



Air Grippers Precautions 1

Be sure to read this before handling products.

Design/Selection

Warning

1. Confirm the specifications.

Products represented in this catalog are designed only for use in compressed air systems (including vacuum).

Do not operate at pressures, temperatures, etc., beyond the range of specifications, as this can cause damage or malfunction. (Refer to the specifications.)

Please contact SMC when using a fluid other than compressed air (including vacuum).

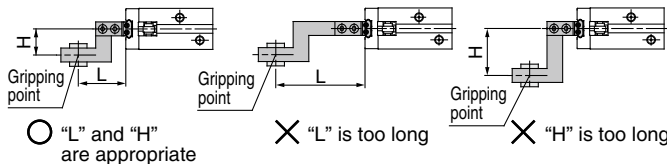
We do not guarantee against any damages if the product is used outside of the specification range.

2. Take safety measures (e.g. mounting protective covers) when workpieces pose a danger of fingers being caught in a gripper, etc.

3. If circuit pressure drops due to a power failure, trouble with the air supply, etc., there is a danger of workpieces dropping because of reduced gripping force. Implement drop prevention measures to avoid human injury and equipment damage.

4. Keep the gripping point within the specified range of the gripping distance.

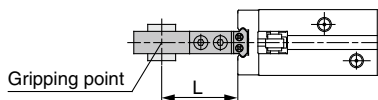
When the gripping point distance becomes too large, the gripper attachment applies an excessively large load to the gripper sliding section. This causes adverse effects on the service life. Refer to the graph of the specified range of the gripping distance for each series.



5. Attachments should be designed to be as light and short as possible.

1) A long or heavy attachment increases the inertia force to open or close the fingers. Therefore, it may cause unsteady movement of fingers and have an adverse effect on the product's life.

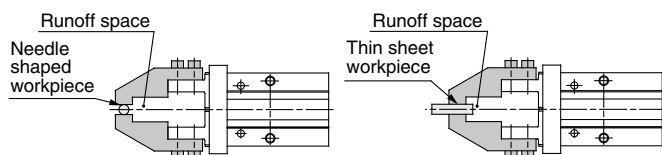
2) Even if the gripping point remains within the range limit, make the attachment as light and short as possible.



3) Select a larger size gripper or use two or more grippers together for handling a long and/or large workpiece.

6. Provide a runoff space in the attachment when using with a small or thin workpiece.

If a runoff space is not provided within the finger part, gripping becomes unsteady, and it may lead to gripping failure or slippage.



7. Select a model whose gripping force is compatible with the workpiece mass.

Incorrect selection may lead to the dropping of a workpiece, etc. Refer to the model selection criteria of each series for the effective gripping force and the workpiece mass.

8. Do not use in applications where excessive external force or impact force may be applied to the gripper.

Excessive external force or impact force may cause a malfunction. Please consult with SMC regarding any other applications.

9. Select a model with a sufficient working finger opening/closing width.

<In case of insufficient width>

1) Gripping becomes unsteady due to variations in opening/closing width or workpiece diameter.

2) When using an auto switch, the detection may not be reliable. Refer to the Auto Switch Hysteresis section and set the stroke to include the hysteresis length for a reliable switch function.

When using the water-resistant 2-color indicator auto switch, the gripper stroke may be limited by the setting of the indicator color during detection.

10. Please consult with SMC regarding a single acting, spring force only grip type.

This can cause unstable gripping in some cases or return malfunction due to faulty operation, etc.

11. Do not disassemble the product or make any modifications, including additional machining.

Doing so may cause human injury and/or an accident.

12. Refer to the Auto Switches Precautions (pages 15 to 19) if using with an auto switch.

Mounting

Warning

1. Operation manual

Install the product and operate it only after reading the operation manual carefully and understanding its contents. Also, keep the manual in a location where it can be referred to as necessary.

2. Ensure sufficient space for maintenance activities.

When installing the products, allow access for maintenance and inspection.

3. Tighten threads with the proper tightening torque.

When installing the products, follow the listed torque specifications.

4. Do not scratch or dent the air gripper by dropping or bumping it when mounting.

Even a slight deformation can cause inaccuracy or malfunction.

5. Tighten the screw within the specified torque range when mounting the attachment.

Tightening with higher torque than the specified range may cause malfunction, while tightening with lower torque may cause the gripping position to move out of place or the dropping of a workpiece.



Air Grippers Precautions 2

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Mounting

⚠ Caution

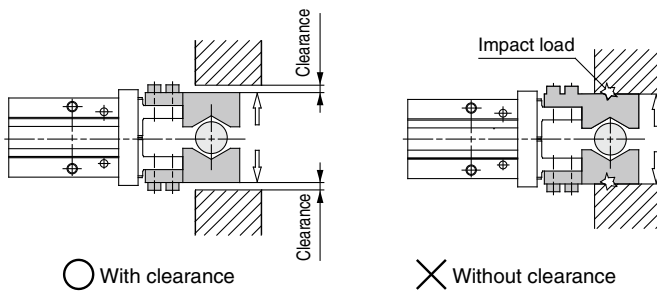
1. Avoid twisting the gripper when mounting an attachment.

Any damage to the gripper may cause malfunction and reduce accuracy.

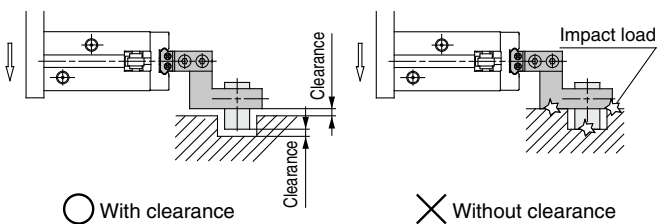
2. Avoid applying an external force to fingers.

Fingers may be damaged by a continual lateral or impact load. Provide clearance to prevent the workpiece or the attachment from striking against any object at the stroke end.

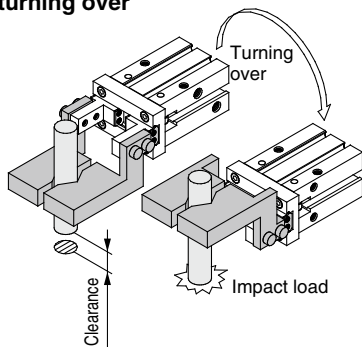
1) Stroke end when fingers are open



2) Stroke end when gripper is moving

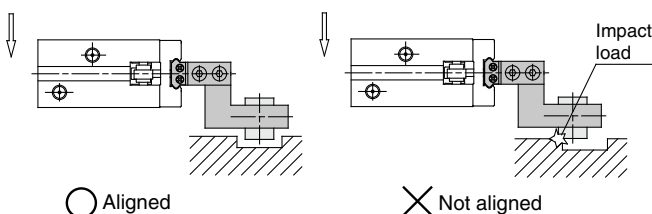


3) When turning over



3. Adjust the gripping point so that an excessive force will not be applied to the fingers when inserting a workpiece.

Confirm that the gripper can operate without receiving any shock by testing it in manual operation mode or by low speed operation.



4. Control the opening/closing speed with the speed controller to avoid excessive high-speed operation.

If the finger opening/closing speed is greater than necessary, impact forces on the fingers and other parts will increase. This can cause a loss of repeatability when gripping a workpiece and have an adverse effect on the life of the unit.

Finger Opening/Closing Speed Adjustment Example of Using SMC's Speed Controller

Double acting	<ul style="list-style-type: none"> The speed can be adjusted with the built-in speed controller in the following series: MHC2-10D to 25D, MHK2-12D to 25D, and MHKL2-12D to 25D. Use the table below as a guide for adjusting the speed. Series other than those previously mentioned For a cylinder with an inner diameter of $\phi 6$ or $\phi 10$, connect 2 speed controllers in a meter-in state or 1 dual speed controller. If the cylinder has a bore size of $\phi 16$ or larger, connect 2 speed controllers in a meter-out state.
Single acting	Connect 1 speed controller in a meter-in state or 1 dual speed controller. External gripping ——— Connect to closing port. Internal gripping ——— Connect to opening port.

Applicable speed controllers

Air gripper mounted type ——— AS1200-M3/M5
AS2200-01, etc.

Piping type ——— AS1000 series
AS1002F, AS2052F, etc.

Guide to Built-in Needle Adjustment

Model	Number of needle rotations from fully closed state *1
MHC2-10	1/4 to 1/2
MHC2-16	1/2 to 1
MHC2-20	1 to 1 1/2
MHC2-25	1 1/2 to 2
MHK2-12D	3/4 to 1
MHK2-16D	1 to 1 1/4
MHK2-20D	1 1/2 to 1 3/4
MHK2-25D	1 3/4 to 2
MHKL2-12D	1 to 1 1/4
MHKL2-16D	1 1/4 to 1 1/2
MHKL2-20D	1 3/4 to 2
MHKL2-25D	2 to 2 1/4

*1 Needle is tightened until it strikes the end lightly.

When an angular gripper is used, depending on the length of the attachment, it might be necessary to adjust the open/close movement to a slower speed. This will prevent the base of the fingers from being exposed to shocks that are created by inertial force.



Air Grippers Precautions 3

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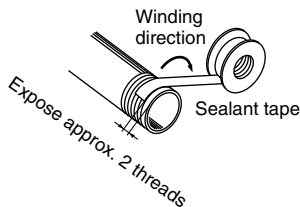
Piping

⚠ Caution

1. Refer to the Fittings and Tubing Precautions (pages 52 to 56) for handling One-touch fittings.
2. Preparation before piping
3. Winding of sealant tape

Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil, and other debris from inside the pipe.

When screwing piping or fittings into ports, ensure that chips from the pipe threads or sealing material do not enter the piping. Also, if sealant tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.



Lubrication

⚠ Caution

1. The non-lube type air gripper is lubricated at the factory and can be used without any further lubrication.
With the exception of the M*HR series, when lubrication is applied, use class 1 turbine oil (without additives) ISO VG32. Furthermore, once lubrication is applied, it must be continued. If lubrication is later stopped, malfunction can occur due to loss of the original lubricant. Refer to the Safety Data Sheet (SDS) of the hydraulic fluid when supplying the fluid.

Air Supply

⚠ Warning

1. Type of fluids
Please consult with SMC when using the product in applications other than compressed air.
2. When there is a large amount of drainage
Compressed air containing a large amount of drainage can cause the malfunction of pneumatic equipment. An air dryer or water separator should be installed upstream from filters.
3. Drain flushing
If condensation in the drain bowl is not emptied on a regular basis, the bowl will overflow and allow the condensation to enter the compressed air lines. This causes the malfunction of pneumatic equipment.
If the drain bowl is difficult to check and remove, the installation of a drain bowl with an auto drain option is recommended. For compressed air quality, refer to the SMC Best Pneumatics No. 6 catalog.
4. Use clean air.
Do not use compressed air that contains chemicals, synthetic oils that include organic solvents, salt, corrosive gases, etc., as it can cause damage or malfunction.

⚠ Caution

1. When extremely dry air is used as the fluid, degradation of the lubrication properties inside the equipment may occur, resulting in reduced reliability (or reduced service life) of the equipment. Please consult with SMC.
2. Install an air filter.
Install an air filter upstream near the valve. Select an air filter with a filtration size of 5 µm or smaller.
3. Take measures to ensure air quality, such as by installing an aftercooler, air dryer, or water separator.
Compressed air that contains a large amount of drainage can cause the malfunction of pneumatic equipment, such as air grippers. Therefore, take appropriate measures to ensure air quality, such as by providing an aftercooler, air dryer, or water separator.
4. Ensure that the fluid and ambient temperatures are within the specified range.
If the fluid temperature is 5°C or less, the moisture in the circuit could freeze, causing damage to the seals or equipment malfunction. Therefore, take appropriate measures to prevent freezing.
For compressed air quality, refer to the SMC Best Pneumatics No. 6 catalog.



Air Grippers Precautions 4

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Operating Environment

Warning

- 1. Do not use in an atmosphere containing corrosive gases, chemicals, sea water, water, water steam, or where there is direct contact with any of these.**
Refer to each construction drawing for information on the materials of air grippers.
- 2. Do not expose the product to direct sunlight for an extended period of time.**
- 3. Do not use in a place subject to heavy vibration and/or shock.**
- 4. Do not mount the product in locations where it is exposed to radiant heat.**
- 5. Do not use in dusty locations or where water, oil, etc., splash on the equipment.**

Caution

- 1. Use caution in regards to the corrosion resistance of the finger guide section.**
Martensitic stainless steel is used for the finger guide. But, please note that its corrosion resistance is inferior to that of austenitic stainless steel.
Especially in an environment where water drops adhere due to condensation, etc., rust might be generated. Refer to Specific Product Precautions.

Maintenance

Warning

- 1. Perform maintenance and inspection according to the procedures indicated in the operation manual.**
If handled improperly, human injury and/or malfunction or damage of machinery and equipment may occur.
- 2. Maintenance work**
If handled improperly, compressed air can be dangerous. Assembly, handling, repair, and element replacement of pneumatic systems should be performed by a knowledgeable and experienced person.
- 3. Drain flushing**
Remove drainage from air filters regularly.
- 4. Removal of equipment, and supply/exhaust of compressed air**
Before components are removed, first confirm that measures are in place to prevent workpieces from dropping, run-away equipment, etc. Then, cut off the supply pressure and electric power, and exhaust all compressed air from the system using the residual pressure release function.
When machinery is restarted, proceed with caution after confirming that appropriate measures are in place to prevent sudden movement.
- 5. Do not allow people to enter or place objects in the carrying path of the air gripper.**
This may cause human injury and/or an accident.
- 6. Do not put hands, etc., in between the air gripper fingers or attachments.**
This may cause human injury and/or an accident.
- 7. When removing the air gripper, first confirm that no workpieces are being held and then release the compressed air before removing the air gripper.**
If a workpiece is still being held, there is a danger of it being dropped.

Caution

- 1. The dust cover is a consumable part. Replace it as necessary.**
Fine particles, cutting oil, etc., may cause the main body to malfunction.