Safety Precautions

Be sure to read this section before use.

When designing and manufacturing a device using CKD products, the manufacturer is obligated to check that device safety mechanism, pneumatic control circuit, or water control circuit and the system operated by electrical control that controls the devices is secured.
It is important to select, use, handle and maintain the product appropriately to ensure that the CKD product is used safely.
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 device design and control, etc.

ISO4414, JIS B 8370 (Pneumatics 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 all systems 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 attention to possible water leakage and leakage of electricity.
❹ When starting or restarting a machine or device that incorporates pneumatic components, make sure that the system safety, such as pop-out prevention measures, is secured.

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

■ The precautions are ranked as "DANGER", "WARNING" and "CAUTION" in this section.

DANGER: When a dangerous situation may occur if handling is mistaken leading to fatal or serious injuries, and when there is a high degree of emergency to a warning.

WARNING: If handled incorrectly, a dangerous situation may occur, resulting in death or serious injury.

CAUTION: When a dangerous situation may occur if handling is mistaken leading to minor injuries or physical damage.

Note that some items described as "CAUTION" may lead to serious results depending on the situation.
Every item provides 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.

Safety precautions

Fluid Control Components: Warnings and Cautions

Be sure to read this section before use.

Precautions for each model series and for individual products

Components for Life Science

Design/selection

⚠WARNING

1 Ambient environment

Take appropriate safeguards when using this product in places where it may be exposed to water drops.

2 Do not disassemble the product

Once disassembled, the product may not satisfy the required performance any longer even if reassembled.

⚠CAUTION

① Check the compatibility of product component materials and working fluids. Do not allow fluid to come into contact with the product body.

② Do not use for strong acids such as hydrochloric acid, hydrofluoric acid or nitric acid.

③ Do not use for sodium hypochlorite (soda). (Some models are excluded.)

④ Carefully select the solenoid valve, taking the chemical liquid characteristics into consideration. (Presence of crystal deposits when chemical liquids dry, effect on solenoid valve component materials if chemical liquids evaporate, etc.)

⑤ When using these components for a chemical liquid having a low boiling point, such as hexane, the chemical liquid in the solenoid valve could evaporate due to heating of the coils, and cause bubbles, etc., in the solenoid valve and pipe. Use an AMD type air operated valve for chemical liquids if formation of bubbles, etc., poses a problem.

⑥ When using the solenoid valve with negative pressure, such as for dispensing control, air may be sucked into the solenoid valve depending on the type of chemical liquid, type of connection fitting, and type of tube, etc. Check carefully before starting use.

⑦ Use a smoothed power supply with sufficient margin against power consumption for the power supply.

■ Working pressure and proof pressure

Working pressure and proof pressure are as listed below. Carefully select the model with full understanding.

Working pressure: Pressure at which the valve opens and closes normally.

Proof pressure: Pressure which the valve can withstand without any decrease in its function or performance. The catalog specifications are satisfied, even when pressure exceeding the working pressure is temporarily applied, upon return to the working pressure.

Mounting, piping and wiring

⚠WARNING

1 Always flush the piping before installing the solenoid valve.

Any foreign materials or foreign matter in the fluid may prevent the solenoid valve from functioning correctly. When there is contamination, install a filter on the primary side of the solenoid valve according to the circuit used.

2 For products that have an arrow displayed, ensure that the piping is performed so that the flow of the fluid is consistent with the direction of the arrow.

⚠CAUTION

1 Refer to the table below for the piping tightening torque.

Note that if the solenoid valve body is made of resin, a PP or fluororesin fitting must be used. The port could be damaged if a metal fitting is used.

[Stainless steel solenoid valve]

Piping nominal diameter	Recommended tightening torque [N·m]
M5	2.1 to 3
Rc1/8	18 to 20
Rc1/4	23 to 25
Rc3/8	31 to 33

[PPS/PEEK solenoid valve]

Piping nominal diameter	Recommended tightening torque [N·m]
M5,M6 1/4-28UNF	0.10 to 0.15
Rc1/8	0.5 to 0.8
Rc1/4	1.0 to 1.5
Rc3/8	1.0 to 1.5

[Fluorine resin solenoid valve]

Piping nominal diameter	Recommended tightening torque [N·m]
M6	0.05 to 0.08
Rc1/4	0.7 to 1.0
Rc3/8,R3/8	1.0 to 1.5
Rc1/2,R1/2	1.5 to 2.0
R 3/4	2.0 to 2.5

2 When using vertical piping on the secondary side, keep it within 2 m in height. Use tubing or piping with the same or larger bore size as the orifice size to fix the pipe.

3 Do not hold the lead wire while handling.

Do not pull the lead wires.

[Precautions for each model]

MR10R/MR16 Safety precautions

⚠CAUTION

① Check the compatibility of product component materials and working fluids.

② Do not use for hydrochloric acid, hydrofluoric acid or nitric acid. Contact CKD when the effective chlorine concentration of sodium hypochlorite (soda) is more than 0.1%. For 0.1% or less effective chlorine concentration, perform functional testing according to your application before use.

③ Foreign matter, etc., inside the piping may cause malfunction and valve seat leakage. Make sure to flush the piping.

④ When using vertical piping on the secondary side, keep it within 2 m in height. Use tubing or piping with the same or larger bore size as the orifice size to fix the pipe.

⑤ Do not disassemble.Once disassembled, the product may not satisfy the required performance any longer even if reassembled.

⑥ If the product is bent with the mounting plate fixed, the body will be damaged, and external leakage will occur. Do not apply load to the mounting plate.

Safety precautions

Fluid Control Components: Warnings and Cautions

Be sure to read this section before use.

Precautions for each model series and for individual products

[Precautions for each model]

MKB3 Safety precautions

⚠CAUTION

① Slide the product in the piping direction by pulling the lever to remove from the mounting plate.

② Do not disassemble the product.

③ Foreign matter, etc., inside the piping may cause malfunction and valve seat leakage. Always flush the piping before installing the valve.

④ When using vertical piping on the secondary side, keep it within 2 m in height. Use tubing or piping with the same or larger bore size as the orifice size to fix the pipe.

⑤ Do not hold the lead wire while handling.

MAB1/MAG1 Safety precautions

⚠CAUTION

① Foreign matter in the piping and the environment during piping work could damage the valve seat or diaphragm seal, and lead to leaks. Always flush the piping before installing the valve.

② When using strong acids, such as hydrochloric acid, hydrofluoric acid or nitric acid, or sodium hypochlorite (soda), use an AMD type air operated valve for chemical liquids.

③ Consult with CKD if the secondary piping is laid at a high level or extremely restricted.

④ Do not disassemble the product. Once disassembled, the product may not satisfy the required performance any longer even if reassembled.

MYB$\frac{1}{3}$/MYG$\frac{1}{3}$/MEB2/MEG2 Safety precautions

⚠CAUTION

① Check the compatibility of product component materials and working fluids. Do not allow fluid to come into contact with the product body.

② Foreign matter in the piping and the environment during piping work could damage the valve seat or diaphragm seal, and lead to leaks.Always flush the piping before installing the valve.

③ When using strong acids, such as hydrochloric acid, hydrofluoric acid or nitric acid, or sodium hypochlorite (soda) or solvents, use an AMD type air operated valve for chemical liquids.

④ Leakage current from the control circuit must be less than that specified for each voltage.

⑤ Contact CKD if the secondary piping is vertical and long (2 m or higher) or extremely restricted.

⑥ Do not disassemble the product.
Once disassembled, the product may not satisfy the required performance any longer even if reassembled.

MJB3 Safety precautions

⚠CAUTION

① Check the compatibility of product component materials and working fluids.
② Piping foreign materials may cause malfunction and valve seat leakage. Always flush the valve before installing it.
③ Do not use for hydrochloric acid, hydrofluoric acid or nitric acid. Contact CKD when the effective chlorine concentration of sodium hypochlorite (soda) is more than 0.1%. For 0.1% or less effective chlorine concentration, perform functional testing according to your application before use.
④ Do not apply excessive force on the fitting when connecting or disconnecting the tube.
⑤ Recommended tube
Material: silicone rubber, size: I.D. x O.D. = ø5 x ø11
⑥ Do not disassemble the product.
Once disassembled, the product may not satisfy the required performance any longer even if reassembled.
⑦ Recommended tightening torque of mounting screw (M3) for fixing product 0.6 to 0.7N·m

EMB21 Safety precautions

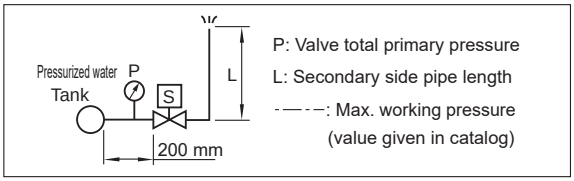
⚠CAUTION

① Foreign matter in the piping and the environment during piping work could damage the valve seat or diaphragm seal, and lead to leaks.
② Consult with CKD if the secondary piping is laid at a high level.
③ When using strong acids, such as hydrochloric acid, hydrofluoric acid or nitric acid, or sodium hypochlorite (soda), use an AMD type air operated valve for chemical liquids.
④ Do not disassemble the product. Once disassembled, the product may not satisfy the required performance any longer even if reassembled.

EMB41/EMB51 Safety precautions

⚠CAUTION

① Foreign matter in the piping and the environment during piping work could damage the valve seat or diaphragm seal, and lead to leaks. Always flush the piping before installing the valve.
② Use VCTF-0.75 (2-conductor: O.D. 6.6) vinyl cord for equipment (JISC3306) for the lead-out wires
③ Consult with CKD if the secondary piping is laid at a high level.
④ When using strong acids, such as hydrochloric acid, hydrofluoric acid or nitric acid, or sodium hypochlorite (soda) or solvents, use an AMD type air operated valve for chemical liquids.
⑤ In particular, the working pressure changes according to the OUT side piping conditions, so refer to the characteristics in the graph at right before use (note that the fluid is water).



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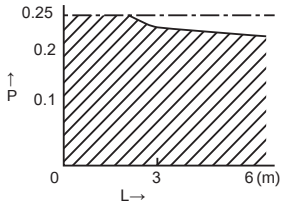

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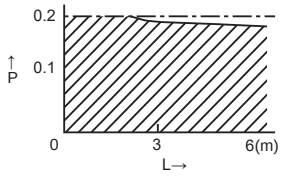

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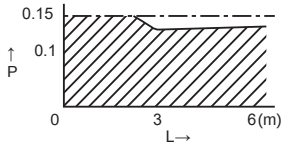

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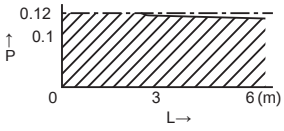

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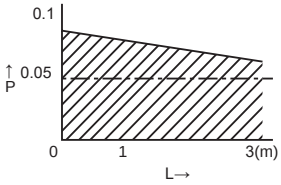

Safety precautions

Fluid Control Components: Warnings and Cautions

Be sure to read this section before use.

[Precautions for each model]

HMTB/HMTG Safety precautions

⚠CAUTION

① Use direct current (excluding rectified alternating current).

② Do not apply excessive force on the fitting when connecting or disconnecting the tube.

③ Do not disassemble the product.
Once disassembled, the product may not satisfy the required performance any longer even if reassembled.

④ Do not use for hydrochloric acid, hydrofluoric acid or nitric acid. When using sodium hypochlorite (soda), select FKM for the sealant material. (EPDM will deteriorate over long-term use even with tap water levels of residual chlorine)
Contact CKD when the effective chlorine concentration of sodium hypochlorite (soda) is more than 0.1%. For 0.1% or less effective chlorine concentration, perform functional testing according to your application before use.

UMB/UMG Safety precautions

⚠CAUTION

① Do not disassemble the product.
Once disassembled, the product may not satisfy the required performance any longer even if reassembled.

② Do not apply torque exceeding 0.3 N·m on the mounting bolt (M3).

③ Protect the product against contact with water. Water could cause insulation or operation faults.

④ When using strong acids, such as hydrochloric acid, hydrofluoric acid or nitric acid, or sodium hypochlorite (soda) or solvents, use an AMD type air operated valve for chemical liquids.

HB Safety precautions

⚠CAUTION

① Foreign matter, etc., inside the piping may cause malfunction and valve seat leakage. Always flush the piping before installing the valve.

② Do not disassemble the product. Once disassembled, the product may not satisfy the required performance any longer even if reassembled.

③ When using strong acids, such as hydrochloric acid, hydrofluoric acid or nitric acid, or sodium hypochlorite (soda) or solvents, use an AMD type air operated valve for chemical liquids.

HYN Safety precautions

⚠CAUTION

① For the DC type, use a high-capacity power supply. A full-wave or half wave rectified bridge is affected by ripples, so always use a stabilized power supply.

② Securely insert the tube to the prescribed position.

③ Depending on the working fluid, the silicone tube may not be resistant to chemical liquids, or chemical liquids may adhere to it. Check this before use.

④ Do not expose the coil to water.

⑤ If a silicone tube is left attached for long periods, it could stick and prevent the tube from opening. If the tube sticks, replace the tube or un-stick the tube by applying pressure or by hand.

⑥ Do not apply higher pressure than the working pressure. Otherwise the tube may dislocate.