As a Robotic Hand

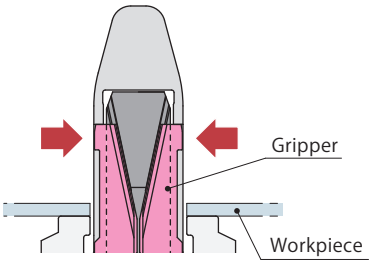
Locating Pin Clamp

Model **SWP**

Expansion Pin Clamp allows for High-Accuracy Locating and Clamping of Thin Workpieces

PAT.

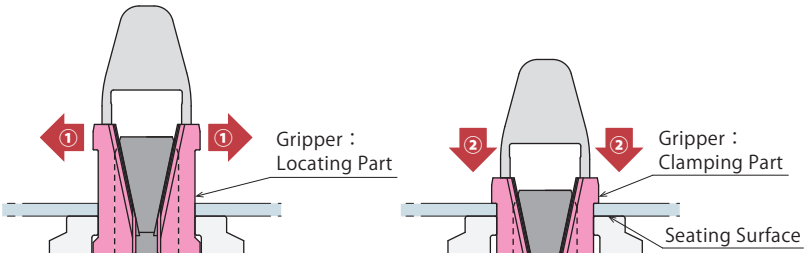
Action Description



Release

Release Air ON | Lock Air OFF

Gripper is retracted.
Workpiece can be smoothly installed due to an adequate space between the workpiece hole and pin.



Lock

Release Air OFF | Lock Air ON

① Locating Action

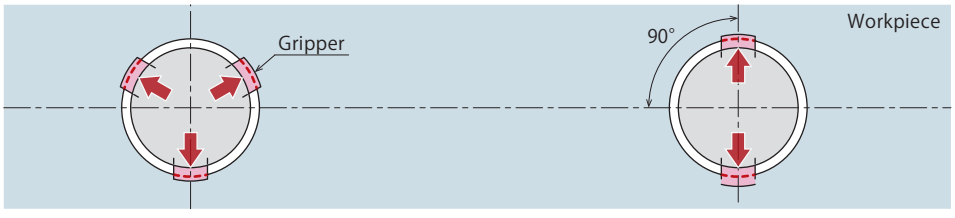
Gripper expands to locate the workpiece.

② Locking Action

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

Functions

As general locating pin, 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.

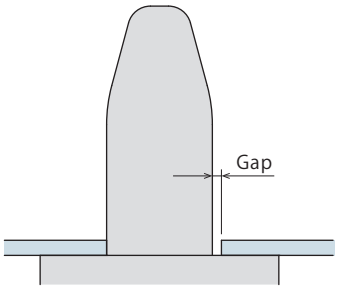
For One Direction Locating (Equivalent to Diamond Pin)

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

Features

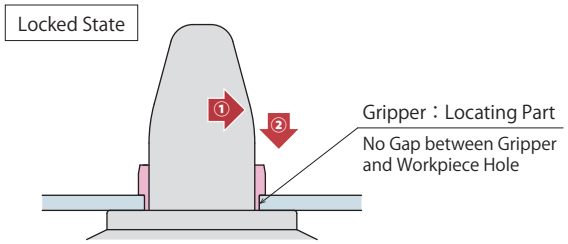
High Accuracy

Expansion of locating part allows for higher accuracy than general locating pin.
Locating Repeatability：0.05mm



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.

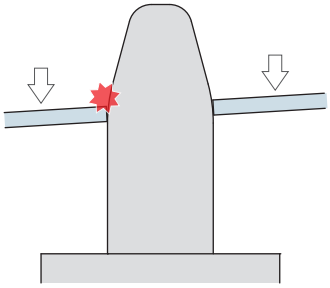


KOSMEK Locating Pin Clamp

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

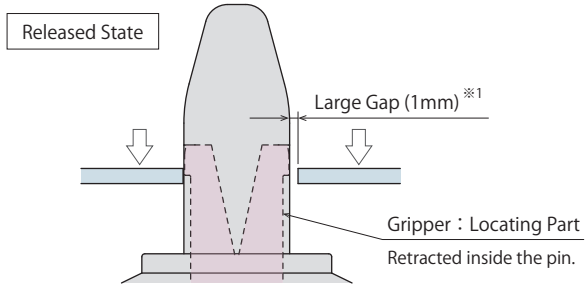
Work Efficiency

Smooth loading/unloading even with robots due to large gap between the pin and workpiece hole at 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.

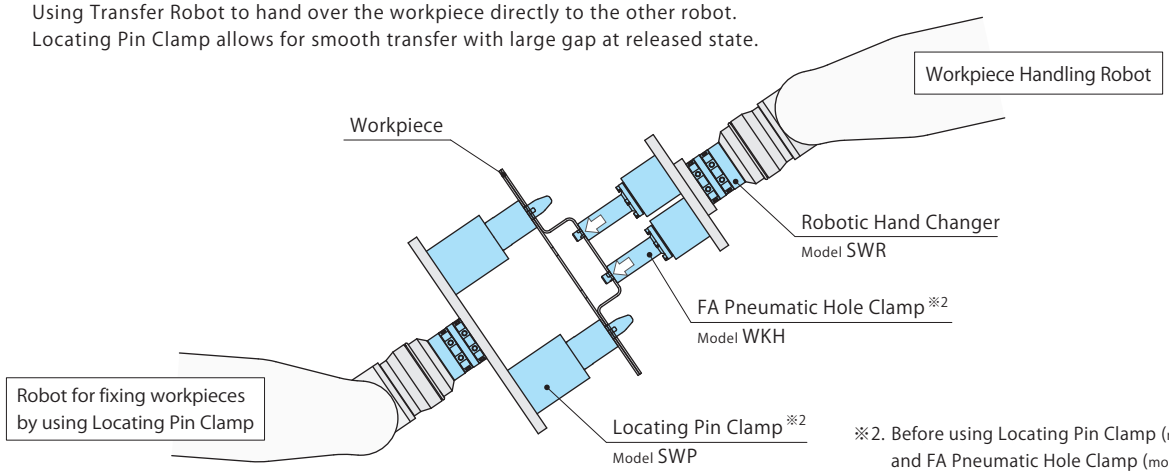


KOSMEK Locating Pin Clamp

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 of SWP0501-□-100 (Workpiece Hole Diameter ϕ10) is 0.5mm.
Refer to the specifications for further information.

Smooth Workpiece Transfer with Expansion Pin Clamp for Dual Robot Systems

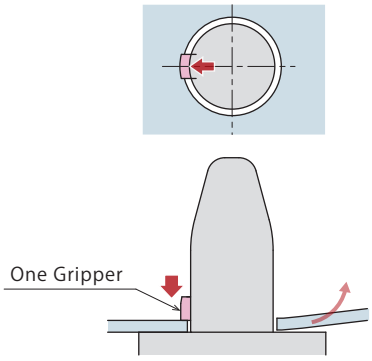
Application Example :
Using Transfer Robot to hand over the workpiece directly to the other robot.
Locating Pin Clamp allows for smooth transfer with large gap at released state.



※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.

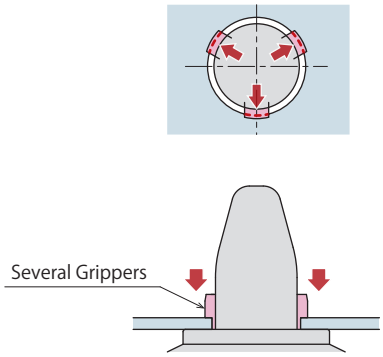
Stable Clamping

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.

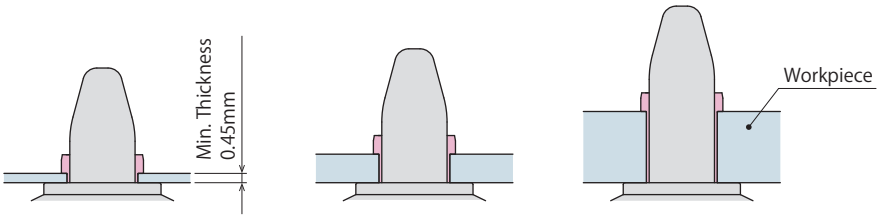


KOSMEK Locating Pin Clamp with Several Grippers

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

Flexible

Longer stroke allows for workpiece thickness variance and flexible fixturing. (Lock Stroke: 5.5~10mm)

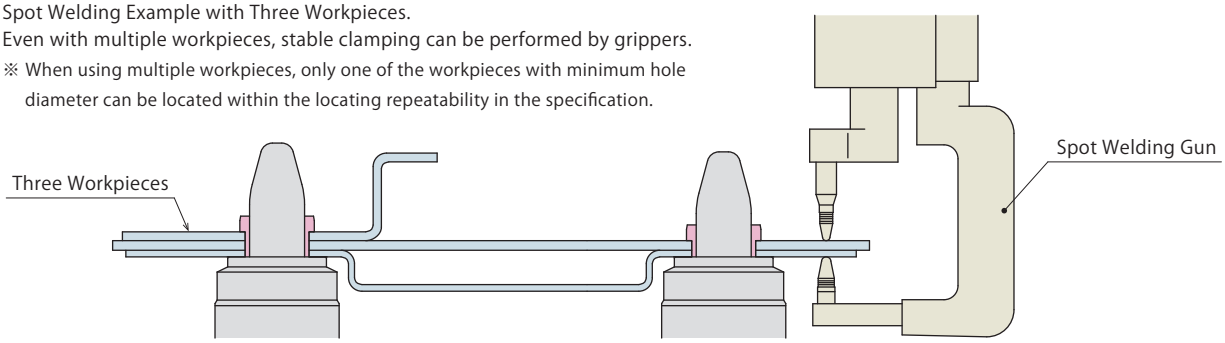


(mm)

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

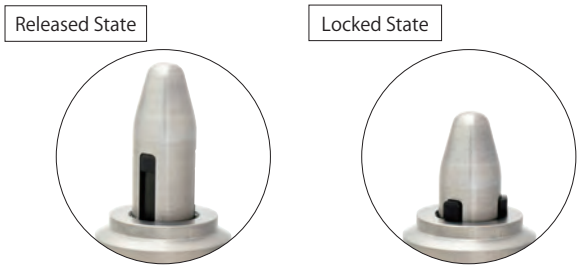
Ability to Clamp Multiple Workpieces

Spot Welding Example with Three Workpieces.
Even with multiple workpieces, stable clamping can be performed by grippers.
※ When using multiple workpieces, only one of the workpieces with minimum hole diameter can be located within the locating repeatability in the specification.



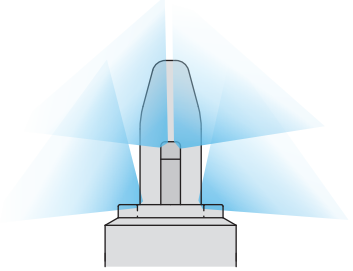
Anti-Contamination

Since the gap of clamping part is minimal, it keeps contaminants out even at 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

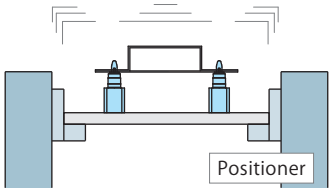
Short body allows for more compact and lighter applications.

Weight : 380 g

Ex. 1
SWP0501-□-100-□
(Workpiece Hole Diam. ϕ 10)

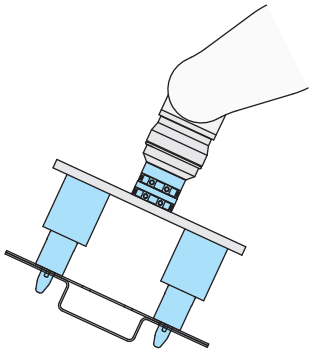
Weight : 700 g

Ex. 2
SWP1001-□-200-□
(Workpiece Hole Diam. ϕ 20)



Less Load to the Positioner

Light fixture with light Pin Clamp decreases load to the positioner.

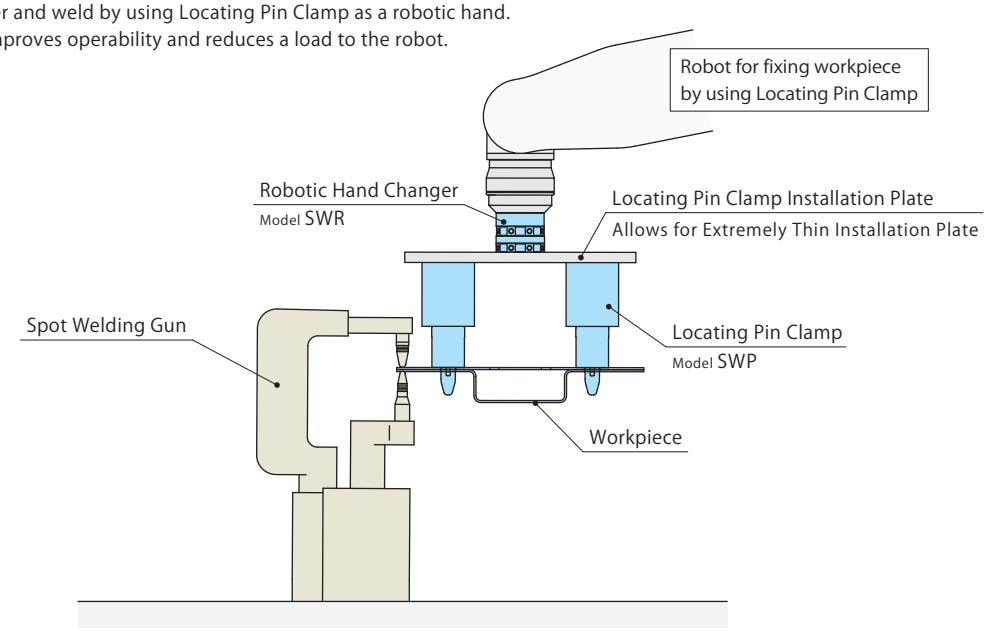


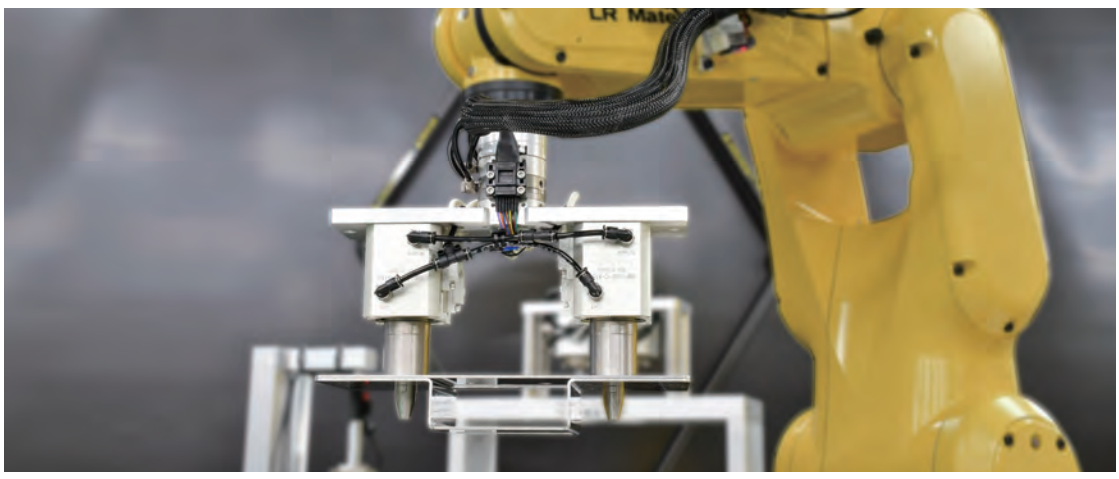
Compact and Light Transfer Hand

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.

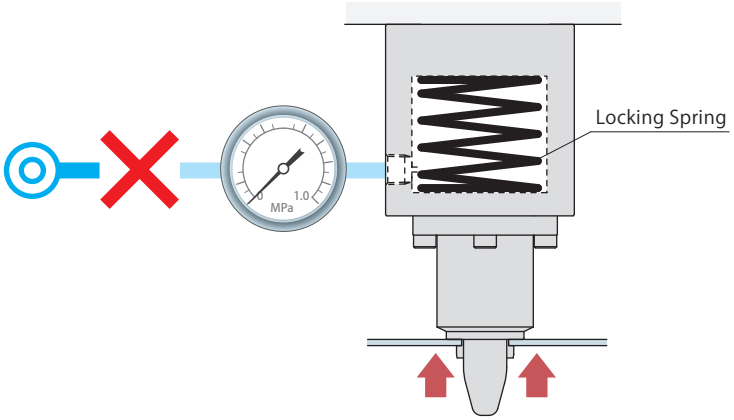




Safety Function

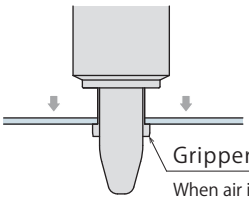
Built-in locking spring maintains locked state even when air pressure is cut off.

(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.



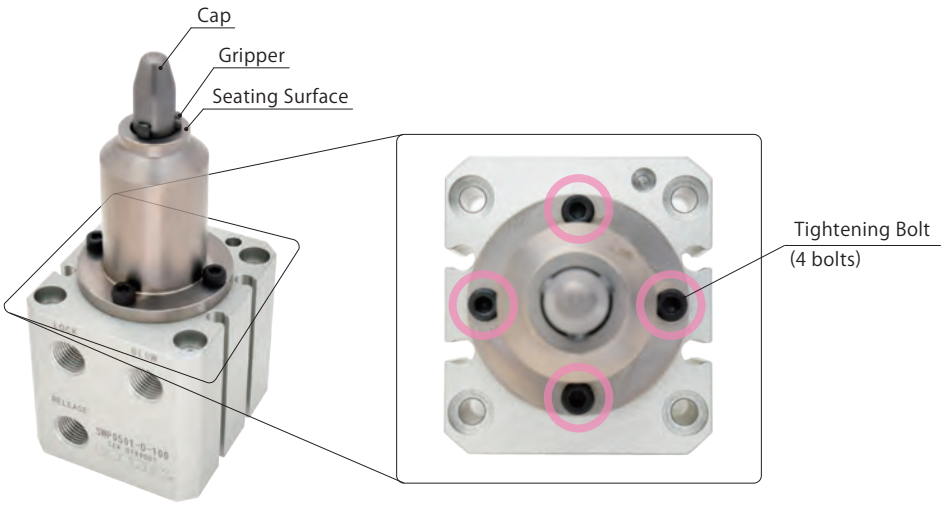
Gripper

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

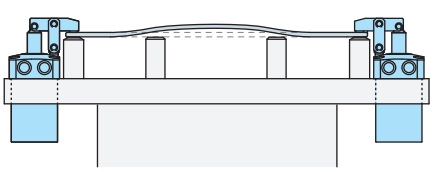
Removable Pin Allows for Simple Maintenance

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.



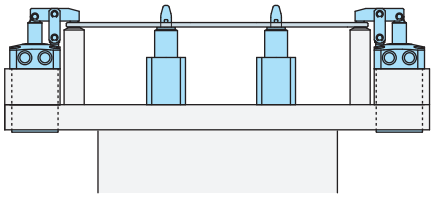
No Bending

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 Action

Recommended Auto Switch

JEP Series (made by KOSMEK)

Magnetic Field Resistant Model：

D-P3DWA (made by SMC)

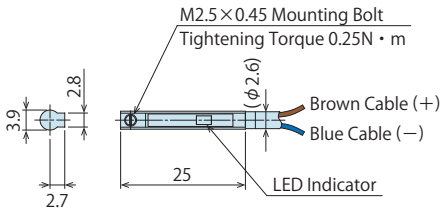
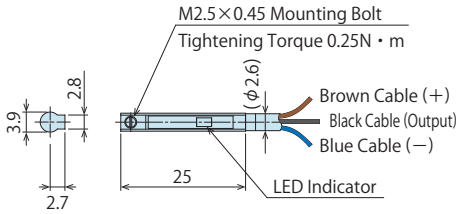
【Applicable Auto Switch】

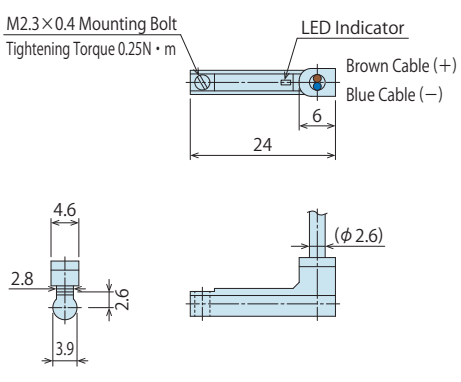
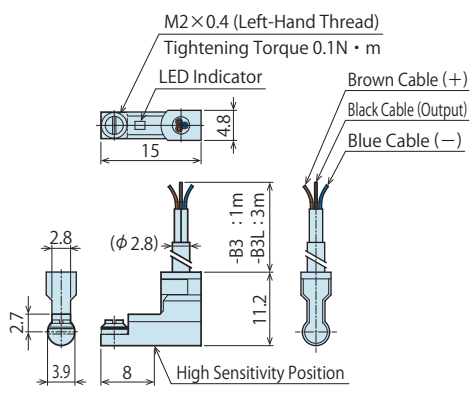
Refer to P.405 - P.414 for detailed specifications.

Please use D-P3DWA (made by SMC) for an environment which generates a magnetic field disturbance.

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

Auto Switch may be stuck out of the clamp depending on the installation position and direction.

Auto Switch Model No.	JEP0000-A2	JEP0000-A2L	JEP0000-B2	JEP0000-B2L
Switch Type	Reed Auto Switch		Solid State Auto Switch	
Wiring Method	2-Wire		3-Wire	
Cable Length	1m	3m	1m	3m
Specifications • Electric Circuit Diagram	Refer to P.406		Refer to P.407	
External Dimensions				

Auto Switch Model No.	JEP0000-A2V	JEP0000-A2VL	JEP0000-B3	JEP0000-B3L
Switch Type	Reed Auto Switch		Solid State Auto Switch	
Wiring Method	2-Wire		3-Wire	
Cable Length	1m	3m	1m	3m
Specifications • Electric Circuit Diagram	Refer to P.406		Refer to P.408	
External Dimensions				

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 Diameter ϕ10, ϕ11, ϕ12, ϕ13

100 : Select from Workpiece Hole Diameter ϕ14, ϕ15, ϕ16, ϕ18, ϕ20

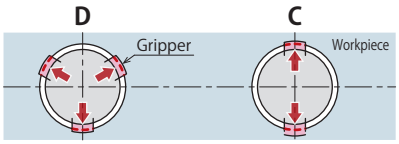
2 Design No.

1 : Revision Number

3 Function

D : Datum (For Datum Locating)

C : Cut (For One Direction Locating)



4 Workpiece Hole Diameter

When selecting 1 Body Size **050**

100 : Workpiece Hole Diameter ϕ10 ±0.2

110 : Workpiece Hole Diameter ϕ11 ±0.2

120 : Workpiece Hole Diameter ϕ12 ±0.2

130 : Workpiece Hole Diameter ϕ13 ±0.2

When selecting 1 Body Size **100**

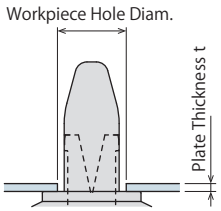
140 : Workpiece Hole Diameter ϕ14 ±0.2

150 : Workpiece Hole Diameter ϕ15 ±0.2

160 : Workpiece Hole Diameter ϕ16 ±0.2

180 : Workpiece Hole Diameter ϕ18 ±0.2

200 : Workpiece Hole Diameter ϕ20 ±0.2

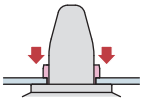


5 Self-Locking Function

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 -□-100-□	SWP0501 -□-110-□	SWP0501 -□-120-□	SWP0501 -□-130-□	SWP1001 -□-140-□	SWP1001 -□-150-□	SWP1001 -□-160-□	SWP1001 -□-180-□	SWP1001 -□-200-□
Workpiece mm	Hole Diameter		10 ±0.2	11 ±0.2	12 ±0.2	13 ±0.2	14 ±0.2	15 ±0.2	16 ±0.2	18 ±0.2	20 ±0.2
	Thickness t	Min.	0.45								
		Max.	5.5	6	6.5	7	8.5	10			
Locating Repeatability ※1 mm			0.05 (When Combining 3 **D** and **C**)								
Cylinder Full Stroke mm			12.1	13.8	14.3	14.8	16.3	17.8			
Lock Stroke mm			5.5	6	6.5	7	8.5	10			
Cylinder Capacity cm³	Lock Side		8.4	9.5	9.9	10.2	17.2	18.8			
	Release Side		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 :

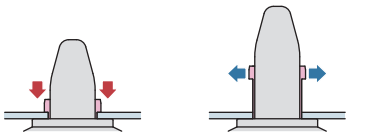
※2. Clamping force shows the pressing force against the seating surface.
The values in the table shows the calculated value when the workpiece thickness t is 0.45mm.

※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.

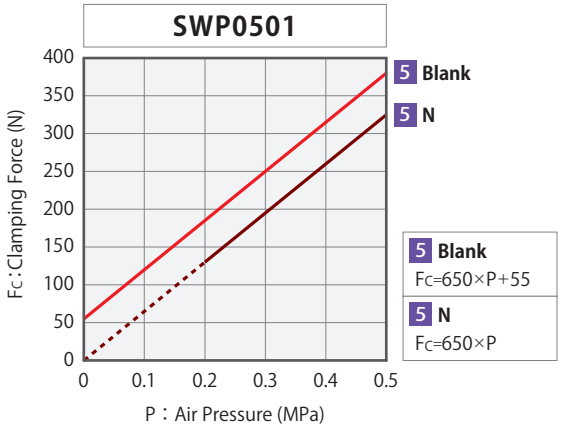
※5. Fc: Clamping Force (N), FE: Expanding Force (N), P: Air Pressure (MPa)

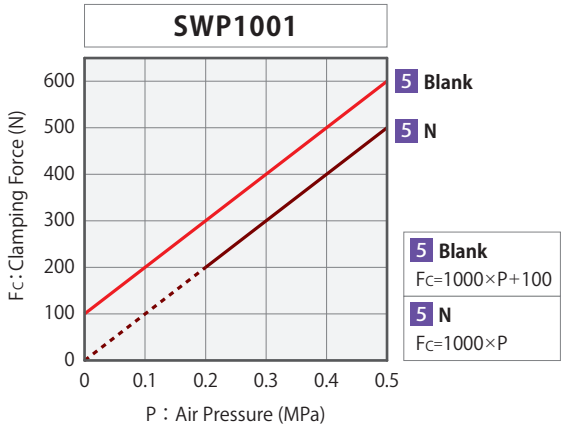
1. Depending on the material, thickness and chamfer shape of a workpiece hole, it can be deformed by clamping action, and the specifications will not be satisfied. Make sure to test clamping beforehand and adjust pressure accordingly.



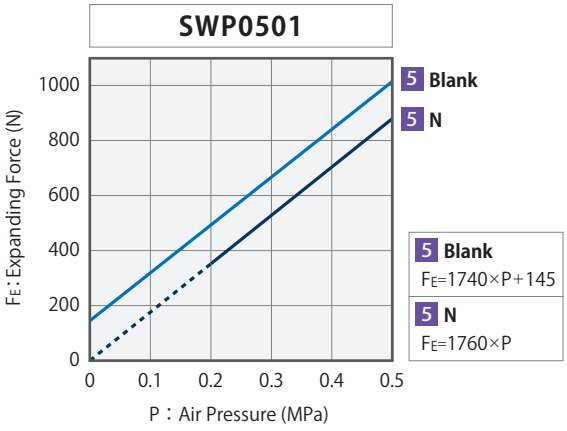
Fc: Clamping Force　FE: Expanding Force

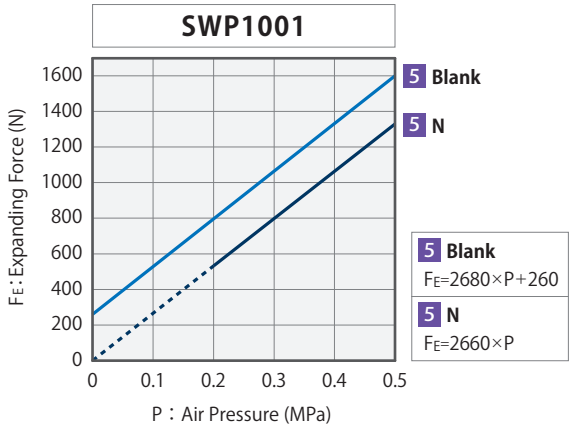
Clamping Force Curve



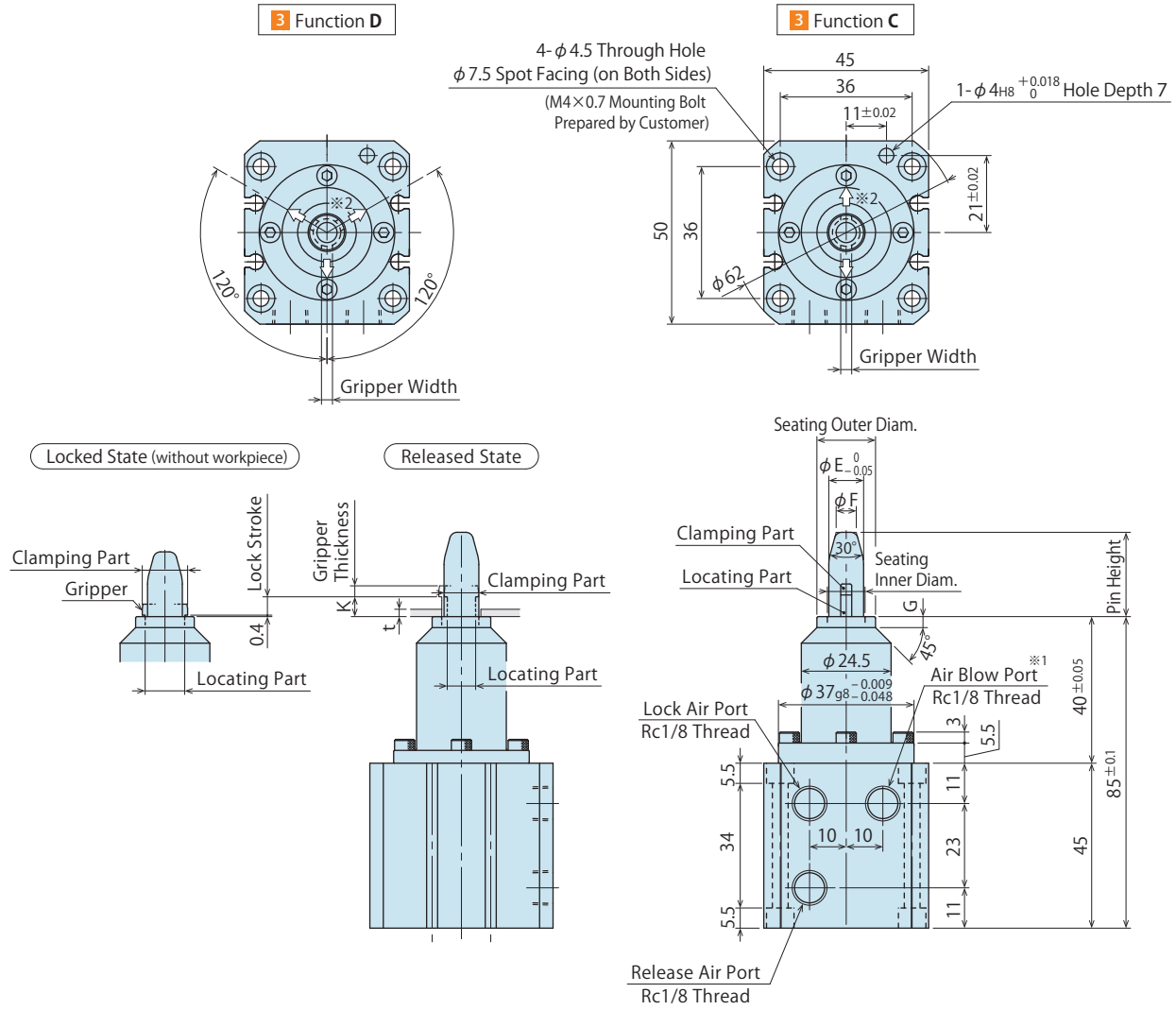


Expanding Force Curve





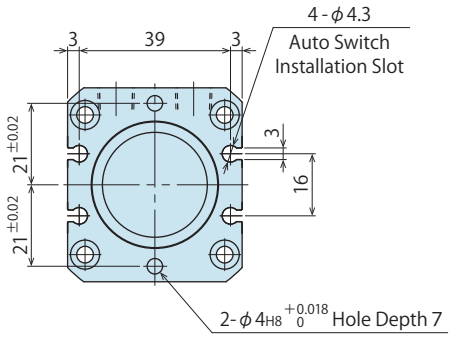
External Dimensions : SWP0501 ※ This drawing shows the released state of SWP0501.

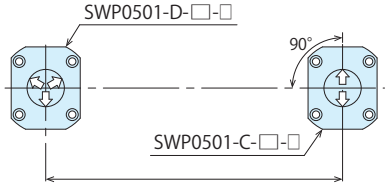


External Dimension List

(mm)

Model No.			SWP0501 -□-100-□	SWP0501 -□-110-□	SWP0501 -□-120-□	SWP0501 -□-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			23	23.5	24	24.5
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 Function D		3	3.5	3.5	3.5
	3 Function C		3.5	3.5	3.5	3.5
Gripper Thickness			3	3	3	3
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
Seating Part G			3	3	3	3
Lock Stroke			5.5	6	6.5	7





Cumulative accuracy of workpiece hole distance and clamp mounting distance must be within ±0.4mm※3.

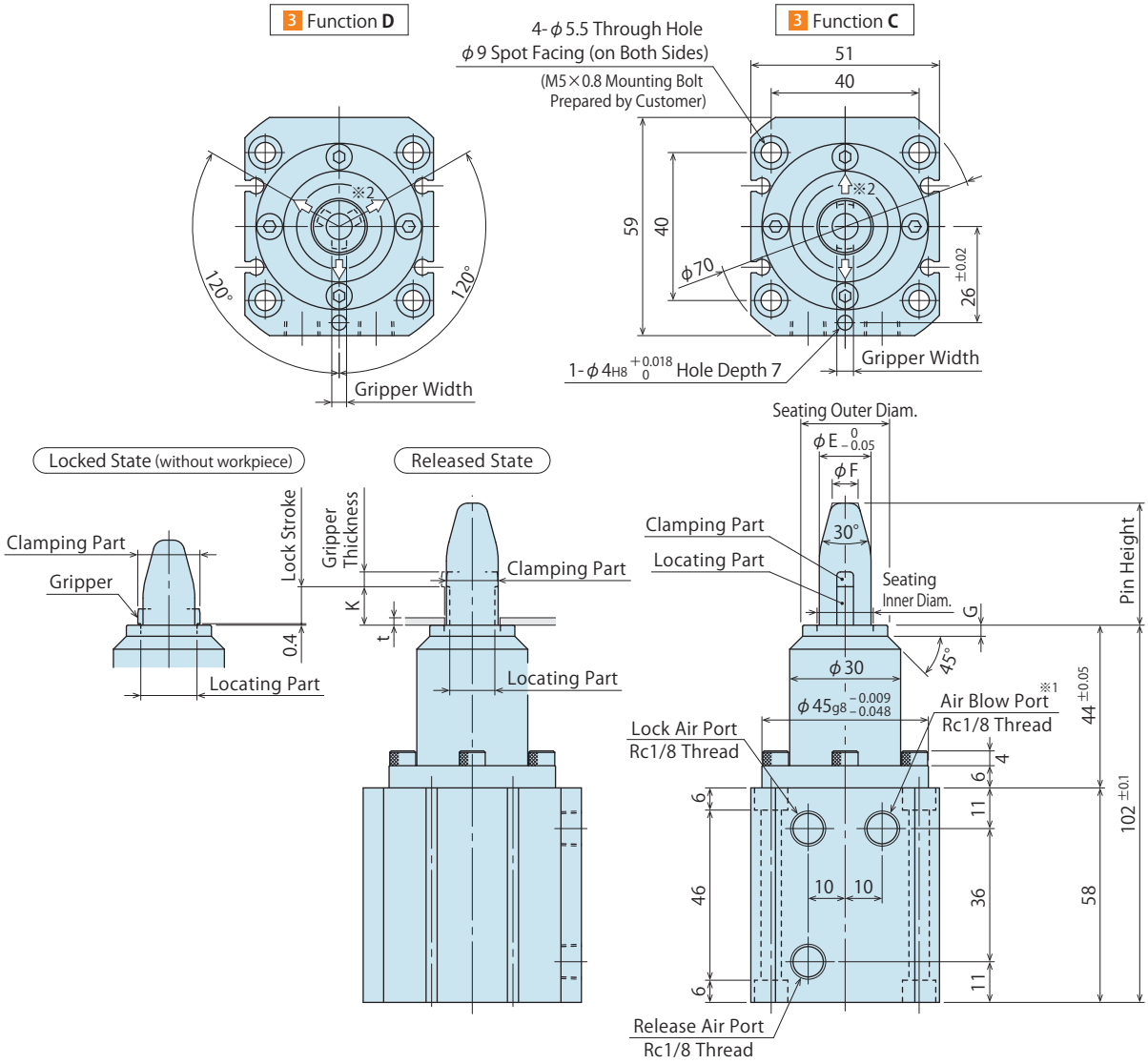
Notes :

※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※3 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.

※3. Cumulative accuracy for SWP0501-□-100-□ (Workpiece Hole Diameter φ10) must be within ±0.15mm.

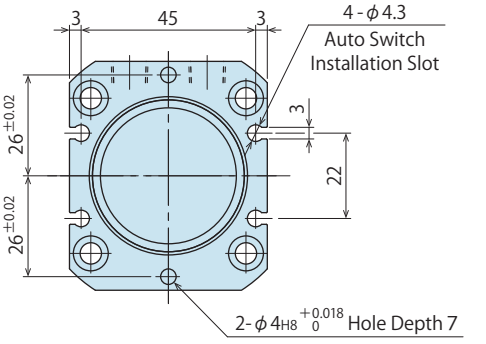
External Dimensions : SWP1001 ※ This drawing shows the released state of SWP1001.

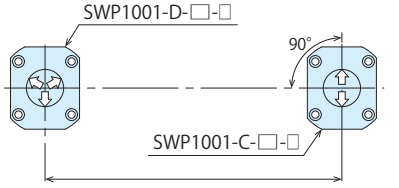


External Dimension List

(mm)

Model No.			SWP1001 -□-140-□	SWP1001 -□-150-□	SWP1001 -□-160-□	SWP1001 -□-180-□	SWP1001 -□-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			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
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 within ±0.4mm.

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※3 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.

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

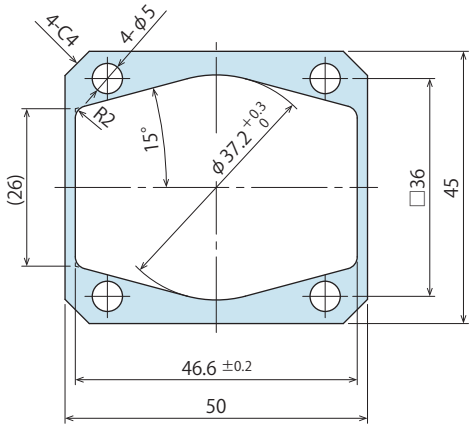
050 : For SWP050
100 : For SWP100

2 Design No.

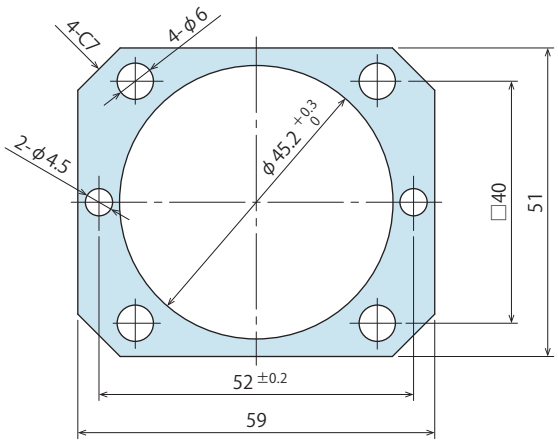
1 : Revision Number

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



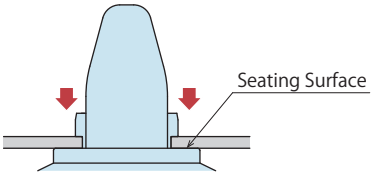
Note :
1. Material : SUS304

Cautions

Notes for Design

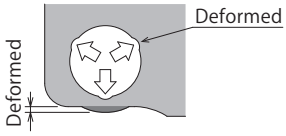
1) Check Specifications
- Please use each product according to the specifications.
- This product is air double acting model which locks and releases with air pressure. In case of Self-Locking Function Option, the clamp will be locked by spring force when release air pressure is released.

2) Reference Surface 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.

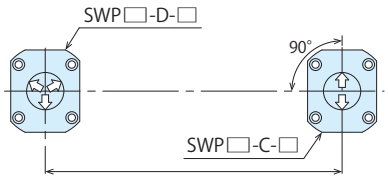
4) Wall Thickness around Workpiece Hole
- Thin wall around the workpiece hole could be deformed by locking action, and clamping force and/or locating repeatability will not fill the specification.
  Please test clamping and adjust pressure accordingly before use.



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.

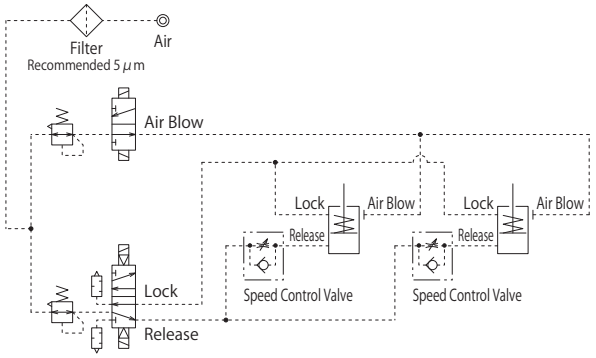
6) Installation of the Clamp
- The arrow ⇨ in the drawing shows expanding direction of grippers. Since the clamping part is not a floating structure, when clamping a workpiece with two of these products, use them within ±0.4mm※ of distance accuracy and with arrangement shown in the drawing below. With out-of specification distance accuracy, workpiece will interfere with the guide part causing damages.
  Contact us when using more than three of these products.



Cumulative accuracy of workpiece hole distance and clamp mounting distance must be within ±0.4mm※.

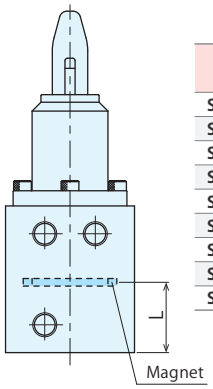
※ Cumulative accuracy for SWP0501-□-100-□ (Workpiece Hole Diameter ϕ10) must be within ±0.15mm.

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 Datum Cylinder (Function D) locks before Cut Cylinder (Function C).



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.

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-□-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.
Recommended Auto Switch：JEP0000 (made by KOSMEK)
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 handled by qualified personnel.
- The hydraulic machine and air compressor should be operated and maintained by qualified personnel.

2) Do not operate or remove the product unless the safety protocols are ensured.
① The machine and equipment can only be inspected or prepared when it is confirmed that the safety devices are in place.
② Before the product is removed, make sure that the above-mentioned safety devices are in place. Shut off the pressure and power source, and make sure no pressure exists in the air 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 a clamp while it is working.
Otherwise, your hands may be injured due to clinching.
- 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.

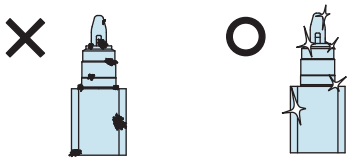
4) When transferring a workpiece, secure the safety of environment in case of a workpiece detachment.

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

Maintenance and Inspection

1) Please refer to P.715 for general maintenance and inspection.

2) Regularly clean the area around the gripper and 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 to 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) 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 following to 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.

4) Please contact us for overhaul and repair.
Built-in spring is very strong and can be dangerous.

※ Please refer to P.715 for common cautions. • Maintenance/Inspection • Warranty

Model No. Indication

JEP 000 0 - A1 L

1 2 3

1 Design No.

0 : Revision Number

2 Switch Type

A1 : 2-Wire Reed Auto Switch
A2 : 2-Wire Reed Auto Switch
A2V : 2-Wire L-Shaped Reed Auto Switch
B1 : 3-Wire Solid State Auto Switch
B2 : 3-Wire Solid State Auto Switch
B3 : 3-Wire L-Shaped Solid State Auto Switch
P : 3-Wire Proximity Switch for Gripping Detection (Length 32mm)
P2 : 3-Wire Proximity Switch for Gripping Detection (Length 16mm)

3 Electric Cable Length ※1

Blank : 1m
L : 3m

Note :
※1. 3 Electric Cable Length is chosen only for A□/B□ Auto Switch of 2 Switch Type.
For P□: Proximity Switch for Gripping Detection, electric cable length is all 2m.

Application Table

Switch Type	2-Wire Reed Auto Switch		3-Wire Solid State Auto Switch		
Model No.	JEP0000-A1□	JEP0000-A2□ JEP0000-A2V□	JEP0000-B1□	JEP0000-B2□	JEP0000-B3□
SWJ2000		●		●	●
SWP050□		●		●	●
SWP100□		●		●	●
WKH2000		●		●	●
WPA0120		●		●	●
WPA0160		●		●	●
WPA0200		●		●	●
WPA0250		●		●	●
WPH0100		●		●	●
WPH0160		●		●	●
WPH0200	●		●		
WPS0160-C		●		●	●
WPS0200-C		●		●	●
WPW0500-C		●		●	●
WPW0600-C		●		●	●

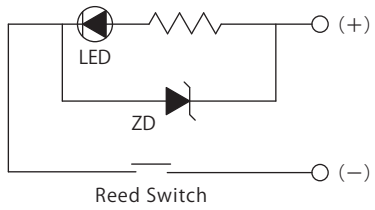
Switch Type	3-Wire Proximity Switch for Gripping Detection	
Model No.	JEP0000-P	JEP0000-P2
WPP0300	●	●
WPP0400	●	●
WPP0500	●	●
WPP0600	●	●
WPP0800	●	●
WPP1000	●	●
WPP1250	●	●
WPQ0200	●	●
WPQ0250	●	●
WPQ0300	●	
WPQ0400	●	
WPQ0500	●	
WPQ0600	●	
WPQ0800	●	
WPQ1000	●	

JEP0000-A□□ (2-Wire Reed Auto Switch)

Specifications

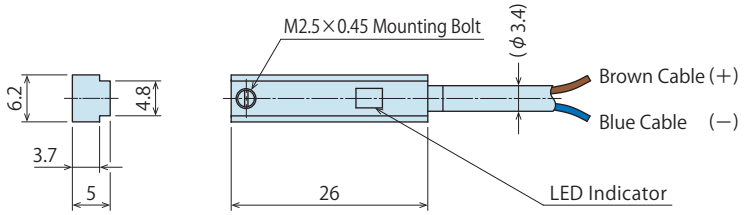
Model No.	JEP0000-A1	JEP0000-A1L	JEP0000-A2	JEP0000-A2L	JEP0000-A2V	JEP0000-A2VL
Name	Reed Auto Switch					
Wiring Type	2-Wire					
Applicable Load	Relay, Programmable Logic Controller (PLC)					
Load Voltage / Load Current	Less than DC24V / 40mA Less than AC100V / 20mA					
Internal Voltage Drop	Less than 3V					
Operating Time	1ms					
Ambient Temperature	-10 ~ 70℃					
Withstand Voltage	AC1500V (There should be no abnormalities in 1 min. application.)					
Leakage Current	0					
Shock Resistance	30G					
Protection Circuit	None					
Protection Grade	IP67 (IEC Standard)					
Indicator Light	Red LED illuminates when turned ON					
Electric Cable Length	1m	3m	1m	3m	1m	3m

Electric Circuit Diagram

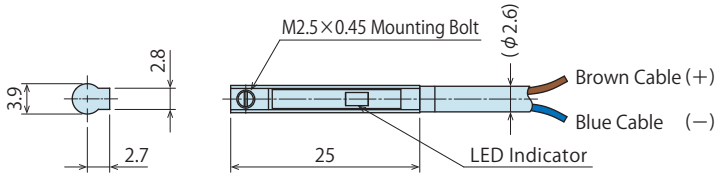


Note :
1. Auto switch will instantly break due to over loading current if turning on the auto switches without connecting the load. (Refer to Notes on Wiring 4) and 5) on P.413.)

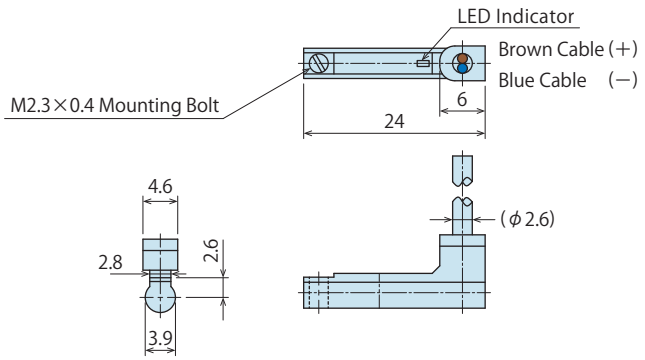
External Dimensions : JEP0000-A1□



External Dimensions : JEP0000-A2□



External Dimensions : JEP0000-A2V□

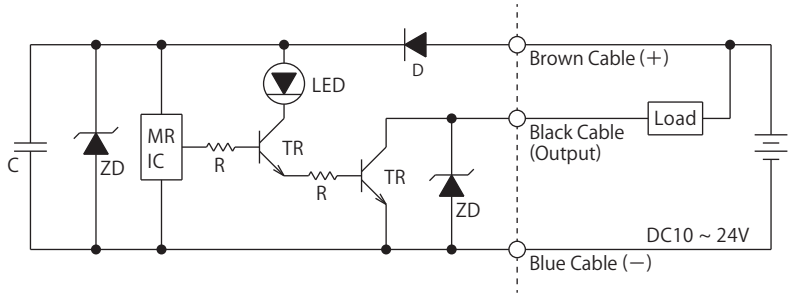


JEP0000-B□□ (3-Wire Solid State Auto Switch)

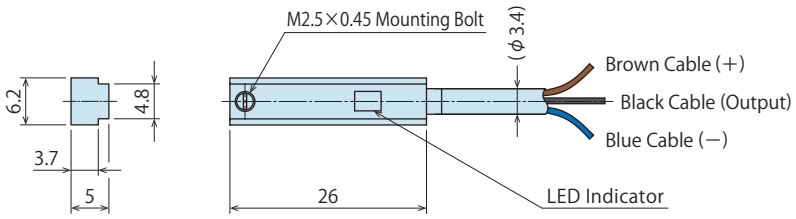
Specifications

Model No.	JEP0000-B1	JEP0000-B1L	JEP0000-B2	JEP0000-B2L
Name	Solid State Auto Switch			
Wiring Type	3-Wire			
Applicable Load	Relay, Programmable Logic Controller (PLC)			
Output Type	NPN			
Load Voltage / Load Current	Less than DC10 ~ 24V / 100mA			
Internal Voltage Drop	Less than 0.7V			
Operating Time	1ms			
Ambient Temperature	−10 ~ 70℃			
Withstand Voltage	AC2000V (There should be no abnormalities in 1 min. application.)			
Leakage Current	0			
Shock Resistance	30G			
Protection Grade	IP67 (IEC Standard)			
Indicator Light	Red LED illuminates when turned ON			
Electric Cable Length	1m	3m	1m	3m

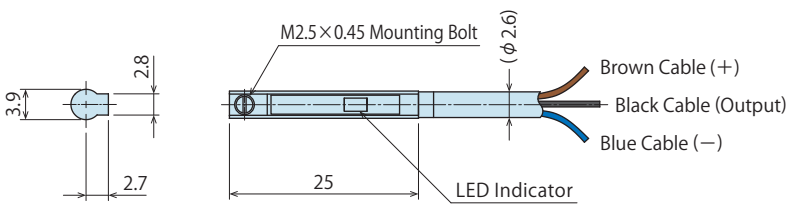
Electric Circuit Diagram



External Dimensions：JEP0000-B1□



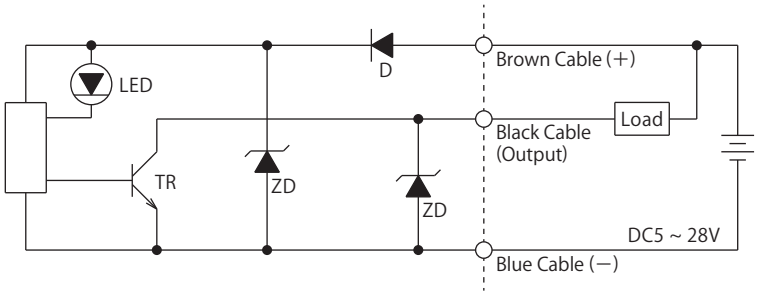
External Dimensions：JEP0000-B2□



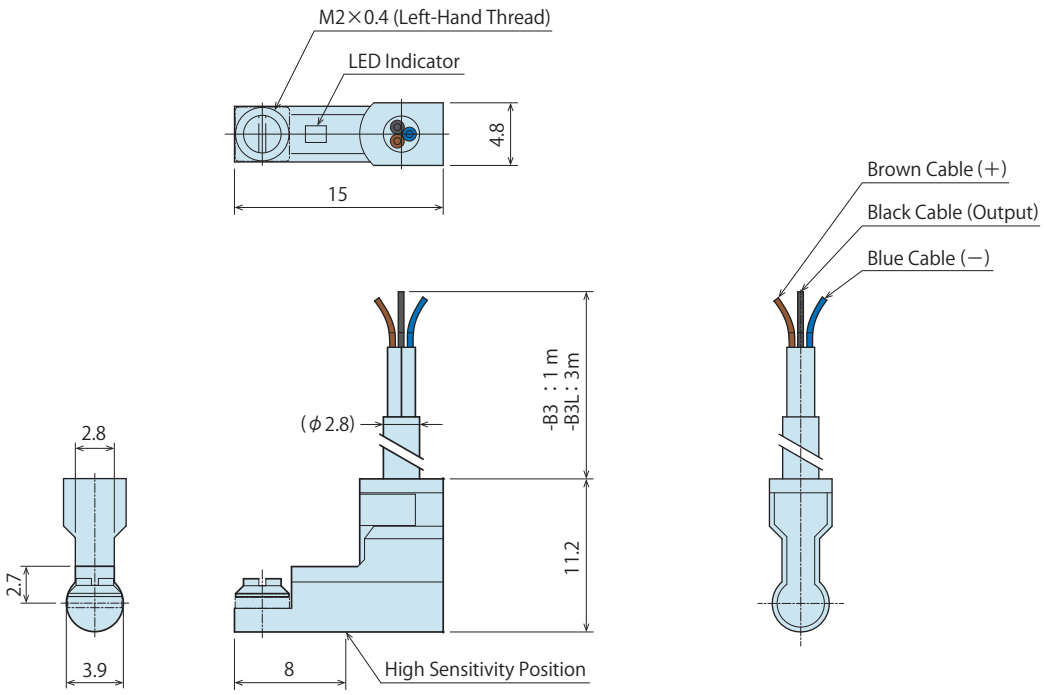
Specifications

Model No.	JEP0000-B3	JEP0000-B3L
Name	Solid State Auto Switch	
Wiring Type	3-Wire	
Applicable Load	Relay, Programmable Logic Controller (PLC)	
Output Type	NPN	
Load Voltage / Load Current	Less than DC5 ~ 28V / 0.1 ~ 40mA	
Internal Voltage Drop	Max. 0.5V	
Leakage Current	Max. 50 μA (DC24V)	
Current Consumption	Max. 10 mA	
Response Time	Max. 1ms	
Ambient Temperature	0 ~ 60℃	
Withstand Voltage	AC1500V (There should be no abnormalities in 1 min. application.)	
Insulation Resistance	More than 100MΩ / DC500V (Between the Case and Signal Cable)	
Shock Resistance	30G	
Protection Grade	IP67(IEC Standard)	
Indicator Light	Red LED illuminates when turned ON	
Electric Cable Length	1m	3m

Electric Circuit Diagram



External Dimensions : JEP0000-B3□

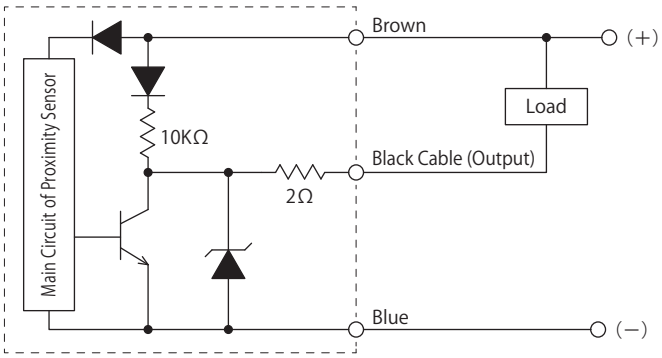


JEP0000-P□ (3-Wire Proximity Switch for Gripping Detection)

Specifications

Model No.	JEP0000-P	JEP0000-P2
Name	Proximity Switch for Gripping Detection	
Wiring Type	3-Wire	
Output Type	NPN	
Moving Distance	1.5±0.15mm	
Voltage Range	DC10 ~ 30V	
Opening / Closing Voltage	Less than 200mA	
Current Consumption	Less than 10mA	
Response Frequency	800Hz	
Ambient Temperature	−25 ~ 70℃	
Withstand Voltage	AC2000V (There should be no abnormalities in 1 min. application.)	
Protection Grade	IP67 (IEC Standard)	
Indicator Light	Red LED illuminates when turned ON	
Electric Cable Length	2m	

Electric Circuit Diagram



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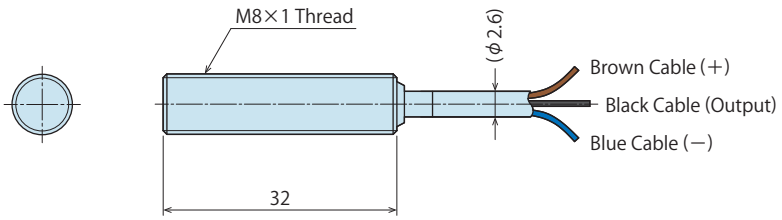

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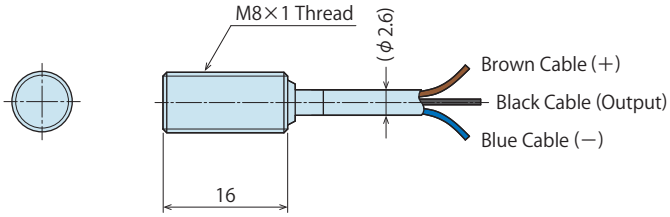


MEMO

Cautions

Notes for Design

1) Check the Specifications
- Please use each product according to the specifications. The product may be damaged or malfunction if used outside the range of load or specifications.

2) Notes on Use in the Interlock Circuit
- When the auto switch is used for an interlock signal that requires high reliability, please use a double interlock system by providing a mechanical protection function. Or by using another switch (sensor) together with the auto switch. Also, please perform periodic maintenance and confirm proper operation.

3) Wiring should be prepared as short as possible.
- For the reed auto switch, if the wiring length to the load is longer, inrush current to the auto switch increases and the life span will be shortened. (Remains ON)
- If the wiring length of the solid state auto switch is long, we recommend installing the ferrite core on both ends of the electric cable for noise control.

4) Please avoid using loads that generate surge voltage.
- If driving loads that generate surge voltage such as relay, please use the auto switch equipped with junction protective circuit or install protective box.
- If surge voltage is repeatedly applied to the auto switch even with the Zener Diode for surge protection, it may damage the contact. When directly driving loads generating surge voltage, such as solenoid valves, use the auto switch equipped with surge absorption element.
- The magnet switch is equipped with surge absorption element. However, please provide an absorption element, such as varistor, if there is large surge-generating equipment.
  Example: Motors or welding machines.

5) Leakage Current
- In case of 2-wire solid state auto switch, the leakage current that activates internal circuit of the auto switch may flow even in OFF state. If the load operating current (the controller is in OFF state) does not satisfy the specified leakage current, it may result in restoration defect (remains ON state).
  If it does not satisfy the specifications, please use 3-wire auto switch. Also, n parallel connections will multiply leakage current flowing to the load by n times.

6) Internal Voltage Drop of the Auto Switch
- Due to voltage drop (refer to internal voltage drop on the specifications) caused by internal resistance of LED, voltage drop of n auto switches connected in series will be multiplied by n times.
  As a result, in some cases the load will not activate even if the auto switch drives properly.

7) When wiring is disconnected, or when forcibly activating the auto switch for action confirmation, carefully design the circuit to avoid reverse current.
- The auto switch may malfunction or be damaged when reverse current occurs.

8) When multiple cylinders or robotic hands are placed close together.
- Please provide enough space when using multiple actuators such as cylinders or robotic hands equipped with auto switches. (If allowable distance of each actuator is specified please follow specified instructions.) If they are too close, auto switches may malfunction due to magnetic interference.

9) Secure space for maintenance and inspection
- Please secure space for maintenance and inspection of auto switches when setting actuators such as cylinders and robotic hands equipped with auto switches.

Notes on Operating Environment

1) Never use the product in an atmosphere with explosive gases.
- Auto switches are not designed to prevent explosion. Do not use the product in an atmosphere with explosive gases since it may cause serious explosions.

2) Do not use the product in an area where a magnetic field is generated.
- Auto switches may malfunction, or internal magnet actuators, such as cylinders or robotic hands, equipped with auto switches will be demagnetized.

3) Do not use the product in an environment where the auto switches are continuously exposed to water or coolant.
- Although IEC standard IP67 structure is satisfied, please avoid using auto switches in an environment where continuously exposed to water or coolant. This may cause insulation failure or malfunction.

4) Do not use the product in an environment with oil or chemicals.
- If auto switches are used in an environment with coolant or cleaning solvent, even in a short time, they may be adversely affected by improper insulation, malfunction due to swelling of potting resin and/or hardening of electric cable.

5) Do not use the product in an environment subject to large temperature cycle.
- Heat cycles other than ordinary changes in temperature may adversely affect the internal structure of auto switches.

6) Avoid accumulation of steel dust and close connection of magnetic materials.
- An amount of steel chips or steel dusts, such as sputters of welding accumulate around an actuator. Cylinders, robotic hand equipped with auto switches and or magnetic materials (those attracted by magnet) are gathered closely to the actuator. These can weaken internal magnet actuators.

7) Do not use the product in an environment with excessive impact.
- Under the condition of the excessive impact of more than 30G, the contact of the reed auto switch will malfunction and the indicator light may signal or may be disconnected.

Installation Notes

1) Do not drop or bump.
- Do not drop, bump or apply excessive impact on auto switches. The auto switches may be damaged and cause malfunction.

2) Tighten auto switches with appropriate tightening torque.
- Please follow the tightening torque below.
Excessive tightening torque may damage the mounting screw, fitting or main body of the auto switch.
Also, mounting position may be shifted due to insufficient tightening torque.

Mounting Screw Size	Tightening Torque (N·m)
M2×0.4	0.1
M2.5×0.45	0.25
M3×0.5	0.5

3) Do not carry cylinders or robotic hands by holding the electric cable of the auto switch.
- It may break the electric cable or damage the internal element.

4) Do not fix auto switches with the mounting screws other than attached in main body of the auto switches.
- Using non-designated screws may damage auto switches.

5) Install the auto switches at the center of the operating area.
- Installation position of auto switches should be adjusted so that a detected object (piston etc.) stops at the center of operating range. (Installation position shown in the catalog shows the most suitable fixed position of stroke end.) Please refer to P.345 for WPS, P.355 for WPA, P.363 for WPH, P.375 for WPP and P.391 for WPQ. If the auto switches are installed at the edge of operating range (near the boundary of ON and OFF), output movement may be unstable.

6) Installation position of the auto switches should be adjusted by checking actual operating state.
- Depending on the installation environment, actuators such as cylinders and robotic hands may not operate properly even if they are installed to the appropriate position.
Make sure to check the operating condition even when mounting them at the middle of the stroke.

Cautions

Notes on Wiring

1) Check the insulation of wiring.
● Insulation failure (interference with other circuit, ground fault, and insulation failure between terminals) may send excessive voltage or current to the auto switches causing damage.

2) Do not place wires and auto switch cables close to other cables and high voltage cables.
● Otherwise, surge voltages will be induced creating noise and leading to malfunctions.

3) Repeated bending stress or stretching force should be avoided on electric cables.
● Wiring with bending stress or stretching force repeatedly applied on electric cables will prematurely breakdown.
Bending stress or stretching force applied on the connecting area of electric cables and main body of the auto switches will damage the electric cables.
Auto switches or wires should not be moving especially near the connecting areas.

4) Make sure to check the load state (connection and current value) before turning on the power.
● For 2-Wire Type
Auto switches will instantly break due to over loading current if turning on the auto switches without connecting the load (Shorted Load Circuit). The above statement is also applied to the condition when the brown cable (+, output) of 2-wire type is directly connected to the (+) power terminal of a fixture and etc.

5) Avoid shorted load circuit.
● Reed Auto Switch
Auto switches will instantly break due to over loading current if turning on the auto switch in load short circuit condition.
● Solid State Auto Switch
Be aware of auto switch breakages when products with PNP output is not equipped with short-circuit protection.

6) Avoid wrong wiring
● Reed Auto Switch
The electric circuit has polarities. The brown cable is "+" , and the blue cable is "−" . The reed switch can operate even with reversed connection, but LED light will not illuminate.
Also, flowing excessive current will damage LED and it will not operate properly.
● Solid State Auto Switch
In case of 2-wire type, even if connected reversely, the auto switch will not be damaged due to protection circuit, but it is always ON.
If reversely connected under short circuit condition, the auto switch will be damaged.
In case of 3-wire type, even if the connections are reversed (power supply line "+" and "−"), the auto switch will be protected by a protection circuit.
However, if connecting the power supply "+" to the blue cable and "−" to the black cable, the auto switch will be damaged.

Notes on Handling

1) It should be operated by qualified personnel.
● Machines and devices with hydraulic and pneumatic equipment should be operated and maintained by qualified personnel.

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

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

Maintenance・Inspection

Conduct the below maintenances and inspections periodically in order to avoid unintended malfunctions and to ensure the safety.

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 trouble/issue in the bolts and respective parts before restarting.

2) Never touch terminals while the power is on.
- It will cause electric shock, malfunction and damage to the auto switches.

3) Retightening of Mounting Screws
- Retighten the screws after adjusting the mounting position when the mounting position of the auto switches is shifted due to the looseness of the mounting screws.

4) Check if the electric cable is damaged or not.
- Damaged cables may cause insulation failure. Exchange the auto switch or repair the reed if there is damage on the electric cable.

5) Check the setting position of the detector.
- Confirm the set position is stopped at the center of the detecting range (the area that red LED illuminates).

6) Cleaning Auto Switches
- The auto switch should be clean. Do not use benzene, paint thinner or alcohol for cleaning. Doing so will cause scratches on the product and indications may be erased. If it is hard to remove stains from the product, wipe it out with a cloth soaked in a neutral detergent diluted with water. Wipe with a dry cloth to remove wet residue.

7) Product Storage
- Keep the product out of direct sunlight in a cool area where it is protected from water and humidity.

8) Please contact us for auto switch replacements.

※ Please refer to P.716 for common cautions. ・Warranty

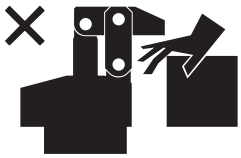
Cautions

Notes on Handling

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

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

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

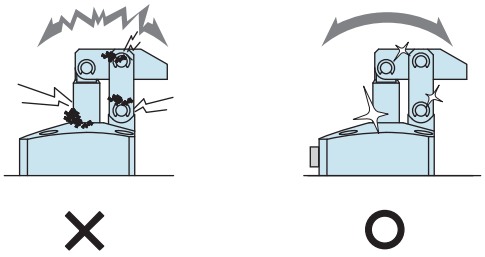


4) Do not disassemble or modify.
- If the equipment is taken apart or modified, the warranty will be voided even within the warranty period.

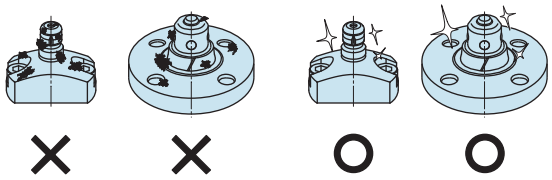
Maintenance and Inspection

1) Removal of the Machine and Shut-off of Pressure Source
- Before removing the product, make sure that the safety 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 trouble/issue in the bolts and respective parts before restarting.

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



3) Regularly clean the reference surfaces (taper reference surface and seating surface) of locating products (SWT/SWQ/SWP/VRA/VRC/VX/VXE/VXF/WVS/VWH/VWM/VWK).
- Locating products (except VRA/VRC/VX/VXE/VXF and SWR without air blow port) can remove contaminants with the cleaning function. When installing a workpiece or a pallet, make sure there are no contaminants such as thick sludge.
- Continuous use with dirt on components will lead to locating failure, fluid leakage and malfunction.



4) Regularly tighten pipe, mounting bolt, nut, snap ring, cylinder and others to ensure proper use.

5) Make sure the hydraulic fluid has not deteriorated.

6) 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.

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

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

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

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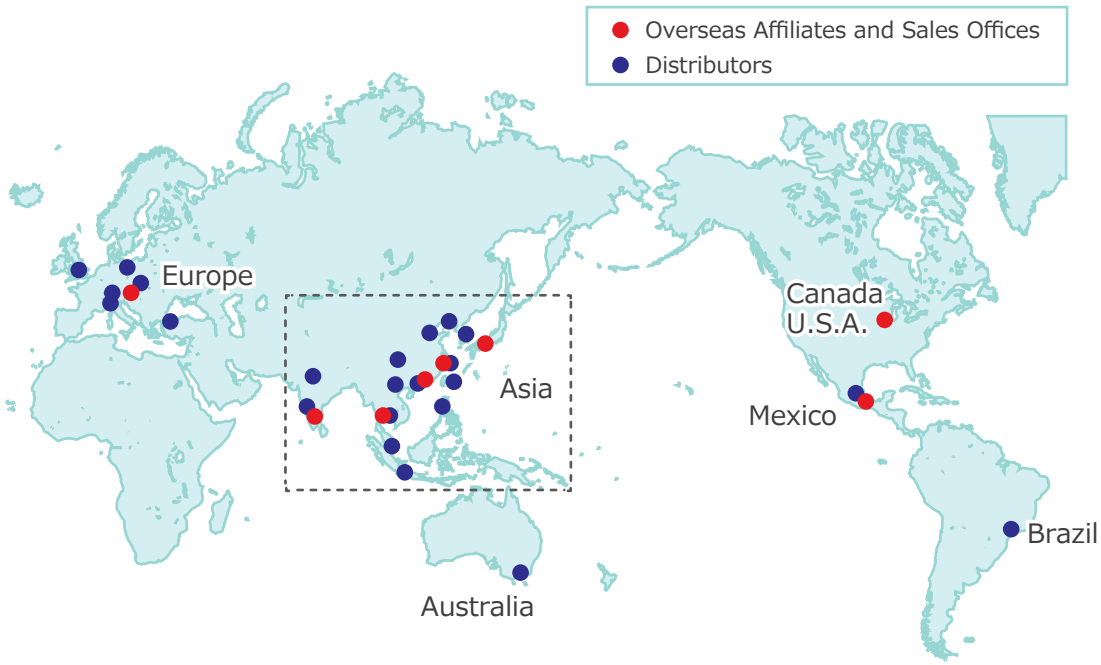
Global Network



Asia Detailed Map

KOSMEK
Harmony in Innovation

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