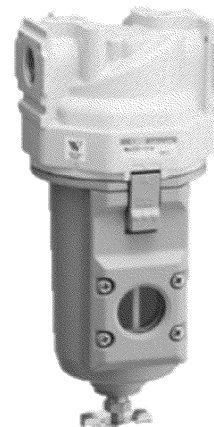


Oil mist filter

MW Outdoor-use Series

INSTRUCTION MANUAL

SM-602207-A/2



- 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 " **MW Outdoor-use Series**" Oil mist filter.

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 or water 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, JIS B 8370, JFPS 2008 (the latest edition of each standard), the High Pressure Gas Safety Act, the Industrial Safety and Health Act, other safety rules, organization standards, relevant laws and regulations




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 Use

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 (excludes outdoor 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

		A Model No.		
		MW 3000	MW 4000	MW 8000
Code	Description			
B Port size				
8	1/4	●	●	
10	3/8	●	●	
15	1/2		●	
20	3/4			●
25	1			●
C Port thread				
		*1, *2		
Blank	Rc thread (pressure unit: MPa; temperature display unit: °C)	●	●	●
N	NPT thread (pressure unit: psi; temperature display unit: °F)	●	●	●
G	G thread (pressure unit: bar; temperature display unit: °C)	●	●	●
D Option				
		*3		
Drain discharge *4	Blank	With manual cock	●	●
	F1	Auto-drain with manual override (NC: No exhaust w/o pressurization)	●	●
Mantle (Element)	Blank	M type (nominal 0.01 μm; remaining oil 0.01mg/m ³)	●	●
	S	S type (nominal 0.3 μm; remaining oil 0.5mg/m ³)	●	●
guarantee period	Blank	1 year after delivery	●	●
	G	3 years after delivery (with inspection certificate, inspection guidelines, traceability system diagram)	●	●
Flow Direction	Blank	Standard flow (left → right)	●	●
	X1	Reverse flow (right → left)	●	●
E Other attachments				
		Blank	Not included	●
		BW	C-bracket	●

⚠ Precautions for model No. selection

- *1: G and NPT threads are available for IN, OUT and drain outlet of auto-drain.
- *2: In compliance with the Measurement Act, the psi display cannot be used in Japan.
- *3: Select options for the drainage, mantle, warranty period and flow direction. When selecting options for several items, list options in order from the top.
- *4: NO auto-drain cannot be selected.
- *5: Refer to "Pneumatic, Vacuum, and Auxiliary Components (Catalog No.CB-024SA)" for the auto-drain use conditions.
- *6: The warranty period of option G is 3 years from the date of delivery or 1 year from initial use.
- *7: For option G, the specifications and drawings must be agreed upon.

1.2 Specifications

1.2.1 Common specifications

Model	MW3000-W	MW4000-W	MW8000-W
Working fluid	Compressed air		
Working pressure MPa	0.1 (≈15 psi, 1 bar) to 1.0 (≈150 psi, 10 bar) *1		
Proof pressure MPa	1.5(≈220 psi, 15 bar) *2		
Drain capacity cm ³	45	80	80
Port size Rc, NPT, G	1/4, 3/8	1/4, 3/8, 1/2	3/4, 1
Weight kg	0.38	0.62	1.45

*1: In the case of "F1" with auto-drain, the min. working pressure is 0.15 MPa.

1.2.2 Option specifications

Mantle option name		Blank (M type)	S (S type)
Max. processing flow rate/ l/min(ANR) Primary pressure 0.7MPa *1	MW3000-□-W	360	450
	MW4000-□-W	825	1000
	MW8000-□-W	2600	2900
Fluid temperature °C		-20-60(no freezing)	
Ambient temperature °C		-20~60	
Filtration rating μm		0.01 (nominal)	0.3
Secondary side oil concentration mg/m ³		≤0.01 (≤0.1 after oil saturation *1, *2)	0.5 or less *1
Mantle (element) change		1 year (6000 hours) or pressure drop 0.1 MPa	

*1: The secondary oil concentration is the value when the primary oil concentration is 30 mg/m³ and inlet air temperature is 21°C.

*2: Install an oil mist filter (S type) as a pre-filter on the primary side to prevent early clogging.

1.2.3 Weight

■ Optional mass

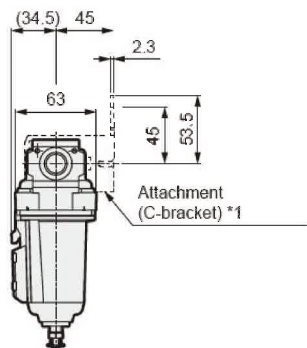
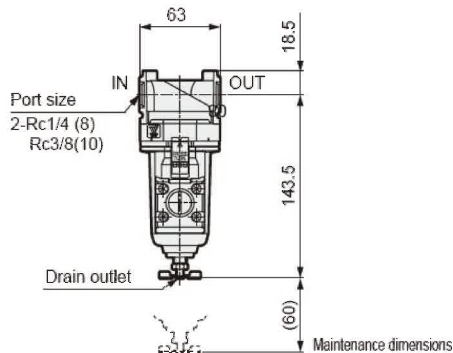
Unit : kg

	Drain discharge	Attachment
Symbol	F1	BW
MW3000	0.02	0.17
MW4000	0.02	0.21
MW8000	0.02	0.36

· Add to the standard equipment mass.

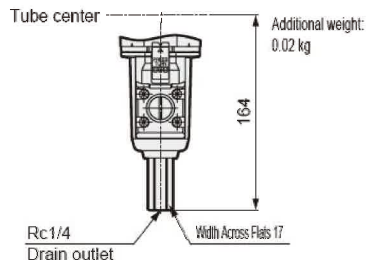
1.3 Dimensions

● MW3000-W



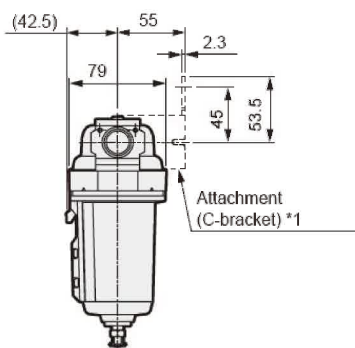
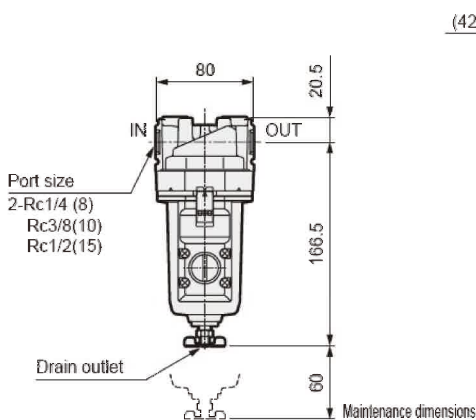
*1: Bracket is an included option.

• Optional dimensions
With auto-drain (F1)



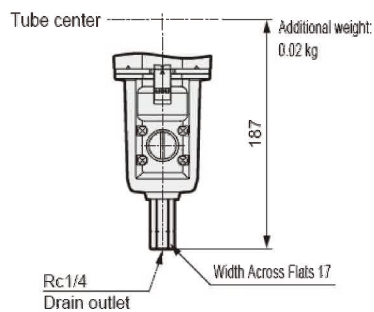
• Attachment
C-bracket (-BW)
Part model No.: B320
• Material: Steel Zinc plated

● MW4000-W

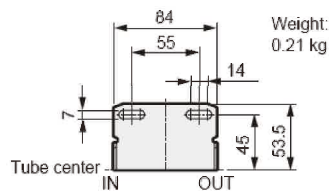


*1: Bracket is an included option.

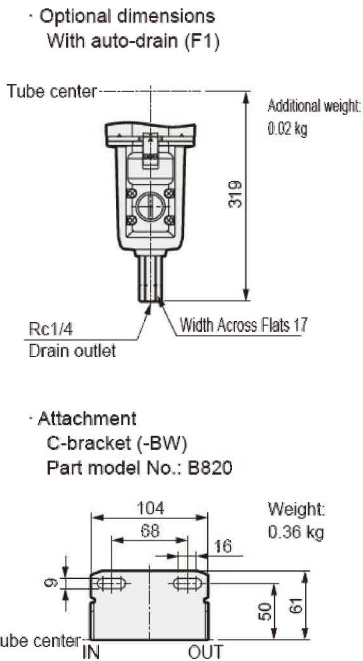
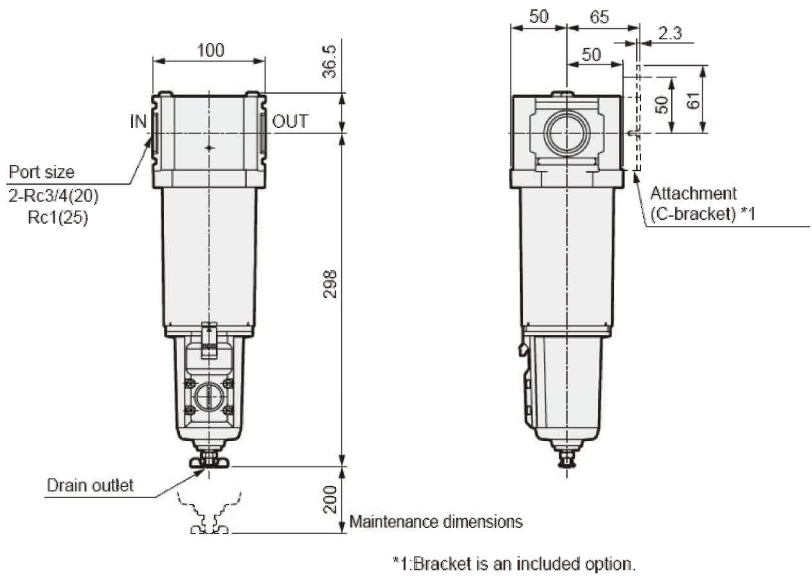
• Optional dimensions
With auto-drain (F1)



• Attachment
C-bracket (-BW)
Part model No.: B420

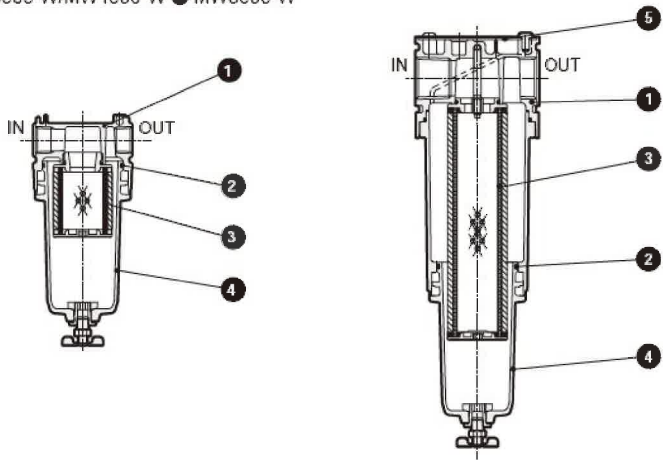


● MW8000-W



1.4 Internal Structure

● MW3000-W/MW4000-W ● MW8000-W



No.	Part name	Material
1	Body	Aluminum alloy die-casting
2	O-ring	Special nitrile rubber
3	Mantle assembly	-
4	Metal bowl assembly	Aluminum alloy die-casting, copper alloy, Zinc alloy die-casting, nitrile rubber
5	Plate cover	Aluminum

2. INSTALLATION

2.1 Environment

CAUTION

Observe the following precautions regarding the ambient environment.

- Avoid installing the product where it is subject to vibrations and shocks.

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

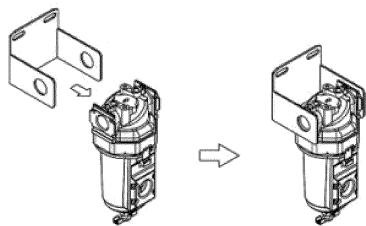
Do not open the packing of the product until just before piping.
Foreign matters may enter the product and cause a failure or malfunction.

- 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 Mounting

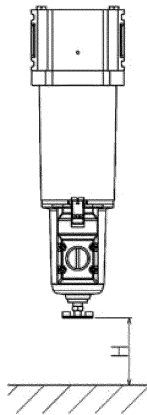
■ C-type bracket (if selected in the model number)

Attach the C-type bracket to the product as shown in the figure below before piping.



Align the convex portion of the C-type bracket with the concave portion of the product and push in.

- Install the product so that the drain outlet faces downward.
- Install as close as possible to the pneumatic equipment used.
- When disassembling and cleaning, reserve the maintenance space shown in the table below under the bowl so that the parts can be taken out.

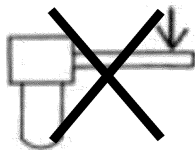


Model	Maintenance dimensions H
MW3000-W series	60mm or more
MW4000-W series	
MW8000-W series	200mm or more

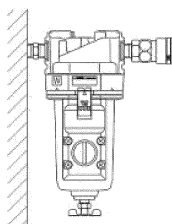
2.4 Piping

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	MW3000-W	MW4000-W	MW8000-W
Max. torque (N·m)	50	50	100

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.

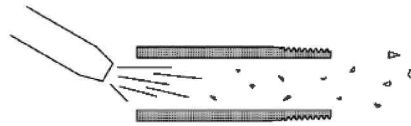
Residual dust or foreign matter in a pipe may cause lower performance of the product.

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.

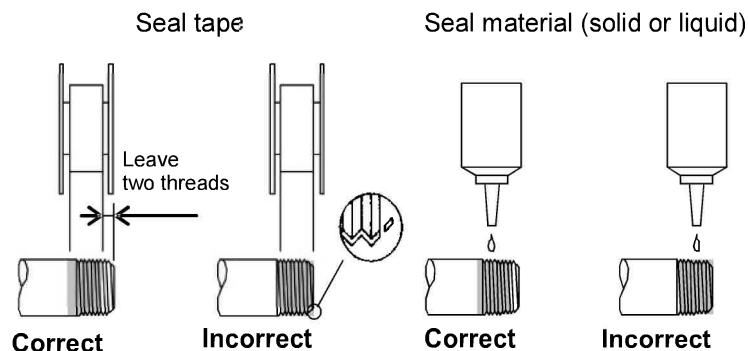


■ Seal material

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.

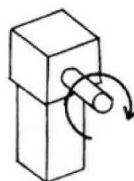
When using a liquid sealant, do not apply seal material to the internal threads.



■ Pipe screwing torque

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

Series	MW3000-W	MW4000-W	MW8000-W
Max. torque (N·m)	30	30	70

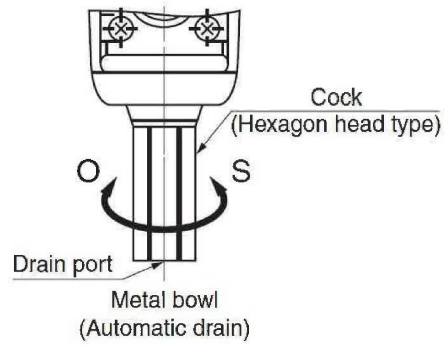


■ Drain piping for bowl

Avoid piping that applies lateral loads to the bowl.

■ Drain piping with automatic drain

Secure the hexagon part of the cock and screw the fitting into the internal threads of the drain port. When using with automatic drain, drainage cannot be manually discharged if a tightening joint is used for the drain piping.



3. USAGE

⚠ WARNING

Use only clean compressed air.

If the compressed air contains organic chemicals, chemicals or corrosive gas, it may cause malfunction or product damage.

Use the product within the specifications.

Failure to follow this instruction may result in breakage of the bowl or malfunction of terminal equipment.

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

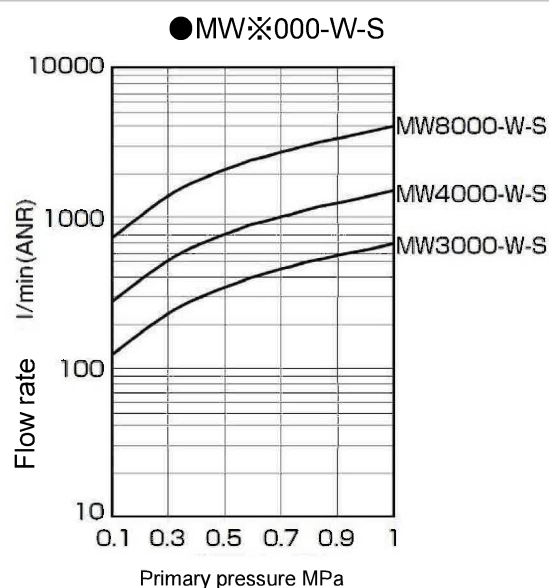
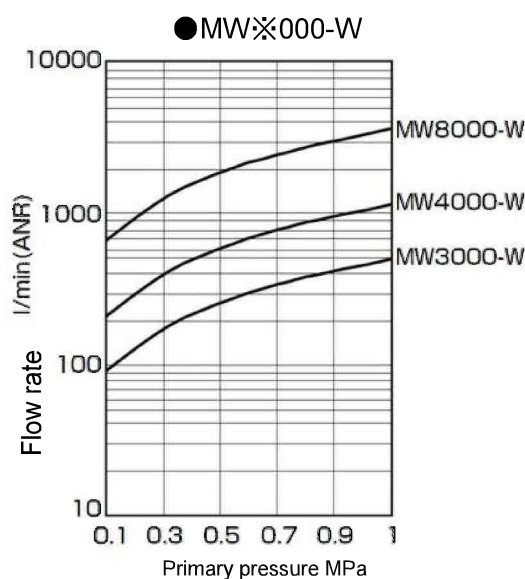
Drain accumulated in the bowl is not drained or disposed of.

It may cause environmental pollution.

Do not ride on the product.

Please do not take the load for the product.

Maximum processing flow rate graph of oil mist filter



- Use a compressor (a compressor with a capacity of 0.75 kW or less can be used).
- Set the pressure to 0.15 MPa or more.

To use the product correctly:

- Do not use if the maximum processing flow rate is temporarily exceeded or in a place with large pulsation. The drain may scatter to the secondary side and cause a malfunction of the terminal equipment.
- The primary oil concentration should be 30 mg / m³ or less.
- See 4. Maintenance for mantle life and replacement.
- For the optional auto-drain product, the minimum working pressure is 0.15MPa.

4. MAINTENANCE AND INSPECTION

CAUTION

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, 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.

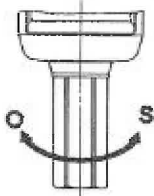
4.2 Periodic Inspection

- 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

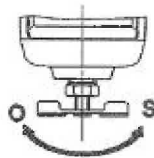
■ Discharging drainage (filter and filter regulator)

Metal bowl with automatic drain



Drainage is discharged automatically when it is accumulated or can be discharged manually. It is operated in the same way as the Manual drain metal bowl. Drainage cannot be manually discharged if a tightening joint is used for the drain piping.

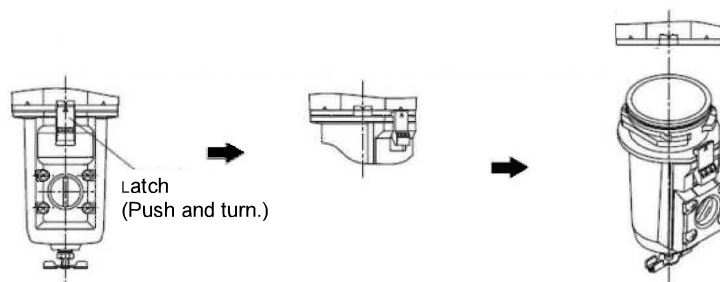
Manual discharge metal bowl



To discharge drainage, turn the cock in the O-direction, and to stop discharging, turn the cock in the S-direction.

4.4 How to Perform Maintenance

■ Removing the plastic bowl



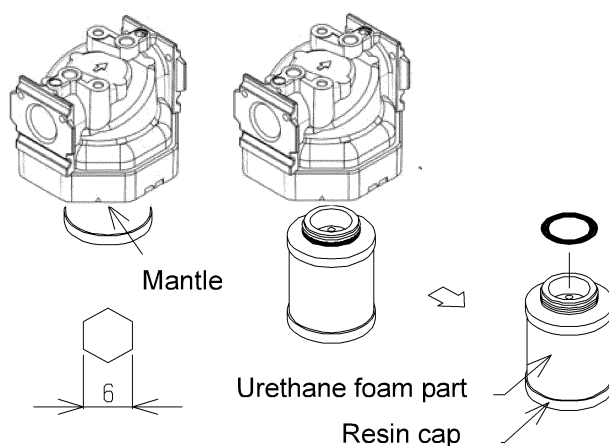
■ Element

Do not hold the central part during maintenance.
It may be damaged or unable to function.

- How to remove

Turn the mantle (element) to remove it.

If it is hard and difficult to turn by hand, you can also turn it using a hex wrench with a nominal 6 in the hexagonal hole at the bottom of the mantle (element).



- Mounting type

Turn the mantle (element) to attach it to the body.

When assembling to the body, do not hold the urethane foam part, but hold the resin cap when assembling.

The turning torque at the time of installation is 2.5 N·m.

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.
Flow rate does not flow Large pressure drop	Mantle (element) life	Stop the compressed air, remove the bowl assembly, remove the mantle (element), and replace the mantle (element) with a new one.
Drainage does not discharge when drain cock is opened.	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.
Automatic drain does not automatically discharge drainage. Air leaks from drain port.	Automatic drain is damaged, or drain port is clogged with foreign matters.	
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.

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.