

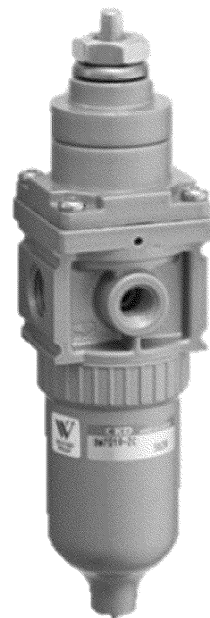
F.R. Unit

Filter•Regulator Outdoor Series

INSTRUCTION MANUAL

SM-P00100-A/2

Filter•Regulator BW7019



- Read this Instruction Manual before using the product.
- Read the safety notes carefully.
- Keep this Instruction Manual in a safe and convenient place for future reference.

PREFACE

Thank you for purchasing CKD's **"Filter-Regulator Outdoor series"**.

This Instruction Manual contains basic matters such as installation and usage instructions in order to ensure optimal performance of the product. Please read this Instruction Manual thoroughly and use the product properly.

Keep this Instruction Manual in a safe place and be careful not to lose it.

Product specifications and appearances presented in this Instruction Manual are subject to change without notice.

- The product is intended for users who have basic knowledge about materials, piping, electricity, and mechanisms of pneumatic components. CKD shall not be responsible for accidents caused by persons who selected or used the product without knowledge or sufficient training.
- Since there are a wide variety of customer applications, it is impossible for CKD to be aware of all of them. Depending on the application or usage, the product may not be able to exercise its full performance or an accident may occur due to fluid, piping, or other conditions. It is the responsibility of the customer to check the product specifications and decide how the product shall be used in accordance with the application and usage.

SAFETY INFORMATION

When designing and manufacturing any device incorporating the product, the manufacturer has an obligation to ensure that the device is safe. To that end, make sure that the safety of the machine mechanism of the device, the pneumatic control circuit, and the electric system that controls such mechanism is ensured.

To ensure the safety of device design and control, observe organization standards, relevant laws and regulations, which include the following:

ISO 4414 and JIS B 8370 (the latest edition of each standard)




In order to use our products safely, it is important to select, use, handle, and maintain the products properly.

Observe the warnings and precautions described in this Instruction Manual to ensure device safety.

Although various safety measures have been adopted in the product, customer's improper handling may lead to an accident. To avoid this:

**Thoroughly read and understand this Instruction Manual
before using the product.**

To explicitly indicate the severity and likelihood of a potential harm or damage, precautions are classified into three categories: "DANGER", "WARNING", and "CAUTION".

 DANGER	Indicates an imminent hazard. Improper handling will cause death or serious injury to people.
 WARNING	Indicates a potential hazard. Improper handling may cause death or serious injury to people.
 CAUTION	Indicates a potential hazard. Improper handling may cause injury to people or damage to property.

Precautions classified as "CAUTION" may still lead to serious results depending on the situation. All precautions are equally important and must be observed.

Other general precautions and tips on using the product are indicated by the following icon.



Indicates general precautions and tips on using the product.

Precautions on Product Disposal

WARNING

The product must be handled by a qualified person who has extensive knowledge and experience.

The product is designed and manufactured as a device or part for general industrial machinery.

Use the product within the specifications.

The product must not be used beyond its specifications. Also, the product must not be modified and additional work on the product must not be performed.

The product is intended for use in devices or parts for general industrial machinery. It is not intended for use outdoors (Except for outdoor specification products) or in the conditions or environment listed below.

- In applications for nuclear power, railroad system, aviation, ship, vehicle, medical equipment, and equipment that directly touches beverage or food.
- For special applications that require safety including amusement equipment, emergency shut-off circuit, press machine, brake circuit, and safety measures.
- For applications where life or properties may be adversely affected and special safety measures are required.

(Exception is made if the customer consults with CKD prior to use and understands the specifications of the product. However, even in that case, safety measures must be taken to avoid danger in case of a possible failure.)

Do not handle the product or remove pipes and devices until confirming safety.

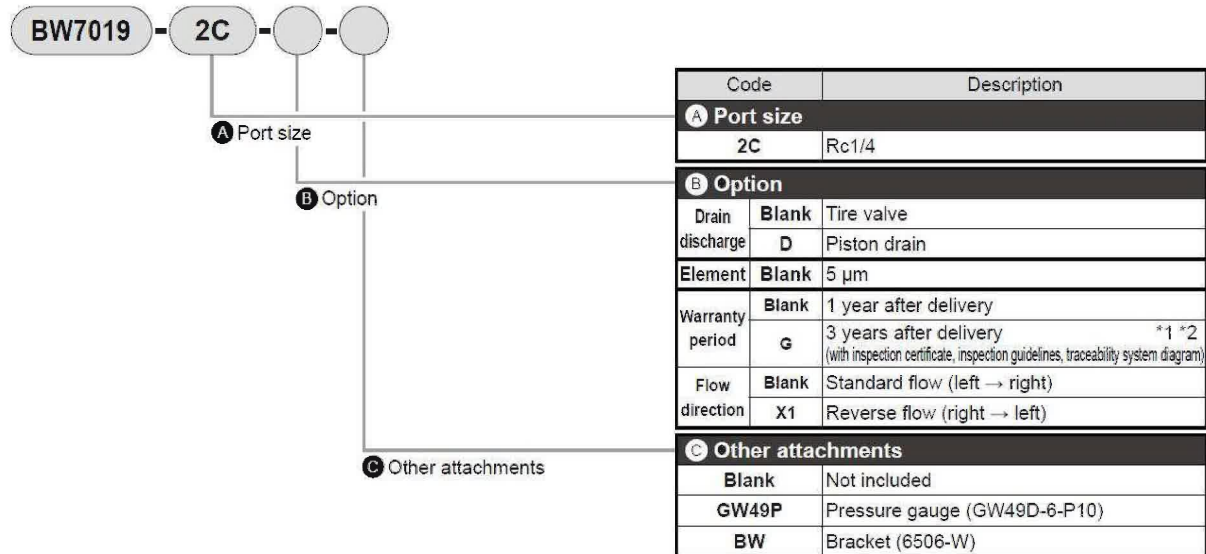
- Inspect and service the machine and devices after confirming the safety of the entire system. Also, turn off the energy source (air supply or water supply) and power to the relevant facility. Release compressed air and fluid from the system and use extreme care to avoid water or electric leakage.
- Since there may be hot or live parts even after operation has stopped, use extreme care when handling the product or removing pipes and devices.
- When starting or restarting a machine or device that incorporates pneumatic components, make sure that a safety measure (such as a pop-out prevention mechanism) is in place and system safety is secured.

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1. PRODUCT OVERVIEW

1.1 Model Number Indication



*1: The warranty period of option G is 3 years from the date of delivery or 1 year from initial use, whichever comes first.

*2: For option G, the specifications and drawings must be agreed upon.

1.2 Specifications

1.2.1 Common specifications

Item		BW7019
Max. working pressure	MPa	10
Proof pressure	MPa	1.5
Fluid temperature	°C	-20 to +60(no freezing)
Ambient temperature	°C	-20 to +60
Filtration	μm	5
Set pressure	MPa	0.04 to 0.83
Pressure relief		With relief mechanism
Port size	Rc	1/4
Wight	kg	0.45

1.2.2 Weight

Option

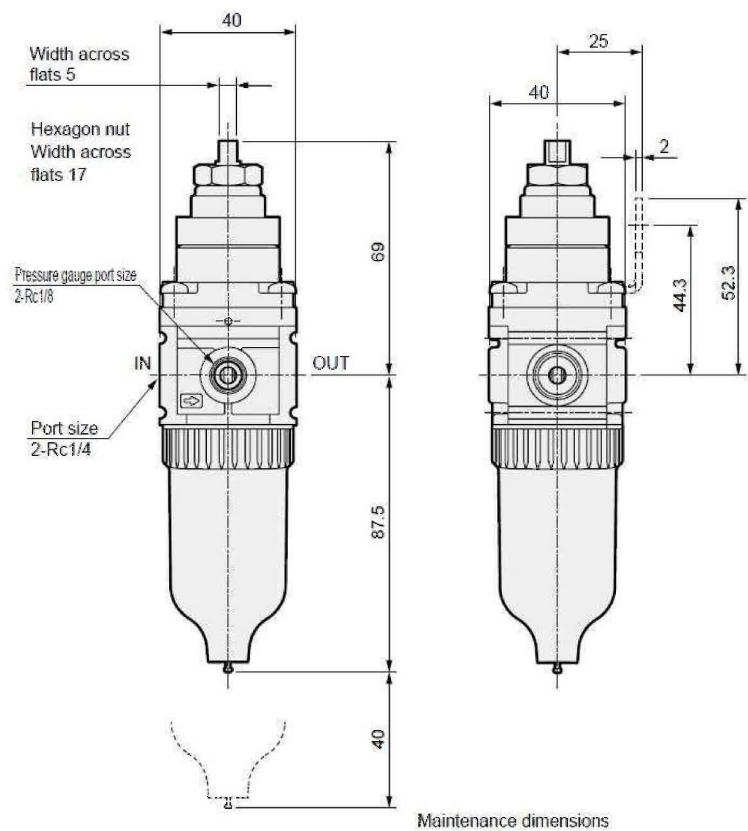
Unit: kg

	Drain dischrge	Pressure gauge	Bracket
Code	D	G	B
BW7019	0	0.086	0.03

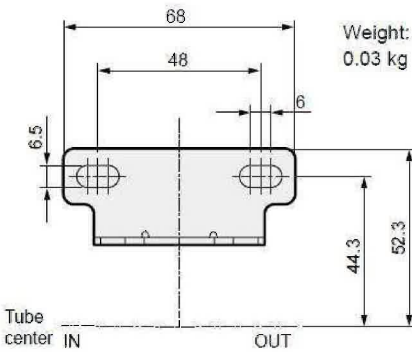
- Add to the weight of the standard accessories.

1.3 Dimensions

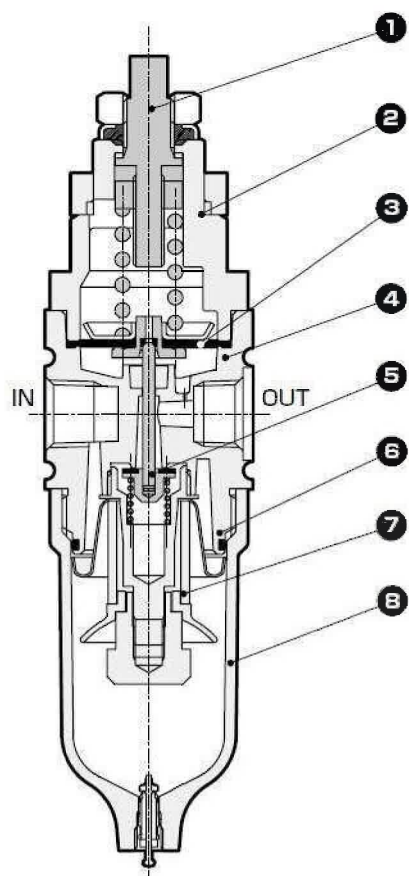
● BW7019



● Attachment
Bracket (-BW)
Part model No.: 6506-W



1.4 Internal structure



No.	Part name	Material
1	Adjusting screw	Stainless steel
2	Cover	Zinc alloy die-casting, aluminum
3	Diaphragm assembly	Nitrile rubber, copper, zinc alloy die-casting
4	Body	Aluminum alloy die-casting
5	Valve assembly	Copper alloy/hydeogenated nitrile rubber
6	O-ring	Special nitril rubber
7	Element	Polyprorylene
8	Metal bowl assembly	Zinc alloy die-casting

2. INSTALLATION

2.1 Environment

WARNING

Install safety equipment if an output pressure above the set pressure of the regulator can cause damage or operation fault on the secondary side device.

Observe the conditions of use.

- There are cases in which the regulator cannot be used in secondary side sealing circuits and balance circuits.

Residual pressure treatment (secondary pressure removal) cannot be performed when the primary pressure is released.

When using in cold regions, take appropriate measures for cold regions.

- If freezing occurs, leaks and malfunctions can occur. Dew point of air quality please perform appropriate management.

Do not use the product in an environment where:

- Ambient temperature is not within the product operating temperature range
(If you use it in an environment exposed to direct sunlight, the product temperature may become higher than the ambient temperature.)
- Air can freeze
- Atmosphere contains corrosive gas, fluids, or chemicals
- Atmosphere contains a lot of dust
- Atmosphere contains spatter
- There is a heat source in the surrounding area and heat is radiated
- Ozone is produced

2.2 Unpacking

CAUTION

Do not open the packing of the product until just before piping.

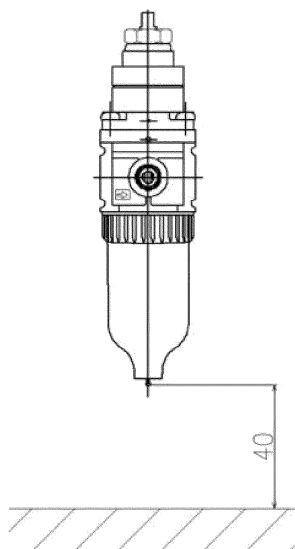
Foreign matters may enter the product and cause a failure or malfunction.

- Check that the model number ordered and the model number indicated on the product are the same.
- Check the exterior of the product for any damage.

2.3 Piping

■ Bracket (When selected by model number)

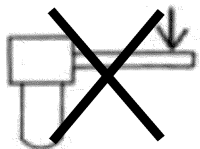
- After attaching the bracket to the product, attach the piping.
- When installing the bracket (option), remove the screws (2 places) on the back of the product and assemble using the screws included with the bracket.
Tighten the screws at 1.4 to 1.6 N·m.
- When attaching the pressure gauge to the gauge port, tighten it to 3 to 5 N·m or less.
- Do not move or swing the product by holding the pressure control section (adjusting screw).
- Install the product so that the drain outlet faces downward.
- Install as close as possible to the pneumatic equipment used.
- When disassembling and cleaning, leave a space of 40 mm or more under the bowl so that the parts can be taken out.



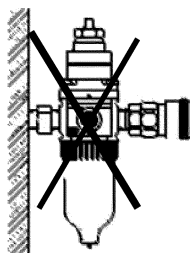
2.4 Wiring

WARNING

Do not apply pipe loads or torque to the body and the pipes.



Do not support the product at only one end as illustrated in the figure below since this may apply excessive force and lead to damage.



<Piping load torque>

Series	BW7019
Max. torque (N·m)	15

CAUTION

Fully flush and clean the pipes before use.

Residual dust or foreign matter in a pipe may cause operation fault.

Connect the pipes correctly according to the direction of flow by checking the direction of the arrow.

Prevent foreign matters from entering the pipes while piping and connecting the fitting.

Be careful not to allow cutting chips from the piping screw and seal material from entering the pipes while piping and connecting the fitting.

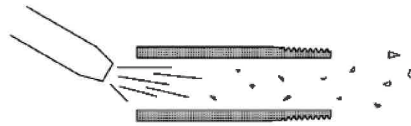
Residual dust or foreign matter in a pipe may cause lower performance of the product.

Tighten the pipes with the appropriate tightening torque.

Do not subject the body and the pipes to a bending moment that is due to pipe loads.

■ Pipe cleaning

Before piping, blow air into the pipes to clean the interior and to remove cutting chips and foreign matters.

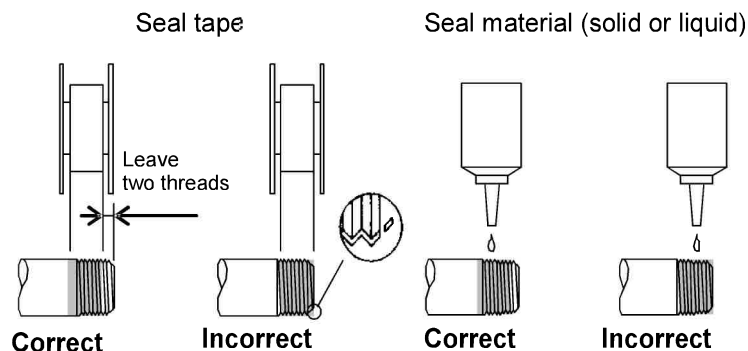


■ Seal material

Apply a seal tape or seal material to the screw threads leaving two or more threads at the pipe end uncovered or uncoated. If the pipe end is fully covered or coated, a shred of seal tape or residue of seal material may enter inside of the pipes or device and cause a failure.

When using a seal tape, wind it around the screw threads in the direction opposite from the screw threads and press it down with your fingers to attach it firmly.

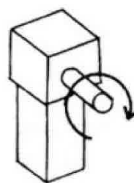
When using a liquid sealant, do not apply seal material to the internal threads.



■ Pipe screwing torque

Do not apply excessive torque to the body and the pipes when piping.

Series	BW7019
Max. torque (N·m)	15



■ Drain piping for bowl

Avoid piping that applies lateral loads to the bowl.

3. USAGE

WARNING

Use the product within the specifications.

It may cause damage to the product or malfunction of the terminal equipment, which may lead to an accident.

Do not use the product for medical purposes or in any equipment or circuit that concerns human life.

The product is designed for industrial use.

CAUTION

Check the working circuit and the working fluid.

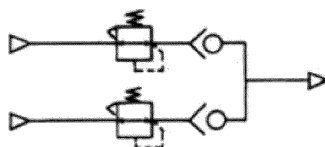
If fluids containing solids or fluids not in the specifications flow into the product, operation faults may occur. Attach a filter to the primary side of the product to prevent solids from entering.

Set the secondary side pressure of the regulator to 85% or less of the primary side pressure.

The pressure drop may increase.

Do not use the OUT side as a closed circuit when using the regulators in parallel as shown below.

If a closed circuit is required, attach a check valve to the OUT side of each regulator.



If pulsation occurs on the regulator or the filter regulator, change the conditions of use or the piping conditions. For example, lower the primary side pressure.

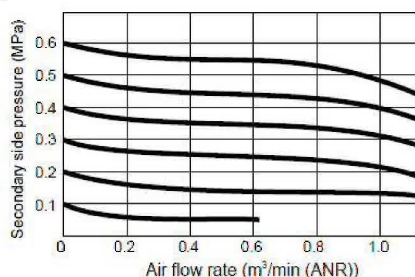
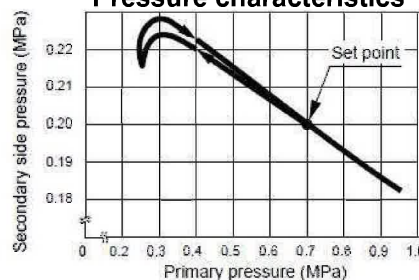
Pulsation may occur depending on the conditions of use or the piping conditions.

Check the pressure regularly.

The set pressure changes from the initial set value depending on the usage environment, conditions, and changes over time in the component materials.

The pressure is set after loosening the hexagon nut and unlocking.

There is a risk of damage if you operate it forcibly without unlocking it.

Flow characteristic**Pressure characteristics****<Conditions for using the piston drain>**

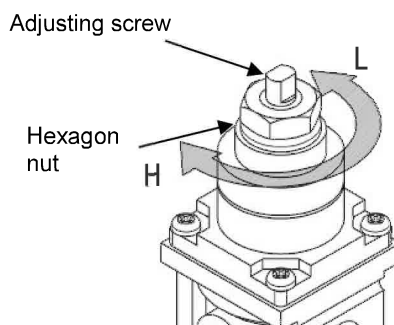
- Set the pressure to 0.10 MPa or more.
- It is an automatic discharge type for intermittent flow.
Drain does not drain under conditions of use where air is constantly flowing.

To use the product correctly:

- Set the pressure in the ascending direction, and after setting the pressure, lock the adjusting screw with the hexagon nut.
Check the primary pressure carefully before setting the pressure.
- Check the arrow pointing to the air inlet. Reverse connection may cause malfunction.
- Mount the bowl vertically vertically. Poor drainage may occur.
- Avoid using the piston drain in a place with vibration as it may cause a malfunction.

Secondary pressure adjustment

Turn the hex nut in the L direction on the top surface of the cover to loosen the hex nut. Turning the adjusting screw in the H direction increases the secondary pressure and turning it in the L direction decreases the secondary pressure. After adjusting the secondary pressure, turn the hex nut in the L direction to fix the adjusting screw and it will not turn.



4. MAINTENANCE AND INSPECTION

WARNING

Use and maintain after carefully reading the handling precautions attached to the product and understanding the contents.

Perform regular maintenance every six months to one year.

Replace consumable parts every other year.

(Metal bowl assembly, valve assembly, bottom spring, element, mantle, o-ring)

This product is guaranteed for outdoor use, but it does not guarantee corrosion resistance (no rust, no discoloration).

4.1 Daily Inspection

- Thoroughly read and understand this Instruction Manual before maintenance and inspection.
- Check that the product operates properly before starting use.

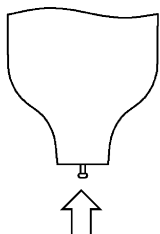
4.2 Periodic Inspection

- In order to use the product under optimum conditions, perform a periodic inspection every six months.
- It is recommended to check that there is no leakage from the pipes.

4.3 How to Discharge Drainage

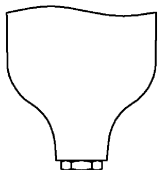
■ Discharging drainage (filter and filter regulator)

Metal bowl
No symbol



When the drain is accumulated, it is automatically discharged, but it can also be discharged manually

Metal bowl
Option: D



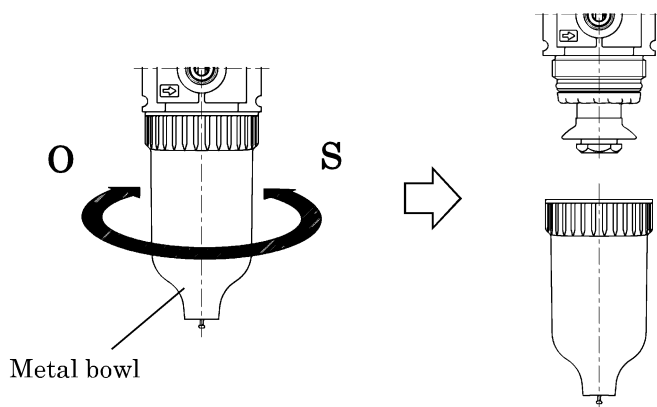
It is automatically discharged in the gap of intermittent flow.

4.4 How to Perform Maintenance

■ Removing the bowl

- How to removal

After confirming that there is no residual pressure, turn the metal bowl in the O direction.
(When installing the metal bowl, turn it in the S direction.)

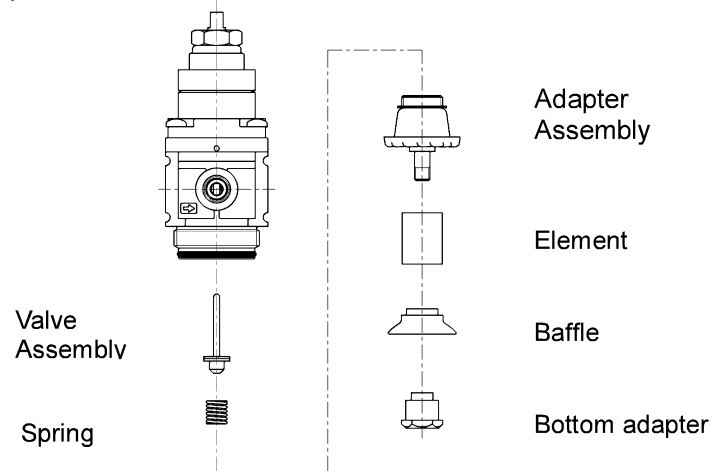


■ Element

The valve assembly can be removed during maintenance, so check it at the same time.
At that time, be careful not to lose the spring etc.

- How to removal

Turn the bottom adapter to remove it.



5. TROUBLESHOOTING

5.1 Problems, Causes, and Solutions

If the product does not operate as intended, check the table below for a possible solution.

Problem	Cause	Solution
Drainage occurs immediately after startup.	Drainage exceeds upper limit.	Discharge the drainage. (Refer to "4.3 How to Discharge Drainage".)
	Maximum processing flow rate is exceeded.	Replace with a model suitable for the working flow rate.
Piston drain does not automatically discharge drainage. Air leaks from drain port.	Piston drain is damaged, or drain port is clogged with foreign matters.	Stop supplying the compressed air, remove the bowl assembly, and clean the inside of the bowl. If the problem persists after cleaning, replace the bowl assembly.
Air leaks from where bowl is mounted.	There are scratches or foreign matters on O-ring for bowl sealing.	Stop supplying the compressed air, remove the bowl assembly, and clean or replace the O-ring.
	Bowl is damaged.	Stop supplying the compressed air, remove the bowl assembly, and replace the bowl assembly.
Air leaks from relief port when primary pressure is applied.	IN and OUT ports are connected in reverse.	Connect the product correctly.
Pressure does not rise.	Primary side pressure is insufficient.	Check the primary side pressure.
	Pipe is too long or flow of air is restricted on primary side.	Shorten the pipe or use a pipe with a larger diameter on the primary side.
	Needle of pressure gauge does not move.	Replace the pressure gauge since it may become damaged.
Pressure does not drop.	Back pressure is applied to regulator.	Check if there is a problem with the system.
	It is not relieving pressure since it is non-relief type.	Replace the product with a relief-type.
Leakages occur from cover. Set pressure rises abnormally.	Foreign matters have adhered to valve. Diaphragm is damaged.	Clean or replace the parts.

If you have any other questions or concerns, contact your nearest CKD sales office or distributor.

6. WARRANTY PROVISIONS

6.1 Warranty Conditions

■ Warranty coverage

If the product specified herein fails for reasons attributable to CKD within the warranty period specified below, 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:

- 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 this Instruction Manual.
- Failure caused by incorrect use such as careless handling or improper management.
- Failure not caused by the product.
- Failure caused by use not intended for the product.
- Failure caused by modifications/alterations or repairs not carried out by CKD.
- Failure that could have been avoided if the customer's machinery or device, into which the product is incorporated, had functions and structures generally provided in the industry.
- Failure caused by reasons unforeseen at the level of technology available at the time of delivery.
- 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.

■ Confirmation of product compatibility

It is the responsibility of the customer to confirm compatibility of the product with any system, machinery, or device used by the customer.

■ Others

The terms and conditions of this warranty stipulate basic matters.

When the terms and conditions of the warranty described in individual specification drawings or the Specifications are different from those of this warranty, the specification drawings or the Specifications shall have a higher priority.

6.2 Warranty Period

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