



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.)
 - ① 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.
 - ② 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.
 - ① Inspect and service the machine and devices after confirming safety of all systems related to this product.
 - ② Note that there may be hot or charged sections even after operation is stopped.
 - ③ 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.
 - ④ 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

WP Series: Warning / Precautions

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Refer to "Pneumatic, Vacuum and Auxiliary Components (CB-024SA)", "Pneumatic Valves (CB-023SA)", "General Purpose Valves (CB-03-1SA)", and "Pneumatic Cylinders (CB-029SA)" for general and product-specific precautions.

Product-specific cautions: FRL, drain separator, pressure gauge (Outdoor Series)

*For product-specific cautions other than those below, refer to Safety precautions for the FRL unit (modular design) and the FRL unit (compact design) in "Pneumatic and Auxiliary Components (No. CB-024SA)".

WARNING

■ Design/Consideration

- This product is for industrial use. Do not use for medical purposes, or in any equipment or circuit that concerns human life.
- Output pressure exceeding the regulator's set pressure value could result in damage or faulty operation of the secondary side devices. Be sure to install a safety device.

■ Working environment

- This product has outdoor specifications, but should not be used in the following environments.
 - When ambient temperature exceeds the specifications. (The product temperature is at risk of exceeding the ambient temperature when exposed to direct sunlight.)
 - When air freezes.
 - In atmospheres containing corrosive gases, liquids and chemicals.
 - Locations with vibration or impact.

■ Precautions for use in cold climates

- When using this product in a cold climate, take the necessary measures to prevent freezing. Freezing can cause leakage or operation failure. Conduct appropriate dew point management of air quality.

■ Use/Maintenance

- Do not disassemble the filter/regulator or regulator cover.

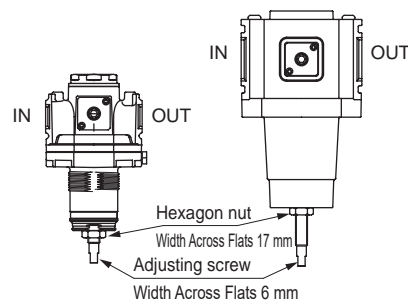
CAUTION

■ Use/Maintenance

- Except when adjusting the pressure, tighten the hex nut and secure the adjusting screw. (Use without tightening may lead to damage.)
- Do not apply a load to the product unless it is within the parameters of use. (Do not climb/step onto the product.)
- Using the regulator with the cover facing downward may cause the pressure regulation to fail due to freezing. Be especially careful in low-temperature environments.
- The set pressure changes from the initial set point due to the working environment and conditions, as well as aging of part materials. Check the pressure regularly, and reset if conditions have changed.
- Perform regular maintenance every six months to one year.
- Consumable parts (metal bowl assembly, valve assembly, bottom spring, element, the mantle assembly and O-ring) must be replaced every other year. Contact a CKD sales representative for details regarding consumable parts.
- When the set pressure is high, the operating force for rotating the adjusting screw (knob) will increase.

■ Working fluids

- Use only compressed air. Air containing corrosive gases, fluids or chemicals could result in improper pressure adjustment due to body damage or rubber deterioration.





Safety precautions

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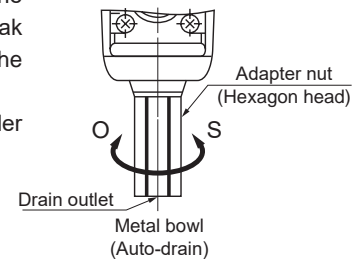
Product-specific cautions: FRL, drain separator, pressure gauge (Outdoor Series)

*For product-specific cautions other than those below, refer to Safety precautions for the FRL unit (modular design) and the FRL unit (compact design) in "Pneumatic and Auxiliary Components (No. CB-024SA)".

CAUTION

Other

- This product guarantees outdoor use, but not corrosion resistance (no rust or discoloration).
- Fix the hex side of the adaptor nut before screwing the fitting, etc., into the drain outlet of the auto-drain with metal cup. If the hex side of the adaptor nut is not fixed, the product may break due to excessive screw-in of the adaptor nut. When using the metal bowl with auto-drain, if the drain is piped with a tightening fitting, manual operation is not possible.
- Piston drain uses automatic discharge for intermittent flow. Drainage is not discharged under working conditions where air flows constantly.



3-year warranty after delivery (Option G)

When requesting the above options, CKD will prepare specifications with the following descriptions.

Please make a note of the start date of use, affix a seal, and return it to CKD. Indicate the start date of use within two years after delivery.

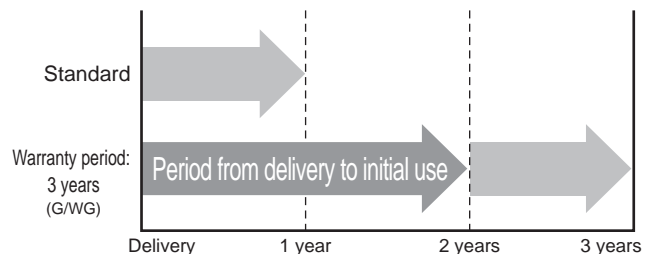
Expected start date: __/__/__/ Sign: _____

Warranty period:

A warranty for a period of three years from the date of delivery or for a period of one year from the start of use, whichever comes first.

* Please return it after the description of the scheduled date of use. Note that the 3-year warranty will not apply if there is no description or return.

* With inspection certificate, inspection guidelines, drawings, specifications, traceability system diagram



Drain separator
F.R.L. unit

Pneumatic auxiliary
components

Pneumatic
valves

Fluid control
valves

Pneumatic
cylinders

Related
products

Safety
precautions



Safety precautions

WP Series: Warning / Precautions

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Product-specific cautions: Silencer/Speed controller (Outdoor Series)

* For cautions other than those below, refer to Product-specific cautions of silencer/speed controller in "Pneumatic, Vacuum, Auxiliary Components (No. CB-C24SA)".



WARNING

■ Design/Consideration

- This product is for industrial use. Do not use for medical purposes, or in any equipment or circuit that concerns human life.

■ Working environment

- This product has outdoor specifications, but should not be used in the following environments.
 - When the ambient temperature and product temperature exceed the specifications.
(The product temperature is at risk of exceeding the ambient temperature when exposed to direct sunlight.)
 - When air freezes.
 - In atmospheres containing corrosive gases, liquids and chemicals.
 - locations with vibration or impact.

■ Precautions for use in cold climates

- When using this product in a cold climate, take the necessary measures to prevent freezing.
Freezing can cause leakage or operation failure. Conduct appropriate dew point management of air quality.

■ Use/maintenance

- Do not disassemble the speed controller.
- Do not install the exhaust outlet of the silencer facing upward.
Also, implement measures to prevent foreign matter, dust, and rainwater from entering the exhaust outlet.



CAUTION

■ Use/Maintenance

- Do not apply a load to the product unless it is within the parameters of use. (Do not climb/step onto the product.)
- Check that the C snap ring of the silencer does not pop off when removed or attached.
- Assemble the C snap ring of the silencer accurately when replacing the element.
Parts used inside could pop out and cause problems if assembly is not complete.
- Depending on the working status, the element could clog and reduce exhaust in the silencer.
Service, clean, and replace the element of the product regularly.

■ Working fluids

- Use only compressed air. Air containing corrosive gases, fluids, or chemicals could result in body damage or rubber deterioration.

■ Other

- This product guarantees outdoor use, but not corrosion resistance (no rust or discoloration).



Safety precautions

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Product-specific cautions: Fluid control valves AB/G41, ADK11, ADK21-W, CHB/G-W (Outdoor Series), pneumatic valves 4F-W (Outdoor Series)

* For precautions other than the following, refer to Individual precautions AB, AG, ADK, CHB/G in "General Purpose Valves (No. CB-03-1SA)" and Individual precautions 4F in "General Purpose Valves (No. CB-023SA)".



WARNING

■ Design/Consideration

- This product is for industrial use. Do not use for medical purposes, or in any equipment or circuit that concerns human life.
- The W Series does not have explosion-proof certification, so it cannot be used in atmospheres requiring explosion-proofing.

■ Working environment

- This product has outdoor specifications, but should not be used in the following environments.
 - When the ambient temperature and product temperature exceed the specifications. (The product temperature is at risk of exceeding the ambient temperature when exposed to direct sunlight.)
 - When fluid freezes.
 - Corrosive gas / In atmospheres containing liquids, chemicals, and explosive gases.
 - Locations with vibration or impact.

■ Precautions for use in cold climates

- When using this product in a cold climate, take the necessary measures to prevent freezing. Freezing can cause leakage or operation failure. Conduct appropriate dew point management of air quality.



CAUTION

■ When piping (AB, AG, ADK-W Series, CHB/G-W Series)

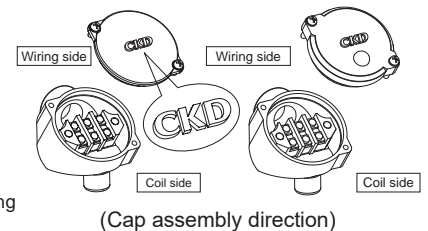
- 1) Precautions for implementing antifreezing measures
 - Take care not to interfere with heat dissipation at the coil.
 - The heat generated by the coil will increase, risking early deterioration or coil disconnection.

■ Wiring

- 1) Precautions for disassembly and assembly

● Precautions for assembly of cap

The cap must be assembled in a certain direction. When the cap is to be assembled after performing wiring work, etc., make sure to assemble the cap with attention to the assembly direction.
(In the figure to the right, align with the direction of the CKD logo mark)
When placed in the opposite direction, the cap cannot be assembled.



- 2) Wiring

- (1) Fasten crimp terminals to the electrical wiring and process the ends of the wires before installing them.

- * Use terminal thread of size M3 and a crimp terminal with an outer diameter of 7 mm or less.
- * The crimp terminals used should be sheathed terminals.

- (2) Tighten the screws with the following tightening torque.

- * Gap mounting screw tightening torque: 0.5 N·m.

- * Terminal screw tightening torque: 0.5 N·m.

- (3-1) When there are 2 lead wires wired from the terminal block of the coil.

- * Terminal box without lamp 3E (AB/G41, ADK11-W Series), B (CHB/G-W Series) terminal box 3L with lamp (AB/AG41, ADK11-W Series) has no polarity. Wire to the A terminal and C terminal on the terminal block.

- * Terminal box with lamp, BL (CHB/G-W Series)/ For DC voltage

If there is polarity, be careful while wiring.

Wire the ⊖ pole to the A terminal and the ⊕ pole to the C terminal on the terminal block.

- (The solenoid valve will operate even if the polarity is incorrect, but the lamp will not turn ON.)

- (3-2) When there are 3 lead wires wired from the terminal block of the coil. (*1)

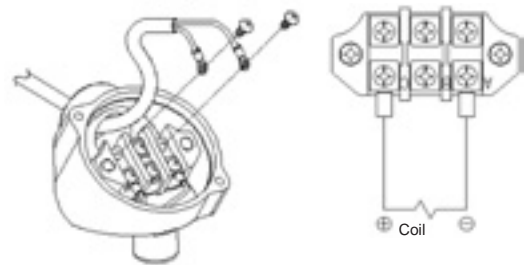
- * Terminal box 3E, 3L (ADK21-W Series) For, There is no polarity.

If the operating frequency is 50Hz, wire to the A terminal and C terminal on the terminal block.

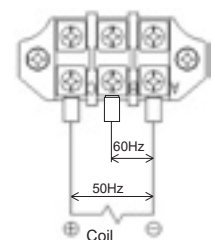
If the operating frequency is 60Hz, wire to the A terminal and B terminal on the terminal block.

- *1: 4F-W Series cannot have 3 wires.

- *2: It is recommended that you insert a fuse to the electrical circuit for safety and unit protection.



(Wiring method (for two lead wires))



(Wiring method (for three lead wires))

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Product-specific cautions: Fluid control valves AB/G41, ADK11, ADK21-W, CHB-W (Outdoor Series), pneumatic valves 4F-W (Outdoor Series)

*For precautions other than the following, refer to Individual precautions AB/AG/ADK/CHB in "General Purpose Valves (No. CB-03-1SA)" and Individual precautions 4F in "General Purpose Valves (No. CB-023SA)".

CAUTION

■ When using the product

- The male thread section of the round terminal box main body is fixed to the coil section of the solenoid valve using an adhesive. Do not remove the round terminal box main body or change the direction of the wiring port. Doing so may cause rainwater to enter the round terminal box through the male thread section. With the CHB-W Series, follow the table below and do not configure the exhaust ports for atmosphere release, and be sure to implement measures to prevent foreign matter, dust, and rainwater from entering the body. In addition, implement waterproof measures for the electrical wires and piping with the use of cable glands, etc.

Actuator (actuation)	Applicable Port
W (double acting)	-
WR* (single acting)	EXH
WV1 (with solenoid valve/double acting)	E1,E2
WX1 (with solenoid valve/single acting)	E1,E2,EXH

*When using a silencer, install the silencer to E1 and E2 for the V1 type, and to E1 for the X1 type.



■ Installation environment

- With the 4F-W Series, the PE exhaust and breathing holes are connected to the atmosphere. Install the product so that rainwater, etc., does not enter directly.

■ Installation

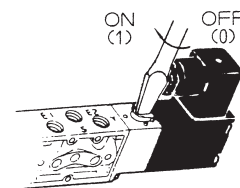
- Avoid plugging the E1 and E2 ports. This may cause malfunction. (4F1/4F3-NM Series)

■ Manual operation (CHB-W Series, 4F-W Series)

- Use the manual button for confirmation of operation during test operation. When used for long periods in the locked state, the locking mechanism may fail and switch the unit from ON to OFF.
- Manual override
As this is a pilot solenoid valve, the main valve will not be switched even if the manual override is operated unless air is supplied to the S port.
- Locking manual override
If the locking manual override is turned clockwise by approximately 45° with a screwdriver, the valve will be in the same state as when energized and locked. Do not force the rotation, as rotating the device further clockwise after the valve has been locked will cause damage. Be sure to release the lock (0 position) of the locking manual override prior to starting normal operation.

■ Other

- This product guarantees outdoor use, but not corrosion resistance (no rust, no discoloration, no peeling of paint).
- This product is provided with performance which enables outdoor use in standard environmental conditions. This product satisfies certain performance requirements after implementation of an accelerated weathering test (sunshine weathering meter) for 1000 hours and a (salt, dry, moisture) compound cycle test for 960 hours. However, the risk of defects such as rust occurring in a short amount of time may increase when using the unit in a special environment. Consult with CKD when using this device in a special environment.



■ 3-year warranty after delivery (Option G)

When requesting the above options, CKD will prepare specifications with the following descriptions.

Please make a note of the start date of use, affix a seal, and return it to CKD. Indicate the start date of use within two years after delivery.

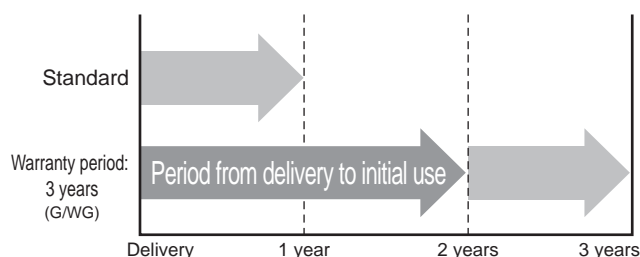
Expected start date: ____/____/____ Sign: _____

Warranty period:

A warranty for a period of three years from the date of delivery or for a period of one year from the start of use, whichever comes first.

* Please return it after the description of the scheduled date of use. Note that the 3-year warranty will not apply if there is no description or return.

* With inspection certificate, inspection guidelines, drawings, specifications, traceability system diagram





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Product-specific cautions: Pneumatic cylinder SCA2, SCS2 Series (Outdoor Series)

*Refer to the product-specific cautions in "Pneumatic Cylinders (No. CB-029SA)" for precautions other than the following SCA2, SCS2.

CAUTION

■ Design/Selection

- In dusty places or when exposed to rain or water, it is recommended to attach roofs or covers to extend the service life.
- Use dry air that does not condense according to the ambient temperature and working pressure.
- The bellows and the tie for fixing the bellows are consumable parts. Inspect and replace as necessary every 6 months.

[SCA2 Series]

- Cushion packing-Use the one with the 10 to 60°C specification. When using in a low-temperature environment, select the type without cushion and if necessary, use an external shock absorber.

[SCS2 Series]

- Cushion packing-Use the one with the 5 to 60°C specification. When using in a low-temperature environment, select the type without cushion and if necessary, use an external shock absorber.

■ Precautions for use in cold climates

- When using this product in a cold climate, take the necessary measures to prevent freezing.
- Protect the piston rod or cylinder from condensation, mist, and other moisture adhering to and freezing.

■ Other

- This product guarantees outdoor use, but not corrosion resistance (no rust or discoloration). However, rust and discoloration in parts other than the sliding parts should not cause basic operation problems.
- This product is provided with performance which enables outdoor use in standard environmental conditions. The product satisfies the specified performance after 1,000 hours of accelerated weathering test (Sunshine Weather Meter) and 960 hours of (salt, dry, wet) combined cycle test. However, the risk of defects such as rust occurring in a short amount of time may increase when using the unit in a special environment. Consult with CKD when using this device in a special environment.

■ Mounting, installation and adjustment

- The thermal expansion coefficient varies by material. The tightening force may change after the cylinder is fastened due to changes in the ambient temperature. Take measures to loosen, such as regularly tightening the screws.

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F.R.L. unit

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