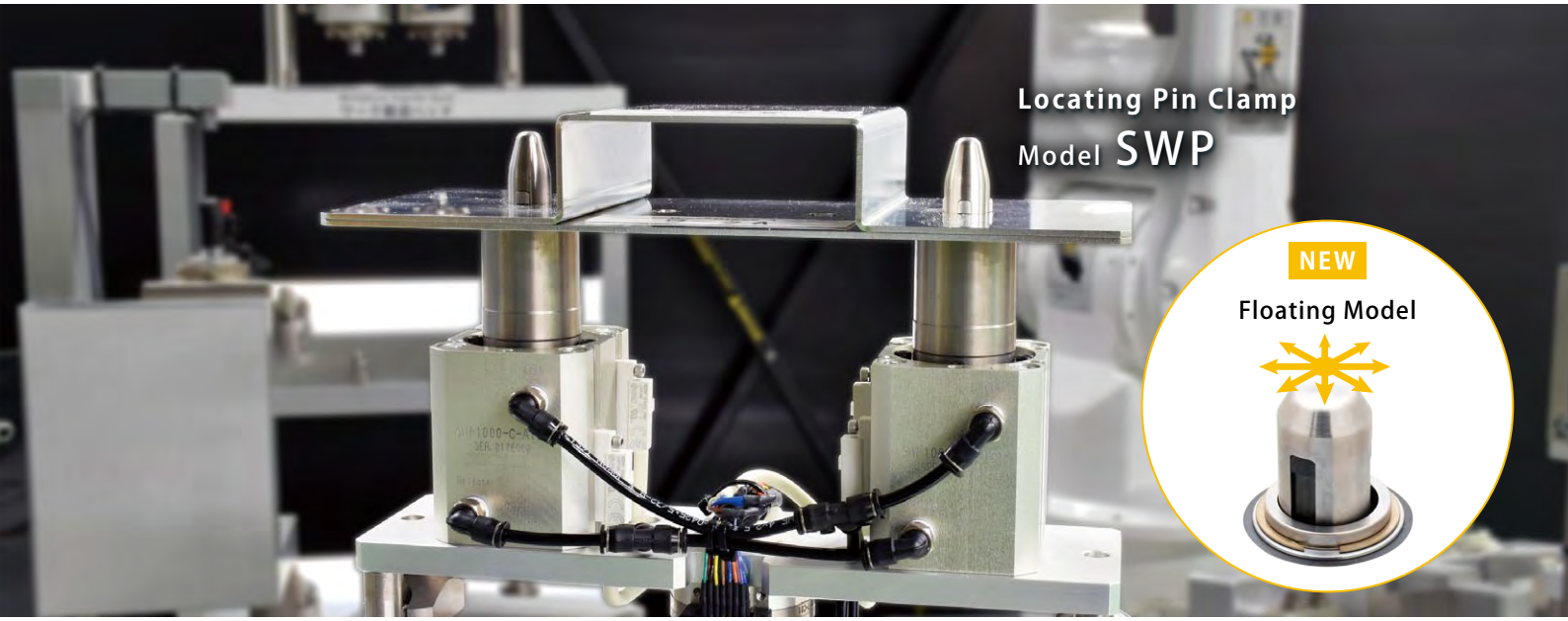
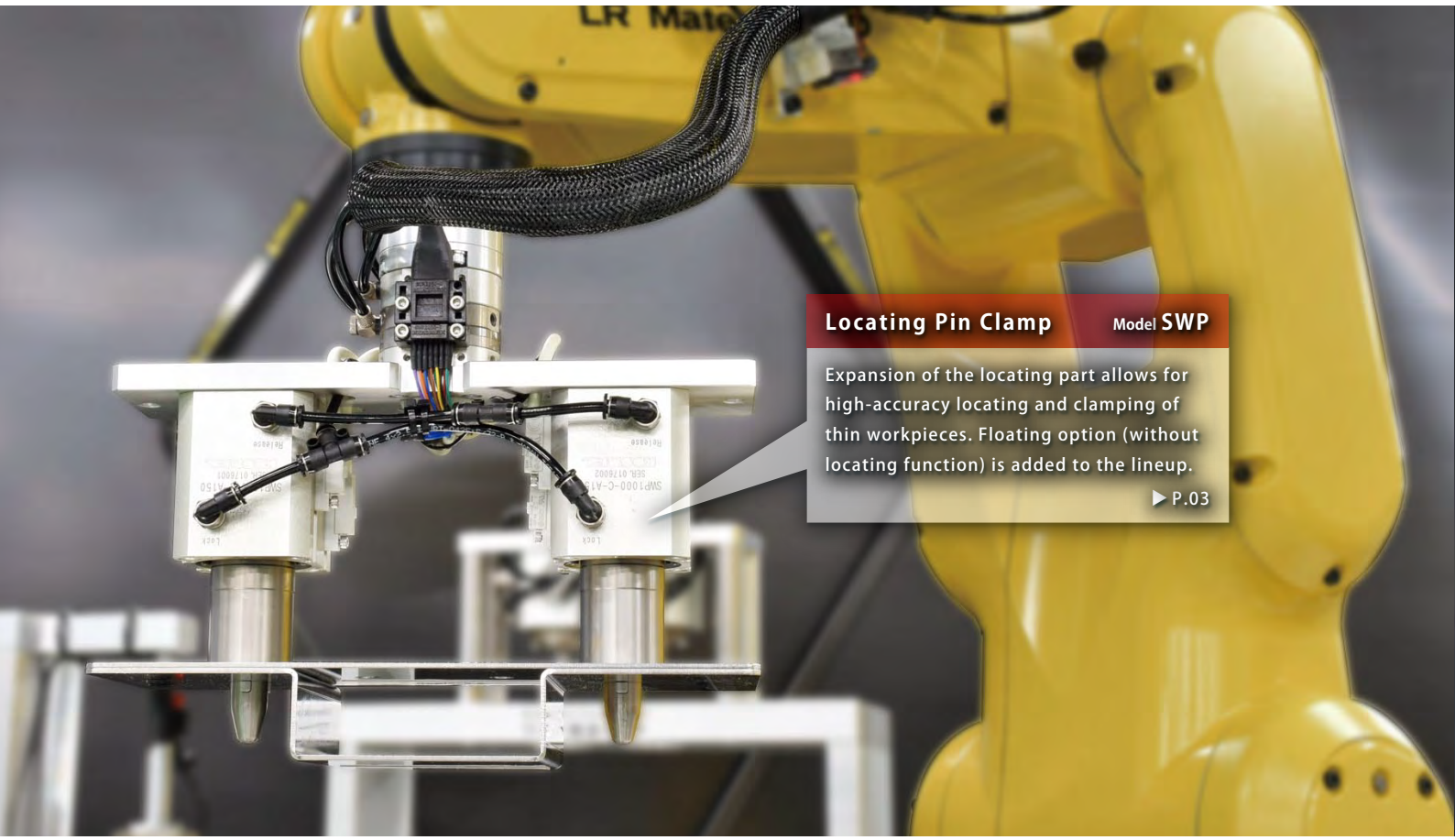
For setup improvement of welding applications

Kosmek Welding Products



KOSMEK
Harmony in Innovation



Locating Pin Clamp Model **SWP**

Expansion of the locating part allows for high-accuracy locating and clamping of thin workpieces. Floating option (without locating function) is added to the lineup.

▶ P.03

Spot Welding

Robotic Hand Changer Model **SWR**

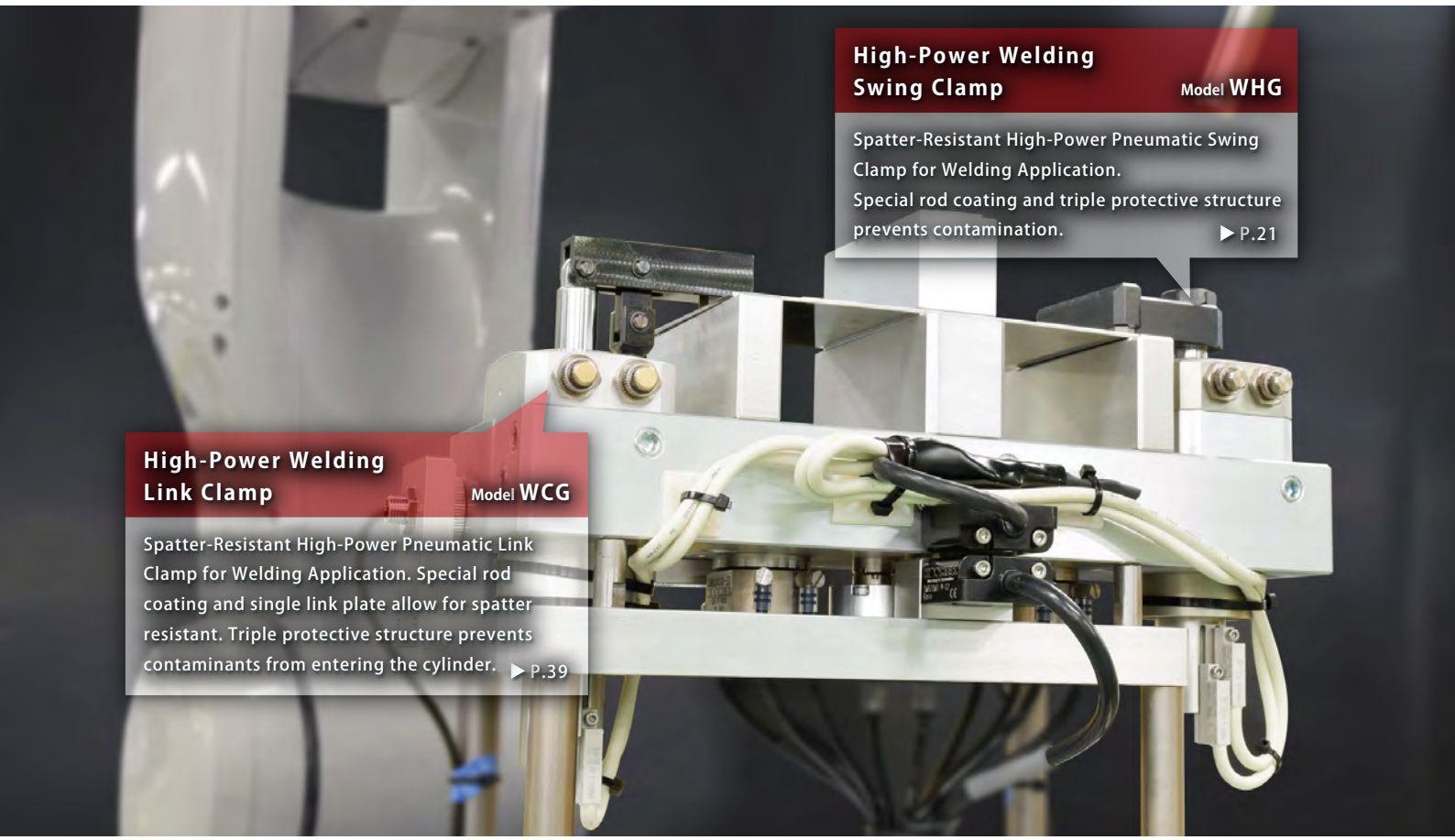
The World's Only Robotic Hand Changer with No Backlash
Secures the aimed position with 3 μm locating repeatability at connected state.

▶ P.65

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.69



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.21

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.39

Arc Welding

Compact Location Clamp
Model SWQ

For Pallet Exchange Automation.
Clamping and locating simultaneously with 3 μm locating repeatability
▶ P.73

Auto Coupler

Auto Coupler automatically connects air circuits to provide the air pressure to the pallet when the location clamp is locked.
▶ P.74

For Welding Application

Locating Pin Clamp

Model **SWP**

Locating Pin Clamp Description Video Available on Our Website

http://www.kosmek.co.jp/php_file/video_products.php?id=025&lang=2

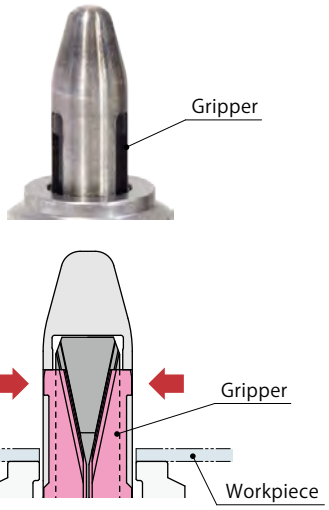
High Accuracy Locating and Clamping of Thin Workpieces

Applicable to Workpiece Hole Diameter ϕ8 or larger PAT.

Action Description

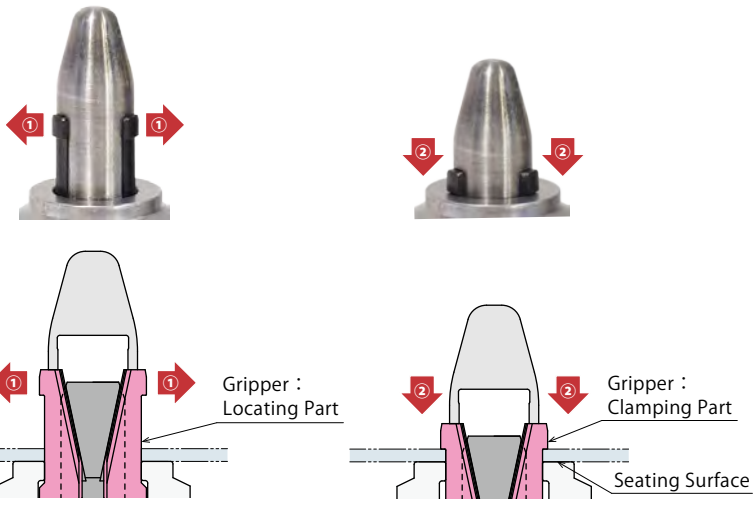
Release

Release Air ON | Lock Air OFF



Lock

Release Air OFF | Lock Air ON



Workpiece Loading / Unloading

Gripper is retracted. Workpiece loading/ unloading is smooth due to an adequate space between the workpiece hole and pin.

① Expanding Action

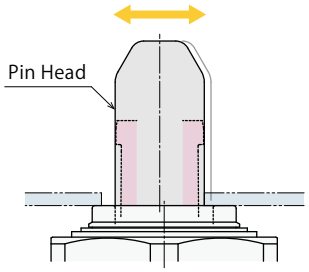
Gripper expands.

In case of Function **D**/**C** : Locating Function

A workpiece is located by the locating part.

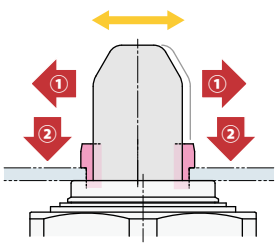
② Locking Action

Gripper pulls in the workpiece after locating, and the clamping part pulls the workpiece onto the seating surface for locking.



In case of Function **M** : Floating Function

The pin head floats following a workpiece hole.



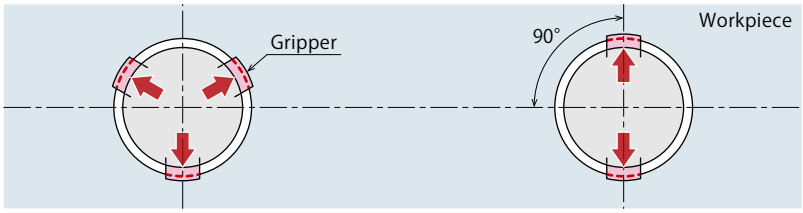
In case of Function **M** : Floating Function

The workpiece is locked with the pin head floating. (No locating function)

Function

Locating Function — Locating Repeatability：0.05 mm

As general locating pin, Locating Pin Clamp has two types:
Datum Locating Pin (round pin) and One-Direction Locating Pin (diamond pin).

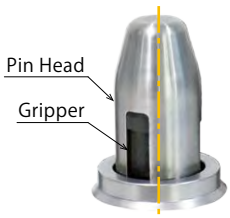


For Datum Locating (Equivalent to Round Pin)

Workpiece hole and gripper make contact at three points for datum locating.

For One Direction Locating (Equivalent to Diamond Pin)

Workpiece hole and gripper make contact, perpendicular to the reference hole, at two points for one-direction locating.

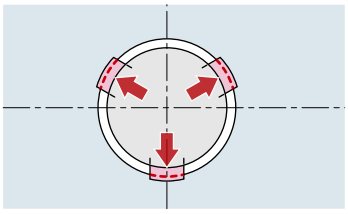


Pin Head：Fixed

Floating Function — Allowable Offset (Pin Head Floating Amount)：±0.8 mm※

In a released state, the pin head floats according to a workpiece hole. The pin head remains floated when a workpiece is securely clamped by the gripper (three parts). (No locating function)

※ It shows the allowable offset of body size **100**.
The allowable offset of body size **050** is ±0.6mm.

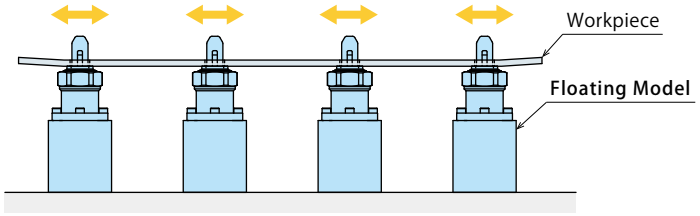


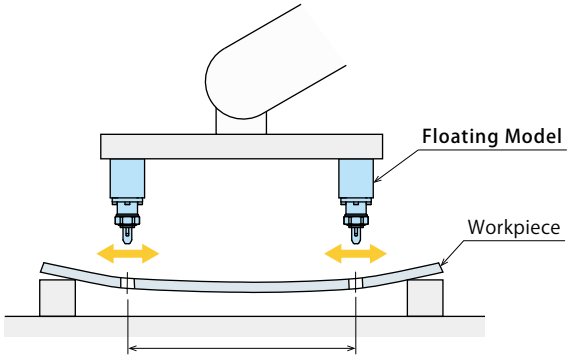
Pin Head：Floating

Application Examples of Floating Model

● In case there is a large variation in workpiece hole distance due to warp or flection of a workpiece.

Variation of workpiece hole distance can be absorbed by the floating function.

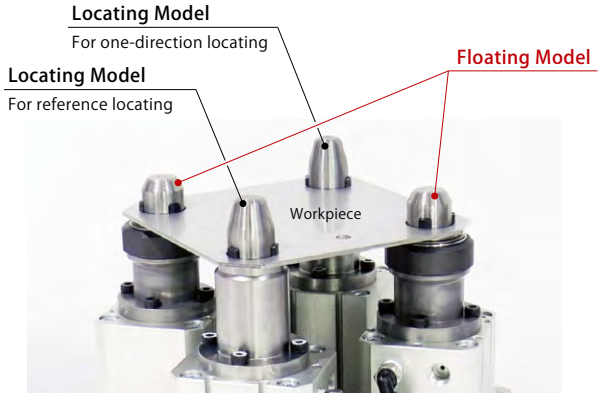




Variation of Workpiece Hole Distance due to Flection

● In case of locating with the locating model and requiring additional clamping force.

The floating model enables additional clamping force without interfering the locating model.



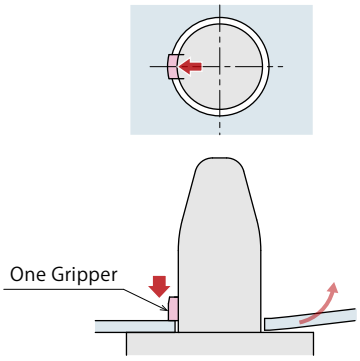
Description Video of the Floating Model Available on Our Website

http://www.kosmek.co.jp/php_file/video_products.php?id=083&lang=2

Features

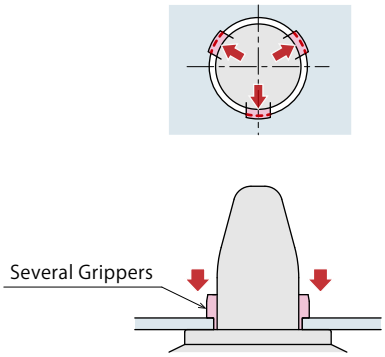
Stable Clamping

Gripper makes contact evenly, allowing for stable clamping.



Pin Clamp with One Gripper Only

Gripper force is concentrated only on one part, causing deformation of workpiece.



KOSMEK Locating Pin Clamp with Several Grippers

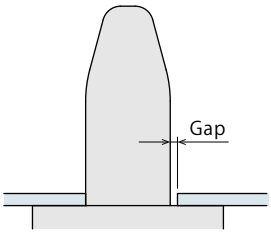
Three or two grippers press a workpiece hole evenly, so the force is distributed allowing for stable clamping.

High Accuracy

Expansion of locating part enables higher accuracy than general locating pin.

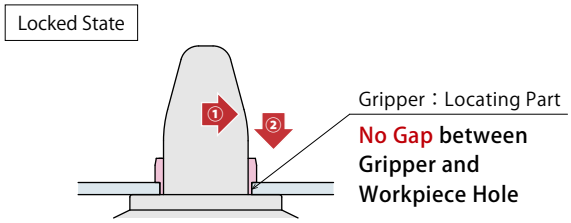
Locating Repeatability：0.05mm

※ In case of Locating Model (when combining Functions D and C) only.



General Locating Pin

Backlash caused by the gap between locating pin and workpiece hole lowers locating accuracy. Also, variance in tolerance of workpiece hole diameter creates variance in locating repeatability of each workpiece.

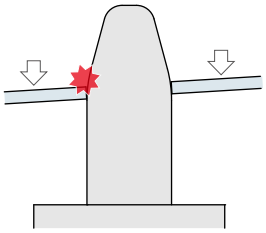


KOSMEK Locating Pin Clamp

Gripper expansion allows for high accuracy locating with no gaps. Variance in tolerance of workpiece hole diameter never affects locating accuracy.

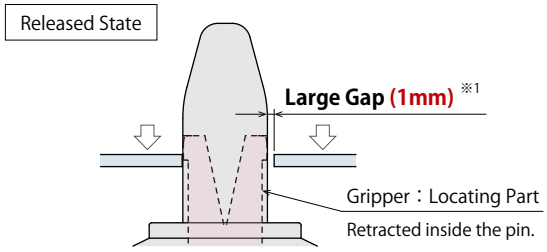
Work Efficiency

Smooth loading/unloading even with robots due to large gap between the pin and workpiece hole in a released state.



General Locating Pin

When making a gap smaller in order to improve locating accuracy, it becomes difficult to load/unload workpieces, causing frequent momentary stops of automated system. Also, wear of the pin lowers locating accuracy.

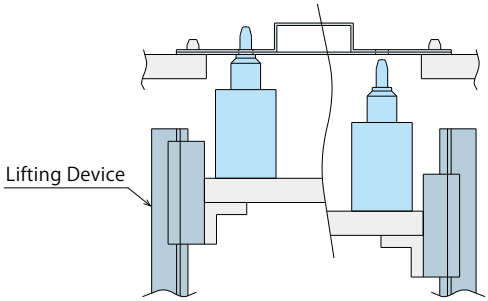


KOSMEK Locating Pin Clamp

Workpieces do not touch the grippers and are smoothly loaded/unloaded since the grippers are retracted inside the pin at released state.

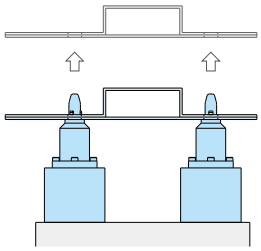
※1. The gap is 0.2mm for SWP0501-□-080/090-□ (Workpiece Hole Diameter ϕ8/9), and 0.5mm for SWP0501-□-100-□ (Workpiece Hole Diameter ϕ10). Refer to the specifications for further information.

● Fixture Cost Reduction



General Locating Pin

Because a gap between a locating pin and a workpiece hole is small, a lifting device may be required to pull out the workpiece stuck by welding distortion.

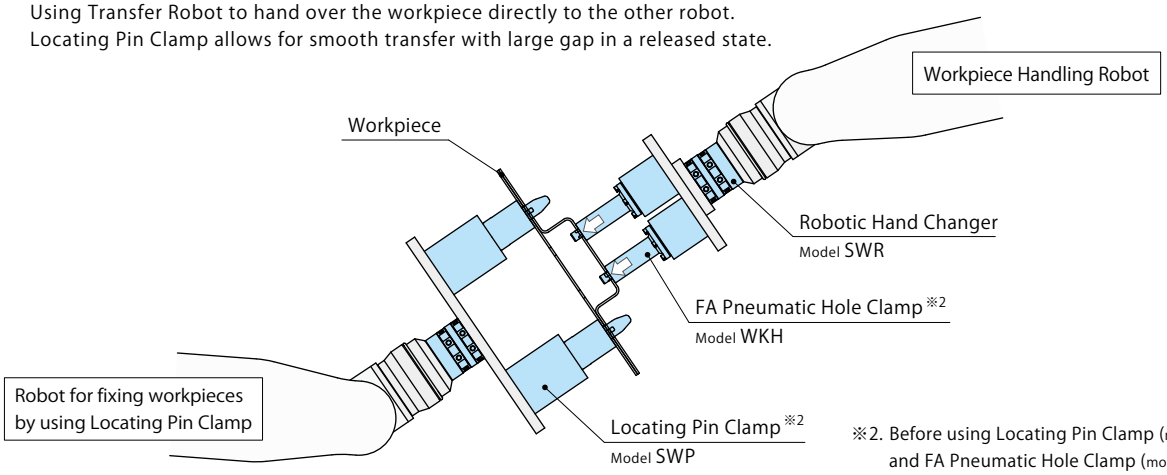


KOSMEK Locating Pin Clamp

Enables simple and low-cost equipment by smooth loading/unloading due to a large gap between Locating Pin Clamp and a workpiece hole.

● Smooth Workpiece Transfer with Expansion Pin Clamp for Dual Robot Systems

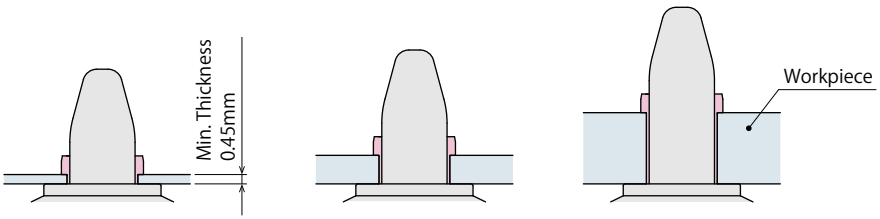
Application Example :
Using Transfer Robot to hand over the workpiece directly to the other robot.
Locating Pin Clamp allows for smooth transfer with large gap in a released state.



※2. Before using Locating Pin Clamp (model SWP) and FA Pneumatic Hole Clamp (model WKH): Make sure to test and ensure that there is no trouble such as workpiece deformation, etc.

Flexible Fixturing

Longer stroke allows for workpiece thickness variance and flexible fixturing.



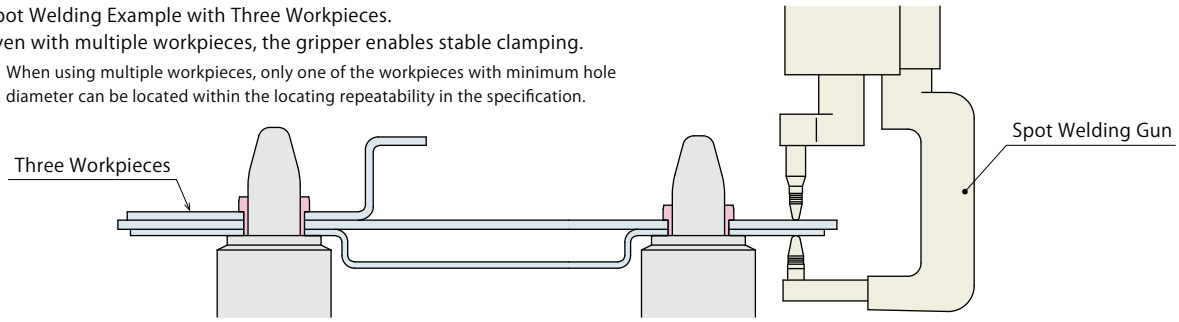
(mm)

Workpiece Hole Diam.	Lock Stroke
ϕ8	2.3
ϕ9	3.6
ϕ10	5.5
ϕ11	6
ϕ12	6.5
ϕ13	7
ϕ14	8.5
ϕ15	10
ϕ16	10
ϕ18	10
ϕ20	10

● Ability to Clamp Multiple Workpieces

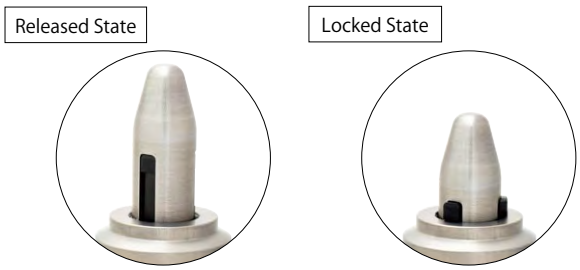
Spot Welding Example with Three Workpieces.
Even with multiple workpieces, the gripper enables stable clamping.

※ When using multiple workpieces, only one of the workpieces with minimum hole diameter can be located within the locating repeatability in the specification.



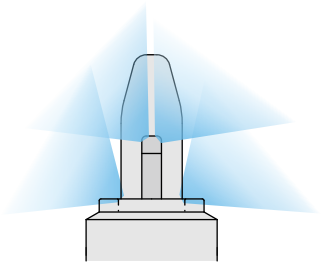
Anti-Contamination

Since the gap of clamping part is minimal, it keeps contaminants out even in a locked state. Also equipped with air blow function.



No Gap. Spatter Entering Protection

The pin itself goes down along with the gripper when locking, so there is hardly any gap at locked state, preventing contaminants.



Air Blow Function

Air blow keeps contaminants out.

Compact•Light

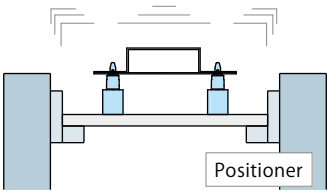
Short body allows for more compact and lighter applications.

Weight : 380 g

Ex. 1
SWP0501-D/C-100-□
(Workpiece Hole Diam. ϕ10)

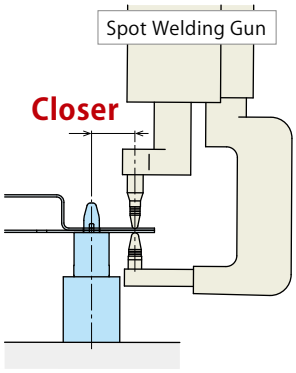
Weight : 700 g

Ex. 2
SWP1001-D/C-200-□
(Workpiece Hole Diam. ϕ20)



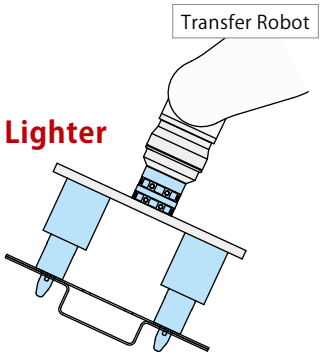
Less Load to Positioner

Light fixture with light Locating Pin Clamp reduces load to the positioner.



High Accessibility of Spot Welding Gun

Compact Locating Pin Clamp enables high accessibility of spot welding gun to a workpiece hole.

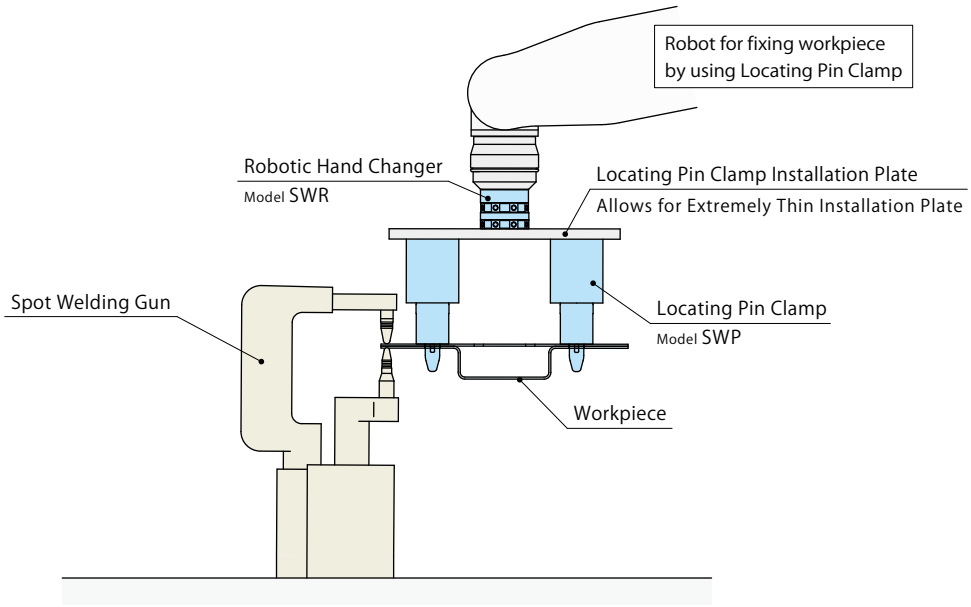


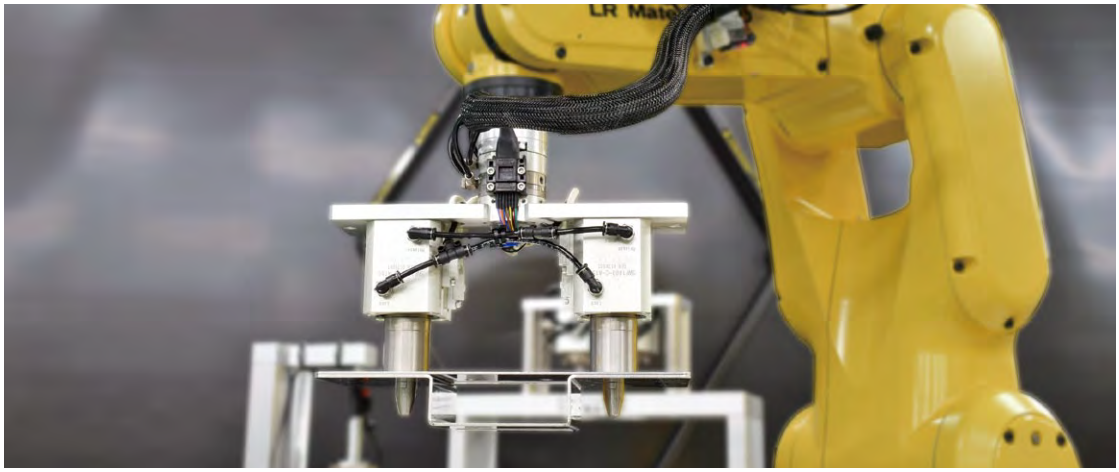
Compact and Light Transfer Hand

Compact and Light Locating Pin Clamp is also suitable for transferring thin plates.

● Compact and Light Locating Pin Clamp is also suitable for spot welding with a robot holding a workpiece.

Application Example for Work Efficiency and Space Saving：
One robot can both transfer and weld by using Locating Pin Clamp as a robotic hand.
Compact and light body improves operability and reduces a load to the robot.

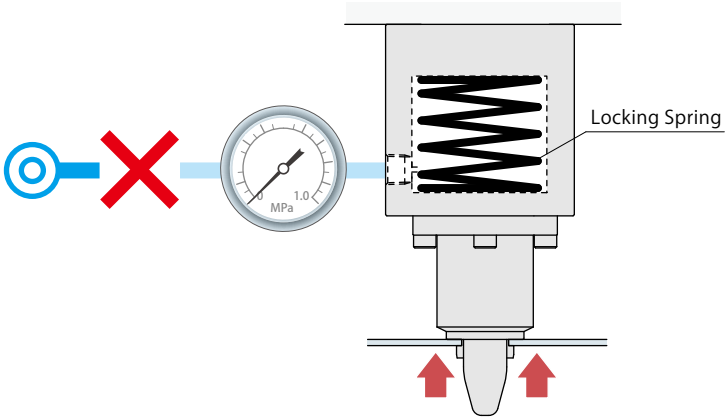




Safety Function

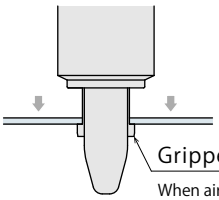
Built-in locking spring maintains locked state even when air pressure is cut off.

※ Only for Self-Locking Function Option



Without Self-Locking Function

Even when air is cut off, the gripper holds the workpiece to prevent it from falling.



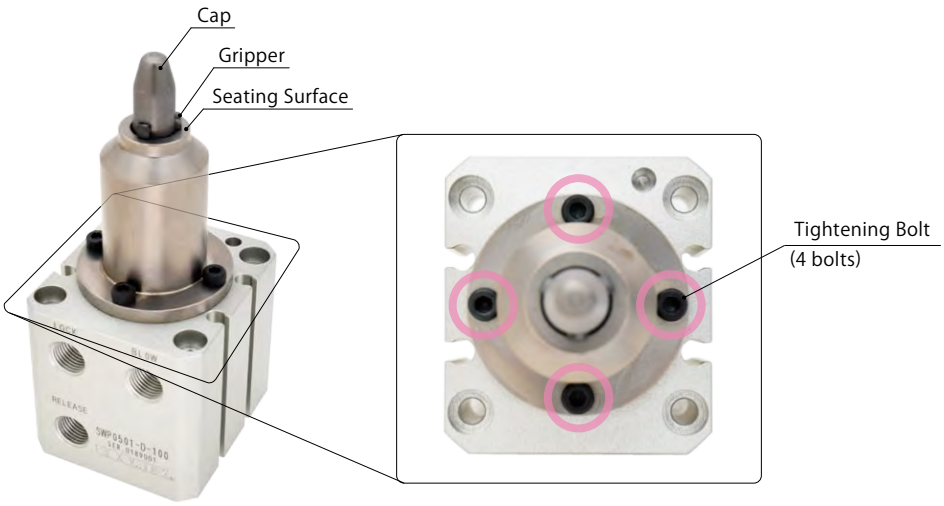
Gripper

When air is cut off, the gripper will go down due to the workpiece weight, but not retract. This enables the gripper to hold the workpiece.

Maintenance

Removable Pin Allows for Simple Maintenance

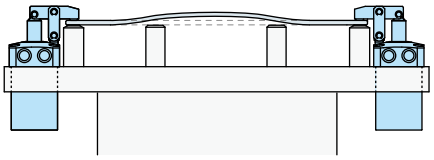
The gripper and cap can be replaced by removing tightening bolts on the seating part.
No special tools or hard work are required for maintenance. It also helps customer prepare for replacements.



※ The picture shows in case of functions D/C.

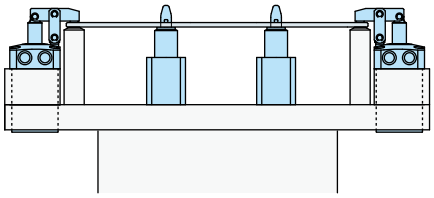
No Bending

Compared to perimeter clamping, Locating Pin Clamp is able to clamp the center of the workpiece without bending.



Perimeter Clamping

Perimeter clamping can be the cause of bending.



Locating Pin Clamp

No bending with Locating Pin Clamp by clamping workpiece holes.

Action Confirmation

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

Auto Switch (Prepared by Customer)

Ability to Confirm Lock/Release Actions

Recommended Auto Switch

Magnetic Field Resistant Model：D-P3DWA (made by SMC)
JEP Series (made by KOSMEK) ※1 ※2

Notes :

※1. Please refer to FA・Industrial Robot Related Catalog (CATALOG No. FA0020□□-□□-GB) for detailed specifications of JEP series.

※2. Please use D-P3DWA (made by SMC) for an environment which generates a magnetic field disturbance.
JEP series cannot be used in such an environment.

1. When using an auto switch not made by Kosmek, check specifications of each manufacture.
2. Auto Switch may be stuck out of the clamp depending on the installation position and direction.

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 Application Related Products
Die Change System for Press Machines
Company Profile Sales Offices

Model No. Indication

SWP 100 1 - D - 150 - ☐

1 2 3 4 5

1 Body Size

※ Refer to the Specifications, Clamping Force, Expanding Force and External Dimensions for further information.

050 : Select from Workpiece Hole Diam. ϕ8, 9, 10, 11, 12, 13

100 : Select from Workpiece Hole Diam. ϕ14, 15, 16, 18, 20

2 Design No.

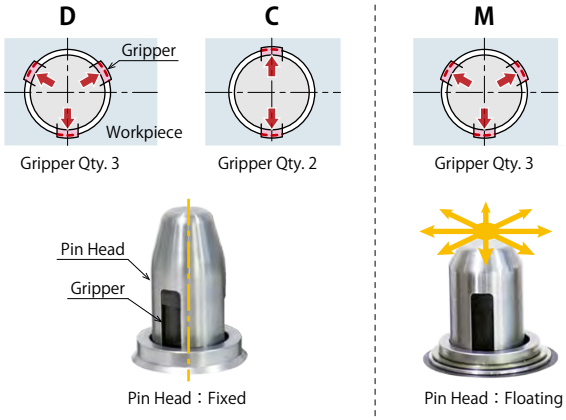
1 : Revision Number

3 Function

D : Datum (For Datum Locating)

C : Cut (For One Direction Locating)

M : Pin Head Floating (No Locating Function)



4 Workpiece Hole Diameter

In case of 1 Body Size **050**

080 : Workpiece Hole Diam. $\phi 8^{+0.2}_{-0.1}$

090 : Workpiece Hole Diam. $\phi 9^{+0.2}_{-0.1}$

100 : Workpiece Hole Diam. $\phi 10^{\pm 0.2}$

110 : Workpiece Hole Diam. $\phi 11^{\pm 0.2}$

120 : Workpiece Hole Diam. $\phi 12^{\pm 0.2}$

130 : Workpiece Hole Diam. $\phi 13^{\pm 0.2}$

In case of 1 Body Size **100**

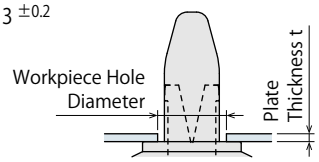
140 : Workpiece Hole Diam. $\phi 14^{\pm 0.2}$

150 : Workpiece Hole Diam. $\phi 15^{\pm 0.2}$

160 : Workpiece Hole Diam. $\phi 16^{\pm 0.2}$

180 : Workpiece Hole Diam. $\phi 18^{\pm 0.2}$

200 : Workpiece Hole Diam. $\phi 20^{\pm 0.2}$

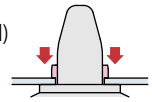


4 Workpiece Hole Diam.		080	090	100~200
3 Function	D	–	○	○
	C	○	○	○
	M	–	–	○

5 Self-Locking Function

Blank : With Self-Locking Function (Standard)

N : Without Self-Locking Function



※ With self-locking function, the clamp is locked at 0MPa. The ability of SWP varies depending on this function. Refer to the next page for further information.

Specifications

Model No.			SWP0501 -C-080-☐	SWP0501 -☐-090-☐	SWP0501 -☐-100-☐	SWP0501 -☐-110-☐	SWP0501 -☐-120-☐	SWP0501 -☐-130-☐	SWP1001 -☐-140-☐	SWP1001 -☐-150-☐	SWP1001 -☐-160-☐	SWP1001 -☐-180-☐	SWP1001 -☐-200-☐
Workpiece mm	Hole Diameter		$8^{+0.2}_{-0.1}$	$9^{+0.2}_{-0.1}$	$10^{\pm 0.2}$	$11^{\pm 0.2}$	$12^{\pm 0.2}$	$13^{\pm 0.2}$	$14^{\pm 0.2}$	$15^{\pm 0.2}$	$16^{\pm 0.2}$	$18^{\pm 0.2}$	$20^{\pm 0.2}$
	Thickness t	Min.	0.45										
		Max.	2.3	3.6	5.5	6	6.5	7	8.5	10			
Locating Repeatability ※1		mm	0.05 (when combining 3 D and C) ※ In case of 4 080 : when combining 3 C and C										
Allowable Offset (Pin Head Floating Amount)		mm	-		±0.6 (In case of 3 M)				±0.8 (In case of 3 M)				
Cylinder Full Stroke		mm	8	9.3	12.1	13.8	14.3	14.8	16.3	17.8			
Lock Stroke		mm	2.3	3.6	5.5	6	6.5	7	8.5	10			
Cylinder Capacity cm³	Lock Side		5.5	6.4	8.4	9.5	9.9	10.2	17.2	18.8			
	Release Side		6.4	7.5	9.7	11.1	11.5	11.9	20.5	22.4			
5 Blank	Max. Operating Pressure	MPa	0.5										
	Min. Releasing Pressure	MPa	0.2										
5 N	Operating Pressure	MPa	0.2 ~ 0.5										
Withstanding Pressure		MPa	0.75										
Usable Fluid			Dry Air										
Recommended Air Blow Pressure		MPa	0.1 ~ 0.2										
Operating Temperature		℃	0 ~ 70										
Weight		g	380						700				

Notes :

※1. Locating repeatability under the same condition (no load).

1. This product locks and releases with air pressure.
2. When using with other clamps, make sure this product operates first by sequence control of a circuit.

Clamping Force・Expanding Force

(N)

Model No.		SWP0501		SWP1001	
		5 **Blank**:With Self-Locking	5 **N**:Without Self-Locking	5 **Blank**:With Self-Locking	5 **N**:Without Self-Locking
Clamping Force ※2 ※3	Air Pressure 0.5 MPa	380	325	600	500
	Air Pressure 0.4 MPa	315	260	500	400
	Air Pressure 0.3 MPa	250	195	400	300
	Air Pressure 0 MPa	55	-	100	-
	Calculated Value ※5	Fc=650×P+55	Fc=650×P	Fc=1000×P+100	Fc=1000×P
Expanding Force ※4	Air Pressure 0.5 MPa	1015	880	1600	1330
	Air Pressure 0.4 MPa	840	700	1330	1060
	Air Pressure 0.3 MPa	670	530	1060	800
	Air Pressure 0 MPa	145	-	260	-
	Calculated Value ※5	FE=1740×P+145	FE=1760×P	FE=2680×P+260	FE=2660×P

Notes :

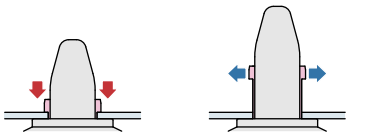
※2. Clamping force shows the pressing force against the seating surface.
The values in the table shows the calculated value when the workpiece thickness t is 0.45mm.

※3. When supplying air pressure to the air blow port, a clamping force may decrease due to internal pressure.

※4. Expanding force shows the force acting perpendicular to the pin's center axis.
Expanding force shows the calculated value when the friction coefficient is μ0.15.

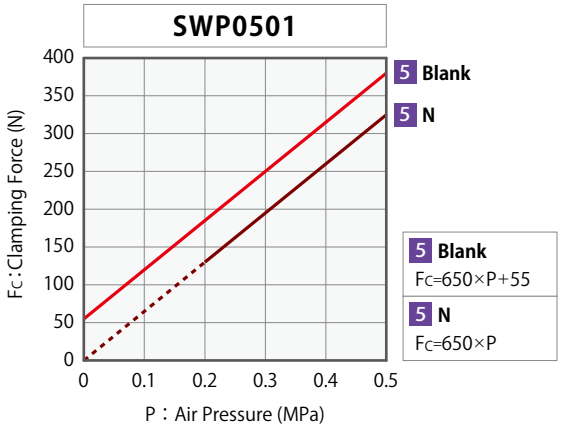
※5. Fc:Clamping Force (N), FE:Expanding Force (N), P:Air Pressure (MPa)

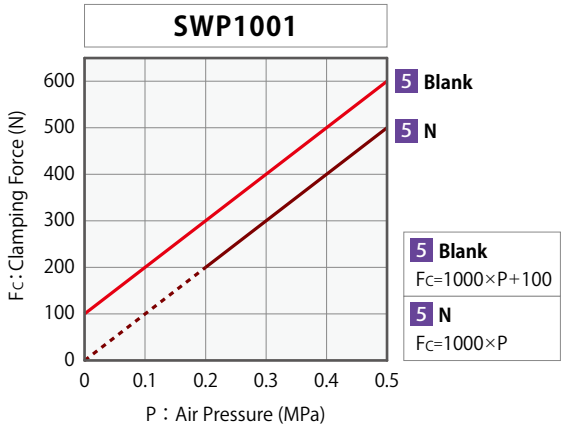
1. Depending on the material, thickness and chamfer shape of a workpiece hole, it can be deformed by clamping action, and the specifications will not be satisfied. Make sure to test clamping beforehand and adjust pressure accordingly.



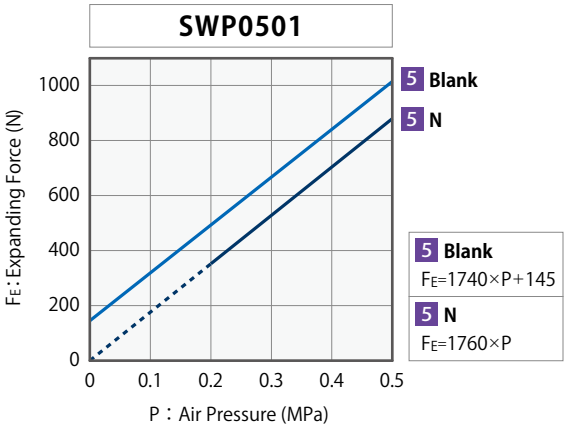
Fc:Clamping Force　FE:Expanding Force

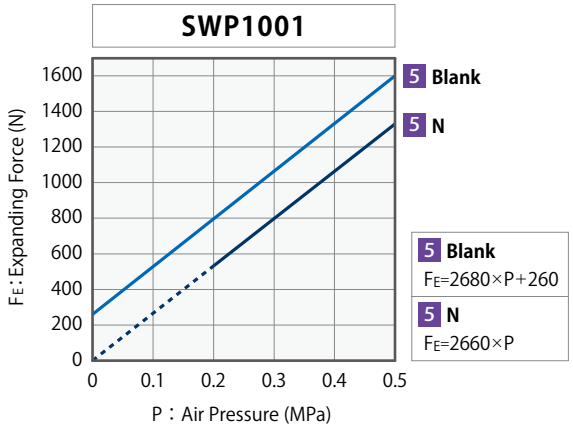
Clamping Force Curve





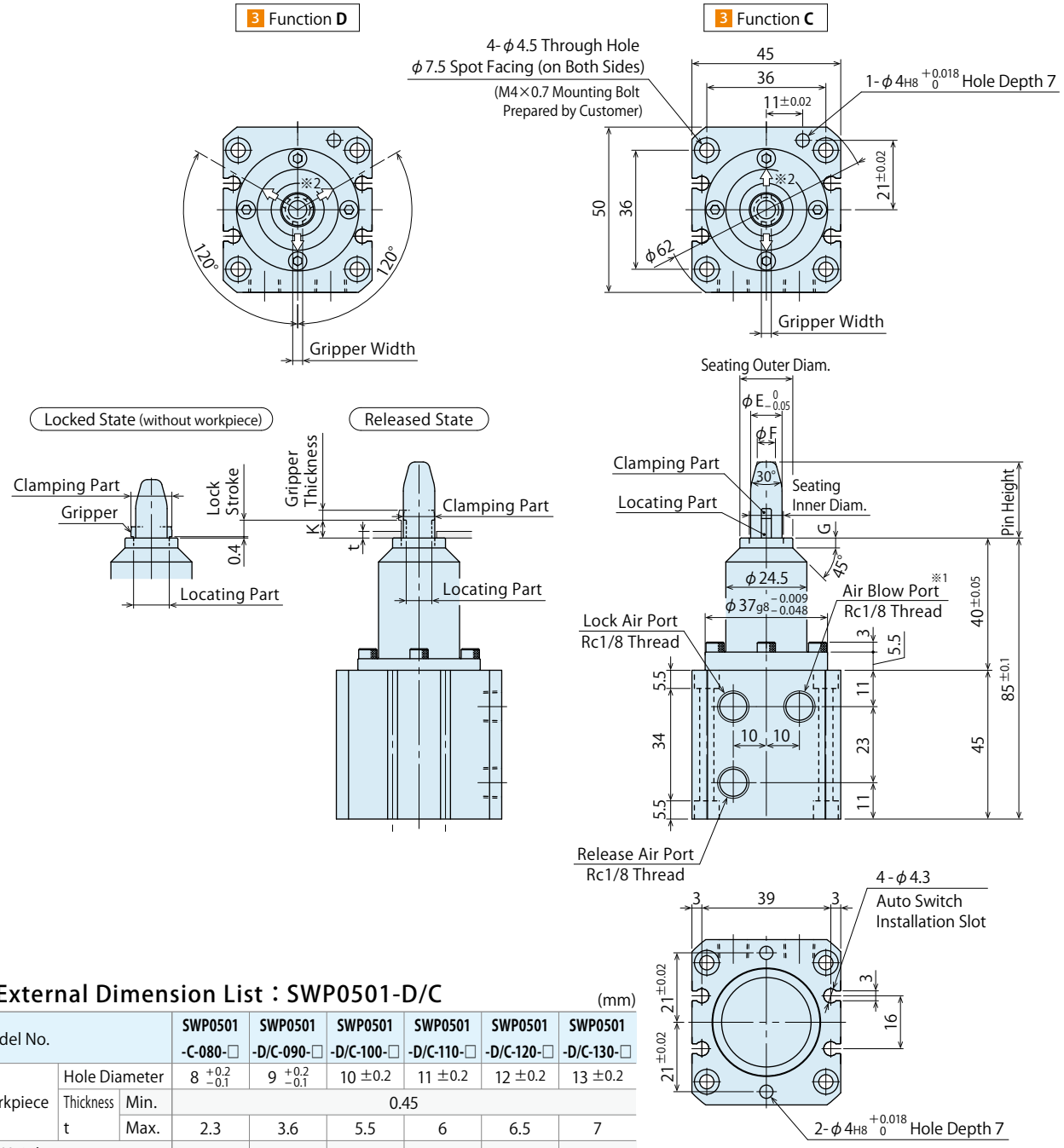
Expanding Force Curve





External Dimensions : SWP0501-D/C

※ This drawing shows the released state of SWP0501-D/C.



External Dimension List : SWP0501-D/C

(mm)

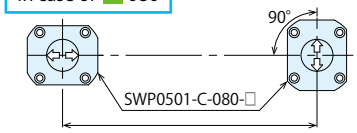
Model No.			SWP0501 -C-080-□	SWP0501 -D/C-090-□	SWP0501 -D/C-100-□	SWP0501 -D/C-110-□	SWP0501 -D/C-120-□	SWP0501 -D/C-130-□
Workpiece	Hole Diameter		8 +0.2 −0.1	9 +0.2 −0.1	10 ±0.2	11 ±0.2	12 ±0.2	13 ±0.2
	Thickness	Min.	0.45					
	t	Max.	2.3	3.6	5.5	6	6.5	7
Pin Height			17	19	23	23.5	24	24.5
Pin Outer Diam. E			7.8	8.8	9.5	10	11	12
Pin End Diam. F			4.5	5.5	5.5	6	7	8
Clamping Part	At Released		7.7	8.7	9.3	9.8	10.8	11.8
	At Locked (without workpiece)		9.8	10.8	11.8	12.8	13.8	14.8
Locating Part	At Released		6.1	7.1	7.7	8.2	9.2	10.2
	At Locked (without workpiece)		8.2	9.2	10.2	11.2	12.2	13.2
Gripper Width	3 Function D		-	3	3	3.5	3.5	3.5
	3 Function C		3	3	3.5	3.5	3.5	3.5
Gripper Thickness			2	2	3	3	3	3
Released Height K			2.7	4	5.9	6.4	6.9	7.4
Seating Inner Diam.			8.3	9.3	10.3	11.3	12.3	13.3
Seating Outer Diam.			15	15.5	16	17	18	19
Seating Part G			2.5	2.5	3	3	3	3
Lock Stroke			2.3	3.6	5.5	6	6.5	7

Notes :

※1. Continuously supply air pressure to the air blow port.

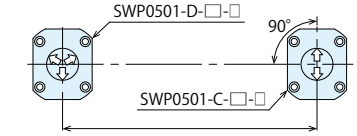
※2. The arrow ⇨ in the drawing shows expanding direction of grippers.
Since the clamping part is not a floating structure, when clamping a workpiece with two of these products, consider distance accuracy and use them with arrangement shown in the drawing on the right. With out-of specification distance accuracy, workpiece will interfere with the guide part causing damages.

In case of 4 080



Cumulative accuracy of workpiece hole distance and clamp mounting distance must be as shown in the table below.

In case of 4 090 ~ 130

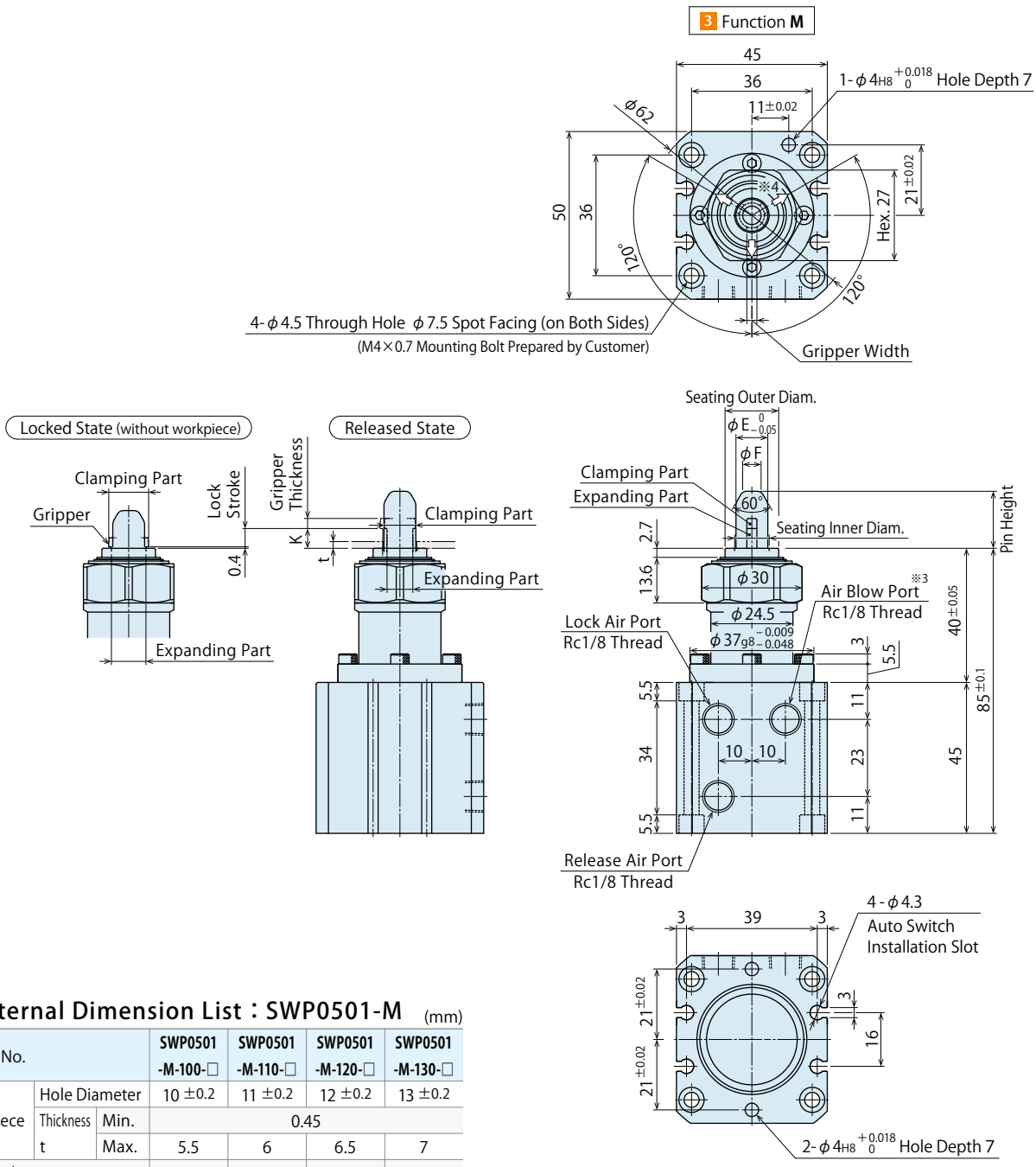


Cumulative accuracy of workpiece hole distance and clamp mounting distance must be as shown in the table below.

4 Hole Diam.	Distance Accuracy
080～090	±0.05mm or better
100	±0.15mm or better
110～130	±0.40mm or better

External Dimensions : SWP0501-M

※ This drawing shows the released state of SWP0501-M.



External Dimension List : SWP0501-M

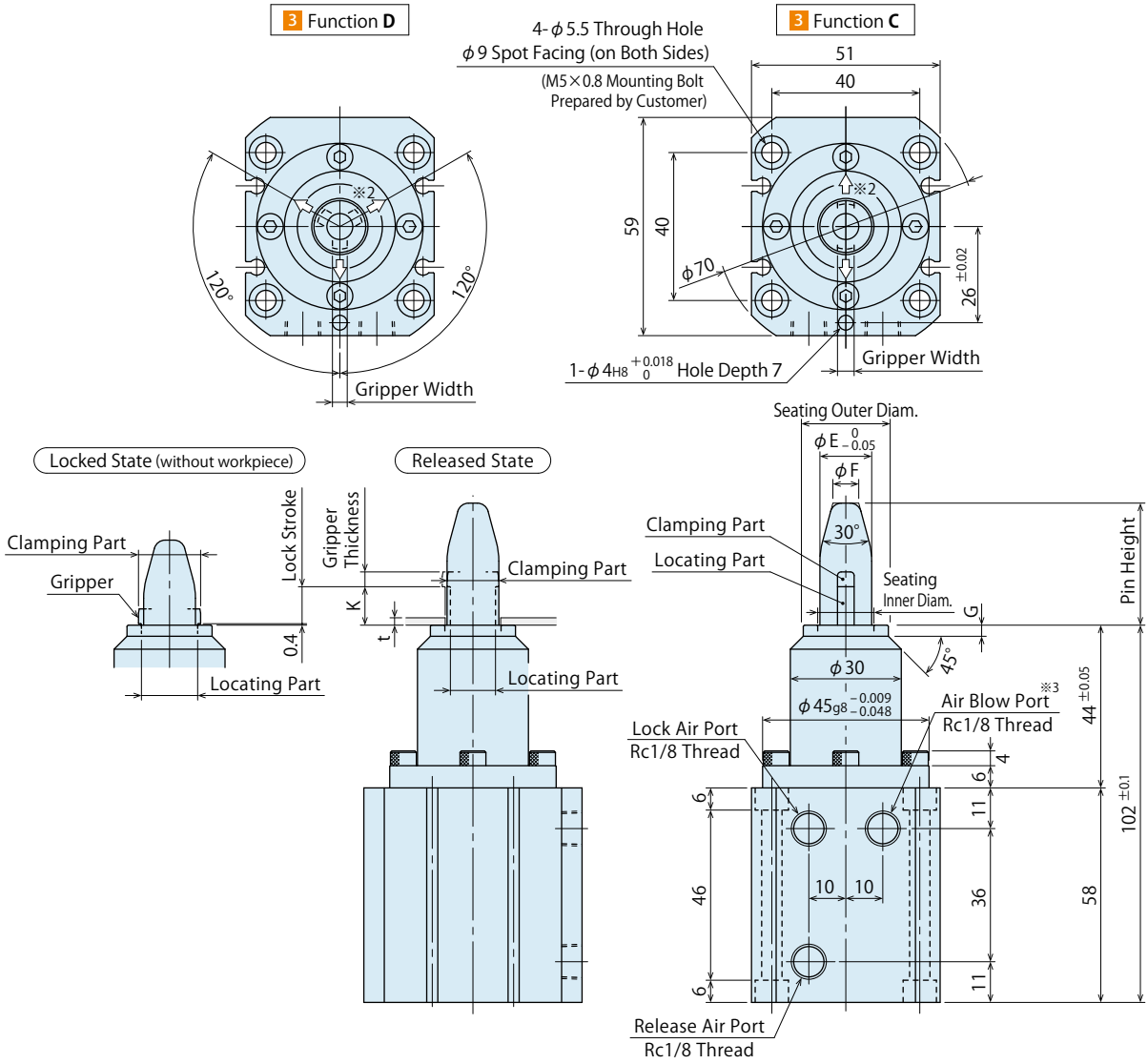
(mm)

Model No.			SWP0501 -M-100-□	SWP0501 -M-110-□	SWP0501 -M-120-□	SWP0501 -M-130-□
Workpiece	Hole Diameter		10 ±0.2	11 ±0.2	12 ±0.2	13 ±0.2
	Thickness t	Min.	0.45			
		Max.	5.5	6	6.5	7
Pin Height			17	19	19.5	20
Pin Outer Diam. E			9.5	10	11	12
Pin End Diam. F			5.5	6	7	8
Clamping Part	At Released		9.3	9.8	10.8	11.8
	At Locked (without workpiece)		11.8	12.8	13.8	14.8
Locating Part	At Released		7.7	8.2	9.2	10.2
	At Locked (without workpiece)		10.2	11.2	12.2	13.2
Gripper Width			3	3.5	3.5	3.5
Gripper Thickness			3	3	3	3
Released Height K			5.9	6.4	6.9	7.4
Seating Inner Diam.			10.3	11.3	12.3	13.3
Seating Outer Diam.			16	17	18	19
Lock Stroke			5.5	6	6.5	7

Notes :
※3. Continuously supply air pressure to the air blow port.
※4. The arrow ⇨ in the drawing shows expanding direction of grippers.

External Dimensions : SWP1001-D/C

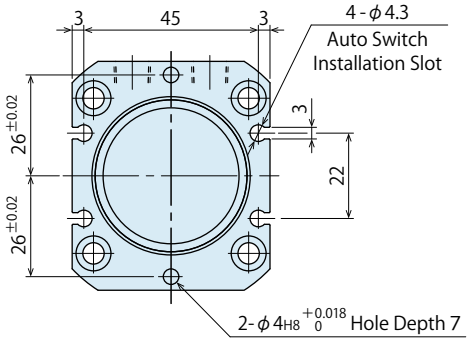
※ This drawing shows the released state of SWP1001-D/C.

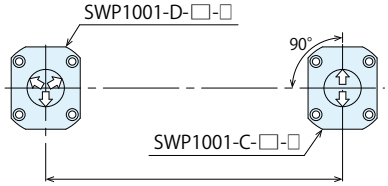


External Dimension List : SWP1001-D/C

(mm)

Model No.			SWP1001 -D/C-140-□	SWP1001 -D/C-150-□	SWP1001 -D/C-160-□	SWP1001 -D/C-180-□	SWP1001 -D/C-200-□
Workpiece	Hole Diameter		14 ±0.2	15 ±0.2	16 ±0.2	18 ±0.2	20 ±0.2
	Thickness	Min.	0.45				
	t	Max.	8.5	10			
Pin Height			31	33	33	33	33
Pin Outer Diam. E			13	14	15	17	19
Pin End Diam. F			7	7	8	10	12
Clamping Part	At Released		12.8	13.8	14.8	16.8	18.8
	At Locked (without workpiece)		15.8	16.8	17.8	19.8	21.8
Locating Part	At Released		11.2	12.2	13.2	15.2	17.2
	At Locked (without workpiece)		14.2	15.2	16.2	18.2	20.2
Gripper Width	3 Function D		4	4	4.5	5.5	5.5
	3 Function C		4	4.5	4.5	5.5	5.5
Gripper Thickness			3.5	4	4	4	4
Released Height K			8.9	10.4	10.4	10.4	10.4
Seating Inner Diam.			14.3	15.3	16.3	18.3	20.3
Seating Outer Diam.			22	23	24	25	27
Seating Part G			3	3	3	4	4
Lock Stroke			8.5	10	10	10	10





Cumulative accuracy of workpiece hole distance and clamp mounting distance must be ±0.4mm or better.

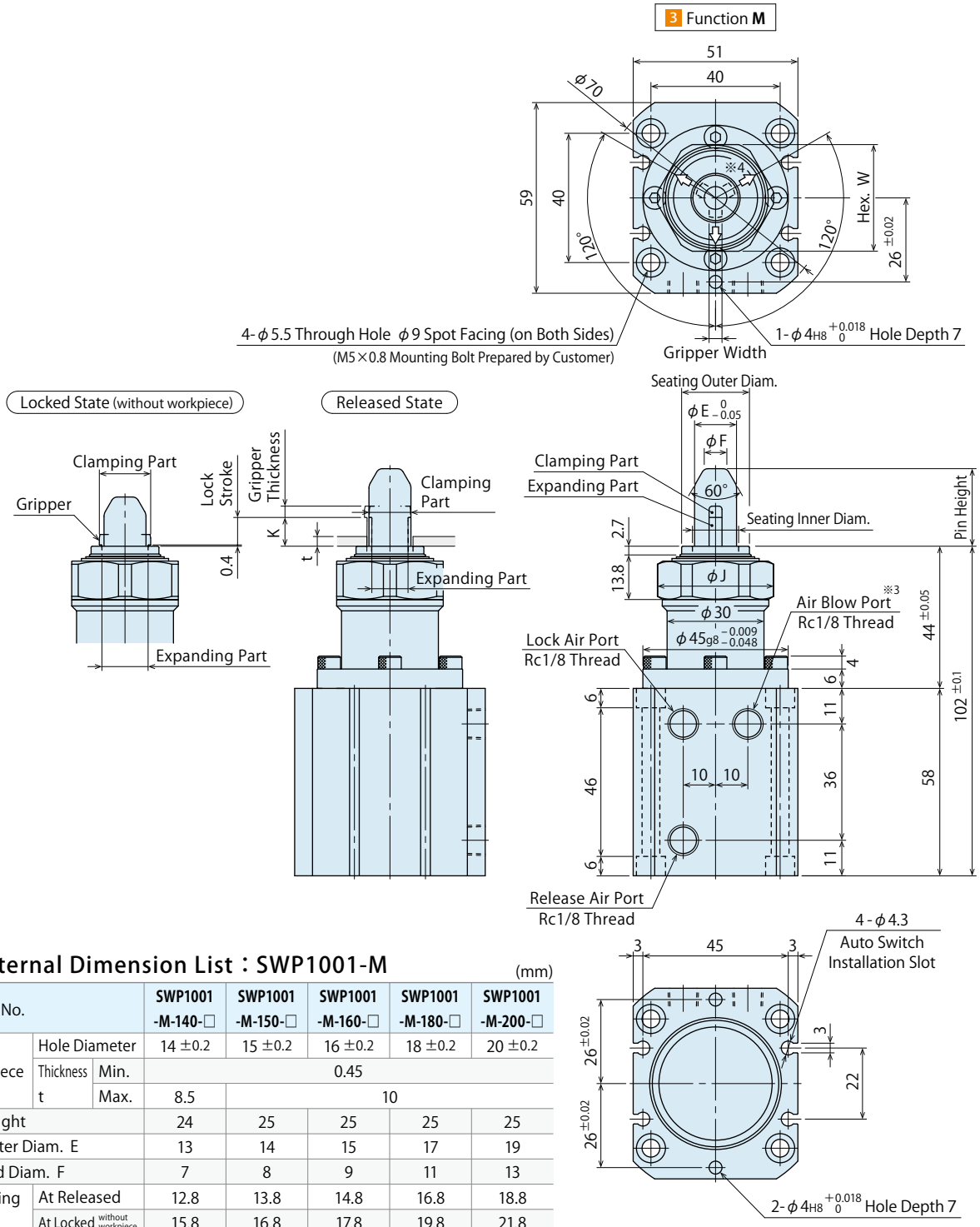
Notes :

※1. Continuously supply air pressure to the air blow port.

※2. The arrow ⇨ in the drawing shows expanding direction of grippers.
Since the clamping part is not a floating structure, when clamping a workpiece with two of these products, use them within ±0.4mm of distance accuracy and with arrangement shown in the drawing on the right. With out-of specification distance accuracy, workpiece will interfere with the guide part causing damages.

External Dimensions : SWP1001-M

※ This drawing shows the released state of SWP1001-M.



External Dimension List : SWP1001-M

(mm)

Model No.			SWP1001 -M-140-□	SWP1001 -M-150-□	SWP1001 -M-160-□	SWP1001 -M-180-□	SWP1001 -M-200-□
Workpiece	Hole Diameter		14 ±0.2	15 ±0.2	16 ±0.2	18 ±0.2	20 ±0.2
	Thickness t	Min.	0.45				
		Max.	8.5	10			
Pin Height			24	25	25	25	25
Pin Outer Diam. E			13	14	15	17	19
Pin End Diam. F			7	8	9	11	13
Clamping Part	At Released		12.8	13.8	14.8	16.8	18.8
	At Locked (without workpiece)		15.8	16.8	17.8	19.8	21.8
Locating Part	At Released		11.2	12.2	13.2	15.2	17.2
	At Locked (without workpiece)		14.2	15.2	16.2	18.2	20.2
Gripper Width			4	4	4.5	5.5	5.5
Gripper Thickness			3.5	4	4	4	4
Released Height K			8.9	10.4	10.4	10.4	10.4
Seating Inner Diam.			14.3	15.3	16.3	18.3	20.3
Seating Outer Diam.			21	21	22	25	26
Hex. W (Outer Diam. φJ)			33 (φ36)	33 (φ36)	33 (φ36)	35 (φ38)	35 (φ38)
Lock Stroke			8.5	10	10	10	10

Notes :
※3. Continuously supply air pressure to the air blow port.
※4. The arrow ⇨ in the drawing shows expanding direction of grippers.

Accessory：Shim Set

A set of shims for level adjustment of the seating surface.

Model No. Indication

SWPZ 100 1 - S

1 2

1 Body Size

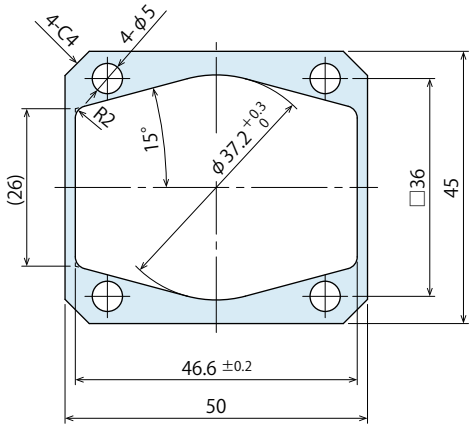
050：For SWP050
100：For SWP100

2 Design No.

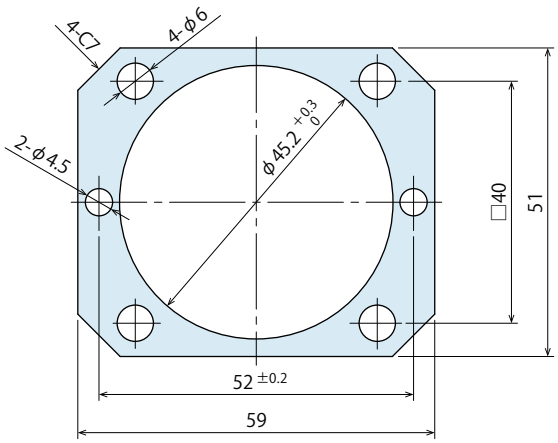
1 ：Revision Number

External Dimensions

SWPZ0501-S Contents 2 of 0.5mm-thick shims, 2 of 1.0mm-thick shims



SWPZ1001-S Contents 2 of 0.5mm-thick shims, 2 of 1.0mm-thick shims



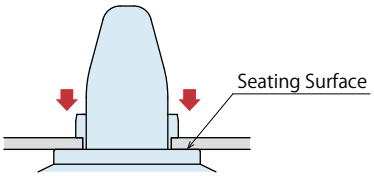
Note :
1. Material：SUS304

Cautions

Notes for Design

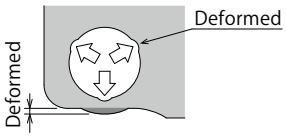
1) Check Specifications
- Please use each product according to the specifications.
- This product is an air double-acting clamp which locks and releases with air pressure. In case of Self-Locking Function Option, the clamp will be locked by spring force when release air pressure is released.

2) Reference Surface (Seating Surface) towards Z-axis
- This product has the seating surface for workpiece and locates in Z direction.



3) Clamping Force and Expanding Force
- Clamping force shows the pressing force against the seating surface, and expanding force shows the gripping force generated inside workpiece hole.
  Make sure to test clamping and adjust pressure accordingly.
  Insufficient clamping force and/or expanding force leads to locking malfunctions and accuracy failure.

4) Wall Thickness around Workpiece Hole
- Thin wall around the workpiece hole could be deformed by locking action, and clamping force and/or locating repeatability will not fill the specification.
  Please test clamping and adjust pressure accordingly before use.

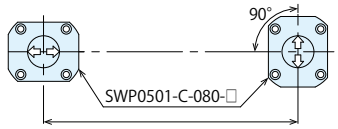


5) Workpiece hole size and thickness should be within the range of the specification.

When workpiece hole diameter is larger than specification.	Expansion stroke is insufficient leading to accuracy failure and locking malfunction.
When using it with insufficient clamping force.	Leads to locking malfunction.
When workpiece hole diameter is smaller than specification.	Difficult to attach/detach the workpiece leading to damage.
Workpiece is thin.	Leads to locking malfunction.
Workpiece is thick.	Leads to locking malfunction.

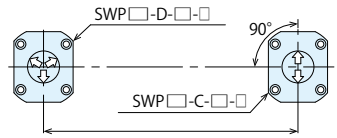
6) Installation of the Clamp
- The arrow ⇨ in the drawing shows expanding direction of grippers. Since the clamping part of Function D (Datum) / C (Cut) does not have a floating structure, when clamping a workpiece with two of these products, consider distance accuracy and use them with arrangement shown in the drawing below.
  With out-of specification distance accuracy, workpiece will interfere with the guide part causing damages.
  Please use Function M (Floating) when using more than three of these products.

In case of Workpiece Hole Diam. **080**: ϕ8



Cumulative accuracy of workpiece hole distance and clamp mounting distance must be as shown in the table below.

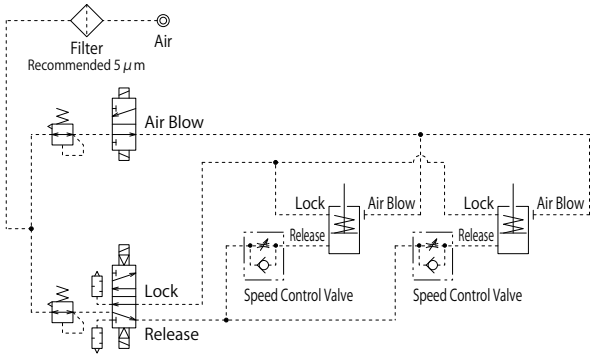
In case of Workpiece Hole Diam. **090 ~ 200**: ϕ9 ~ 20



Cumulative accuracy of workpiece hole distance and clamp mounting distance must be as shown in the table below.

Hole Diam.	Distance Accuracy
080~090	±0.05mm or better
100	±0.15mm or better
110~200	±0.40mm or better

7) Refer to the drawing below for air circuit.
- Excessive locking action speed leads to possible damage to the grippers and internal parts. Adjust the flow control valve with check valve (meter-out) to set the locking action time at 0.5 ~ 1 sec.
  When using two Locating Pin Clamps for locating a workpiece, adjust the action procedure so that Function D (Datum) is locked before Function C (Cut). Function M (Floating) should be locked after locating is completed.



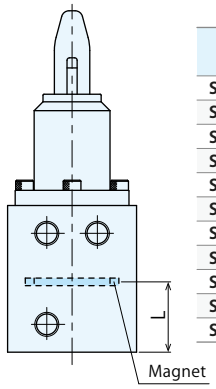
8) Fall Prevention Measures
- When using for transfer, etc., please prepare fall prevention measures for safety in case of an accident such as detachment of a workpiece.

Cautions

Notes for Design

9) For Use of Auto Switch

- Magnet is built in the cylinder of this product, so the clamp action can be detected by auto switch.
  Refer to the following for the position of the built-in magnet.



(mm)

Model No.	L	
	At Released	At Locked (without workpiece)
SWP0501-□-080	24.7	16.7
SWP0501-□-090	24.7	15.4
SWP0501-□-100	24.7	12.6
SWP0501-□-110	24.7	10.9
SWP0501-□-120	24.7	10.4
SWP0501-□-130	24.7	9.9
SWP1001-□-140	27.8	11.5
SWP1001-□-150	27.8	10
SWP1001-□-160	27.8	10
SWP1001-□-180	27.8	10
SWP1001-□-200	27.8	10

Select an auto switch depending on the environment.
Please use D-P3DWA (made by SMC) for an environment which generates a magnetic field disturbance.
An auto switch may be stuck out of the clamp depending on the installation position and direction.
The auto switch detection part (magnet) is interlocked with the piston movement, so it does not detect the gripper movement.

10) Continuously supply air pressure to the air blow port.

- When using under environment with cutting chips, air blow is recommended in order to prevent spatter.
  When supplying air pressure to the air blow port, clamping force may decrease due to internal pressure.

11) All clamps must be fully released before loading and unloading a workpiece.

- When a workpiece is loaded and unloaded during lock or release operation, it will lead to damage of clamp or fall of workpiece.

Installation Notes

1) Check the fluid to use.

- Please supply filtered clean dry air.
  Also, install the drain removing device such as aftercooler, air dryer, etc.
- 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 secondary lubricant, please supply lubricant continuously.
  Otherwise, the initial grease applied from KOSMEK will be removed from the secondary lubricant.)

2) Preparation for Piping

- The pipeline, piping connector and fixture circuits should be cleaned and flushed thoroughly. The dust and cutting chips in the circuit can lead to fluid leakage and malfunction.
- There is no filter provided with this product to prevent contamination in the 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.
- In order to prevent contamination during the piping work, it should be carefully cleaned before working.

4) Mounting Locating Pin Clamp

- When mounting the product use four hexagonal socket bolts (with tensile strength of 12.9 or more) and tighten them with the torque shown in the table below. Tightening with greater torque than recommended can dent the seating surface or break the bolt.

Model No.	Tightening Bolt Size	Tightening Torque (N·m)
SWP0501	M4×0.7	3.2
SWP1001	M5×0.8	6.3

5) Port Position of Locating Pin Clamp

- The name of each port is marked on the flange surface.
  Be careful with the mounting direction of piping.
  LOCK : Air Lock Port
  RELEASE : Air Release Port
  BLOW : Air Blow Port

6) It is recommended to use air piping with outer diameter ϕ6 (inner diameter ϕ4) or larger for air blow.

7) Level Adjustment of the Seating Surface
If requiring level adjustment of the seating surface, use a shim set for level adjustment (sold separately).

Notes on Handling

1) It should be operated by qualified personnel.
● Hydraulic and/or pneumatic machines and devices 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 removing the product, 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 circuits.
③ After stopping the product, do not remove until the temperature drops.
④ Make sure there is no trouble/issue in the bolts and respective parts before restarting the machine or equipment.

3) Do not touch the clamp while it is working.
Otherwise, your hands may be injured.
● In case of Self-Locking Function Option, the clamp will be locked when air pressure is cut off. Be careful not to pinch your hands.

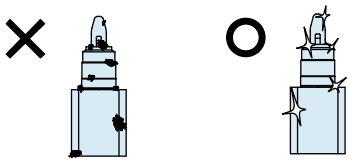
4) When transferring a workpiece, secure the safety of environment in case of a workpiece detachment.

5) Do not modify or disassemble the air cylinder.
● Built-in spring is very strong and dangerous.

Maintenance and Inspection

1) Removal of the Product and Shut-off of Pressure Source
● Before removing the product, 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 gripper and the seating surface.
● If it is used when the surface is contaminated with dirt, it may lead to malfunctioning, accuracy failure and air leakage.



● If there is malfunction even after cleaning the product from outside, there may be contaminants or damage within internal parts.
In this case, overhaul is required. Please call us or overhaul by yourself following the replacement procedure.
Contact us for the replacement procedure for grippers.
(If overhauled by unauthorized personnel, the warranty will be void even the period is still active.)

3) Regularly tighten pipe, mounting bolt to ensure proper use.

4) Friction on the gripper leads to locking malfunction and lower locating repeatability.
● Replacement period differs depending on operating pressure, workpiece material, and shape of hole. When you find friction on gripper locating part, the gripper needs to be replaced.
Please contact us for replacement, or replace the parts by following the replacement procedure.
Regularly apply lubricant oil or grease on the gripper locating part in order to prevent friction and extend the gripper's operational life.

5) 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.

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

7) Please contact us for overhaul and repair.
Built-in spring in the air cylinder is very strong and dangerous.

※ Please refer to P.62 for general cautions. ・Warranty

High-Power Welding Swing Clamp

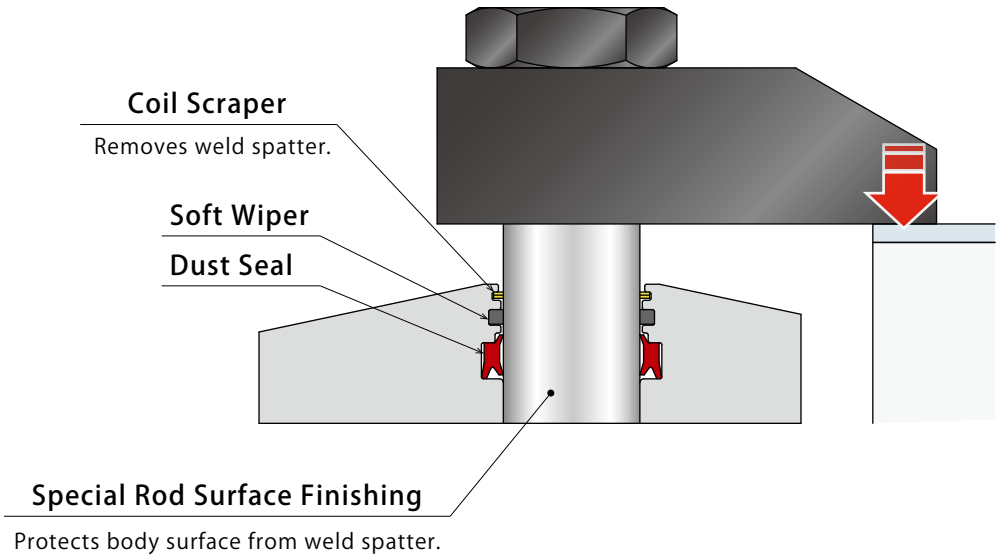
Model WHG

Spatter Resistant High-Power Welding Swing Clamp

PAT.

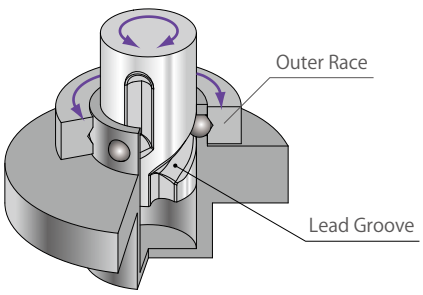
Features

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



- **Swing Mechanism with High Speed and High Durability**

  Our strong hydraulic clamp mechanism is used to pneumatic clamps.
  Makes it faster with 3 lines of lead groove + outer race.
  (High Rigidity makes it possible to use a long lever.)



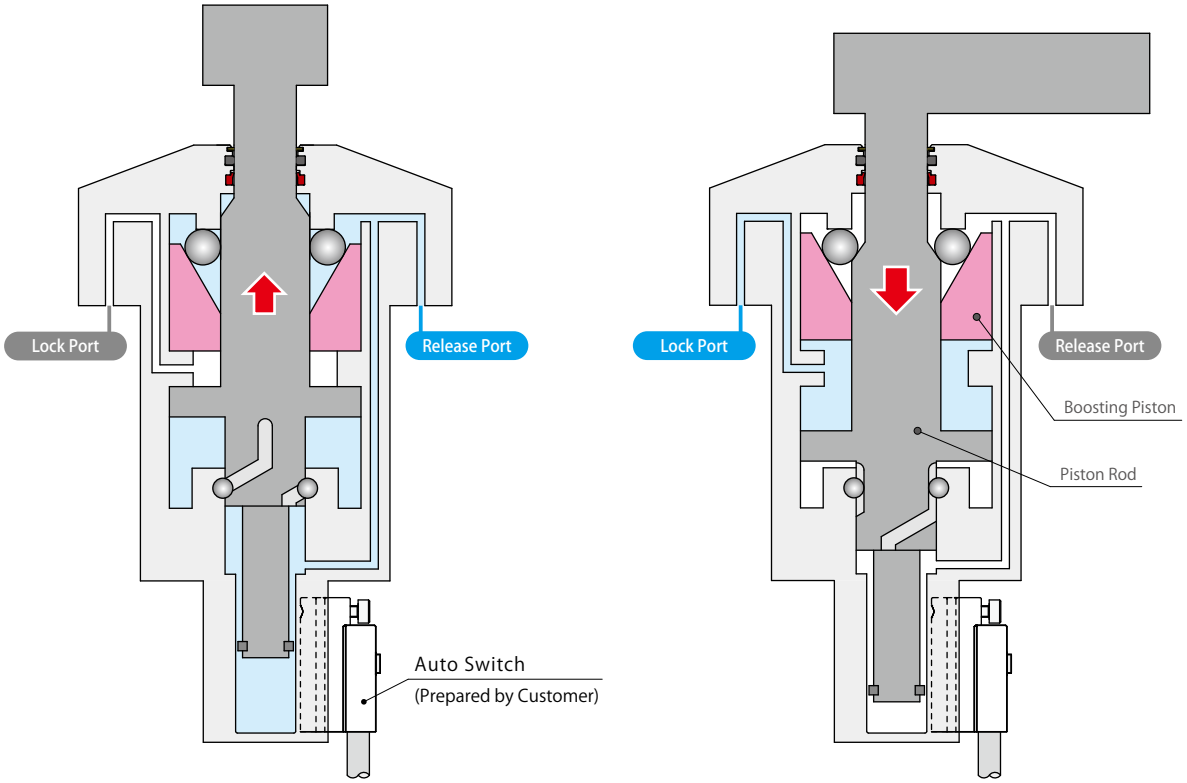
Ball Guide Part

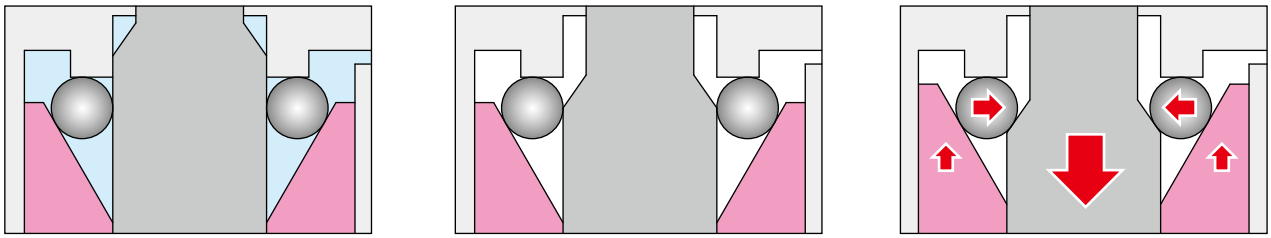
The High-Power Welding Swing Clamp is a hybrid system using air pressure and a mechanical lock.

Action Description

Released State — Lock Air OFF / Release Air ON

Locked State — Lock Air ON / Release Air OFF





Released State

The piston rod ascends to release.

Locking Operation

(Swing Stroke+Vertical Stroke 2mm)

① The piston rod rotates while it descends along the cam.

② After swing completion, the piston descends vertically until the lever clamps the workpiece.

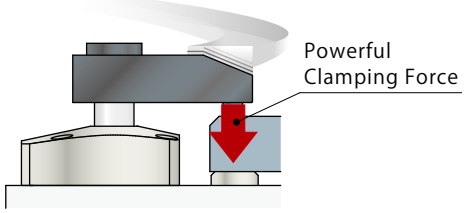
Locked State

(Boosting Stroke 4mm)

The piston rod descends and the boosting piston activates. Exerts strong clamping force and holding force with the wedge mechanism.

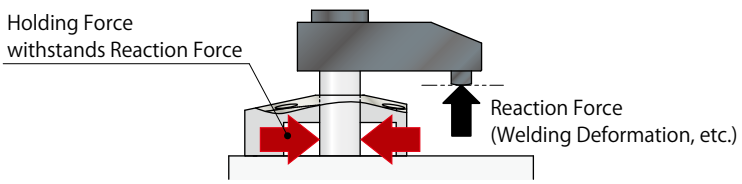
No Hydraulic Use

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



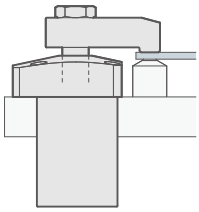
Holding Force

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

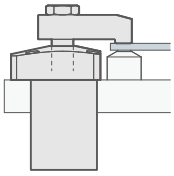


Smaller Footprint

Exerts three times clamping force compared to the same size general air cylinder. Smaller cylinder allows for more compact fixtures.

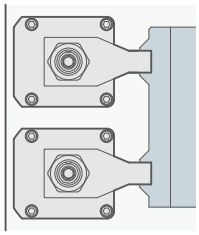


General Air Cylinder

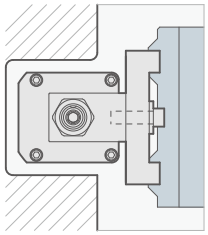


High-Power Welding Clamp

Downsized



General Air Cylinder

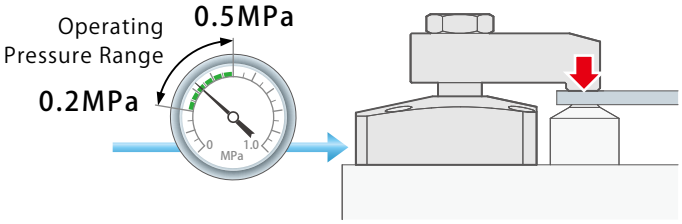


High-Power Welding Clamp

Reduced Number of Clamps

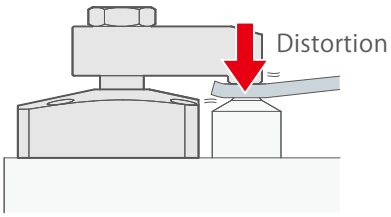
Energy Saving

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

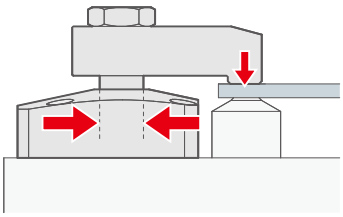


High Quality

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



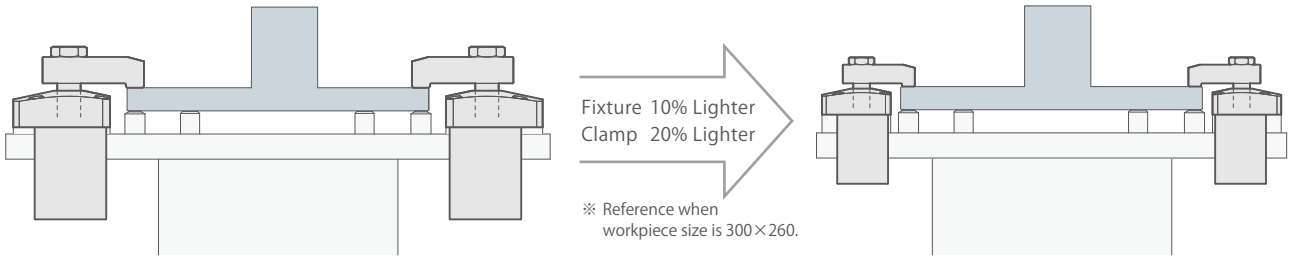
Strong clamping force distorts workpiece.



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.

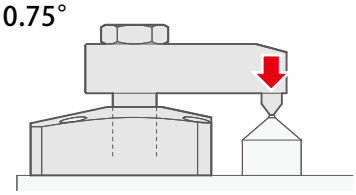


General Air Cylinder

High-Power Welding Clamp

High Accuracy

High locating accuracy at locked position allows for precise clamping.
Swing Complete Position Repeatability：±0.75°



Action Confirmation

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

Auto Switch (Prepared by Customer)

Ability to Confirm Lock/Release Actions

Recommended Auto Switch

Magnetic Field Resistant Model：D-P3DWA (made by SMC)
JEP Series (made by KOSMEK) ※1 ※2

Notes :

※1. Please refer to FA・Industrial Robot Related Catalog (CATALOG No. FA0020□□-□□-GB) for detailed specifications of JEP series.
※2. Please use D-P3DWA (made by SMC) for an environment which generates a magnetic field disturbance.
JEP series cannot be used in such an environment.
1. When using an auto switch not made by Kosmek, check specifications of each manufacture.

Model No. Indication

WHG 160 0 – 2 A R T
1 2 3 4 5

1 Cylinder Force

100 : Cylinder Force 1.0 kN (Air Pressure 0.5MPa)
160 : Cylinder Force 1.6 kN (Air Pressure 0.5MPa)
250 : Cylinder Force 2.4 kN (Air Pressure 0.5MPa)
400 : Cylinder Force 3.9 kN (Air Pressure 0.5MPa)

※ Cylinder force differs from clamping force and holding force.

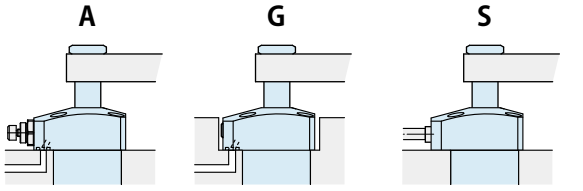
2 Design No.

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)

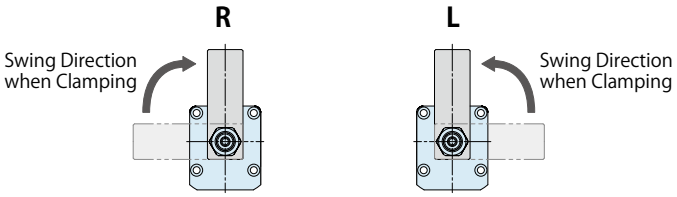
※ Speed control valve (BZW) is sold separately.
Please refer to P.57.



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

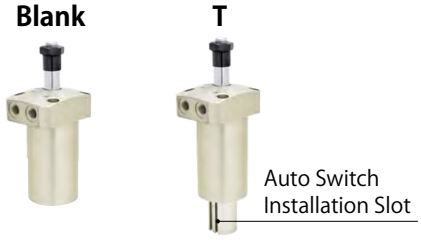
4 Swing Direction when Clamping

R : Clockwise
L : Counter-Clockwise



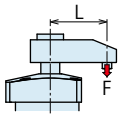
5 Action Confirmation Method

Blank : None (Standard)
T : With Auto Switch Installation Slot



Specifications

Model No.		WHG1000-2□□□	WHG1600-2□□□	WHG2500-2□□□	WHG4000-2□□□
Cylinder Force (at 0.5MPa)	kN	1.0	1.6	2.4	3.9
Clamping Force (Calculation Formula) ※1	kN	F=(1.8842-0.00346×L)×P	F=(3.0603-0.00505×L)×P	F=(4.7875-0.00654×L)×P	F=(7.6871-0.00947×L)×P
Holding Force (Calculation Formula) ※1	kN	$Fk=\frac{4.08\times P}{1-0.0021\times L}$	$Fk=\frac{6.628\times P}{1-0.0012\times L}$	$Fk=\frac{10.481\times P}{1-0.0008\times L}$	$Fk=\frac{16.806\times P}{1-0.0006\times L}$
Full Stroke	mm	14.5	15	17.5	19.5
Swing Stroke (90°)	mm	8.5	9	11.5	13.5
Vertical Stroke	mm	6			
(Break down) Idle Stroke	mm	2			
(Break down) Lock Stroke※2	mm	4			
Swing Angle Accuracy		90° ±3°			
Swing Completion Position Repeatability		±0.75°			
Max. Operating Pressure	MPa	0.5			
Min. Operating Pressure※3	MPa	0.2			
Withstanding Pressure	MPa	0.75			
Operating Temperature	℃	0 ~ 70			
Usable Fluid		Dry Air			



Notes：

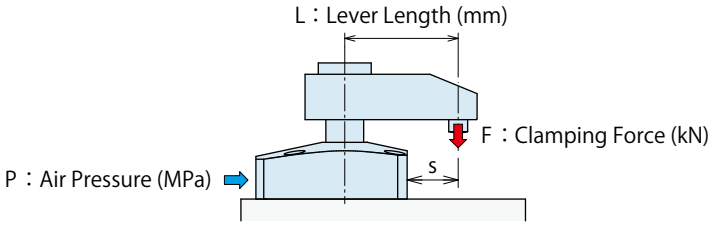
※1. F：Clamping Force (kN), Fk：Holding Force (kN), P：Supply Air Pressure (MPa),
L：Distance between the piston center and the clamping point (mm).

※2. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range.
(Please refer to "The specification value is not fulfilled when clamping out of the lock stroke range." on P.37.)

※3. Minimum pressure to operate the clamp without load.
The clamp may stop in the middle of swing action depending on the lever shape. (Refer to "Notes on Lever Design" on P.37.)

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

Clamping Force Curve



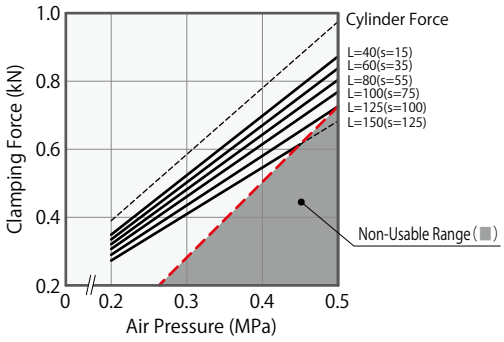
(How to read the Clamping Force Curve)
In case of WHG1600
Supply Air Pressure 0.4MPa
Lever Length L=60mm
Clamping force is about 1.1kN.

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 shown in the below tables and graphs is the value when clamping within the lock stroke range. (Please refer to "The specification value is not fulfilled when clamping out of the lock stroke range." on P.37.)
4. The clamping force is shown with lever in the locked position.
5. The clamping force varies as per the lever length. Please use it with supply air pressure suitable for lever length.
6. Operation in the non-usable range can damage the clamp and lead to fluid leakage.

WHG1000

Clamping Force Calculation Formula※1(kN) $F = (1.8842 - 0.00346 \times L) \times P$

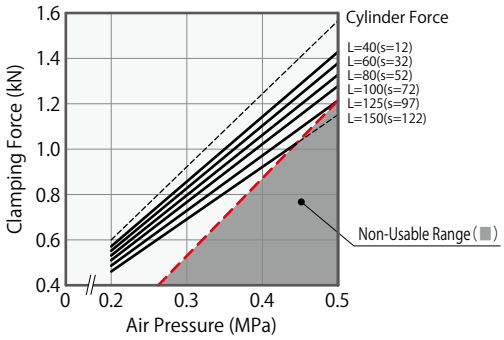
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range (■) Lever Length L (mm) 40	60	80	100	125	150	Max. Lever Length (mm)
0.5	0.98	0.87	0.84	0.80	0.77	0.73		125
0.4	0.78	0.70	0.67	0.64	0.62	0.58	0.55	180
0.3	0.59	0.52	0.50	0.48	0.46	0.44	0.41	190
0.2	0.39	0.35	0.34	0.32	0.31	0.29	0.27	190
Max. Operating Pressure (MPa)		0.5	0.5	0.5	0.5	0.5	0.44	



WHG1600

Clamping Force Calculation Formula※1(kN) $F = (3.0603 - 0.00505 \times L) \times P$

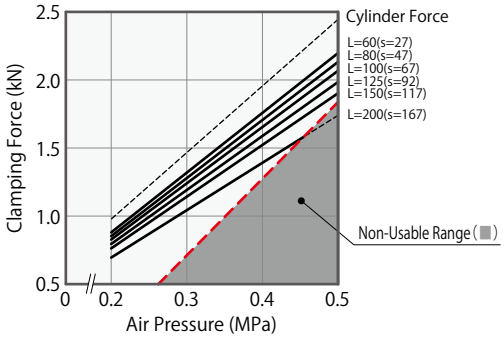
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range (■) Lever Length L (mm) 40	60	80	100	125	150	Max. Lever Length (mm)
0.5	1.57	1.43	1.38	1.33	1.28	1.22		125
0.4	1.25	1.14	1.10	1.06	1.02	0.97	0.92	174
0.3	0.94	0.86	0.83	0.80	0.77	0.73	0.69	200
0.2	0.63	0.57	0.55	0.53	0.51	0.49	0.46	200
Max. Operating Pressure (MPa)		0.5	0.5	0.5	0.5	0.5	0.44	



WHG2500

Clamping Force Calculation Formula※1(kN) $F = (4.7875 - 0.00654 \times L) \times P$

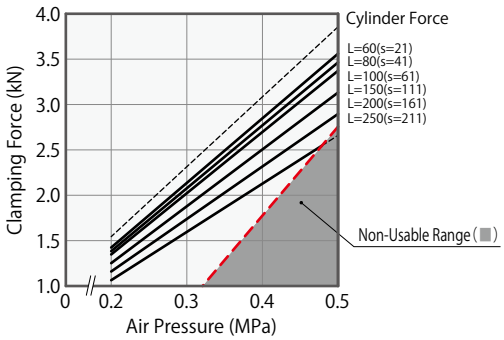
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range (■) Lever Length L (mm) 60	80	100	125	150	200	Max. Lever Length (mm)
0.5	2.44	2.20	2.13	2.07	1.99	1.90		170
0.4	1.96	1.76	1.71	1.65	1.59	1.52	1.39	245
0.3	1.47	1.32	1.28	1.24	1.19	1.14	1.04	270
0.2	0.98	0.88	0.85	0.83	0.79	0.76	0.70	270
Max. Operating Pressure (MPa)		0.5	0.5	0.5	0.5	0.5	0.45	



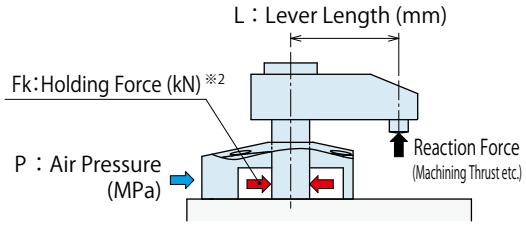
WHG4000

Clamping Force Calculation Formula※1(kN) $F = (7.6871 - 0.00947 \times L) \times P$

Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range (■) Lever Length L (mm) 60	80	100	150	200	250	Max. Lever Length (mm)
0.5	3.86	3.56	3.46	3.37	3.13	2.90		230
0.4	3.09	2.85	2.77	2.70	2.51	2.32	2.13	330
0.3	2.32	2.14	2.08	2.02	1.88	1.74	1.60	330
0.2	1.54	1.42	1.39	1.35	1.25	1.16	1.06	330
Max. Operating Pressure (MPa)		0.5	0.5	0.5	0.5	0.5	0.48	

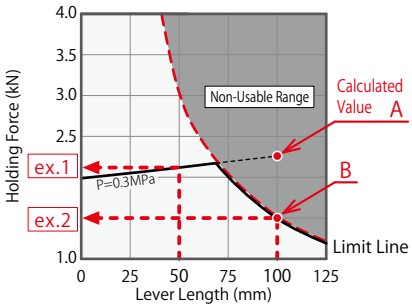


Holding Force Curve



(How to read the Holding Force Curve:ex.1)
In case of WHG1600,
Supply Air Pressure 0.3MPa, Lever Length L=50mm
Holding force is about 2.1kN.

(How to read the Holding Force Curve:ex.2)
In case of WHG1600,
Supply Air Pressure 0.3MPa, Lever Length L=100mm
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 1.5kN.



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.

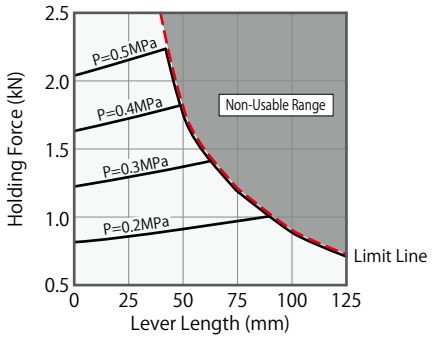
1. The table and the graph show the relation between holding force (kN) and lever length (mm).
2. Holding force shown in the below tables and graphs is the value when clamping within the lock stroke range.
(Please refer to "The specification value is not fulfilled when clamping out of the lock stroke range." on P.37.)
3. Holding force indicates the value when the lever locks a workpiece in horizontal position.
4. Holding force varies depending on the lever length. Set the supply air pressure suitable to the lever length.
5. Using in the non-usable range may damage the clamp and lead to fluid leakage.

WHG1000

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

$$Fk = \frac{4.08 \times P}{1 - 0.0021 \times L}$$

Air Pressure (MPa)	Holding Force (kN) Non-Usable Range( ) Lever Length L (mm)					
	40	60	80	100	125	150
0.5	2.23	1.51	1.13	0.91	0.73	
0.4	1.78	1.51	1.13	0.91	0.73	0.61
0.3	1.34	1.40	1.13	0.91	0.73	0.61
0.2	0.89	0.93	0.98	0.91	0.73	0.61

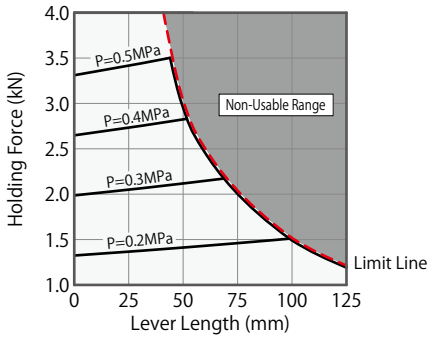


WHG1600

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

$$Fk = \frac{6.628 \times P}{1 - 0.0012 \times L}$$

Air Pressure (MPa)	Holding Force (kN) Non-Usable Range( ) Lever Length L (mm)					
	40	60	80	100	125	150
0.5	3.48	2.53	1.90	1.52	1.22	
0.4	2.79	2.53	1.90	1.52	1.22	1.01
0.3	2.09	2.14	1.90	1.52	1.22	1.01
0.2	1.39	1.43	1.47	1.51	1.22	1.01

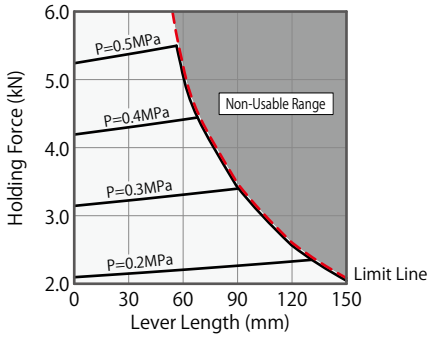


WHG2500

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

$$Fk = \frac{10.481 \times P}{1 - 0.0008 \times L}$$

Air Pressure (MPa)	Holding Force (kN) Non-Usable Range( ) Lever Length L (mm)					
	60	80	100	125	150	200
0.5	5.21	3.91	3.12	2.50	2.08	
0.4	4.40	3.91	3.12	2.50	2.08	1.56
0.3	3.30	3.36	3.12	2.50	2.08	1.56
0.2	2.20	2.24	2.28	2.33	2.08	1.56

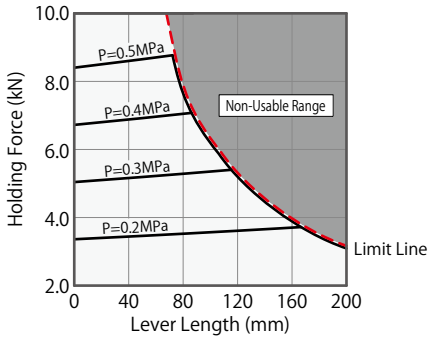


WHG4000

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

$$Fk = \frac{16.806 \times P}{1 - 0.0006 \times L}$$

Air Pressure (MPa)	Holding Force (kN) Non-Usable Range( ) Lever Length L (mm)					
	60	80	100	150	200	250
0.5	8.72	7.92	6.34	4.22	3.17	
0.4	6.97	7.06	6.34	4.22	3.17	2.53
0.3	5.23	5.30	5.36	4.22	3.17	2.53
0.2	3.49	3.53	3.58	3.69	3.17	2.53

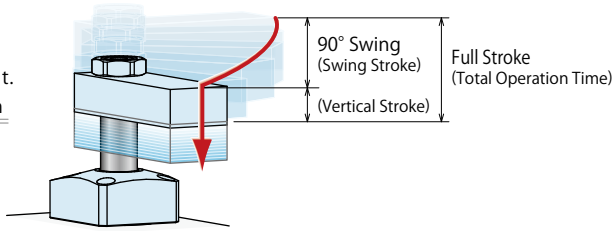


Allowable Swing Time Graph

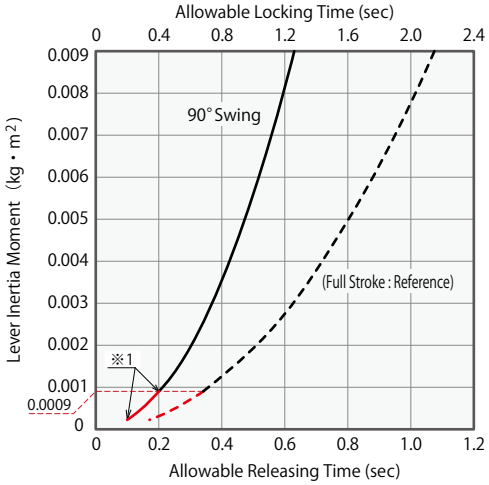
Adjustment of Swing Time

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

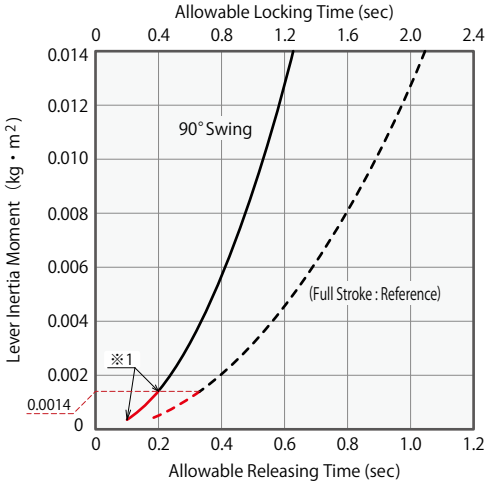
Excessive action speed can reduce stopping accuracy and damage internal parts.



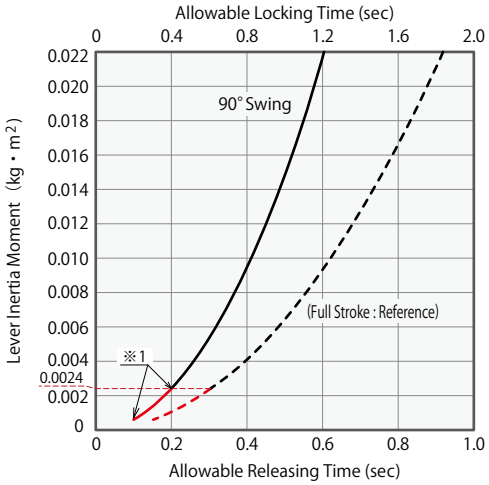
WHG1000



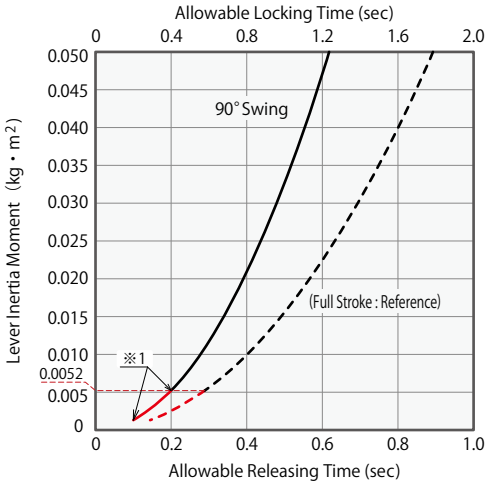
WHG1600



WHG2500



WHG4000



Notes:

※1. For any lever inertia moment, minimum 90° swing time should be 0.2 sec.

1. There may be no lever swing action with large inertia depending on supply air pressure, flow and lever mounting position.
2. For speed adjustment of clamp lever, please use meter-out flow control valve.
   In case of meter-in control, the clamp lever may be accelerated by its own weight during swinging motion (clamp mounted horizontally) or the piston rod may be moving too fast.
   (Please refer to P.37 for speed adjustment.)
3. Please contact us if operational conditions differ from those shown on the graphs.

(How to read the Allowable Swing Time Graph)

In case of WHG1600

Lever Inertia Moment : 0.005 kg·m²

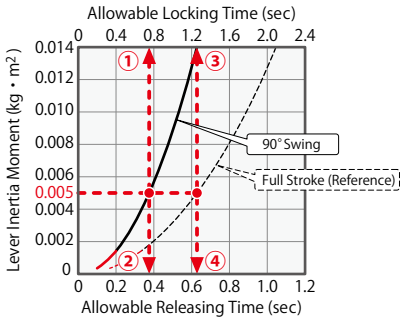
① 90° Swing Time when Locking : About 0.76 sec or more

② 90° Swing Time when Releasing : About 0.38 sec or more

③ Total Lock Operation Time : About 1.27 sec or more

④ Total Release Operation Time : About 0.63 sec or more

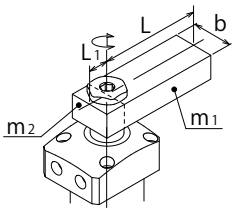
1. The total operation time on the graph represents the allowable operation time when fully stroked.



How to calculate inertia moment (Estimated)

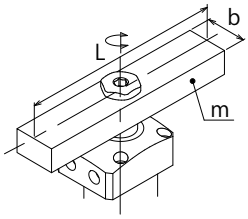
I : Inertia Moment (kg・m²) L,L₁,L₂,K,b : Length (m) m,m₁,m₂,m₃ : Weight (kg)

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



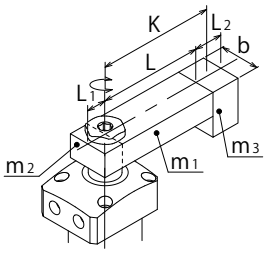
$$I = m_1 \frac{4L^2+b^2}{12} + m_2 \frac{4L_1^2+b^2}{12}$$

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



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

③ The load is applied on the lever front end.

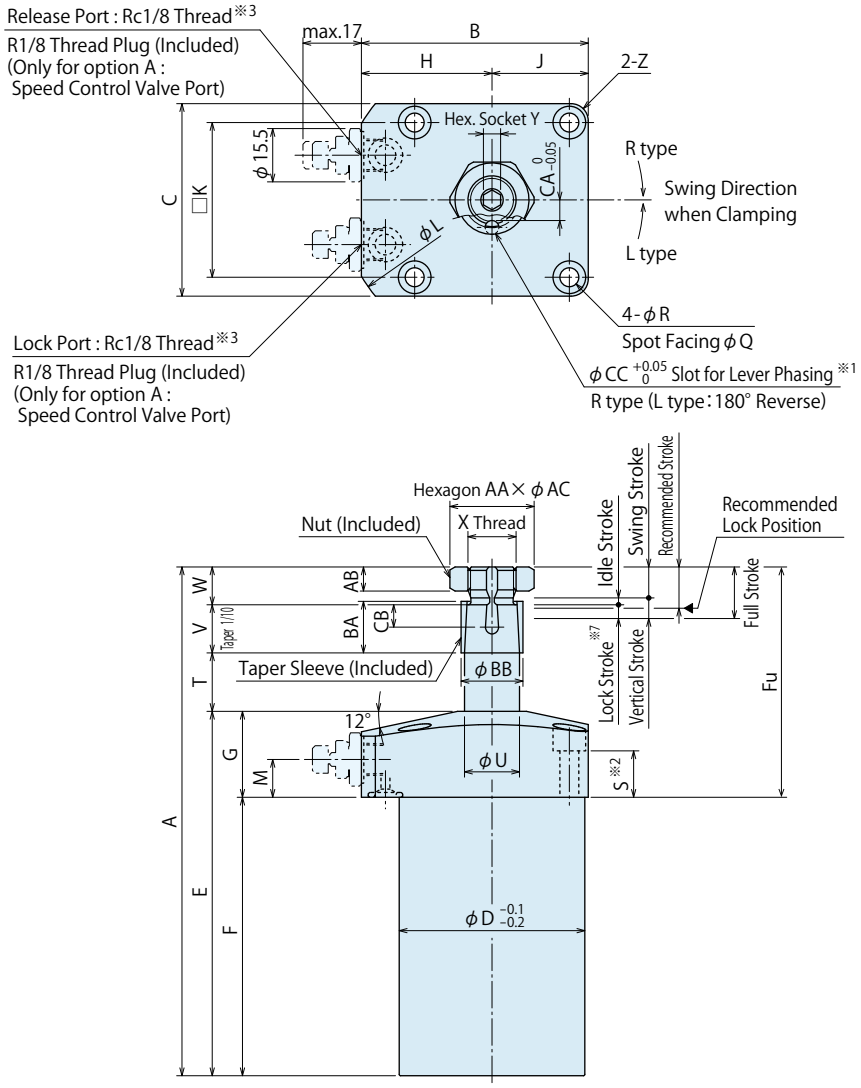


$$I = m_1 \frac{4L^2+b^2}{12} + m_2 \frac{4L_1^2+b^2}{12} + m_3K^2 + m_3 \frac{L_2^2+b^2}{12}$$

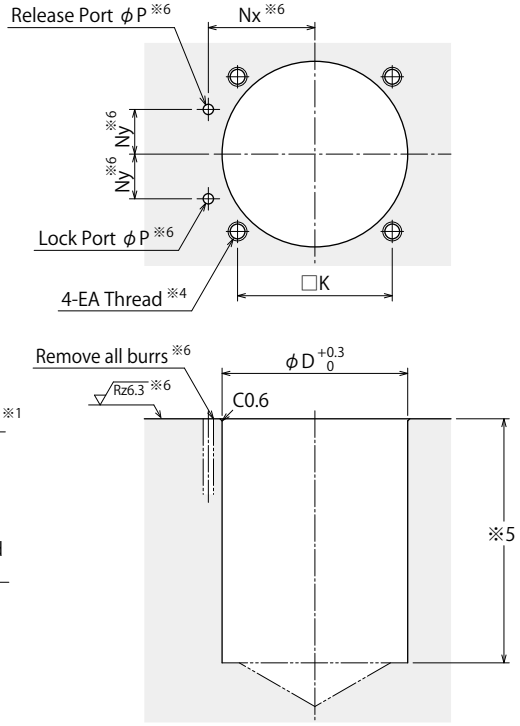
External Dimensions

A：Gasket Option (With Ports for Speed Controller：R-Thread Plug Included)

※ The drawing shows the released state of WHG-2AR.



Machining Dimensions of Mounting Area

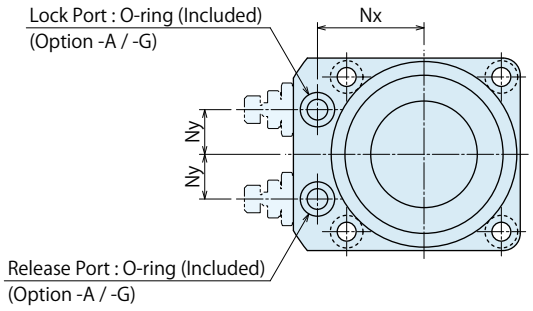


Notes：

※4. EA 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.



Notes：

※1. The slot for lever phasing faces the port side when locked.

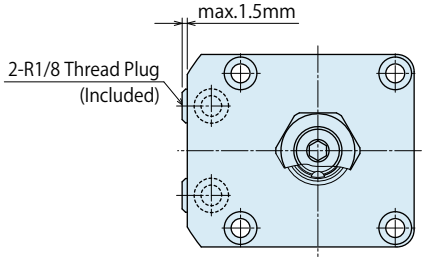
※2. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.

※3. Speed control valve is sold separately. Please refer to P.57.

Piping Method

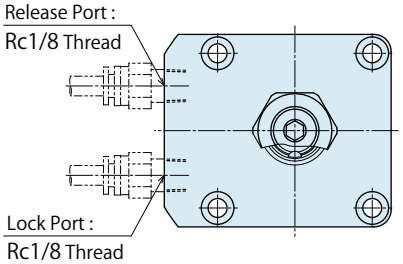
G : Gasket Option (With R Thread Plug)

※The drawing shows the released state of WHG-2GR.



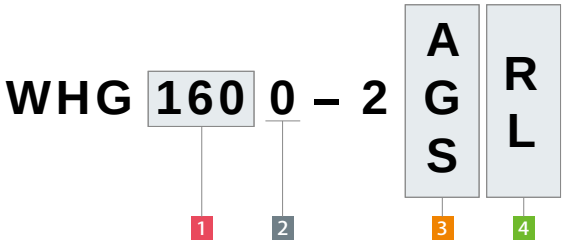
S : Piping Option (Rc Thread)

※The drawing shows the released state of WHG-2SR.



Model No. Indication

(Format Example：WHG1000-2AR, WHG2500-2SL)



1 Cylinder Force
2 Design No.
3 Piping Method
4 Swing Direction when Clamping
5 Action Confirmation (When Blank is chosen)

External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	WHG1000-2□□	WHG1600-2□□	WHG2500-2□□	WHG4000-2□□
Full Stroke	14.5	15	17.5	19.5
Swing Stroke (90°)	8.5	9	11.5	13.5
Vertical Stroke	6			
(Breakdown) Idle Stroke	2			
(Breakdown) Lock Stroke ※7	4			
Recommended Stroke	11.5	12	14.5	16.5
A	138.5	148	174	192.5
B	60	66	76	87
C	50	56	66	78
D	46	54	64	77
E	99.5	106	124.5	135
F	74.5	81	94.5	105
Fu	64	67	79.5	87.5
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	13	13
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	16.5	17	19.5	21.5
U	14	16	20	25
V	12	14	17	21
W	10.5	11	13	15
X (Nominal × Pitch)	M12×1.5	M14×1.5	M16×1.5	M22×1.5
Y	5	5	6	8
Z (Chamfer)	R5	R5	R6	R6
AA	19	22	24	32
AB	6.5	7	8	10
AC	21.2	24.5	26.5	35.5
BA	13	15	18	22
BB	16	18	22	28
CA	5	6	8	10
CB	4.5	6.5	5.5	9.5
CC	4	4	4	6
EA (Nominal×Pitch)	M5×0.8	M5×0.8	M6×1	M6×1
O-ring (Option A/G)	1BP7	1BP7	1BP7	1BP7
Cylinder Capacity cm³ Lock	21.8	35.5	61.3	103.8
Cylinder Capacity cm³ Release	25.5	40.3	69.2	117.6
Weight ※8 kg	0.8	1.0	1.8	2.9

Notes：

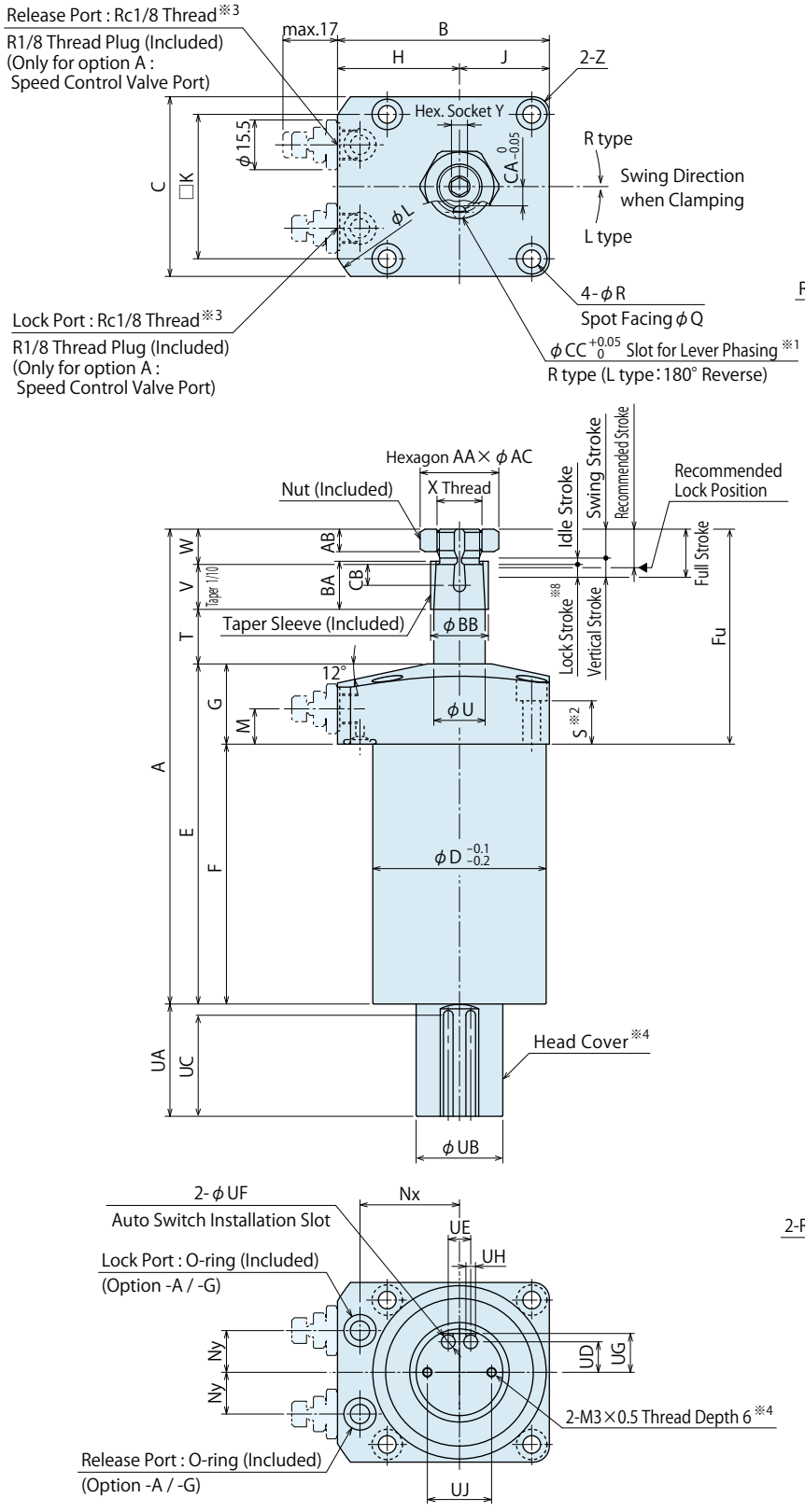
※7. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range.
(The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)

※8. It shows the weight of single swing clamp including taper sleeve and nut.

External Dimensions

A：Gasket Option (With Ports for Speed Controller：R-Thread Plug Included)

※ The drawing shows the released state of WHG-2ART.



Notes：

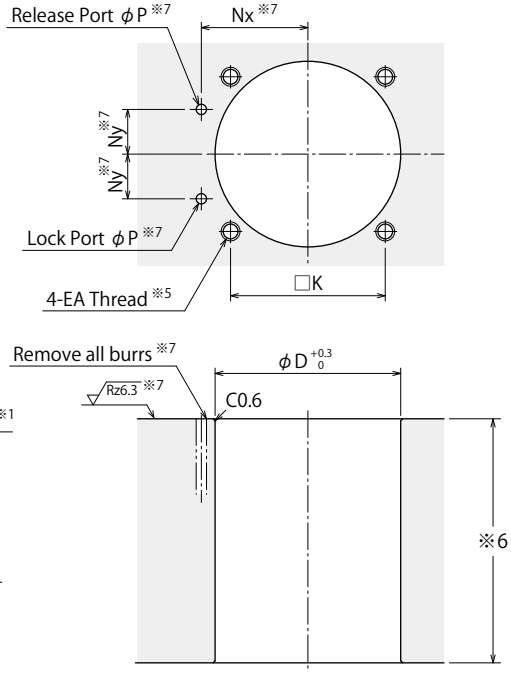
※1. The slot for lever phasing faces the port side when locked.

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

※3. Speed control valve is sold separately. Please refer to P.57.

※4. 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.

Machining Dimensions of Mounting Area



Notes：

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

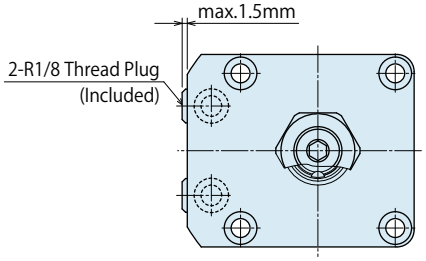
※6. The depth of the body mounting hole ϕD should be decided according to the mounting height referring to dimension 'F'.

※7. The machining dimension is for -A/-G：Gasket Option.

Piping Method

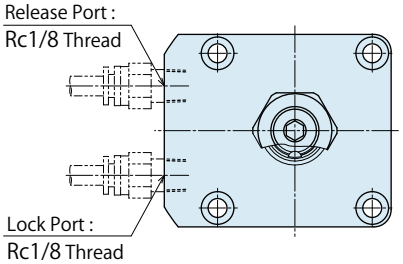
G : Gasket Option (With R Thread Plug)

※The drawing shows the released state of WHG-2GRT.



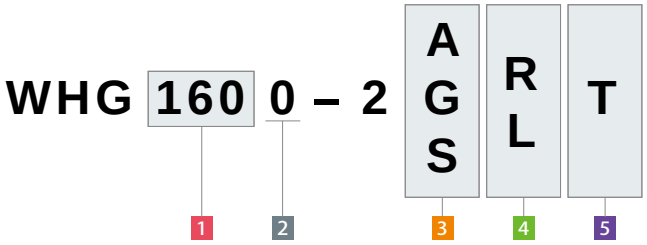
S : Piping Option (Rc Thread)

※The drawing shows the released state of WHG-2SRT.



Model No. Indication

(Format Example：WHG1000-2ART, WHG2500-2SLT)



External Dimensions and Machining Dimensions for Mounting

(mm)

Model No.	WHG1000-2□□T	WHG1600-2□□T	WHG2500-2□□T	WHG4000-2□□T
Full Stroke	14.5	15	17.5	19.5
Swing Stroke (90°)	8.5	9	11.5	13.5
Vertical Stroke	6			
(Break down) Idle Stroke	2			
(Break down) Lock Stroke ※8	4			
Recommended Stroke	11.5	12	14.5	16.5
A	138.5	148	174	192.5
B	60	66	76	87
C	50	56	66	78
D	46	54	64	77
E	99.5	106	124.5	135
F	74.5	81	94.5	105
Fu	64	67	79.5	87.5
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	13	13
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	16.5	17	19.5	21.5
U	14	16	20	25
V	12	14	17	21
W	10.5	11	13	15
X (Nominal × Pitch)	M12×1.5	M14×1.5	M16×1.5	M22×1.5
Y	5	5	6	8
Z (Chamfer)	R5	R5	R6	R6
AA	19	22	24	32
AB	6.5	7	8	10
AC	21.2	24.5	26.5	35.5
BA	13	15	18	22
BB	16	18	22	28
CA	5	6	8	10
CB	4.5	6.5	5.5	9.5
CC	4	4	4	6
EA (Nominal×Pitch)	M5×0.8	M5×0.8	M6×1	M6×1
UA	35	35	38	40
UB	27	27	30	30
UC	31	31.5	34	36
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
Cylinder Capacity cm³ Lock	21.8	35.5	61.3	103.8
Cylinder Capacity cm³ Release	25.5	40.3	69.2	117.6
Weight ※9 kg	0.9	1.1	1.9	3.0

Notes：

※8. The specification value of cylinder force, clamping force, holding force and swing completion position repeatability is fulfilled only when clamping within the lock stroke range.
(The specification value is not fulfilled when clamping within the range of swing stroke and idle stroke.)

※9. It shows the weight of single swing clamp including taper sleeve and nut.

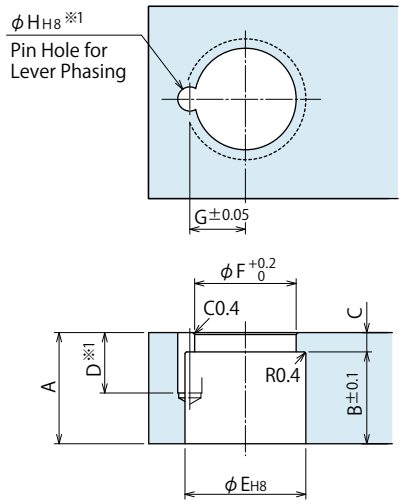
Taper Lock Lever Design Dimensions

※ Reference for designing taper lock swing lever.

Corresponding Model No.

WHG □ 0 - 2 [A / G / S] [L / R] [Blank / T]

1 Cylinder Force



(mm)

Corresponding Model No.	WHG1000-2□□□	WHG1600-2□□□	WHG2500-2□□□	WHG4000-2□□□
A	16	18	22	26
B	13	15	18	22
C	3	3	4	4
D	8.5	10.5	10.5	14.5
E	16 +0.027 0	18 +0.027 0	22 +0.033 0	28 +0.033 0
F	13	15	17	23.5
G	7.1	8.1	10.1	13.1
H	4 +0.018 0	4 +0.018 0	4 +0.018 0	6 +0.018 0
Phasing Pin (Reference)※2	ϕ4(h8)×8	ϕ4(h8)×10	ϕ4(h8)×10	ϕ6(h8)×14

Notes：

1. Swing lever should be designed with its length according to performance curve.
2. If the swing lever is not in accordance with the dimensions shown above, performance may be degraded and damage can occur.

※1. The pin hole (ϕH) for determining the lever phase should be added, if necessary.

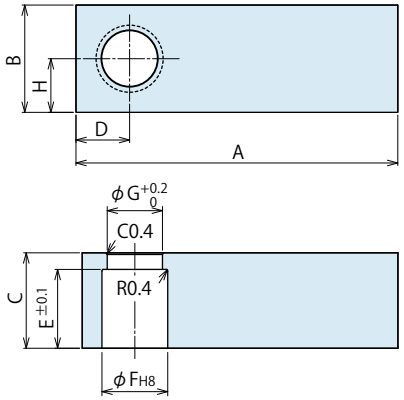
※2. Phasing pin is not included. Prepare it separately.

Accessories：Material Swing Lever for Taper Lock Option

Model No. Indication

WHZ 160 0 – T

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



(mm)

Model No.	WHZ1000-T	WHZ1600-T	WHZ2500-T	WHZ4000-T
Corresponding Model No.	WHG1000-2□□□	WHG1600-2□□□	WHG2500-2□□□	WHG4000-2□□□
A	90	125	150	170
B	25	28	34	45
C	16	18	22	26
D	12.5	14	17	23
E	13	15	18	22
F	$16^{+0.027}_{0}$	$18^{+0.027}_{0}$	$22^{+0.033}_{0}$	$28^{+0.033}_{0}$
G	13	15	17	23.5
H	12.5	14	17	22.5

Notes：

1. Material : S50C
2. If necessary, the front end should be additionally machined.
3. When determining the phase, refer to taper lock lever design dimensions for each model for the additional machining.

Cautions

Notes for Design

1) Check Specifications

- Please use each product according to the specifications.

2) Notes for Circuit Design

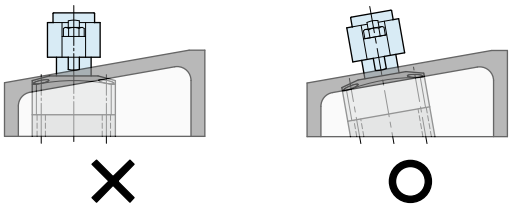
- Ensure there is no possibility of supplying air pressure to the lock port and the release port simultaneously. Improper circuit design may lead to malfunctions and damages.

3) Swing lever should be designed so that the inertia moment is small.

- Large inertia moment will degrade the lever's stopping accuracy and cause undue wear to the clamp.
  Additionally, the clamp may not function, depending on supplied air pressure and lever mounting position.
- Please set the operating time after the inertia moment is calculated. Please make sure that the clamps work within allowable operating time referring to the allowable operating time graph.
- If supplying a large amount of air right after installation, action time will be extremely fast leading to severe damage on a clamp. Install the speed controller (meter-in) near the air source and gradually supply air pressure.

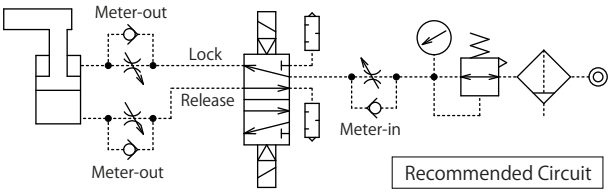
4) When clamping on a sloped surface of the workpiece

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



5) Swing Speed Adjustment

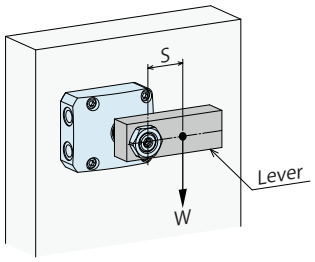
- If the clamp operates too fast the parts will wear out leading to premature damage and ultimately complete equipment failure. Adjust the speed following "Allowable Swing Time Graph".
- Install a speed control valve (meter-out) and gradually control the flow rate from the low-speed side (small flow) to the designated speed. Controlling from the high-speed side (large flow) causes excessive surge pressure or overload to the clamp leading to damage of a machine or device.



- When operating multiple clamps simultaneously, please install the speed controller (meter-out) to each clamp.

6) Notes for Lever Design

- Please design the lever as light as possible, and it should be no larger than necessary.
  The clamp may not function depending on supplying air pressure, mounting position and shape of the lever. If using a large lever with the mounting position shown below, it may stop in the middle of swing action. Please use a lever with (Lever Weight W) × (Gravity Center S) lighter than shown in the following table.

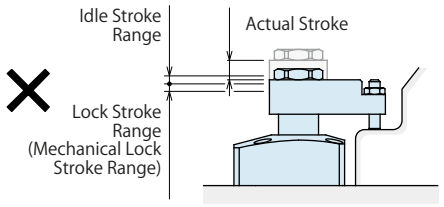


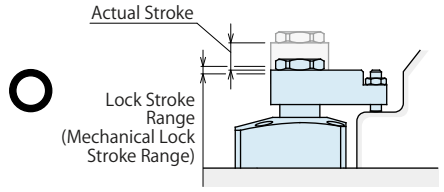
Model No.	(Lever Length W) × (Center of Gravity S) (N·m)
WHG1000	0.10
WHG1600	0.20
WHG2500	0.45
WHG4000	0.90

7) The specification value is not fulfilled when clamping out of the lock stroke range.

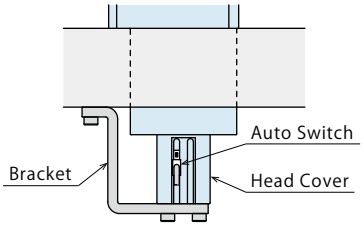
- The mechanical lock function will not work when clamping within the range of swing stroke and idle stroke, and the specification value of cylinder force, clamping force, holding force and swing completion position repeatability will not be fulfilled.

The actual stroke of the piston that descends from the release-end to lock-end should be designed to have the same value as the recommended stroke listed in the external dimensions.





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



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 secondary lubricant, please supply lubricant continuously. Otherwise, the initial grease applied from KOSMEK will be removed from the secondary lubricant.)

2) Preparation for Piping

- The pipeline, piping connector and fixture circuits should be cleaned and flushed thoroughly.
  The dust and cutting chips in the circuit may lead to fluid 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 screw direction.
  Wrapping in the wrong direction will cause leakage and malfunction.
- Pieces of the sealing tape can lead to air leakage and malfunction.
- When piping, be careful that contaminant such as sealing tape does not enter in 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 table below. Tightening with greater torque than recommended can depress the seating surface or break the bolt.

Model	Thread Size	Tightening Torque (N·m)
WHG1000	M5×0.8	6.3
WHG1600	M5×0.8	6.3
WHG2500	M6×1	10
WHG4000	M6×1	10

5) Installation of the Flow Control Valve

- Tightening torque for installing flow control valve is 5 to 7 N・m.

6) Installation / Removal of the Swing Lever

- Oil or debris on the mating surfaces of the lever, taper sleeve or piston rod can cause the lever to loosen.
  Please clean them thoroughly before installation.
- Tightening torque for the swing lever is shown below.

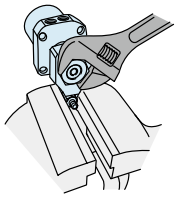
Standard：Taper Lock Lever Option

Model	Thread Size	Tightening Torque (N·m)
WHG1000	M12×1.5	17 ~ 20
WHG1600	M14×1.5	21 ~ 25
WHG2500	M16×1.5	33 ~ 40
WHG4000	M22×1.5	84 ~ 100

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

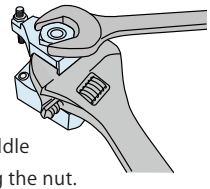
Installation Procedure

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



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

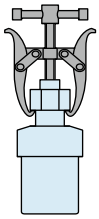
③ If tightening the nut with the clamp positioned to the jig, use a wrench to the hexagon part of piston rod, or fix the lever with a spanner.
It is best to bring the lever to the middle of the swing stroke before tightening the nut.



Removal Procedure

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

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



7) Swing Speed Adjustment

- Adjust the speed following "Allowable Swing Time Graph".
  If the clamp operates too fast the parts will wear out leading to premature damage and ultimately complete equipment failure.
- 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, the bolt and nut may be tightened lightly. Check the looseness and re-tighten as required.

※ Please refer to P.61 for general cautions. ・Notes on Handling ・Maintenance/Inspection ・Warranty

High-Power Welding Link Clamp

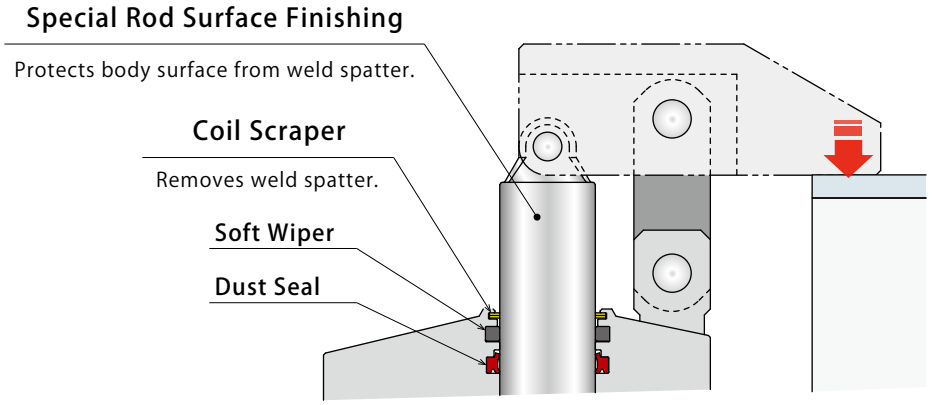
Model WCG

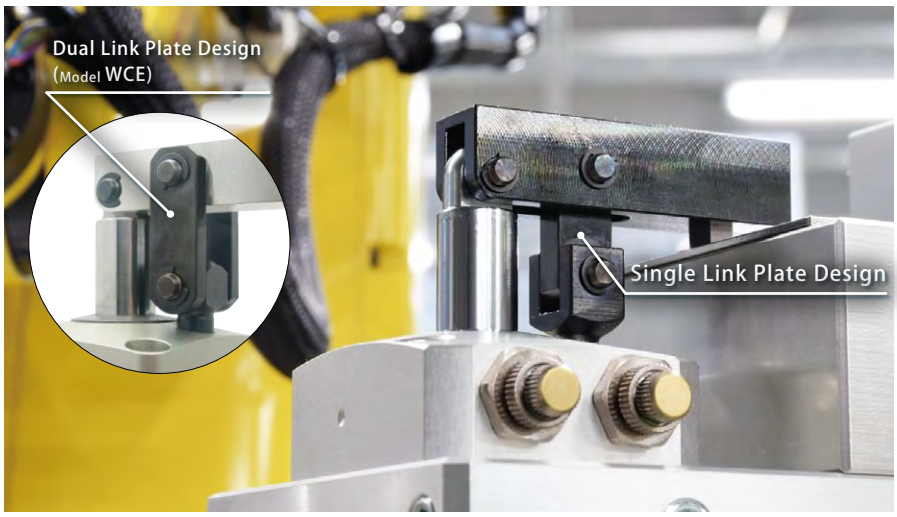
Spatter Resistant High-Power Welding Link Clamp

PAT.

Features

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





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

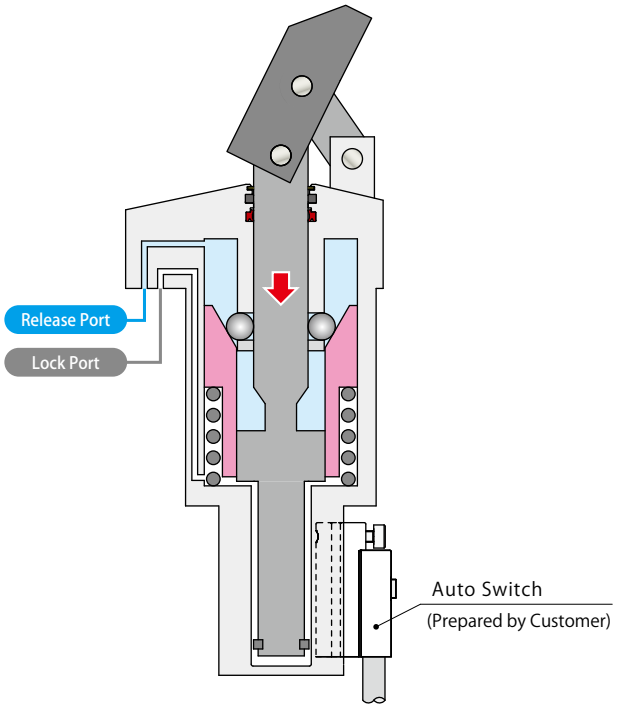
The rod operates without failure even after exposed to spatter for a long time.

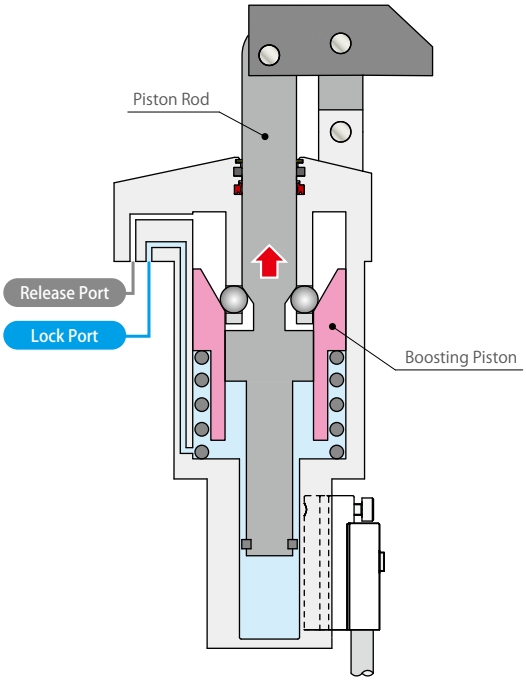
The High-Power Welding Link Clamp is a hybrid system using air pressure and a mechanical lock.

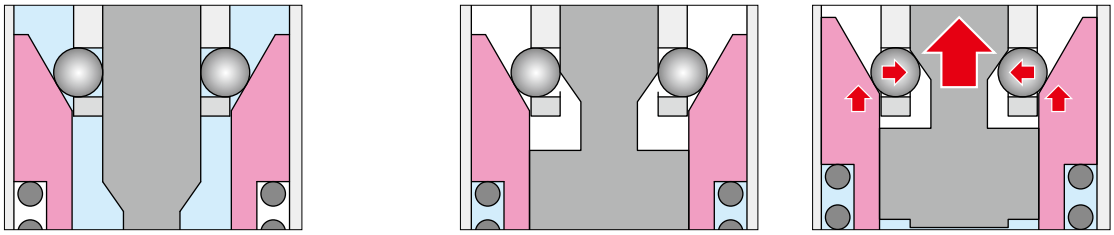
Action Description

Released State
Lock Air OFF
Release Air ON

Locked State
Lock Air ON
Release Air OFF







Released State

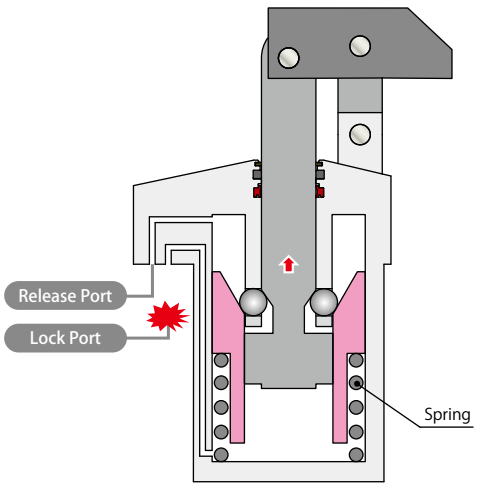
The piston rod descends to release.

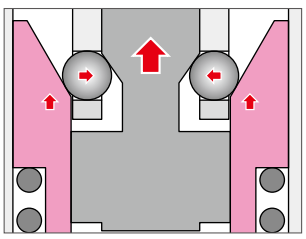
Locking Operation
(Idle Stroke Completed)

Locked State
(Boosting Stroke)

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



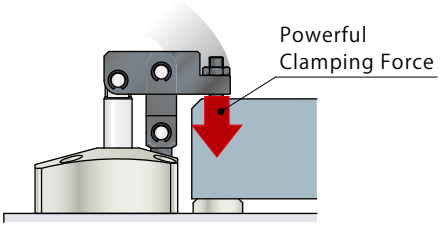


Self-Locking State
(Holding with Spring Force + Mechanical Lock)

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

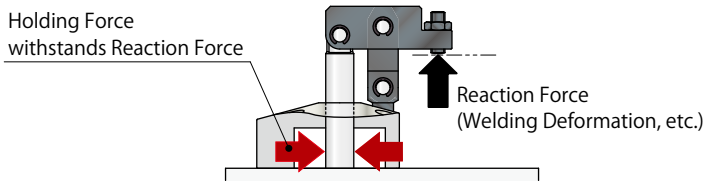
No Hydraulic Use

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



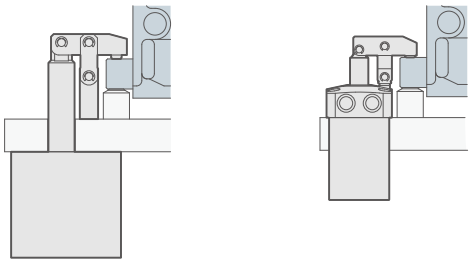
Holding Force

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



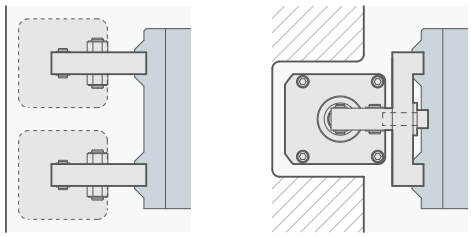
Smaller Footprint

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

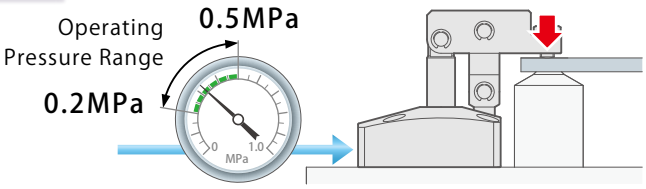


General Air Cylinder — High-Power Welding Clamp

Reduced Number of Clamps

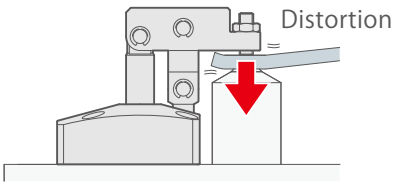
Energy Saving

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

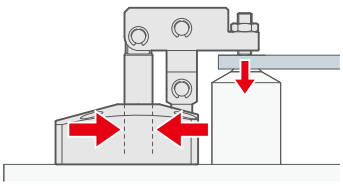


High Quality

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



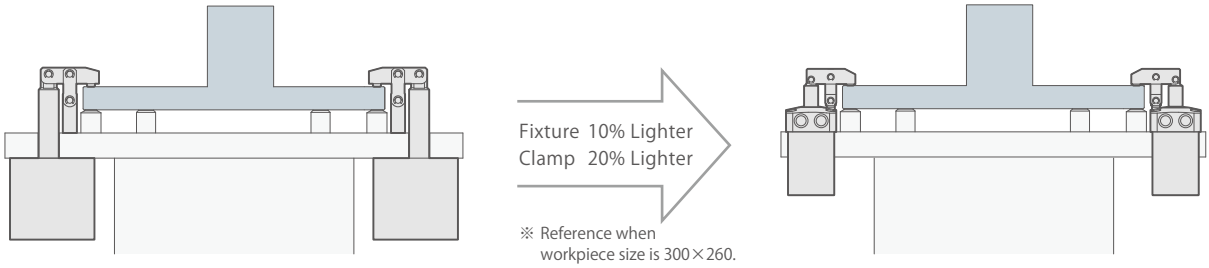
Strong clamping force distorts workpiece.



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.



General Air Cylinder — High-Power Welding Clamp

Action Confirmation

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

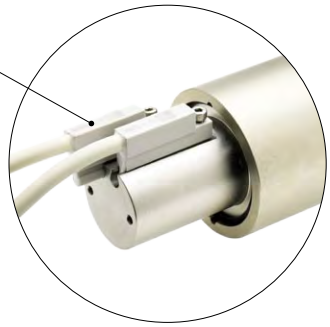
Auto Switch (Prepared by Customer)

Ability to Confirm Lock/Release Actions

Recommended Auto Switch

Magnetic Field Resistant Model：D-P3DWA (made by SMC)

JEP Series (made by KOSMEK) ※1 ※2



Notes :

※1. Please refer to FA・Industrial Robot Related Catalog (CATALOG No. FA0020□□-□□-GB) for detailed specifications of JEP series.

※2. Please use D-P3DWA (made by SMC) for an environment which generates a magnetic field disturbance.
JEP series cannot be used in such an environment.

1. When using an auto switch not made by Kosmek, check specifications of each manufacture.

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 Application Related Products
Die Change System for Press Machines
Company Profile Sales Offices

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.

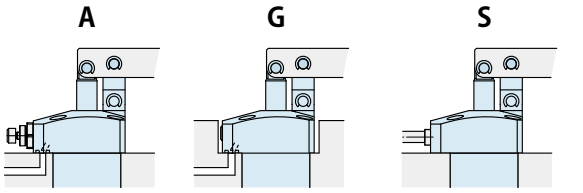
2 Design No.

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.57.

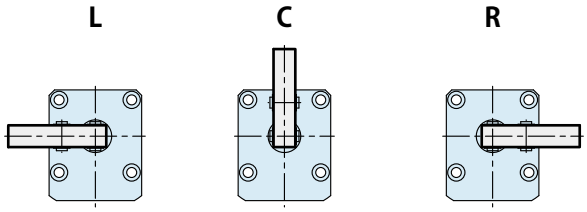


Gasket Option		Piping Option
With Ports for Speed Controller Includes R Thread Plug (order speed controller separately)	with R Thread Plug	Rc Thread No Gasket Port

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.



5 Action Confirmation Method

Blank : None (Standard)
T : With Auto Switch Installation Slot

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.45			
Holding Force			Refer to “Holding Force Curve” on P.46			
Clamping Force and Holding Force at 0MPa			Refer to “Clamping Force and Holding Force Curve at 0 MPa” on P.47			
Full Stroke		mm	22	23.5	27.5	33
(Break down)	Idle Stroke	mm	18	19.5	23.5	29
	Lock Stroke ※1	mm	4	4	4	4
Cylinder Capacity cm^3	Lock		22.4	35.8	56.1	95.6
	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			

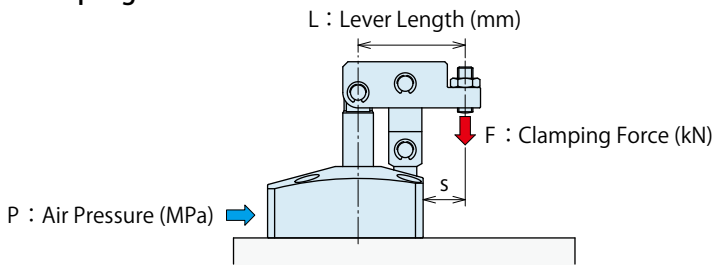
Notes:

※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



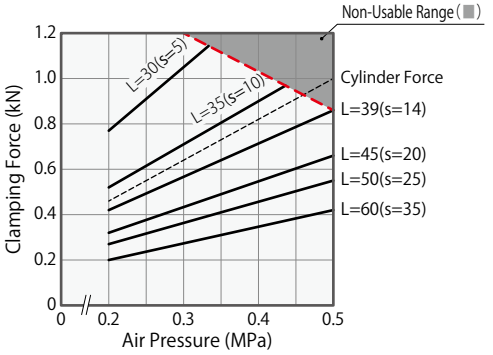
(How to read the Clamping Force Curve)
In case of WCG2500
Supply Air Pressure 0.3MPa
Lever Length L=50mm
Clamping force is about 1.46kN.

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

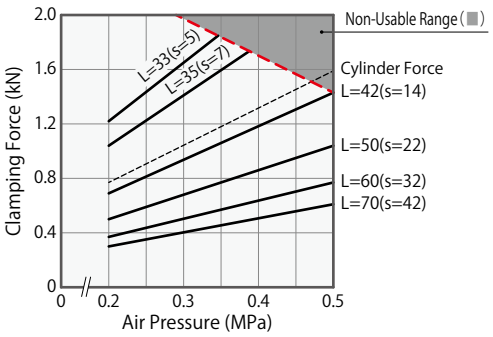
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range ( ) Lever Length L (mm) 30	35	39	45	50	60	Min. Lever Length (mm)
0.5	0.94			0.85	0.65	0.54	0.41	39
0.4	0.78		0.88	0.70	0.54	0.45	0.34	33
0.3	0.62	1.03	0.70	0.55	0.42	0.35	0.27	29
0.2	0.45	0.76	0.51	0.41	0.31	0.26	0.20	25
Max.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



WCG1600

Clamping Force Calculation Formula※1(kN) $F = \frac{51.6 \times P + 4.3}{L - 21}$

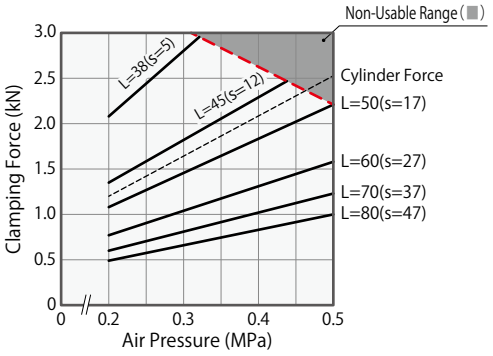
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range ( ) Lever Length L (mm) 33	35	42	50	60	70	Min. Lever Length (mm)
0.5	1.59			1.43	1.04	0.77	0.61	42
0.4	1.32			1.19	0.86	0.64	0.51	36
0.3	1.05	1.65	1.41	0.94	0.68	0.51	0.40	31
0.2	0.77	1.22	1.04	0.70	0.50	0.37	0.30	28
Max. Operating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



WCG2500

Clamping Force Calculation Formula※1(kN) $F = \frac{93.9 \times P + 8.3}{L - 25}$

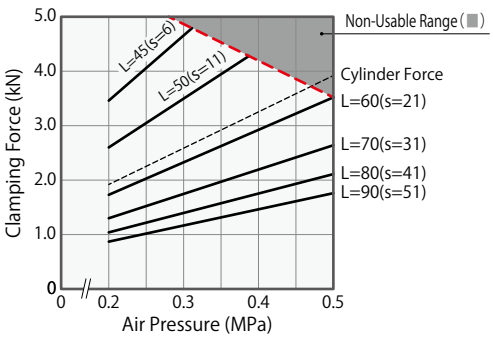
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range ( ) Lever Length L (mm) 38	45	50	60	70	80	Min. Lever Length (mm)
0.5	2.46			2.21	1.58	1.23	1.00	50
0.4	2.04		2.29	1.83	1.31	1.02	0.83	42
0.3	1.62	2.81	1.82	1.46	1.04	0.81	0.66	37
0.2	1.20	2.08	1.35	1.08	0.77	0.60	0.49	33
Max.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



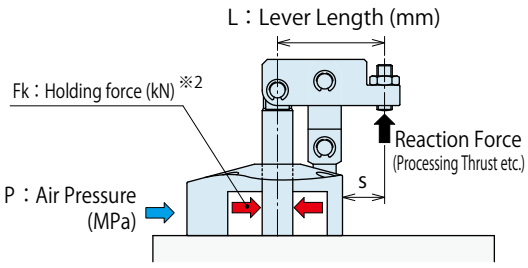
WCG4000

Clamping Force Calculation Formula※1(kN) $F = \frac{179.2 \times P + 16.1}{L - 30}$

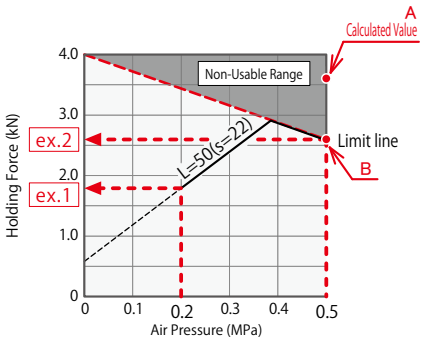
Air Pressure (MPa)	Cylinder Force (kN)	Clamping Force (kN) Non-Usable Range ( ) Lever Length L (mm) 45	50	60	70	80	90	Min. Lever Length (mm)
0.5	3.92			3.52	2.64	2.11	1.76	60
0.4	3.25			2.93	2.19	1.76	1.46	51
0.3	2.59	4.66	3.49	2.33	1.75	1.40	1.16	44
0.2	1.92	3.46	2.60	1.73	1.30	1.04	0.87	39
Max. Operating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



Holding Force Curve



(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.)

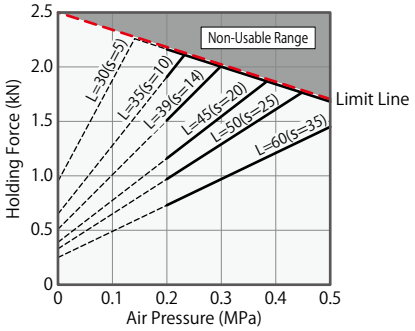
※3. Fk : Holding force (kN) , P : Supply air pressure (MPa) , L : Lever length (mm). When a holding force calculated value exceeds the value of a limit line, holding force becomes a value of a limit line.

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

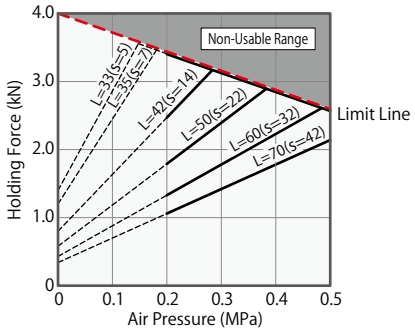
Air Pressure (MPa)	Holding Force (kN) Non-Usable Range( ) Lever Length L (mm) 30	35	39	45	50	60	Non-Usable Range Limit Line Value (kN)
0.5			1.67	1.67	1.67	1.45	1.67
0.4		1.84	1.84	1.84	1.61	1.21	1.84
0.3	2.01	2.01	2.01	1.54	1.29	0.97	2.01
0.2	2.18	1.90	1.51	1.16	0.97	0.73	2.18



WCG1600

Holding Force Formula ※3 (Fk ≦ Limit Line Value) (kN) $Fk = \frac{175.2 \times P + 16.8}{L - 21}$

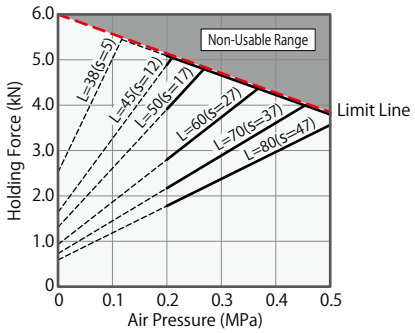
Air Pressure (MPa)	Holding Force (kN) Non-Usable Range( ) Lever Length L (mm) 33	35	42	50	60	70	Non-Usable Range Limit Line Value (kN)
0.5			2.58	2.58	2.58	2.13	2.58
0.4			2.86	2.86	2.23	1.77	2.86
0.3	3.14	3.14	3.14	2.39	1.78	1.42	3.14
0.2	3.42	3.42	2.47	1.79	1.33	1.06	3.42



WCG2500

Holding Force Formula ※3 (Fk ≦ Limit Line Value) (kN) $Fk = \frac{325.6 \times P + 32.6}{L - 25}$

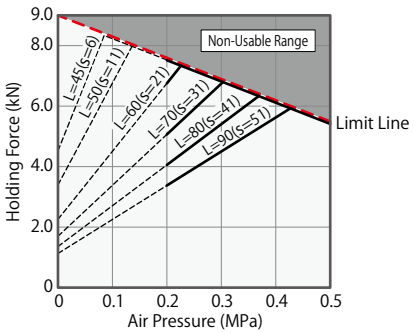
Air Pressure (MPa)	Holding Force (kN) Non-Usable Range( ) Lever Length L (mm) 38	45	50	60	70	80	Non-Usable Range Limit Line Value (kN)
0.5			3.81	3.81	3.81	3.55	3.81
0.4		4.24	4.24	4.24	3.62	2.96	4.24
0.3	4.67	4.67	4.67	3.72	2.90	2.37	4.67
0.2	5.10	4.89	3.91	2.79	2.17	1.78	5.10



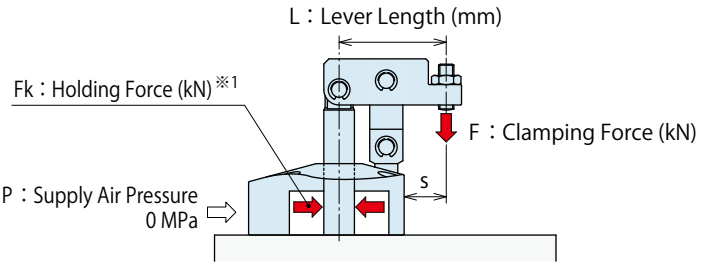
WCG4000

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( ) Lever Length L (mm) 45	50	60	70	80	90	Non-Usable Range Limit Line Value (kN)
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



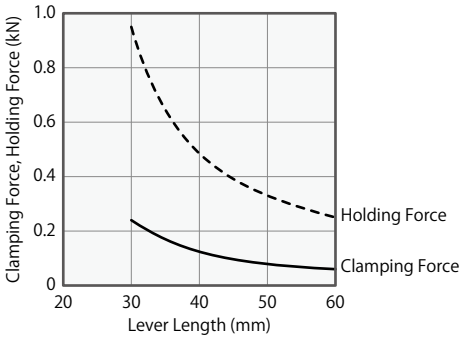
(How to read the Clamping Force and Holding Force Curve at 0MPa)
In case of WCG1600
When air pressure is shut off at clamped state:
Supply Air Pressure = 0MPa, Lever Length L=50 mm
Clamping force becomes about 0.15 kN.
Holding force becomes about 0.58 kN.

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)	$F = \frac{2.2}{L - 19.5}$
Holding Force Formula at 0MPa ※2	(kN)	$Fk = \frac{10.0}{L - 19.5}$

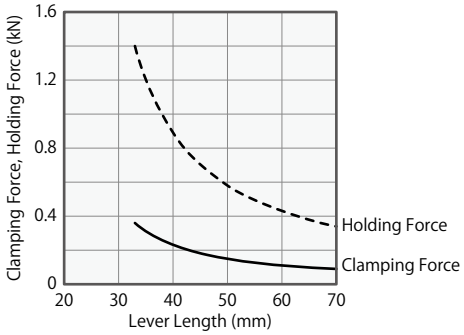
Lever Length	(mm)	30	35	39	45	50	60
Clamping Force Reference Value at 0MPa	(kN)	0.21	0.14	0.11	0.09	0.07	0.05
Holding Force Reference Value at 0MPa	(kN)	0.95	0.65	0.51	0.39	0.33	0.25



WCG1600

Clamping Force Formula at 0MPa ※2	(kN)	$F = \frac{4.3}{L - 21}$
Holding Force Formula at 0MPa ※2	(kN)	$Fk = \frac{16.8}{L - 21}$

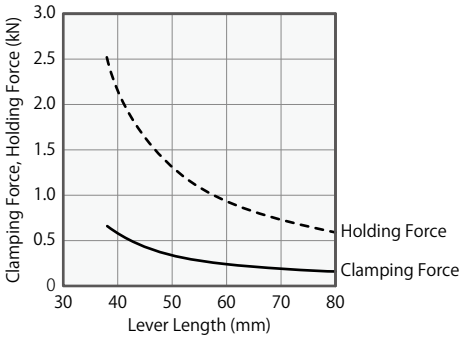
Lever Length	(mm)	33	35	42	50	60	70
Clamping Force Reference Value at 0MPa	(kN)	0.36	0.31	0.20	0.15	0.11	0.09
Holding Force Reference Value at 0MPa	(kN)	1.40	1.20	0.80	0.58	0.43	0.34



WCG2500

Clamping Force Formula at 0MPa ※2	(kN)	$F = \frac{8.3}{L - 25}$
Holding Force Formula at 0MPa ※2	(kN)	$Fk = \frac{32.6}{L - 25}$

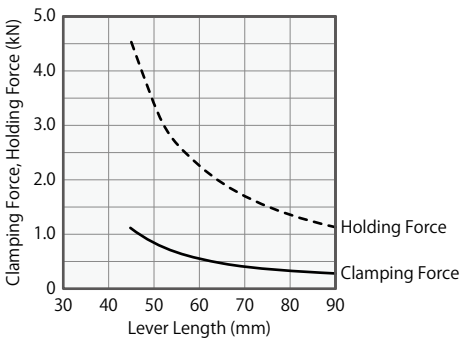
Lever Length	(mm)	38	45	50	60	70	80
Clamping Force Reference Value at 0MPa	(kN)	0.64	0.42	0.33	0.24	0.18	0.15
Holding Force Reference Value at 0MPa	(kN)	2.51	1.63	1.30	0.93	0.72	0.59



WCG4000

Clamping Force Formula at 0MPa ※2	(kN)	$F = \frac{16.1}{L - 30}$
Holding Force Formula at 0MPa ※2	(kN)	$Fk = \frac{68.0}{L - 30}$

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

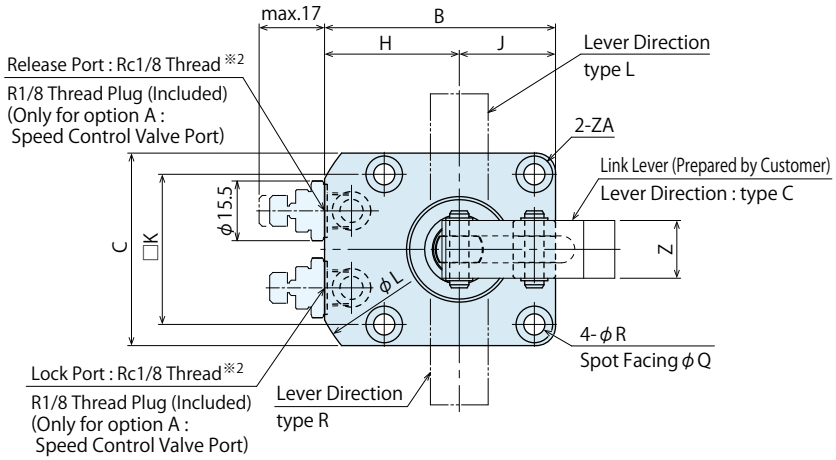


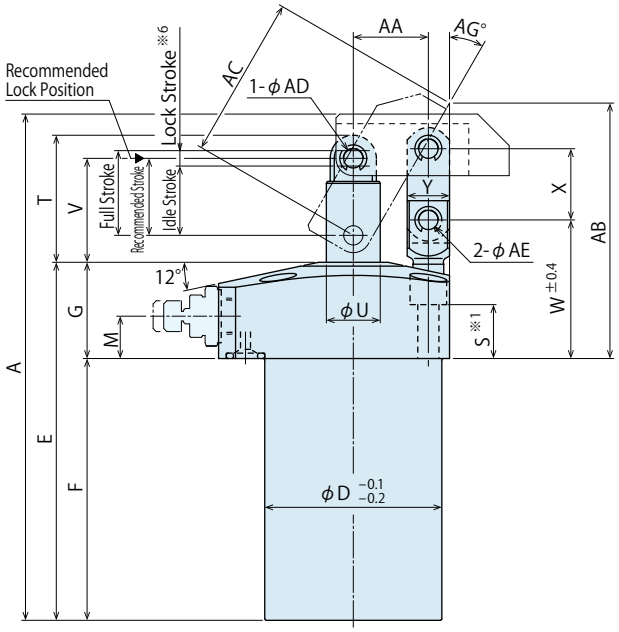
Locating Pin Clamp
SWP
High-Power Welding Swing Clamp
WHG
High-Power Welding Link Clamp
WCG
Air Flow Control Valve
BZW
Manifold Block
WHZ-MD
General Cautions
Welding Application Related Products
Die Change System for Press Machines
Company Profile Sales Offices

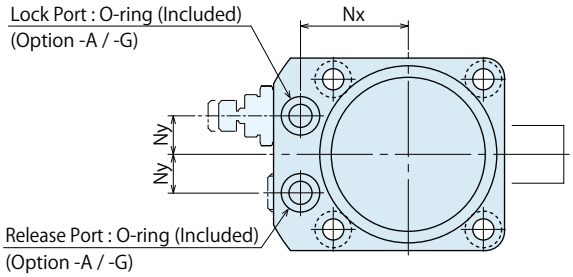
External Dimensions

A：Gasket Option (With Ports for Speed Controller：R-Thread Plug Included)

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







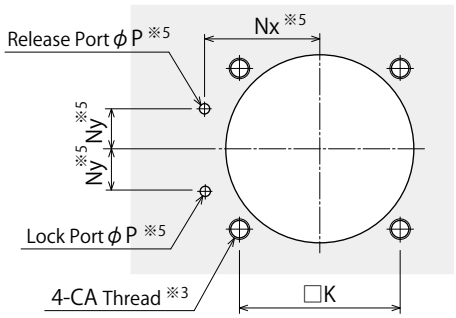
Notes：

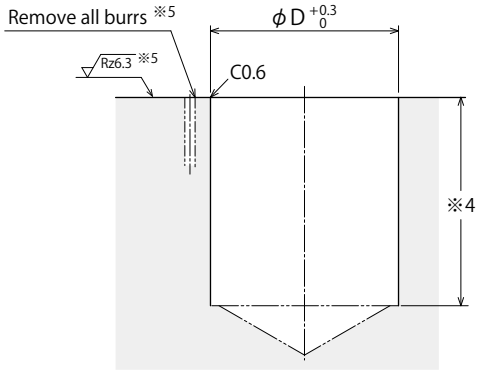
※1. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.

※2. Speed control valve is sold separately. Please refer to P.57.

1. Please use the attached pin (equivalent to ϕADf6, ϕAEf6, HRC60) as the mounting pin for lever.

Machininig Dimensions of Mounting Area





Notes：

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

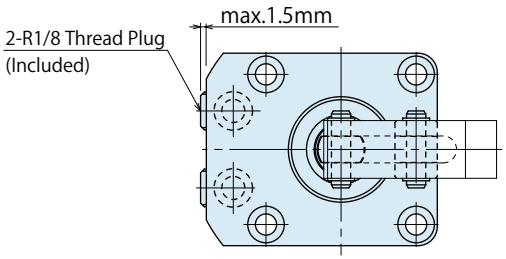
※4. The depth of the body mounting hole ϕD should be decided according to the mounting height referring to dimension 'F'.

※5. The machining dimension is for -A/-G：Gasket Option.

Piping Method

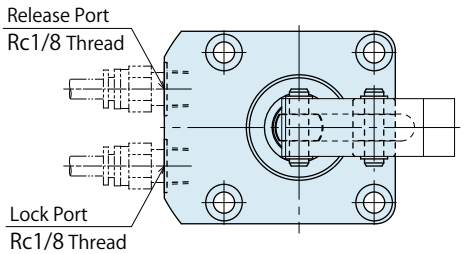
G：Gasket Option (with R Thread Plug)

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



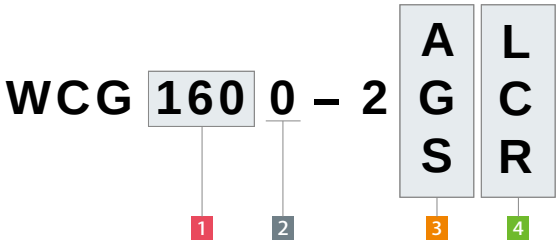
S：Piping Option (Rc Thread)

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



Model No. Indication

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



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)

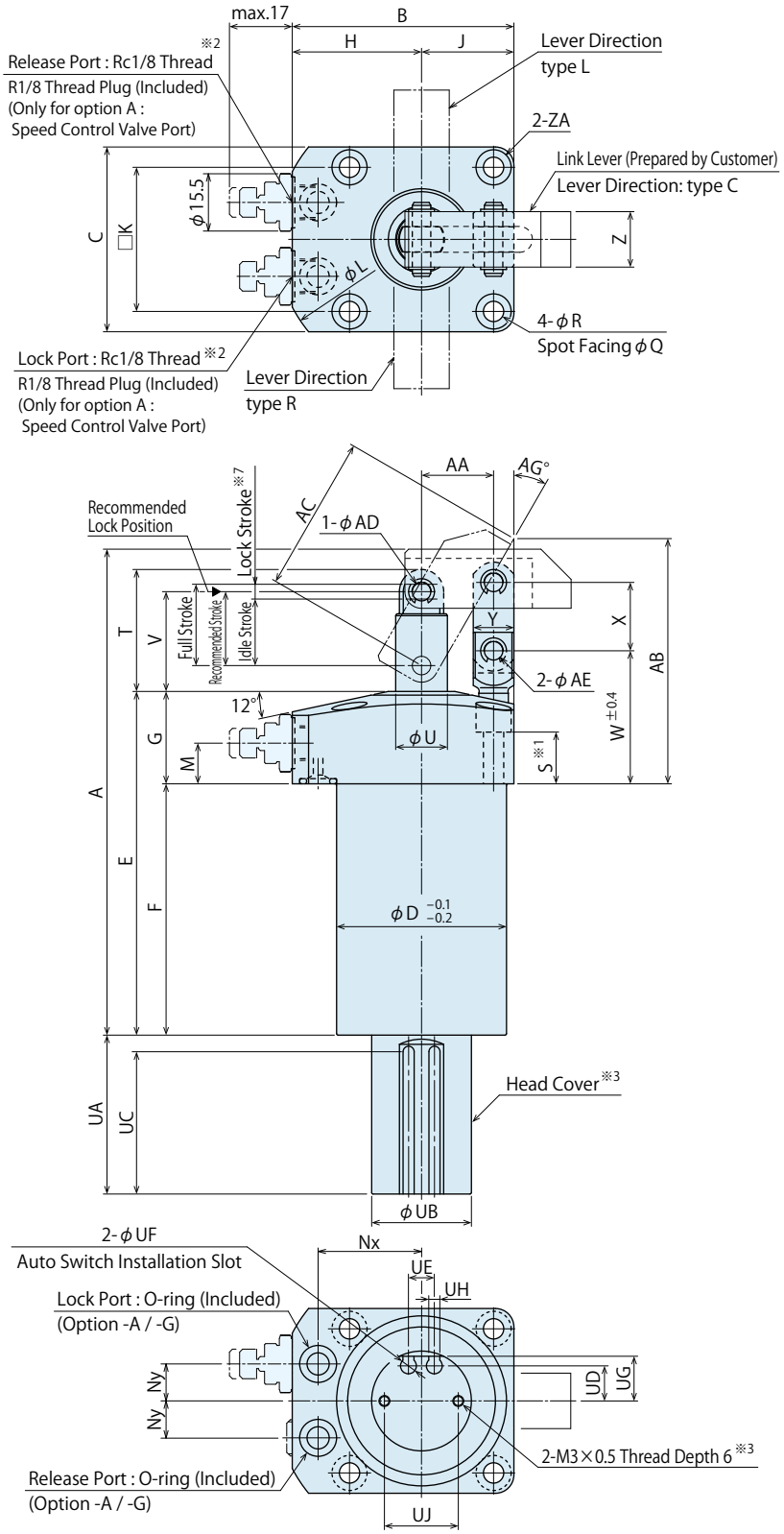
Model No.		WCG1000-2□□	WCG1600-2□□	WCG2500-2□□	WCG4000-2□□
Full Stroke		22	23.5	27.5	33
(Break down)	Idle Stroke	18	19.5	23.5	29
(Break down)	Lock Stroke ※6	4	4	4	4
Recommended Stroke		20	21.5	25.5	31
A		131.5	143.5	169	197.5
B		60	66	76	87
C		50	56	66	78
D		46	54	64	77
E		93	99.5	117	133
F		68	74.5	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.



Notes：

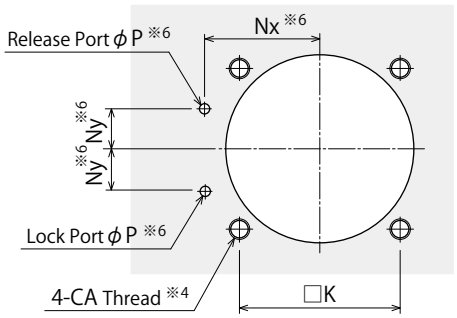
※1. Mounting bolts are not provided. Please prepare them according to the mounting height referring to dimension 'S'.

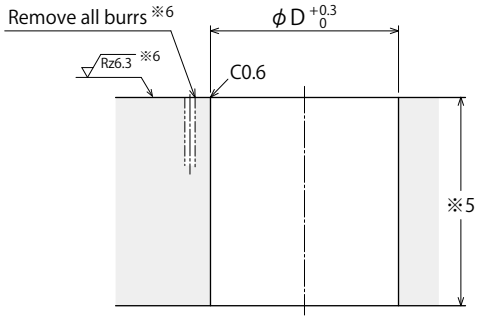
※2. Speed control valve is sold separately. Please refer to P.57.

※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





Notes：

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

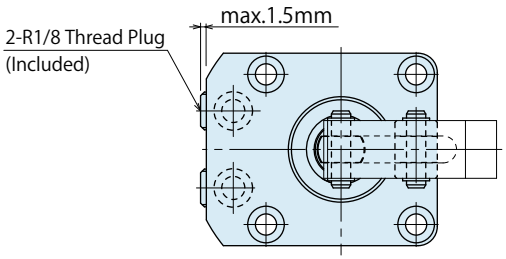
※5. The depth of the body mounting hole ϕD should be decided according to the mounting height referring to dimension 'F'.

※6. The machining dimension is for -A/-G：Gasket Option.

Piping Method

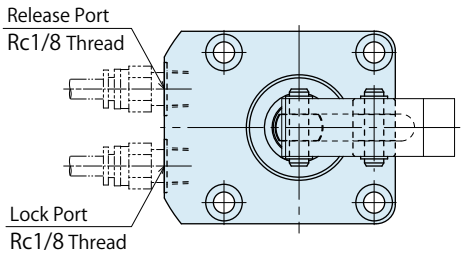
G：Gasket Option (with R Thread Plug)

※The drawing shows the locked state of WCG-2GCT.



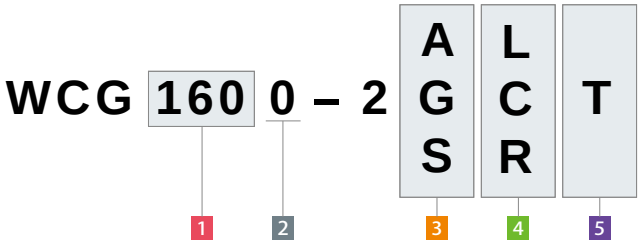
S：Piping Option (Rc Thread)

※The drawing shows the locked state of WCG-2SCT.



Model No. Indication

(Format Example：WCG1000-2ART, WCG2500-2SLT)



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

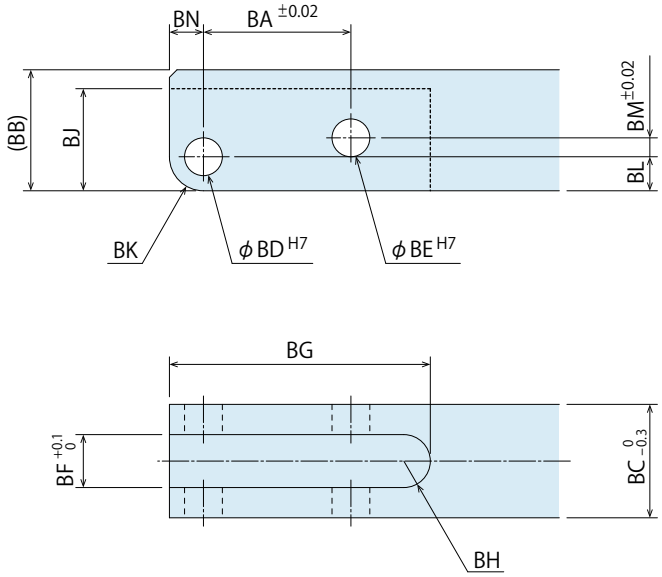
(mm)

Model No.		WCG1000-2□□T	WCG1600-2□□T	WCG2500-2□□T	WCG4000-2□□T
Full Stroke		22	23.5	27.5	33
(Break down)	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:

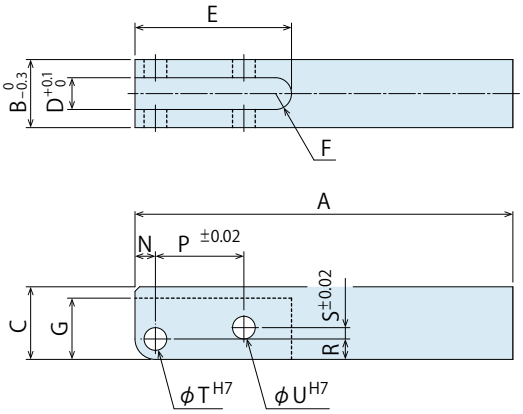
1. Design the link lever length according to the performance curve.
2. If the link lever is not in accordance with the dimension shown above, performance may be degraded and damage can occur.
3. Please use the attached pin (equivalent to ϕADf6, ϕAEf6, HRC60) as the mounting pin for lever.
   (Please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

Accessories : Material Link Lever

Model No. Indication

WCZ 160 0 – L3

- 160: Size (Refer to following table)
- 0: Design No. (Revision Number)
- L3



(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

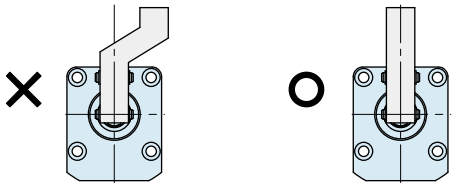
- Please use each product according to the specifications.
- The mechanical lock mechanism of this clamp maintains clamping force and holding force even when air pressure falls to zero. (Refer to “Clamping Force and Holding Force Curve at 0MPa” .)

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.

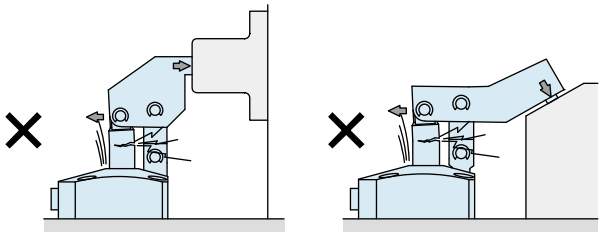
3) Do not apply offset load.

- Do not apply offset load on the link part. The point of load (clamping point) should be within the width of the link lever.



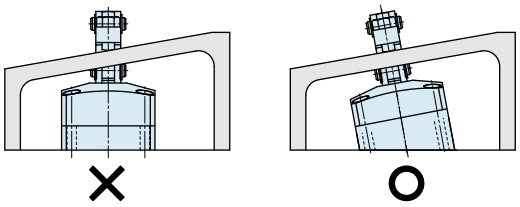
4) Notes for Link Lever Design

- 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

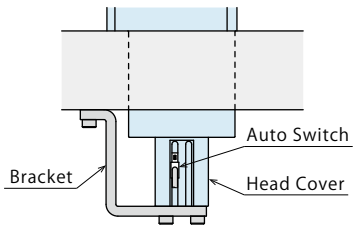
- Make sure the clamping surface and the mounting surface of the clamp are parallel.



6) When using in a dry environment

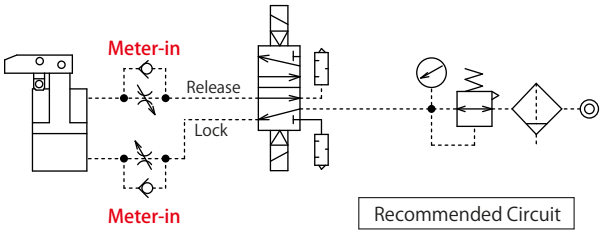
- The link pin may dry out. Grease it periodically or use a special pin. Contact us for the specifications for the special pin.

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.

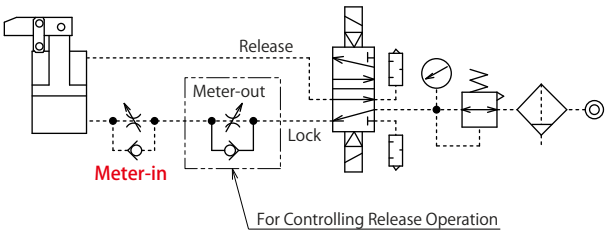


8) Speed Adjustment

- 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.)

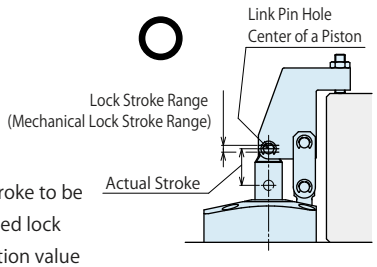


Please set one speed controller (meter-in) to each clamp when operating multiple clamps simultaneously.
When large thrust force is applied to the releasing direction in releasing action, install a meter-out speed controller to the lock port side for speed adjustment.



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) Preparation for 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.

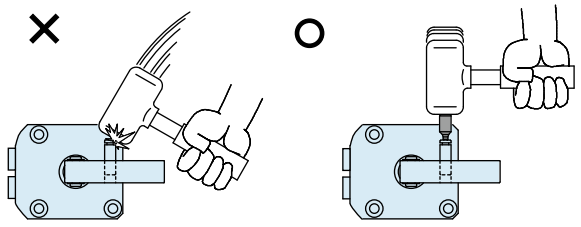
3) Applying Sealing Tape
- Wrap with tape 1 to 2 times following the screwing direction.
  Wrapping in the wrong direction will cause air leakage and malfunction.
- Pieces of the sealing tape can lead to air leakage and malfunction.
- When piping, be careful that contaminants such as sealing tape do not enter into products.

4) Installation of the Product
- When mounting the product use four hexagonal 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 control 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.

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.61 for general cautions. • Notes on Handling • Maintenance/Inspection • Warranty

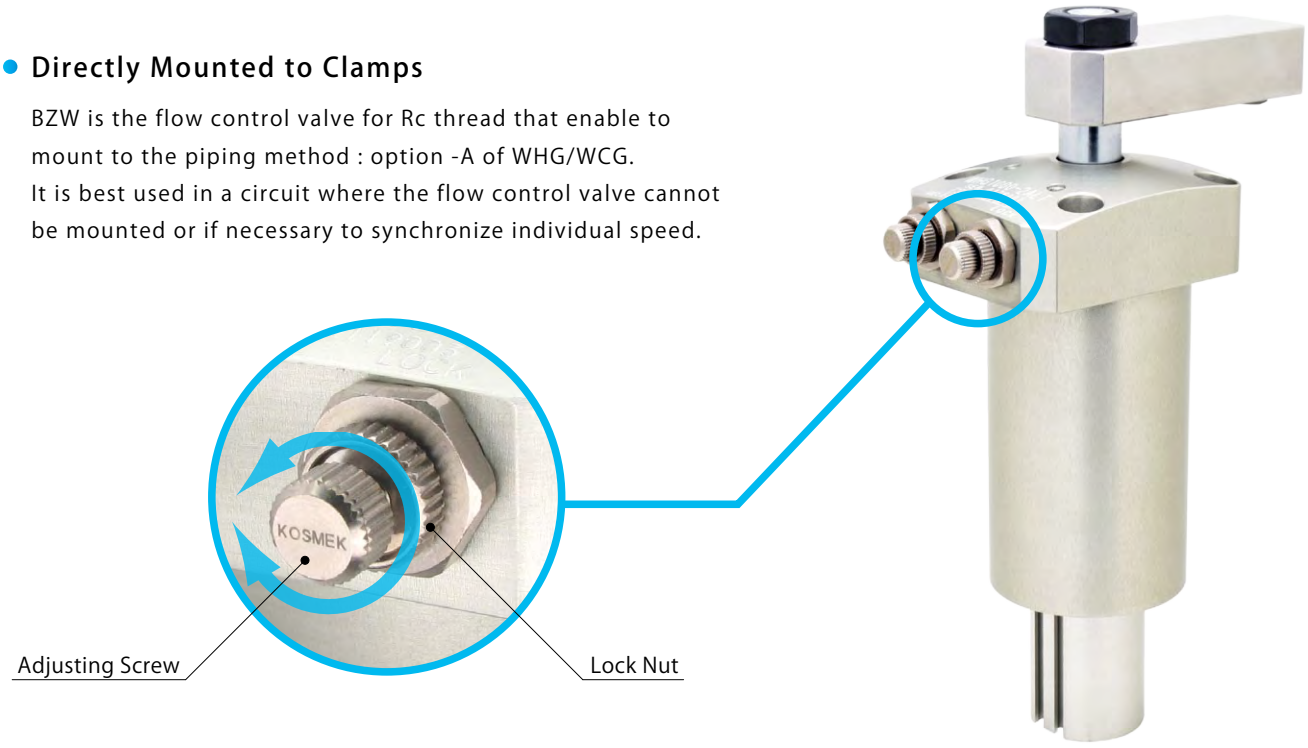
Air Flow Control Valve

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.



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

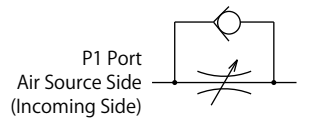
- **B**: Control Method — **B** : Meter-out, **A** : Meter-in
- **0**: Design No. — **0** : Revision Number
- **010**: R Thread Size — **010** : Rc1/8

Specifications

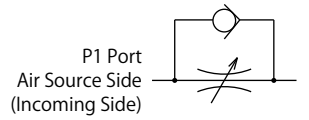
Model No.	BZW0100-B	BZW0100-A
Control Method	Meter-out	Meter-in
Operating Pressure MPa	0.1 ~ 1.0	
Withstanding Pressure MPa	1.5	
Adjust Screw Number of Rotations	10 Rotations	
Tightening Torque N•m	5 ~ 7	
Corresponding Model No.	WHG□-2A□	WCG□-2A□

Circuit Symbol

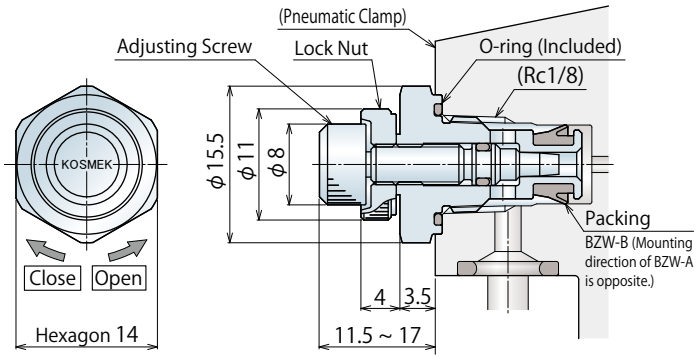
BZW0100-B : Meter-out



BZW0100-A : Meter-in

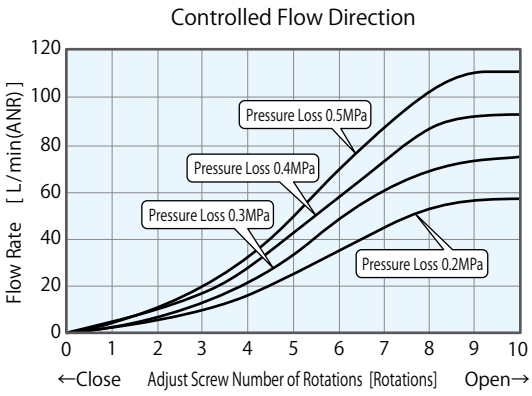


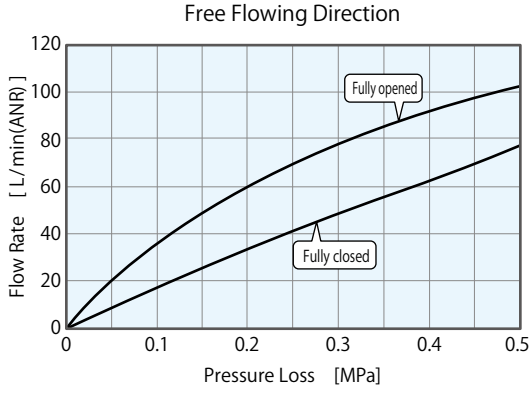
External Dimensions



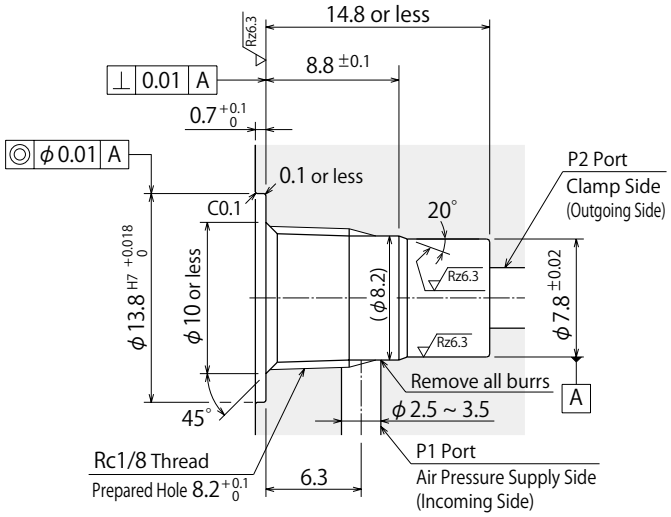
Flow Rate Graph

BZW0100-B/BZW0100-A common





Machining Dimensions of Mounting Area



Notes :

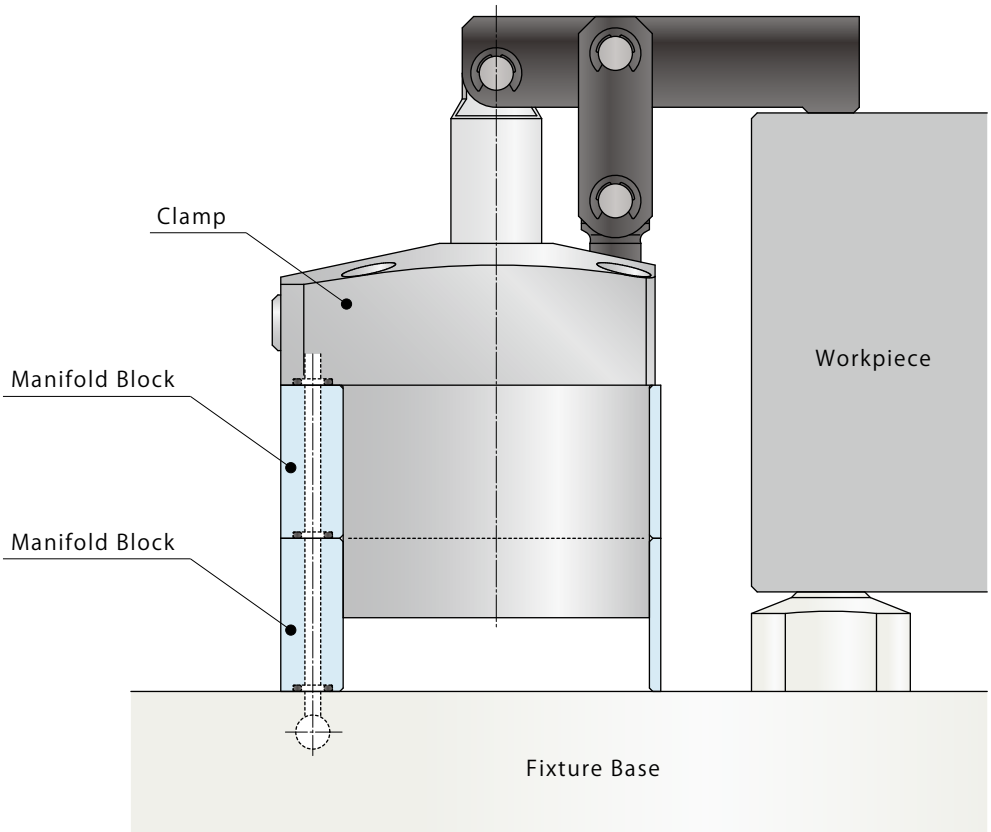
1. Since the $\sqrt{Rz6.3}$ area is sealing part, be careful not to damage it.
2. No cutting chips or burr should be at the tolerance part of machining hole.
3. As shown in the drawing, P1 port is used as the air supply side and P2 port as the clamp side.

Manifold Block

Model **WHZ-MD**

Manifold Block

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



Applicable Model

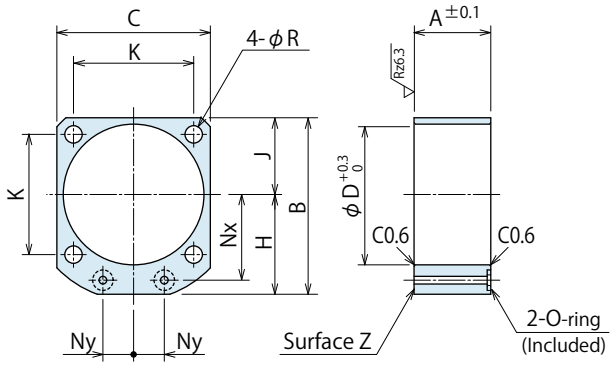
Manifold Block Model No.	Corresponding Item Model No.
Model WHZ-MD	Model WCG Model WHG

Manifold Block for WCG/WHG

Model No. Indication

WHZ 048 0 – MD

- 048: Size (Refer to following table)
- 0: 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.

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 Application Related Products
Die Change System for Press Machines
Company Profile Sales Offices

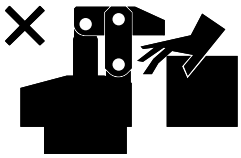
Cautions

Notes on Handling

1) It should be operated by qualified personnel.
- Hydraulic and/or pneumatic machines and devices 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 removing the product, 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 circuits.
③ After stopping the product, do not remove until the temperature drops.
④ Make sure there is no trouble/issue 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.

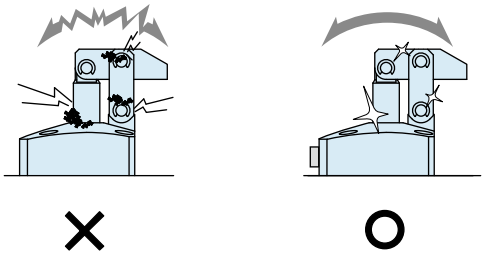


4) Do not disassemble or modify.
- If the product is taken apart or modified, the warranty will be voided even within the warranty period.

Maintenance and Inspection

1) Removal of the Product and Shut-off of Pressure Source
- Before removing the product, 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.
- 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 pipes, mounting bolts, nuts, snap rings, cylinders 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

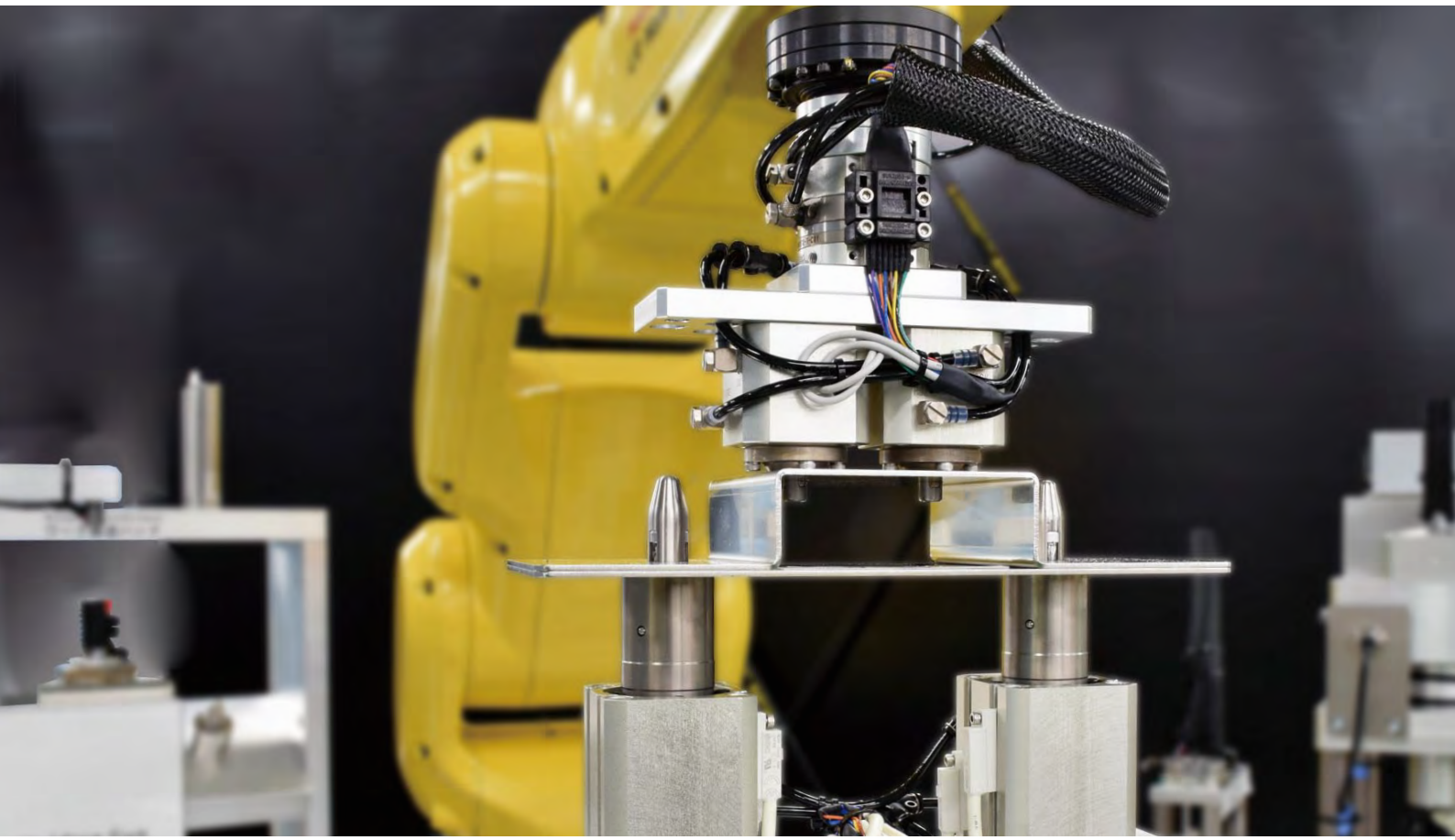
- The product warranty period is 18 months from shipment from our factory or 12 months from initial use, whichever is earlier.

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 Failure caused by the use of the non-confirming state at the user's discretion.
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.



Introducing Kosmek

Robotic Hand Changer

▶P.65

Robotic Hand Series

▶P.69

Work Support

▶P.72

Welding Products

High Accuracy Locating・Clamping

▶P.73

Auto Coupler

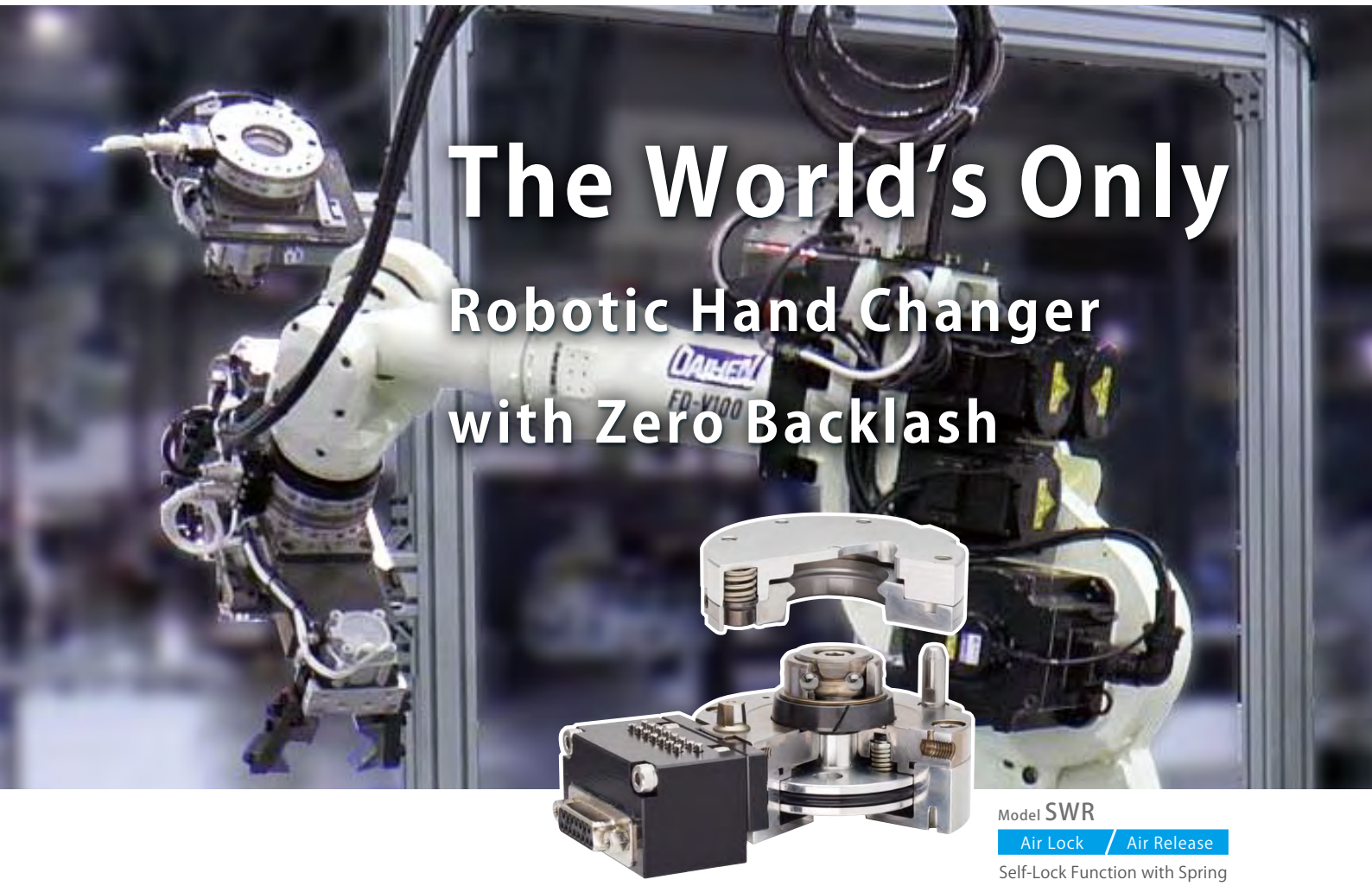
▶P.74

FA・Industrial Robot Related Product Catalog

Please find further information on our complete catalog.
You can order from our website (http://www .kosmek.co.jp/english/).

Scan the QR code for
Catalog Request and Inquiry

http://www.kosmek.co.jp/php_file/inquiry.php?lang=2



The World's Only

Robotic Hand Changer with Zero Backlash

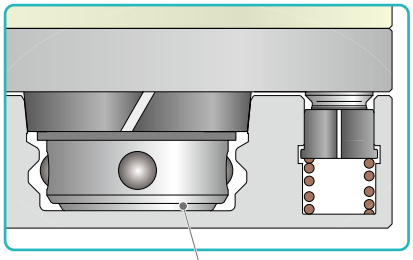
Model SWR

Air Lock / Air Release

Self-Lock Function with Spring

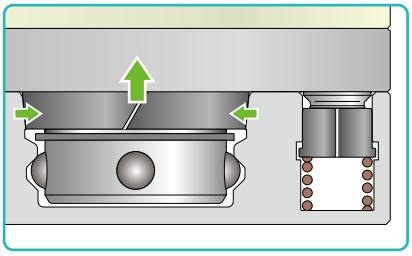
KOSMEK Exclusive Non-Backlash Mechanism

Before Connecting



Detaching Function

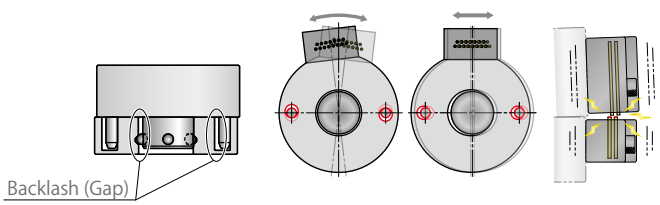
When Connected



Zero-Backlash Connection with Dual Contact

Backlash of a Tool Changer Causes Electrode Errors

Noise and Continuity Failure due to Friction of Contact Probe

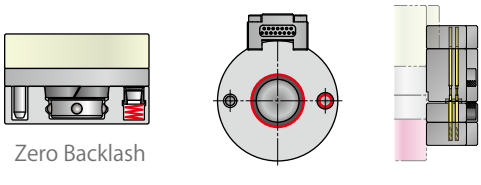


Continuity Failure of Electrode

↓

Frequent Moment Stop

Kosmek Hand Changer with No Backlash Prevents Electrode Errors No Noise



No Continuity Failure of Electrode

↓

Sharp Decline of Moment Stop

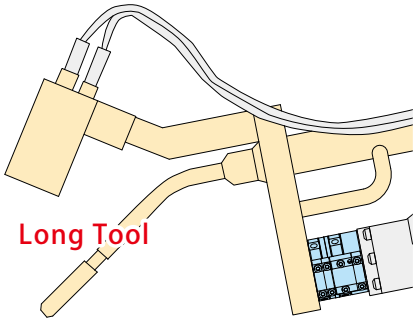
Locating Pin Clamp
SWP
High-Power Welding Swing Clamp
WHG
High-Power Welding Link Clamp
WCG
Air Flow Control Valve
BZW
Manifold Block
WHZ-MD
General Cautions
Welding Application Related Products
Die Change System for Press Machines
Company Profile Sales Offices

Secures the Aimed Position

When Connected, Locating Repeatability is 3μm※

Even with long tools or hands, fluctuation of the edge is extremely small. It secures high-accuracy processing even after tool change.

※ Only SWR0010 (0.5kg~1kg payload model) has repeatability of 5μm.

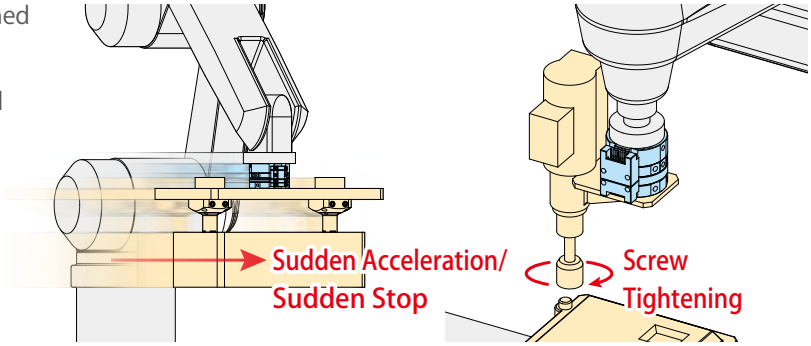


24-Hour Continuous Operation is Possible

Uncomparably High Rigidity and Durability

Strong to "bend" and "torsion" with high rigidity obtained by non-backlash function. Also, high strength material is used in all the contact part of the master and the tool so that it ensures high durability and 3μm (5μm※) repeatability even after 1 million cycles.

※ Only SWR0010 (0.5kg~1kg payload model) has repeatability of 5μm.

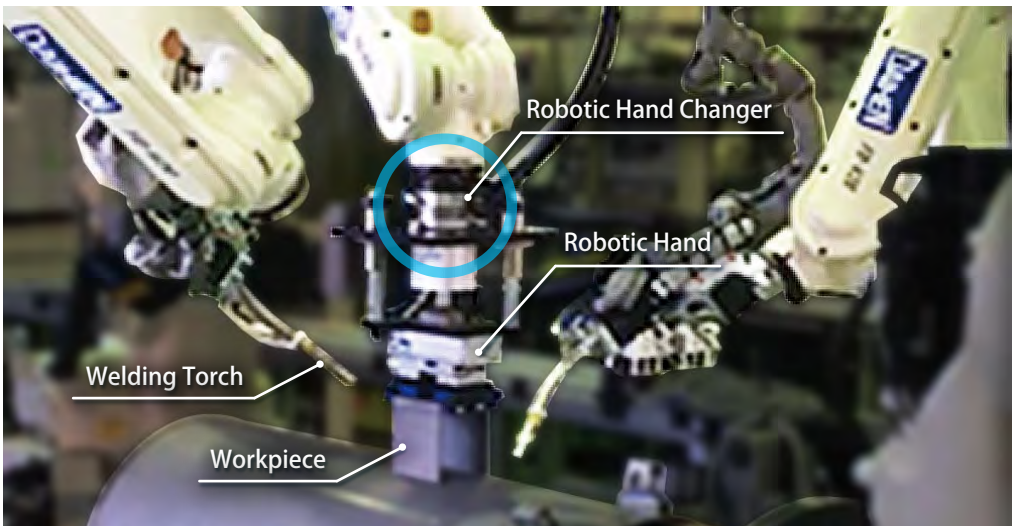


Payload：0.5kg ~ 360kg

A Variety of Electrode/Air Joint Options

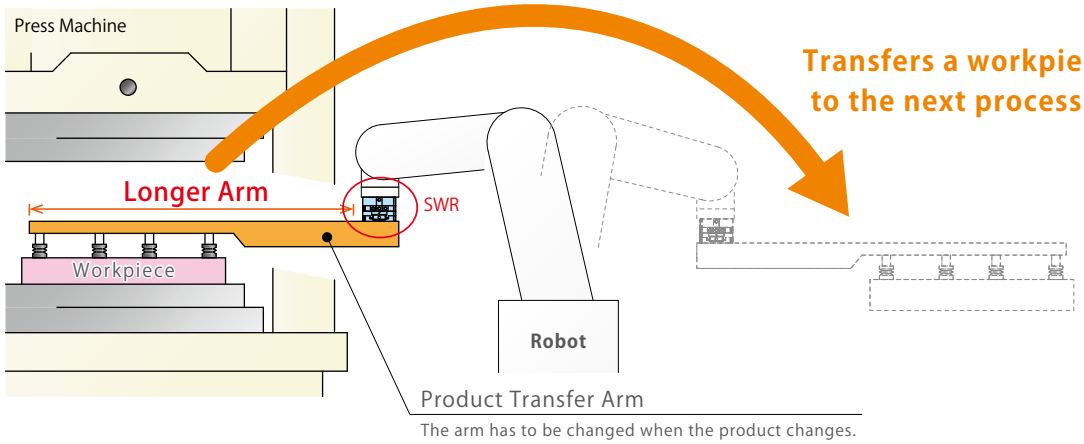
- Resin Connector Electrode
- Solder Terminal
- Solder Terminal with Cable
- Waterproof Electrode (Simple Waterproof)
  Only when connected：Equivalent to IP54
- D-sub Connector
- Circular Connector (Connector Based on JIS C 5432)
- Compact Electric Power Transmission (Ability to Transmit AC/DC200V 5A)
- Power Transmission Option (Connector Based on MIL-DTL-5015)
- High Current Transmission Option
  (Connector Based on MIL-DTL-5015)
- Waterproof Electrode (Noncontact Waterproof) IP67 Compact Model
- Waterproof Electrode (Noncontact Waterproof) IP67
- Air Joint (3 Port Option・with Larger Port：φ6)
- Air Joint (2 Port Option)
- Air Joint (4 Port・Solder Terminal Extensible Option)
- Air Port with Check Valve

Holds Welding Workpiece without Backlash

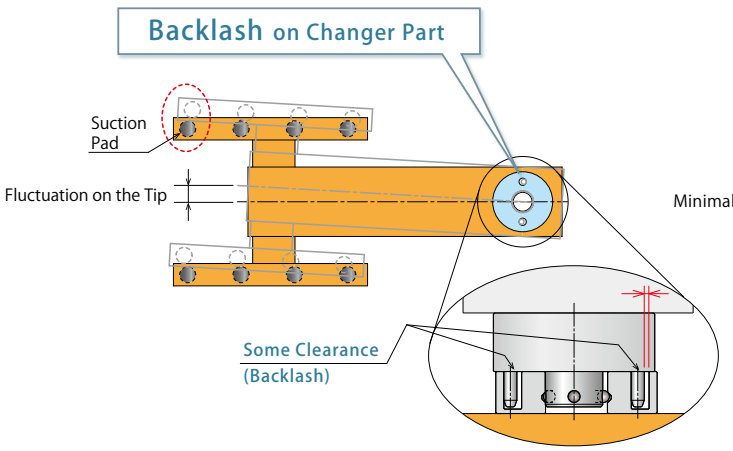


A case study of Robotic Hand Changer exchanging robotic hands which hold a welding workpiece.
Kosmek non-backlash changer allows for stable product quality and appearance of arc welding.

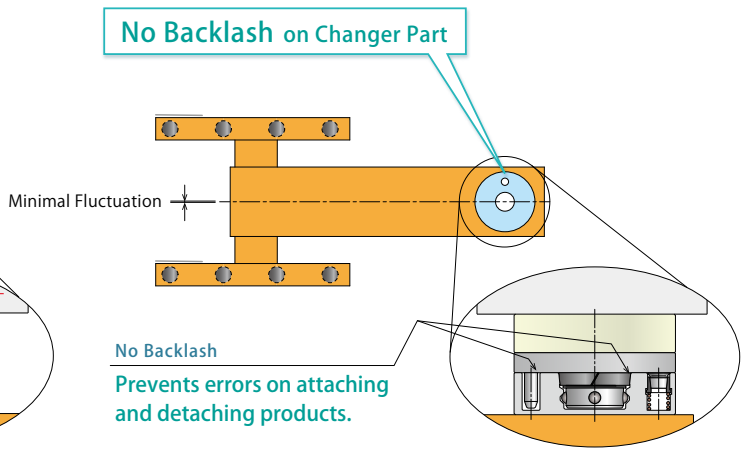
High-Accuracy Change of Transfer Arms



General Changer

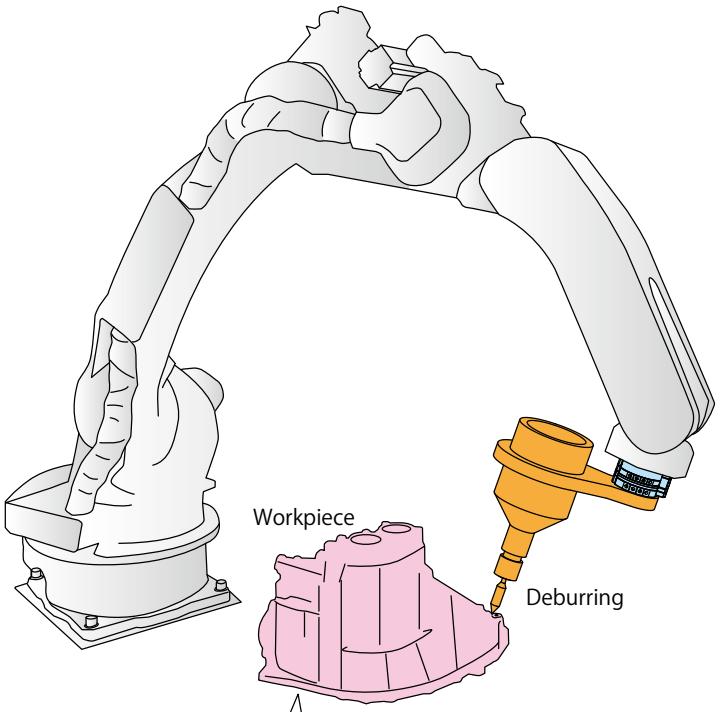


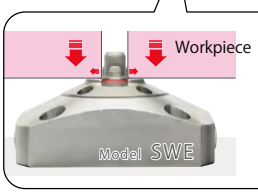
Kosmek Robotic Hand Changer



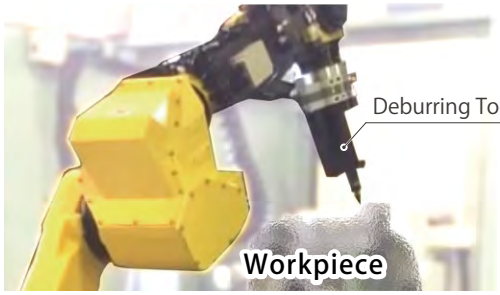
Locating Pin Clamp
SWP
High-Power Welding Swing Clamp
WHG
High-Power Welding Link Clamp
WCG
Air Flow Control Valve
BZW
Manifold Block
WHZ-MD
General Cautions
Welding Application Related Products
Die Change System for Press Machines
Company Profile Sales Offices

Change the Transfer Hand and Deburring Tool with High Rigidity





By clamping workpiece with Hole Clamp (model SWE), every workpiece surface is accessible.



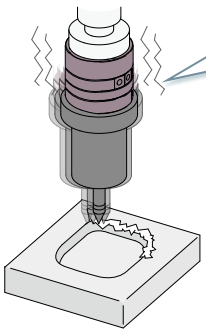
Hand Change

Workpiece Transfer Tool

Withstands Heavy Load with Non-Backlash Function

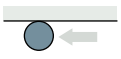
Strong to "bend" and "torsion" with high rigidity.
It ensures stable production even with offset transfer hand or heavy load deburring.

General Tool Changer

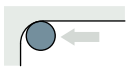


Backlash on Changer Part

Due to backlash, a tool changer is weak to torsion and can be broken if high load is applied when deburring surface R which has large contact area.



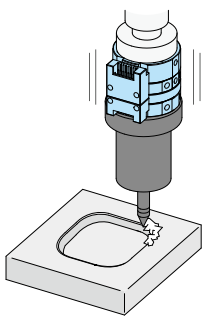
Low Load



High Load

Contact area of surface R is large and receives high load.

Kosmek Robotic Hand Changer

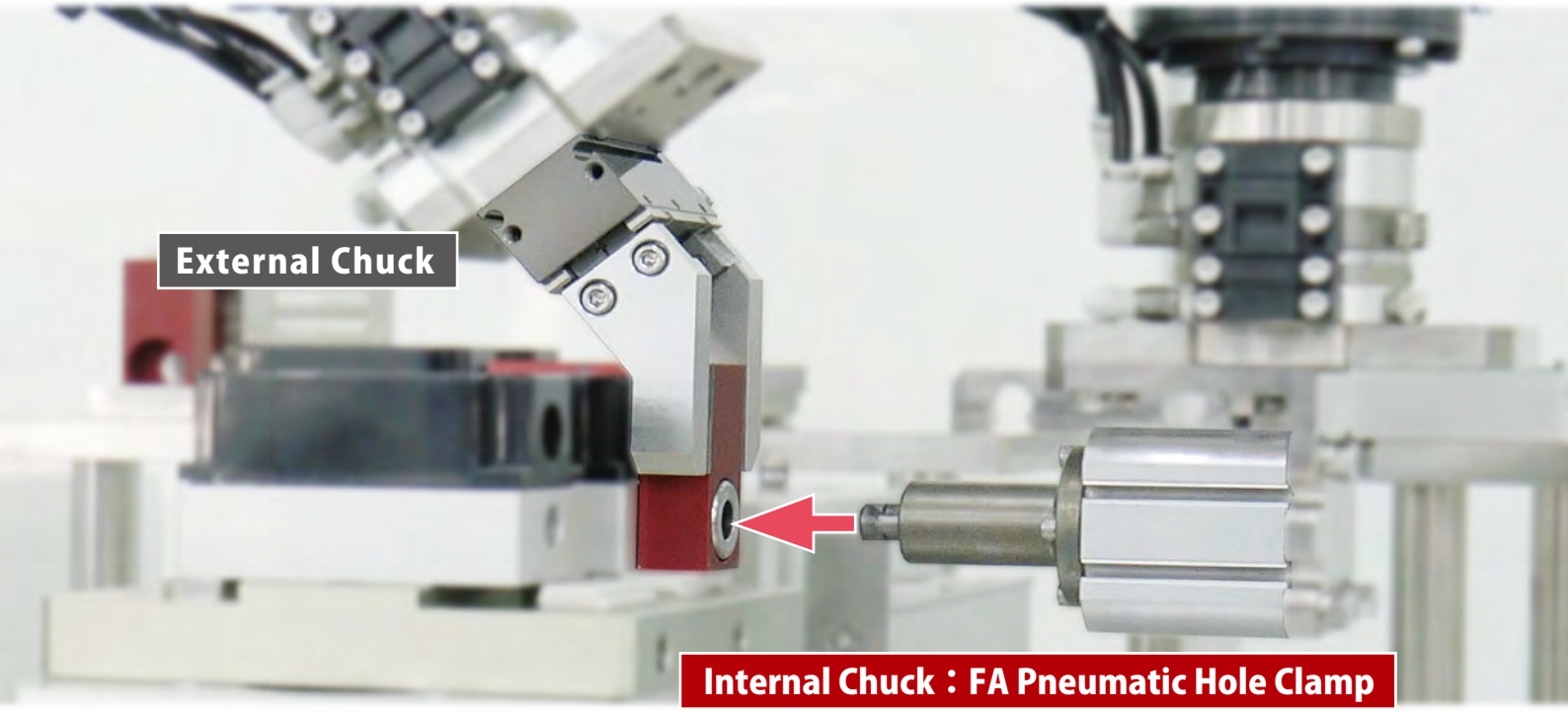


No Backlash on Changer Part

The changer has no backlash so it is highly rigid and strong to torsion. This allows for no fluctuation on tools.

It also withstands high load of casting deburring.

Light and Compact Robotic Hand Series for Factory Automation



Kosmek Exclusive Internal Chuck Series

FA Pneumatic Hole Clamp
Model WKH

Gripper expands and pulls workpiece in.
Light Body with Selectable Functions：Locating and Floating
Workpiece Diameter φ6～φ14 in 0.5mm increments.

Air Lock / Air Release
Self-Lock Function with Spring

High-Power Pneumatic Hole Clamp
Model SWE

Can be used in machine tools. Gripper expands and pulls workpiece in.
High Power with Contaminant Prevention for Machine Tools, etc.
Workpiece Diameter φ6～φ13 in 0.5mm increments.

Air Lock / Air Release
Self-Lock Function with Spring

Ball Lock Cylinder
Model WKA

Secures/Transfers a pallet and prevents falling off with steel balls.
Powerful, Light and Compact
Pull-Out Load Capacity (Holding Force)：50N / 70N / 100N / 150N / 200N

Spring Lock / Air Release

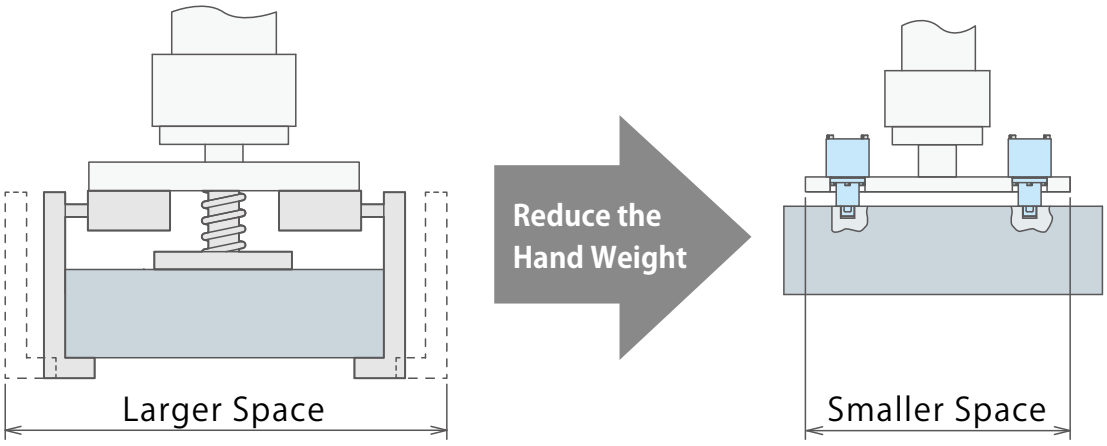
Locating Pin Clamp
SWP
High-Power Welding Swing Clamp
WHG
High-Power Welding Link Clamp
WCG
Air Flow Control Valve
BZW
Manifold Block
WHZ-MD
General Cautions
Welding Application Related Products
Die Change System for Press Machines
Company Profile Sales Offices

Advantages of FA Pneumatic Hole Clamp

Model WKH FA Pneumatic Hole Clamp

Chucking Inside of Workpiece Holes Allows for

Compact and Light Applications

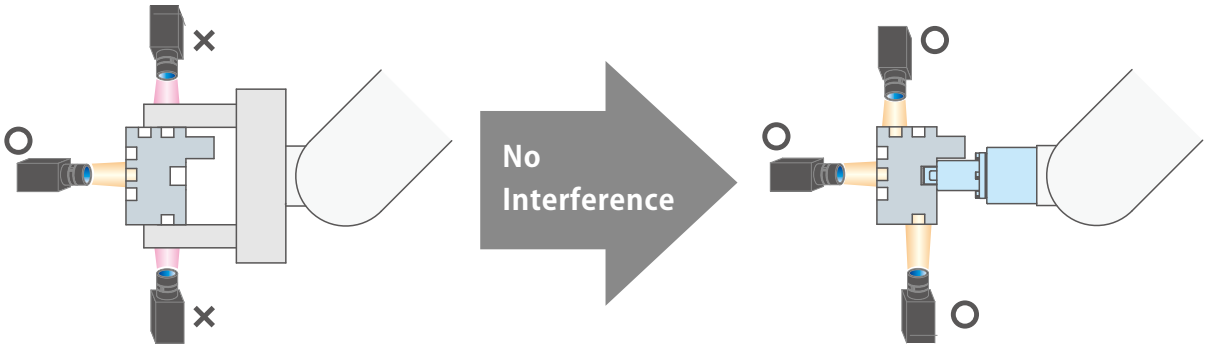


Loading/Lifting Hand with Parallel Hand/Linear Cylinder

Hole Clamp is Compact and Light with Powerful Gripping Force

Chucking Inside of Workpiece Holes Allows for

Zero Interference and Minimum Setup



Interferes with the hand when holding a workpiece.

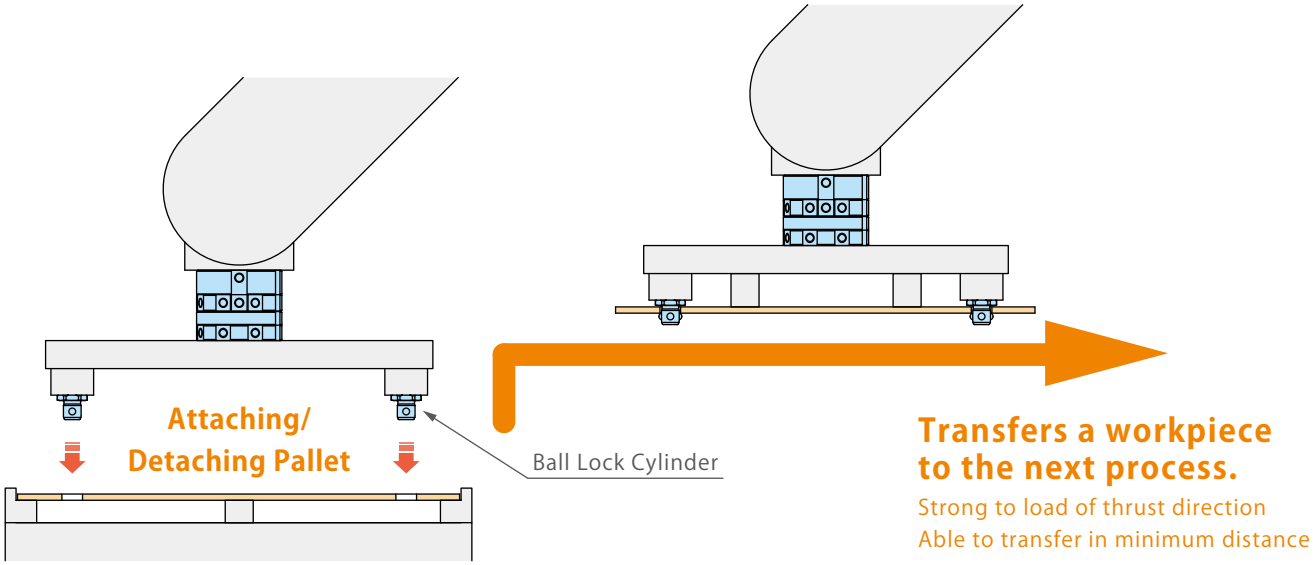
5 Faces Accessible with No Interference

External Chuck Series

High-Power Parallel Gripper	Compact Parallel Gripper	Wide Angular Gripper	Parallel Gripper	Compact Parallel Gripper	Angular Gripper	Three-Jaw Chuck	Two-Jaw Chuck	Parallel Hand with Auto-Grip Changer
Model WPS	Model WPA	Model WPE	Model WPF	Model WPH	Model WPJ	Model WPP	Model WPQ	Model WPW

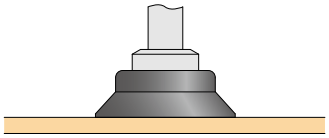
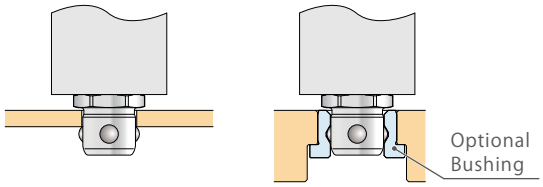
For Faster and More Accurate Pallet Transfer

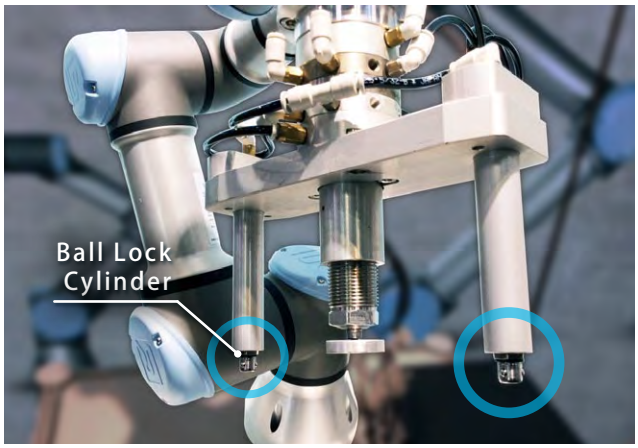
Model WKA Ball Lock Cylinder

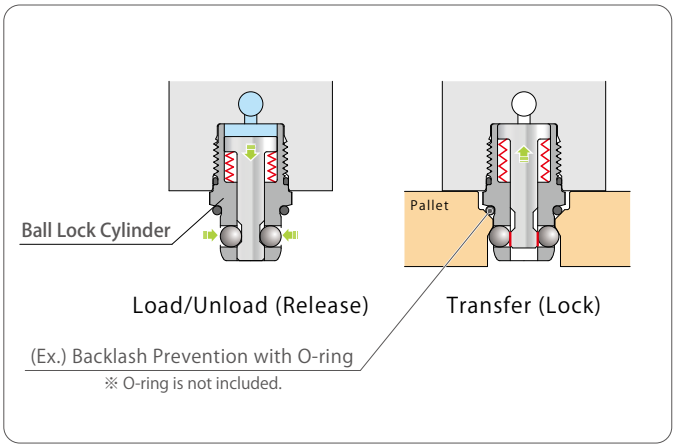


Transfers a workpiece to the next process.

Strong to load of thrust direction
Able to transfer in minimum distance

Current Method (Suction Pad)	Ball Lock Cylinder
Limited Speed Low Suction Force	Powerful・Light・Compact with Mechanical Lock Single Circuit for Positive Pressure Only
	
Suction Pad has critical weight limits and speed limits due to low suction force. Also, the suction force is affected by the roughness of surface and is decreased due to deterioration and friction.	Requires Hole Machining Optional bush simplifies hole machining.





Automation Products

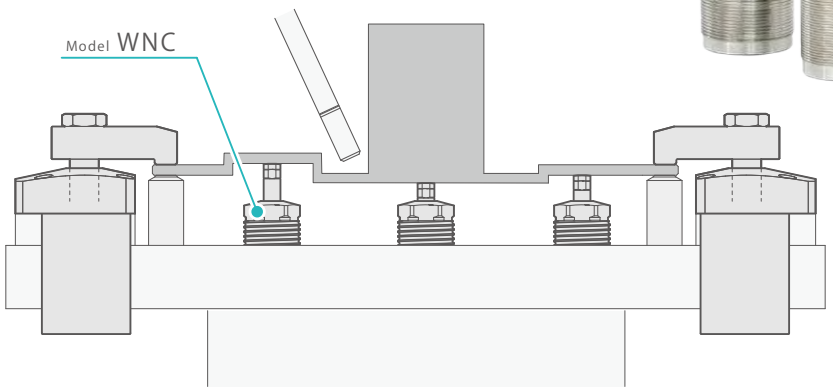
Powerful Support for Unstable Parts

High-Power Pneumatic Work Support (Standard / Rodless Hollow)

Model WNC / WNA

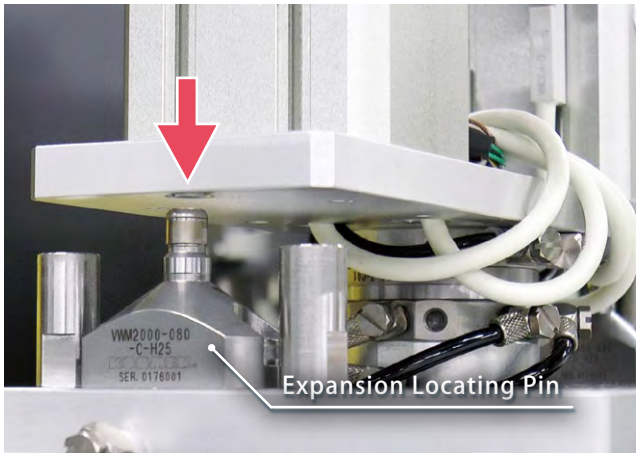
Firmly Supports the Workpiece and Prevents Chattering and Distortion

Locks when the tip of work support contacts a workpiece.
Securely supports a workpiece with various heights.



Air Lock / Spring Release

High Accuracy Locating of Workpiece • Pallet



Expansion Locating Pin

No Gap with High Accuracy Locating Pin

High-Accuracy Model

Model VWM
Locating Repeatability
3 μm
Workpiece Hole Diameter :
ϕ8 ~ ϕ30

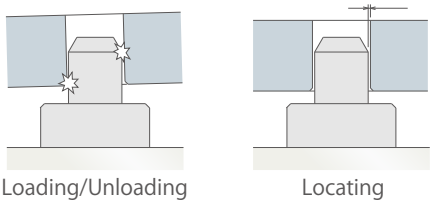
Large-Expansion Model

Model VWH
Locating Repeatability
10 μm
Workpiece Hole Diameter :
ϕ9 ~ ϕ15

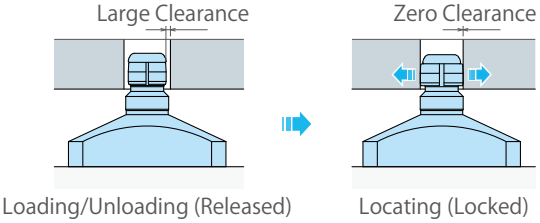
Manual-Operating Model

Model VX
Locating Repeatability
5 μm
Workpiece Hole Diameter :
ϕ8 ~ ϕ20

Fixed Pin



Expansion Locating Pin



Difficult to Load/Unload
Some Clearance

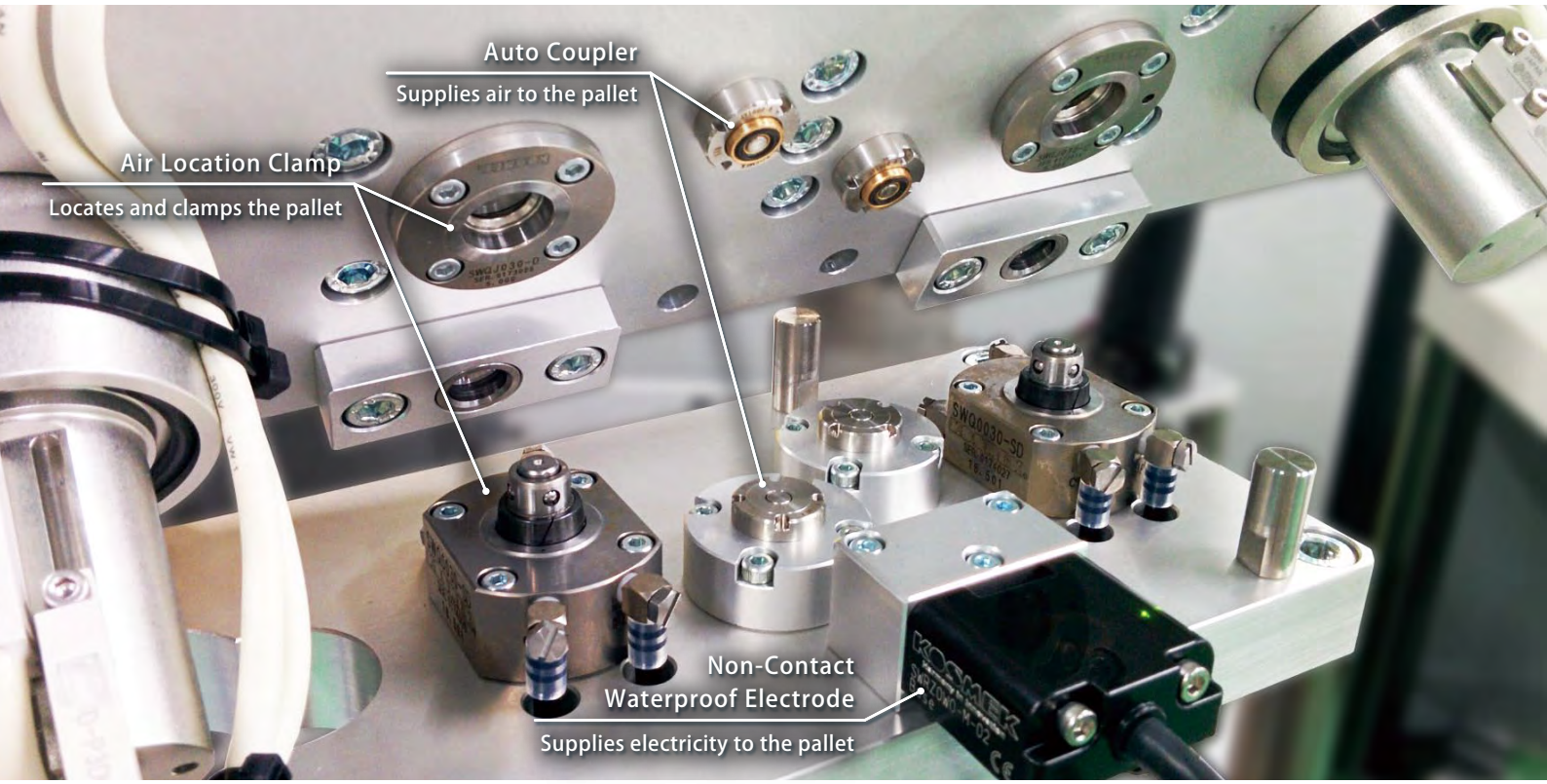
Easy to Load/Unload
Zero Clearance and High Accuracy

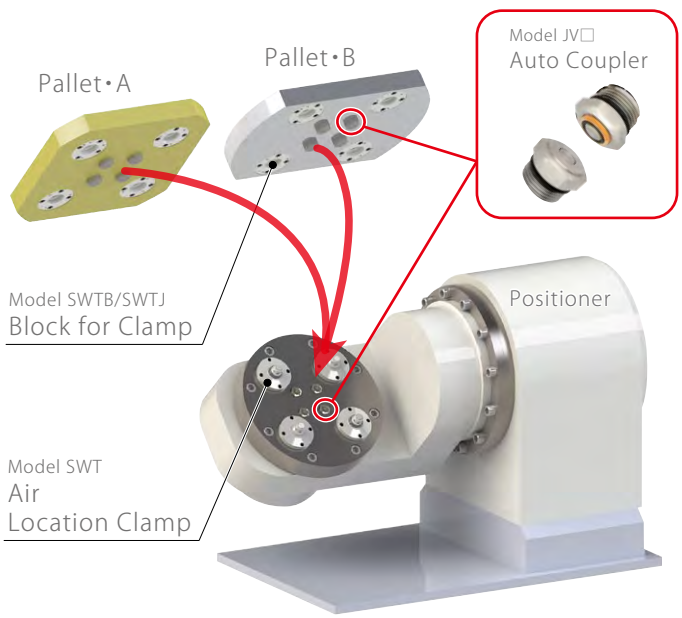
High Speed and High Accuracy Fixture Setup

Air Location Clamp

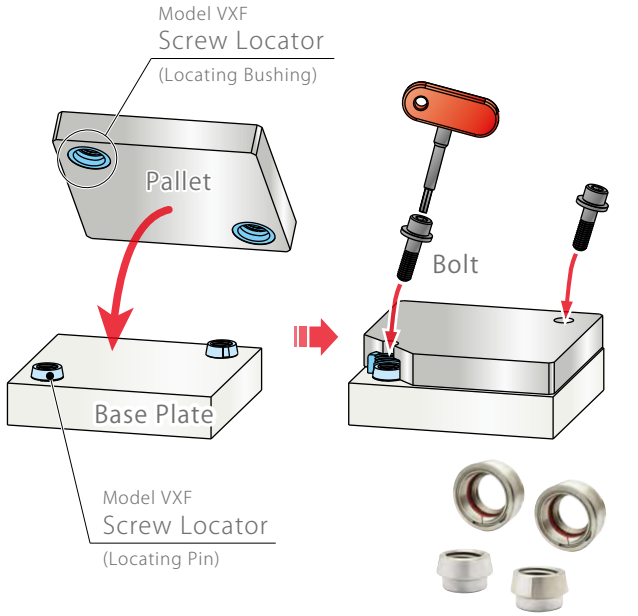
Locates and clamps a fixture
on a positioner simultaneously.

**Enables setup time reduction
and productivity improvement.**





Fixture Setup of the Positioner



Manual Pallet Change

Locating Repeatability 3 μ m

Manual Lock / Manual Release

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

Pneumatic Location Clamp Series

FA Pneumatic Pallet Clamp
Model WVG

Suitable for setup of welding fixtures and pallet transfer.

Locating Repeatability : 0.08mm

Air + Spring Lock / Air Release

Compact Air Location Clamp
Model SWQ

Compact model. Suitable for setup of compact/light pallets/fixtures.

Locating Repeatability : 3 μm

Air + Spring Lock / Air Release

Air Location Clamp
Model SWT

Equipped with Contamination Prevention

Locating Repeatability : 3 μm

Air + Spring Lock / Air Release

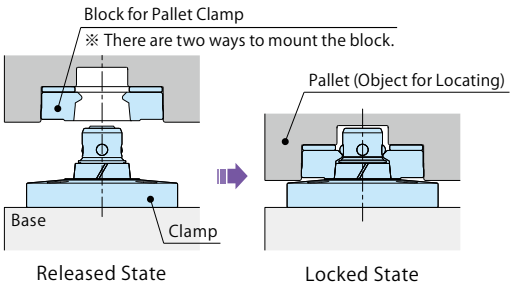
High-Power Pneumatic Pallet Clamp
Model WVS

Exerts equivalent clamping force with hydraulic clamps.

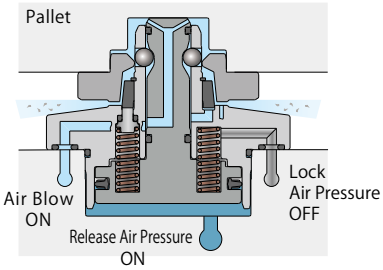
Locating Repeatability : 3 μm

Air + Spring Lock / Air Release

Action Description



Air Blow and Seating Check

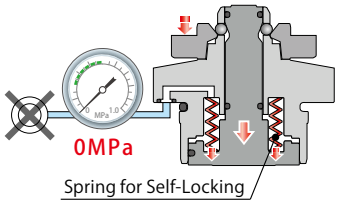


Contaminants can be removed by air blow.
Seating surface is provided with the air hole.
Use the gap sensor for seating check.

Self-Locking (Safety) Function

(Holding Force at 0MPa Air Pressure)

Maintains clamped state.



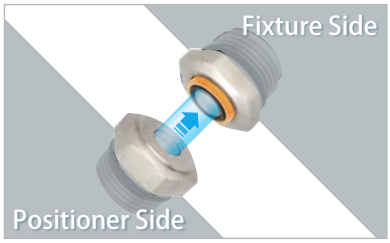
Even if air pressure is at zero, it will stay locked with the self-locking spring.
※ More than the minimum operating air pressure is required for locating.

Automatic Air Supply to a Pallet on a Positioner

Auto Coupler
Model JT□ JV□

Compact Coupler to Connect Hydraulic/Pneumatic/Coolant Circuits

Connection Stroke : 1mm Commonly Used with Screw Locator and Pneumatic Location Clamp



Die Change Systems

Hydraulic Clamp Series

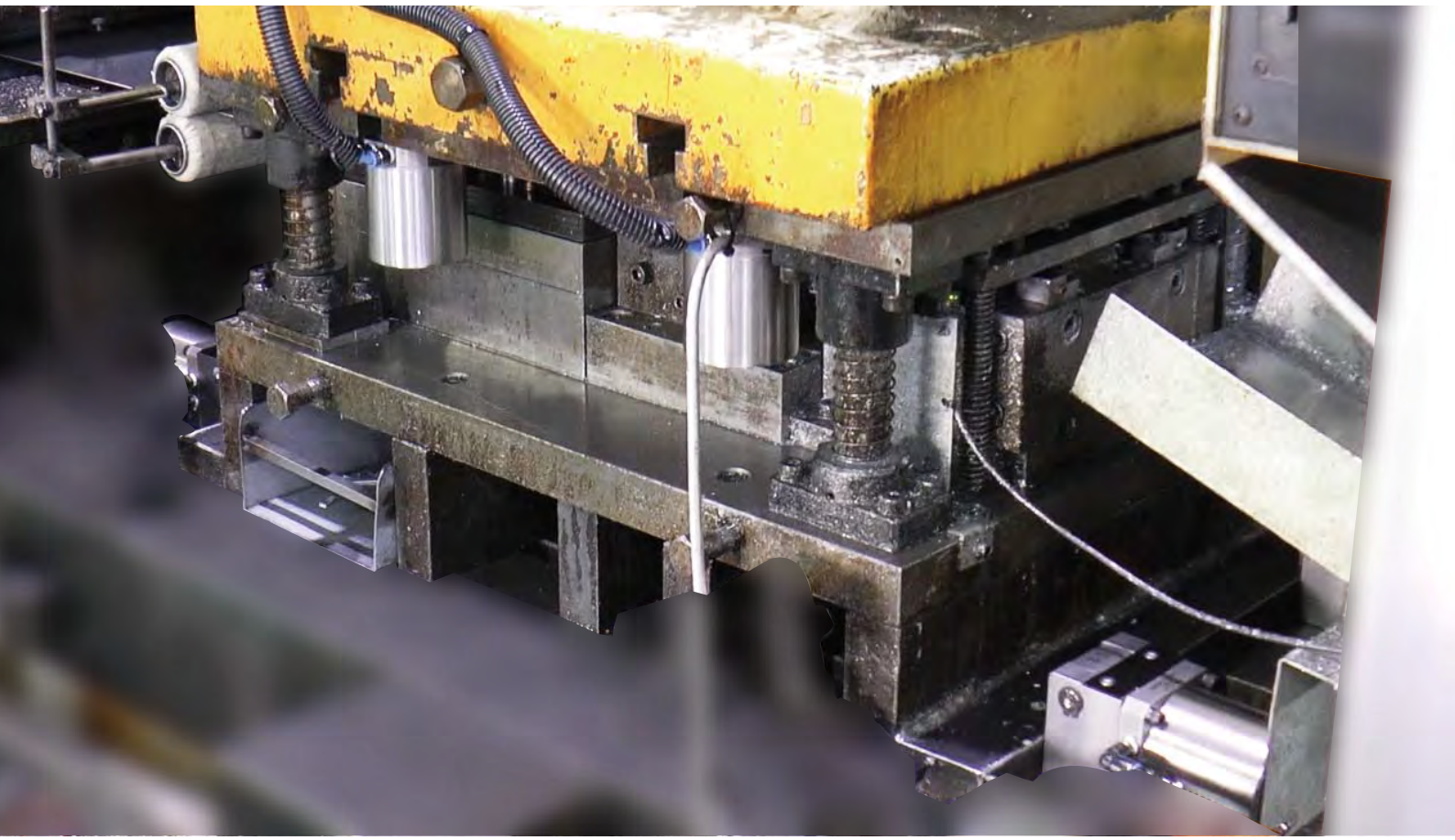
▶P.77

Die Lifter

▶P.79

Pre-Roller

▶P.80



for Press Machines

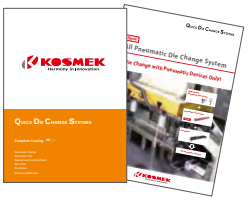
All-Pneumatic System

Pneumatic Ball Lifter

▶P.79

High-Power
Pneumatic Die Clamp

▶P.81



Die Change Systems for Press Machines Complete Catalog

Find further information on our complete catalog. You can order the catalog from our website (http://www.kosmek.co.jp/english/).

Scan the QR code for
Catalog Request and Inquiry

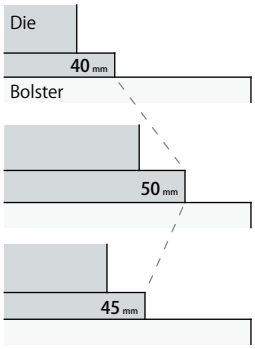
http://www.kosmek.co.jp/php_file/inquiry.php?lang=2

Revolutionary Long Stroke Design Means

Die Variation Possible!!

Presenting the World's First Long Stroke Lever Clamp!

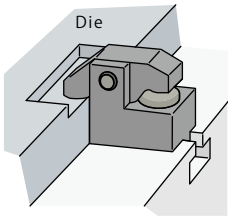
In the Past…



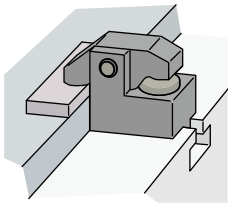
Dies are not standardized…

Die standardization held back plans for converting to auto-clamping…

To introduce auto clamping when plates were not standardized...



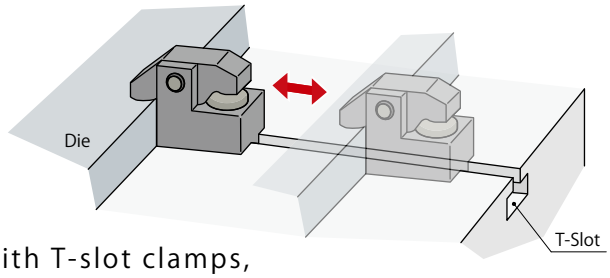
Milling of a Clamping Pocket



Addition of Spacer Plates in Clamping Area

dies had to be modified to accommodate the auto clamps.

The Future is Now!



With T-slot clamps,

Die width variance is possible.

With the GBC clamp long stroke,

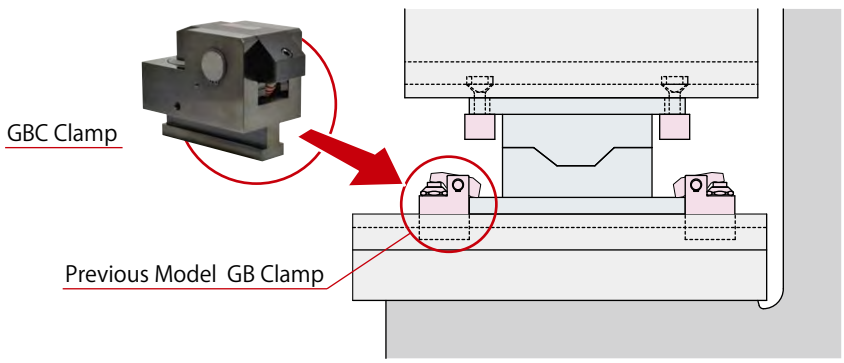
Die clamping plate thickness variance is also possible!

(5 mm Thickness Variance : 0100 ~ 0400 model
10mm Thickness Variance : 0630 ~ 5000 model)

Point ! For Customer Dies with Non-Standardized Dimensions

Point ! No Accidents Caused by Incorrect Spacer Thickness

An existing system can be converted to a long stroke system by replacing only the clamps.



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 Application Related Products
Die Change System for Press Machines
Company Profile Sales Offices

Announcing, for Kosmek's basic hydraulic clamp line,

A Full Model Change!!

Disassembly and assembly possible with only standard tools!

Redesigned from the ground up with ease of maintenance in mind.

NEW MODEL

Point !

Since no special tools are required,

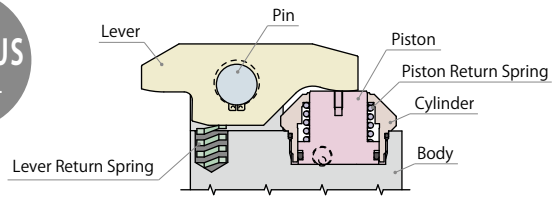
no clamp-specific knowledge is required.

Point !

Since anyone can assemble and disassemble the clamp,

only a seal kit is needed to perform on-site maintenance.

PREVIOUS MODEL



Disassembly and assembly of the lever and cylinder

required special tools and jigs…

Advantages of Die Lifter

A die is easily moved to the bolster with the roller/ball of die lifter.

Hydraulic Roller Lifter
Model RA

Hydraulic Ball Lifter
Model RQA

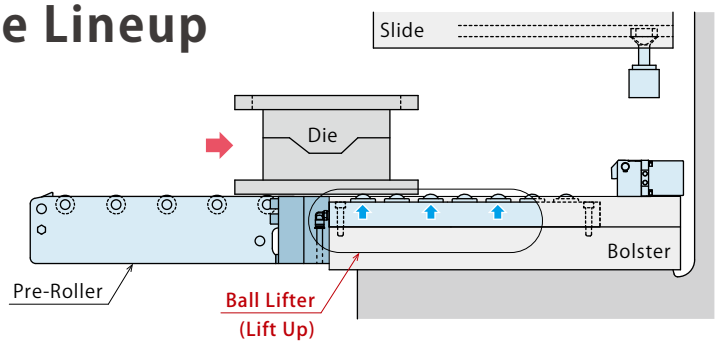
Pneumatic Ball Lifter
Model RQC

Ball Lifting Model Newly Added to the Lineup

Pressure : ON

Die Loading/Unloading

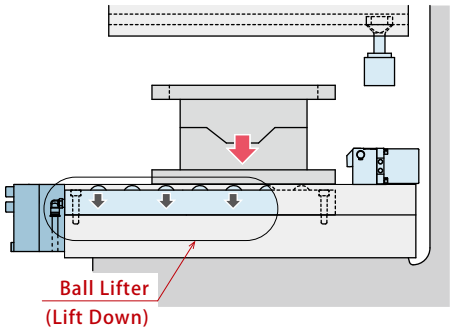
The balls lift up the die.
It enables to move the die into the press machine with light force.



Pressure : OFF

Die Loaded

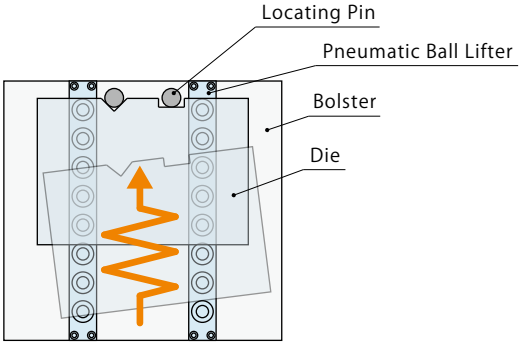
After loading, the balls lift down.
The die is in contact with the bolster.



Lift and Move a Die with Light Force

The Ball Moves 360° Flexibly

Able to move a die easily
to the locating point.



Advantages of Pre-Roller

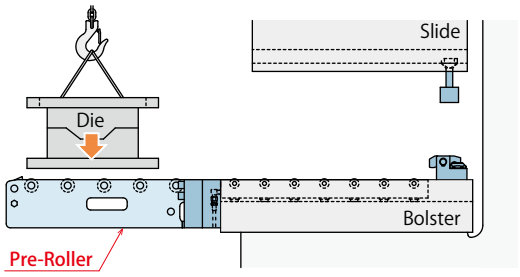
Model MR□

Allows the die to roll from the front of the press onto the bolster.

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 Application Related Products
Die Change System for Press Machines
Company Profile Sales Offices

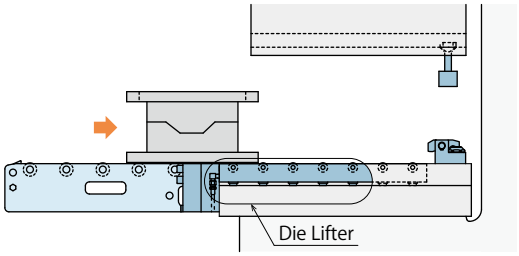
Load the Die

Load the die with a crane or forklift.
Pre-Rollers set in front of press machine enable easy transfer of the die.

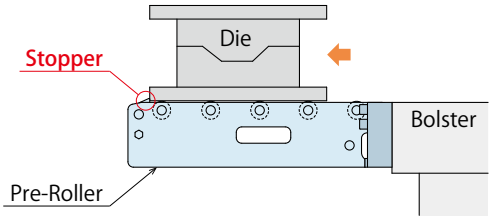


Move the Die to the Bolster

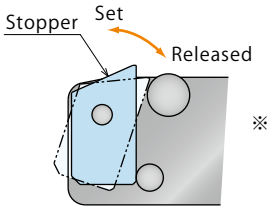
Move the die to the bolster.
Pre-Rollers and die lifters allow the die to roll onto the bolster with minimal force.



The stopper prevents die fall.

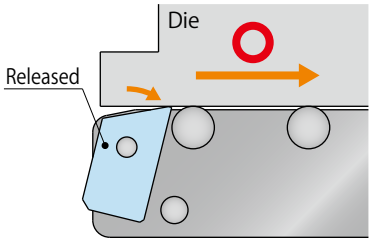


By pushing the stopper until the end, the stopper will be released.

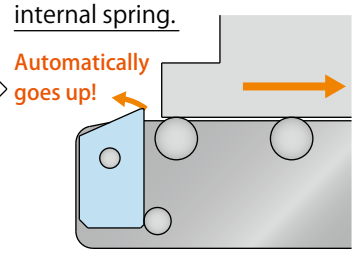


※. When using the stopper, it must be returned to set position manually.

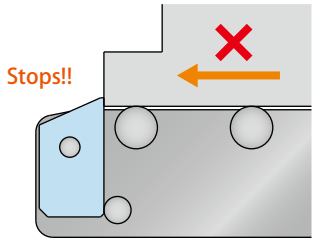
When loading the die, the stopper is pressed down by the die weight.



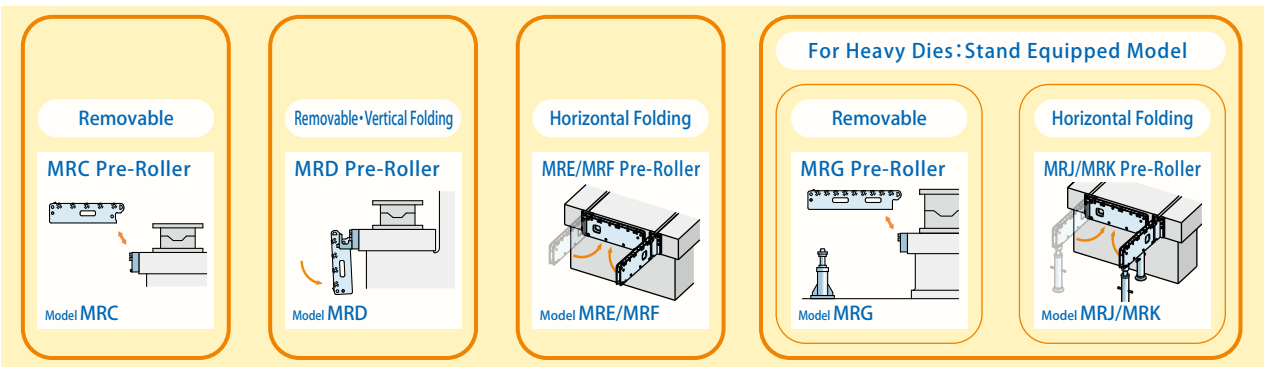
After the die passes over the stopper, it automatically goes up with the internal spring.



In case of reverse travel, the stopper prevents die falling.



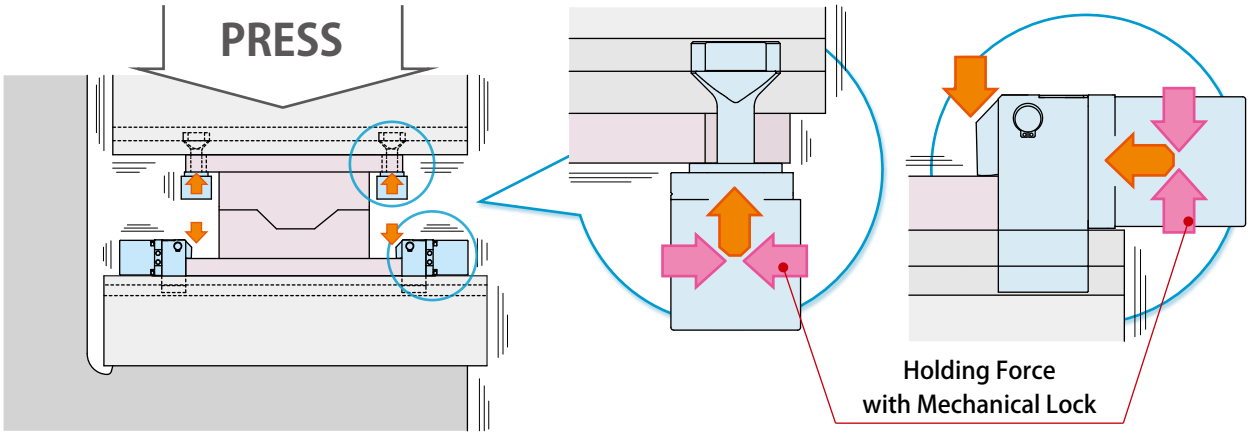
More than 100 options with a variety of sizes and folding methods.



The High-Power Pneumatic Die Clamp is

HIGH-POWER Pneumatic Series

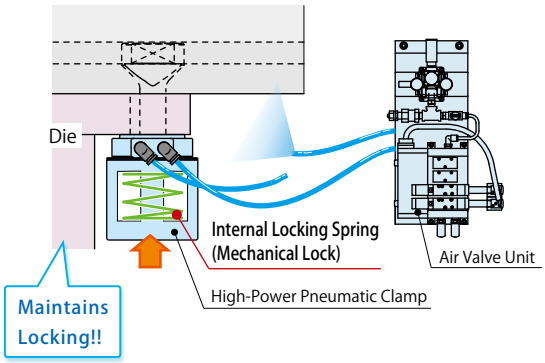
a HYBRID system using air pressure and a mechanical lock.



Advantages of High-Power Pneumatic Die Clamp

Self-Lock Function is built in the clamp.

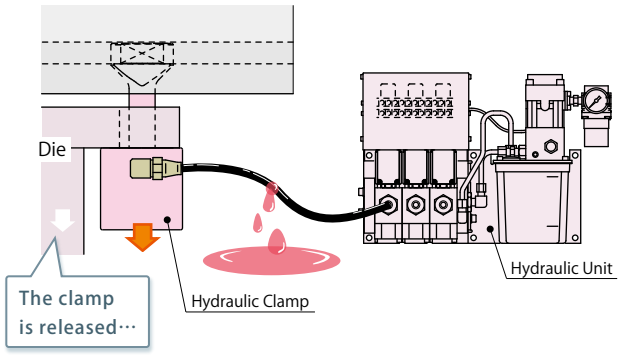
Even when air pressure is cut off, 20% of holding force will prevent falling of the die.



High-Power Pneumatic Die Clamp

With Self Lock Function

Even when air pressure leaks,
the clamp will stay locked with
the internal locking spring.



Hydraulic Clamp

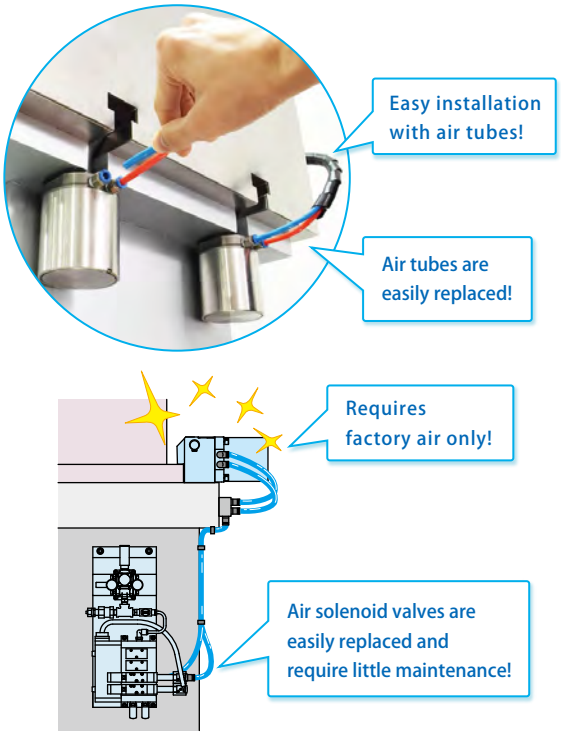
No Self Lock Function

When hydraulic pressure leaks,
the clamp will be released due to
the spring release function.

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 Application Related Products
Die Change System for Press Machines
Company Profile Sales Offices

Improved Maintainability

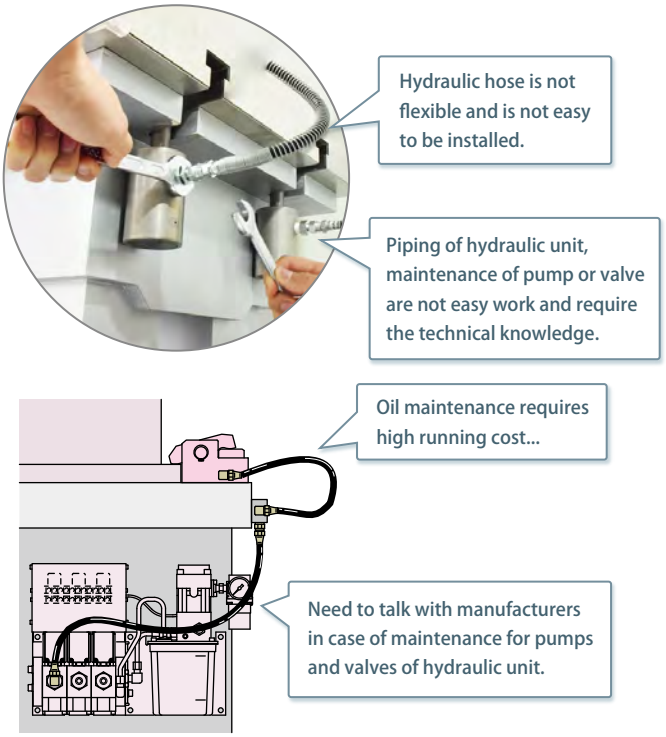
Drastically reduces the running cost since valves and other control devices are available on the market and easily replaced in case of trouble.



Pneumatic System

Short Time • Low Cost Maintenance

Damages on the piping are easily replaced!
Valves are available on the market!
Recovery of equipment in short time!



Hydraulic System

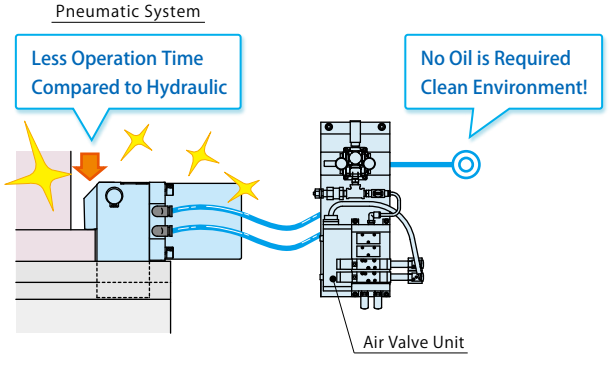
Long Time • High Cost Maintenance

Need to talk with manufacturers for replacement of hydraulic hose.
Require expensive pumps and valves in stock.

Energy Saving • Time Reduction

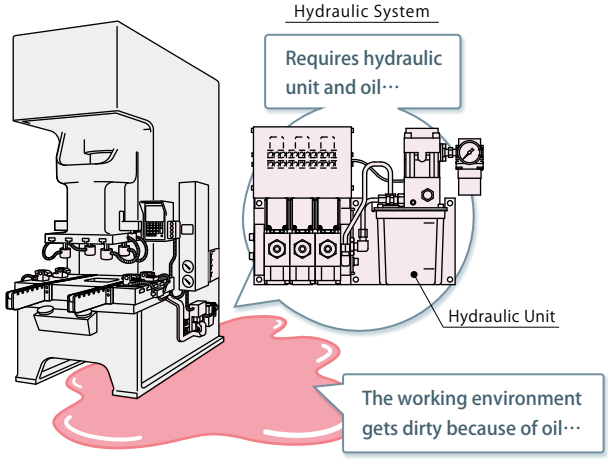
Keeps Your Factory Clean.
Also, since clamping action is faster than hydraulic, the die change time is drastically reduced.

Pneumatic System



Pneumatic Die Clamping System is suitable for press machines of electronic component.

Hydraulic System



Company Profile

KOSMEK LTD. Head Office

Company Name	KOSMEK LTD.
Established	May 1986
Capital	¥99,000,000
President	Tsutomu Shirakawa
Employee Count	270
Group Company	KOSMEK LTD.　KOSMEK ENGINEERING LTD. KOSMEK (USA) LTD.　KOSMEK EUROPE GmbH KOSMEK (CHINA) LTD.　KOSMEK LTD. - INDIA
Business Fields	Design, production and sales of precision products, and hydraulic and pneumatic equipment
Customers	Manufacturers of automobiles, industrial machinery, semiconductors and electric appliances
Banks	Resona Bank, MUFG Bank, The Senshu Ikeda Bank

Sales Offices

Sales Offices across the World

JAPAN
HEAD OFFICE
Overseas Sales

TEL. +81-78-991-5162　FAX. +81-78-991-8787
KOSMEK LTD. 1-5, 2-chome, Murotani, Nishi-ku, Kobe-city, Hyogo, Japan 651-2241
〒651-2241　兵庫県神戸市西区室谷2丁目1番5号

United States of America
SUBSIDIARY
KOSMEK (USA) LTD.

TEL. +1-630-620-7650　FAX. +1-630-620-9015
650 Springer Drive, Lombard, IL 60148 USA

MEXICO
REPRESENTATIVE OFFICE
KOSMEK USA Mexico Office

TEL. +52-1-55-3044-9983
Av. Santa Fe 103, Int. 59, col. Santa Fe Juriquilla, Queretaro, QRO, 76230, Mexico

EUROPE
SUBSIDIARY
KOSMEK EUROPE GmbH

TEL. +43-463-287587　FAX. +43-463-287587-20
Schleppeplatz 2 9020 Klagenfurt am Wörthersee Austria

CHINA
KOSMEK (CHINA) LTD.
考世美(上海)貿易有限公司

TEL. +86-21-54253000　FAX. +86-21-54253709
Room601, RIVERSIDE PYRAMID No.55, Lane21, Pusan Rd, Pudong Shanghai 200125, China
中国上海市浦东新区浦三路21弄55号银亿滨江中心601室 200125

INDIA
BRANCH OFFICE
KOSMEK LTD. - INDIA

TEL. +91-9880561695
F 203, Level-2, First Floor, Prestige Center Point, Cunningham Road, Bangalore -560052 India

THAILAND
REPRESENTATIVE OFFICE
KOSMEK Thailand Representation Office

TEL. +66-2-300-5132　FAX. +66-2-300-5133
67 Soi 58, RAMA 9 Rd., Phatthanakan, Suanluang, Bangkok 10250, Thailand

TAIWAN
(Taiwan Exclusive Distributor)
Full Life Trading Co., Ltd.
盈生貿易有限公司

TEL. +886-2-82261860　FAX. +886-2-82261890
16F-4, No.2, Jian Ba Rd., Zhonghe District, New Taipei City Taiwan 23511
台湾新北市中和區建八路2號 16F－4（遠東世紀廣場）

PHILIPPINES
(Philippines Exclusive Distributor)
G.E.T. Inc, Phil.

TEL. +63-2-310-7286　FAX. +63-2-310-7286
Victoria Wave Special Economic Zone Mt. Apo Building, Brgy. 186, North Caloocan City, Metro Manila, Philippines 1427

INDONESIA
(Indonesia Exclusive Distributor)
PT. Yamata Machinery

TEL. +62-21-29628607　FAX. +62-21-29628608
Delta Commercial Park I, Jl. Kenari Raya B-08, Desa Jayamukti, Kec. Cikarang Pusat Kab. Bekasi 17530 Indonesia

Sales Offices in Japan

Head Office
Osaka Sales Office
Overseas Sales

TEL. 078-991-5162　FAX. 078-991-8787
〒651-2241　兵庫県神戸市西区室谷2丁目1番5号

Tokyo Sales Office

TEL. 048-652-8839　FAX. 048-652-8828
〒331-0815　埼玉県さいたま市北区大成町4丁目81番地

Nagoya Sales Office

TEL. 0566-74-8778　FAX. 0566-74-8808
〒446-0076　愛知県安城市美園町2丁目10番地1

Fukuoka Sales Office

TEL. 092-433-0424　FAX. 092-433-0426
〒812-0006　福岡県福岡市博多区上牟田1丁目8-10-101

Product Line-up

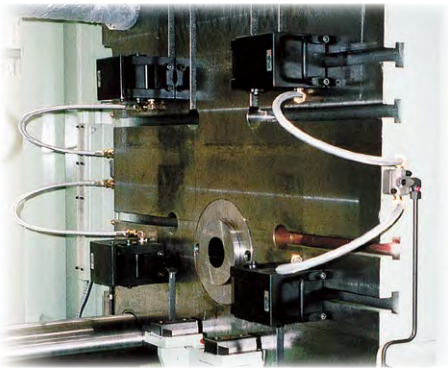
Locating Pin Clamp
SWP
High-Power Welding Swing Clamp
WHG
High-Power Welding Link Clamp
WCG
Air Flow Control Valve
BZW
Manifold Block
WHZ-MD
General Cautions
Welding Application Related Products
Die Change System for Press Machines
Company Profile Sales Offices

■ Quick Die Change Systems

FOR PRESS MACHINES

■ Kosmek Factory Automation Systems

FACTORY AUTOMATION INDUSTRIAL ROBOT RELATED PRODUCTS

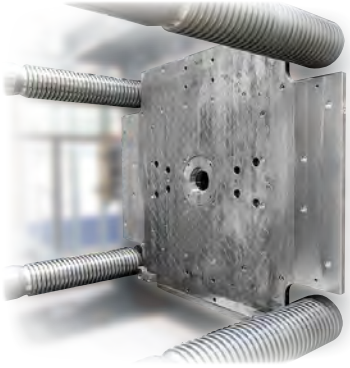


■ Diecast Clamping Systems

FOR DIECAST MACHINES

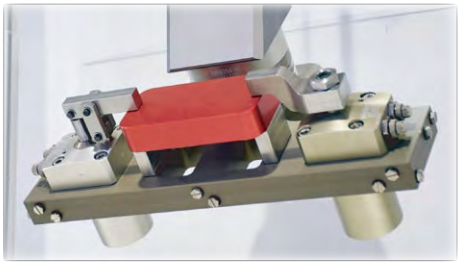
■ Kosmek Work Clamping Systems

MACHINE TOOL RELATED PRODUCTS



■ Quick Mold Change Systems

FOR INJECTION MOLDING MACHINES



■ Washing Application Products

KOSMEK PRODUCTS FOR WASHING APPLICATION

KOSMEK
Harmony in Innovation

KOSMEK LTD.

http://www.kosmek.com/

HEAD OFFICE 1-5, 2-chome, Murotani, Nishi-ku, Kobe-city, Hyogo, Japan 651-2241
TEL.+81-78-991-5162 FAX.+81-78-991-8787

United States of America SUBSIDIARY
KOSMEK (USA) LTD.
650 Springer Drive, Lombard, IL 60148 USA
TEL. +1-630-620-7650 FAX. +1-630-620-9015

MEXICO REPRESENTATIVE OFFICE
KOSMEK USA Mexico Office
Av. Santa Fe 103, Int. 59, col. Santa Fe Juriquilla, Queretaro, QRO, 76230, Mexico TEL. +52-1-55-3044-9983

EUROPE SUBSIDIARY
KOSMEK EUROPE GmbH
Schleppeplatz 2 9020 Klagenfurt am Wörthersee Austria
TEL. +43-463-287587 FAX. +43-463-287587-20

CHINA SUBSIDIARY
KOSMEK (CHINA) LTD.
Room601, RIVERSIDE PYRAMID No.55, Lane21, Pusan Rd, Pudong Shanghai 200125, China TEL. +86-21-54253000

INDIA BRANCH OFFICE
KOSMEK LTD. - INDIA
F 203, Level-2, First Floor, Prestige Center Point, Cunningham Road, Bangalore -560052 India TEL.+91-9880561695

THAILAND REPRESENTATIVE OFFICE
KOSMEK Thailand Representation Office
67 Soi 58, RAMA 9 Rd., Phatthanakan, Suanluang, Bangkok 10250, Thailand
TEL. +66-2-300-5132 FAX. +66-2-300-5133

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

JQA-QMA10823
KOSMEK HEAD OFFICE

JAB CM009

CAT.NO. SWP001-03-GB
Printed in Japan

2017/12 First 1Ry
2020/08 3rd 1Ry