Safety Precautions

Be sure to read this section before use.

When designing and manufacturing equipment using CKD products, the manufacturer is obligated to ensure that the safety of the mechanism, pneumatic control circuit and/or water control circuit and the system that runs the electrical controls are secured.
It is important to select, use, handle and maintain CKD products appropriately to ensure their safe usage.
Observe warnings and precautions to ensure device safety.
Check that device safety is ensured, and manufacture a safe device.

WARNING

1 This product is designed and manufactured as a general industrial machine part.
It must be handled by an operator having sufficient knowledge and experience.

2 Use this product in accordance with specifications.

This product must be used within its stated specifications. In addition, never modify or additionally machine this product.
This product is intended for use in general industrial machinery equipment or parts. It is not intended for use outdoors (except for products with outdoor specifications) or for use under the following conditions or environments. (Note that this product can be used when CKD is consulted prior to its usage and the customer consents to CKD product specifications. The customer should provide safety measures to avoid danger in the event of problems.)

❶ Use for applications requiring safety, including nuclear energy, railways, aircraft, marine vessels, vehicles, medical devices, devices or applications in contact with beverages or foodstuffs, amusement devices, emergency cutoff circuits, press machines, brake circuits, or safety devices or applications.
❷ Use for applications where life or assets could be significantly affected, and special safety measures are required.

3 Observe organization standards and regulations, etc., related to the safety of the device design and control, etc.

ISO4414,JIS B 8370(Pneumatic fluid power - General rules and safety requirements for systems and their components)
JFPS2008(Principles for pneumatic cylinder selection and use)
Including the High Pressure Gas Safety Act, Industrial Safety and Health Act, other safety rules, organization standards and regulations, etc.

4 Do not handle, pipe, or remove devices before confirming safety.

❶ Inspect and service the machine and devices after confirming safety of the entire system related to this product.
❷ Note that there may be hot or charged sections even after operation is stopped.
❸ When inspecting or servicing the device, turn OFF the energy source (air supply or water supply), and turn OFF power to the facility. Discharge any compressed air from the system, and pay enough attention to possible water leakage and leakage of electricity.
❹ When starting or restarting a machine or device that incorporates pneumatic components, make sure to secure system safety, such as pop-out prevention measures.

5 Observe the warnings and cautions on the following pages to prevent accidents.

■ Precautions are ranked as “DANGER”, “WARNING”, and “CAUTION” in this section.

DANGER:	In the case where the product operation is mishandled and/or when the urgency of a dangerous situation is high, it may lead to fatalities or serious injuries.
WARNING:	A dangerous situation may occur if handling is mistaken, leading to fatal or serious injuries.
CAUTION:	A dangerous situation may occur if handling is mistaken, leading to minor injuries or property damage.

Note that some items indicated with “CAUTION” may lead to serious results depending on the conditions.
All items contain important information and must be observed.

Warranty

1 Warranty period

The product specified herein is warranted for one (1) year from the date of delivery to the location specified by the customer.

2 Warranty coverage

If the product specified herein fails for reasons attributable to CKD within the warranty period specified above, CKD will promptly provide a replacement for the faulty product or a part thereof or repair the faulty product at one of CKD's facilities free of charge.

However, following failures are excluded from this warranty:

1) Failure caused by handling or use of the product under conditions and in environments not conforming to those stated in the catalog, the Specifications, or the Instruction Manual.
2) Failure caused by use of the product exceeding its durability (cycles, distance, time, etc.) or caused by consumable parts.
3) Failure not caused by the product.
4) Failure caused by use not intended for the product. 5) Failure caused by modifications/alterations or repairs not carried out by CKD.
6) Failure caused by reasons unforeseen at the level of technology available at the time of delivery.
7) Failure caused by acts of nature and disasters beyond control of CKD.

The warranty stated herein covers only the delivered product itself. Any loss or damage induced by failure of the delivered product is excluded from this warranty.

Note: For details on the durability and consumable parts, contact your nearest CKD sales office.

3 Compatibility check

The customer is responsible for confirming the compatibility of CKD products with the customer's systems, machines and equipment.

Precautions for export

1 Security Trade Control

The products in this catalog and their related technologies may require approval before export or provision.

For the sake of maintaining world peace and safety, there may be cases in which approval under the Foreign Exchange and Foreign Trade Control Law is required in advance, depending on the country to where the product or related technology is being exported or provided.

The scope of products and related technologies requiring approval are listed in the Export Trade Control Order Appendix Table 1 or Foreign Exchange Order Appendix Table.

The Export Trade Control Order Appendix Table 1 and Foreign Exchange Order Appendix Table contain the following two types of information.

- "List controls" specified for items 1 to 15
- "Catch-all controls" that do not indicate specifications by item, but restriction by application (Section 16)

An application for approval is received by the Security Export Licensing Division of the Ministry of Economy, Trade and Industry or local bureaus of the Ministry of Economy, Trade and Industry.

2 Products and related technologies in this catalog

The products and related technologies in this catalog are subject to the catch-all control of the Foreign Exchange and Foreign Trade Control Law.

When exporting or providing the products or related technologies in this catalog, ensure that they are not used for arms or weapons.

3 Contact

Contact your local CKD Sales Office for information on the Security Trade Control of products and related technologies in this catalog.

Design/selection

1. Checking the specifications

⚠WARNING

- Use the product in the range of conditions specified for the product. The product in this catalog is designed for use only in a compressed air system. Use with pressures or temperatures outside the specifications range may result in damage or operation failure.
  (Refer to specifications)
  Contact CKD when using fluids other than those specified in the specifications.

2. Safety design

⚠WARNING

- Take measures to prevent physical harm or property damage in the event of failure of this product.

⚠CAUTION

- Understand the characteristics of compressed air before designing a pneumatic circuit.
  - The same functions as the mechanical, hydraulic, and electrical methods cannot be anticipated if instantaneous stopping and holding are required during an emergency stop.
  - Pop-out, air discharge, or leakage due to air compression and expansion may occur.
  - Design the circuit so that compressed air in the system is exhausted.

- Decide on a method of lubricating pneumatic components, and provide correct maintenance.
  - Is it a lubrication type?
  - Is it a no-lubrication type?
    Specify either of the above for control of lubricant.

- Check for leakage current to avoid malfunction caused by the leakage current.
  - When using a programmable controller, leakage current may cause malfunction.

3. Design by application

⚠CAUTION

- Exerts no influence on performance as it uses compressed air and a small amount of leakage is tolerable.
  Contact CKD if no leakage is required.

4. Working environment

⚠WARNING

- Install the product where it will not be exposed to rain, water or direct sunlight.

- Do not use this product in a corrosive environment. Use in such an environment could lead to damage or operation failure.

- Avoid using this product in environments where ozone is generated. Consult with CKD if ozone is generated in the air supply, as an ozone-resistant series is available.

- If ambient temperature is 5°C or below, moisture in the circuit could freeze and lead to misoperation, etc. Remove moisture to prevent freezing.

⚠CAUTION

- Confirm before use that the product will withstand the working environment.
  - Cannot be used in environments where its functions will be impeded.
    Such environments include high temperatures, chemical atmospheres, or those where chemical liquids, vibration, moisture, dripping water, coolant or gas are present.
    Environment where ozone is generated.

5. Securing of space

⚠CAUTION

- Around the pneumatic component, keep space for installation, removal, wiring, and piping work.

6. Statement in the instruction manual

⚠CAUTION

- Indicate the maintenance conditions in the device's instruction manual.
  - The product's performance may drop too low to maintain an appropriate safety level depending on usage conditions, working environment and maintenance status. With correct maintenance, the product functions can be used to the fullest.

Mounting, installation and adjustment

⚠ CAUTION

1. Installation

■ Do not remove the pneumatic component packaging and the piping port seat cap until just before starting to pipe.
- Removing the piping port cap before piping work may cause foreign matter to enter the pneumatic components from the piping port, resulting in failure or malfunction.

■ When mounting pneumatic components, do not use a mounting method that relies on support from the piping.

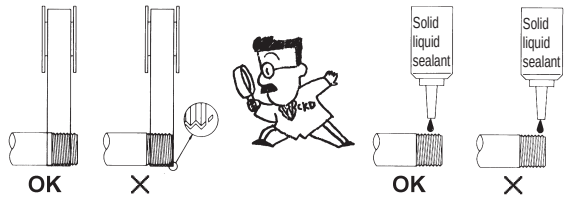
■ Remove the dust-proof seal of piping port just before starting to pipe.
- Removing it before starting to pipe work may cause foreign matter to enter the inside from the piping port, resulting in failure or malfunction.

2. Pre-operation confirmation

■ After connecting pipings, always check all pipe connections for air leaks before supplying compressed air.
- Apply a leakage detection agent to pipe connections with a brush and check for air leaks. Make sure that the leak detection agent does not adhere to the plastic bowl. The plastic bowl could break, which is dangerous.

3. Piping

■ When connecting pipes, wrap sealing tape in the opposite direction from the threading, from the inside position to within 2 mm from the pipe end.
- If sealing tape protrudes from the pipe threads, it could be cut when screwing the bolts in. This could cause the tape to enter the solenoid valve, causing failures.



When using a liquid sealant, make sure that it does not adhere to the plastic bowl. The plastic bowl could break, which is dangerous.

■ Check that the piping connected to the pneumatic components is not dislocated due to vibration, looseness, or tension.
- Piping dislocation is dangerous.

■ Observe the following precautions when using nylon tubes or urethane tubes for piping material.
- Use flame-resistant tubes or metal steel pipes in an environment where spattering may occur.
- Use a hydraulic hose when piping is for both hydraulic and pneumatic use.
- When using the standard push-in fitting on the spiral tube, fix the base of the tube with a hose clamp. Rotation may occur, causing a reduction in holding force.
- Use a spigot fitting for high-temperature fluid. The push-in fitting cannot be used.

■ Connect piping so that connections are not dislocated by equipment movement, vibration, or tension.

■ Always flush just before piping pneumatic components.
- Any foreign matter that has entered the pipes during piping must not enter the pneumatic components.

■ Use appropriate torque to tighten the pipes when connecting them.
- The purpose is to prevent air leakage and damage to bolts.
- First tighten the bolts by hand to ensure that the threads are not damaged, then use a tool.

[Recommended values]

Port thread	Tightening torque N·m
M3	0.3 to 0.6
M5	1 to 1.5
Rc1/8	3 to 5
Rc1/4	6 to 8
Rc3/8	13 to 15
Rc1/2	16 to 18
Rc3/4	19 to 40
Rc1	41 to 70

Note: If a specific tightening torque is recommended for the model, use the torque.

4. Pneumatic source

■ Install a pneumatic filter just before the pneumatic component in the circuit.

■ When supplying compressed air after connecting pipes, do not suddenly apply high pressure.
- The pipe connection could dislocate, causing the pipe tube to fly out, leading to accidents.
- Caution: If compressed air is supplied too slowly, sealing pressure may not be generated depending on the internal sealing mechanism of the solenoid valve and may cause air leakage.

■ Air quality
- Use CKD clean air system components appropriate for your application.
- Use compressed air that does not contain oil oxides, tar, carbon, etc., from the air compressor.
- Use compressed air that does not contain solid foreign matter.

Use/maintenance

⚠CAUTION

1. Disassembly/assembly

- Pneumatic components must be disassembled and assembled by qualified personnel.
  - Pneumatic Pressure Skill Test Class 2 or higher level is required.

- Read the relevant product's instruction manual thoroughly and fully familiarize yourself with the work before disassembling or assembling the pneumatic components.
  - Personnel must be fully familiar with pneumatic component structure and operational principles and safety requirements.

2. Maintenance and inspection

- Before conducting maintenance, turn the power OFF, stop the supply of compressed air and make sure that there is no residual pressure.
  - Observe the conditions to ensure safety.