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

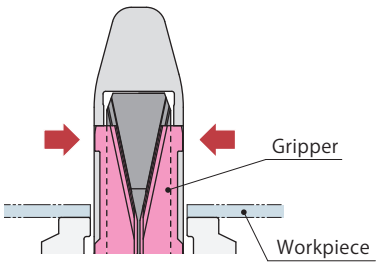
High Accuracy Locating and Clamping of Thin Workpieces

Applicable to Workpiece Hole Diameter ϕ8 or larger PAT.

Action Description

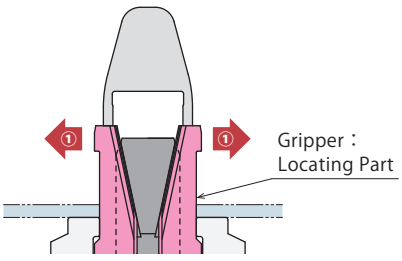
Release

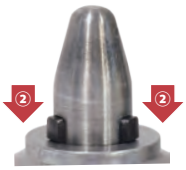
Release Air ON | Lock Air OFF

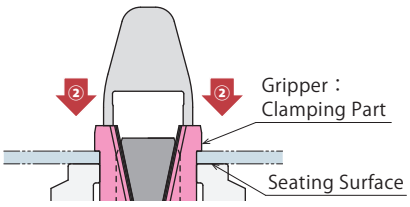


Lock

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

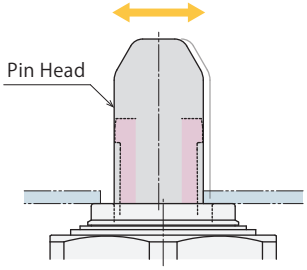
Gripper expands.

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

A workpiece is located by the locating part.

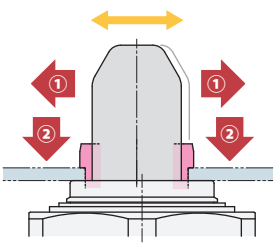
② Locking Action

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.



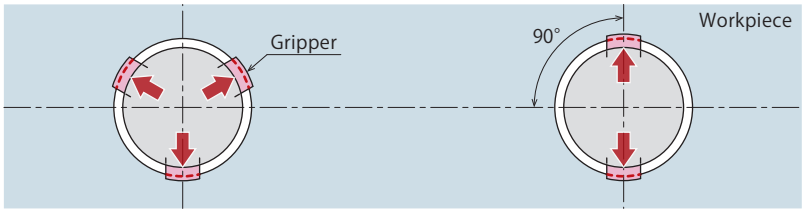
In case of Function **M**：Floating Function

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).

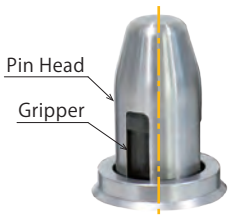


For Datum Locating (Equivalent to Round Pin)

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.

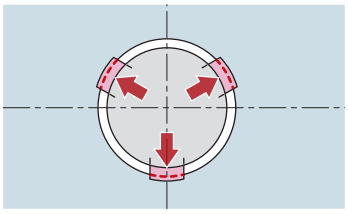


Pin Head : Fixed

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.

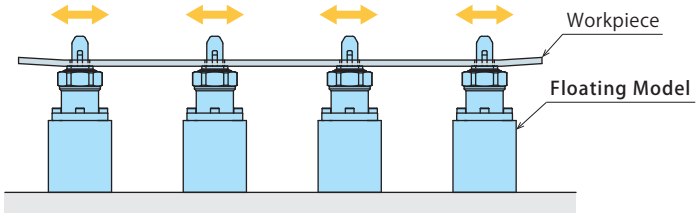


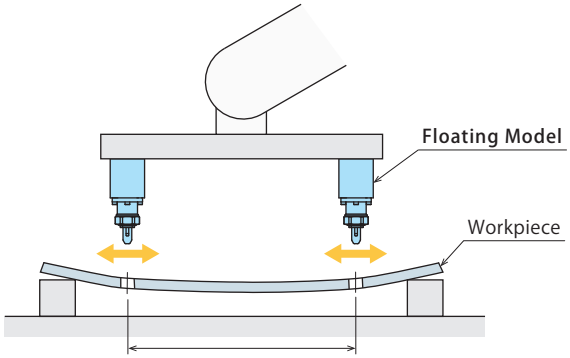
Pin Head : Floating

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.

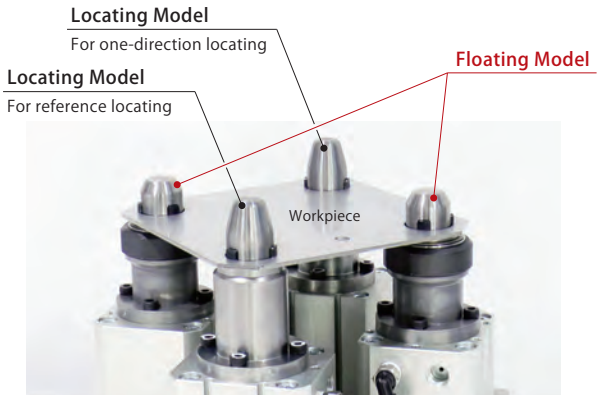




Variation of Workpiece Hole Distance due to Flection

- **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.



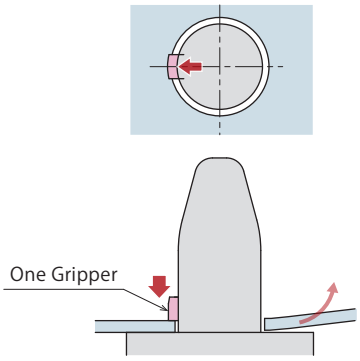
Description Video of the Floating Model Available on Our Website

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

Features

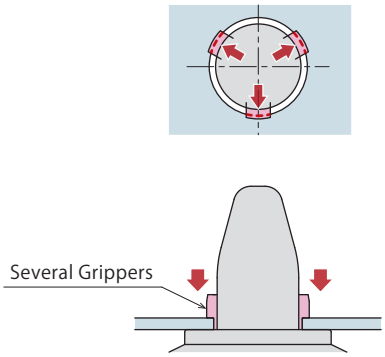
Stable Clamping

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

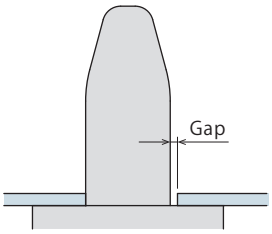
Three or two grippers press a workpiece hole evenly, so the force is distributed allowing for stable clamping.

High Accuracy

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

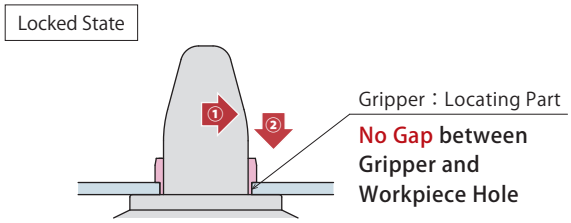
Locating Repeatability：0.05mm

※ 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.

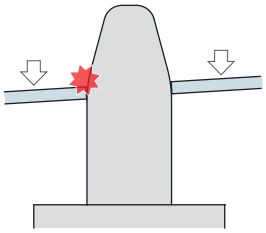


KOSMEK Locating Pin Clamp

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

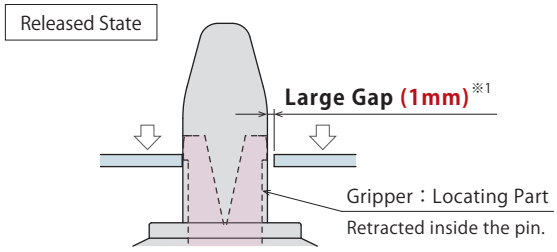
Work Efficiency

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.

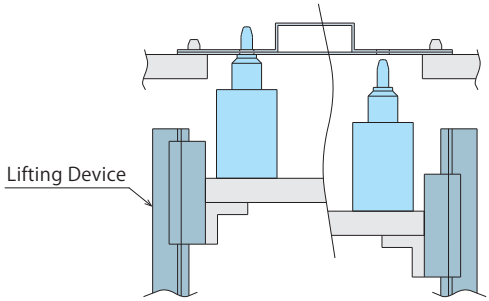


KOSMEK Locating Pin Clamp

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

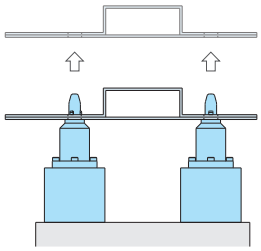
※1. The gap is 0.2mm for SWP0502-□-080/090-□ (Workpiece Hole Diameter ϕ8/9), and 0.5mm for SWP0502-□-100-□ (Workpiece Hole Diameter ϕ10). Refer to the external dimensions for further information.

● 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.

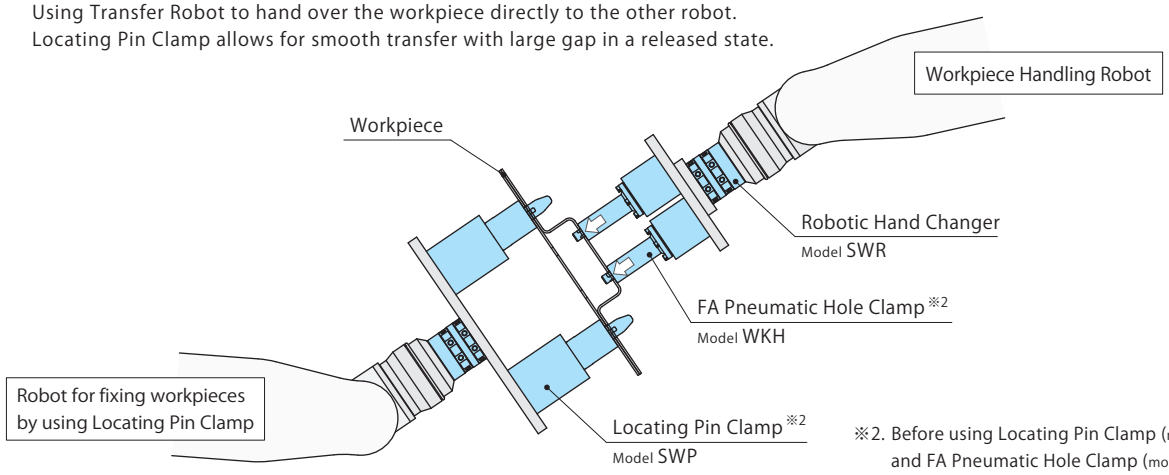


KOSMEK Locating Pin Clamp

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

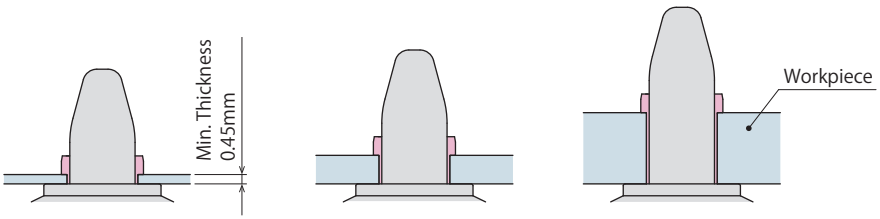
Application Example :
Using Transfer Robot to hand over the workpiece directly to the other robot.
Locating Pin Clamp allows for smooth transfer with large gap in a released state.



※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.



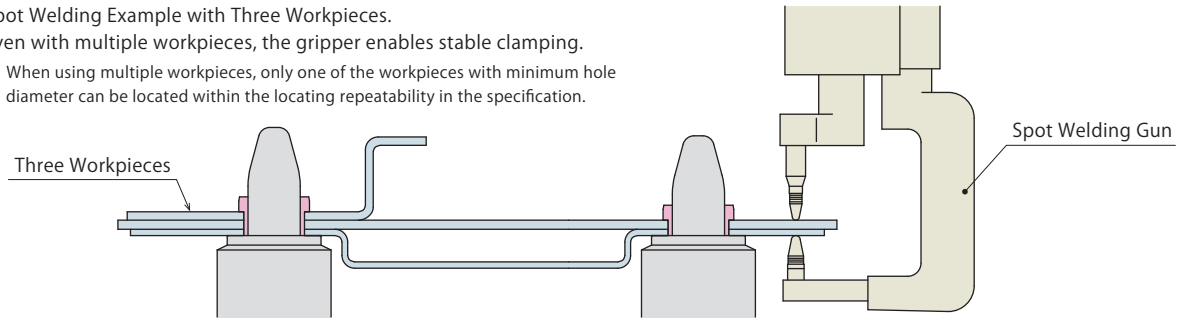
(mm)

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

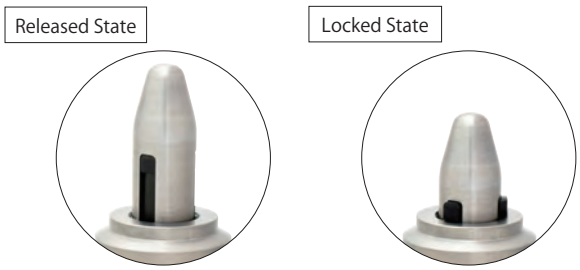
Spot Welding Example with Three Workpieces.
Even with multiple workpieces, the gripper enables stable clamping.

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



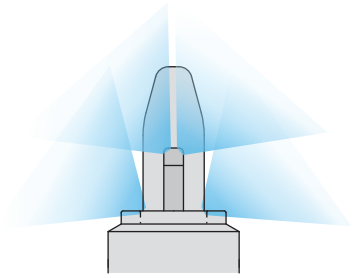
Anti-Contamination

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

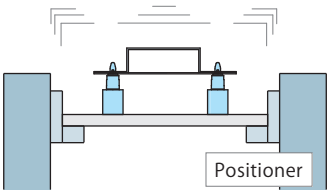
Short body allows for more compact and lighter applications.

Weight : 350 g

Ex. 1
SWP0502-D/C□-100-□
(Workpiece Hole Diam. ϕ10)

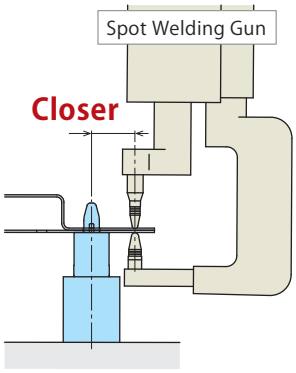
Weight : 700 g

Ex. 2
SWP1002-D/C□-160-□
(Workpiece Hole Diam. ϕ16)



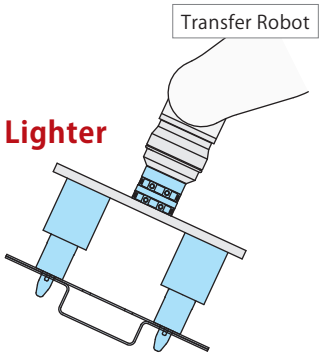
Less Load to Positioner

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.

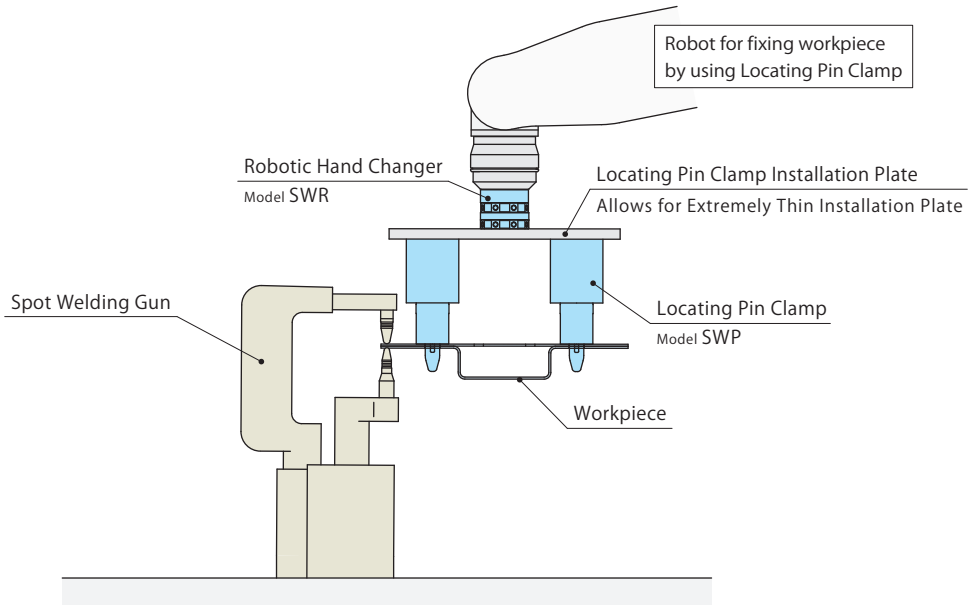


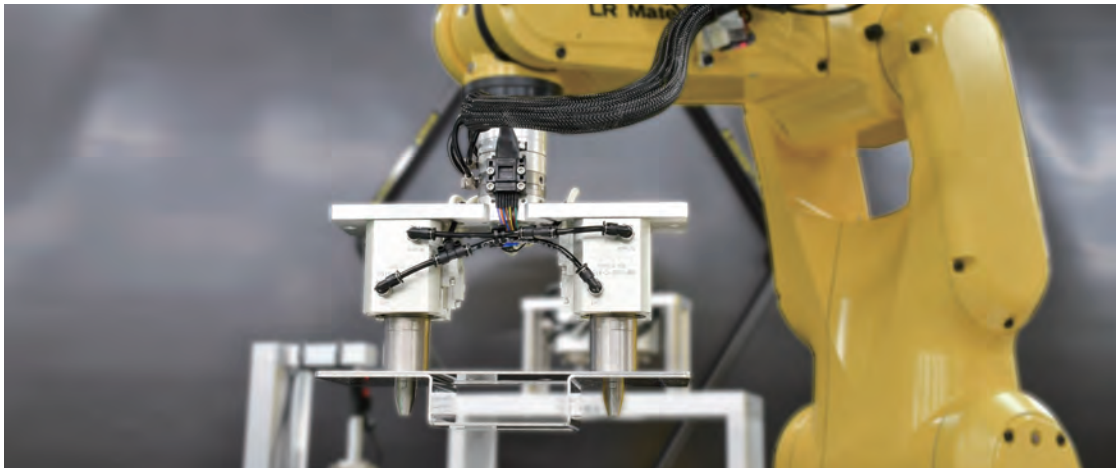
Compact and Light Transfer Hand

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.

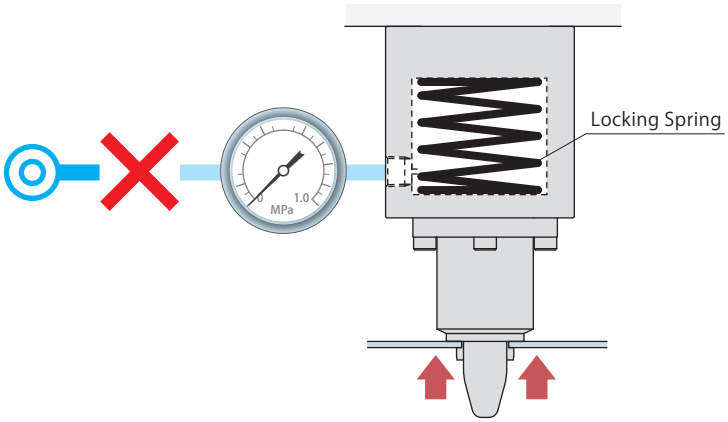




Safety Function

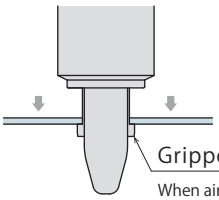
Built-in locking spring maintains locked state even when air pressure is cut off.

※ 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.



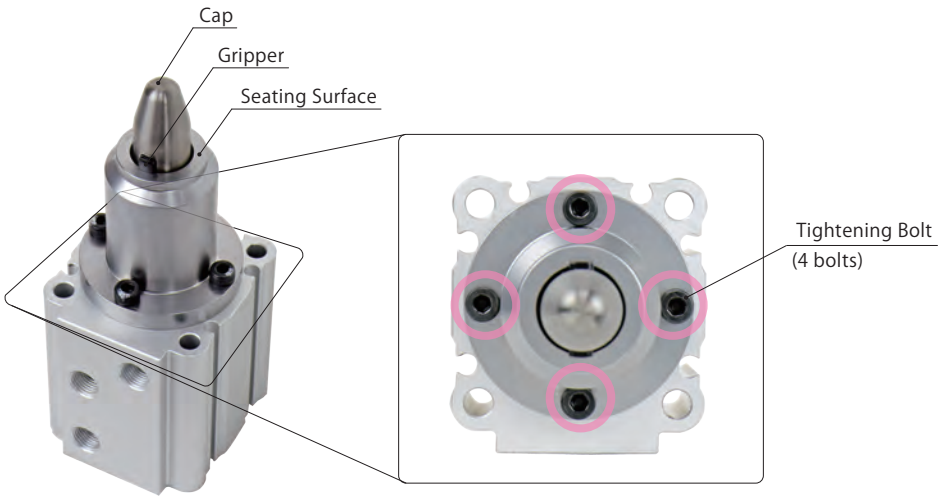
Gripper

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

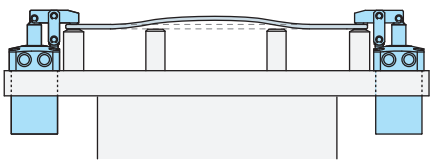
The gripper and cap can be replaced by removing tightening bolts on the seating part.
No special tools or hard work are required for maintenance. It also helps customer prepare for replacements.



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

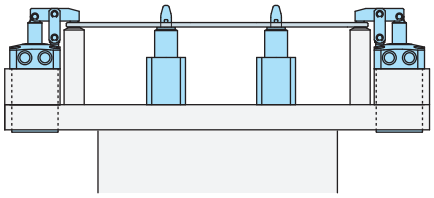
No Bending

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/JES Series (made by KOSMEK) ※1 ※2

Notes :

※1. Please refer to FA・Industrial Robot Related Products Complete Catalog (CATALOG No.FA0020□□-□□-G1B) for the detailed specifications of JEP/JES series.

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

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

Model No. Indication

SWP 100 2 - C X - 150 - ☐
1 2 3 4 5 6

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.

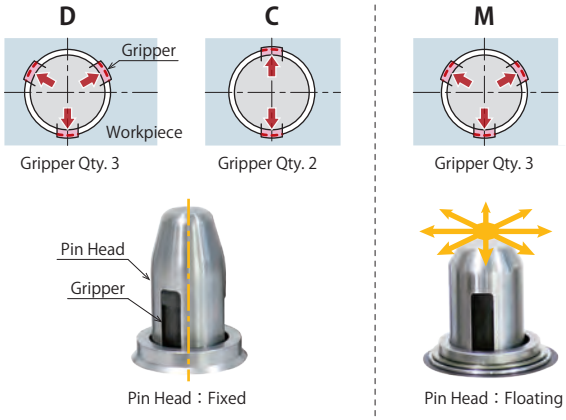
2 : Revision Number

3 Function

D : Datum (For Datum Locating)

C : Cut (For One Direction Locating)

M : Pin Head Floating (No Locating Function)



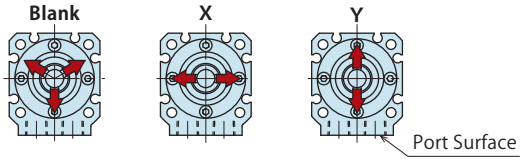
4 Gripper Expanding Direction

Blank : 3 In case of **D, M**

X : Parallel to the port surface.

Y : Perpendicular to the port surface.

3 In case of **C**



5 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. $\phi 14^{\pm 0.2}$

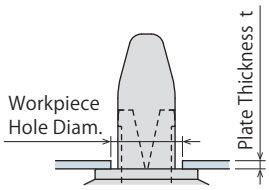
150 : Workpiece Hole Diam. $\phi 15^{\pm 0.2}$

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

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

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

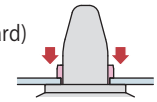
5 Workpiece Hole Diam.		080	090~200
3 Function	D	–	○
	C	○	○
	M	–	○



6 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.			SWP0502 -C☐-080-☐	SWP0502 -☐-090-☐	SWP0502 -☐-100-☐	SWP0502 -☐-110-☐	SWP0502 -☐-120-☐	SWP0502 -☐-130-☐	SWP1002 -☐-140-☐	SWP1002 -☐-150-☐	SWP1002 -☐-160-☐	SWP1002 -☐-180-☐	SWP1002 -☐-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			
Repeatability ※1		mm	0.05 (when combining 3 **D** 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			
6 **Blank**	Max. Operating Pressure	MPa	0.5										
	Min. Releasing Pressure	MPa	0.2										
6 **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	350						700				

Notes :

※1. Repeatability under the same condition (no load).

1. This product locks and releases with air pressure.
2. When using SWP☐-D/C☐-☐ with other clamps, make sure SWP☐-D/C☐-☐ operates first by sequence control of a circuit.
3. When using SWP☐-M-☐ with other locating clamps or locating devices, make sure SWP☐-M-☐ operates after workpiece locating is completed.

Clamping Force・Expanding Force

(N)

Model No.		SWP0502		SWP1002	
		6 **Blank**:With Self-Locking	6 **N**:Without Self-Locking	6 **Blank**:With Self-Locking	6 **N**:Without Self-Locking
Clamping Force ※2	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 ※4	Fc=650×P+55	Fc=650×P	Fc=1000×P+100	Fc=1000×P
Expanding Force ※3	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 ※4	FE=1740×P+145	FE=1760×P	FE=2680×P+260	FE=2660×P

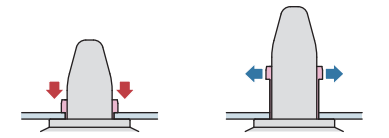
Notes :

※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. Expanding force shows the gripping force generated inside workpiece hole.
Values in the table show the calculated value when the friction coefficient is μ0.15.

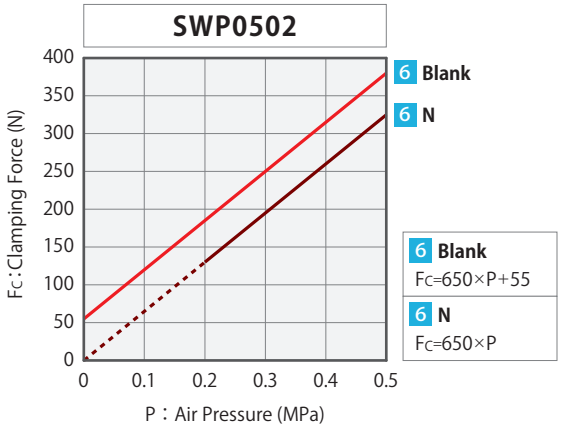
※4. Fc:Clamping Force (N), FE:Expanding Force (N), P:Air Pressure (MPa)

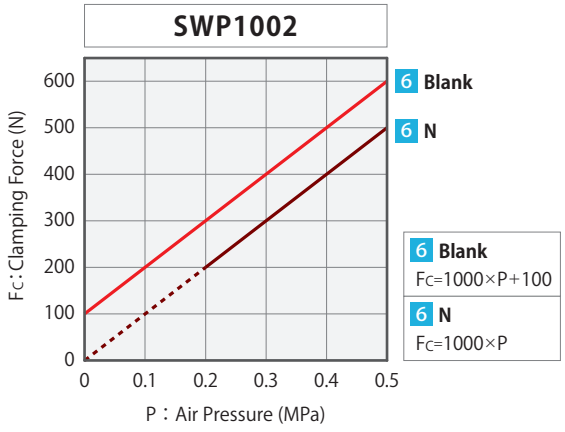
1. Depending on the material, thickness and chamfer shape of a workpiece hole, it can be deformed by clamping action, and the specifications will not be satisfied. Make sure to test clamping beforehand and adjust pressure accordingly.



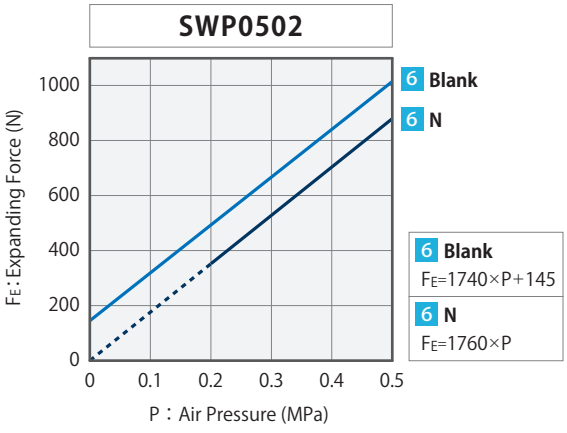
Fc:Clamping Force　FE:Expanding Force

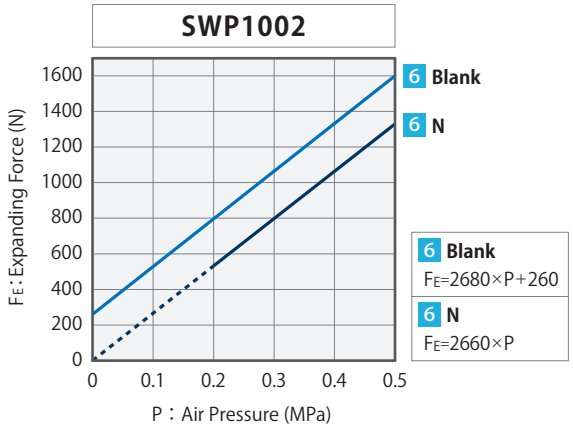
Clamping Force Curve





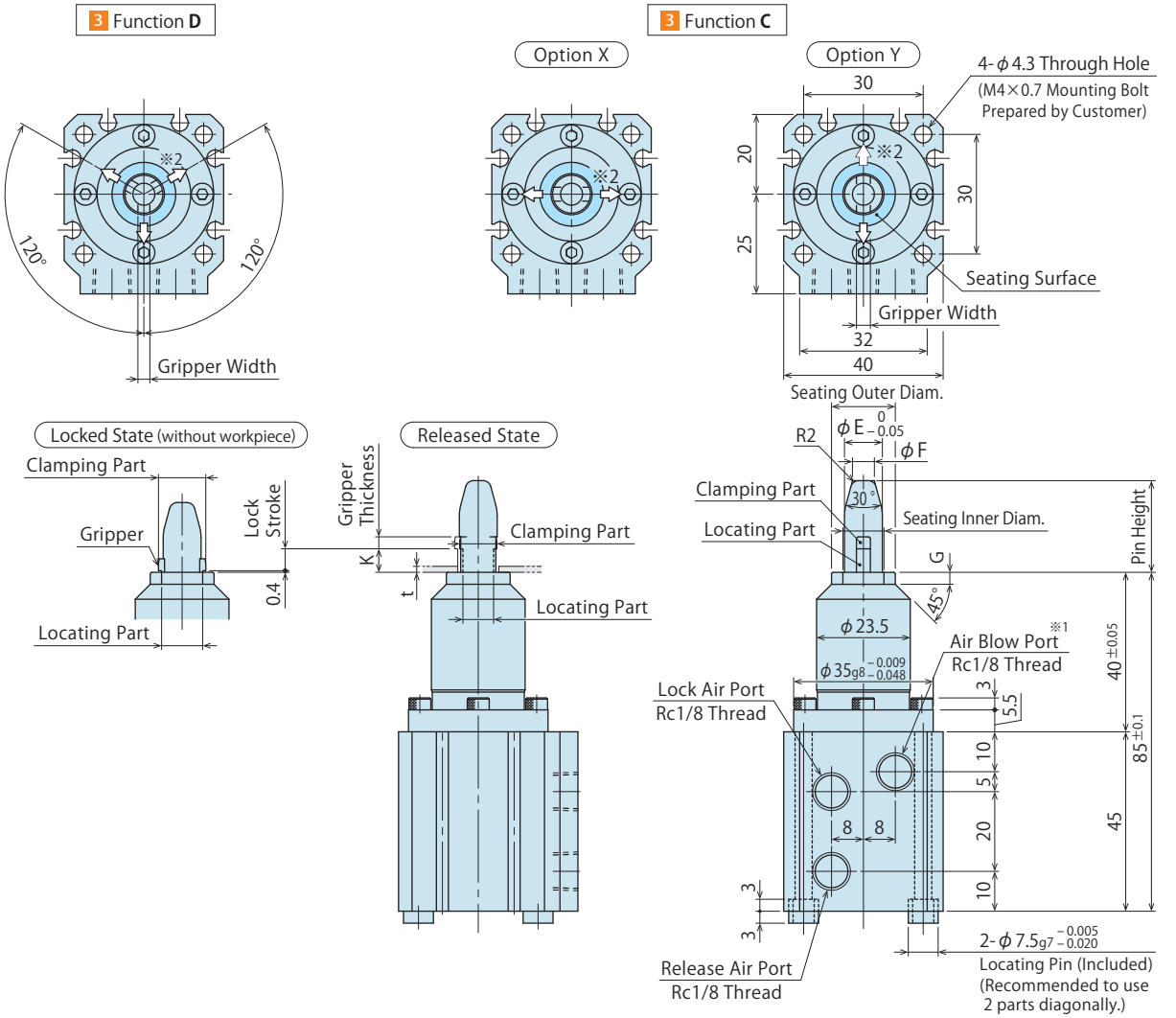
Expanding Force Curve

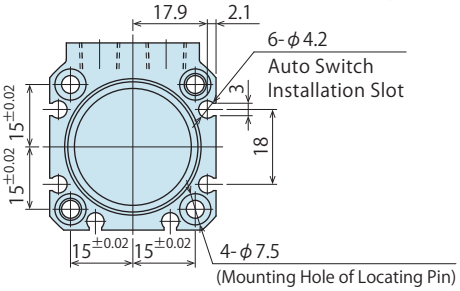




External Dimensions : SWP0502-D/C

※ This drawing shows the released state of SWP0502-D/C.





External Dimension List : SWP0502-D/C

(mm)

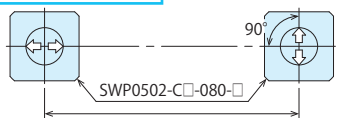
Model No.			SWP0502 -C□-080-□	SWP0502 -D/C□-090-□	SWP0502 -D/C□-100-□	SWP0502 -D/C□-110-□	SWP0502 -D/C□-120-□	SWP0502 -D/C□-130-□
Workpiece	Hole Diameter		8 +0.2 −0.1	9 +0.2 −0.1	10 ±0.2	11 ±0.2	12 ±0.2	13 ±0.2
	Thickness	Min.	0.45					
	t	Max.	2.3	3.6	5.5	6	6.5	7
Pin Height			17	19	23	23.5	24	24.5
Pin 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 for the use in an environment where contaminants may enter into the product such as welding.

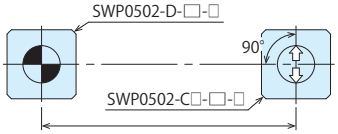
※2. The arrow ⇨ in the drawing shows expanding direction of grippers.
Since the clamping part is not a floating structure, when clamping a workpiece with two of these products, consider distance accuracy and use them with arrangement shown in the drawing on the right. With out-of specification distance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

In case of 5 **080**



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

In case of 5 **090 ~ 130**

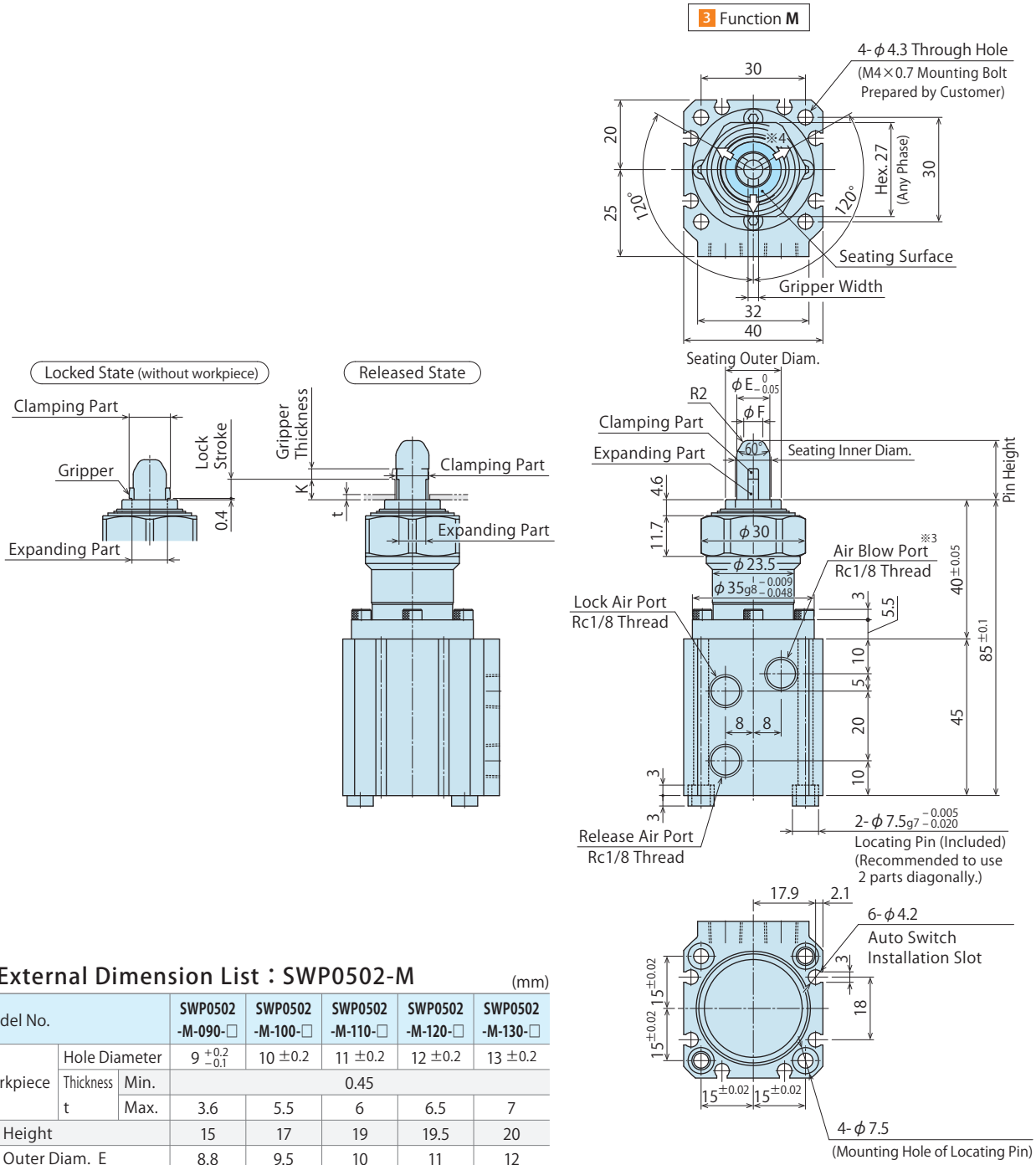


Cumulative accuracy of workpiece hole distance and clamp mounting distance must be as shown in the table below.

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

External Dimensions : SWP0502-M

※ This drawing shows the released state of SWP0502-M.



External Dimension List : SWP0502-M

(mm)

Model No.			SWP0502 -M-090-□	SWP0502 -M-100-□	SWP0502 -M-110-□	SWP0502 -M-120-□	SWP0502 -M-130-□
Workpiece	Hole Diameter		9 +0.2 −0.1	10 ±0.2	11 ±0.2	12 ±0.2	13 ±0.2
	Thickness t	Min.	0.45				
		Max.	3.6	5.5	6	6.5	7
Pin Height			15	17	19	19.5	20
Pin Outer Diam. E			8.8	9.5	10	11	12
Pin End Diam. F			5	5.5	6	7	8
Clamping Part	At Released		8.7	9.3	9.8	10.8	11.8
	At Locked (without workpiece)		10.8	11.8	12.8	13.8	14.8
Locating Part	At Released		7.1	7.7	8.2	9.2	10.2
	At Locked (without workpiece)		9.2	10.2	11.2	12.2	13.2
Gripper Width			3	3	3.5	3.5	3.5
Gripper Thickness			2	3	3	3	3
Released Height K			4	5.9	6.4	6.9	7.4
Seating Inner Diam.			9.3	10.3	11.3	12.3	13.3
Seating Outer Diam.			15.5	16	17	18	19
Lock Stroke			3.6	5.5	6	6.5	7

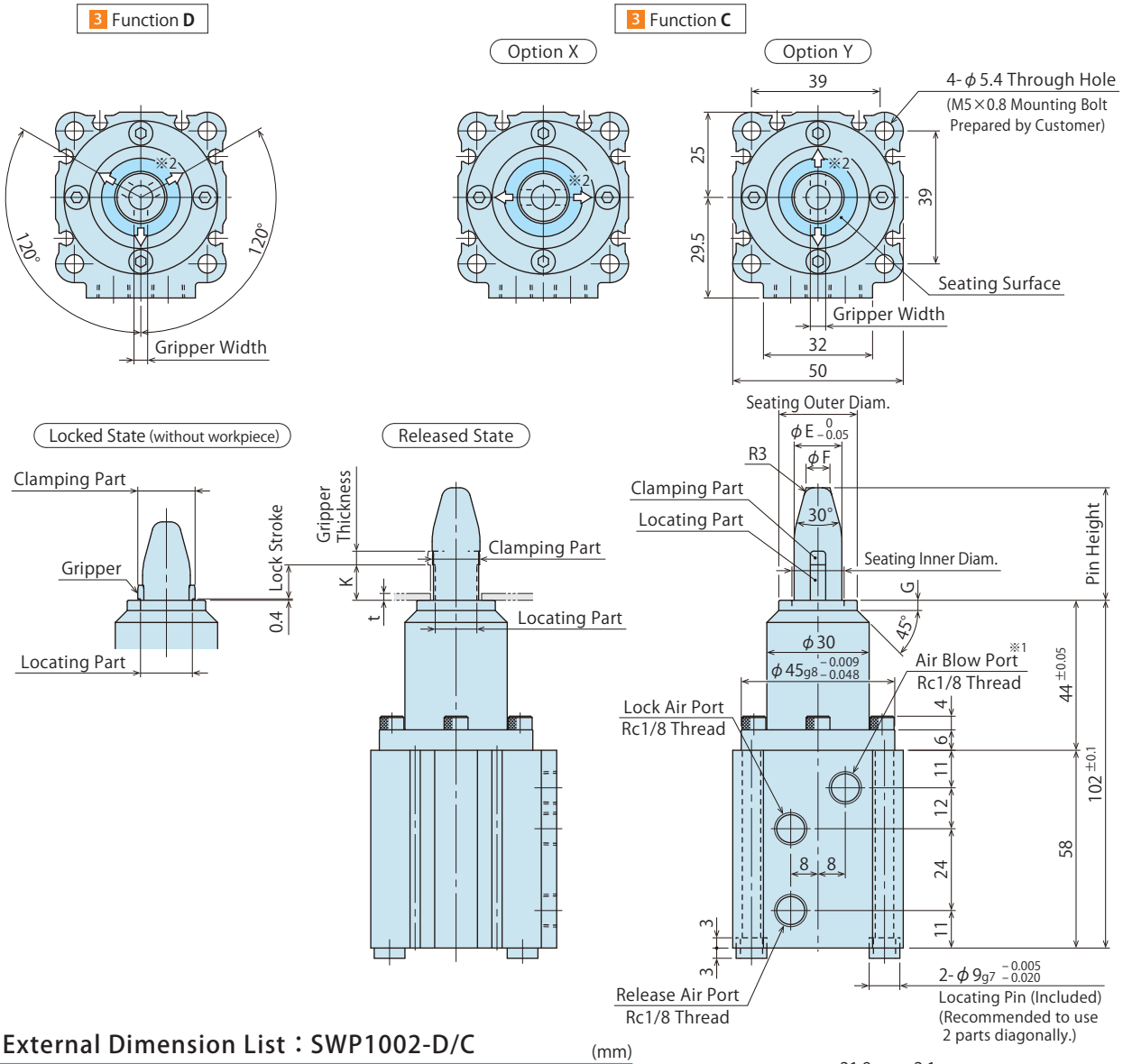
Notes :

※3. Continuously supply air pressure to the air blow port for the use in an environment where contaminants may enter into the product such as welding.

※4. The arrow ⇨ in the drawing shows expanding direction of grippers.

External Dimensions : SWP1002-D/C

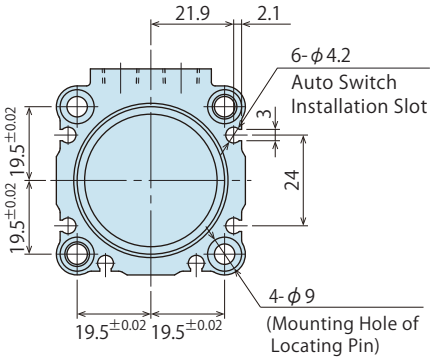
※ This drawing shows the released state of SWP1002-D/C.

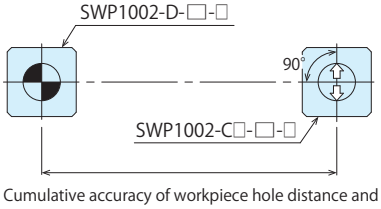


External Dimension List : SWP1002-D/C

(mm)

Model No.			SWP1002 -D/C□-140-□	SWP1002 -D/C□-150-□	SWP1002 -D/C□-160-□	SWP1002 -D/C□-180-□	SWP1002 -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.

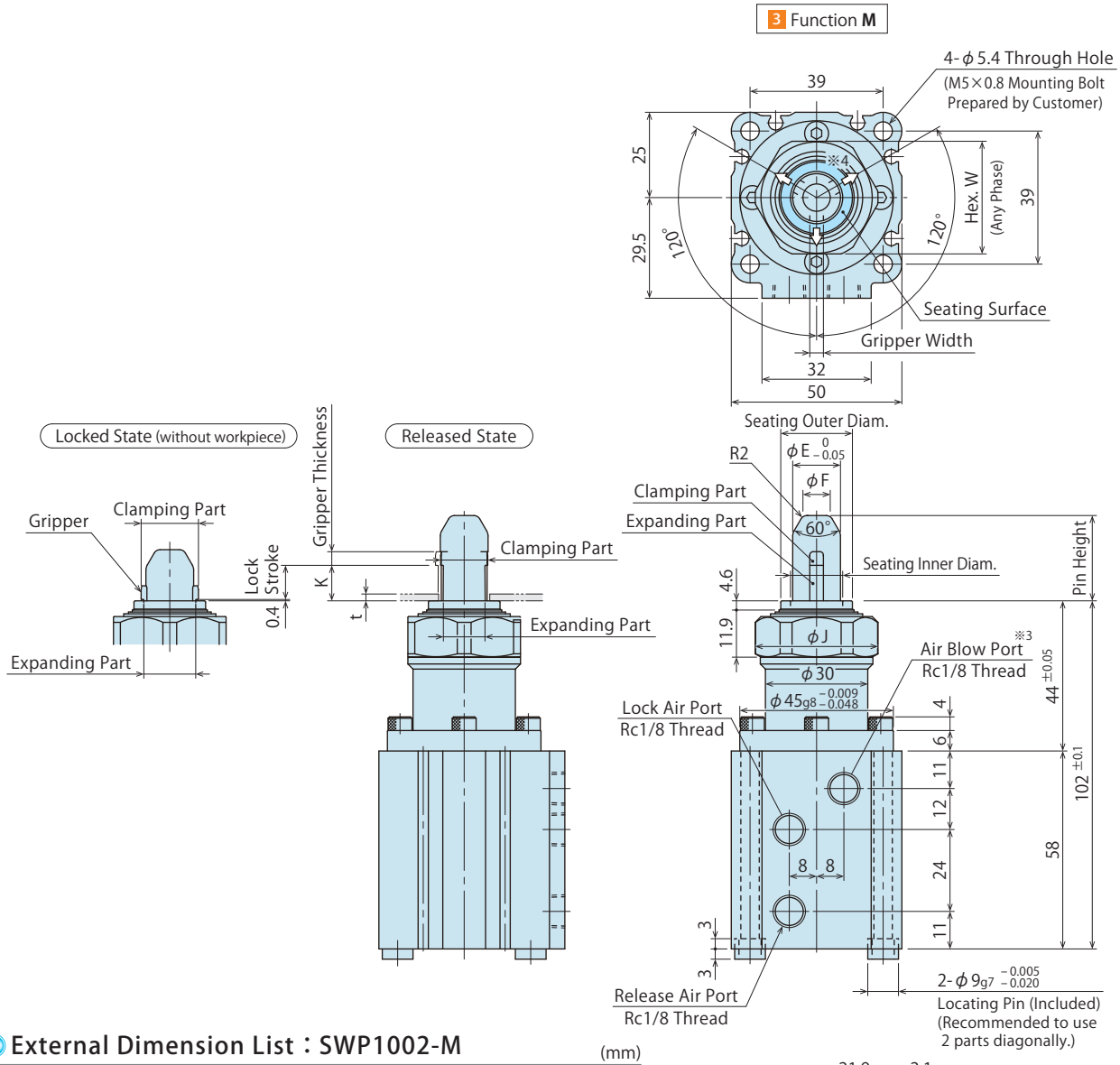
Notes :

※1. Continuously supply air pressure to the air blow port for the use in an environment where contaminants may enter into the product such as welding.

※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 : SWP1002-M

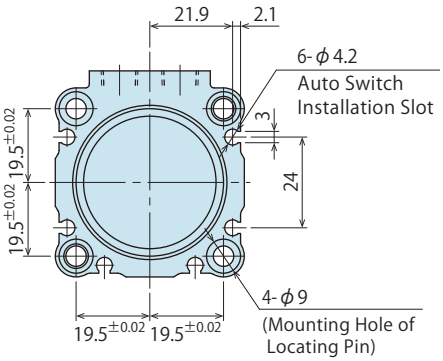
※ This drawing shows the released state of SWP1002-M.



External Dimension List : SWP1002-M

(mm)

Model No.			SWP1002 -M-140-□	SWP1002 -M-150-□	SWP1002 -M-160-□	SWP1002 -M-180-□	SWP1002 -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 for the use in an environment where contaminants may enter into the product such as welding.

※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 2 - S

1 2

1 Body Size

050：For SWP0502

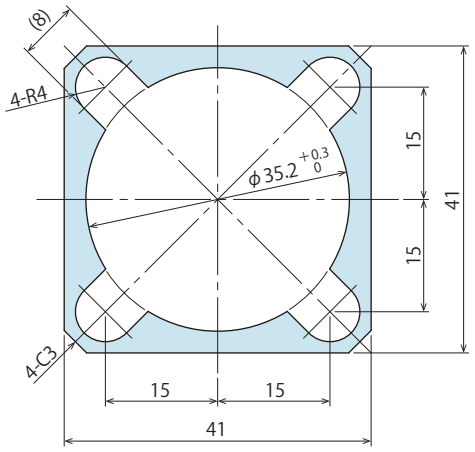
100：For SWP1002

2 Design No.

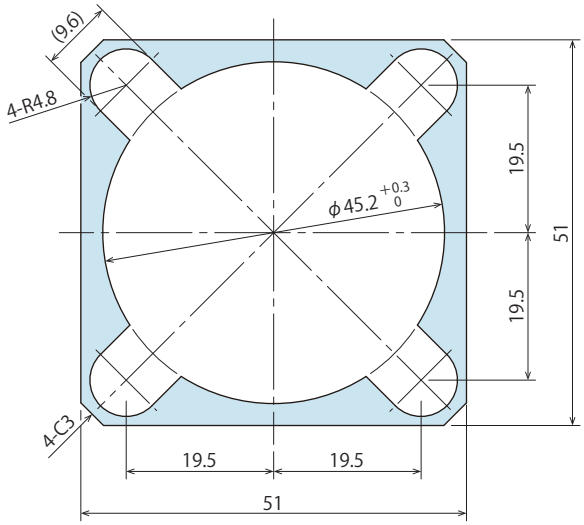
2 ：Revision Number

External Dimensions

SWPZ0502-S Contents 1 of 0.5mm-thick shim, 2 of 1.0mm-thick shims



SWPZ1002-S Contents 1 of 0.5mm-thick shim, 2 of 1.0mm-thick shims



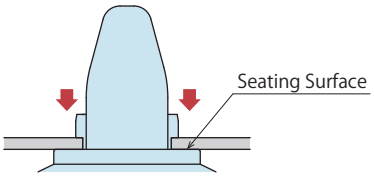
Note :
1. Material：SUS304

Cautions

Notes for Design

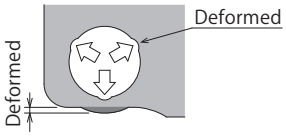
1) Check Specifications
- Please use each product according to the specifications.
- This product is an air double-acting clamp which locks and releases with air pressure. In case of Self-Locking Function Option, the clamp will be locked by spring force when release air pressure is released.

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.



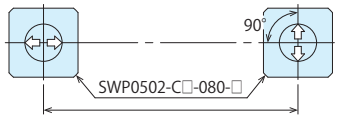
5) Workpiece hole size and thickness should be within the range of the specification.

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.
  (Accuracy is not guaranteed since there is no reference locating.)
  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.

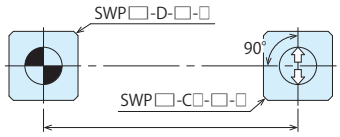
In case of Workpiece Hole Diam. **080**: ϕ8

(Accuracy is not guaranteed since there is no reference locating.)



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

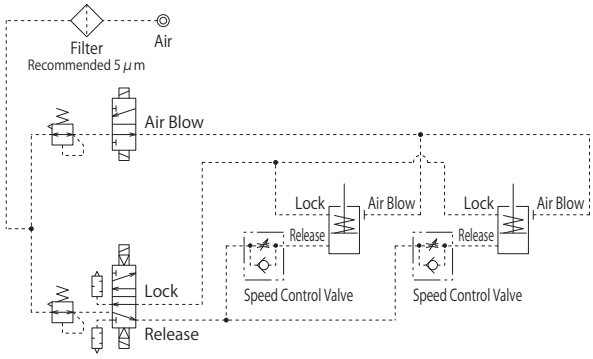
In case of Workpiece Hole Diam. **090** ~ **200**: ϕ9 ~ 20



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.



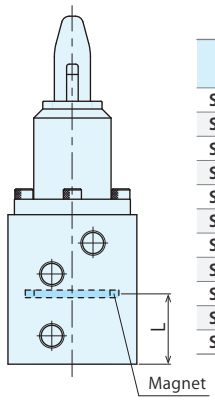
8) Fall Prevention Measures
- When using for transfer, etc., please prepare fall prevention measures for safety in case of an accident such as detachment of a workpiece.

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)
SWP0502-□-080	24.7	16.7
SWP0502-□-090	24.7	15.4
SWP0502-□-100	24.7	12.6
SWP0502-□-110	24.7	10.9
SWP0502-□-120	24.7	10.4
SWP0502-□-130	24.7	9.9
SWP1002-□-140	27.8	11.5
SWP1002-□-150	27.8	10
SWP1002-□-160	27.8	10
SWP1002-□-180	27.8	10
SWP1002-□-200	27.8	10

- Select an auto switch depending on the environment.
- Please use a magnetic field resistant auto switch for an environment which generates a magnetic field disturbance.
  Recommended Auto Switch：D-P3DWA (made by SMC)
- An auto switch may be stuck out of the clamp depending on the installation position and direction.
- If a magnetic substance (such as a steel plate) closely set with the cylinder, the operation of the auto switch may become unstable.
- 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 for the use in an environment where contaminants may enter into the product such as welding.

- When using under environment with cutting chips, air blow is recommended in order to prevent spatter from entering in.

11) Release Action
When using in a horizontal application, it is recommended to install a fall prevention of workpiece for temporal tacking.

12) 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.

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 A2-70) 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	Strength Class	Tightening Torque (N·m)
SWP0502	M4×0.7	12.9	3.2
		A2-70	2.5
SWP1002	M5×0.8	12.9	6.3
		A2-70	5.0

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 ：Lock Air Port
  RELEASE：Release Air 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.
- Machines and devices with hydraulic and pneumatic products should be operated and maintained by qualified personnel.

2) Do not operate or remove the product unless the safety protocols are ensured.
① Machines and devices 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.

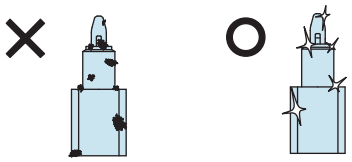
4) When transferring a workpiece, secure the safety of environment in case of a workpiece detachment.

5) Do not modify or disassemble the air cylinder.
- Contains a powerful spring in the air cylinder which is 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 circuits.
- Make sure there is no trouble/issue 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.
Contains a powerful spring in the air cylinder which is dangerous.

※ Please refer to P.83 for general cautions. ・Warranty

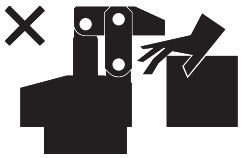
Cautions

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.

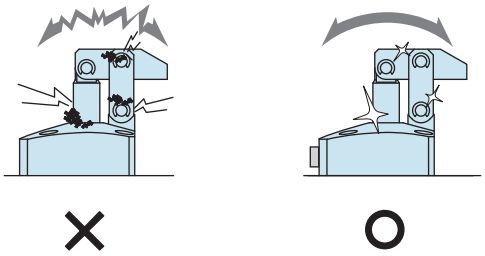


4) Do not disassemble or modify.
- If the product is taken apart or modified, the warranty will be voided even within the warranty period.

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.

Company Profile

KOSMEK LTD. Head Office

Company Name	KOSMEK LTD.
Established	May 1986
Capital	¥99,000,000
President & CEO	Koji Kimura
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, Tokyo-Mitsubishi bank

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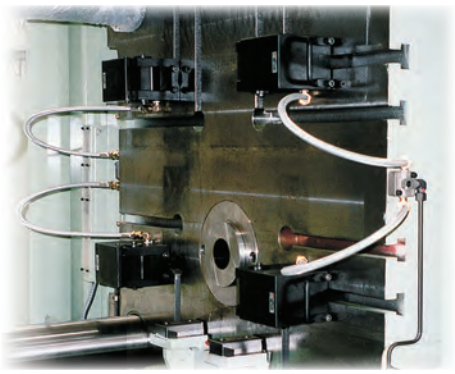
Product Line-up

■ Quick Die Change Systems

FOR PRESS MACHINES

■ Kosmek Factory Automation Systems

FACTORY AUTOMATION INDUSTRIAL ROBOT RELATED PRODUCTS

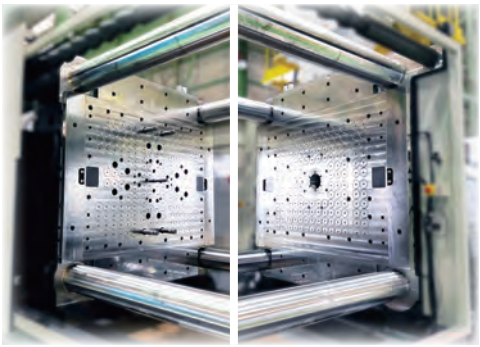


■ Diecast Clamping Systems

FOR DIECAST MACHINES

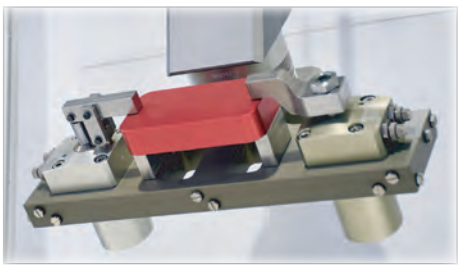
■ Kosmek Work Clamping Systems

MACHINE TOOL RELATED PRODUCTS



■ Quick Mold Change Systems

FOR INJECTION MOLDING MACHINES



■ Washing Application Products

KOSMEK PRODUCTS FOR WASHING APPLICATION

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- For Further Information on Unlisted Specifications and Sizes, Please call us.
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