New

Pneumatic Expansion Locating Pin

High-Accuracy Locating (Locating Repeatability : 0.05mm)

Smooth Workpiece Removal even after Welding Distortion

Model SWG

KOSMEK
Harmony in Innovation

Pneumatic
Expansion Locating Pin

Model SWG

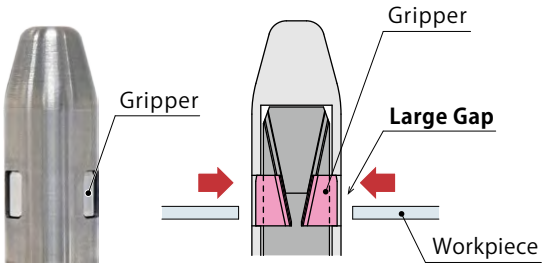
High-Accuracy Locating
(Locating Repeatability：0.05mm)

Smooth Workpiece Removal even after Welding Distortion

Action Description

Release

Release Air ON | Lock Air OFF

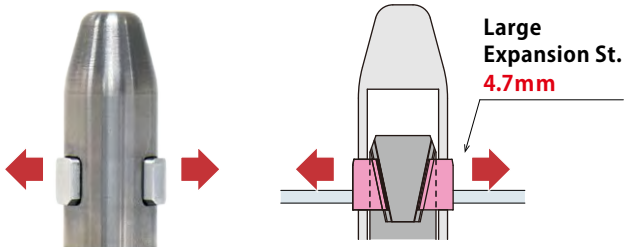


Workpiece Loading / Unloading

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

Lock

Release Air OFF | Lock Air ON



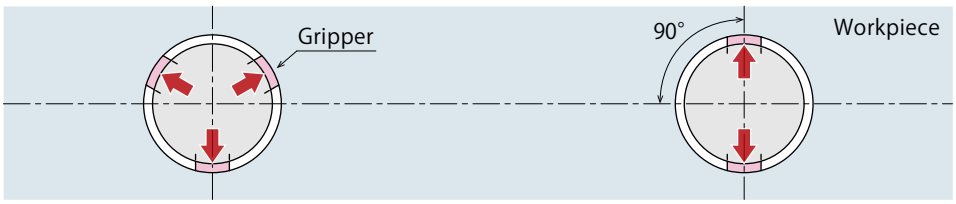
Locating

Gripper (locating part) expands to locate the workpiece.

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.

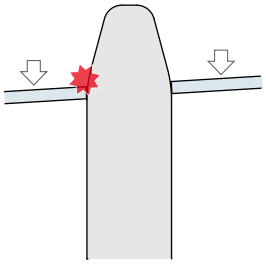
For One Direction Locating
(Equivalent to Diamond Pin)

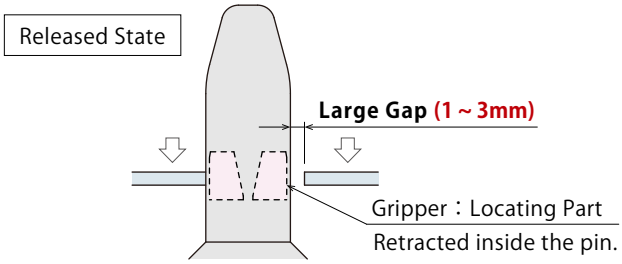
Workpiece hole and gripper make contact, perpendicular to the reference hole, at two points for one-direction locating.

Features

Work Efficiency

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





General Locating Pin

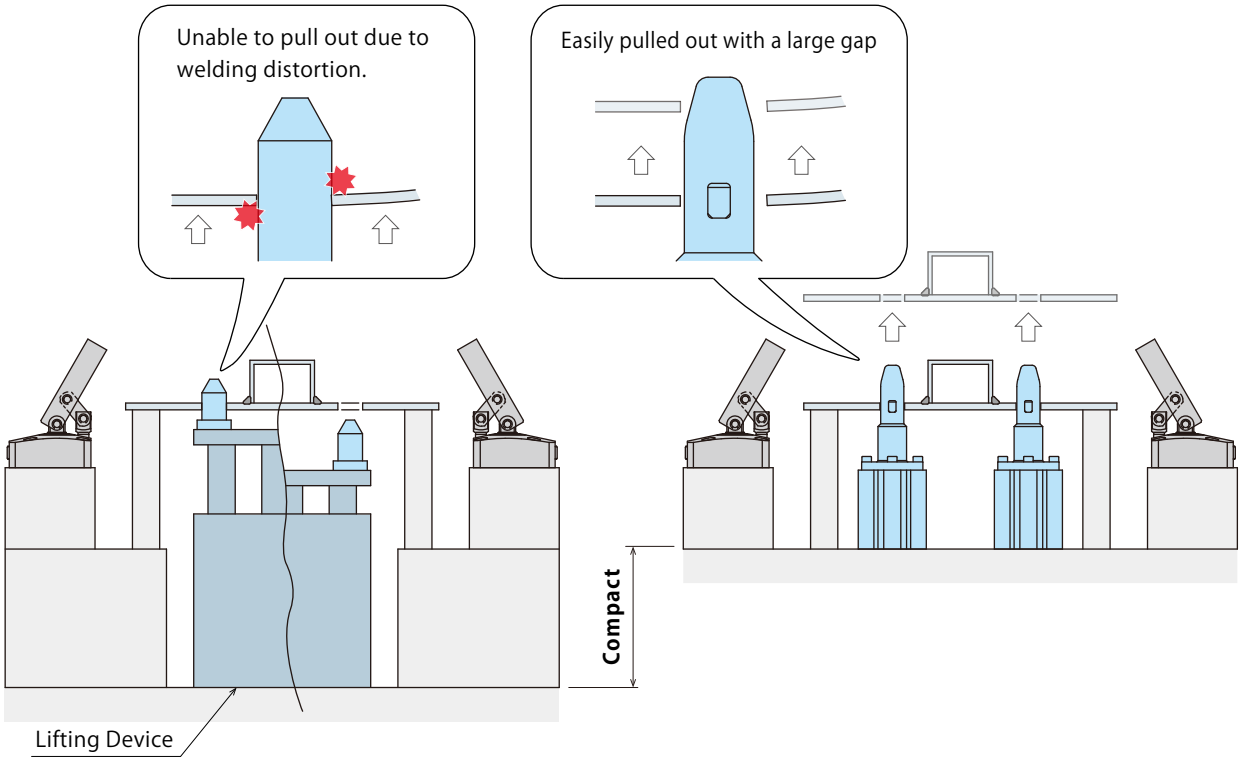
When making a gap smaller in order to improve locating accuracy, it becomes difficult to load/unload workpieces, causing frequent momentary stops of automated system.

Pneumatic Expansion Locating Pin

Workpieces are smoothly loaded/unloaded since the grippers are retracted inside the pin at released state.

Solution to Welding Distortion

Smooth workpiece removal even after welding distortion. Reduce cost by not needing a lift system.



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.

Pneumatic Expansion Locating Pin

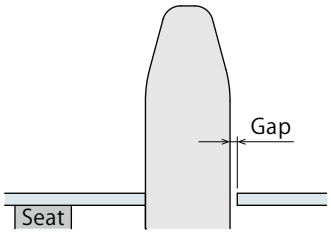
Enables simple and low-cost equipment by smooth loading/unloading due to a large gap between Pneumatic Expansion Locating Pin and a workpiece hole.

High-Accuracy Locating

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

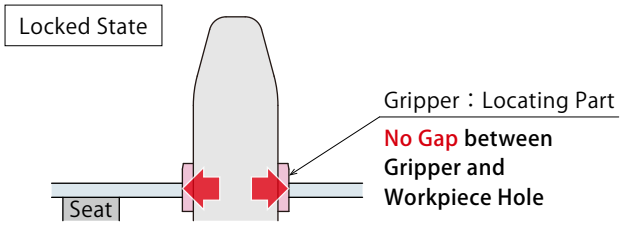
Locating Repeatability：0.05mm

※ When 'Function D' and 'Function C ' are combined.



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.

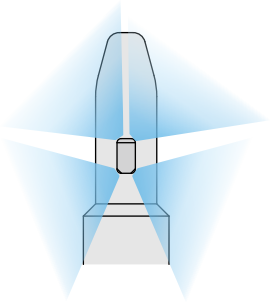


Pneumatic Expansion Locating Pin

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

Anti-Contamination

Air blow keeps contaminants out.

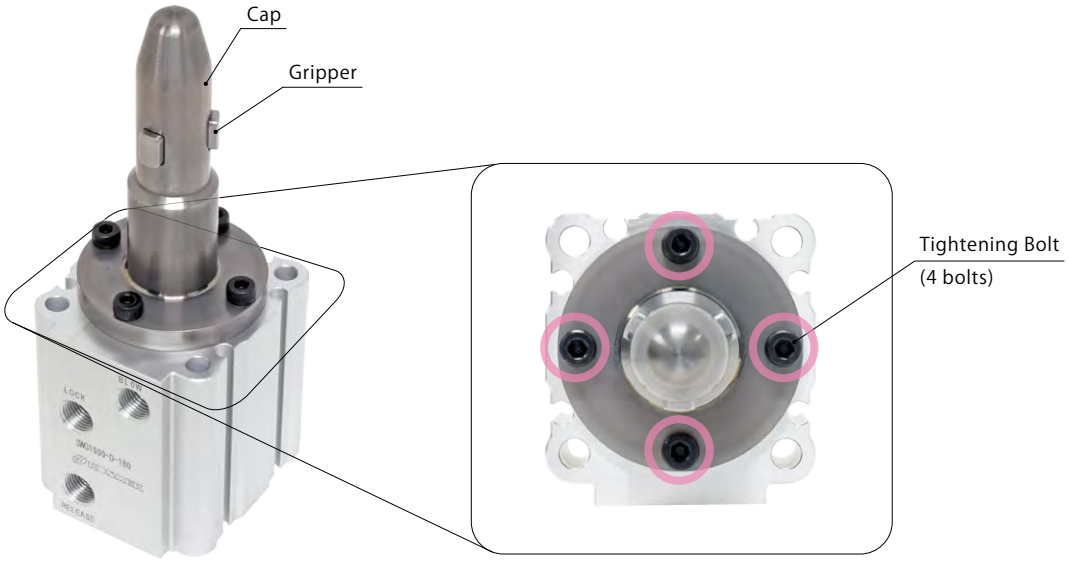


Air Blow Function

Maintenance

Removable Pin Allows for Simple Maintenance

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



※ The picture shows SWG 'without seating surface' .

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

SWG 100 0 - CX - 160 - B - N
1 2 3 4 5 6 7

1 Body Size

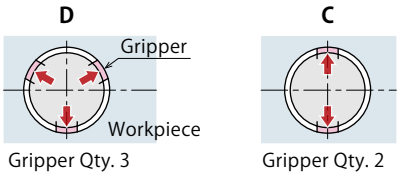
100 : Select from Workpiece Hole Diam. ϕ16, 18

2 Design No.

0 : Revision Number

3 Function

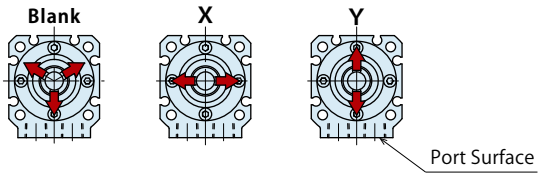
D : Datum (For Datum Locating)
C : Cut (For One Direction Locating)



Gripper Qty. 3 Gripper Qty. 2

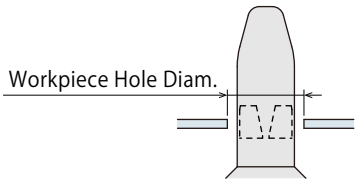
4 Gripper Expanding Direction

Blank : 3 In case of **D**
X : Parallel to the port surface.
Y : Perpendicular to the port surface.
3 In case of **C**



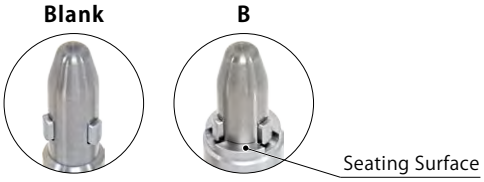
5 Workpiece Hole Diameter

160 : Workpiece Hole Diameter ϕ15.8 ~ ϕ18.2
180 : Workpiece Hole Diameter ϕ17.8 ~ ϕ20.2



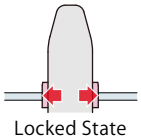
6 Seating Surface

Blank : Without Seating Surface
B : With Seating Surface



7 Self-Locking Function

Blank : With Self-Locking Function (Standard)
N : Without Self-Locking Function


Locked State

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

Specifications

Model No.		SWG1000 -□-160-□-□	SWG1000 -□-180-□-□
Workpiece mm	Hole Diameter d	15.8 ~ 18.2	17.8 ~ 20.2
	Min. Thickness t	0.45	
Locating Repeatability※1 mm		0.05 (when combining 3 **D** and **C**)	
Cylinder Capacity cm³	Lock Side	12.1	
	Release Side	14.5	
7 Self-Locking Function **Blank**	Max. Operating Pressure MPa	0.5	
	Min. Releasing Pressure MPa	0.2	
7 Self-Locking Function **N**	Operating Pressure Range 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	6 Seating Surface **Blank**	500	
	6 Seating Surface **B**	600	

Notes :

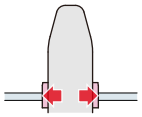
※1. Locating Repeatability under the same condition (no load).

1. In case of 7 **Blank**：lock with air pressure + built-in spring and release with air pressure. (Gripper expanded at 0MPa.)
   In case of 7 **N**：lock and release with air pressure.
2. This product is a positioning cylinder and has no clamping function.
3. When using with other clamps, make sure this product operates first by sequence control of a circuit.

Expanding Force

(N)

Model No.		SWG1000	
		7 **Blank**:With Self-Locking	7 **N**:Without Self-Locking
Expanding Force※2	Air Pressure 0.5 MPa	1690	1330
	Air Pressure 0.2 MPa	880	530
	Air Pressure 0 MPa	340	–
	Calculated Value※3	F_E=2700×P−35×d+970	F_E=2655×P



F_E：Expanding Force

Notes :

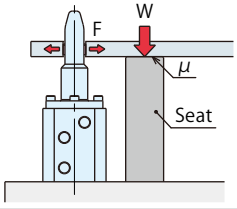
※2. Expanding force shows the gripping force generated inside workpiece hole.
Values in the table show the calculated value when the friction coefficient μ is 0.15 and the workpiece hole diameter d (mm) is at maximum.

※3. F_E：Expanding Force (N), P：Air Pressure (MPa), d：Workpiece Hole Diameter (mm)

1. Thin wall around the workpiece hole can be deformed by locking action, and the specifications will not be satisfied.
   Please make sure to test the functions beforehand and adjust to the appropriate supply of pressure.

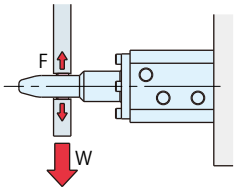
Relative Equation of Expanding Force and Allowable Workpiece Weight for Locating

Horizontal Attitude



$$\text{Workpiece Weight (W) [kg]} \leqq \frac{\text{Expanding Force per Expansion Locating Pin (F) [N]} \times \text{Efficiency } 0.25}{\text{Friction Coefficient of Workpiece Seat Face } (\mu) \times 9.8}$$

Vertical Attitude※4



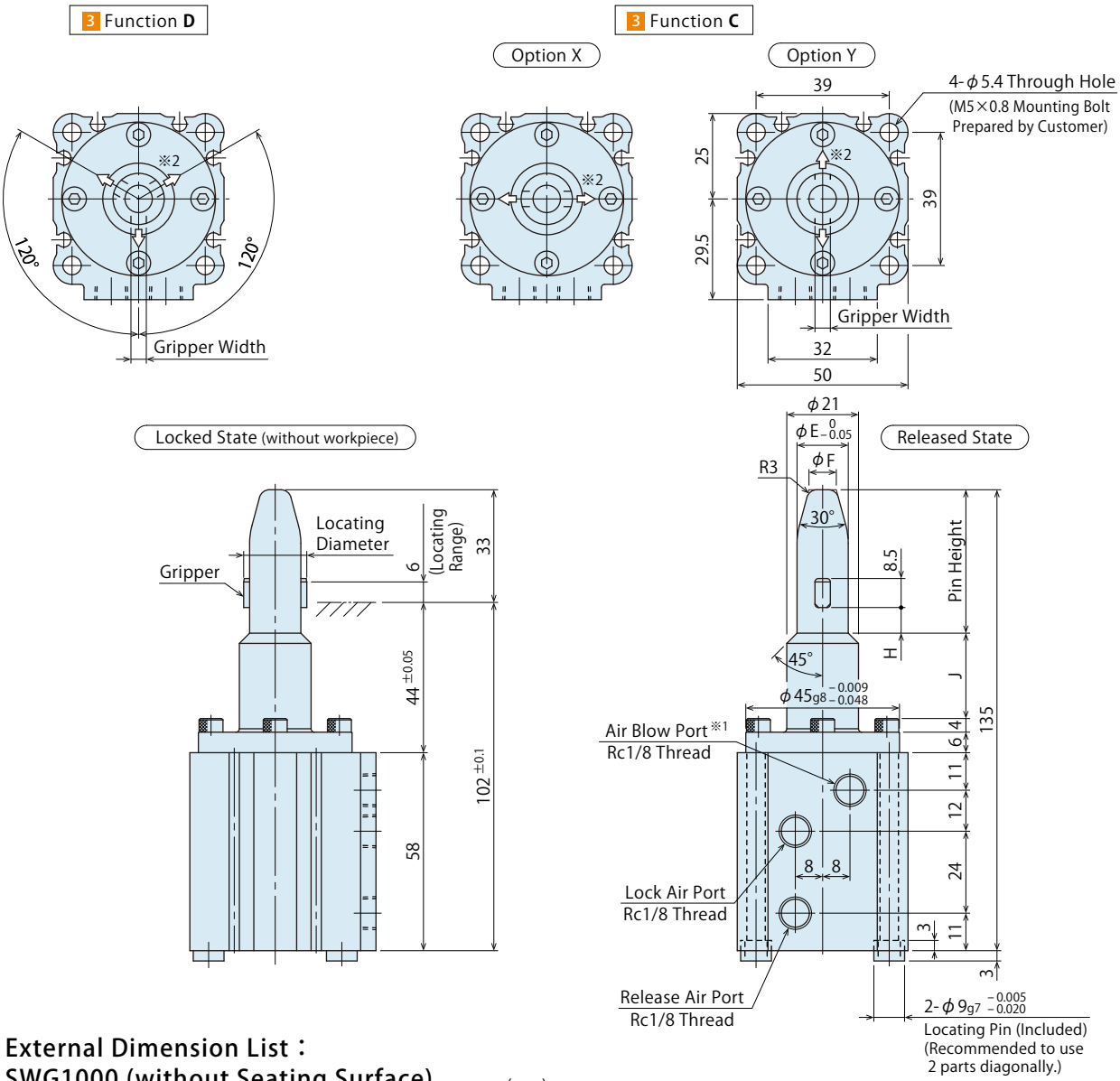
$$\text{Workpiece Weight (W) [kg]} \leqq \frac{\text{Expanding Force per Expansion Locating Pin (F) [N]} \times \text{Efficiency } 0.25}{9.8}$$

Note :

※4. When a workpiece is set, please make sure there is no lifting or slope of the workpiece.
If the expanding operation is done with lifting or slope of the workpiece, it will lead to possible damage of the product and deformation of the workpiece hole.

External Dimensions : SWG1000 (without Seating Surface)

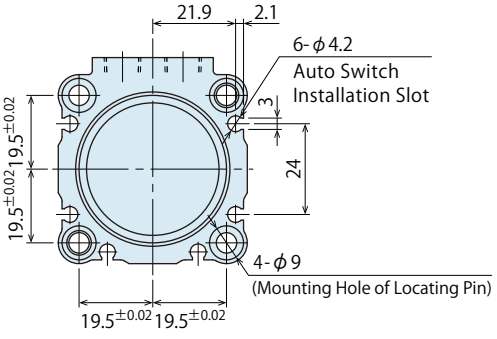
※ This drawing shows the released state of SWG1000 (without Seating Surface).



External Dimension List : SWG1000 (without Seating Surface)

(mm)

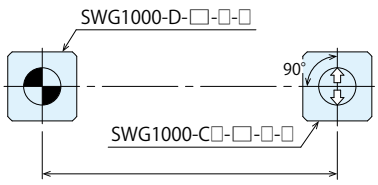
Model No.		SWG1000 -□-160-□	SWG1000 -□-180-□
Workpiece	Hole Diam.	15.8 ~ 18.2	17.8 ~ 20.2
	Min. Thickness	0.45	
Pin Height		42	43
Pin Outer Diam. E		15	17
Pin End Diam. F		8	10
Locating Diameter	At Released	13.7	15.7
	At Locked (without workpiece)	18.4	20.4
Gripper Width		4.5	5.5
H		7.5	8.5
J		25	24



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 gripper is not a floating structure, when locking a workpiece with two of these products, set the distance accuracy ±0.4mm or better 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.

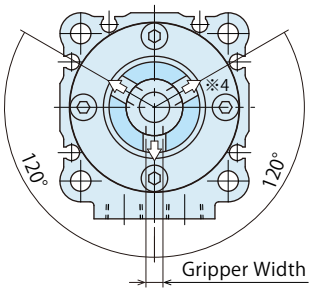


Cumulative accuracy of workpiece hole distance and product mounting distance must be ±0.4mm or better.

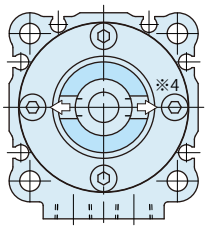
External Dimensions : SWG1000-B (with Seating Surface)

※ This drawing shows the released state of SWG1000-B (with Seating Surface).

3 Function **D**

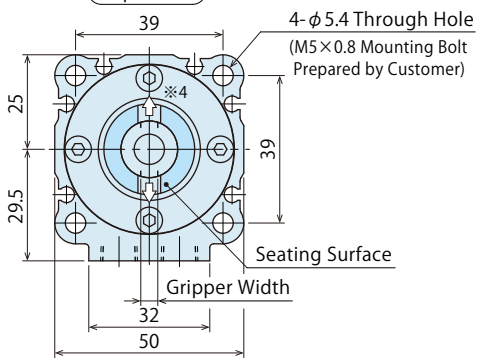


Option X

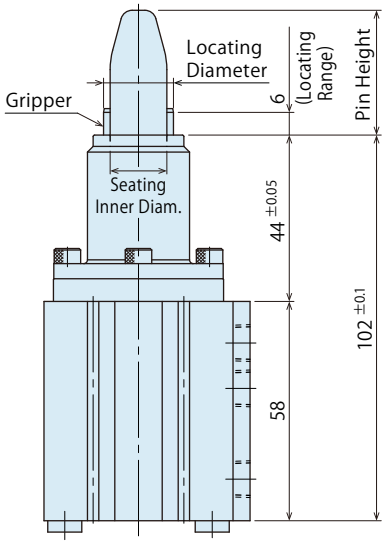


3 Function **C**

Option Y

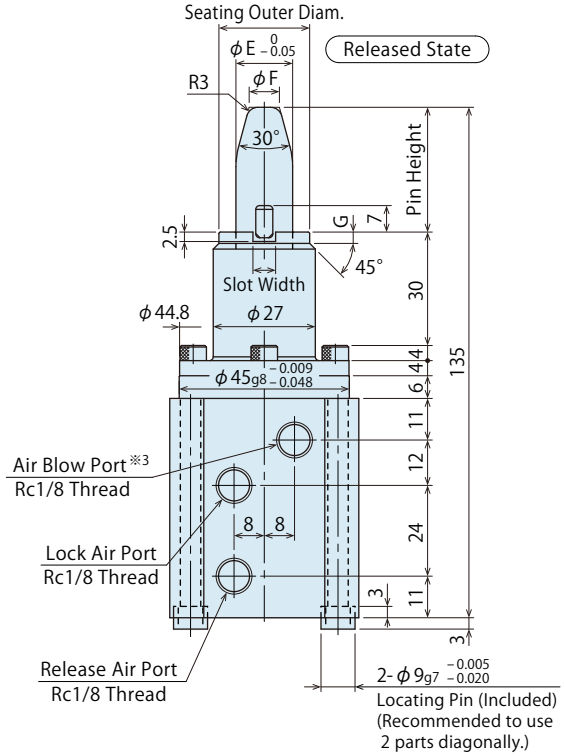


Locked State (without workpiece)



Seating Outer Diam.

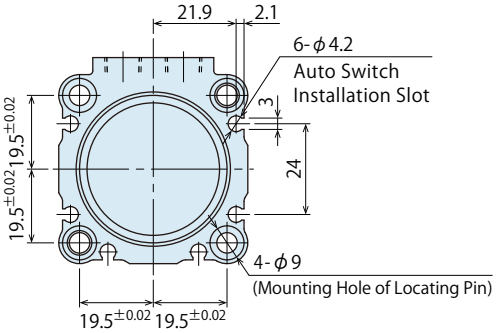
Released State

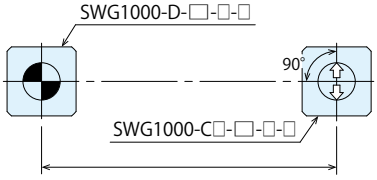


External Dimension List : SWG1000-B (with Seating Surface)

(mm)

Model No.		SWG1000 -□-160-B-□	SWG1000 -□-180-B-□
Workpiece	Hole Diam.	15.8 ~ 18.2	17.8 ~ 20.2
	Min. Thickness	0.45	
Pin Height		33	33
Pin Outer Diam. E		15	17
Pin End Diam. F		8	10
Locating Diameter	At Released	13.7	15.7
	At Locked (without workpiece)	18.4	20.4
Gripper Width		4.5	5.5
Slot Width		6	8
Seating Inner Diameter		15	17
Seating Outer Diameter		24	25
Seating Part G		3	4





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

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. Since the gripper is not a floating structure, when locking a workpiece with two of these products, set the distance accuracy ±0.4mm or better 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.

Accessory：Shim Set

A set of shims for level adjustment of the seating surface. (In case of SWG-B：with Seating Surface)

Model No. Indication

SWPZ 100 2 - S

1 2

1 Body Size

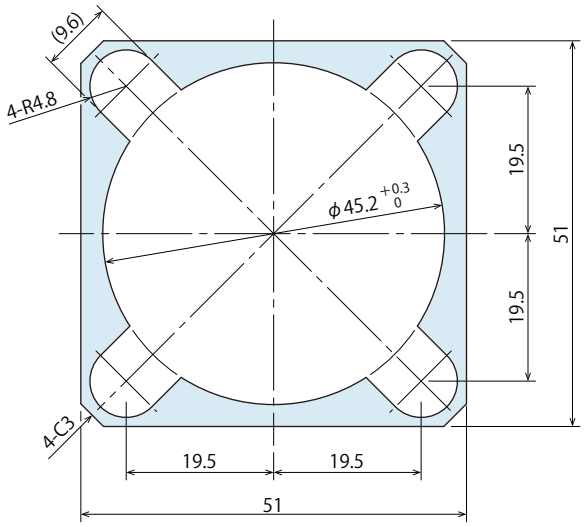
100：For SWG1000

2 Design No.

2 ：Revision Number

External Dimensions

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



Note :
1. Material：SUS304

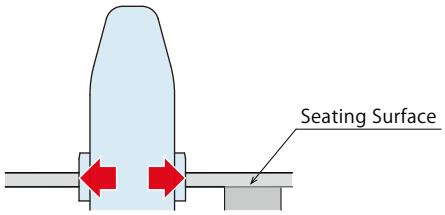
MEMO

Cautions

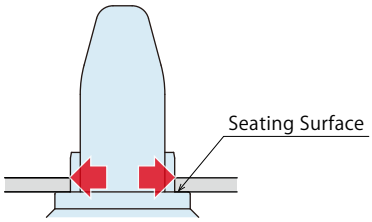
Notes for Design

1) Check Specifications
- Please use each product according to the specifications.
- This product is an air double-acting cylinder which locates and releases with air pressure. In case of Self-Locking Function Option, the cylinder will be locked by spring force when release air pressure is released.
- This product is a positioning cylinder and has no clamping function. A clamp must be provided separately.

2) Reference Surface (Seating Surface) towards Z-axis
- 'Without seating surface' option has no seating of workpiece. Please prepare it separately.

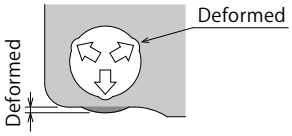


- 'With seating surface' option (-B) has seating surface of workpiece.



3) Expanding Force
- Expanding force shows the gripping force generated inside workpiece hole. Make sure to test and adjust air pressure accordingly. Insufficient expanding force leads to locking malfunctions and accuracy failure.

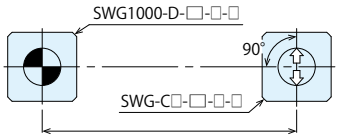
4) Wall Thickness around Workpiece Hole
- Thin wall around the workpiece hole could be deformed by locking action, and locating repeatability and/or expanding force will not fill the specification.
  Please test and adjust air pressure accordingly before use.



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

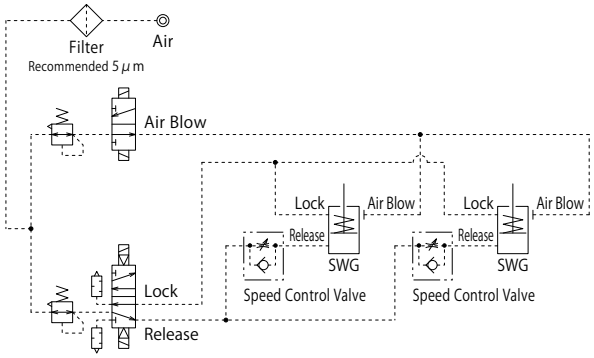
When workpiece hole diameter is larger than specification.	Leads to insufficient expansion stroke. Locating repeatability and expanding force will not fil the specification.
When workpiece hole diameter is smaller than specification.	Difficult to attach/detach the workpiece leading to damage.

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



Cumulative accuracy of workpiece hole distance and product mounting distance must be ±0.4mm 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 Pins for locating a workpiece, adjust the action procedure so that Function D (Datum) is locked before Function C (Cut).



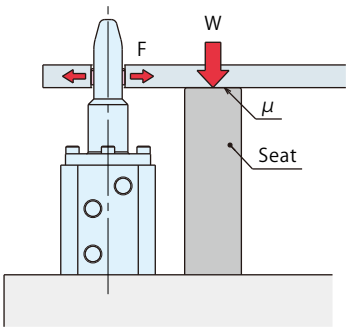
8) For Use of Auto Switch
- Magnet is built in the cylinder of this product, so operation of this product can be detected by auto switch.
- Select an auto switch depending on the environment.
- Please use a magnetic field resistant auto switch for an environment which generates a magnetic field disturbance.
  Recommended Auto Switch：D-P3DWA (made by SMC)
- An auto switch may be stuck out of this product 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.

9) 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.

10) All products 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 product or fall of workpiece.

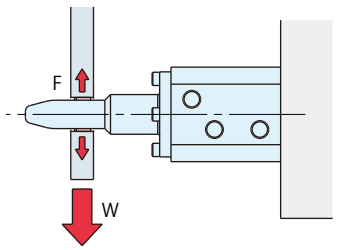
11) Weight of Workpiece
- Allowable workpiece weight for locating is calculated from the expanding force.

- Horizontal Attitude



$$\text{Workpiece Weight (W) [kg]} \leqq \frac{\text{Expanding Force per Expansion Locating Pin (F) [N]} \times \text{Efficiency } 0.25}{\text{Friction Coefficient of Workpiece Seat Face } (\mu) \times 9.8}$$

- Vertical Attitude
  When a workpiece is set, please make sure there is no lifting or slope of the workpiece. If the expanding operation is done with lifting or slope of the workpiece, it will lead to possible damage of the product and deformation of the workpiece hole.



$$\text{Workpiece Weight (W) [kg]} \leqq \frac{\text{Expanding Force per Expansion Locating Pin (F) [N]} \times \text{Efficiency } 0.25}{9.8}$$

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) Installation of Expansion Locating Pin
- 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)
SWG1000	M5×0.8	6.3

5) Port Position of Expansion Locating Pin
- 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 $\phi 6$ (inner diameter $\phi 4$) or larger for air blow.

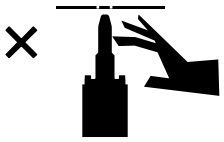
7) Level Adjustment of the Seating Surface
(required for '-B：with seating surface' only)
If requiring level adjustment of the seating surface, use a shim set for level adjustment (sold separately).

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

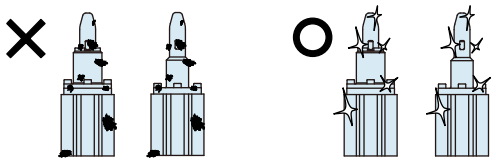


4) Do not modify or disassemble the air cylinder.
- Contains a powerful spring in the air cylinder which is dangerous.

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.

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.

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

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CAT.NO. SBR-SWG001-01-G1B
Printed in Japan

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