

iB Series

iB-Cyclone

PAT. PEND.

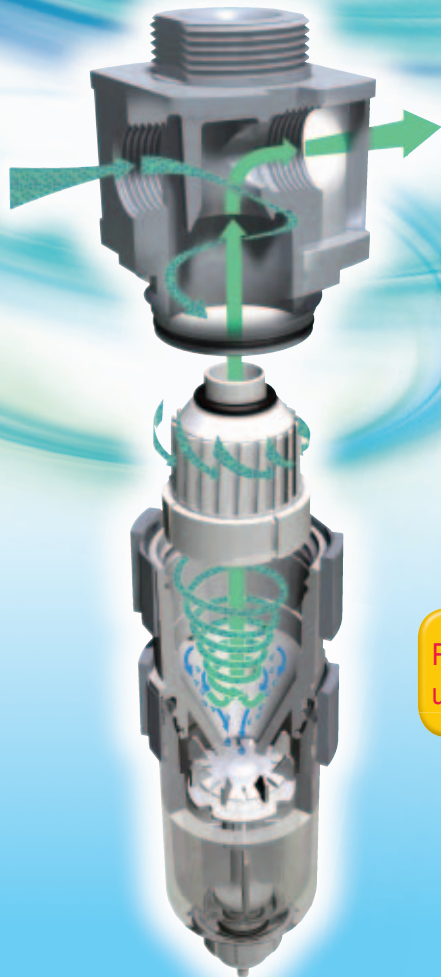


KOGANEI Brand

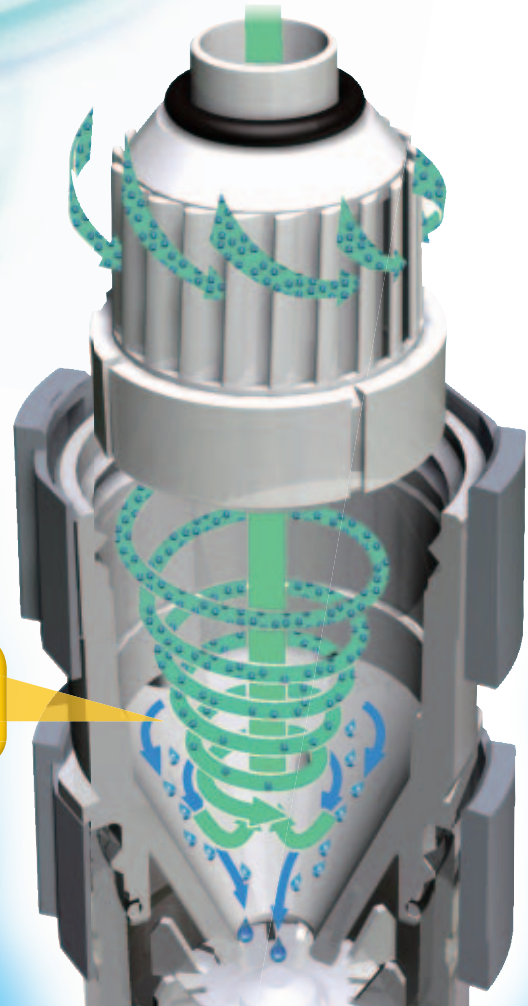
All products are **RoHS** compliant

iB-Cyclone

PAT. PEND.



Removing water droplets using high-speed cyclone



Superior water separation performance

1/2 volume and over 99%^{Note} water separation ratio compared to other devices. Note: According to Koganei measurement standards.

Cyclone system

High-speed cyclone water separator uses the power of centrifugal separation (patent pending).

Maintainability improved

Maintenance free because element is not used.
Select NO type or NC type auto drain.

Wide range of flow rates

Excellent water separation performance in a wide range of flow rates.

Compatible in a wide range of environments

Specifications for ozone resistance, NCU specifications (copper free) compatible as standard.

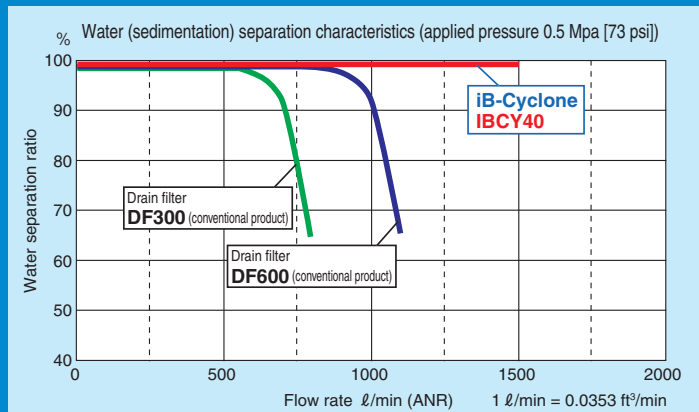
 **CAUTION** Read the safety precautions on page ③ before using this product.

User issues

- Having trouble removing water droplets from piping
- Changing elements and other maintenance is difficult.

Koganei provides solutions to user problems with **iB-Cyclone**, which delivers new value.

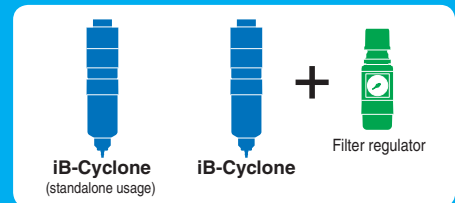
The iB-Cyclone uses a high-speed cyclonic system to maintain water separation rates even if flow is increased. Separation performance is always steady from small to large flow rates.



*Compared with Koganei drain filter (reference).

iB-Cyclone application example

- Removing water droplets in sub-lines and from various equipment
- Removing primary-side water droplets of filters and regulators
- Pre-processing air supply going to membrane dryer
- Removing water droplets from equipment end



Variations and Options

IBCY30



IBCY40



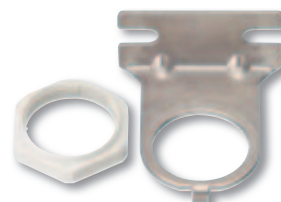
IBCY50



Auto drain type
NO (Normally open)
NC (Normally closed)



Drain cock with fitting







Bracket
8Z-CBK

Before selecting and using the products, please read all the Safety Precautions carefully to ensure proper product use.

The Safety Precautions described below are to help you use the product safely and correctly, and to prevent injury or damage to you, other people, and assets.

Always adhere to the following safety regulations: ISO4414 (Pneumatic fluid power - General rules and safety requirements for systems and their components) and JIS B 8370 (General rules relating to systems).

The directions are ranked according to degree of potential danger or damage: “DANGER!”, “WARNING!”, “CAUTION!”, and “ATTENTION!”

 Warning	Indicates situations that can be clearly predicted as dangerous. Failure to avoid the situation creates the risk of death or serious injury. It could also result in damage or destruction of assets.
 WARNING	Indicates situations that, while not immediately dangerous, could become dangerous. Failure to avoid the situation creates the risk of death or serious injury. It could also result in damage or destruction of assets.
 CAUTION	Indicates situations that, while not immediately dangerous, could become dangerous. Failure to avoid the situation creates the risk of minor or semi-serious injury. It could also result in damage or destruction of assets.
 ATTENTION	While there is little chance of injury, this content refers to points that should be observed for appropriate use of the product.

■ This product was designed and manufactured for use in general industrial machinery.

- When selecting and handling equipment, the system designer or another person with sufficient knowledge and experience should always read the Safety Precautions, catalog, User's Manual and other literature before commencing operation. Improper handling is dangerous.
- After reading the Instruction Manual, catalog, and other documentation, always store them in a location that allows easy availability for reference to users of this product.
- Whenever transferring or lending the product to another person, always attach the catalog, instruction manual, and other information to the product where they are easily visible in order to ensure that the new user can use the product safely and properly.
- The danger, warning and caution items listed under these Safety Precautions do not cover all possible contingencies. Read the catalog and instruction manual carefully, and always keep safety first.

 **Warning**

- Do not use the product for the purposes listed below:
 1. Medical equipment related to maintenance or management of human lives or bodies.
 2. Machines or equipment designed for the purpose of moving or transporting people.
 3. Critical safety components in mechanical devices.
 This product has not been planned or designed for purposes that require high levels of safety. Using the product in any of the ways described above creates the risk of loss of human life.
- Do not use the product in locations with or near dangerous substances such as flammable or ignitable substances. This product is not explosion-proof. Doing so creates the risk of ignition and fire.
- When mounting the product and workpiece, always firmly support and secure them in place. Falling, dropping, or abnormal operation of the product creates the risk of personal injury.
- Never attempt to modify the product. Abnormal operation can lead to injury.
- Never attempt inappropriate disassembly, assembly, or repair of the product relating to basic construction, or to its performance or functions. This can lead to injury, etc.
- While the product is in operation, avoid touching it with your hands or otherwise approaching too close except for specified operations. Also, do not attempt to make any adjustments to internal or attached mechanisms, or to perform any type of adjustment (disconnecting tubes or sealed plugs, adjustment of the product's mounting position, etc.) while the product is in operation. Falling, dropping, or abnormal operation of the product creates the risk of personal injury.

 **WARNING**

- Because KOGANEI products are designed for use under a wide variety of conditions, decisions concerning conformance with a particular system should be made upon the careful evaluation of a person in charge of system design. Assurances concerning expected system performance and safety are the responsibility of the designer who decides system conformity. Be sure to use the latest catalogs and technical materials to study and evaluate specification details, to consider the possibility of machine breakdown, and to configure a system that ensures fail-safe safety and reliability.

- Do not use the product in excess of its specification range. Doing so creates the risk of product breakdown, loss of function, or damage. It could also drastically reduce operating life.
- Before supplying air to the device and before starting operation, always conduct a safety check of the area of machine operation. Unintentional supply of air creates the risk of injury due to contact with moving parts.
- Do not allow the product to be thrown into fire. Doing so creates the risk of explosion, resulting in the release of toxic gasses.
- Do not sit on the product, place your foot on it, or place other objects on it. Doing so creates the risk of injury due to tripping or the product tipping over or falling, resulting in product damage and abnormal, erratic, or runaway operation.
- Before conducting maintenance, inspection, repair, replacement, or any other similar procedure, always completely cut off all air connections and confirm that residual pressure inside the product or in piping connected to the product is atmospheric pressure. In particular, be aware that residual air will still be in the compressor or storage tank. The actuator may move abruptly if residual air pressure remains inside the piping, causing injury.
- Use safety circuits or create system designs that prevent damage to machinery or injury to personnel when the machine is shut down due to an emergency stop or electrical power failure.
- Always check the catalog and other reference materials for correct product piping. Improper piping creates the risk of abnormal operation of the actuator.
- When the device not used for long periods (over 30 days), it is possible that the contacting parts may have become stuck leading to slow operation or sudden movements, and it will create the risk of injury. Check for proper operation a minimum of once every 30 days.
- Do not use the product at the beach in direct sunlight, near mercury lamp, or near equipment that generates ozone. Ozone causes rubber components to deteriorate resulting in reduced performance, or a limitation or stop of functions.
- Do not use any type of medium that is not specifically stipulated in the specifications. Using a non-specified medium could lead to short term loss of function, sudden degradation of performance, and a reduced operating life.
- In initial operations after the equipment has been idle for 48 hours or more, or has been in storage, there is a possibility that contacting parts may have become stuck, resulting in equipment operation delays or in sudden movements. Before these initial operations, always run a test to check that operating performance is normal.

- Do not use the product in locations that are subject to direct sunlight (ultraviolet rays); locations with high humidity and temperature, dust, salt, or iron powder. Do not use fluids in the product or use the product in an environment that includes corrosive fluids such as organic solvents, phosphate ester type hydraulic oil, sulfur dioxide, chlorine gas, acids, etc. It could lead to early shutdown of some functions, a sudden degradation of performance, and a reduced operating life. For information about materials, see Major Parts and Materials.
- Do not use in locations where there is a heat source nearby or that are subject to radiated heat.

CAUTION

- When mounting the product, leave room for adequate working space around it. Failure to do so will make it more difficult to conduct daily inspections or maintenance, which could eventually lead to system shutdown or damage to the product.
- Do not scratch, dent, or deform the product by climbing on it using it as a scaffold, or placing objects on top of it. Doing so creates the risk of damage to or breakage of the product, resulting in operational shutdown or degraded performance.
- Always be sure to post an "operation in progress" sign during installation, adjustment, or other operations, to avoid unintended air supply. Unintentional supplying of air can cause sudden operation and may result in injury.
- Use in extremely dry air under temperatures lower than -20 °C [-4 °F] may affect the quality of the lubricating oil used. This creates the risk of degraded performance, loss of function, or other problems.

ATTENTION

- When considering the possibility of using this product in situations or environments not specifically noted in the Catalog or Instruction Manual, or in applications where safety is an important requirement such as in an aircraft facility, combustion equipment, leisure equipment, safety equipment, and other places where human life or assets may be greatly affected, take adequate safety precautions such as the application with enough margins for ratings and performance or fail-safe measures. Be sure to consult us with such applications.
- Always check the catalog and other reference materials for product piping.
- Use a protective cover and other means to ensure that the operating parts of mechanical devices are isolated and do not come into direct contact with human bodies.
- Do not configure control of the system in a way that could cause workpieces to fall due to power failure.
Configure control of the system to prevent workpieces, and other items from falling due to power failure or by emergency stop of mechanical devices.
- When handling the product, wear protective gloves, safety glasses, safety shoes etc.
- When the product can no longer be used or is no longer necessary, dispose of it appropriately as industrial waste.
- Pneumatic equipment can exhibit degraded performance and function over its operating life. Always conduct daily inspections of the pneumatic equipment, and confirm that all requisite system functions are satisfied, to prevent accidents from happening.
- For inquiries about the product, contact your nearest KOGANEI sales office or the KOGANEI overseas group. The addresses and telephone numbers are shown on the back cover of this catalog.

Other

- Always observe the following items.
 1. When using this product in pneumatic systems, always use genuine KOGANEI parts or compatible parts (recommended parts).
When conducting maintenance and repairs, always use genuine KOGANEI parts or compatible parts (recommended parts).
Always observe the prescribed methods and procedures.
 2. Never attempt inappropriate disassembly or assembly of the product relating to basic configurations, or its performance or functions.

KOGANEI shall not be held responsible for any problems that occur as a result of these items not being properly observed.

Warranty and General Disclaimer

1. Warranty Period
KOGANEI warrants this product for a period of no more than 180 days after it is purchased.
2. Scope of Warranty and General Disclaimer
 - (1) The KOGANEI product warranty covers individual products. When a product purchased from KOGANEI or from an authorized KOGANEI dealer or KOGANEI distributor malfunctions during the warranty period in a way that is found to be attributable to KOGANEI responsibility, KOGANEI will repair or replace the product free of charge. Even if a product is still within the warranty period, its durability is determined by its operation cycles and other factors. Contact your nearest KOGANEI sales office or the KOGANEI overseas group for details.
 - (2) KOGANEI shall not be held responsible for any losses or for any damage to other machinery caused by breakdown, loss of function, or loss of performance of KOGANEI products.
 - (3) KOGANEI shall not be held responsible for any losses due to use or storage of the product in a way that is outside of the product specifications prescribed in KOGANEI catalogs and the instruction manual, and/or due to actions that violate the mounting, installation, adjustment, maintenance and other safety precautions.
 - (4) KOGANEI shall not be held responsible for any losses caused by breakdown of the product due to factors outside the responsibility of KOGANEI, including but not limited to fire, natural disaster, the actions of third parties, and intentional actions or errors by you.

Handling Instructions and Precautions



General Precautions

- Before performing piping work, thoroughly flush the inside of the pipes with compressed air.
Machining chips, sealing tape, rust and other debris getting entered in during piping work may result in lowered performance and functionality or function stoppage.
- This product cannot be used when the medium or ambient atmosphere includes any of the following substances:
Organic solvents, phosphate ester type hydraulic oil, sulfur dioxide, chlorine gas, fluorine gas, ozone, acids, or other corrosive gasses.
- The bowl material is polycarbonate. This product cannot be used in environments with the above gasses and fluids, nor threadlocking adhesive, leak detection fluid, hot water or where it may be exposed to them. This product cannot be used in direct ultra-violet light. See page 8 for details.
- Cover the unit or take other measures when using it in locations where it might be subject to excessive dust, dripping water, dripping oil, etc.
- Do not exceed the specified volume of droplets for the product. The droplets may splash into the secondary side. See page 10 for information about separation characteristics.
- If mist or condensation forms in the product, it may splash into the secondary side.
- If anything larger than 0.5 mm [0.02 in] enters the primary side of the iB-Cyclone, remove it before using the product.



Mounting and Piping

CAUTION

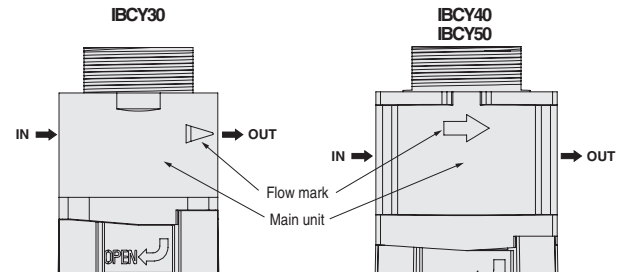
iB-Cyclone

Note

- The iB-Cyclone is for removing water droplets (sedimentation). Steam in pressurized air cannot be removed (dehumidifying cannot be done). Use a membrane air dryer or something on the secondary side if dehumidifying is needed.
- Place a device to lower the supplying air from the ambient temperature, by using a refrigerated air dryer or after cooler in the air line so condensation does not occur in the secondary side of piping of the iB-Cyclone. Also, install the iB-Cyclone as close as to the using pneumatic equipment.

- Install in a location where the air supply and the ambient temperature is under 60 °C [140 °F].
- Install vertically so the piping connection portion is up and the drain outlet is down.
- Allow enough space to easily do maintenance tasks, such as turning the guard button and attaching and removing the bowl.

- Connect the piping so the air flows in the direction of the arrow (flow mark) on the product. The water droplets removal function will be ineffective if the flow is reversed.



- Do not place any weight of the product's piping or apply excessive torque on the product. When tightening the piping, hold the main unit and tighten it to the torque recommended in the diagram below.

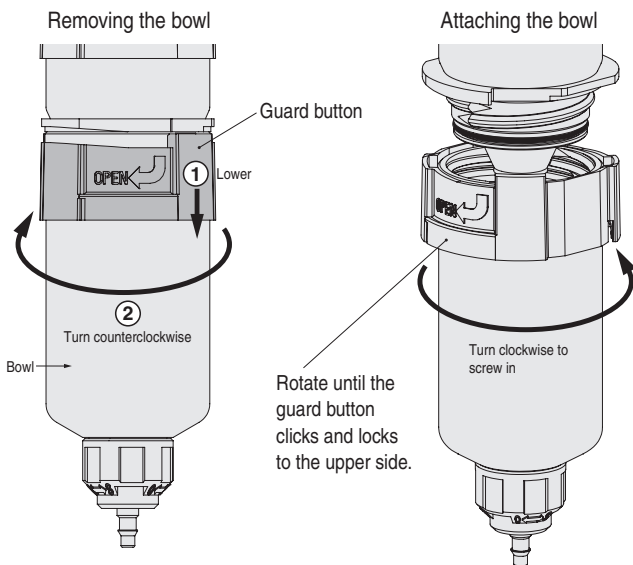
Recommended tightening torque				N·m [ft·lbf]
Connecting thread	1/8	1/4	3/8	1/2
Torque	7~9 [5.2~6.6]	12~14 [8.9~10.3]	22~24 [16.2~17.7]	28~30 [20.7~22.1]

- Large moment and vibration are easily transmitted from steel or non-flexible piping, place a flexible hose between the product and the piping to prevent this from affecting the product.

● Periodic maintenance

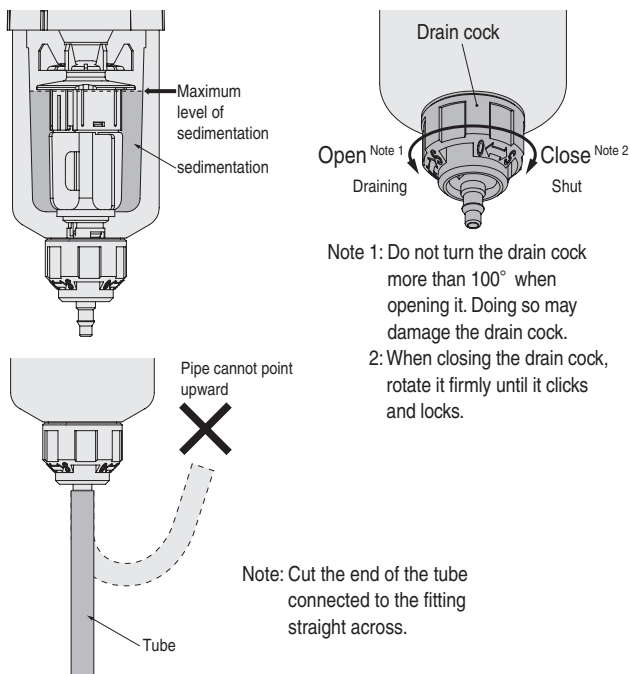
Bowl

1. Do periodic inspections to look for cracks, scratches, or other deterioration in the bowl (clear plastic part).
2. If you find any cracks, scratches, or other deterioration, replace the bowl with a new one, because it may cause a breakdown. See page 9 for information about ordering bowls.
3. Replace the bowl with a new one if it becomes dirty or the transparency is reduced. To wash the bowl, use diluted household neutral detergent to wash it and then rinse it off with water.
4. Remove and replace the bowl as shown in the diagram below (release all pressure from inside the product before starting work).



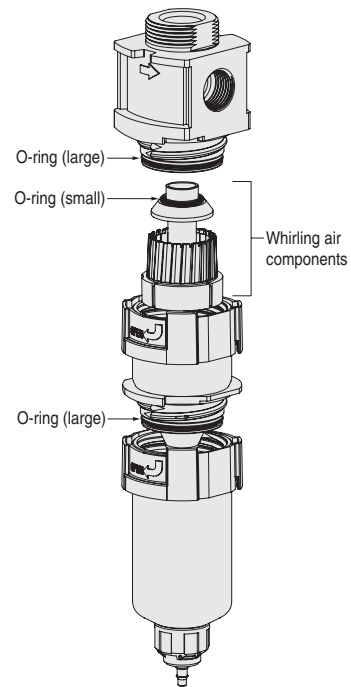
Drain cock

1. If the volume of sedimentation is greater than that shown in the left side diagram below, the water droplets removal function is greatly reduced. Be sure to drain before the sedimentation reaches the level shown in the left side diagram below. Turn the drain cock with your hand in the case.
2. A tube with an inner diameter of $\phi 4$ [0.157 in] can be attached to the drain cock. Make sure the drain cock is closed (locked) before attaching the tube. Do not allow tubing to become severely bent or twisted in the vicinity of the fitting. Lateral force may damage the fitting. Do not point the pipe upward and use a pipe that is under 5 m [16.4 ft].



Whirling air components

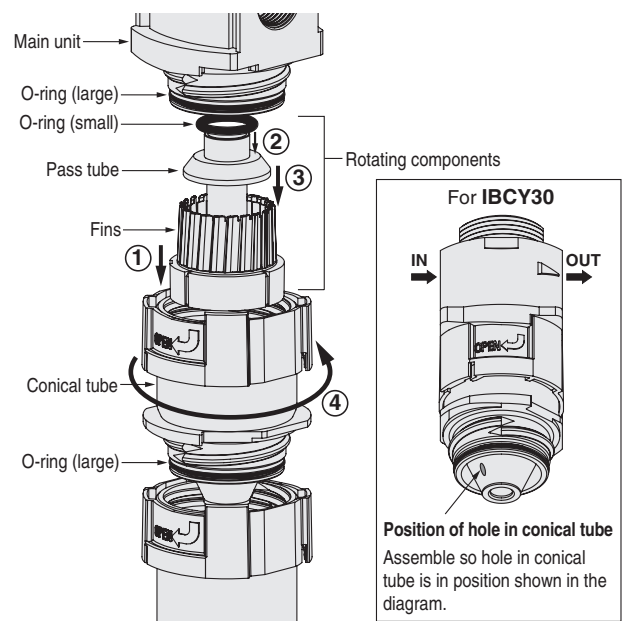
1. Dust collecting in the whirling air components reduces the separation function. If this happens, disassemble and wash the product to remove the dust as shown in the diagram below (release all pressure from inside the product before starting work).
2. Use a Seal Kit to replace the o-rings when reassembling the whirling air components. See page 9 for information about ordering Seal Kits.



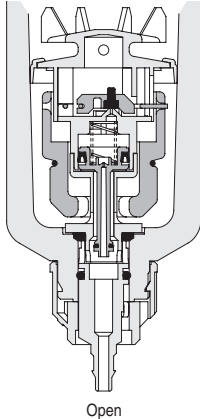
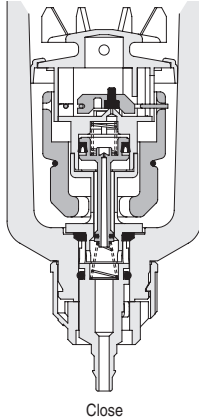
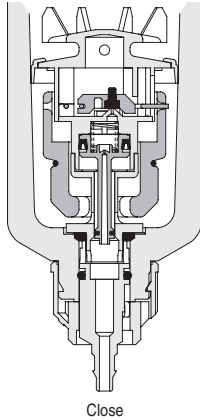
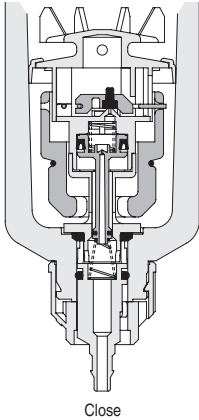
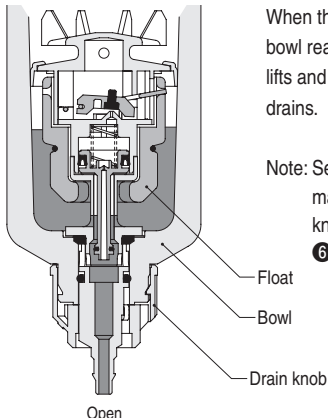
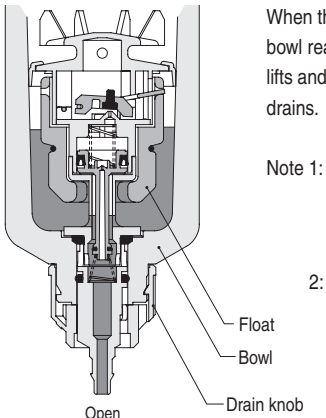
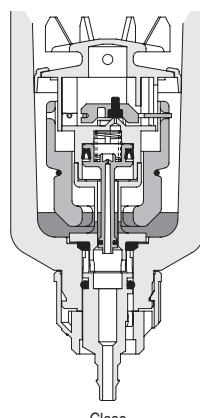
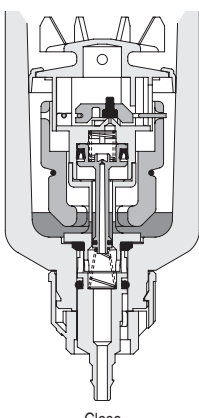
Assembly method

Reassemble according to the following procedure.

- ① Insert the fins into the conical tube and press them in with your hand.
- ② Attach a new o-ring (small) to the pass tube.
- ③ Fit the pass tube to the fins (fit it so it touches the seating of the fins).
- ④ Replace the two o-rings (large) and connect the conical tube to the main unit.



● Explanation of operation of auto drain system

State	Type	NO type	NC type
Not pressurized	NO type	 <p>Open</p> <p>When unpressurized, the draining outlet opens and the sedimentation drains naturally.</p>	 <p>Close</p> <p>When unpressurized, the draining outlet closes and the sedimentation cannot drain.</p> <p>Note: Sedimentation does not drain when unpressurized, if there is a lot of sedimentation even when unpressurized (low pressure) condition, it may be necessary to drain the sedimentation by hand.</p>
		 <p>Close</p> <p>Air and sedimentation will be discharged from the draining outlet until the pressure exceeds the minimum operating pressure (0.15 MPa [22 psi]). The air and sedimentation will stop after stored pressure exceeds the minimum operating pressure.</p> <p>Note: A compressor with a small discharge volume may not reach full pressure, as there is exhaust air until the minimum operating pressure is exceeded.</p>	 <p>Close</p> <p>In the same way, when unpressurized, the draining outlet closes and the sedimentation cannot drain.</p>
Draining sedimentation	NO type	 <p>Open</p> <p>When the level of sedimentation in the bowl reaches a specified level, the float lifts and the sedimentation automatically drains.</p> <p>Note: Sedimentation can be drained manually by turning the drain knob counterclockwise. See page 6 for details.</p>	 <p>Open</p> <p>When the level of sedimentation in the bowl reaches a specified level, the float lifts and the sedimentation automatically drains.</p> <p>Note 1: Supply pressure is needed to operate the auto drain. A minimum of 0.15 MPa [22 psi] is needed for the supply pressure. 2: Sedimentation can be drained manually by turning the drain knob counterclockwise. See page 6 for details.</p>
		 <p>Close</p> <p>When the sedimentation drains, the float lowers and the draining outlet closes, and sedimentation stops draining.</p>	 <p>Close</p> <p>When the sedimentation drains, the float lowers and the draining outlet closes, and sedimentation stops draining.</p>

● About the chemical resistance of polycarbonate

The chemicals in the following table degrade polycarbonate. They may damage the bowl and cause an accident. Do not allow the following chemicals into the compressed air or the environment around the product, do not allow them to contact the product. This does not mean that polycarbonate is chemically resistant to all chemicals not listed below.

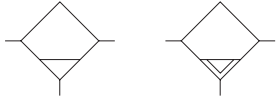
Type	Classification	Chemical name	Application example
Inorganic compound	Acid	Hydrochloric acid, sulfuric acid, nitric acid, fluorine, phosphoric acid, chromic acid	Coating processing, acid degreasing, and pickling of metals
	Alkali	Caustic soda, caustic potash, hydrated lime, aqueous ammonia, sodium carbonate	Alkaline degreasing of metals
	Inorganic salt	Sodium sulfide, potassium nitrate, potassium dichromate, sodium nitrate	Dyes, rust inhibitor
Organic compounds	Aromatic hydrocarbons	Benzene, toluene, xylene, ethylbenzene, styrene	Paint thinner (benzene, toluene, xylene)
	Chlorinated aliphatic hydrocarbons	Methyl chloride, ethylene chloride, methylene chloride, acetylene chloride, chloroform, trichlene, tetrachloroethylene, carbon tetrachloride	Organic solvents for metal cleaning (trichlene, tetrachloroethylene, carbon tetrachloride)
	Chlorinated aromatic hydrocarbons	Chlorobenzene, dichlorobenzene, benzene hexachloride (BHC)	Agricultural chemicals
	Petroleum components	Solvent, naphtha, gasoline	Fuel
	Alcohol	Methyl alcohol, ethyl alcohol, cyclohexanol, benzyl alcohol	Anti-freezing agents
	Phenol	Carbolic acid, cresol, naphthol	Antiseptic solutions
	Ether	Methyl ether, methylethyl ether, ethyl ether	Brake fluid additive, detergent
	Ketones	Acetone, methyl ethyl ketone, cyclohexane, acetophenone	Cleaning solutions
	Carboxylic acid	Formic acid, acetic acid, butyl acid, acrylic acid, oxalic acid, phthalic acid	Dyes, aluminum processing solution (oxalic acid), paint base (phthalic acid)
	Phthalic acid ester	Dimethyl phthalate (DMP), diethyl phthalate (DEP), dibutyl phthalate (DBP), dioctyl phthalate (DOP)	Lubricants, synthetic hydraulic fluids, rust inhibitor additives, synthetic resin plasticizer
	Oxyacid	Glycolic acid, lactic acid, malic acid, citric acid, tartaric acid	Food preservatives, acidifiers
	Nitro compounds	Nitromethane, nitroethene, nitro ethylene, nitrobenzene	Paint medium, explosives
	Amine	Methylamine, dioctylamine, ethylamine, aniline, acetanilide	Brake fluid additive
	Nitrile	Acetonitrile, acrylonitrile, benzonitrile	Nitrile rubber materials

iB-Cyclone

IBCY30, IBCY40, IBCY50



Symbol



Auto drain type

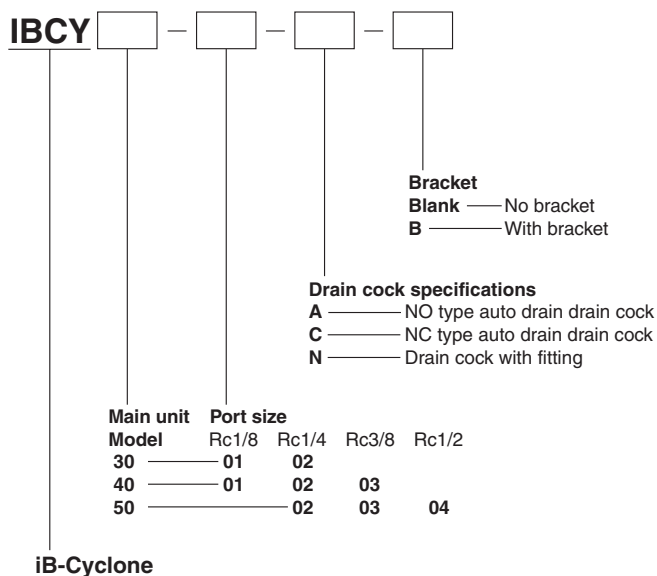
Specifications

Item	Model	IBCY30	IBCY40	IBCY50
Medium		Air		
Port size	Rc	1/8, 1/4	1/8, 1/4, 3/8	1/4, 3/8, 1/2
Maximum operating pressure	MPa [psi]	1.0 [145]		
Proof pressure	MPa [psi]	1.5 [218]		
Operating temperature range (ambient and medium)	°C [°F]	0~60 [32~140]		
Water separation rate ^{Note 1}	%	99 or more		
Maximum flow rate ^{Note 2}	ℓ /min [ft ³ /min] (ANR)	850 [30.0]	1500 [53.0]	2800 [98.8]
Materials used in major parts	Main unit	Die cast aluminum alloy		
	Bowl	Polycarbonate		
	Bracket	Steel plate (electroless nickel plated)		
Mass (standard product, maximum port size)	kg [oz]	0.15 [5.3]	0.20 [7.1]	0.30 [10.6]
Options		Bracket		

Note 1: According to Koganei measurement conditions.

Note 2: Maximum flow rate in an environment with 0.5 MPa [73 psi] and 0.1 MPa [14.5 psi] pressure drop (maximum port size piping). Check the graphs of characteristics on each 10 page when making a decision.

Order Codes



Order codes for brackets only

8Z-CBK

* Common to all body sizes



Maintenance parts

Bowl assembly

BA-IBCY -

Drain cock specifications

A — NO type auto drain drain cock
C — NC type auto drain drain cock
N — Drain cock with fitting

Body size

30 — for IBCY30
 40 — for IBCY40
 50 — for IBCY50

* If the body size is the same, you can purchase the bowl assembly and change the drain cock with another specification one.



Auto drain type



With fitting

Seal kit (o-ring (large) 2 pcs., o-ring (small) 1 pc.)

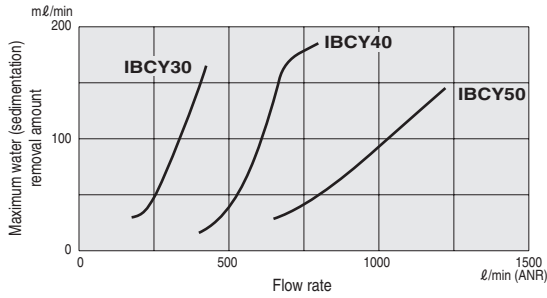
SRK-IBCY

Body size

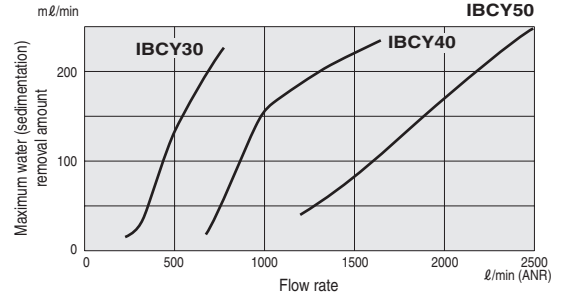
30 — for IBCY30
 40 — for IBCY40
 50 — for IBCY50

Separation characteristics

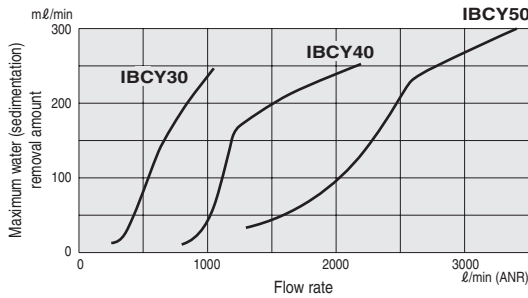
● 0.1 MPa [15 psi]



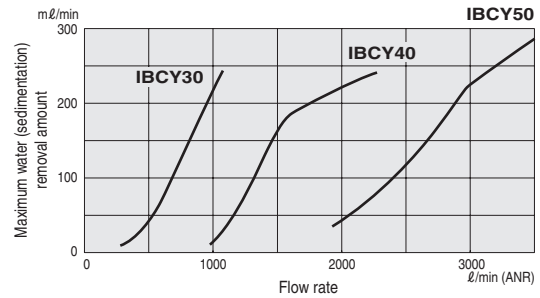
● 0.3 MPa [44 psi]



● 0.5 MPa [73 psi]



● 0.7 MPa [102 psi]

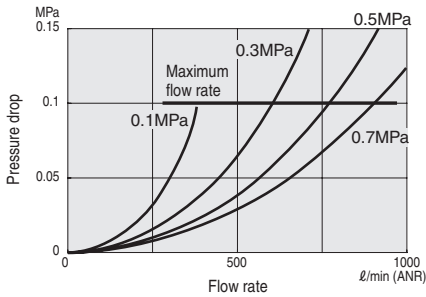


Note: The maximum amount of water removed from a volume of air in a process depends on the conditions of usage (this graph is not a guarantee). Use it as a guideline for your selection.

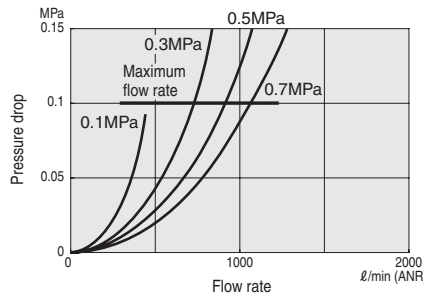
1 m ℓ / min = 3.53 x 10⁻⁵ ft³ / min,
1 ℓ / min = 0.0353 ft³ / min

Flow rate characteristics

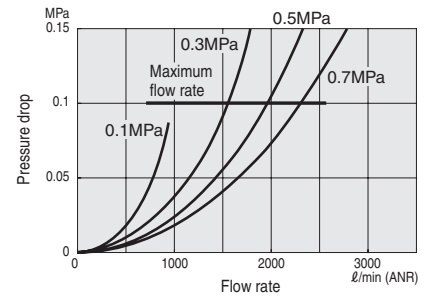
IBCY30-01



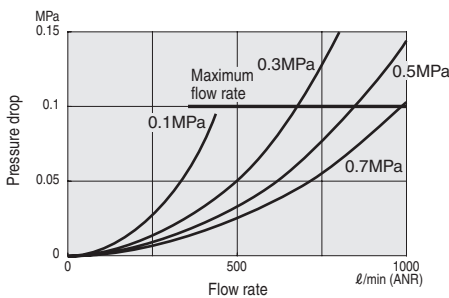
IBCY40-01



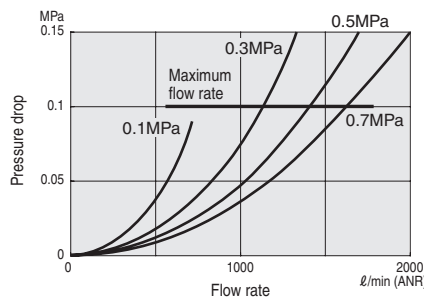
IBCY50-02



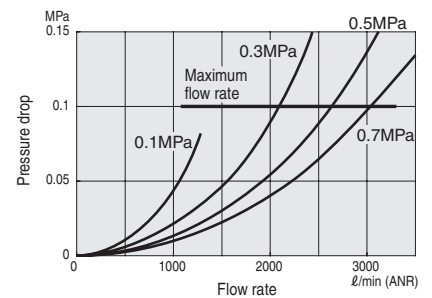
IBCY30-02



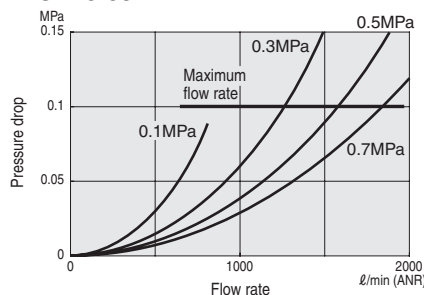
IBCY40-02



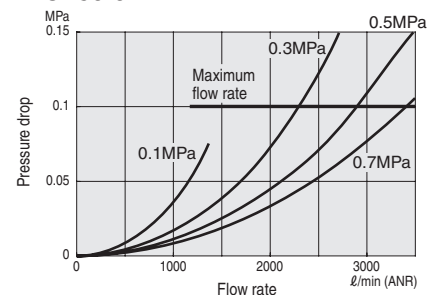
IBCY50-03



IBCY40-03

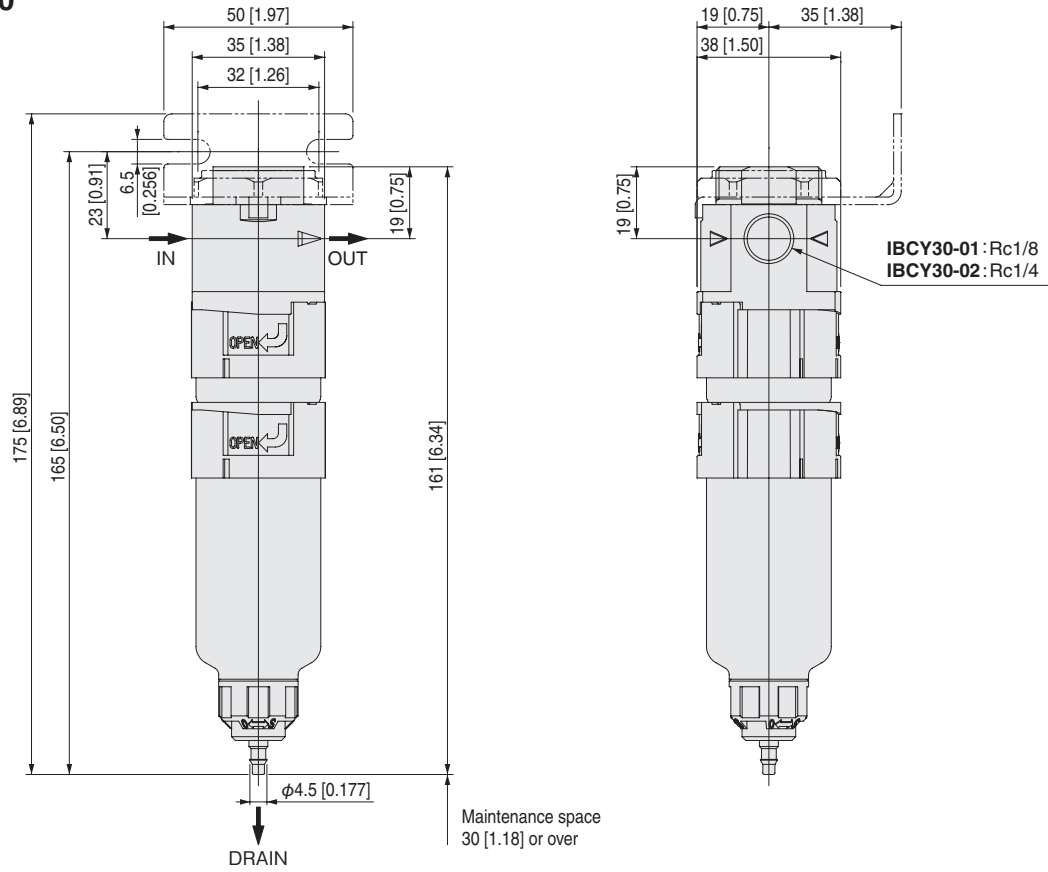


IBCY50-04

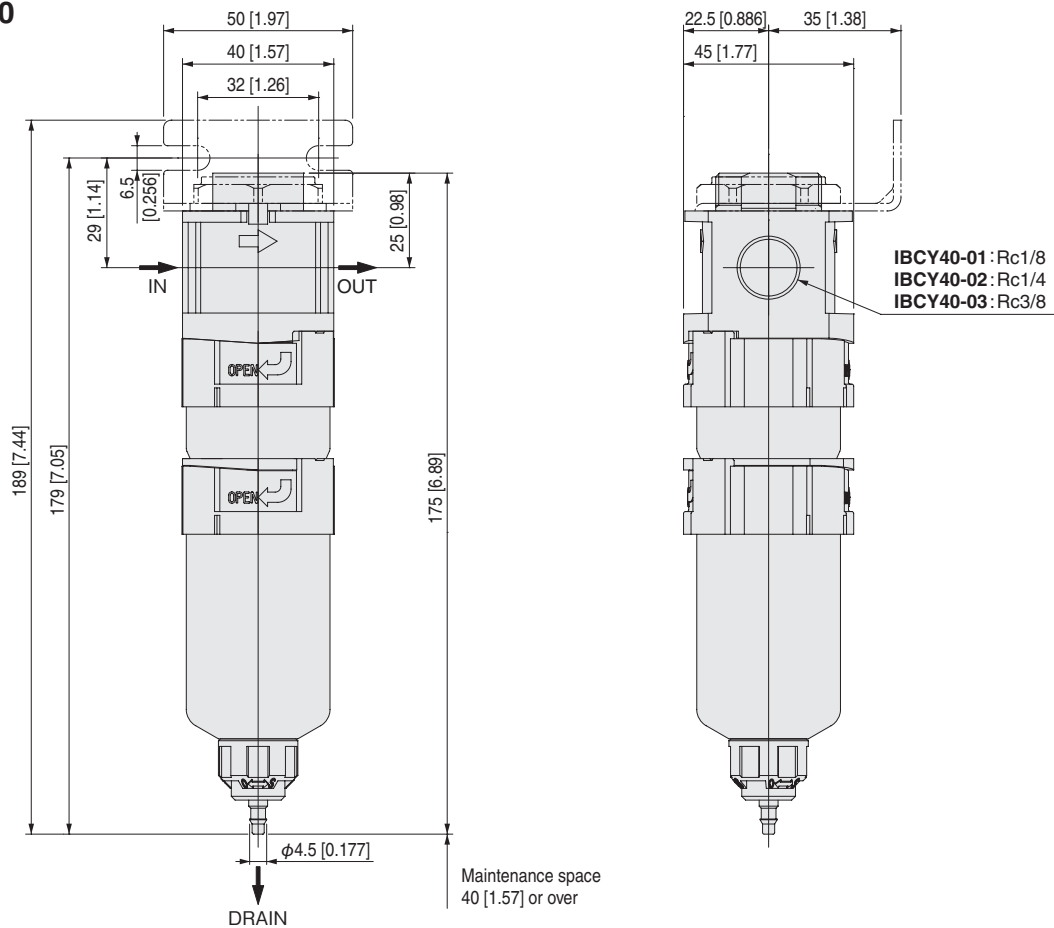


1 MPa = 145 psi
1 ℓ / min = 0.0353 ft³ / min

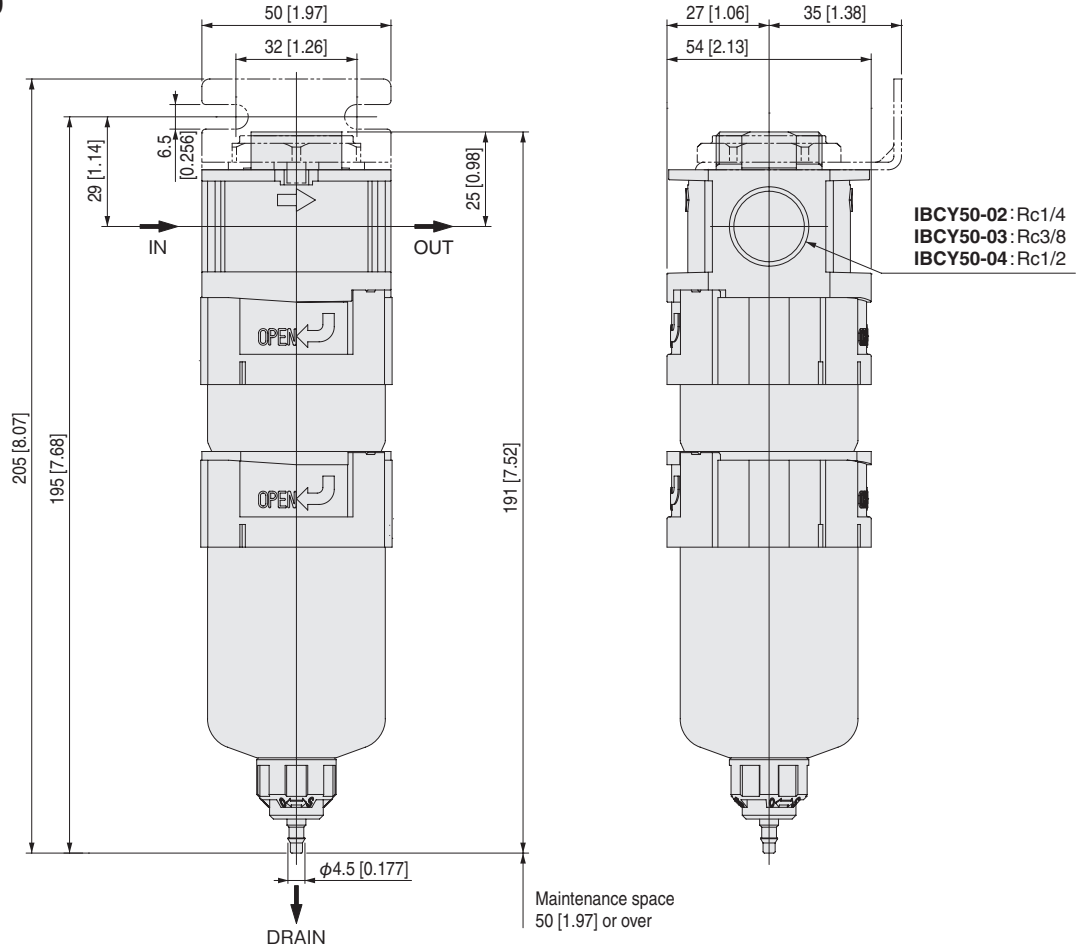
● IBCY30



● IBCY40

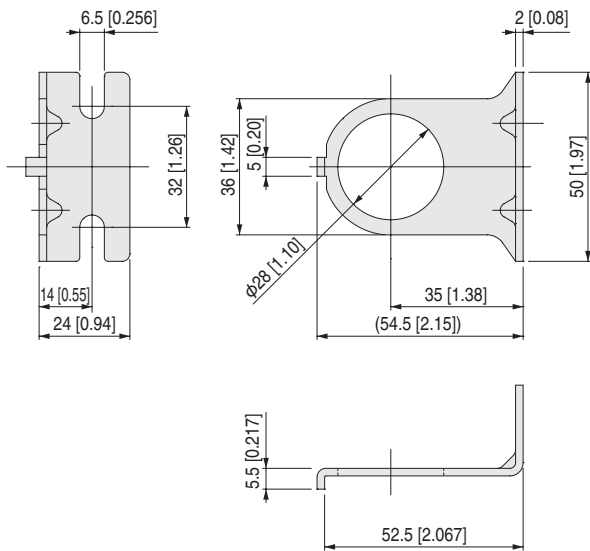


● IBCY50

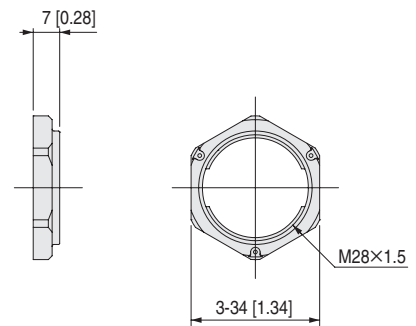


● 8Z-CBK

Bracket



Mounting ring



Limited Warranty

KOGANEI CORP. warrants its products to be free from defects in material and workmanship subject to the following provisions.

Warranty Period The warranty period is 180 days from the date of delivery.

Koganei Responsibility If a defect in material or workmanship is found during the warranty period, KOGANEI CORP. will replace any part proved defective under normal use free of charge and will provide the service necessary to replace such a part.

Limitations ● This warranty is in lieu of all other warranties, expressed or implied, and is limited to the original cost of the product and shall not include any transportation fee, the cost of installation or any liability for direct, indirect or consequential damage or delay resulting from the defects.

● KOGANEI CORP. shall in no way be liable or responsible for injuries or damage to persons or property arising out of the use or operation of the manufacturer's product.

● This warranty shall be void if the engineered safety devices are removed, made inoperative or not periodically checked for proper functioning.

● Any operation beyond the rated capacity, any improper use or application, or any improper installation of the product, or any substitution upon it with parts not furnished or approved by KOGANEI CORP., shall void this warranty.

● This warranty covers only such items supplied by KOGANEI CORP. The products of other manufacturers are covered only by such warranties made by those original manufacturers, even though such items may have been included as the components.

The specifications are subject to change without notice.

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