CKD

New product

Drain separator
FX Series

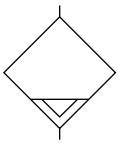
Overview

Use cyclone effect to hit water drops in compressed air to inner wall of bowl, to gather water drops to enlarge. This allows to remove more than 99% moisture. Appropriate simple method to remove moisture from air piping.

Features

- Lightweight and compact drain separator
- Moisture separating efficiency 99%
- Applicable compressor 0.75 kW to 37 kW
- FX1004, FX1011 can be module connected to FRL-3000 Series and FRL-4000 Series. FX1037 can be module connected to FRL-6000 Series and FRL-8000 Series.

- JIS symbol



RoHS

Element is not required, and achieve 99% of moisture separating efficiency

Specifications

Descriptions	FX1004	FX1011	FX1037
Working fluid	Compressed air		
Working pressure MPa	0.1 to 1.0 Note 3		
Proof pressure MPa	1.5		
Ambient temperature/fluid temperature °C	5 to 60		
Separating efficiency %	99 Note 2		
Max. flow rate Note 1 L/min (ANR)	550	1800	6100
Port size Rc, NPT, G	1/4, 3/8	1/4, 3/8, 1/2	3/4, 1
Product weight kg	0.3	0.5	1.2

Note 1: Primary pressure = 0.7 MPa.
Note 2: Water drops separating efficiency at the max. flow rate. (vaporized water drops (water vapor) cannot be separated)
Note 3: The automatic drain's minimum operating pressure for "F1" with an automatic drain is 0.15 MPa.

Weight for options

* Add to the weight of the standard accessories.

Unit: kg

Symbol	Drainage			Bowl material
	C	F	F1	M
FX1004	0	0.02	0.02	0.1
FX1011	0	0.02	0.02	0.1
FX1037	0	0.02	0.02	0.1

Refer to "Safety Precautions" on the rear side before use.

CKD Corporation
CC-1136A 3

How to order

FX1004 - 8 ○ - W - F - BW

Ⓐ Model no.
Ⓑ Port size
Ⓒ Port thread type
Ⓓ Option
Ⓔ Attachment

Symbol	Descriptions	Ⓐ Model no. FX1004	FX1011	FX1037
Ⓑ Port size				
8	1/4	●	●	
10	3/8	●	●	
15	1/2		●	
20	3/4			●
25	1			●
Ⓒ Port thread type				
Blank	Rc thread	●	●	●
N	NPT thread	●	●	●
G	G thread	●	●	●
Ⓓ Option Note 1, Note 2				
Drainage **Blank**	With manual drain cock (1/8 female thread only at metal bowl)	●	●	●
C	With manual cock (selectable only for metal bowl)	●	●	●
F	Automatic drain with manual override (NO type: exhausts without pressurized)	●	●	●
F1	Automatic drain with manual override (NC type: no exhaust without pressurized)	●	●	●
Bowl material **Blank**	Polycarbonate bowl	●	●	●
Z	Nylon bowl	●	●	●
M	Metal bowl	●	●	●
M1	Metal bowl with manual drain cock	●	●	●
Flow Direction **Blank**	Standard flow (left → right)	●	●	●
X1	Reverse flow (right → left)	●	●	●
Ⓔ Attachment (attached) Note 3, Note 4				
Blank	Not attached	●	●	●
A8*W	1/4 piping adaptor set	●	●	
A10*W	3/8 piping adaptor set	●	●	
A15*W	1/2 piping adaptor set	●	●	
A20*W	3/4 piping adaptor set		●	●
A25*W	1 piping adaptor set			●
A32*W	1 1/4 piping adaptor set			●
BW	C type bracket	●	●	●
*** Adaptor screw type**				
Blank	Rc thread	●	●	●
N	NPT thread	●	●	●
G	G thread	●	●	●

⚠ Note on model no. selection

Note 1: Select options for drainage discharge, bowl material, flow direction and others.
When selecting options for several items, list options in order from the top.
Note 2: Refer to page 2 for working conditions of the automatic drain.
Note 3: The piping adaptor set and C bracket cannot be used together.
Note 4: A joiner set is attached with the piping adaptor set.

Part list for exchange

Bowl guard

Bowl guard model no. / Model	Polycarbonate For bowl	Nylon For bowl
FX1004	F3000-W-BOWL-GUARD	F3000-W-BOWL-GUARD-Z
FX1011, FX1037	F4000-W-BOWL-GUARD	F4000-W-BOWL-GUARD-Z

Bowl assembly (Set of bowl assembly and bowl O ring)

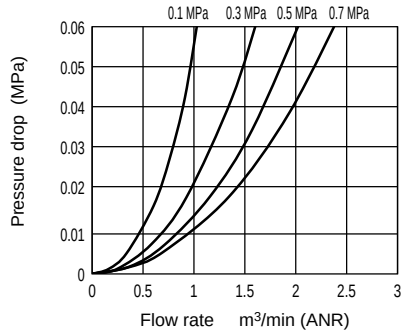
Bowl assembly model no. / Model	With manual cock PC bowl assembly	With manual cock PA bowl assembly	With manual petcock Metal bowl assembly	With Rc1/8 thread Metal bowl assembly	With manual cock Metal bowl assembly
FX1004	F3000-W-BOWL	F3000-W-BOWL-Z	F3000-W-BOWL-M	FX1004-W-BOWL-M	F3000-W-BOWL-M1
FX1011, FX1037	F4000-W-BOWL	F4000-W-BOWL-Z	F4000-W-BOWL-M	FX1011-W-BOWL-M	F4000-W-BOWL-M1

Bowl assembly model no. / Model	With NO automatic drain PC bowl assembly	With NO automatic drain PA bowl assembly	With NO automatic drain Metal bowl assembly	With NO automatic drain Metal bowl assembly
FX1004	F3000-W-BOWL-F	F3000-W-BOWL-FZ	F3000-W-BOWL-FM	F3000-W-BOWL-FM1
FX1011	F4000-W-BOWL-F	F4000-W-BOWL-FZ	F4000-W-BOWL-FM	F4000-W-BOWL-FM1
FX1037	F8000-W-BOWL-FF	F8000-W-BOWL-FFZ	F8000-W-BOWL-FFM	F8000-W-BOWL-FFM1

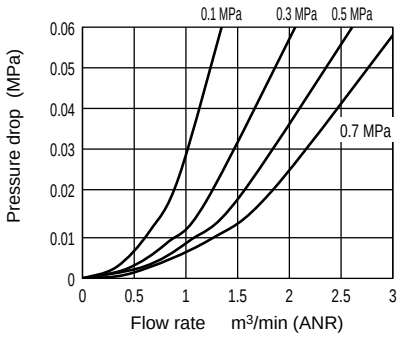
Bowl assembly model no. / Model	With NC automatic drain PC bowl assembly	With NC automatic drain PA bowl assembly	With NC automatic drain Metal bowl assembly	With NC automatic drain Metal bowl assembly
FX1004	M3000-W-BOWL-F1	M3000-W-BOWL-F1Z	M3000-W-BOWL-F1M	M3000-W-BOWL-F1M1
FX1011	M4000-W-BOWL-F1	M4000-W-BOWL-F1Z	M4000-W-BOWL-F1M	M4000-W-BOWL-F1M1
FX1037	F8000-W-BOWL-FF1	F8000-W-BOWL-FF1Z	F8000-W-BOWL-FF1M	F8000-W-BOWL-FF1M1

Flow characteristics

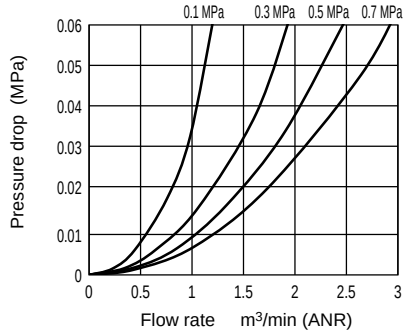
● FX1004-8-W



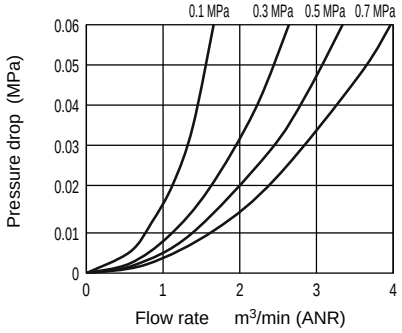
● FX1004-10-W



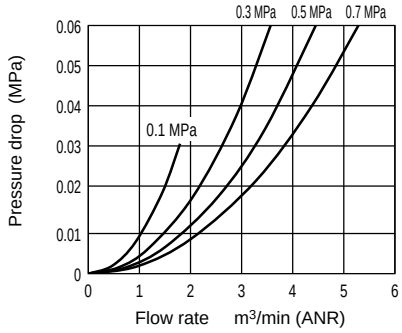
● FX1011-8-W



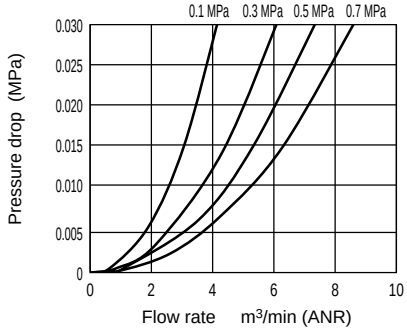
● FX1011-10-W



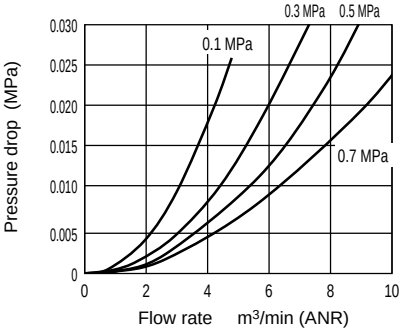
● FX1011-15-W



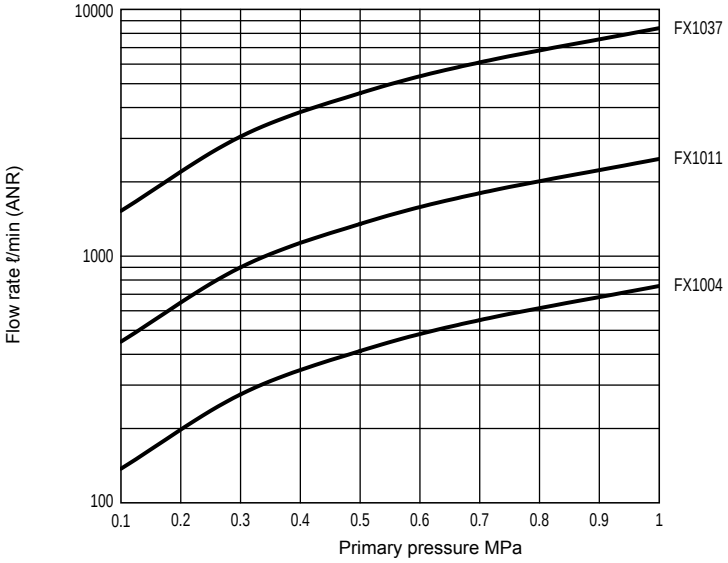
● FX1037-20-W



● FX1037-25-W

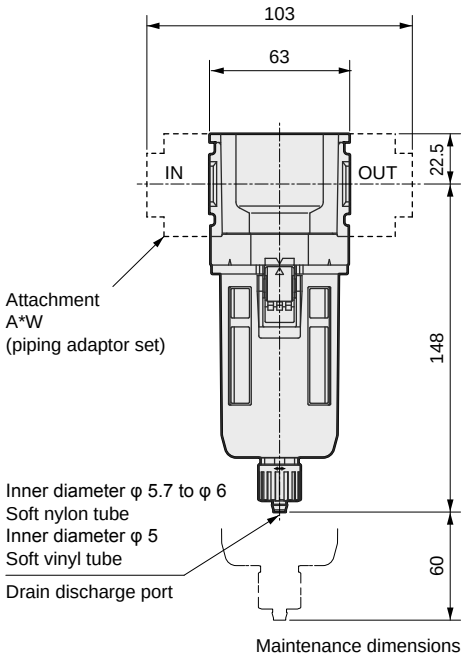


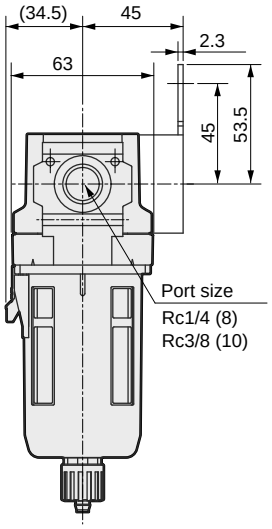
Max. flow rate



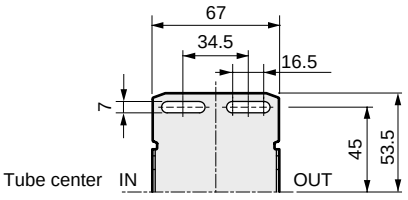
Dimensions

● FX1004-W





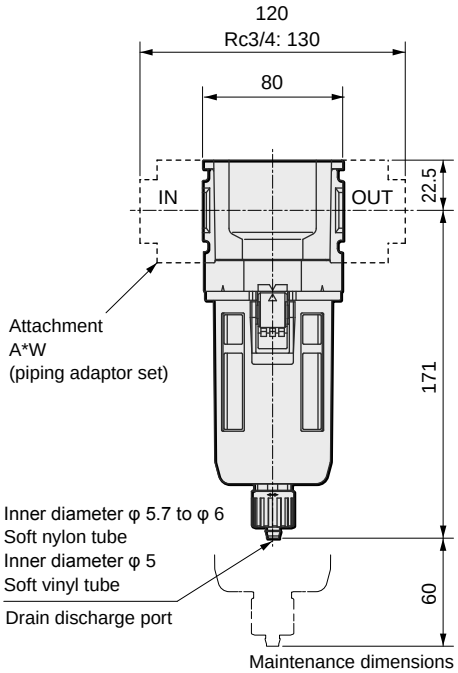
• Attachment
C type bracket (-BW)
Part no.: B320

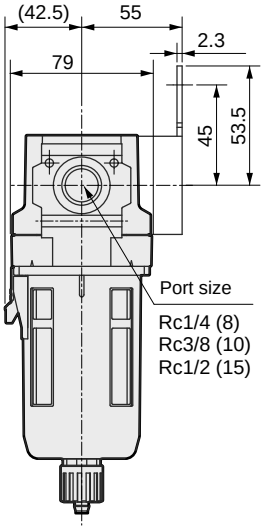


● For the plastic bowl, the dimensions are the same regardless of whether the manual cock or with automatic drain.

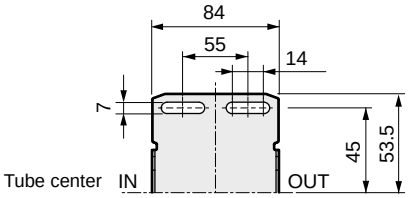
Note: C-type bracket and piping adaptor set attachments cannot be used at the same time.

● FX1011-W





• Attachment
C type bracket (-BW)
Part no.: B420

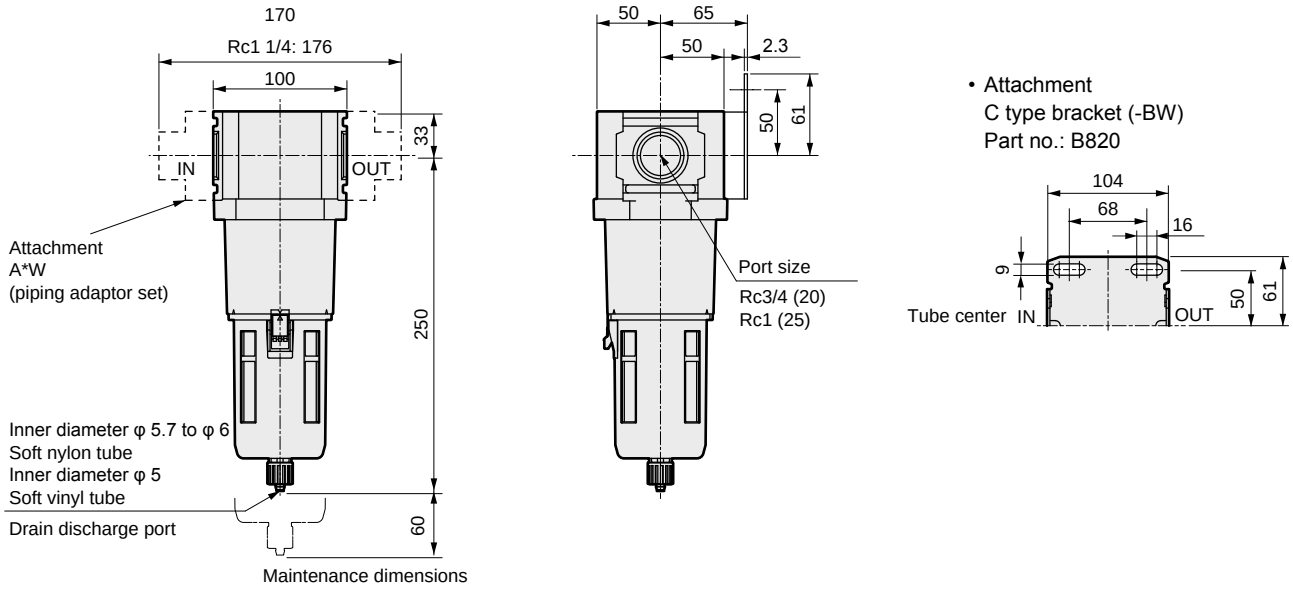


● For the plastic bowl, the dimensions are the same regardless of whether the manual cock or with automatic drain.

Note: C-type bracket and piping adaptor set attachments cannot be used at the same time.

Dimensions

● FX1037-W



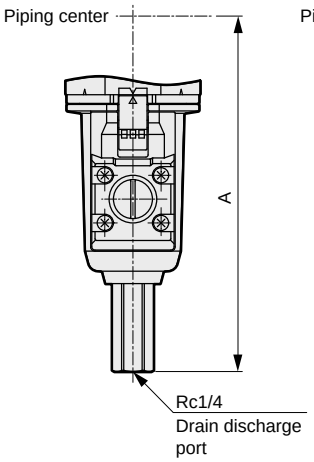
● For the plastic bowl, the dimensions are the same regardless of whether the manual cock or with automatic drain.

Note: C-type bracket and piping adaptor set attachments cannot be used at the same time.

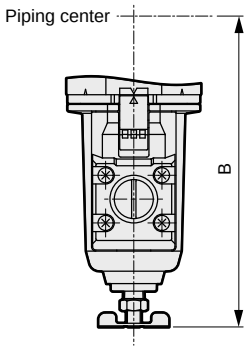
Optional dimensions

● Metal bowl FX1004-W/FX1011-W/FX1037-W (option)

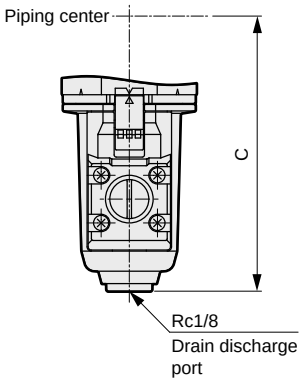
With automatic drain
Metal bowl (FM, F1M)



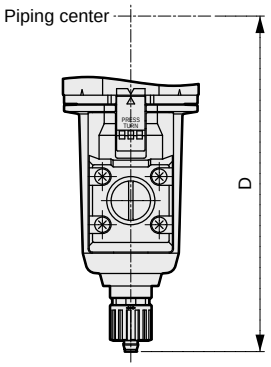
With manual petcock
Metal bowl (CM)



Without cock
Metal bowl (M)



With manual cock
Metal bowl (CM1, FM1, F1M1)



Dimensions table

Model no.	FM/F1M	CM	M	CM1/FM1/F1M1
	A	B	C	D
FX1004	164	143.5	127	154
FX1011	187	166.5	150	177
FX1037	266	245.5	229	256

Safety Precautions

Always 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 in handling.

2 Use this product in accordance with specifications.

It cannot be used outside of product-specific specifications. Do not attempt to modify or additionally machine the product.
This product's applied scope is for use as equipment and parts for general industrial machinery. Therefore, outdoor (except for outdoor specifications) use as well as the following conditions and environments shall be considered outside of the applied scope.
(If you consult CKD upon adoption and consent to CKD product specification, it will be applicable; however, safeguards should be adopted that will circumvent dangers in the event of failure.)

❶ Use for special applications including nuclear energy, railway, aircraft, marine vessel, vehicle, medicinal devices, devices or applications coming into contact with beverages or foodstuffs, amusement devices, emergency shutoff circuits, press machine, brake circuits, or for safeguard.
❷ Use for applications where life or assets could be adversely 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 (General rules for pneumatic systems)
JFPS2008 (Principles for pneumatic cylinder selection and use)
Including High Pressure Gas Safety Act, Industrial Safety and Health Act, other safety rules, body 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 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 precautio ns 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.

Limited warranty and disclaimer

1 Term of warranty

This warranty shall be valid for one year after delivery to the customer's designated site.

2 Scope of warranty

If any faults, found to be the responsibility of CKD, occur during the above warranty term, the product shall be replaced, the required replacement parts provided free of charge, or shall be repaired at the CKD factory free of charge.
This Limited Warranty will not apply to:
(1) Product abuse/misuse contrary to conditions/environment recommended in its catalogs/specifications
(2) Failure caused by other than the delivered product
(3) Use other than original design purposes
(4) Third-party repair/modification
(5) Failure caused by reason that is unforeseeable with technology put into practical use at the time of delivery
(6) Failure attributable to force majeure
The warranty covers the actually delivered product, and does not cover any damage resulting from losses induced by faults in the delivered product.

3 Compatibility confirmation

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

Safety precautions

Always read this section before use.
Also refer to the safety precautions of "Pneumatic/vacuum/auxiliary components (No. CB-024SA)".

⚠ WARNING

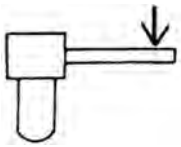
■ Design & selection

- This product is for industrial use. Must not be used in components or circuits for medical equipment or components that involve human lives.

- Material of plastic bowl is polycarbonate or nylon. Do not use in the atmosphere with synthetic oil, organic solvent, chemical materials, cutting oil, screw locking adhesive, liquid soap, hot water, etc., or possible exposure to these substances.
  Refer to the following page for details on bowl chemical resistance.

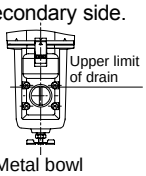
- Piping load torque
  Make sure that no piping load or torque is applied to the body or pipes.

Series	FX1004	FX1011	FX1037
Max. torque N·m	50	50	100



■ During use & maintenance

- Regularly, once or more in six months, check the plastic bowl for cracks, damage, and other deterioration.
  Cracks, damage or other deterioration could result in breakage, so if found, replace with a new bowl or with a metal bowl.
- Check regularly the plastic bowl for dust.
  · If parts are heavily contaminated or if transparency has dropped, replace with a new bowl.
  · Use a diluted neutral household detergent to wash parts, and then rinse well with clean water. Use of other agents could result in breakage.
- Removing bowl
  Before removing the bowl, the compressed air, discharge pressure in the bowl completely, and confirm that no residual pressure remains.
- Drain so that drain separator drainage does not accumulate beyond the maximum.
  Components could malfunction if drainage flows into the secondary side.



Metal bowl

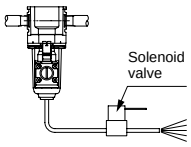
· The resin bowl must not be filled more than the "drain upper limit" or "max. level" stamped on the bowl guard.

⚠ CAUTION

■ Design & selection

- If using a water lubricated compressor circuit
  Take measures to prevent chlorine-based substances from entering the compressed air.
- Use the automatic drain under the working conditions below.
  Failure to observe this could result in operation faults.
  N.O. type automatic drain (exhaust without pressurized): F
  · Use a compressor with a capacity of 0.75 kW (90 ℓ/min (ANR)) or more.
  · Set the working pressure to 0.1 MPa or more. (Air is purged with initial drainage until pressure reaches 0.1 MPa.)
  NC type automatic drain (exhaust without pressurized): F1
  · Can be used with compressor with 0.75 kW or less.
  · Set the working pressure to 0.15 MPa or more.

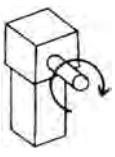
- Automatic drain may not operate appropriately, if the drain will make large flow rate. In case the large amount of drain occur, select bowl option "M", and make sure to drain discharge regularly with solenoid valves etc. from drain piping.



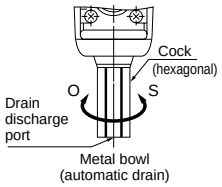
■ Installation & adjustment

- Avoid installing this product where it is subject to UV rays.
- Flush and wash pipes to be used.
  Dirt or foreign materials in piping will lower product performance.
- Check that foreign materials do not enter when tightening pipes or fittings.
  When screwing in piping or fittings, check that swarf from piping threads or sealing agent does not get inside. Any dirt or foreign matter in piping decreases product performance.
- To use drain separator properly
  1. Confirm the arrow to indicate air flow direction to perform piping in correct direction. If the flow direction is not set correctly, drain cannot be separated. (Drain will flow toward secondary.)
  2. Install vertically with the case facing down. Otherwise, drain discharge may be improper.
  3. Use of the automatic drain where vibration is present could cause faults and malfunctions.
- Pipe the automatic drain in the following conditions.
  Otherwise, malfunctioning may occur.
  Use an inner diameter of φ 5.7 and over and piping of 5 m and over for the drainage section. Avoid use vertical piping.
  Pipe so that no lateral load applies on the bowl.
  Fix the hexagon side of the cock before screwing the fitting, etc., into the Rc1/4 female screw.
- Piping screw-in torque
  Make sure that excessive torque is not applied on the body and piping when piping.

Series	FX1004	FX1011	FX1037
Max. torque N·m	30	30	70



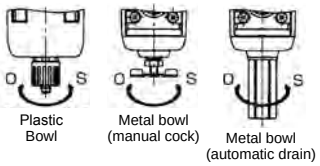
- Drain piping
  · Confirm that the drain cock is closed before inserting the tube. The drain piping for the plastic bowl has a barbed nipple, and can be directly installed. However, confirm that the drain cock is closed before inserting the tube.
  Pipe so that no lateral load applies on the bowl.
  Do not fix the tube connected to drain outlet with lateral load applied. Drain discharge with lateral load applied, external leakage may occur.
  Contact CKD, in case of controlling discharge by installing another valve at the edge of tube which is connected to drain outlet.
- Drain cock tightening torque
  · The max. tightening torque of the drain cock for the plastic bowl is 0.5 N·m.
- Drain piping of metal bowl with automatic drain
  · Fix the cock's hexagonal face before screwing the fitting, etc., into the drain port's female threads. When using the metal bowl with automatic drain, if the drain is piped with a tightening joint, manual operation is not possible.



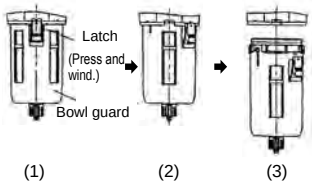
■ During use & maintenance

- Do not disassemble or modify the product.
- Read instructions and precautions enclosed with the product before use or maintenance.
  · Drainage starts when the cock is turned to O side, and the discharge stops when the cock is turned in S direction.
  Tighten in the S direction with your hands.
  · When the automatic drain is provided, drainage is discharged automatically when it accumulates. Drainage can also be discharged manually.

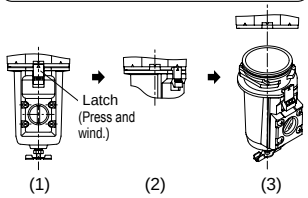
How to discharge drain



Removing resin bowl



Removing metal bowl



Chemical resistance of plastic parts

⚠WARNING

- The chemical resistance of plastic parts is shown below.
- Avoid using products in an atmosphere where chemicals are contained in compressed air, the atmosphere, or where they could adhere to parts.
- Use in the above state could lead to bowl damage and accidents.
- Avoid using these types of chemicals or in an atmosphere containing these chemicals.
- A metal bowl is used if these chemicals must be used.

Chemical resistance of plastic bowl

Use a metal bowl in an atmosphere containing the following chemicals.
Check whether the testing solutions, sealants and adhesives contain the following chemicals.

Chemicals type	Chemicals category	Main products containing the chemical	Example of general usage	Polycarbonate Bowl	Nylon Bowl
Inorganic chemicals	Acid	Hydrochloric acid, sulfuric acid, hydrofluoric acid, phosphoric acid, chromic acid, etc.	Acid washing of metals, acidic degreasing solution, film treatment solution, etc.	×	×
	Alkaline	Alkali matters such as caustic soda, caustic potash, calcium hydroxide, aqueous ammonia, sodium carbonate	Alkaline degreasing of metals, water-based coolant, leakage detection agent	×	○
	Inorganic salts	Sodium sulfide, sodium nitrate, potassium bichromate, sulfate of soda, etc.		×	○
Organic chemicals	Aromatic hydrocarbon	Benzene, toluene, xylene, ethyl benzene, stylene, etc.	Contained in paint thinner (benzene, toluene, and xylene	×	×
	Chlorinated fatty series Hydrocarbon	Methyl chloride, ethylene chloride, methylene chloride, acetylene chloride, chloroform, trichlene, perchlene, carbon tetrachloride	Organic solvent-based washing solution for metals (trichlene, perchlene, carbon tetrachloride)	×	○
	Chlorinated aromatic series Hydrocarbon	Chlorobenzene, dichlorobenzene, benzene hexachloride (B/H/C), etc.	Chlorinated aromatic	×	○
	Petroleum components	Solvent naphtha, gasoline, kerosene		×	○
	Alcohol	Methyl alcohol, ethyl alcohol, cyclohexanol, benzyl alcohol	Used as anti-freeze leakage detection agent	×	×
	Phenol	Carbolic acid, cresol, naphthol, etc.	Antiseptic solution	×	×
	Ether	Methyl ether, methyl ethyl ether, ethyl ether	Brake oil additive	×	○
	Ketone	Acetone, methyl ethyl ketone, cyclohexanone, acetophenone, etc.		×	×
	Carboxylic acid	Formic acid, acetic acid, butyl acid, acrylic acid, oxalic acid, phthalic acid, etc.	Dyes; oxalic acid for aluminum processing; phthalic acid for paint base Used as leakage detection agent	×	×
	Ester	Dimethyl phthalate (DMP), diethyl phthalate (DEP), dibutyl phthalate (DBP), dioctyl phthalate (DOP)	Lubricant/synthetic oil/additive for rust preventing agent Used as plasticizer for synthetic resin	×	○
	Oxo acid	Glycol acid, lactic acid, malic acid, citric acid, tartaric acid		×	×
	Nitro compound	Nitro methane, nitro ethane, nitro ethylene, nitro benzene, etc.		×	○
	Amine	Methylamine, dimethylamine, ethylamine, aniline, acetoacetanilide, etc.	Brake oil additive	×	×
	Nitrile	Acetonitrile, acrylonitrile, benznitrile, acetoylidyne nitrile, etc.	Raw material for nitryl rubber	×	○

○: Permissible ×: Not permissible (plastic will be damaged.)

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2015.7