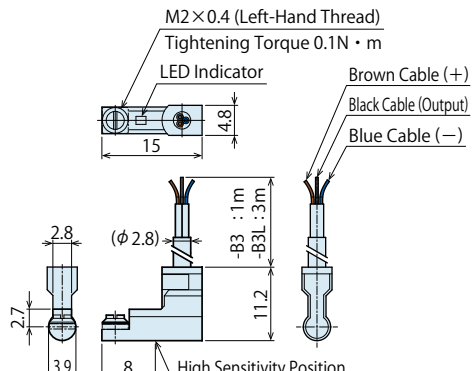JEP Series (KOSMEK)
Magnetic Field Resistant Model：D-P3DWA (SMC)

【Applicable Auto Switch】

Refer to FA・Industrial Robot Related Products (CATALOG No. FA0020□□-□□-GB) for detailed specifications.
Please use D-P3DWA (SMC) for an environment which generates a magnetic field disturbance.
When using an auto switch not made by Kosmek, check specifications of each manufacture.

Auto Switch Model No.	JEP0000-A2	JEP0000-A2L	JEP0000-B2	JEP0000-B2L
Switch Type	Reed Auto Switch		Solid State Auto Switch	
Wiring Method	2-Wire		3-Wire	
Cable Length	1m	3m	1m	3m
Specifications ・Electric Circuit Diagram	Refer to FA・Industrial Robot Related Products (CATALOG No.FA0020□□-□□-GB)		Refer to FA・Industrial Robot Related Products (CATALOG No.FA0020□□-□□-GB)	
External Dimensions	M2.5×0.45 Mounting Bolt Tightening Torque 0.25N・m (φ2.6) 2.8 3.9 2.7 25 Brown Cable (＋) Blue Cable (－) LED Indicator		M2.5×0.45 Mounting Bolt Tightening Torque 0.25N・m (φ2.6) 2.8 3.9 2.7 25 Brown Cable (＋) Black Cable (Output) Blue Cable (－) LED Indicator	

Auto Switch Model No.	JEP0000-A2V	JEP0000-A2VL	JEP0000-B3	JEP0000-B3L
Switch Type	Reed Auto Switch		Solid State Auto Switch	
Wiring Method	2-Wire		3-Wire	
Cable Length	1m	3m	1m	3m
Specifications ・Electric Circuit Diagram	Refer to FA・Industrial Robot Related Products (CATALOG No.FA0020□□-□□-GB)		Refer to FA・Industrial Robot Related Products (CATALOG No.FA0020□□-□□-GB)	
External Dimensions	M2.3×0.4 Mounting Bolt Tightening Torque 0.25N・m LED Indicator Brown Cable (＋) Blue Cable (－) 6 24 4.6 2.8 2.6 3.9 (φ2.6)		M2×0.4 (Left-Hand Thread) Tightening Torque 0.1N・m LED Indicator Brown Cable (＋) Black Cable (Output) Blue Cable (－) 15 4.8 2.8 (φ2.8) 2.7 3.9 8 -B3：1m -B3L：3m 11.2 High Sensitivity Position	

◉ Model No. Indication

WCG 160 0 – 2 A R T

1 2 3 4 5

1 Cylinder Force

100 : Cylinder Force 0.9kN (Air Pressure 0.5MPa)

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

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

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

※ Cylinder force differs from clamping force and holding force.
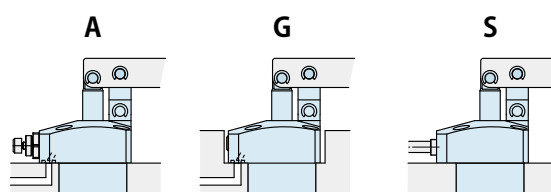
2 Design No.

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) is sold separately.
Please refer to P.53.

A **G** **S**

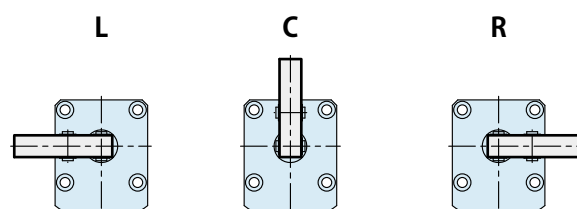| Gasket Option		Piping Option
With Ports for Speed Controller Includes R Thread Plug (order speed controller separately)	with R Thread Plug	Rc Thread No Gasket Port

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.

L **C** **R**

5 Action Confirmation Method

Blank : None (Standard)

T : With Auto Switch Installation Slot

Blank **T**

Auto Switch Installation Slot

Locating
Pin Clamp

SWP

High-Power
Welding
Swing Clamp

WHG

**High-Power
Welding
Link Clamp**

WCG

Air Flow
Control Valve

BZW

Manifold
Block

WHZ-MD

General Cautions

Welding
Related Products

Quick Die
Change Systems

Company Profile
Sales Offices
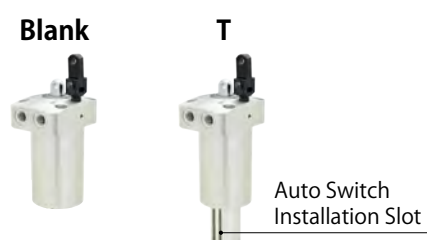
● Specifications

Model No.	WCG1000-2□□□	WCG1600-2□□□	WCG2500-2□□□	WCG4000-2□□□
Cylinder Force (at 0.5MPa)　　kN	0.9	1.6	2.5	3.9
Clamping Force	Refer to "Clamping Force Curve" on P.41			
Holding Force	Refer to "Holding Force Curve" on P.42			
Clamping Force and Holding Force at 0MPa	Refer to "Clamping Force and Holding Force Curve at 0 MPa" on P.43			
Full Stroke　　　　　　　　mm	22	23.5	27.5	33
(Break　　Idle Stroke　　　mm	18	19.5	23.5	29
down)　　Lock Stroke [1]　　mm	4	4	4	4
Cylinder Capacity　　Lock	22.4	35.8	56.1	95.6
cm^3　　Release	18.9	32.1	50.6	85.2
Spring Force　　　　　　　　N	60.8 ~ 78.4	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			

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

◉ Clamping Force Curve

L：Lever Length (mm)

F：Clamping Force (kN)

P：Air Pressure (MPa)

s
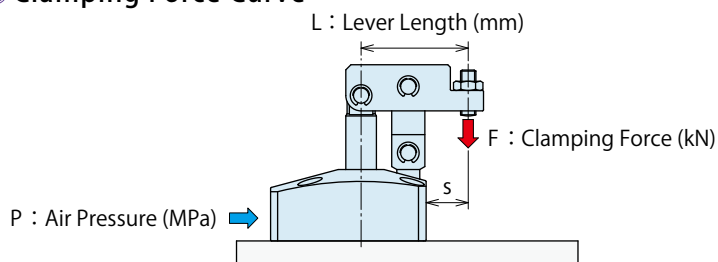
(How to read the Clamping Force Curve)
In case of WCG2500
Supply Air Pressure 0.3MPa
Lever Length L=50mm
Clamping force is about 1.46kN.

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).
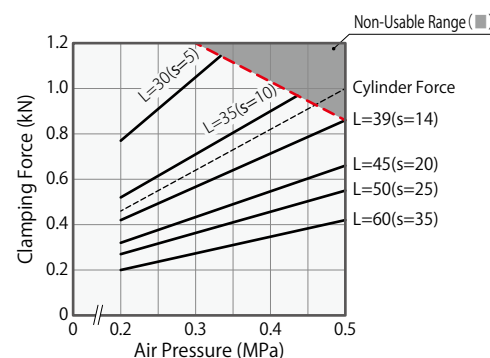2. Cylinder force (When L=0) cannot be calculated from the calculation formula of clamping force.
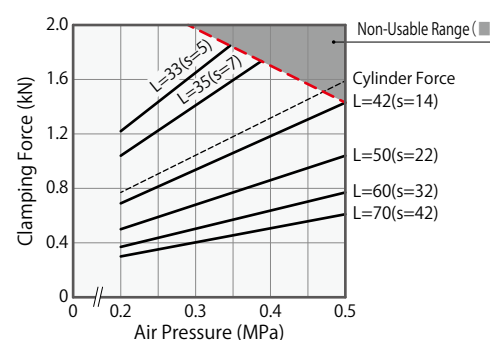3. Clamping force shows capability when a lever locks in a horizontal position.
4. The clamping force varies as per the lever length. Please use it with supply pneumatic pressure suitable for lever length.
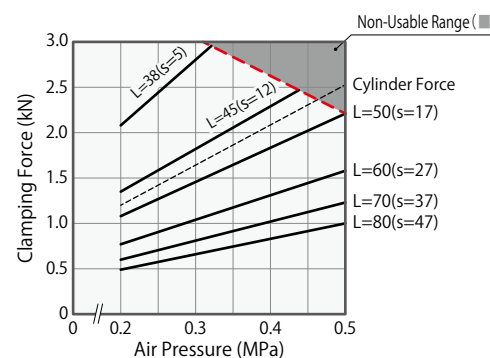5. Operation in the non-usable range can damage the clamp and lead to fluid leakage.

WCG1000

Clamping Force Calculation Formula ※1 (kN)

$$F = \frac{28.6 \times P + 2.2}{L - 19.5}$$

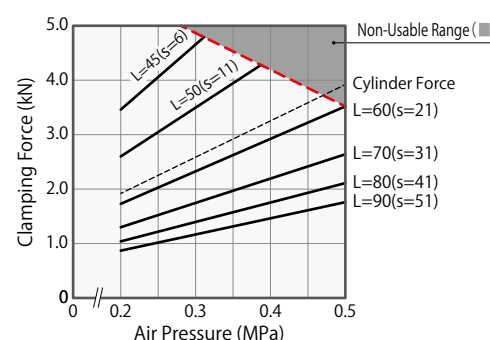| Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range (■)						Min. Lever Length (mm)
		Lever Length L (mm)						
		30	35	39	45	50	60	
0.5	0.94			0.85	0.65	0.54	0.41	39
0.4	0.78		0.88	0.70	0.54	0.45	0.34	33
0.3	0.62	1.03	0.70	0.55	0.42	0.35	0.27	29
0.2	0.45	0.76	0.51	0.41	0.31	0.26	0.20	25
Max. Operating Pressure (MPa)		0.33	0.43	0.50	0.50	0.50	0.50	

Non-Usable Range (■)

L=30(s=5)
L=35(s=10)

Cylinder Force
L=39(s=14)
L=45(s=20)
L=50(s=25)
L=60(s=35)

WCG1600

Clamping Force Calculation Formula ※1 (kN)

$$F = \frac{51.6 \times P + 4.3}{L - 21}$$

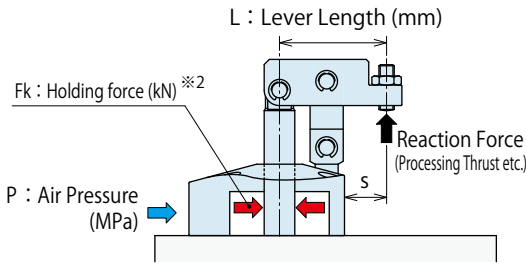| Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range (■)						Min. Lever Length (mm)
		Lever Length L (mm)						
		33	35	42	50	60	70	
0.5	1.59			1.43	1.04	0.77	0.61	42
0.4	1.32			1.19	0.86	0.64	0.51	36
0.3	1.05	1.65	1.41	0.94	0.68	0.51	0.40	31
0.2	0.77	1.22	1.04	0.70	0.50	0.37	0.30	28
Max. Operating Pressure (MPa)		0.35	0.39	0.50	0.50	0.50	0.50	

Non-Usable Range (■)

L=33(s=5)
L=35(s=7)

Cylinder Force
L=42(s=14)
L=50(s=22)
L=60(s=32)
L=70(s=42)

WCG2500

Clamping Force Calculation Formula ※1 (kN)

$$F = \frac{93.9 \times P + 8.3}{L - 25}$$

Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range (■)						Min. Lever Length (mm)
		Lever Length L (mm)						
		38	45	50	60	70	80	
0.5	2.46			2.21	1.58	1.23	1.00	50
0.4	2.04		2.29	1.83	1.31	1.02	0.83	42
0.3	1.62	2.81	1.82	1.46	1.04	0.81	0.66	37
0.2	1.20	2.08	1.35	1.08	0.77	0.60	0.49	33
Max. Operating Pressure (MPa)		0.32	0.43	0.50	0.50	0.50	0.50	

Non-Usable Range (■)

L=38(s=5)
L=45(s=12)

Cylinder Force
L=50(s=17)
L=60(s=27)
L=70(s=37)
L=80(s=47)

WCG4000

Clamping Force Calculation Formula ※1 (kN)

$$F = \frac{179.2 \times P + 16.1}{L - 30}$$

| Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range (■)						Min. Lever Length (mm)
		Lever Length L (mm)						
		45	50	60	70	80	90	
0.5	3.92			3.52	2.64	2.11	1.76	60
0.4	3.25			2.93	2.19	1.76	1.46	51
0.3	2.59	4.66	3.49	2.33	1.75	1.40	1.16	44
0.2	1.92	3.46	2.60	1.73	1.30	1.04	0.87	39
Max. Operating Pressure (MPa)		0.31	0.39	0.50	0.50	0.50	0.50	

Non-Usable Range (■)

L=45(s=6)
L=50(s=11)

Cylinder Force
L=60(s=21)
L=70(s=31)
L=80(s=41)
L=90(s=51)

◉ Holding Force Curve

L : Lever Length (mm)

Fk : Holding force (kN) ※2

P : Air Pressure (MPa)

Reaction Force (Processing Thrust etc.)

s

(How to read the Holding Force Curve：ex.1)
In case of WCG1600,
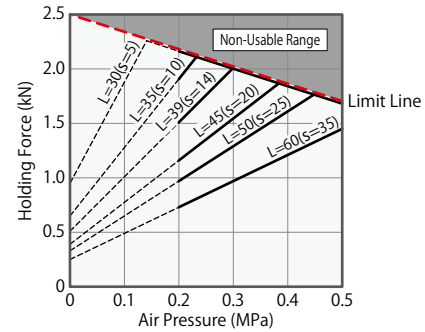Supply Air Pressure 0.2MPa, Lever Length L=50mm
Holding force is about 1.79kN.

(How to read the Holding Force Curve：ex.2)
In case of WCG1600,
Supply Air Pressure 0.5MPa, Lever Length L=50mm
The calculated value is the holding force of point A, but it is in the non-usable range.
The value of intersection B is the holding force that counters the reaction force, and it is about 2.58kN.
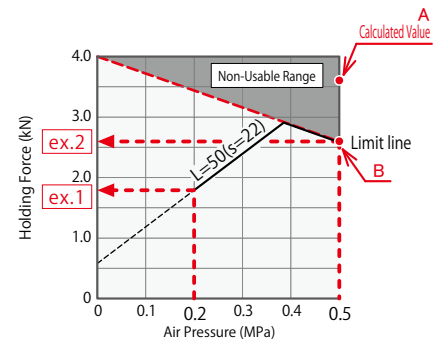
Notes :

※2. Holding force shows the force which can counter to reaction force in the clamping state, and differ from clamping force.
Please note that it may produce displacement depending on lever rigidity even if the reaction force is below the holding force.
(When slight displacement is also not allowed, please keep the reaction force beyond clamping force from being added.)

※3. 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. The table and the graph show the relation between holding force (kN) and supply air pressure (MPa).
2. Holding force indicates the value when the lever locks a workpiece in horizontal position.
3. Holding force varies depending on the lever length. Set the supply air pressure suitable to the lever length.
4. Operation in the non-usable range can damage the clamp and lead to fluid leakage.

WCG1000

Holding Force Formula ※3 (Fk ≦ Limit Line Value) (kN)

$$Fk = \frac{97.6 \times P + 10.0}{L - 19.5}$$

Air Pressure (MPa)	Holding Force (kN) Non-Usable Range( )						Non-Usable Range Limit Line Value
	Lever Length L (mm)						(kN)
	30	35	39	45	50	60	
0.5			1.67	1.67	1.67	1.45	1.67
0.4		1.84	1.84	1.84	1.61	1.21	1.84
0.3	2.01	2.01	2.01	1.54	1.29	0.97	2.01
0.2	2.18	1.90	1.51	1.16	0.97	0.73	2.18

WCG1600

Holding Force Formula ※3 (Fk ≦ Limit Line Value) (kN)

$$Fk = \frac{175.2 \times P + 16.8}{L - 21}$$

Air Pressure (MPa)	Holding Force (kN) Non-Usable Range( )						Non-Usable Range Limit Line Value
	Lever Length L (mm)						(kN)
	33	35	42	50	60	70	
0.5			2.58	2.58	2.58	2.13	2.58
0.4			2.86	2.86	2.23	1.77	2.86
0.3	3.14	3.14	3.14	2.39	1.78	1.42	3.14
0.2	3.42	3.42	2.47	1.79	1.33	1.06	3.42
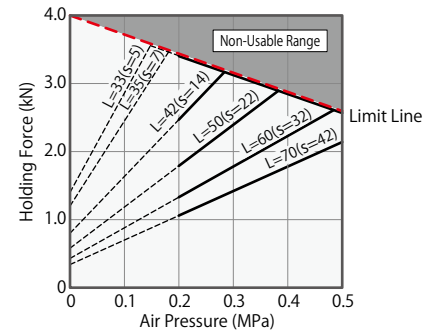
WCG2500

Holding Force Formula ※3 (Fk ≦ Limit Line Value) (kN)

$$Fk = \frac{325.6 \times P + 32.6}{L - 25}$$

Air Pressure (MPa)	Holding Force (kN) Non-Usable Range( )						Non-Usable Range Limit Line Value
	Lever Length L (mm)						(kN)
	38	45	50	60	70	80	
0.5			3.81	3.81	3.81	3.55	3.81
0.4		4.24	4.24	4.24	3.62	2.96	4.24
0.3	4.67	4.67	4.67	3.72	2.90	2.37	4.67
0.2	5.10	4.89	3.91	2.79	2.17	1.78	5.10
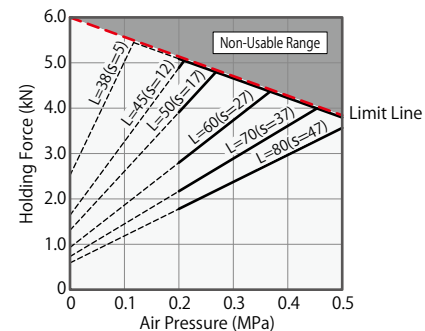
WCG4000

Holding Force Formula ※3 (Fk ≦ Limit Line Value) (kN)

$$Fk = \frac{673.9 \times P + 68}{L - 30}$$

Air Pressure (MPa)	Holding Force (kN) Non-Usable Range( )						Non-Usable Range Limit Line Value
	Lever Length L (mm)						(kN)
	45	50	60	70	80	90	
0.5			5.48	5.48	5.48	5.48	5.48
0.4			6.16	6.16	6.16	5.63	6.16
0.3	6.85	6.85	6.85	6.75	5.40	4.50	6.85
0.2	7.53	7.53	6.76	5.07	4.06	3.38	7.53
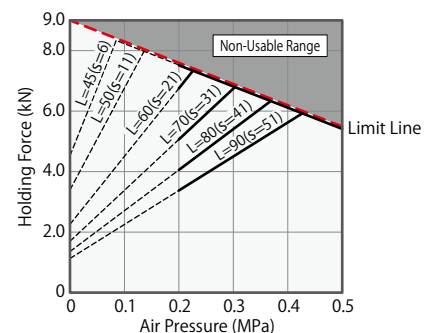
◉ Clamping Force and Holding Force Curve at 0MPa

L：Lever Length (mm)

Fk：Holding Force (kN) ※1

F：Clamping Force (kN)

P：Supply Air Pressure
0 MPa

s

(How to read the Clamping Force and Holding Force Curve at 0MPa)
In case of WCG1600
When air pressure is shut off at clamped state：
Supply Air Pressure = 0MPa, Lever Length L=50 mm
Clamping force becomes about 0.15 kN.
Holding force becomes about 0.58 kN.

Notes:
※1. Holding force shows the force which can counter to reaction force in the clamping state, and differ from clamping force.
　　 Please note that it may produce displacement depending on lever rigidity even if the reaction force is below the holding force.
　　 (When slight displacement is also not allowed, please keep the reaction force beyond clamping force from being added.)
※2. F : Clamping force (kN) , Fk : Holding force (kN) , L : Lever length (mm).
　1. The table and the graph show the relation 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 pneumatic pressure show capability when a lever locks a workpiece in horizontal position.
　3. Clamping force and holding force vary depending on the lever length.

WCG1000

Clamping Force Formula at 0MPa ※2	(kN)	$F = \dfrac{2.2}{L - 19.5}$					
Holding Force Formula at 0MPa ※2	(kN)	$Fk = \dfrac{10.0}{L - 19.5}$					
Lever Length	(mm)	30	35	39	45	50	60
Clamping Force Reference Value at 0MPa (kN)		0.21	0.14	0.11	0.09	0.07	0.05
Holding Force Reference Value at 0MPa (kN)		0.95	0.65	0.51	0.39	0.33	0.25
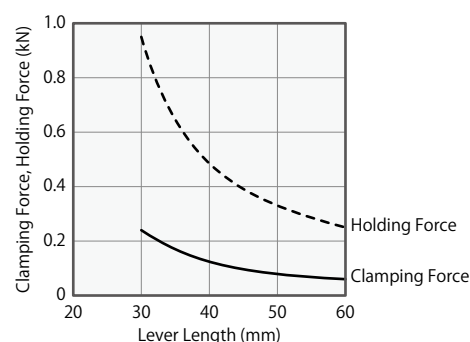
WCG1600

Clamping Force Formula at 0MPa ※2	(kN)	$F = \dfrac{4.3}{L - 21}$					
Holding Force Formula at 0MPa ※2	(kN)	$Fk = \dfrac{16.8}{L - 21}$					
Lever Length	(mm)	33	35	42	50	60	70
Clamping Force Reference Value at 0MPa (kN)		0.36	0.31	0.20	0.15	0.11	0.09
Holding Force Reference Value at 0MPa (kN)		1.40	1.20	0.80	0.58	0.43	0.34
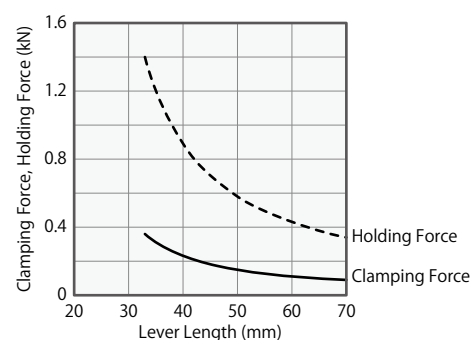
WCG2500

Clamping Force Formula at 0MPa ※2	(kN)	$F = \dfrac{8.3}{L - 25}$					
Holding Force Formula at 0MPa ※2	(kN)	$Fk = \dfrac{32.6}{L - 25}$					
Lever Length	(mm)	38	45	50	60	70	80
Clamping Force Reference Value at 0MPa (kN)		0.64	0.42	0.33	0.24	0.18	0.15
Holding Force Reference Value at 0MPa (kN)		2.51	1.63	1.30	0.93	0.72	0.59
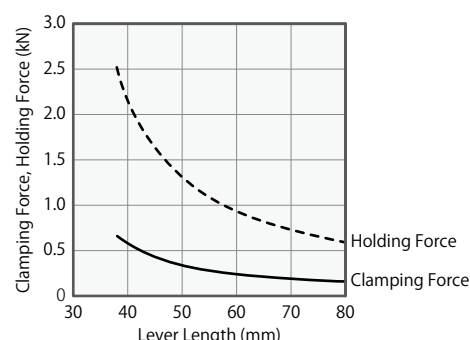
WCG4000

Clamping Force Formula at 0MPa ※2	(kN)	$F = \dfrac{16.1}{L - 30}$					
Holding Force Formula at 0MPa ※2	(kN)	$Fk = \dfrac{68.0}{L - 30}$					
Lever Length	(mm)	45	50	60	70	80	90
Clamping Force Reference Value at 0MPa (kN)		1.07	0.80	0.54	0.40	0.32	0.27
Holding Force Reference Value at 0MPa (kN)		4.53	3.40	2.27	1.70	1.36	1.13

◉ External Dimensions

A：Gasket Option (With Ports for Speed Controller：R-Thread Plug Included)
※The drawing shows the locked state of WCG-2AC.

Release Port : Rc1/8 Thread※2
R1/8 Thread Plug (Included)
(Only for option A :
 Speed Control Valve Port)

Release Port : Rc1/8 Thread※2
max.17
B
H
J
Lever Direction type L
2-ZA
φ15.5
□K
C
φL
Link Lever (Prepared by Customer)
Lever Direction : type C
Z
4-φR
Spot Facing φQ

Lock Port : Rc1/8 Thread※2
R1/8 Thread Plug (Included)
(Only for option A :
 Speed Control Valve Port)
Lever Direction type R

Recommended Lock Position
Lock Stroke※6
AC
AA
AG°
1-φAD
Full Stroke
Recommended Stroke
Idle Stroke
T
V
X
2-φAE
Y
12°
φU
AB
W ±0.4
S※1
G
M
A
E
F
φD −0.1 −0.2

Lock Port : O-ring (Included)
(Option -A / -G)
Nx
Ny Ny
Release Port : O-ring (Included)
(Option -A / -G)

Notes：
※1. Mounting bolts are not provided. Please prepare them
 according to the mounting height referring to dimension 'S'.
※2. Speed control valve is sold separately. Please refer to P.53.
 1. Please use the attached pin (equivalent to φADf6, φAEf6, HRC60)
  as the mounting pin for lever.

◉ Machininig Dimensions of Mounting Area

Release Port φP ※5
Nx ※5
Ny ※5
Ny ※5
Lock Port φP ※5
4-CA Thread ※3
□K

Remove all burrs ※5
φD +0.3 0
Rz6.3 ※5
C0.6
※4
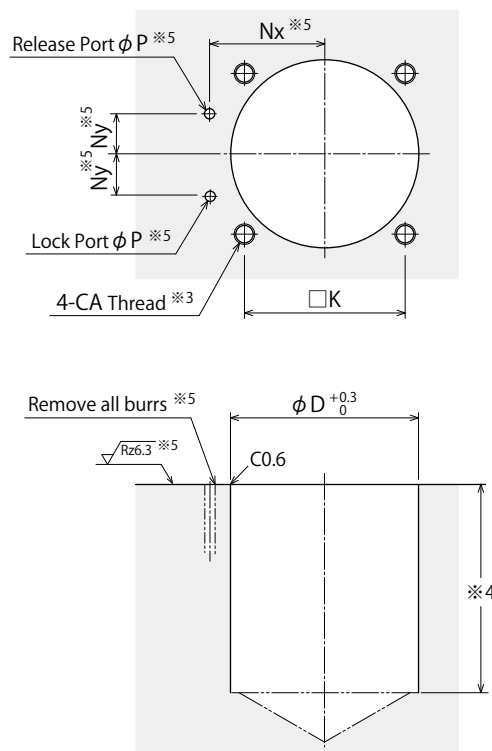
Notes：
※3. CA tapping depth of the mounting bolt should
 be decided according to the mounting height
 referring to dimension 'S'.
※4. The depth of the body mounting hole φD should
 be decided according to the mounting height
 referring to dimension 'F'.
※5. The machining dimension is for -A/-G：Gasket Option.

◉ Piping Method

G：Gasket Option (with R Thread Plug)
※The drawing shows the locked state of WCG-2GC.

2-R1/8 Thread Plug
(Included)
max.1.5mm

S：Piping Option (Rc Thread)
※The drawing shows the locked state of WCG-2SC.

Release Port
Rc1/8 Thread

Lock Port
Rc1/8 Thread

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◉ Model No. Indication

（Format Example：WCG1000-2AR, WCG2500-2SL）

WCG **160** 0 – 2 $\begin{smallmatrix}A\\G\\S\end{smallmatrix}$ $\begin{smallmatrix}L\\C\\R\end{smallmatrix}$

1 2 3 4

1 Cylinder Force

2 Design No.

3 Piping Method

4 Lever Direction

5 Action Confirmation (When Blank is chosen)

◉ External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.		WCG1000-2□□	WCG1600-2□□	WCG2500-2□□	WCG4000-2□□
(Break down)	Full Stroke	22	23.5	27.5	33
	Idle Stroke	18	19.5	23.5	29
	Lock Stroke ※6	4	4	4	4
Recommended Stroke		20	21.5	25.5	31
A		131.5	143.5	169	197.5
B		60	66	76	87
C		50	56	66	78
D		46	54	64	77
E		93	99.5	117	133
F		68	74.5	87	103
G		25	25	30	30
H		35	38	43	48
J		25	28	33	39
K		39	45	53	65
L		79	88	98	113
M		11	11	11	11
Nx		28	31	36	41
Ny		10	13	15	20
P		max. ϕ5	max. ϕ5	max. ϕ5	max. ϕ5
Q		9.5	9.5	11	11
R		5.5	5.5	6.8	6.8
S		14	13.5	16	15
T		33	36	40	50.5
U		14	14	16	20
V		27	30	34	42.5
W		36	37.5	43.5	49
X		18.5	21	26.5	31
Y		11	13	16	18
Z		15	16	19	25
AA		19.5	21	25	30
AB		66.4	70.5	84	93.4
AC		42.3	46	55.8	64.4
AD		5	6	6	8
AE		5	6	8	10
AG		30°	29.7°	29.8°	29.8°
CA (Nominal × Pitch)		M5×0.8	M5×0.8	M6×1	M6×1
ZA (Chamfer)		R5	R5	R6	R6
O-ring (Option A/G)		1BP7	1BP7	1BP7	1BP7
Weight ※7　　kg		0.6	0.9	1.5	2.4

Notes : ※6. 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.)
※7. It shows the weight of single clamp without the link lever.

● External Dimensions

A：Gasket Option (With Ports for Speed Controller：R-Thread Plug Included)
※The drawing shows the locked state of WCG-2ACT.

max.17

B

H   J

Release Port：Rc1/8 Thread ※2
R1/8 Thread Plug (Included)
(Only for option A：
Speed Control Valve Port)

Lever Direction
type L

2-ZA

φ15.5

φ L

□K

C

Link Lever (Prepared by Customer)
Lever Direction: type C

Z

4-φR
Spot Facing φQ

Lock Port：Rc1/8 Thread ※2
R1/8 Thread Plug (Included)
(Only for option A：
Speed Control Valve Port)

Lever Direction
type R

Recommended
Lock Position

Lock Stroke ※7

Full Stroke

Recommended Stroke

Idle Stroke

AC

AA

AG°

1-φAD

2-φAE

12°

φU

M

S ※1

Y

X

W ±0.4

AB

T

V

G

A

E

F

φD −0.1 −0.2

Head Cover ※3

UA

UC

φUB

2-φUF
Auto Switch Installation Slot

Lock Port：O-ring (Included)
(Option -A / -G)

Nx

UE

UH

Ny Ny

Ny Ny

UD UG

2-M3×0.5 Thread Depth 6 ※3

Release Port：O-ring (Included)
(Option -A / -G)

UJ

Notes：
※1. Mounting bolts are not provided. Please prepare them
according to the mounting height referring to dimension 'S'.
※2. Speed control valve is sold separately. Please refer to P.53.
※3. The direction of the Head Cover is not as indicated in the drawing.
Adjust the direction as you need.
Use M3 tapped holes on the bottom to fix the head cover with bracket.
1. Please use the attached pin (equivalent to φADf6, φAEf6, HRC60)
as the mounting pin for lever.

● Machininig Dimensions of Mounting Area

Release Port φP ※6

Nx ※6

Ny ※6 Ny ※6

Lock Port φP ※6

4-CA Thread ※4

□K

Remove all burrs ※6

φD +0.3 0

Rz6.3 ※6

C0.6

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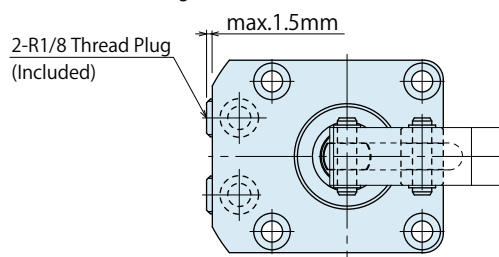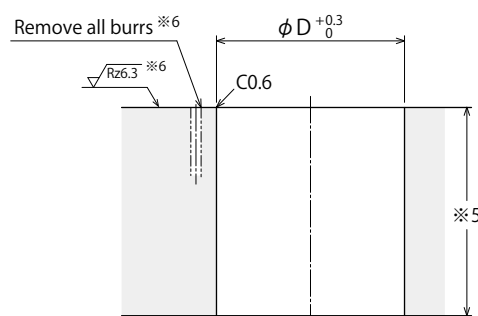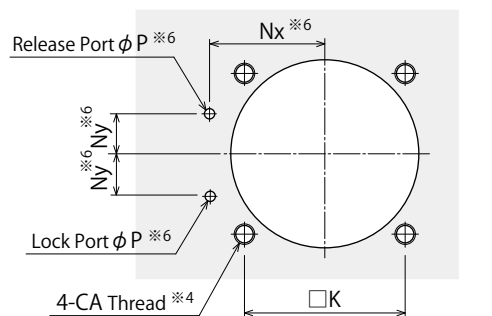
Notes：
※4. CA tapping depth of the mounting bolt should
be decided according to the mounting height
referring to dimension 'S'.
※5. The depth of the body mounting hole φD should
be decided according to the mounting height
referring to dimension 'F'.
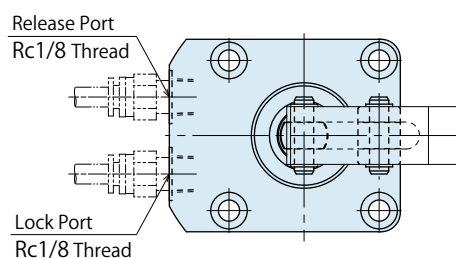※6. The machining dimension is for -A/-G：Gasket Option.

● Piping Method

G：Gasket Option (with R Thread Plug)
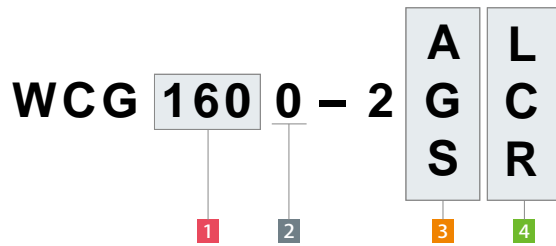※The drawing shows the locked state of WCG-2GCT.
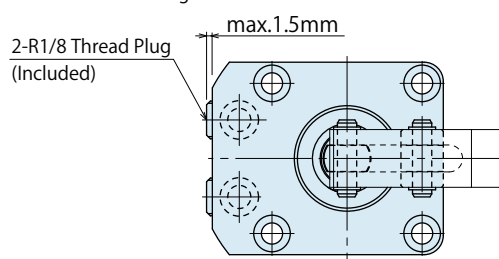
max.1.5mm

2-R1/8 Thread Plug
(Included)

S：Piping Option (Rc Thread)
※The drawing shows the locked state of WCG-2SCT.

Release Port
Rc1/8 Thread

Lock Port
Rc1/8 Thread

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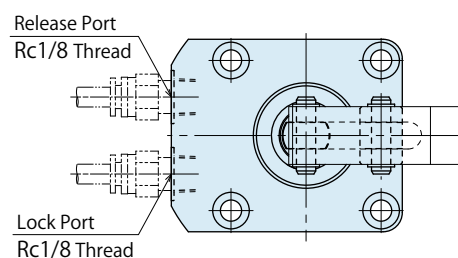
◉ Model No. Indication
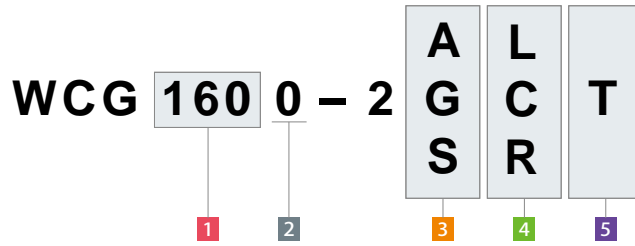
（Format Example：WCG1000-2ART, WCG2500-2SLT）

WCG [160] 0 – 2 [A G S] [L C R] [T]

1　2　　　　3　4　5

1 Cylinder Force
2 Design No.
3 Piping Method
4 Lever Direction
5 Action Confirmation (When T is chosen)

◉ External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	WCG1000-2□□T	WCG1600-2□□T	WCG2500-2□□T	WCG4000-2□□T
Full Stroke	22	23.5	27.5	33
(Breakdown) Idle Stroke	18	19.5	23.5	29
Lock Stroke ※7	4	4	4	4
Recommended Stroke	20	21.5	25.5	31
A	131.5	143.5	169	197.5
B	60	66	76	87
C	50	56	66	78
D	46	54	64	77
E	93	99.5	117	133
F	68	74.5	87	103
G	25	25	30	30
H	35	38	43	48
J	25	28	33	39
K	39	45	53	65
L	79	88	98	113
M	11	11	11	11
Nx	28	31	36	41
Ny	10	13	15	20
P	max. ϕ5	max. ϕ5	max. ϕ5	max. ϕ5
Q	9.5	9.5	11	11
R	5.5	5.5	6.8	6.8
S	14	13.5	16	15
T	33	36	40	50.5
U	14	14	16	20
V	27	30	34	42.5
W	36	37.5	43.5	49
X	18.5	21	26.5	31
Y	11	13	16	18
Z	15	16	19	25
AA	19.5	21	25	30
AB	66.4	70.5	84	93.4
AC	42.3	46	55.8	64.4
AD	5	6	6	8
AE	5	6	8	10
AG	30°	29.7°	29.8°	29.8°
CA (Nominal × Pitch)	M5×0.8	M5×0.8	M6×1	M6×1
ZA (Chamfer)	R5	R5	R6	R6
UA	43	45.5	50.5	55.5
UB	27	27	30	30
UC	38.5	40	44	49.5
UD	9.5	9.5	11	11
UE	7	7	7	7
UF	4.3	4.3	4.3	4.3
UG	12.1	12.1	13.6	13.6
UH	3	3	3	3
UJ	20	20	22	22
O-ring (Option A/G)	1BP7	1BP7	1BP7	1BP7
Weight ※8　kg	0.7	1.0	1.6	2.6

Notes : ※7. 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.)
※8. It shows the weight of single clamp without the link lever.

Link Lever Design Dimension

※ Reference for designing link lever.
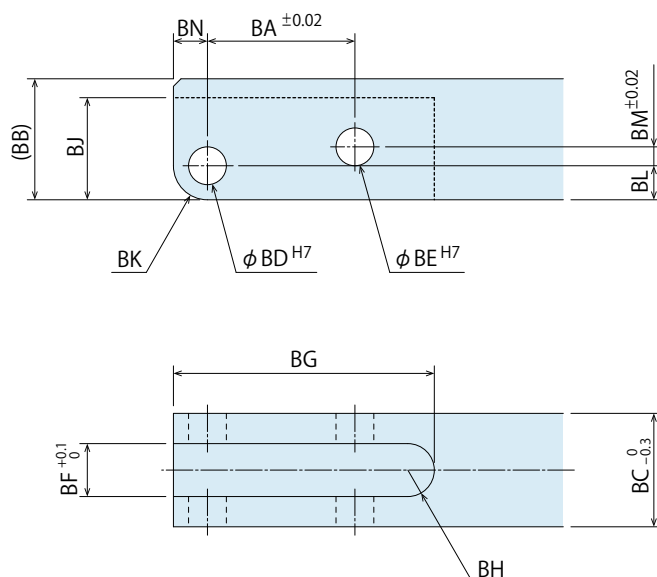
Calculation List of Link Lever Design Dimension (mm)

Corresponding Model No.	WCG1000	WCG1600	WCG2500	WCG4000
BA	19.5	21	25	30
BB	16	20	24	30
BC	15	16	19	25
BD	$5 \, {}^{+0.012}_{0}$	$6 \, {}^{+0.012}_{0}$	$6 \, {}^{+0.012}_{0}$	$8 \, {}^{+0.015}_{0}$
BE	$5 \, {}^{+0.012}_{0}$	$6 \, {}^{+0.012}_{0}$	$8 \, {}^{+0.015}_{0}$	$10 \, {}^{+0.015}_{0}$
BF	7	7	8	12
BG	35.5	39.5	46	56
BH	R3.5	R3.5	R4	R6
BJ	13.5	17	21	26.5
BK	R4.5	R6	R6	R8
BL	4.5	6	6	8
BM	2.5	3.5	6	7.5
BN	4.5	6	6	8

Notes:

1. 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 ϕ ADf6, ϕ AEf6, HRC60) as the mounting pin for lever.

   (Please refer to each external dimension of WCG for the dimensions ϕ AD and ϕ AE.)

Locating
Pin Clamp
SWP

High-Power
Welding
Swing Clamp
WHG

**High-Power
Welding
Link Clamp**
WCG

Air Flow
Control Valve
BZW

Manifold
Block
WHZ-MD

General Cautions

Welding
Related Products

Quick Die
Change Systems

Company Profile
Sales Offices

◉ Accessories：Material Link Lever

Model No. Indication

WCZ $\boxed{160}$ 0 – L3

Size
(Refer to following table)

Design No.
(Revision Number)

(mm)
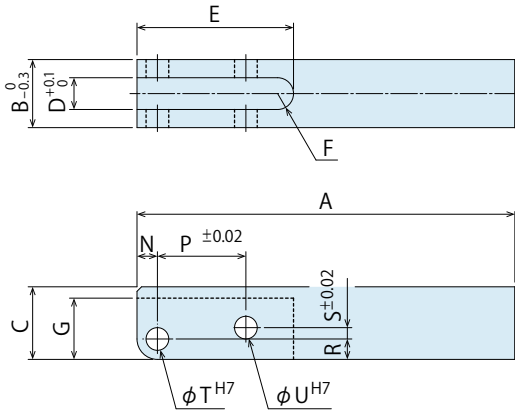
Model No.	WCZ1000-L3	WCZ1600-L3	WCZ2500-L3	WCZ4000-L3
Corresponding Model No.	WCG1000	WCG1600	WCG2500	WCG4000
A	90	100	115	140
B	15	16	19	25
C	16	20	24	30
D	7	7	8	12
E	35.5	39.5	46	56
F	R3.5	R3.5	R4	R6
G	13.5	17	21	26.5
N	4.5	6	6	8
P	19.5	21	25	30
R	4.5	6	6	8
S	2.5	3.5	6	7.5
T	$5^{+0.012}_{0}$	$6^{+0.012}_{0}$	$6^{+0.012}_{0}$	$8^{+0.015}_{0}$
U	$5^{+0.012}_{0}$	$6^{+0.012}_{0}$	$8^{+0.015}_{0}$	$10^{+0.015}_{0}$

Notes :

1. Material　S45C
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.
   (Refer to the external dimensions for ϕAD, ϕAE)

## ◉ Cautions

● Notes for Design

1) Check Specifications
● Please use each product according to the specifications.
● The mechanical lock mechanism of this clamp maintains clamping force and holding force even when air pressure falls to zero. (Refer to "Clamping Force and Holding Force Curve at 0MPa" .)

2) Notes for Circuit Design
● Ensure there is no possibility of supplying air pressure to the lock and release ports simultaneously. Improper circuit design may lead to malfunctions and damages.

3) Do not apply offset load.
● Do not apply offset load on the link part.
The point of load (clamping point) should be within the width of the link lever.
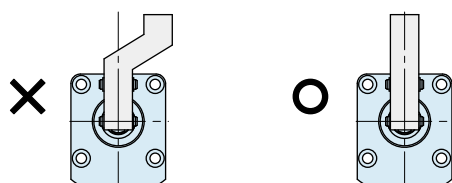
4) Notes for Link Lever Design
● Make sure no force except from the axial direction is applied to the piston rod. The usage like the one shown in the drawing below will apply a large bending stress to the piston rod and must be avoided.
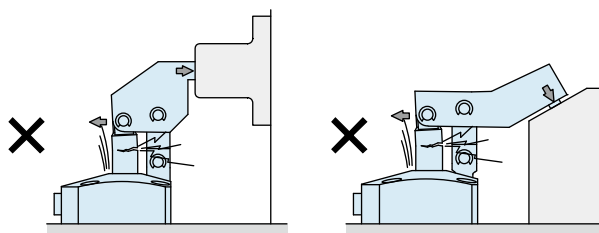
5) When clamping on a sloped surface of the workpiece
● Make sure the clamping surface and the mounting surface of the clamp are parallel.
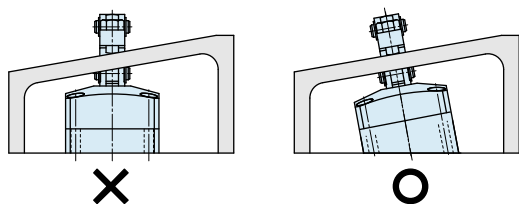
6) When using in a dry environment
● The link pin may dry out. Grease it periodically or use a special pin. Contact us for the specifications for the special pin.

7) Adjust the direction of the head cover as you need.
Use M3 tapped holes on the bottom to fix the head cover with bracket.

Auto Switch
Bracket
Head Cover
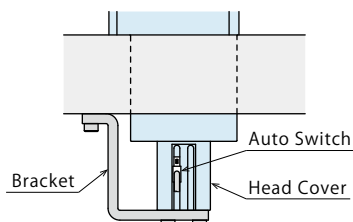
8) Speed Adjustment
● If the clamp operates too fast the parts will wear out and become damaged more quickly leading to equipment failure. Do not adjust with a meter-out valve outside the cylinder because there is an orifice of meter-out connected internally. (The operating time of mechanical locking system 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 isn't malfunction.
(Please note that the above condition will occur when you have to adjust operating time over 1.0 second.)

Meter-in
Release
Lock
Meter-in
Recommended Circuit
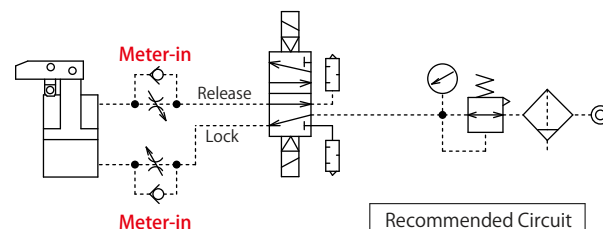
Please set one speed controller (meter-in) to each clamp when operating multiple clamps simultaneously.
When large thrust force is applied to the releasing direction in releasing action, install a meter-out speed controller to the lock port side for speed adjustment.

Release
Meter-out
Lock
Meter-in
For Controlling Release Operation
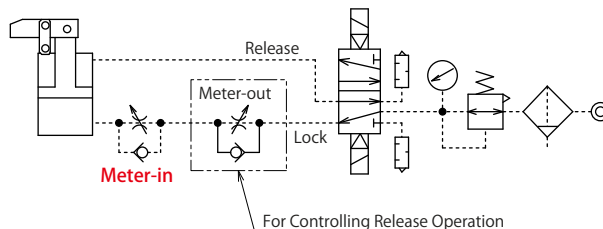
9) The specification value will not be fulfilled when clamping out of the lock stroke (mechanical lock stroke) range.
● When the center of link pin hole of piston rod clamps out of the lock stroke range, the mechanical lock function does not work. As a result, the specification value of clamping force and holding force will not be fulfilled. Moreover, there will be no clamping or holding force at 0MPa air pressure.

Link Pin Hole
Center of a Piston
Lock Stroke Range
(Mechanical Lock Stroke Range)
Actual Stroke
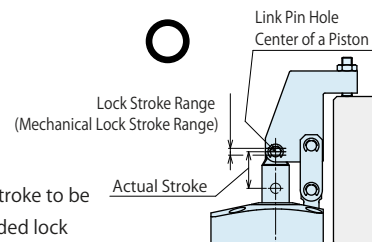
Make sure the actual stroke to be ±2 mm of recommended lock position. (The specification value will be fulfilled since the center of link pin hole of piston rod is within the lock stroke (mechanical lock stroke) range.

Locating
Pin Clamp

SWP

High-Power
Welding
Swing Clamp

WHG

**High-Power
Welding
Link Clamp**

WCG

Air Flow
Control Valve

BZW

Manifold
Block

WHZ-MD

General Cautions

Welding
Related Products

Quick Die
Change Systems

Company Profile
Sales Offices

● 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.
 Wrapping in the wrong direction will cause air leakage and malfunction.
● 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 hexagon socket bolts
 (with tensile strength of 12.9) and tighten them with the torque
 shown in the table below. Tightening with greater torque than
 recommended can depress the seating surface or break the bolt.

Model No.	Thread Size	Tightening Torque (N・m)
WCG1000	M5×0.8	6.3
WCG1600	M5×0.8	6.3
WCG2500	M6×1	10
WCG4000	M6×1	10

5) Installation of the Speed Control Valve
● Tightening torque for speed controll valve : 5 to 7 N・m.

6) 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 snap ring
 groove on the pin.

7) Speed Adjustment
● Adjust the speed so that the operating time is within 0.5 sec.
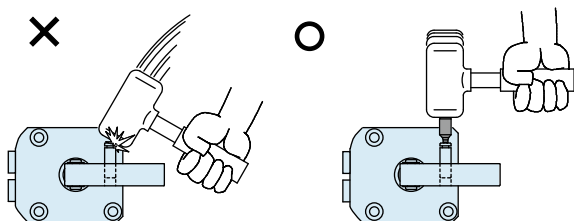 If the clamp operates too fast the parts will wear out leading to
 premature damage and ultimately complete equipment failure.
● Turn the speed control valve gradually from the low-speed side
 (small flow) to the high-speed side (large flow) to adjust the speed.

8) Checking Looseness and Retightening
● At the beginning of 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.

Do Not Operate Manually
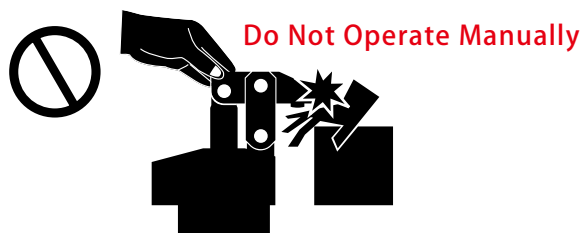
10) Cautions for Trial Operation
● If air pressure with large flow rate is supplied just after installation,
 operating time will be extremely fast leading to severe damage on
 the clamp. Install a meter-in speed controller near the air source
 and supply air pressure gradually.

※ **Please refer to P.57 for general cautions.** ・Notes on Handling ・Maintenance/Inspection ・Warranty

◎ Cautions

● Notes on Handling

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

2) Do not handle or remove the product unless the safety protocols are ensured.
① The machine and equipment can only be inspected or prepared when it is confirmed that the preventive devices are in place.
② Before the product is removed, make sure that the above-mentioned safety measures 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 the clamp (cylinder) while it is working. Otherwise, your hands may be injured due to clinching.
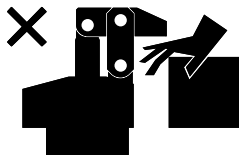
4) Do not disassemble or modify.
● If the product is taken apart or modified, the warranty will be voided even within the warranty period.

● Maintenance and Inspection

1) Removal of the Product and Shut-off of Pressure Source
● Before the product is removed, make sure that safety measures 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.
● If it is used when the surface is contaminated with dirt, it may lead to packing seal damage, malfunctioning, fluid leakage and air leaks.
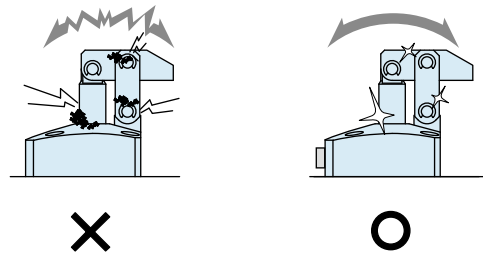
3) Regularly tighten pipings, mounting bolts, nuts, snap rings and cylinders to ensure proper use.

4) Make sure there is smooth action and no abnormal noise.
● Especially when it is restarted after left unused for a long period, make sure it can be operated correctly.

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 handled in inappropriate way by the operator.
(Including damage caused by the misconduct of the third party.)
④ If the defect is caused by reasons other than our responsibility.
⑤ If repair or modifications are carried out by anyone other than Kosmek, or without our approval and confirmation, it will void warranty.
⑥ Other caused by natural disasters or calamities not attributable to our company.
⑦ Parts or replacement expenses due to parts consumption and deterioration.
(Such as rubber, plastic, seal material and some electric components.)

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

Air Flow Control Valve

Model **BZW**

Directly mounted to clamps, easy adjusting

● **Directly Mounted to Clamps**

BZW is the flow control valve for Rc thread that enable to
mount to the piping method : option -A of WHG/WCG.
It is best used in a circuit where the flow control valve cannot
be mounted or if necessary to synchronize individual speed.

Adjusting Screw   Lock Nut
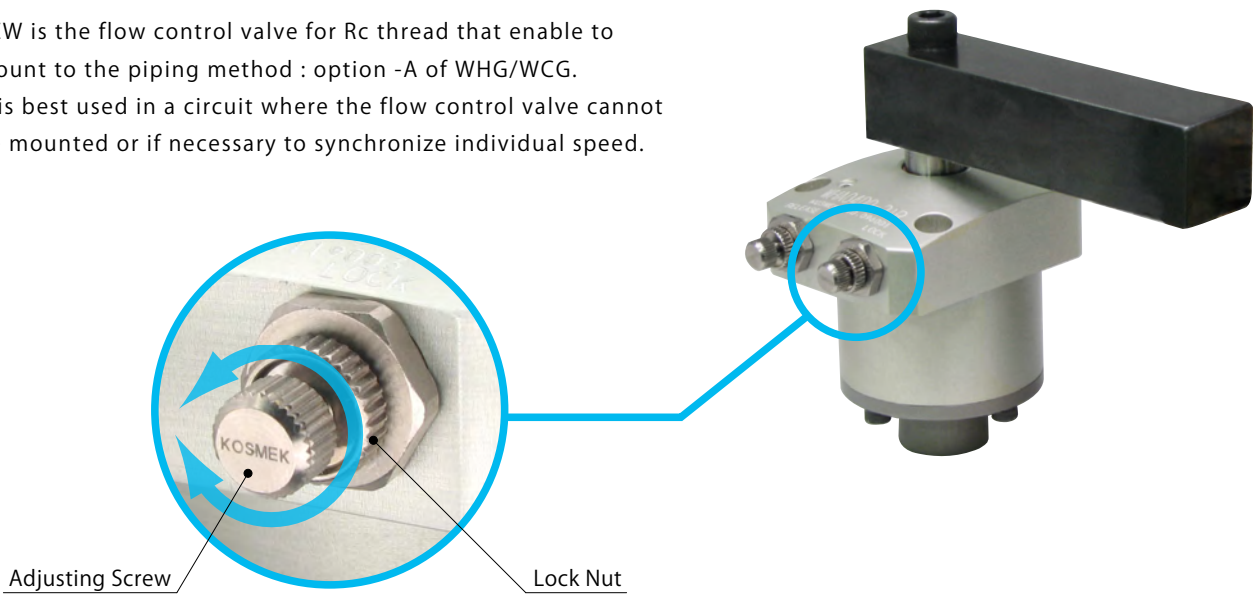
Corresponding Product Model

Clamp	BZW Model No.	Clamp Model No.
High-Power Welding Link Clamp	BZW0100-**A**	WCG☐0-2 A ☐
High-Power Welding Swing Clamp	BZW0100-**B**	WHG☐0-2 A ☐

Corresponding to piping method -A option.

※ When mounting BZW to piping method G,
take off R thread plug and remove the seal
tape not to get inside cylinder.

Model No. Indication

BZW 010 0 – B

Control Method
B : Meter-out
A : Meter-in

Design No.
0 : Revision Number

R Thread Size
010 : Rc1/8

Specifications

| Model No.	BZW0100-B	BZW0100-A
Control Method	Meter-out	Meter-in
Operating Pressure MPa	0.1 ~ 1.0	
Withstanding Pressure MPa	1.5	
Adjust Screw Number of Rotations	10 Rotations	
Tightening Torque N・m	5 ~ 7	
Corresponding Model No.	WHG□–2A□	WCG□–2A□

Circuit Symbol

BZW0100-B：Meter-out

P1 Port
Air Source Side
(Incoming Side)

P2 Port
Clamp Side
(Outgoing Side)

BZW0100-A：Meter-in

P1 Port
Air Source Side
(Incoming Side)

P2 Port
Clamp Side
(Outgoing Side)

External Dimensions

(Pneumatic Clamp)
Adjusting Screw
Lock Nut
O-ring (Included)
(Rc1/8)

ϕ15.5
ϕ11
ϕ8

Packing
BZW-B (Mounting
direction of BZW-A
is opposite.)

KOSMEK

Close Open

Hexagon 14

4   3.5
11.5 ~ 17

Flow Rate Graph

BZW0100-B/BZW0100-A common

Controlled Flow Direction

Flow Rate   [L/min(ANR)]

120
100
80
60
40
20
0

Pressure Loss 0.5MPa
Pressure Loss 0.4MPa
Pressure Loss 0.3MPa
Pressure Loss 0.2MPa

0 1 2 3 4 5 6 7 8 9 10
←Close   Adjust Screw Number of Rotations [Rotations]   Open→

Free Flowing Direction

Flow Rate   [L/min(ANR)]

120
100
80
60
40
20
0

Fully opened
Fully closed

0   0.1   0.2   0.3   0.4   0.5
Pressure Loss   [MPa]

Machining Dimensions of Mounting Area

14.8 or less
8.8 ±0.1
0.7 +0.1 / 0
⊥ 0.01 A
◎ ϕ0.01 A
0.1 or less
C0.1
ϕ13.8 H7 +0.018 / 0
ϕ10 or less
(ϕ8.2)
20°
Rz6.3
P2 Port
Clamp Side
(Outgoing Side)
ϕ7.8 ±0.02
Rz6.3
Remove all burrs
A
ϕ2.5 ~ 3.5
45°
Rc1/8 Thread
Prepared Hole 8.2 +0.1 / 0
6.3
P1 Port
Air Pressure Supply Side
(Incoming Side)

Notes :
1. Since the $\sqrt{\text{Rz6.3}}$ 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 and P2 port as the clamp side.

Manifold Block

Model **WHZ-MD**

- **Manifold Block**

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

Clamp

Manifold Block

Manifold Block

Workpiece

Fixture Base

KOSMEK
Harmony in Innovation
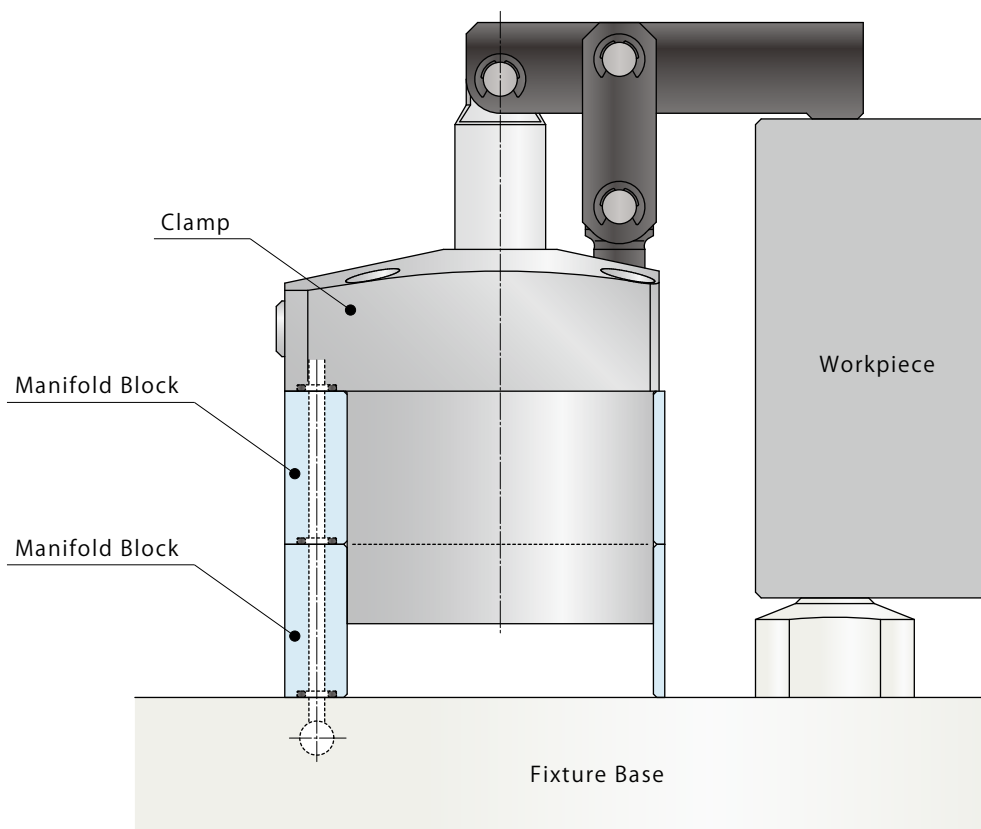
Applicable Model

Manifold Block Model No.	Corresponding Item Model No.	
Model WHZ-MD	Model WCG	Model WHG

◎ Manifold Block for WCG/WHG

Model No. Indication

WHZ 048 0 – MD

Size
(Refer to
following table)

Design No.
(Revision Number)
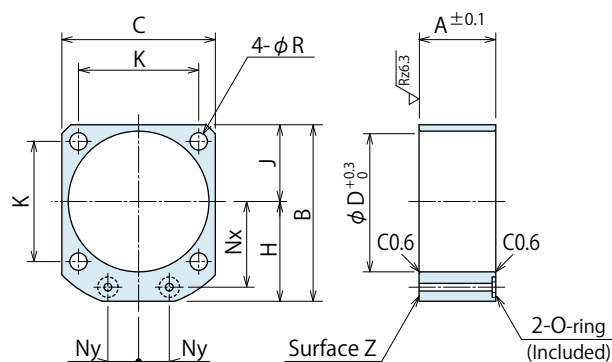
(mm)

Model No.	WHZ0320-MD	WHZ0400-MD	WHZ0500-MD	WHZ0630-MD
Corresponding Item Model Number	WCG1000 WHG1000	WCG1600 WHG1600	WCG2500 WHG2500	WCG4000 WHG4000
A	25	27	31	35
B	60	67	77	88.5
C	50	58	68	81
D	46	54	64	77
H	35	38	43	48
J	25	29	34	40.5
K	39	45	53	65
Nx	28	31	36	41
Ny	10	13	15	20
R	5.5	5.5	6.5	6.5
O-ring	1BP7	1BP7	1BP7	1BP7
Weight kg	0.1	0.1	0.2	0.2

Notes :   1. Material：A2017BE-T4

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

3. If thickness other than A is required, perform additional machining on surface Z. Please refer to the drawing.
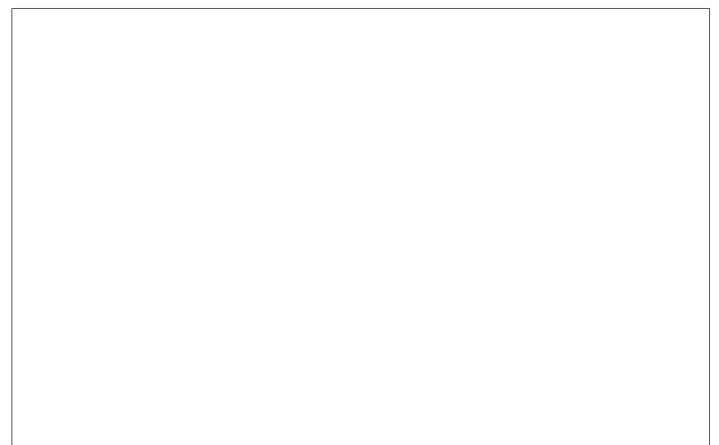
KOSMEK

Harmony in Innovation

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

ISO 9001
JQA-QMA10823
KOSMEK HEAD OFFICE

MS
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CM009