KOGANEI

https://www.koganeiusa.com

Catalog No. BK-E0020BU

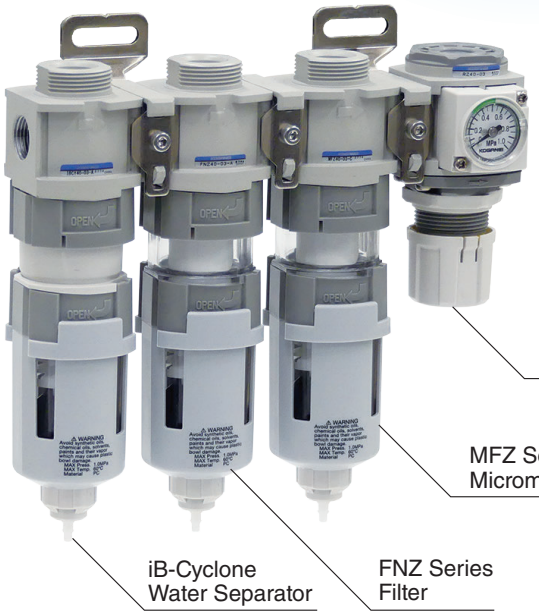
NEW Products

New-Generation Air Preparation Equipment

New Generation Air Treatment Combinations

CMZ Series

Leave your air treatment combination needs to Koganei.



Four types of combinations are available to suit your needs. Selectable from a variety of combinations for each type.

Improved oil resistance
PCT resin bowl (option)

Improved resistance to cutting oil and alcohol
See page 114 for resistance test results

* PCT: Polycyclohexylene-dimethylene terephthalate

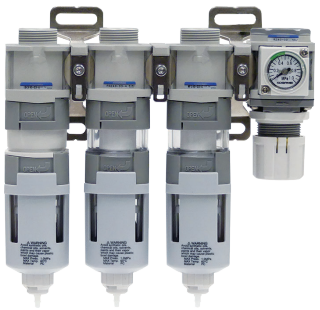
Choose from 4 types according to your intended use:

Standard Combination

CMZA

General Industrial Equipment Applications

- **Regulator based combinations**
- **Filter and regulator are mounted separately**
- **Widest range of combinations**
- **Can be used with various air qualities**



Compact Combination

CMZB

General Industrial Equipment Applications

Space saving

- **Filter regulator based combinations**
- **Overall length (face to face) more compact than CMZA**

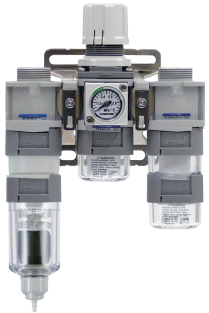
High-End Compact Combinations

CMZ

Space-Saving & Compact

End-of-Line Applications

- **Compact filter regulator based combinations**
- **Suitable for final air treatment and pressure adjustment in lines with relatively clean primary side air quality**

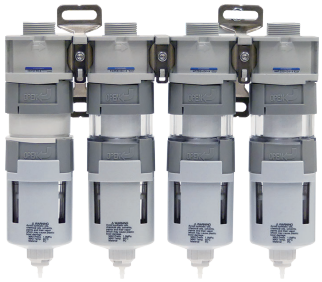


Filter Combinations

CMZF

Air Treatment

- **Filter combinations specialized for air treatment**
- **Combinations available to suit any desired air quality**



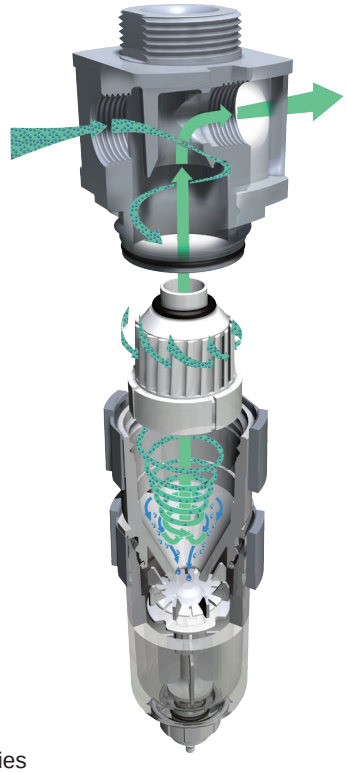
Please contact Koganei for our easy-to-order, preassembled combinations.

CAUTION Read the safety precautions on page 7 before using this product.

iB Series

iB-Cyclone

Page 9



High-speed cyclone type water separator!

IBCY30

IBCY40

IBCY50

* When with bowl guard

Can be used in combination with FRZ series

* Only for 40 and 50 series body sizes

FRZ series

Air filter • Oil mist filter • Micro oil mist filter

Page 27

Specialized for standalone applications

30 series

Air filter
FNZ30

Oil mist filter
MFZ30

Micro oil mist filter
MMFZ30

* All photos are with bowl guard

Can be used in combination

40 and 50 series

Air filter
FNZ40

Air filter
FNZ50

Oil mist filter
MFZ40

Micro oil mist filter
MMFZ40

Oil mist filter
MFZ50

Micro oil mist filter
MMFZ50

Filter regulator

Page 49

Easy-to-use moisture and fluid removal functions in a compact design!

Specialized for standalone applications
30 series

Filter regulator
FRZB30

* All photos are with bowl guard

Can be used in combination
40 and 50 series

Filter regulator
FRZB40

Filter regulator
FRZB50

Filter regulator, regulator

(With no drain cock)

Page 69

Excellent for air lines with moisture and fluid already removed! The compact body can be mounted in any direction!

Regulator
RZ30

Filter regulator
FRZ30

Regulator
RZ40

Filter regulator
FRZ40

Regulator
RZ50

Filter regulator
FRZ50

Cutting fluid resistant specifications

Oil resistant specification
Page 114

In addition to existing polycarbonate bowl material specifications, you can also choose PCT resin, which is highly resistant to oil and chemicals.

iB-Cyclone・FRZ series system chart

Series name	Specifications	Model	Port size					Page
			M5	NPT1/8	NPT1/4	NPT3/8	NPT1/2	
			M5	01	02	03	04	
iB-Cyclone (Water separator) **IBCY** 	–	**IBCY30**		●	●			Page 9
		IBCY40		●	●	●		
		IBCY50			●	●	●	
	–							
Air filter **FNZ** 	5 μm filtration	**FNZ30**		●	●			Page 27
		FNZ40		●	●	●		
		FNZ50			●	●	●	
	40 μm filtration	**FNZ31**		●	●			
		FNZ41		●	●	●		
		FNZ51			●	●	●	
Oil mist filter **MFZ** 	0.3 μm filtration	**MFZ30**		●	●			
		MFZ40		●	●	●		
		MFZ50			●	●	●	
Micro oil mist filter **MMFZ**	0.01 μm filtration	**MMFZ30**		●	●			
		MMFZ40		●	●	●		
		MMFZ50			●	●	●	
FRZB Filter regulator with drain cock **FRZB** 	Standard	**FRZB30**	●	●	●			Page 49
		FRZB40		●	●	●		
		FRZB50			●	●	●	
	For low pressure	**FRZB31**	●	●	●			
		FRZB41		●	●	●		
		FRZB51			●	●	●	
	Built-in check mechanism	**FRZB32**	●	●	●			
Filter regulator with no drain cock. The compact body can be mounted in any direction. **FRZ** 	Standard	**FRZ30**	●	●	●			Page 69
		FRZ40		●	●	●		
		FRZ50			●	●	●	
	For low pressure	**FRZ31**	●	●	●			
		FRZ41		●	●	●		
		FRZ51			●	●	●	
	Built-in check mechanism	**FRZ32**	●	●	●			
Regulator **RZ** 	Standard	**RZ30**	●	●	●			Page 69
		RZ40		●	●	●		
		RZ50			●	●	●	
	For low pressure	**RZ31**	●	●	●			
		RZ41		●	●	●		
		RZ51			●	●	●	
	Built-in check mechanism	**RZ32**	●	●	●			
Residual pressure exhaust valve **50VZ** 	–	**50VZ**		●	●	●	●	Page 95

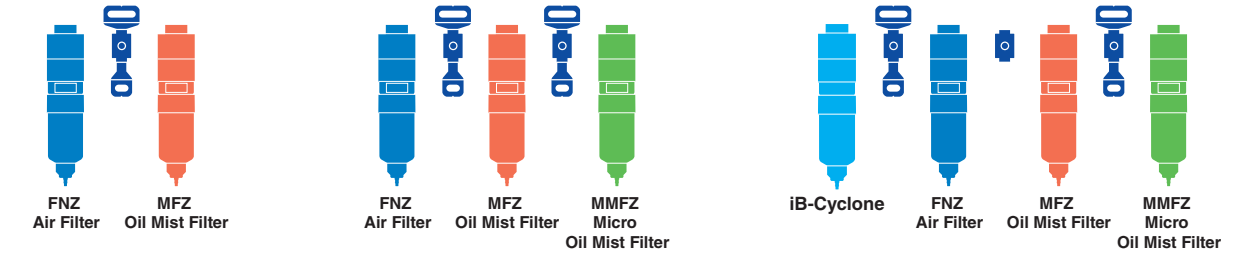
Systems can be upgraded with modules!

The optimum system can be assembled by using D modules and various modules.

Note: Only the 40 and 50 series body sizes support modular configuration. The 30 series body size cannot be combined and configured with modules. It is for standalone use only.

1. Examples of various combinations

2. Examples of filter modules combinations



List of module and adapter models

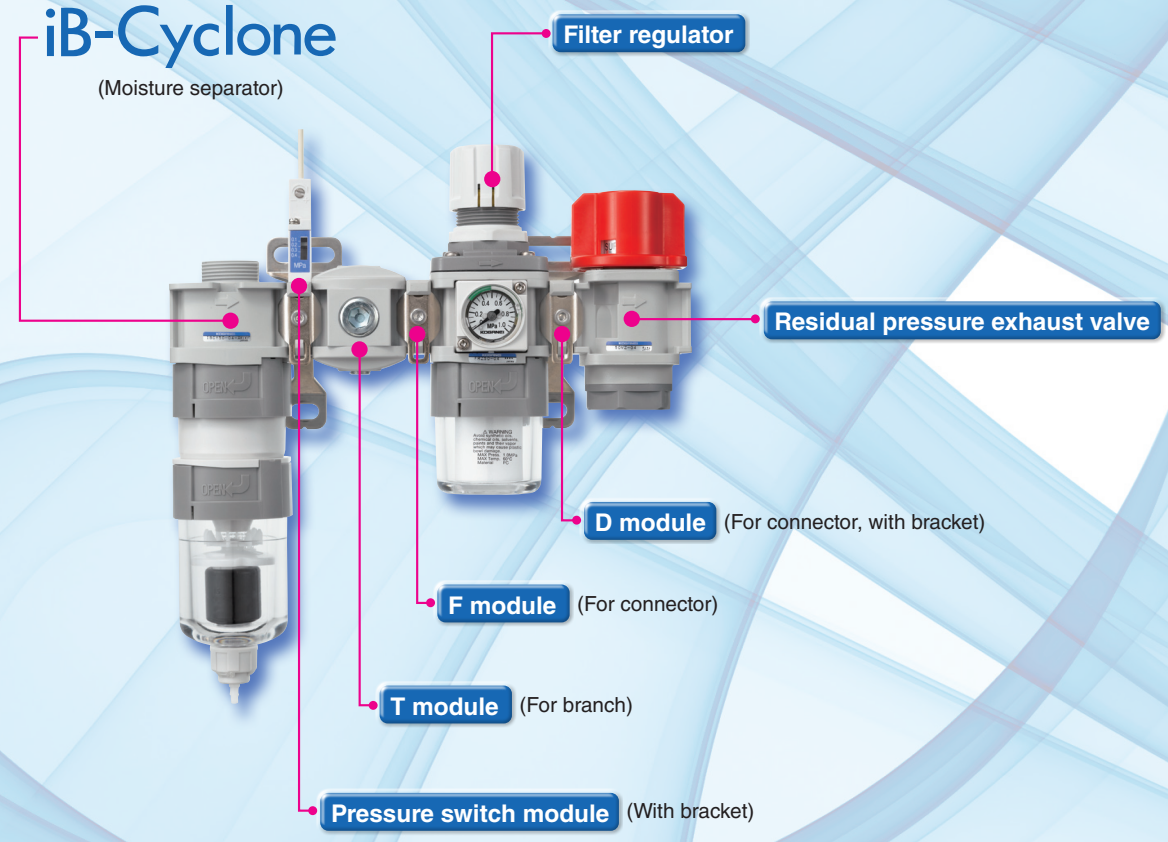
For the 40 and 50 series body sizes

Mounting brackets only	F module For connecting **8Z-F**	D module For connecting (With bracket) **8Z-D**	Pressure switch module For connecting **8Z-PS□**	Pressure switch module For connecting (With bracket) **8Z-DPS□**		
Mounting brackets + Adapter			Pressure switch module Piping with adapter **8Z-PSS□**	Pressure switch module Piping adapter With bracket **8Z-DPSS□**	S adapter For pipe size conversion **8Z-S□**	DS adapter For pipe size conversion (With bracket) **8Z-DS□**
Adapter only[Note]	Intermediate extraction block For branching (Standalone bracket) **8Z-TP□**				Piping adapter For pipe size conversion (Standalone bracket) **8Z-SP□**	

Note: Use when termination is mounting bracket.

Example of combination

Model: **CMZ550-CR-V-04-G1C-PSFA-T-C**



Product Index

- Safety Precautions — Page 7

- iB-Cyclone positive pressure specifications (Water separator) — Page 9 — IBCY Positive pressure specifications

- iB-Cyclone negative pressure specifications (Water separator) — Page 21 — IBCY Negative pressure specifications

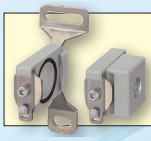
- Air filter
- Oil mist filter
- Micro oil mist filter — Page 27 — FNZ MFZ MMFZ

- FRZB filter regulator (With moisture and fluid removal functions) — Page 49 — FRZB

- Filter regulator (With no moisture or fluid removal functions)
- Regulator — Page 69 — FRZ RZ

- Residual pressure exhaust valve — Page 95 — Residual pressure exhaust valve

- Pressure switch module — Page 98 — Pressure switch module



- Module
- Adapter — Page 101 — Module Adapter

- Bracket — Page 105 — Bracket

- Pressure gauge
- Digital pressure switch — Page 106 — Pressure gauge

- Reference material (resistance to chemicals) — Page 114 — Reference material

Before selecting and using products, please read all the Safety Precautions carefully to ensure proper product use.
The Safety Precautions shown below are to help you use the product safely and correctly, and to prevent injury to you or other people, or damage to property.
Follow the safety precautions for: ISO4414 (Pneumatic fluid power - General rules and safety requirements for systems and their components) and JIS B 8370 (General rules relating to pneumatic systems).

"DANGER", "WARNING", "CAUTION", "ATTENTION"

⚠ DANGER	Indicates situations that can be clearly predicted as dangerous. If the noted danger is not avoided, it could result in death or serious injury. It could also result in damage or destruction of property.
⚠ WARNING	Indicates situations that, while not immediately dangerous, could become dangerous. If the noted danger is not avoided, it could result in death or serious injury. It could also result in damage or destruction of property.
⚠ CAUTION	Indicates situations that, while not immediately dangerous, could become dangerous. If the noted danger is not avoided, it could result in minor or moderate injury. It could also result in damage or destruction of property.
⚠ 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 as parts for use in general industrial machinery.**

■ In the selection and handling of the equipment, the system designer or other person with sufficient knowledge and experience should read the Safety Precautions, Catalog, Owner's Manual and other information before handling the equipment. Making mistakes in handling is dangerous.

■ After reading the Owner's Manual, etc., be sure to keep it where the people using the product can read it at any time.

■ If you transfer or lend the product to another person, always attach the Owner's Manual, etc., to the product where they are easily visible, to ensure that the new user can use the product safely and properly.

■ The danger, warning, and caution items listed in these "Safety Precautions" do not cover all possible cases. Read the Catalog and Owner's Manual carefully, and always keep safety first.

⚠ DANGER

- Do not use the product for the applications listed below:
  1. Medical equipment related to maintenance or management of human lives or bodies.
  2. Mechanical devices or equipment designed for the purpose of moving or transporting people.
  3. Critical safety components in mechanical devices.

  The product has not been planned or designed for applications that require advanced levels of safety. There is a possibility of loss of human life.
- Do not use the product in locations where there are flammable or combustible materials. This product is not explosion-proof. There is a risk of ignition or combustion.
- When mounting the product, be sure it is securely supported and secured (including the workpiece). If the product is dropped or falls, it could malfunction or cause injury.
- People who use a pacemaker or other similar medical device should maintain a distance of at least one meter [3.280 ft] away from the product. There is a possibility that the pacemaker will malfunction due to the strong magnet built into the product.
- Never attempt to modify the product. There is a risk of abnormal operation leading to injury, electric shock, fire, etc.
- Do not disassemble, assemble or repair the product inappropriately in relation to its basic structure, performance, or functions. Doing so could result in injury, electric shock, fire, etc.
- Do not splash water on the product. Spraying it with water, washing it, or using it underwater could result in malfunction of the product leading to injury, electric shock, fire, etc.
- Do not touch or approach the product while it is operating, except for the specified operations. Also, do not adjust any of the mechanisms (such as attaching or detaching wiring connectors, adjusting pressure switches, removing piping tubes or sealing plugs, adjusting the product's mounting position, etc.) that are built into or attached to the product while it is operating.
  There is a risk of injury if the product falls or malfunctions.

⚠ WARNING

- Because Koganei products may be used under a wide variety of conditions, decisions concerning conformance with a particular system should be made after a thorough evaluation by the person in charge of system design.
  The designer who determines the suitability of the system is responsible for ensuring the system's intended performance and safety. Be sure to use the latest catalogs and technical materials to thoroughly study and evaluate specification details, to consider the possibility of machine breakdown, and to configure a system that ensures safety and reliability, such as by using fail-safes.
- Do not use the product in excess of its specification range. Using the product outside of its specification range could cause the product to malfunction, stop functioning or be damaged. It could also drastically reduce its operating life.
- Before supplying air or electricity to the product and before starting operation, always conduct a safety check of the operating range of the equipment. Supplying air or electricity carelessly can result in injury from contact with moving parts.
- Do not touch the terminals or switches while the power is on. There is a possibility of electric shock or abnormal operation.
- Do not throw the product into fire. The product could explode and/or release toxic gases.
- Do not stand on the product, use it as a step, or place objects on it. Doing so may cause accidents, such as falls, injuries from the product falling or being dropped, damage to the product, malfunctions due to damage, or runaway operation, etc.
- Before conducting maintenance, inspection, repair, replacement, or any other similar procedure, always completely cut off all air and connections and check that residual pressure inside the product or in piping connected to the product is at atmospheric pressure. In particular, be aware that residual air will still be in the compressor or air tank.
  If residual air pressure remains inside the piping, the actuator may move abruptly and cause an injury.
- Use safety circuits or system designs to prevent damage to machinery or injury to personnel when the machine is shut down due to an emergency stop or electrical power failure.
- Before performing any kind of wiring work, be sure to turn off the power. There is a risk of electric shock.
- Do not damage lead wires or other cords.
  Allowing the cords to be damaged, bent excessively, pulled, rolled up, placed under heavy objects or squeezed between objects, can result in current leaks or defective continuity that can lead to fire, electric shock, or abnormal operation.
- Do not connect or disconnect connectors while the power is turned on. Also, never apply unnecessary stress to connectors. Doing so may cause injury, device damage, or electric shock due to abnormal machine operation.
- Always check the catalog and other reference materials for correct product wiring and piping. Incorrect wiring or piping may cause abnormal operation of the actuator.
- After completing wiring work, check the wiring for errors before turning on the power.
- After completing piping work, check the circuit for errors before supplying air.
- Do not use any medium other than those listed in the specifications table. Using a medium other than those in the specifications table may lead to early shutdown of some functions, a sudden degradation of performance, or a reduced operating life.
- If the device has been idle for over 48 hours or has been in storage, then when it is used for the first time, sliding parts may stick, causing the device to move slowly or suddenly. For these initial operations, always run a test operation to confirm that operations are normal.

- Do not use the product in locations subject to direct sunlight (ultraviolet rays), high temperatures and humidity, dust, salt, or iron powder, or where the medium being used, or the atmosphere, contains corrosive fluids, such as organic solvents, phosphate ester type hydraulic oil, sulfur dioxide gas, chlorine gas, CFC gas, ozone, acids, or alkalis. It could lead to early shutdown of some functions, a sudden degradation of performance, or a reduced operating life. For information about materials, see Major Parts and Materials.
- If the device is used infrequently (over 30 days), then the sliding parts may stick, causing the device to move slowly or suddenly, which could result in injury. Check for proper operation a minimum of once every 30 days.
- Do not use a pressure switch or the wiring that controls it in locations subject to surges or near strong magnetic fields or power lines through which large electric currents flow. It could result in unintended operation.
- Do not use the product near the ocean in direct sunlight, near mercury vapor, or near equipment that generates ozone. Deterioration of rubber parts caused by ozone may reduce performance and functions or stop functions.
- Do not use the product where there is a heat source nearby or where it is subject to radiated heat.

⚠ CAUTION

- When installing the product, be sure to allow adequate working space around it. Failure to ensure adequate working space will make it more difficult to conduct daily inspections or maintenance, which could eventually lead to system shutdown or damage to the product.
- When transporting or mounting a heavy product, firmly support the product using a lift or support, or use multiple people to ensure personal safety.
- Do not scratch, dent, or deform the product by standing on it, using it as a step, or placing objects on top of it. Doing so may cause the product to stop working or reduce its performance due to damage or breakage.
- Always post a "Work in Progress" sign for installations, adjustments, or other operations, to avoid unintentional supplying of air or electrical power, etc. Supplying air or electric power carelessly can result in electric shock or injury due to a sudden operation.
- When handling the product, take care to avoid dropping it, allowing it to come into contact with other objects, or otherwise subjecting it to excessive impact. Even if the exterior of the product appears undamaged, damage to internal components can cause abnormal operation.
- Do not short-circuit the load to a pressure switch.
  If the comparative output is turned on while the load is short-circuited, the pressure switch may be damaged by an excess of current.
  Example of load short-circuit: Connecting the comparative output lead directly to the power supply.
- Do not bring floppy disks or magnetic media, etc., within 1 meter [3.280 ft.] of the product. Some products have powerful internal magnets, and the magnetic data on magnetic media may be destroyed by the magnetism.
- Depending on the product, unintended operations may occur when a leakage current occurs in the control circuit. Use countermeasures for circuit leakages in the control circuit so as not to exceed the allowable leakage current values for the product's specifications.
- Use the specified lubrication when lubricating the sliding parts. Not doing this leads to changes in the physical properties and deterioration of the materials used, resulting in reduced functionality.
- Do no obstruct the product's breather. Pressure fluctuations occur depending on the volume changes during operation. Blocking the breather will disrupt the pressure balance, preventing the intended operation and causing injury or damage to the device.
- Using extremely dry air with a dew point lower than -20°C [-4°F] may affect the quality of the lubricating oil used. This may cause degraded performance or loss of functions.

⚠ 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 allowing for sufficient safety margins for ratings and performance, and fail-safe measures. Be sure to consult us about such applications.
- Moving parts of machinery should be isolated with protective covers so as not to come into direct contact with human bodies.
- Do not configure controls in such a way as would allow workpieces to fall if power fails.
  Configure the controls to prevent workpieces, etc., from falling if the machinery stops during an emergency stop or power outage.
- Install a noise eliminator (such as mufflers) in the exhaust port.
  Doing so reduces noise during exhaust.
- After adjusting the pressure, lock the pressure adjustment handle.
- When handling the product, be safe by wearing protective gloves, safety glasses, safety shoes, and other protective clothing as necessary.
- When the product can no longer be used, or is no longer necessary, dispose of it appropriately as industrial waste.
- The performance and functions of pneumatic equipment may deteriorate over time. Inspect the pneumatic equipment every day to confirm that it is fulfilling the functions required by the system, and to prevent accidents from occurring.
- Air leakage from the product is not zero. For applications, such as maintaining pressure (including vacuum) inside pressure vessels, design your system with consideration for the required capacity and holding time.
- For inquiries about the product, contact your nearest Koganei sales office or Koganei overseas department. The address and telephone number are shown on the back cover of this catalog.

⚠ OTHERS

- 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 or repairs, always use genuine KOGANEI parts or compatible parts (recommended parts).
     Always observe the required methods and procedures.
  2. Do not inappropriately disassemble or assemble the product as relates to basic configurations, and its performance or functions.

Koganei cannot be responsible if these items are not properly observed.

Warranty and General Disclaimer

1. Warranty Period
The warranty period for Koganei products is 12 months from the date of delivery.

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 distributor or agent malfunctions during the warranty period in a way that is attributable to Koganei's 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 department for details.

(2) Koganei is not responsible for any losses or for any damages to other machinery caused by breakdown, loss of function, or loss of performance of Koganei products.

(3) Koganei is not 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 instruction manuals, and/or due to actions that violate the mounting, installation, adjustment, maintenance or other safety precautions.

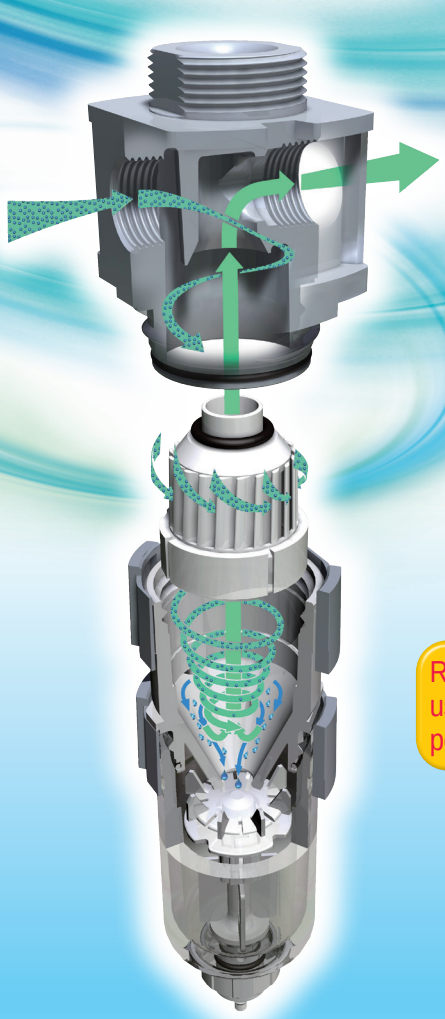
(4) Koganei is not responsible for any losses caused by breakdown of the product due to factors outside the responsibility of Koganei, including but not limited to fire, natural disaster, the actions of third parties, and intentional actions or errors by the purchaser.

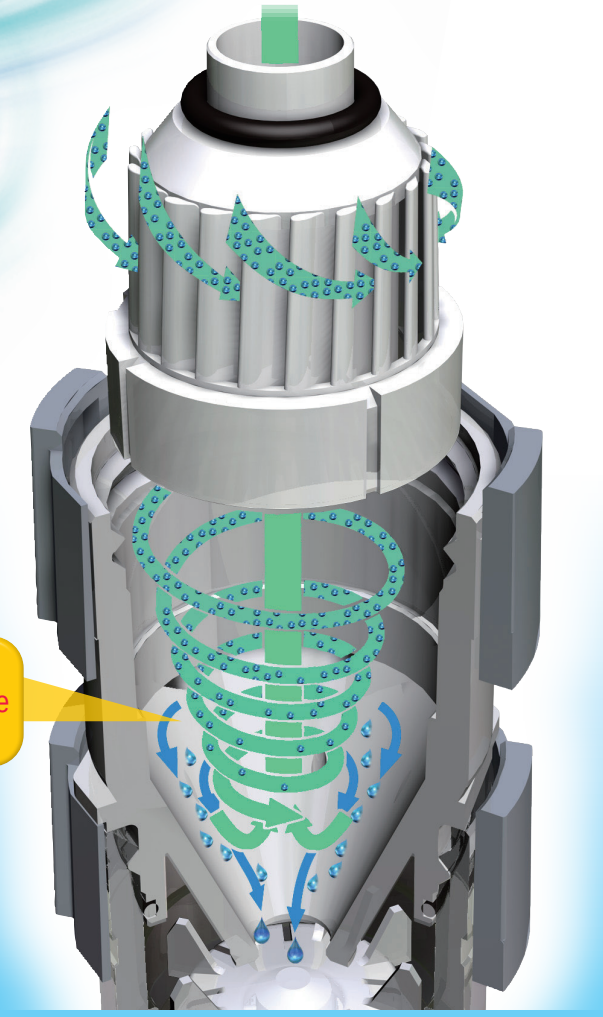
iB Series

Introducing the high-speed cyclone type drain separator!

iB-Cyclone

PAT. PEND.





Superior water separation performance

Half the size and over 99%[Note] drain separation ratio compared to other devices. Note: According to Koganei measurement standards.

Cyclone system

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

Maintainability improved

Maintenance free because an 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

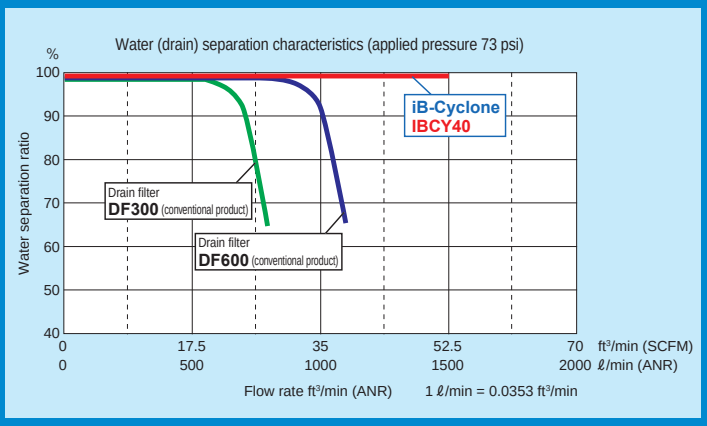
Specifications for ozone resistance, NCU specifications (copper free) are standard.

User issues

- Having trouble removing drain in piping
- Changing elements and other maintenance is difficult.

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

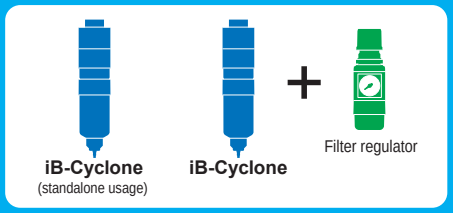
The iB-Cyclone uses a high-speed cyclonic system to maintain water(drain) separation rates even if the flow is increased. Separation performance is always steady, from small to large flow rates.



*Water (drain) separation compared with other Koganei drain filter (reference).

iB-Cyclone application example

- Removing drain in sub-lines and from various equipment
- Removing primary-side drain from filters and regulators
- Pre-processing of the air supply going to the membrane dryer
- Removing drain from equipment extremities



Variations and Options

IBCY30

IBCY40

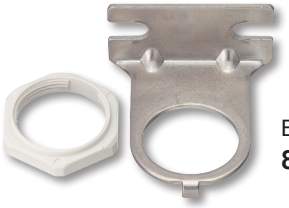
IBCY50

With metal cover
IBCY40-F11-□-□-BG
IBCY50-F11-□-□-BG

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

Drain cock with fitting

Note 1: Metal cover cannot be attached to the IBCY30.
Note 2: Metal cover cannot be attached when iB-Cyclones are connected in a series of in modules.

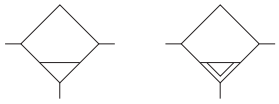


Bracket
8Z-CBK

iB-Cyclone

IBCY30-F11, IBCY40-F11, IBCY50-F11

Symbol



Auto drain type

Specifications

Item \ Model		IBCY30-F11	IBCY40-F11	IBCY50-F11
Medium		Air (Air containing no oil or solids)		
Port size		NPT1/8,NPT1/4	NPT1/8,NPT1/4,NPT3/8	NPT1/4,NPT3/8,NPT1/2
Maximum operating pressure	psi	145		
Proof pressure	psi	218		
Operating temperature range (ambient and medium)		℉		32～140
Water separation rate Note 1	%	99 or more		
Water collection volume (for **-N**)	$10^{-3}ft^3$	0.45	0.56	0.94
Maximum flow rate Note 2	ft^3/min (SCFM)	29.8	52.5	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)	oz	5.3	7.1	10.6
OptionsBracket				

Note 1: According to Koganei measurement conditions.

2: Maximum flow rate in an environment with 73 psi and 14.5 psi pressure drop (maximum port size piping). Check the graphs of characteristics on each 12 page when making a decision.

Order Codes

IBCY □ – **F11** – □ – □ – □ – □

iB-Cyclone

NPT thread specifications

Main unit

Model	NPT1/8	Port size 1/4	3/8	1/2
30	01	02		
40	01	02	03	
50		02	03	04

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

Bowl cover
- **Blank** — No cover
- **PG** — With plastic cover
- **BG** — With metal cover Note

Note: The IBCY30 does not come with a metal cover (only the IBCY40 and 50 do).

Bracket
- **Blank** — No bracket
- **B** — With bracket

●Order codes for brackets only

8Z-CBK

＊Common to all body sizes

●Maintenance parts

●Bowl assembly

BA-FRZB□**-F11-**□**-**□

Bowl guard specifications
- **Blank** — NO bowl guard
- **PG** — With bowl guard

NPT thread specifications

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

●Metal cover assembly

BG-IBCY□

Body size
- **40** — **for IBCY40**
- **50** — **for IBCY50**

With 4 metal hexagon socket head bolts

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

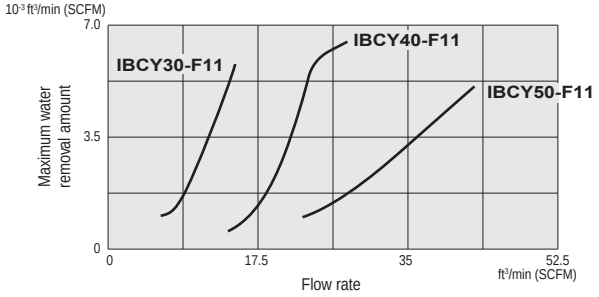
SRK-IBCY□

Body size
- **30** — **for IBCY30**
- **40** — **for IBCY40**
- **50** — **for IBCY50**

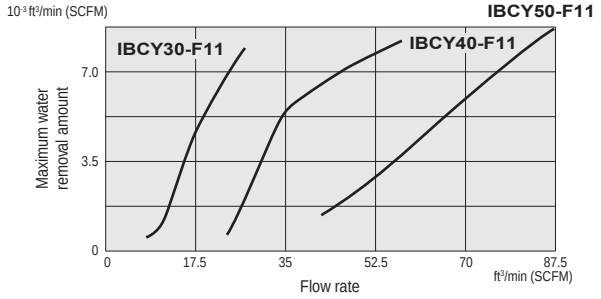
***PCT resin bowl for hash environments also available - Please contact Koganei for details.**

Separation characteristics

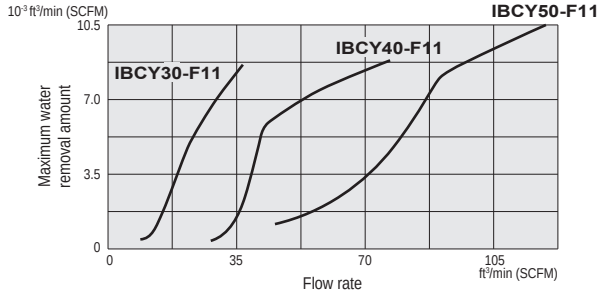
●14.5 psi



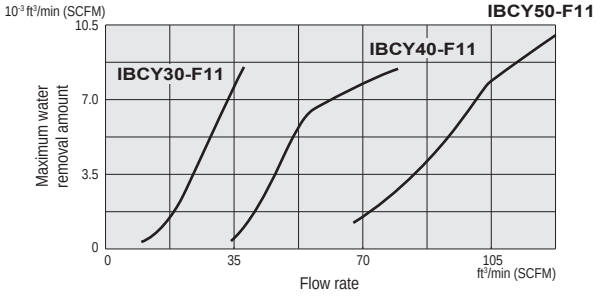
●43.5 psi



●72.5 psi



●101.5 psi

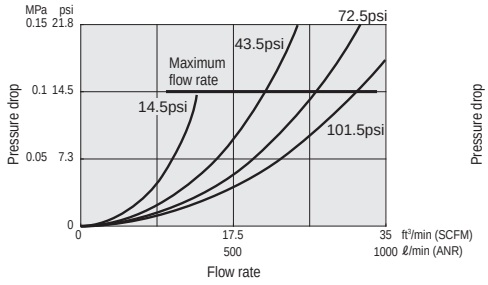


Note: The maximum amount of water removed from a volume of air in a process depends on the conditions of usage (this graph is not a guarantee). Use it as a guideline for your selection.

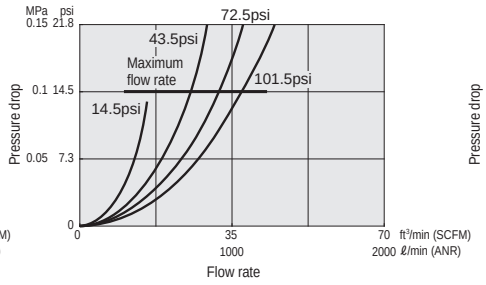
1 m ℓ /min = 3.53 x 10^{-5} ft^3/min,
1 ℓ /min = 0.0353 ft^3/min

Flow rate characteristics

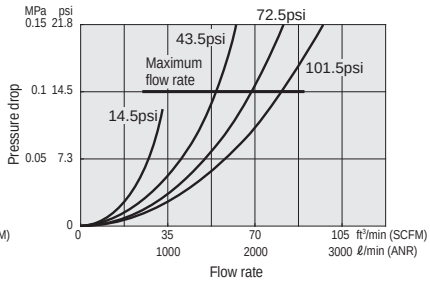
IBCY30-F11-01



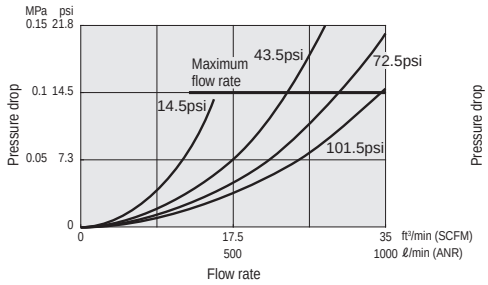
IBCY40-F11-01



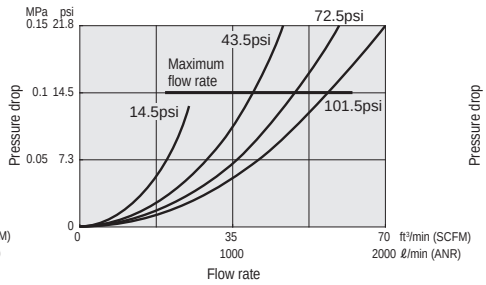
IBCY50-F11-02



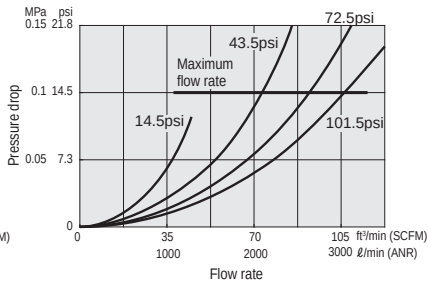
IBCY30-F11-02



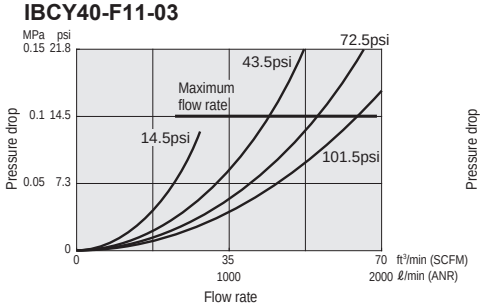
IBCY40-F11-02



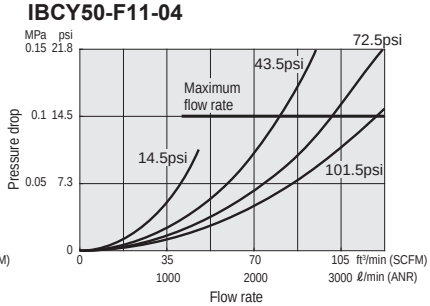
IBCY50-F11-03



IBCY40-F11-03

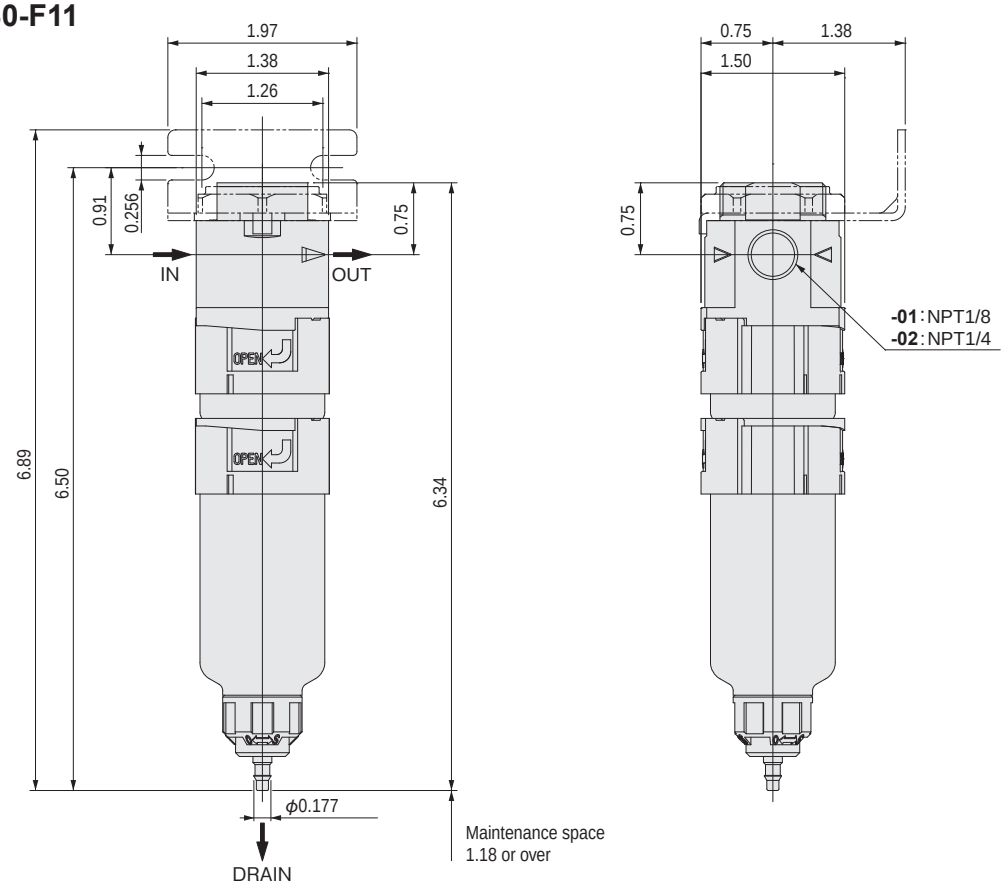


IBCY50-F11-04

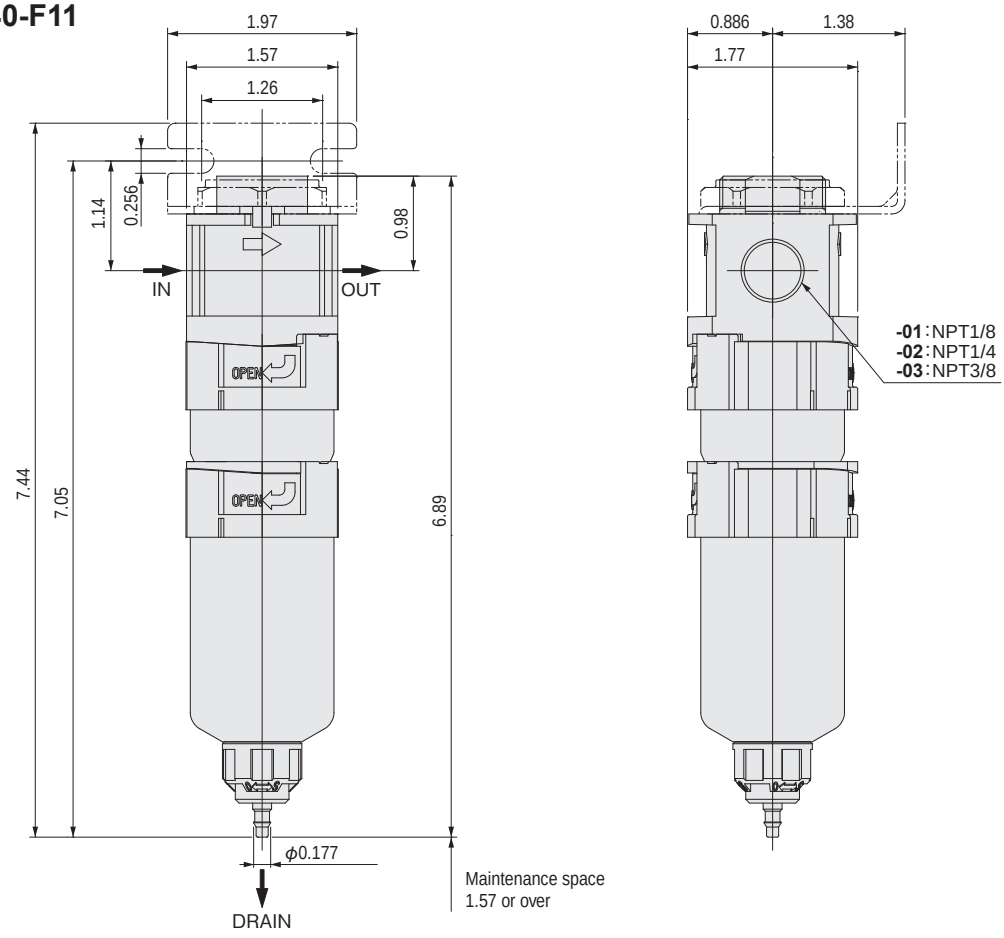


1 MPa = 145 psi
1 ℓ /min = 0.0353 ft^3/min

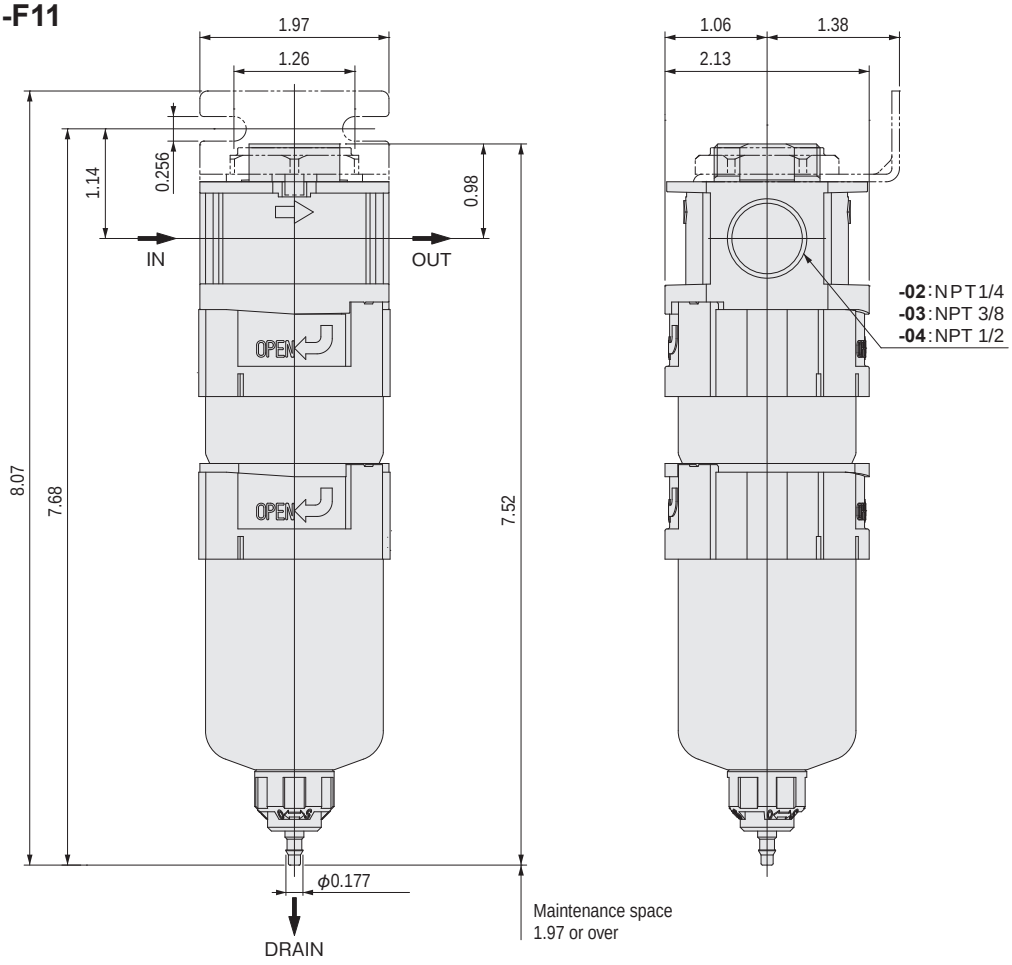
●IBCY30-F11



●IBCY40-F11

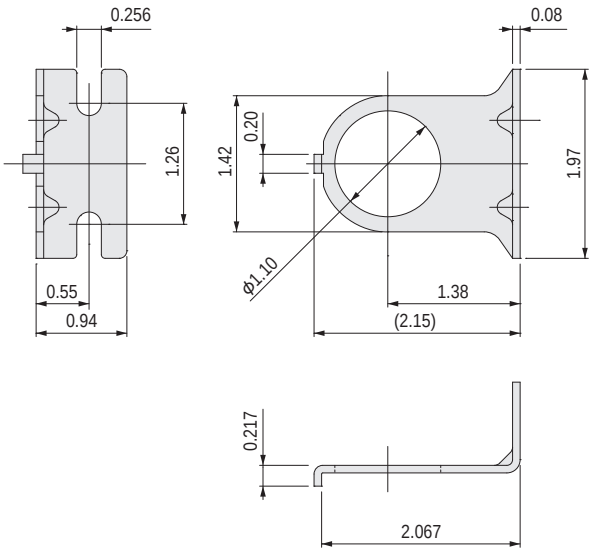


●IBCY50-F11

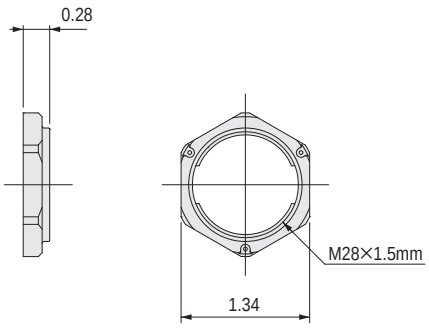


●8Z-CBK

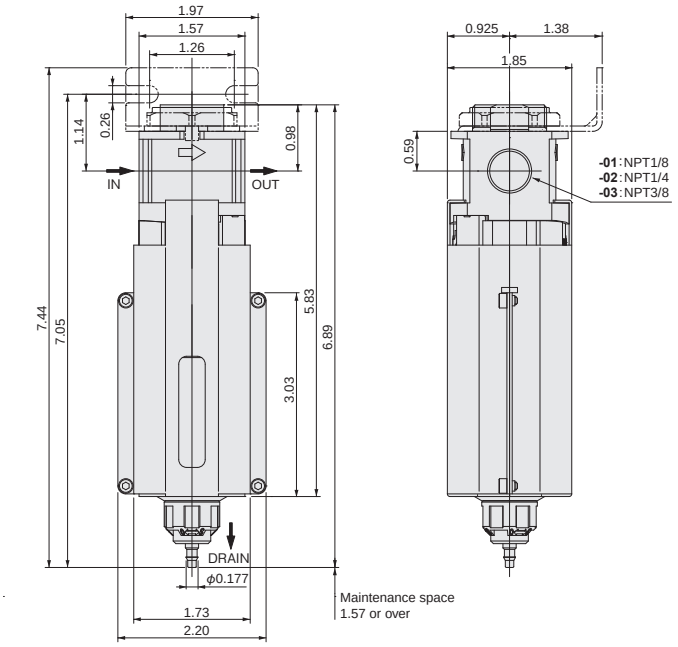
Bracket



Mounting ring



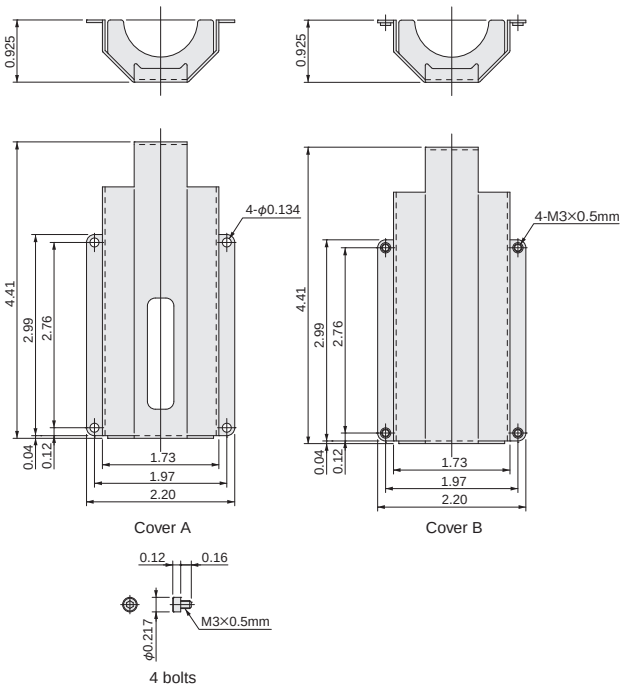
●IBCY40-F11-□-□-BG (With metal cover)



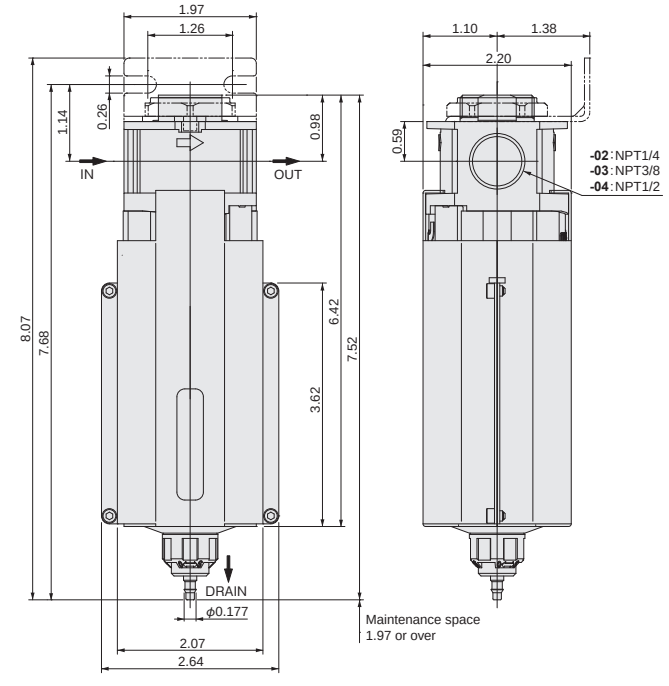
-BG: With metal cover

●BG-IBCY40

Metal cover



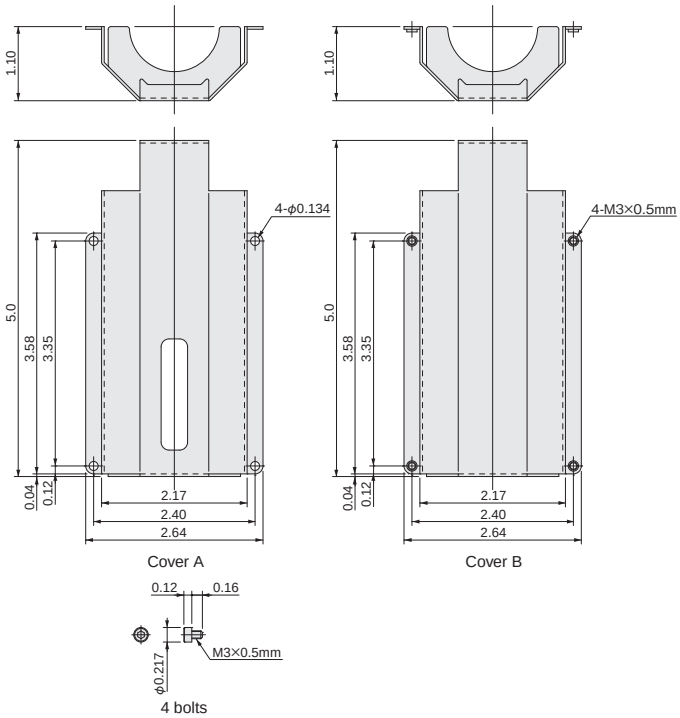
●IBCY50-F11-□-□-BG (With metal cover)



-BG: With metal cover

●BG-IBCY50

Metal cover



General Precautions

1. 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.
2. 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.
3. 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 114 for details.
4. 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.
5. Do not exceed the specified volume of water for the product. The water droplets may splash into the secondary side. See page 12 for information about separation characteristics.
6. If mist or condensation forms in the product, it may splash into the secondary side.

Operating environment and medium

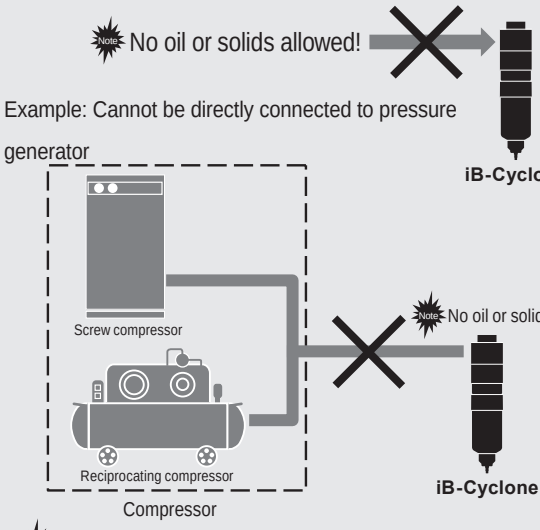
● Usable medium

1. Use cleaned air (filtered to below 40μm) for the medium. If you are considering using something other than cleaned air, contact the nearest Koganei sales office or overseas department.
2. Air that is mixed with oil or solids cannot be used.

Note Using air that contains oil or solids may cause the product to stop functioning, may lower performance, or shorten the service life.

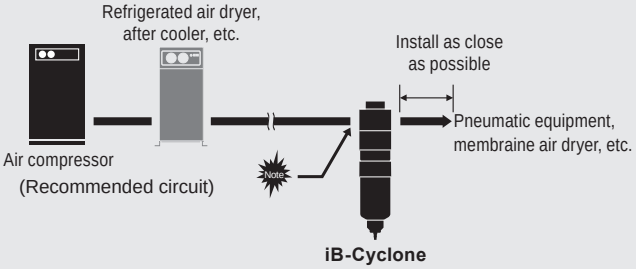
Mounting and Piping

CAUTION Air must be free from oil and solids before use.



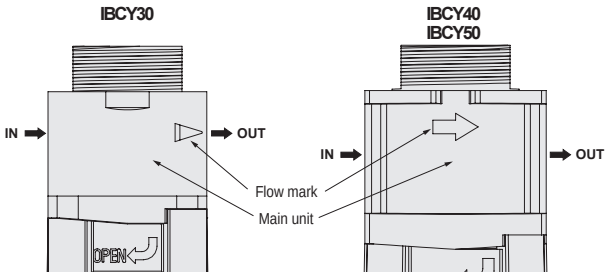
Note Perform sufficient countermeasures to remove oil and solids from air when using iB-Cyclone.
If countermeasures are not performed, the performance of the device will fall dramatically, air will leak, and it will not work well.

CAUTION iB-Cyclone cannot remove humidity.



Note
1. The iB-Cyclone is for removing drain. 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.
2. 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.

1. Install in a location where the air supply and the ambient temperature is under 140 °F.
2. Install vertically so the piping connection portion is up and the drain outlet is down.
3. Allow enough space to easily do maintenance tasks, such as turning the guard button and attaching and removing the bowl.
4. Tighten the mounting ring to less than 2.21 ft·lbf when installing the bracket.
5. Connect the piping so the air flows in the direction of the arrow (flow mark) on the product. The drain removal function will be ineffective if the flow is reversed.



6. 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 ft·lbf

Connecting thread	1/8	1/4	3/8	1/2
Torque	5.2～6.6	8.9～10.3	16.2～17.7	20.7～22.1

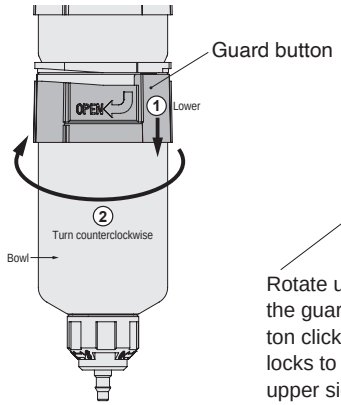
7. Large moment and vibration are easily transmitted from steel or non-flexible piping, place a flexible hose between the product and the piping to prevent this from affecting the product.

●Periodic maintenance

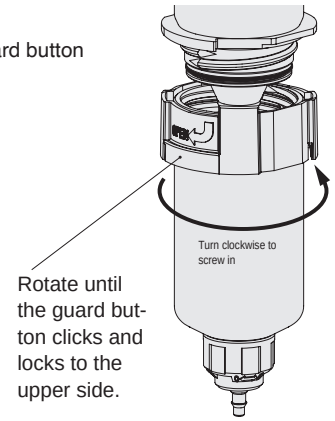
Bowl

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 11 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).

Removing the bowl

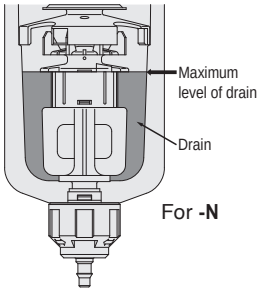


Attaching the bowl

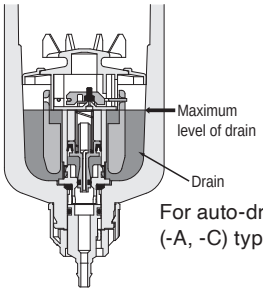


Drain cock

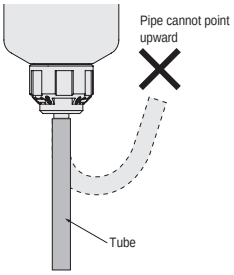
1. If the volume of drain is greater than that shown in the left side diagram below, the drain removal function is greatly reduced. Be sure to drain before the drain volume reaches the level shown in the left side diagram below. Turn the drain cock with your hand in the case.
2. A tube with an inner diameter of ϕ0.157 in. [4mm] 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 16.4 ft.
3. If you are using the auto-drain type, the drain that collects on the primary side is flushed all at once. If collected drain exceeds the maximum level in the right of the diagram below, it could lead to a malfunction. Be careful that it does not exceed the maximum level.

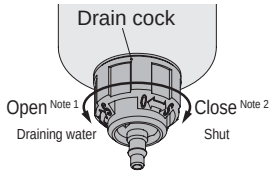


For **-N**



For auto-drain (-A, -C) type



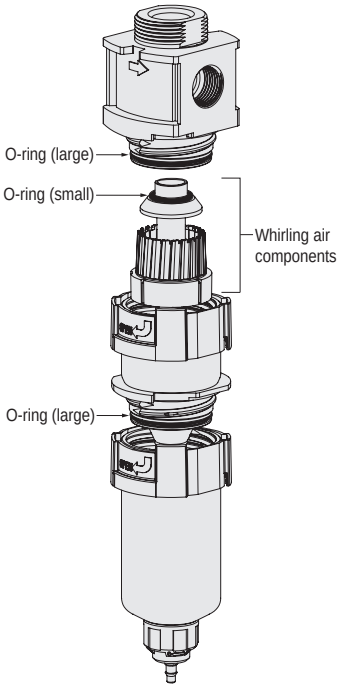


Note: Cut the end of the tube connected to the fitting straight across, and insert completely and securely as shown in the diagram. Also, after installing it, lightly pull it to confirm that it does not come out.

Note 1: Do not turn the drain cock more than 100° when opening it. Doing so may damage the drain cock.
2: When closing the drain cock, rotate it firmly until it clicks and locks.

Whirling air components

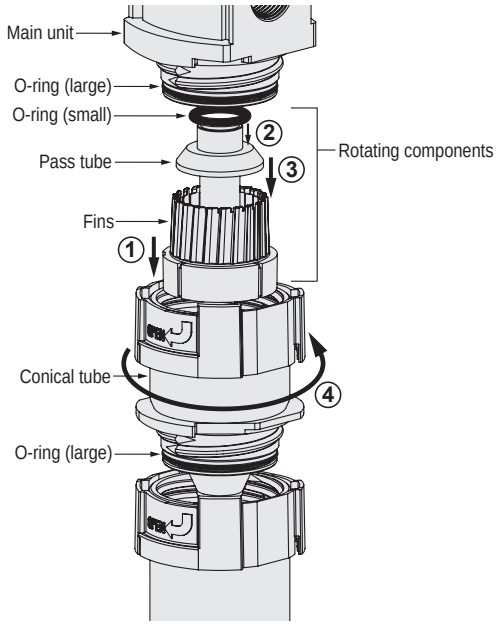
1. Dust collecting in the whirling air components reduces the separation function. If this happens, disassemble and wash the product to remove the dust as shown in the diagram below (release all pressure from inside the product before starting work).
2. Use a Seal Kit to replace the o-rings when reassembling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



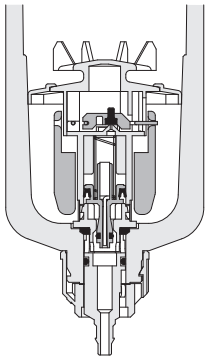
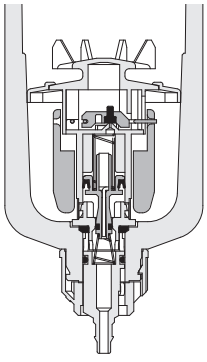
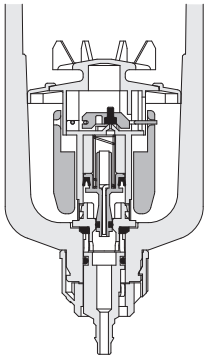
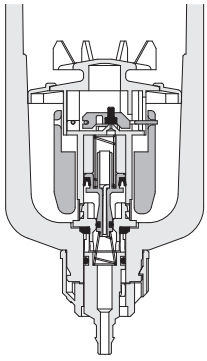
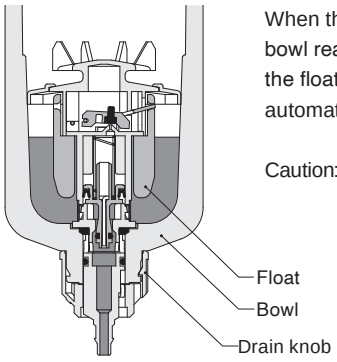
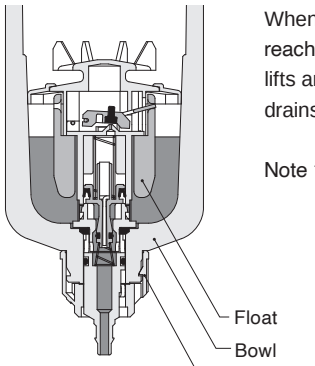
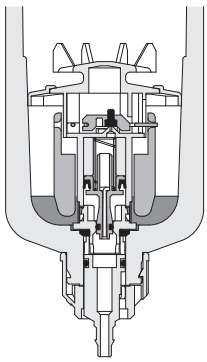
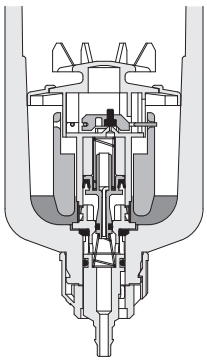
Assembly method

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	 Open When unpressurized, the liquid outlet opens and the liquid drains naturally.	 Closed When unpressurized, the liquid outlet closes and the liquid cannot drain. Caution: The liquid does not drain when unpressurized, if there is a lot of liquid even in an unpressurized (low pressure) condition, it may be necessary to drain the liquid by hand.
Pressurized	 Closed Air and liquid will be discharged from the liquid outlet until the pressure exceeds the minimum operating pressure (22 psi). The air and liquid will stop after stored pressure exceeds the minimum operating pressure. Caution: A compressor with a small output may not reach full pressure, and there may be exhaust air until the minimum operating pressure is exceeded.	 Closed In the same way, when unpressurized, the liquid outlet closes and the liquid cannot drain.
Draining the liquid	 Open When the level of liquid in the bowl reaches a specified level, the float lifts and the liquid automatically drains. Caution: The liquid can be drained manually by turning the drain knob to the left. See page 17 for details.	 Open When the level of drain in the bowl reaches a specified level, the float lifts and the liquid automatically drains. Note 1: Supply pressure is needed to operate the auto drain. A minimum of 22 psi is needed for the supply pressure. 2: The liquid can be drained manually by turning the drain knob to the left. See page 17 for details.
Draining the liquid completed	 Closed When the liquid drains, the float lowers and the liquid outlet closes, and the liquid stops draining.	 Closed When the liquid drains, the float lowers and the liquid outlet closes, and the liquid stops draining.

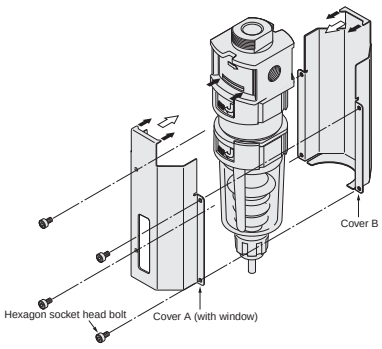
●Metal cover handling instructions

Mounting and removing the metal cover

Use the following procedure to mount the metal cover.

① Enclose the body of the iB-Cyclone between cover A and cover B as shown by the black arrows in the diagram on the right (the window can face either sides).
② Tighten the hexagon socket bolts in the 4 locations from the A cover side around 0.74 to 0.88 ft・lbf.

To remove the metal cover, remove the 4 hexagon socket bolts.



Reference data

●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.

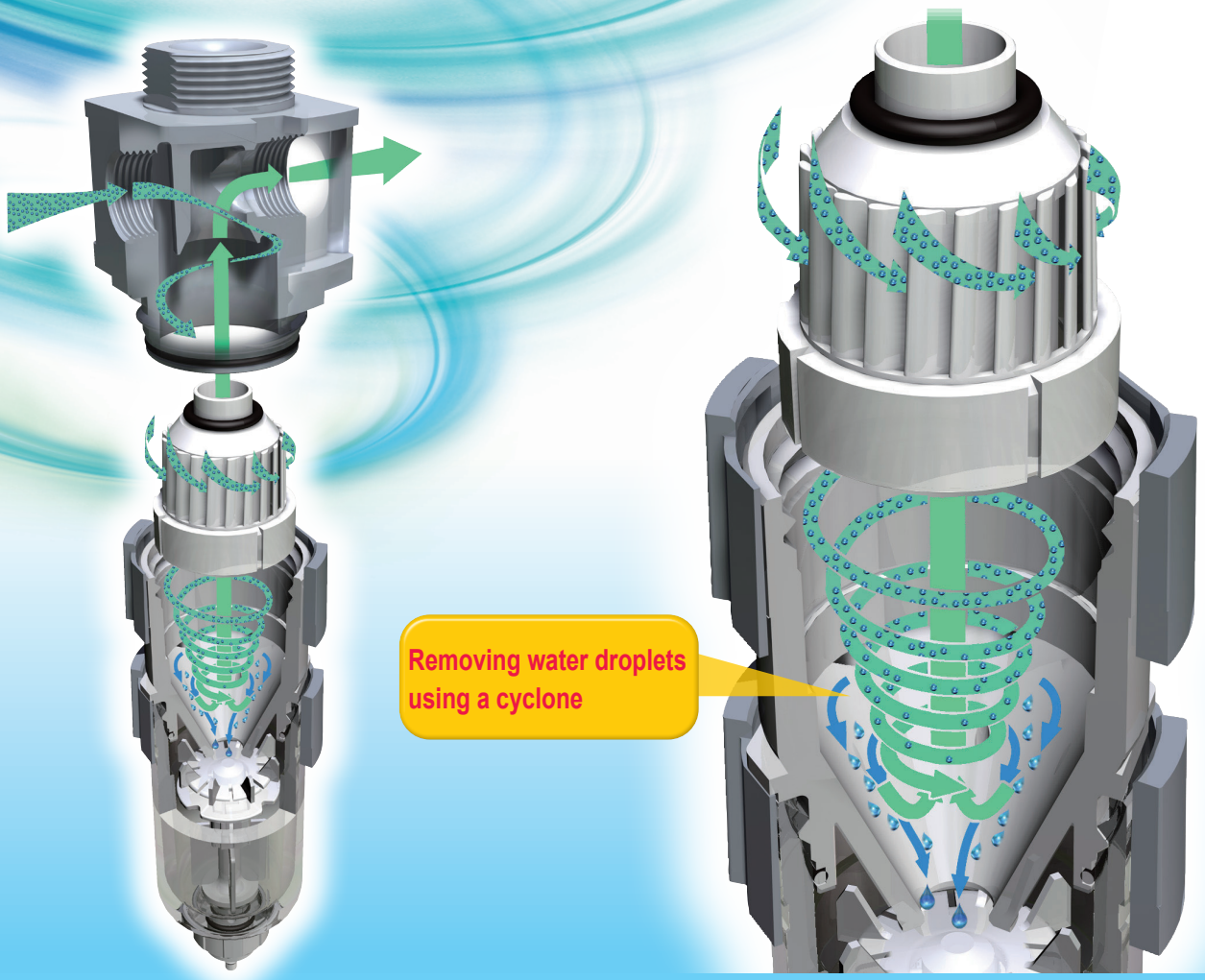
Type	Classification	Chemical name	Application example
Inorganic compound	Acid	Hydrochloric acid, sulfuric acid, nitric acid, fluorine, phosphoric acid, chromic acid	Coating processing, acid degreasing, and pickling of metals
	Alkali	Caustic soda, caustic potash, hydrated lime, aqueous ammonia, sodium 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 Series

Introducing the cyclone type water separator for NEGATIVE pressure!

iB-Cyclone PAT.

iB Cyclone



Superior water separation performance

Water separation rate over 90%[Note].

Note: According to Koganei measurement standards.

Cyclone system

Expertise in centrifugal separation optimizes our high-speed cyclone system water separator (patent pending).

Maintainability improved

Maintenance-free because no element is used.

Wide range of vacuum flow rates

Water separation performance demonstrated over a wide flow rate.

Compatible in a wide range of environments

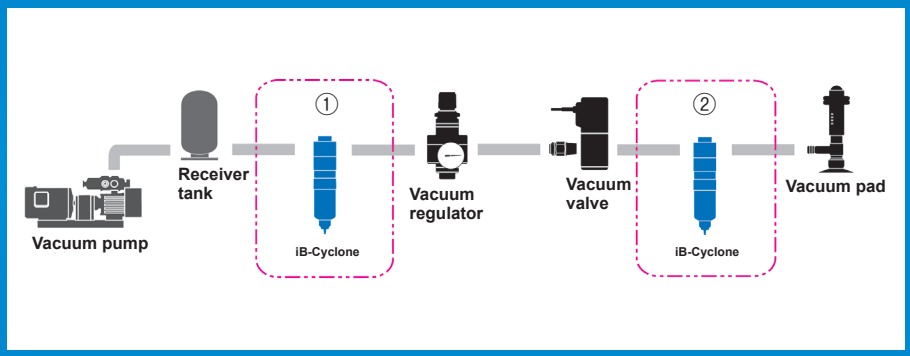
Specifications for ozone resistance, NCU specifications (copper free) compatible as standard.

User Issues

● When using a vacuum pump, users are worried that the moisture sucked in while suctioning workpieces can damage the pump

Koganei solves user problems with iB-Cyclone, which delivers new value.

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



iB-Cyclone application example

- Installed directly after equipment to immediately stop suction of cleaning solutions and other droplets.
- Installed before the pump to immediately remove droplets that have accumulated inside the circuit.

Reduce frequency of maintenance and breakdowns of pump

Variations and Options

Drain cock with fitting

With bowl guard

With metal cover
IBCY40-□-□-□-BG
IBCY50-□-□-□-BG

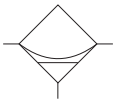
Note 1: Metal cover cannot be attached to the IBCY30.
Note 2: When iB-Cyclone are connected in series in modules, the metal cover can only be attached to one side.

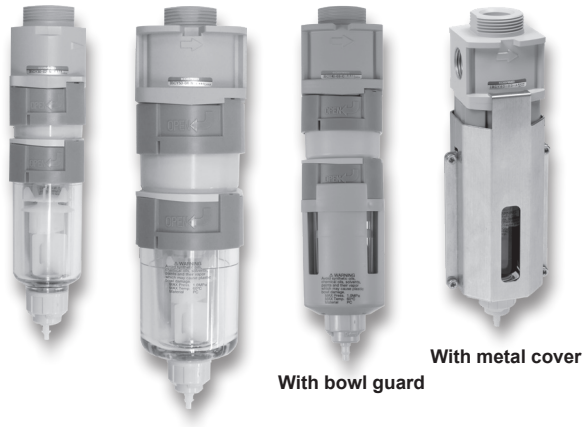
Bracket
8Z-CBK

iB-Cyclone

IBCY30·IBCY40·IBCY50

Symbols





With bowl guard

With metal cover

Specifications (negative pressure)

Item \ Model		IBCY30		IBCY40			IBCY50		
Media		Air							
Port size	Rc	1/8	1/4	1/8	1/4	3/8	1/4	3/8	1/2
Operating pressure range	inHg	–29.540 to 0							
Vacuum break pressure	psi	102 or less[Note5]							
Proof pressure	psi	218							
Operating temperature range (atmospheric and medium)	°F	32 to 140							
Water separation rate [Note1]	%	90 or more							
Water collection volume (for -N)	in³	0.793		0.976			1.648		
Recommended vacuum flow rate	ft³/min(SCFM)	1.766	3.532	3.532	5.298	7.064	7.064	10.596	14.128
Materials used in major parts	Main unit	Die cast aluminum alloy							
	Bowl	PC (polycarbonate)/PCT (Polycyclohexylene-dimethylene terephthalate)[Note 2]							
	Bracket	Steel plate (electroless nickel plated)							
Weight (for standard product, maximum port size)	lb	0.331 (0.353)[Note 3]		0.441 (0.463) < 0.728 >[Note3]			0.662 (0.684) < 1.058 >[Note3]		
Option[Note 4]		Bowl guard (resin, pre-assembled), bracket (included parts)							

Note 1: Under Koganei measurement conditions.
2: Use a PCT resin bowl when using products in a location with a poor atmosphere (places with a risk of exposure to cutting oil, machine oil, etc.).
3: Weights in ( ) parentheses are the weights with a bowl and weights in < > angle brackets are the weights with a metal cover.
4: See the order code column for details about each option.
5: The application of vacuum-breaking air should be instantaneous pressurization.
6: To use the product under positive pressure, see page 11.

Order Codes (Negative Pressure)

IBCY □ – □ – □ – □ – □ – □

Bracket
Blank —— No bracket
B —— With bracket

Bowl guard specifications
Blank —— No bowl guard
PG —— With bowl guard (resin)
BG —— With metal cover (IBCY40·50 only)[Note]
Note: The IBCY30 does not come with a metal cover.
Also, when iB-Cyclones are connected in series in modules, the metal cover can only be attached to one side.

Drain cock specifications
N —— Drain cock with fitting
Note: The auto drain cock cannot be selected for negative pressure specifications.

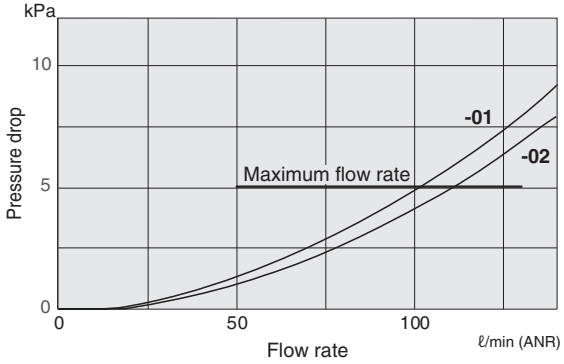
Bowl specifications
Blank —— Standard specifications (polycarbonate)
P —— PCT resin bowl[Note]
Note: Use a PCT resin bowl when using products in a location with a poor atmosphere (places with a risk of exposure to cutting oil, machine oil, etc.).

Main unit Model	Port size Rc1/8	Rc1/4	Rc3/8	Rc1/2
30	01	02		
40	01	02	03	
50		02	03	04

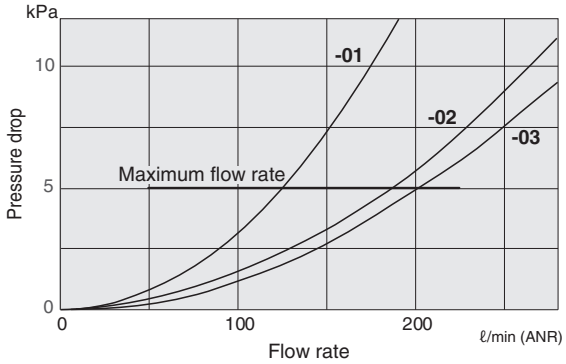
iB-Cyclone

Flow rate characteristics

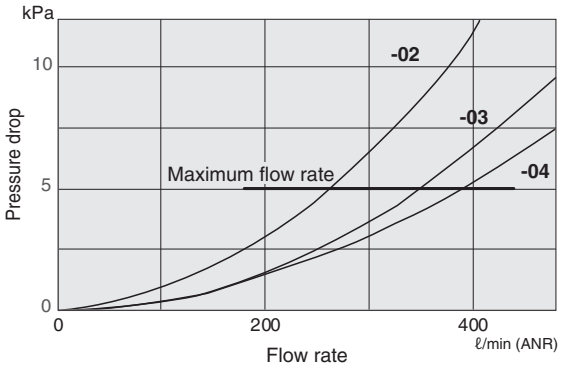
IBCY30



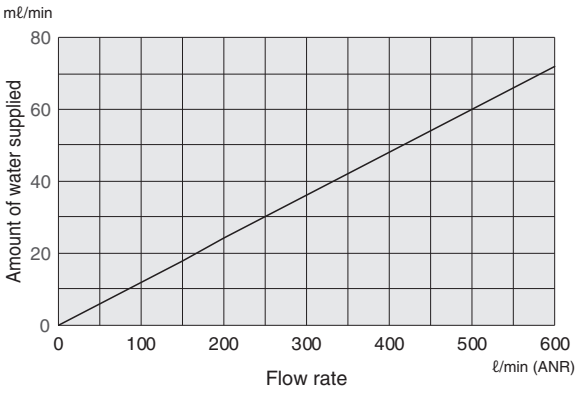
IBCY40



IBCY50



Water supply conditions for tests at Koganei



General precautions

1. Before performing piping work, thoroughly flush the inside of the pipes (blow out with compressed air).
   Machining chips, sealing tape, rust and other debris remaining from the piping work may result in lowered performance and functionality or loss of functions.
2. This product cannot be used if the medium or ambient atmosphere includes any of the following substances:
   Organic solvents, phosphate ester type hydraulic oil, sulfur dioxide gas, chlorine gas, Freon gas, ozone, acids, or other corrosive gasses.
3. This product cannot be used in environments with the gases and fluids in described above, nor threadlocking adhesive, leak detection fluid, hot water or where it may be exposed to them. This product also cannot be used in direct ultra-violet light. See the reference materials on page 114 for details.
4. Cover the unit when using it in locations where it might be subject to excessive dust, dripping water, dripping oil, etc.
5. Do not allow moisture into the flow in excess of the amount in the product specifications. Water droplets may spread to the secondary side. See page 24 for details about the water supply conditions for tests at Koganei.
6. If condensation or frost forms in the product, the moisture (frost) may spread into the secondary side.
7. Do not use this product for vacuum retention.
8. Drain the water periodically. If used at high vacuum pressure, the boiling point of the water accumulated in the bowl may drop, causing bubbles to form. There is also a risk that evaporated water may flow into the vacuum side.

Medium and operating environment

● Usable medium

1. Use cleaned air for the medium. Contact the nearest Koganei sales office or overseas department if you are considering using something other than cleaned air.
2. Do not use air that contains oil or solid matter.

NOTE Using air that contains oil or solids will cause the product's functions to stop after a short period and will reduce the product performance and service life.

● Dust

If explosive powders (aluminum powder, magnesium powder, coal powder, etc.), organic powders (epoxy resin, toner, paper powder, starch, etc.), or flammable organic solvents are mixed in with the dust, there is a risk of a dust explosion, so be especially careful.

● Static electricity

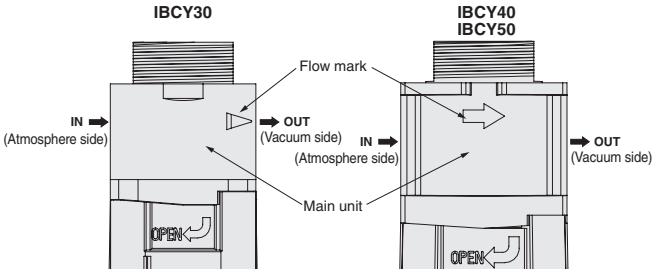
Be careful because static electricity may be generated if powders are mixed in with the cyclone flow.

Mounting and Piping

⚠ CAUTION The iB-Cyclone cannot be used for dehumidification.

NOTE **The iB-Cyclone is a product for removing moisture. It cannot remove (dehumidify) the water vapor contained in air.**

1. Install the product in a location where the ambient temperature is 140°F or less.
2. Install the product vertically, with the piping connection on the top and the drain outlet on the bottom.
3. Leave enough space for various maintenance work, such as for the guard button to rotate and for removing the bowl.
4. When attaching the bracket, tighten the mounting ring to 5.0 N·m [3.688 ft·lbf] or less.
5. Install the piping so that the air flows in the direction of the arrow (flow mark) indicated on the product. If the air flows in the opposite direction, the moisture removal function cannot operate.



6. Do not apply piping load or excessive torque to the product. When tightening the piping, grip the main unit and tighten it to the torque recommended in the table below.

Recommended tightening torque ft·lbf

Connecting thread	1/8	1/4	3/8	1/2
Torque	3.319 to 4.794	5.163 to 6.638	9.220 to 10.695	14.752 to 16.227

7. Piping that is not flexible, such as steel pipe, is easily affected by large moment loads and vibration transmitted from the piping side, so use flexible tubes or the like to prevent these effects.

FRZ series

Air Filter, Oil Mist Filter, and Micro Oil Mist Filter

Specialized **30 series** for standalone applications

1.378

Air filter

FNZ30

Oil mist filter

MFZ30

Micro oil mist filter

MMFZ30

The **40 and 50 series** can be used in combination with others in the FRZ series

1.575

Air filter

FNZ40

Oil mist filter

MFZ40

Micro oil mist filter

MMFZ40

1.969

Air filter

FNZ50

Oil mist filter

MFZ50

Micro oil mist filter

MMFZ50

Down sizing — Improved flow rate characteristics allow a smaller configuration (close side-by-side spacing possible).

Visible filter element — It is easy to check the state of the filter element.

Short type bowl — Compact size. The amount of oil used in component parts is very small.

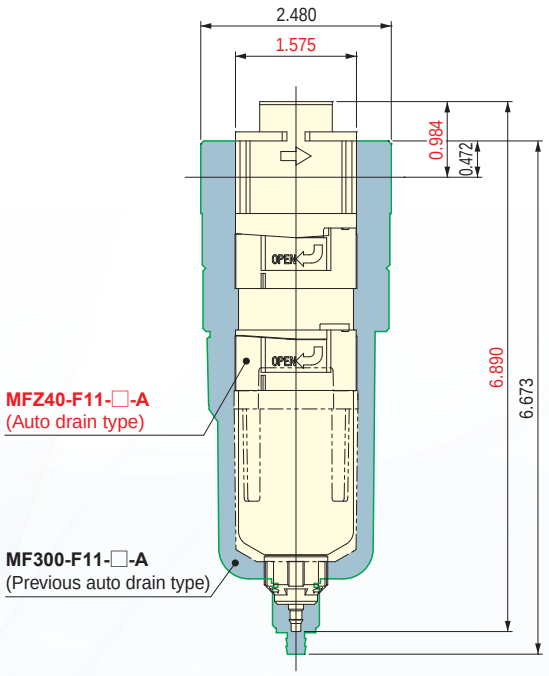
Compatible in a wide range of environments — Specifications for ozone resistance, NCU specifications (copper free) compatible as standard.

CAUTION Read the safety precautions on page 7 before using this product.

Compact design

Improved flow rate characteristics allow a smaller configuration.

★ Comparison of our mist filter **MF300** and oil filter **MFZ40**



Drain cock specifications

Drain cock with fitting or auto drain types can be selected.

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

Drain cock with fitting

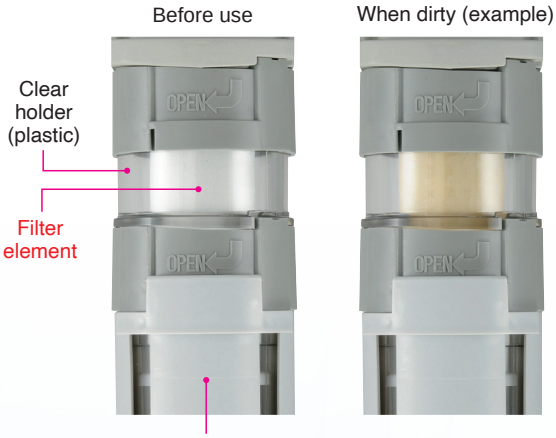
Short type bowl

Compact short type bowls are available.

Note: It cannot be used with air that contains moisture or fluids because there is no function to remove moisture or fluids.

Improved visibility of the filter element

Changes in the flow path and the clear holder make it easy to monitor the element while in use because dirt adheres to the outside of the element.



Bowl guard (option)

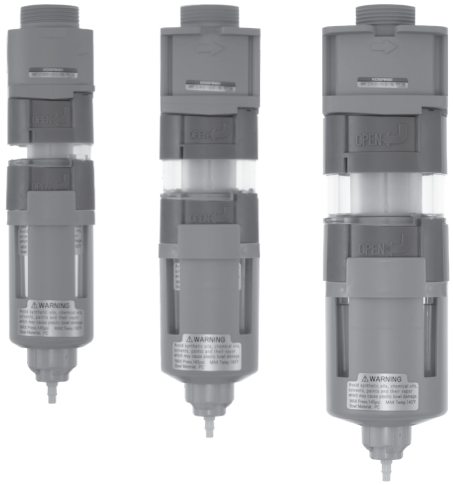
Bowl guard option is available.

Bracket

The brackets can be used with all sizes of all filter regulators. Also, brackets can be used with the iB-Cyclone and others in the FRZ series.

Air filter

FNZ30-F11•FNZ31-F11
FNZ40-F11•FNZ41-F11
FNZ50-F11•FNZ51-F11



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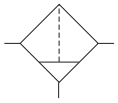


Specifications

Item \ Model		FNZ30-F11	FNZ31-F11	FNZ40-F11	FNZ41-F11	FNZ50-F11	FNZ51-F11
Medium		Air					
Port size		NPT1/8,NPT1/4		NPT1/8,NPT1/4,NPT3/8		NPT1/4,NPT3/8,NPT1/2	
Maximum operating pressure	psi	145					
Proof pressure	psi	218					
Operating temperature range (atmospheric and medium)	F°	41 to 140 (non-condensation)					
Filtration	µm	5	40	5	40	5	40
Water storage capacity (for **-N**)	in^3	0.79		0.98		1.65	
Materials used in major parts	Main unit	Die cast aluminum alloy					
	Holder	Polyethylene-telephthalate					
	Bowl	Polycarbonate*					
	Filter element	Non-woven fabrics					
	Bracket	Steel plate (electroless nickel plated)					
Mass (for standard specifications and maximum port size)	lbf	0.31		0.42		0.64	
Options[Note 1, Note 2]		Auto drain (NO and NC), bowl guard (plastic assembly), bracket (included part)					

Note 1: Ensure that the supply pressure is above 22 psi when selecting auto drain as an option (supply pressure is necessary for auto drain operations).
2: See pages 35, 36 and the order codes for details on the various types of options.

Order codes

FNZ □ – **F11** – □ – □ – □ – □

Air filter

NPT thread specifications

Main unit Port size

Model	NPT1/8	NPT1/4	NPT3/8	NPT1/2	
30	01	02			Filtered particle diameter 5 µm
40	01	02	03		
50		02	03	04	
31	01	02			Filtered particle diameter 40 µm
41	01	02	03		
51		02	03	04	

Drain cock specifications
A — Auto drain type drain cock NO type
C — Auto drain type drain cock NC type
N — Drain cock with fitting
S — No drain cock (short type)

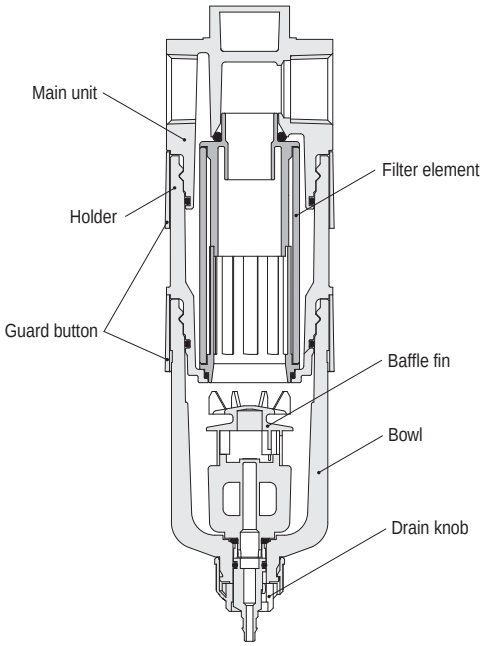
Bowl guard specifications
Blank — No bowl guard
PG — With bowl guard[Note]
Note: Not available for the **-S** models with no drain cocks (short type).

Bracket
Blank: — No bracket
B — With bracket

***PCT resin bowl for hash environments also available. Please contact Koganei for details.**

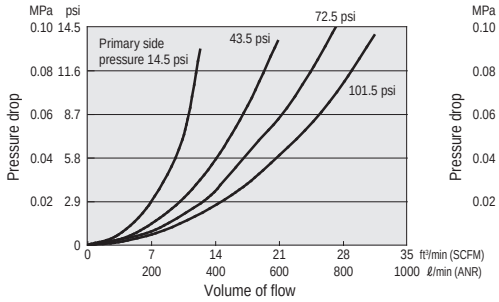
Inner construction

- **FNZ3□**
- **FNZ4□**
- **FNZ5□**

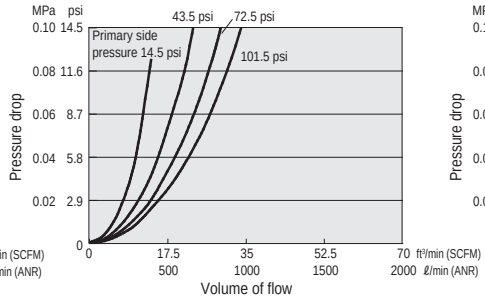


Flow rate characteristics

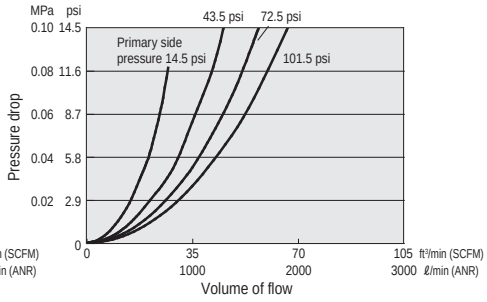
FNZ30-F11-01,FNZ31-F11-01



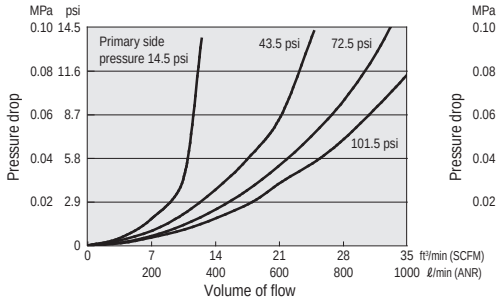
FNZ40-F11-01,FNZ41-F11-01



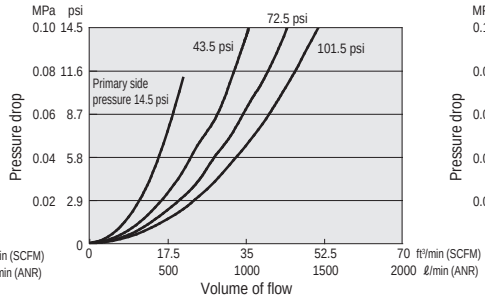
FNZ50-F11-02,FNZ51-F11-02



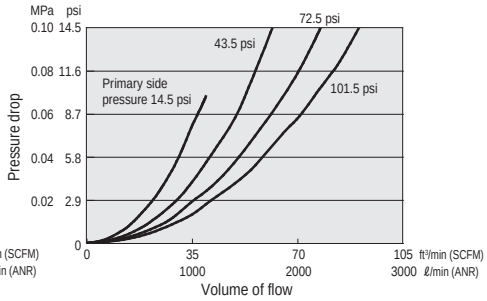
FNZ30-F11-02,FNZ31-F11-02



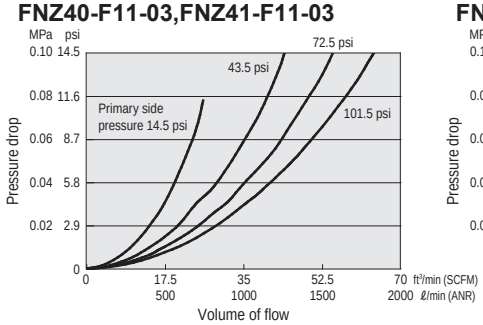
FNZ40-F11-02,FNZ41-F11-02



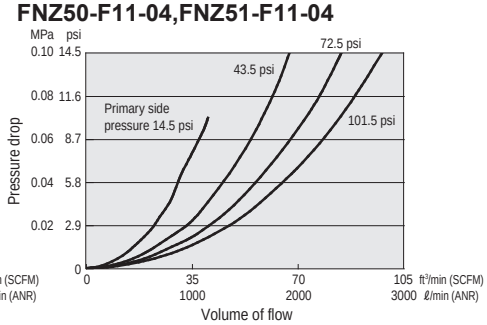
FNZ50-F11-03,FNZ51-F11-03



FNZ40-F11-03,FNZ41-F11-03



FNZ50-F11-04,FNZ51-F11-04

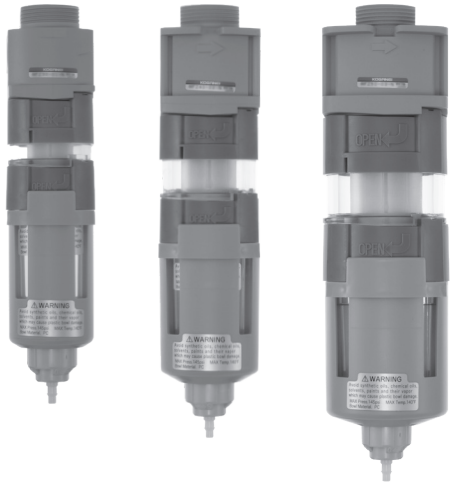


1 MPa = 145 psi

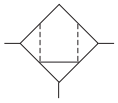
1 ℓ/min = 0.0353 ft^3/min

Oil mist filter

MFZ30-F11
MFZ40-F11
MFZ50-F11



Symbol



Specifications

Item		Model	MFZ30-F11	MFZ40-F11	MFZ50-F11
Medium			Air		
Port size			NPT1/8,NPT1/4	NPT1/8,NPT1/4,NPT3/8	NPT1/4,NPT3/8,NPT1/2
Maximum operating pressure		psi	145		
Proof pressure		psi	218		
Operating temperature range (atmospheric and medium)		F°	41 to 140 (non-condensation)		
Filtration		μm	0.3		
Particle filtering efficiency		%	99.9		
Secondary oil mist concentration[Note 1]		mg/ft^3	2.8×10^{-2} or less		
Maximum flow rate[Note 2]		ft^3/min (SCFM)	3.5	10.6	26.48
Water storage capacity (for **-N**)		in^3	0.79	0.98	1.65
Materials used in major parts	Main unit		Die cast aluminum alloy		
	Holder		Polyethylene-telephthalate		
	Bowl		Polycarbonate*		
	Filter element		Porous membrane		
	Bracket		Steel plate (electroless nickel plated)		
Mass (for standard specifications and maximum port size)		lbf	0.31	0.42	0.64
Options[Note 3, Note 4]			Auto drain (NO and NC), bowl guard (plastic assembly), bracket (included parts)		

Note 1: Value when the primary oil mist concentration is 0.85 mg/ft^3.
2: The maximum flow rate for the primary side is 101.5 psi and 1.45 psi pressure drop (maximum port size piping). The value for the maximum flow rate varies depending on the primary pressure and the secondary pressure.
3: Ensure that the supply pressure is above 22 psi when selecting auto drain as an option (supply pressure is necessary for auto drain operations).
4: See pages 35, 36 and the order codes for details on the various types of options.

Order codes

MFZ □ – **F11** – □ – □ – □ – □

NPT thread specifications

Main unit Port size

Model	NPT1/8	NPT1/4	NPT3/8	NPT1/2
30	01	02		
40	01	02	03	
50		02	03	04

Bracket
Blank: No bracket
B With bracket

Bowl guard specifications
Blank No bowl guard
PG With bowl guard[Note]
Note: Not available for the **-S** models with no drain cocks (short type).

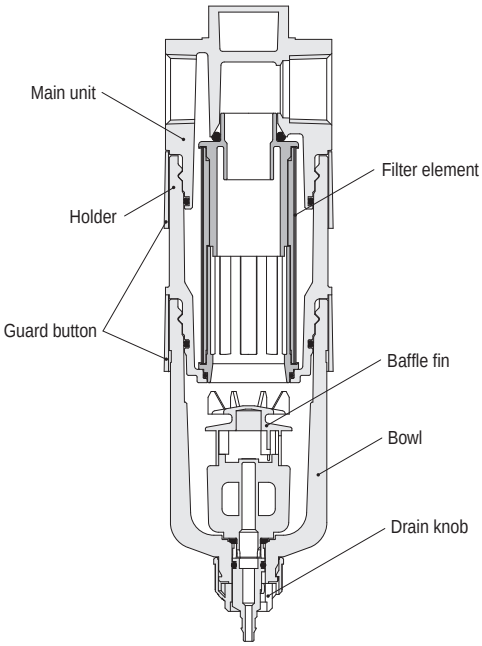
Drain cock specifications
A Auto drain type drain cock NO type
C Auto drain type drain cock NC type
N Drain cock with fitting
S No drain cock (short type)

Oil mist filter

***PCT resin bowl for hash environments also available. Please contact Koganei for details.**

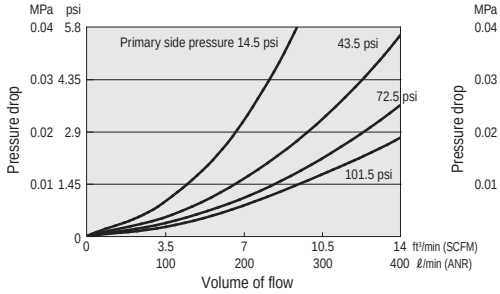
Inner construction

- **MFZ30**
- **MFZ40**
- **MFZ50**

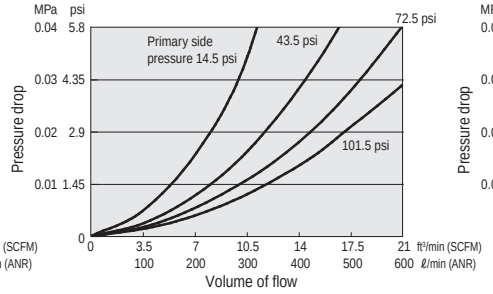


Flow rate characteristics

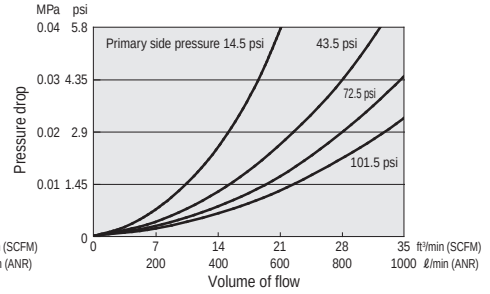
MFZ30-F11-01



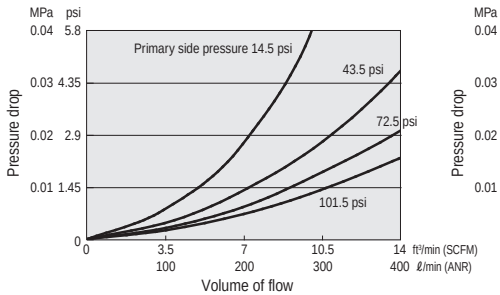
MFZ40-F11-01



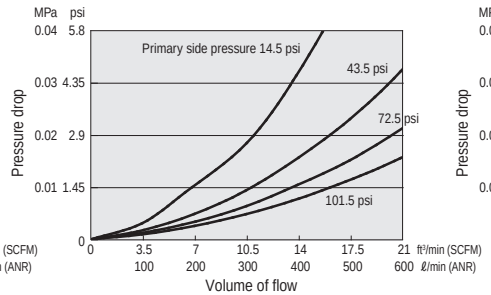
MFZ50-F11-02



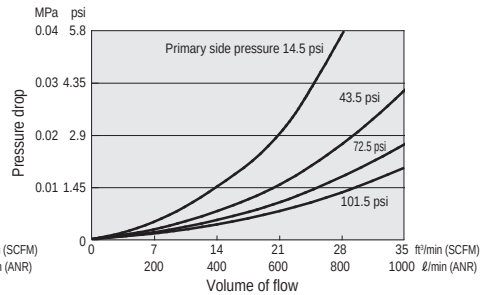
MFZ30-F11-02



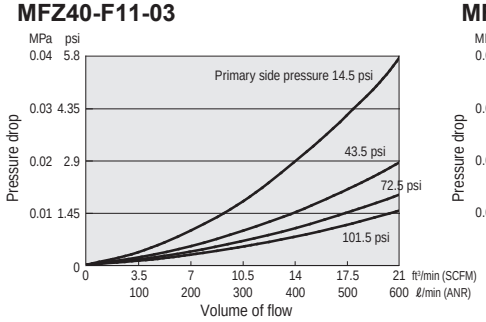
MFZ40-F11-02



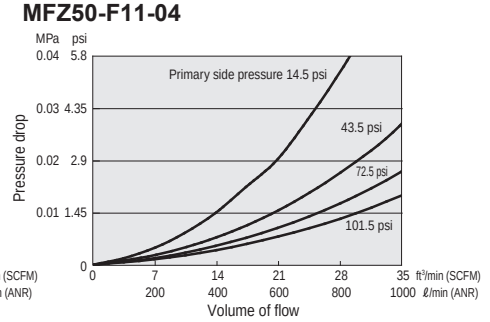
MFZ50-F11-03



MFZ40-F11-03



MFZ50-F11-04

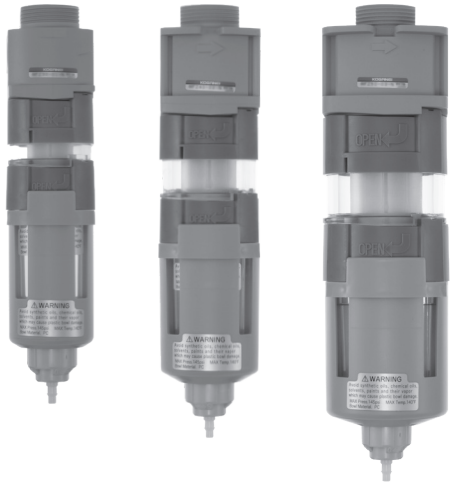


1 MPa = 145 psi

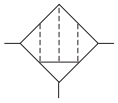
1 ℓ/min = 0.0353 ft^3/min

Micro oil mist filter

MMFZ30-F11
MMFZ40-F11
MMFZ50-F11



Symbol



Specifications

Item \ Model			MMFZ30-F11	MMFZ40-F11	MMFZ50-F11
Medium			Air		
Port size			NPT1/8,NPT1/4	NPT1/8,NPT1/4,NPT3/8	NPT1/4,NPT3/8,NPT1/2
Maximum operating pressure		psi	145		
Proof pressure		psi	218		
Operating temperature range (atmospheric and medium)		F°	41 to 140 (non-condensation)		
Filtration		μm	0.01		
Particle filtering efficiency		%	99.9999		
Secondary oil mist concentration[Note 1]		mg/ft^3	2.8×10^{-4} or less		
Maximum flow rate[Note 2]		ft^3/min (SCFM)	3.5	5.30	14.12
Water storage capacity (for **-N**)		in^3	0.79	0.98	1.65
Materials used in major parts	Main unit		Die cast aluminum alloy		
	Holder		Polyethylene-telephthalate		
	Bowl		Polycarbonate*		
	Filter element		Porous membrane		
	Bracket		Steel plate (electroless nickel plated)		
Mass (for standard specifications and maximum port size)		lbf	0.31	0.42	0.64
Options[Note 3, Note 4]			Auto drain (NO and NC), bowl guard (plastic assembly), bracket (included parts)		

Note 1: Value when the primary oil mist concentration is 0.85 mg/ft^3.
2: The maximum flow rate for the primary side is 101.5 psi and 1.45 psi pressure drop (maximum port size piping). The value for the maximum flow rate varies depending on the primary pressure and the secondary pressure.
3: Ensure that the supply pressure is above 22 psi when selecting auto drain as an option (supply pressure is necessary for auto drain operations).
4: See pages 35, 36 and the order codes for details on the various types of options.

Order codes

MMFZ □ – **F11** – □ – □ – □ – □

NPT thread specifications

Main unit Port size

Model	NPT1/8	NPT1/4	NPT3/8	NPT1/2
30	**01**	**02**		
40	**01**	**02**	**03**	
50		**02**	**03**	**04**

Micro oil mist filter

Drain cock specifications
A — Auto drain type drain cock NO type
C — Auto drain type drain cock NC type
N — Drain cock with fitting
S — No drain cock (short type)

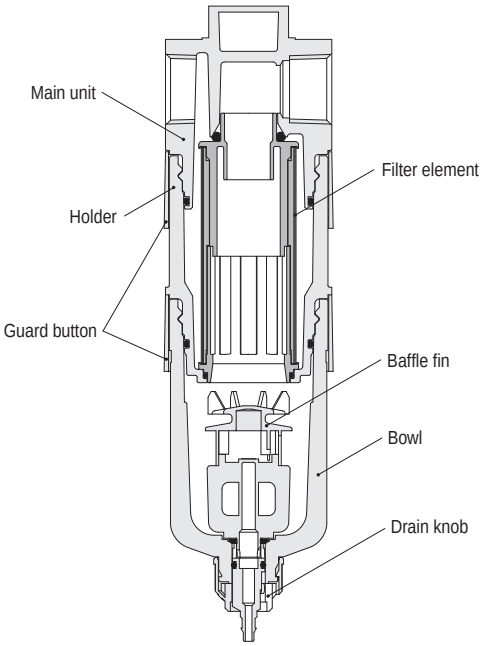
Bowl guard specifications
Blank — No bowl guard
PG — With bowl guard[Note]
Note: Not available for the **-S** models with no drain cocks (short type).

Bracket
Blank: — No bracket
B — With bracket

***PCT resin bowl for hash environments also available. Please contact Koganei for details.**

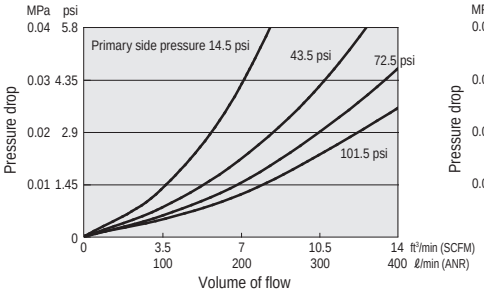
Inner construction

- **MMFZ30**
- **MMFZ40**
- **MMFZ50**

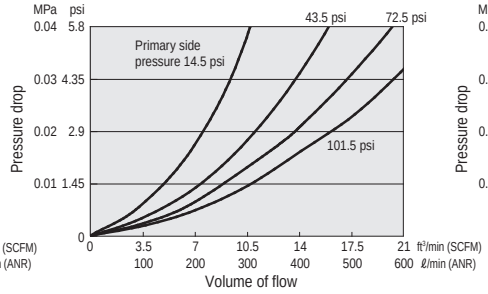


Flow rate characteristics

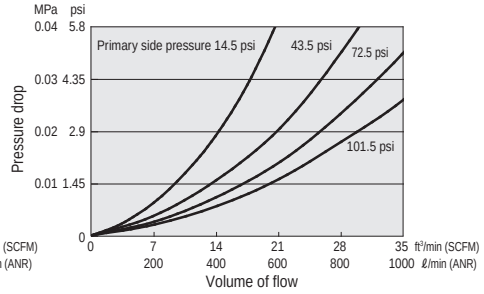
MMFZ30-F11-01



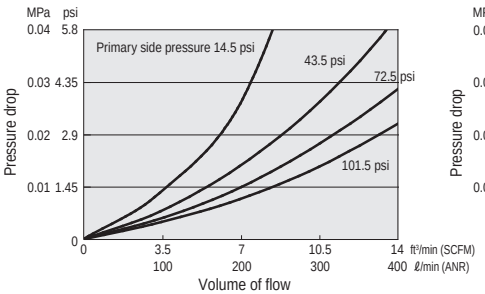
MMFZ40-F11-01



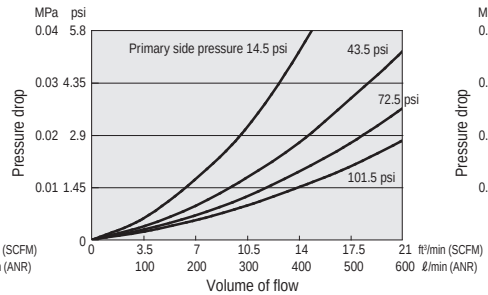
MMFZ50-F11-02



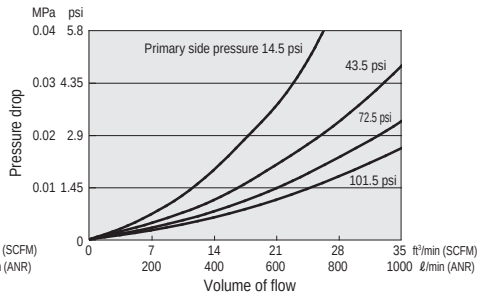
MMFZ30-F11-02



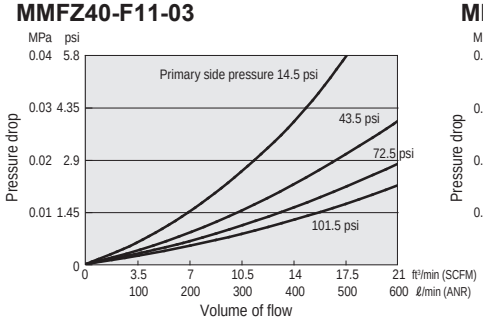
MMFZ40-F11-02



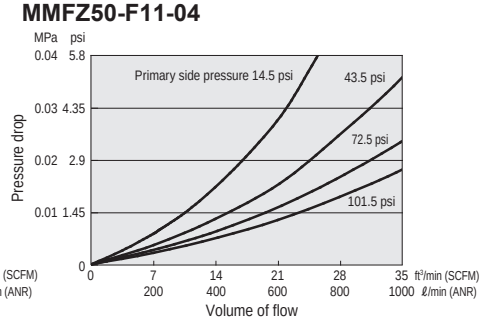
MMFZ50-F11-03



MMFZ40-F11-03



MMFZ50-F11-04

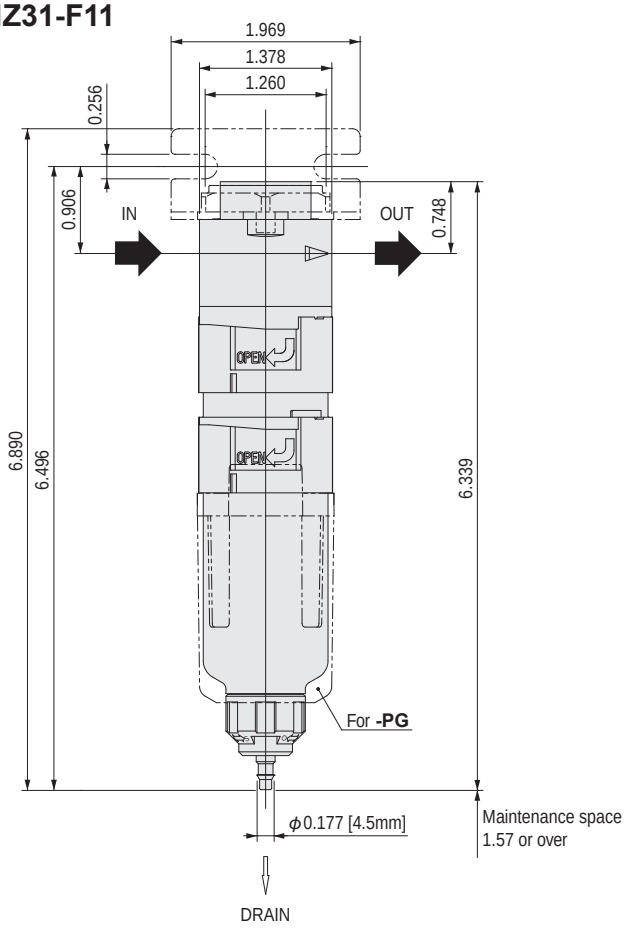


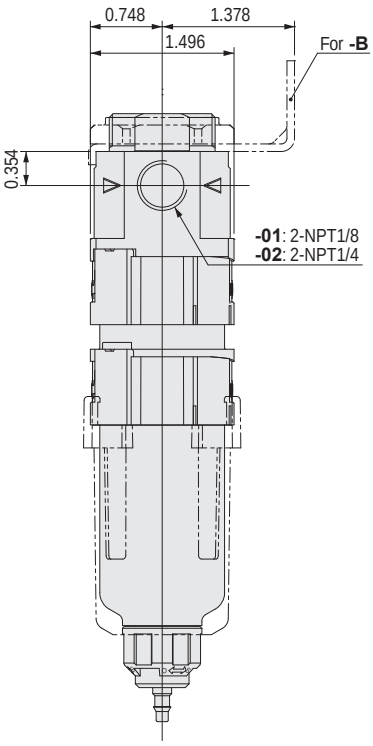
1 MPa = 145 psi

1 ℓ/min = 0.0353 ft^3/min

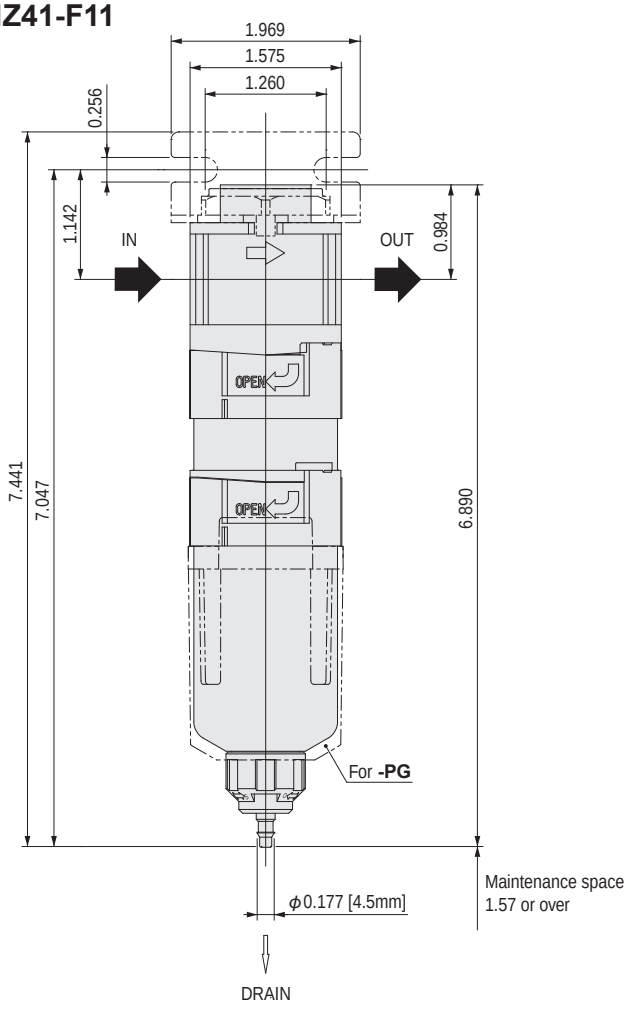
Dimensions in.

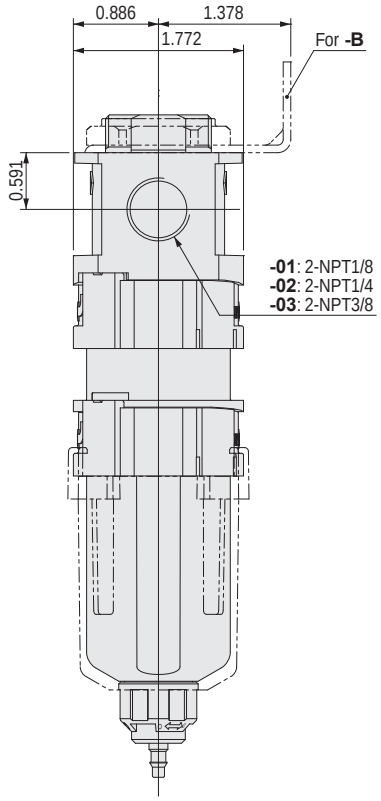
- **FNZ30-F11**,**FNZ31-F11**
- **MFZ30-F11**
- **MMFZ30-F11**





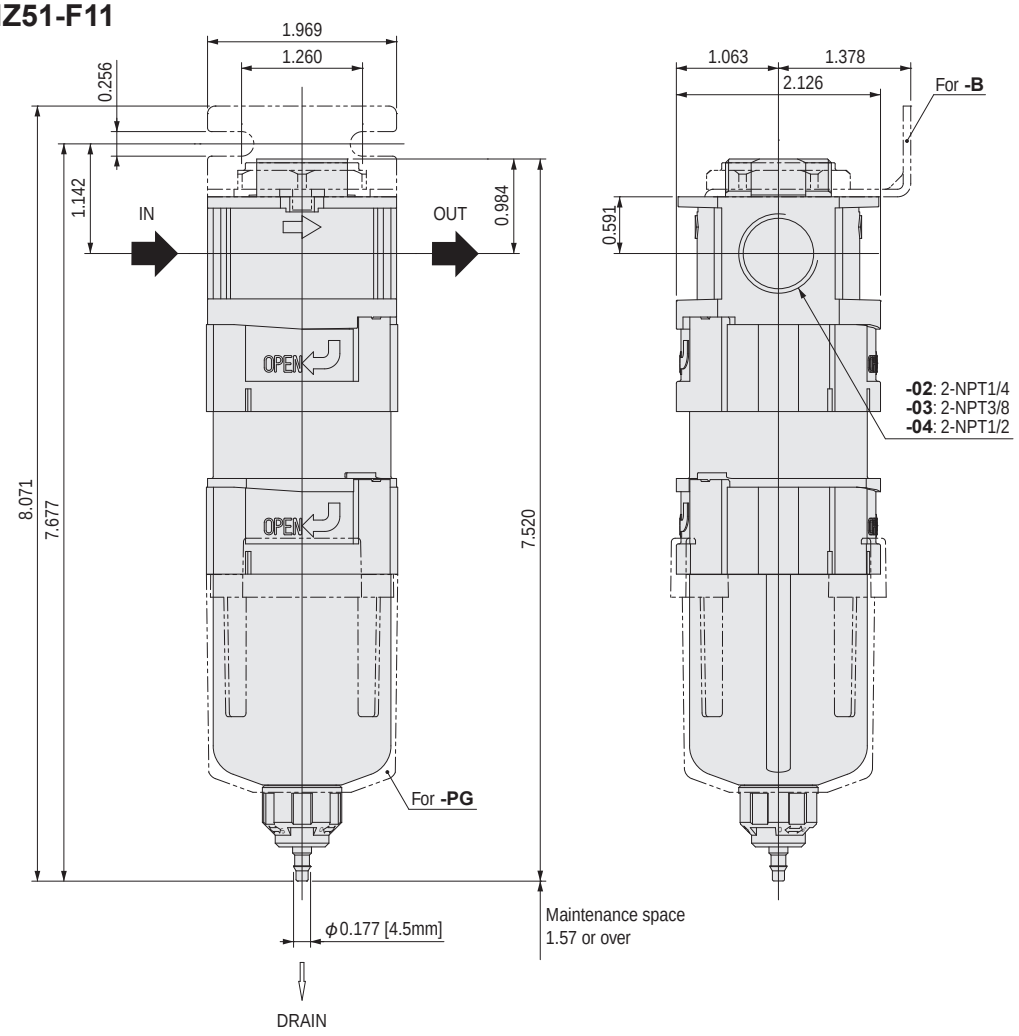
- **FNZ40-F11**,**FNZ41-F11**
- **MFZ40-F11**
- **MMFZ40-F11**





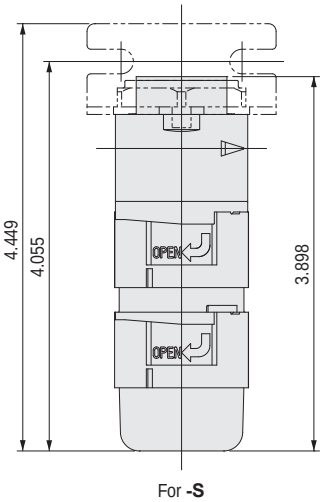
Dimensions in.

- **FNZ50-F11**,**FNZ51-F11**
- **MFZ50-F11**
- **MMFZ50-F11**

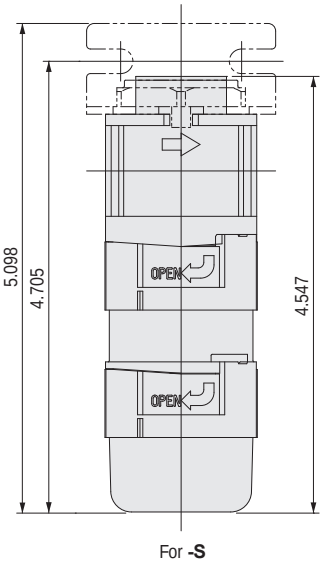


■ No drain cock (short type) for **-S**

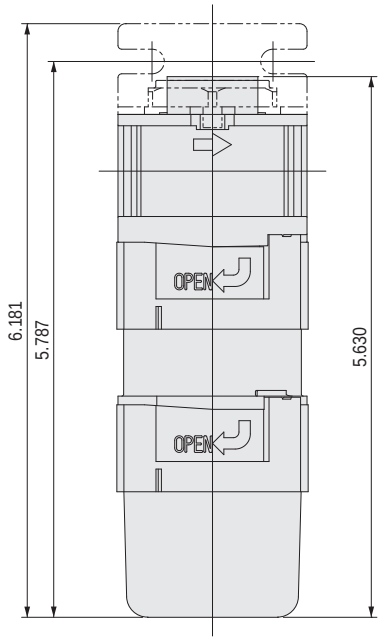
- **FNZ30-F11**,**FNZ31-F11**
- **MFZ30-F11**
- **MMFZ30-F11**



- **FNZ40-F11**,**FNZ41-F11**
- **MFZ40-F11**
- **MMFZ40-F11**



- **FNZ50-F11**,**FNZ51-F11**
- **MFZ50-F11**
- **MMFZ50-F11**



Other maintenance parts and order codes

● Order codes for brackets only

8Z-CBK

∗ With mounting ring
Common to all body sizes

8Z-BK

∗ Common to all body sizes

● Mounting ring

R-FRZ

● Maintenance parts

● Bowl assembly

BA-FRZB□-F11-□-□

Body size
30 — for **FNZ3□**, **MFZ30**, and **MMFZ30**
40 — for **FNZ4□**, **MFZ40**, and **MMFZ40**
50 — for **FNZ5□**, **MFZ50**, and **MMFZ50**

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

Auto drain type
NO type
NC type

Drain cock with fitting

Bowl guard specifications
Blank — No bowl guard
PG — With bowl guard

With bowl guard

● Bowl assembly (**-S** no drain cock (short type))

BA-FRZ□-F11

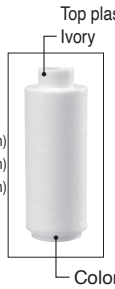
Body size
30 — for **FNZ3□-S**, **MFZ30-S**, and **MMFZ30-S**
40 — for **FNZ4□-S**, **MFZ40-S**, and **MMFZ40-S**
50 — for **FNZ5□-S**, **MFZ50-S**, and **MMFZ50-S**

● Element (for air filter)

E-□FNZ

Body size
30 — for **FNZ30** (filtered particle size 5 µm)
40 — for **FNZ40** (filtered particle size 5 µm)
50 — for **FNZ50** (filtered particle size 5 µm)
31 — for **FNZ31** (filtered particle size 40 µm)
41 — for **FNZ41** (filtered particle size 40 µm)
51 — for **FNZ51** (filtered particle size 40 µm)

The top and bottom plastic parts and the element part are separate structures.



● Element (for oil mist filter)

E-□MFZ

Body size
30 — for **MFZ30**
40 — for **MFZ40**
50 — for **MFZ50**
∗ Filtered particle size 0.3 µm

The top and bottom plastic parts and the element part form one integrated structure.

● Element (for micro oil mist filter)

E-□MMFZ

Body size
30 — for **MMFZ30**
40 — for **MMFZ40**
50 — for **MMFZ50**
∗ Filtered particle size 0.01 µm

The top and bottom plastic parts and the element part form one integrated structure.

●Seal kit (various o-rings)

SRK-MFZ□

Body size
30 — for **FNZ3□**, **MFZ30**, and **MMFZ30**
40 — for **FNZ4□**, **MFZ40**, and **MMFZ40**
50 — for **FNZ5□**, **MFZ50**, and **MMFZ50**

Refer to "Replacing the seal kit, element, and bowl assembly" on page 42 regarding the component parts of the seal kits.

Design and selection

● Selection

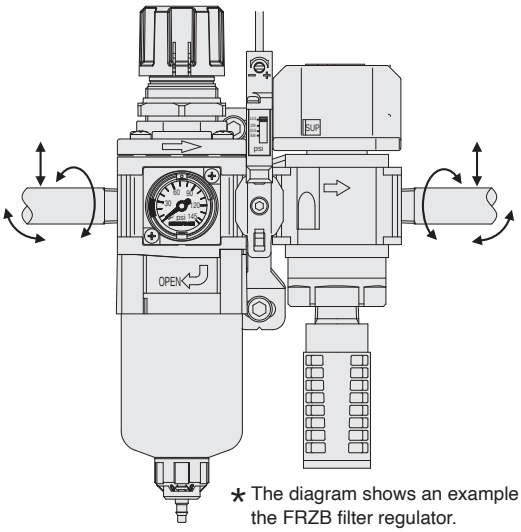
See the Handling Instructions and Precautions, Specifications, Various Characteristics, Dimensions, and other technical materials for each product to make the correct decision.

Mounting (installation) and piping

● Mounting (installation) direction, support, and securing

1. The products cannot be mounted (installed) if a bending moment or twisting moment is applied to the product or piping.

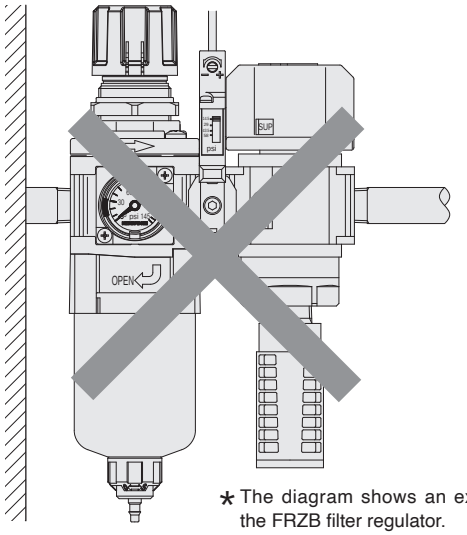
Note Applying bending moment or twisting moment may damage the product.



✱ The diagram shows an example for the FRZB filter regulator.

2. Do not attach piping so that just one side is fixed as shown in the following diagram. Support external piping separately.

Note The moment caused by the OUT (secondary) side pipes may damage the product's piping connections.



✱ The diagram shows an example for the FRZB filter regulator.

3. Use the brackets to install the products.

4. When mounting (installing) products, always make sure they are secured and sufficiently supported.

Note If a product is not securely fixed in place, it may fall over, be dropped, or operate abnormally and cause an injury.

● Maintenance space requirements

Assure there is sufficient space for maintenance inspections and maintenance work.

See the dimension diagrams for each of the products regarding the maintenance space.

Note It there is not enough allowance for maintenance space, it is impossible to remove the bowl assembly and replace the filter. Also, it is impossible to do maintenance inspections so the equipment may stop or the product may be damaged.

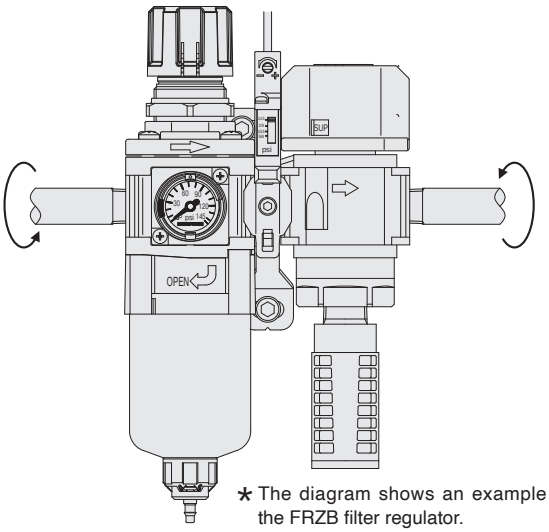
● Attaching steel pipes and fittings

If steel pipes and fittings are attached to the threaded sections of the aluminum die-cast parts of the product, tighten them to the torque recommended in our standards.

Note Tightening with excessive torque may damage the product or injure workers or operators.

Recommended tightening torque ft·lbf

Connecting thread	1/8	1/4	3/8	1/2
Torque	5.2 to 6.6	8.9 to 10.3	16.2 to 17.7	20.7 to 22.1



✱ The diagram shows an example for the FRZB filter regulator.

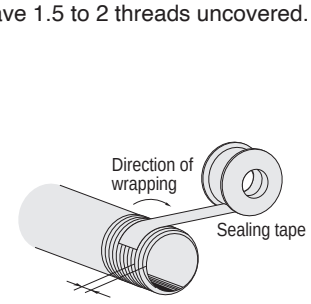
● Preventing contamination by foreign matter

1. Remove all foreign matter, such as metal chips, cutting oil, or dirt, from inside pipes with a compressed air blower (flushing) and thorough washing before fitting the pipes.

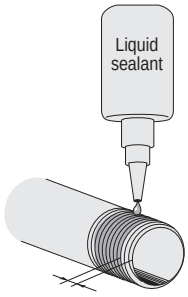
2. Do not allow foreign matter, such as metal chips, or sealing tape from the piping threads, to get into the pipes when installing the pipes and fittings.

Note Foreign matter entering the piping may damage the product or reduce its performance and service life.

3. Wrap the sealing tape in the direction as shown in the diagram below leaving 1.5 to 2 threads uncovered. When using liquid sealant, apply a suitable amount and in the same way leave 1.5 to 2 threads uncovered.



Leave 2 threads open.



Leave 2 threads open.

Note If the sealing tape or sealant gets on the lip of pipes or fittings, bits of it may get into the pipes and cause air leaks.

4. If you are using liquid sealant, do not get it on the polycarbonate parts (the bowl of the filter regulator).

Note If liquid sealant gets on the polycarbonate parts, it may damage them.

Medium and operating environment

●Usable medium

1. Use cleaned air for the medium. Contact the nearest Koganei sales office or overseas department if you are considering using something other than cleaned air.

• For MFZ
Install the FNZ air filter on the primary side to avoid premature clogging.

• For MMFZ
Install the MFZ oil mist filter on the primary side to avoid premature clogging.

2. For drain cock specifications (-A, -C, -N), avoid using air that contains too much water or fluids.

Note Using air that contains too much water or fluids will cause the product's functions to stop after a short period and will reduce the product performance and service life.

3. For drain cock specification (-S), it cannot be used with air that contains water or fluids because there is no function to remove water or fluids.

Note Using air that contains water or fluids will cause the product's functions to stop after a short period and will reduce the product performance and service life.

4. If air that contains water or fluids is used, or if it is possible that they may be mixed in with the air being used, we recommend using the iB-Cyclone to reliably remove water and fluids.

5. Do not use the product if the media being used is prone to extreme pulsating or surging.

Note Medium prone to extreme pulsating or surges will cause the product's functions to stop after a short period and will reduce the product performance and service life.

● Operating environment

1. 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.
2. Cover the unit when using it in locations where it might be subject to excessive dust, dripping water, dripping oil, etc.
3. Do not use the product in environments subject to external vibration or impact.

Note External vibrations or shocks may result in damage to component parts.

4. Avoid piping that is rigid, such as steel piping, if vibrations are transmitted. Use flexible tubes so that the product is not subject to the vibrations.

● Medium and operating environment

1. The temperature of the medium and the ambient environment must be within the range in the specifications.

Note Using the product in an environment that is outside the specified temperature or with media that is outside the specified temperature will cause the product's functions to stop after a short period and will reduce the product performance and service life.

2. Use a device, such as a freeze-type air dryer or after cooler, to lower the dew-point temperature of the medium to below the ambient temperature so condensation or frost does not occur in the secondary pipes.

Note If condensation or frost forms in the product, it may get into the secondary side.

3. Do not use medium in the product or use the product in an environment that includes corrosive components such as organic solvents, phosphate ester type hydraulic oil, sulfur dioxide, chlorine gas, freon gas, ozone, acids, alkaline, etc.

Note Using the product in an environment or with medium that is specified in the above item 3 will cause the product's functions to stop after a short period and will reduce the product performance and service life.

4. The material of the bowl of the filter is polycarbonate. This product cannot be used in environments with the gases and fluids in item 3, nor threadlocking adhesive, leak detection fluid, hot water or where it may be exposed to them. This product also cannot be used in direct ultra-violet light. See the reference materials on page 45 for details.

Operation and maintenance inspections

● Method of use

Read the Handling Instructions and Precautions for each product for instructions on correct usage.

● Maintenance (maintenance inspection)

1. Performance and functions may decrease as the pneumatic equipment ages. Always conduct daily inspections of the pneumatic equipment, and confirm that all requisite system functions are satisfied, to prevent accidents from happening.
2. Read the Handling Instructions and Precautions for instructions on maintenance and replacing maintenance parts.
3. The product must be disassembled and reassembled to use the seal kit.

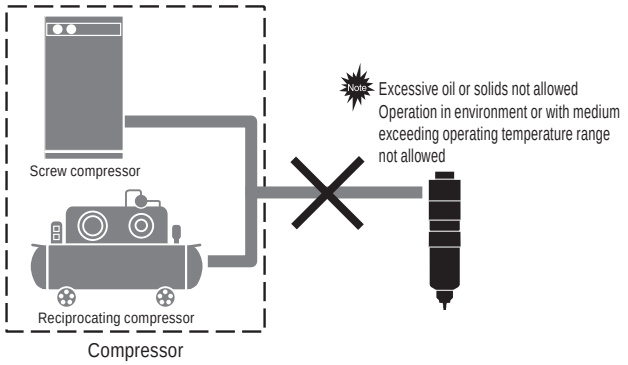
Note The product is no longer under warranty if it is disassembled and reassembled.

Design and selection

• Direct installation on compressor

Do not install the product directly on a compressor. Use sufficient countermeasures for temperature control, and removing oils and solids before use.

Note Not using countermeasures may cause the product's functions to stop after a short period and may reduce the product performance and service life.



• Water and fluids removal functions

The FRZ series air filters, micro oil mist filters, and oil mist filters cannot reliably remove water and fluids.

Note Use an iB-Cyclone to completely remove moisture and fluid.

• Humidity removal

Air filters, micro oil mist filters, and oil mist filters cannot dehumidify.

Note Install a membrane air dryer or something on the secondary side if dehumidifying is needed.

Mounting (installation) and piping

• Mounting (installation) direction

Mount (install) the air filter, micro oil mist filter, or oil mist filter vertically so the drain outlet is down.

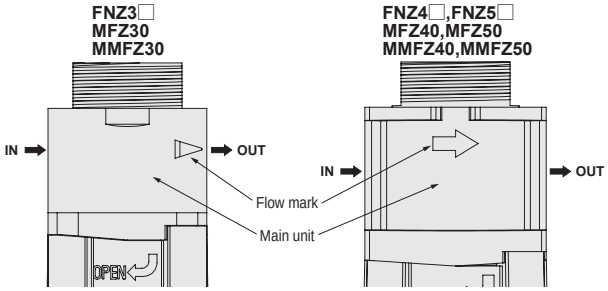
•Direction of flow

1. Connect the air filter, micro oil mist filter, or oil mist filter so that the medium flows in the IN port (primary) side and flows out the OUT port (secondary) side.
2. Use the flow marks on the products to identify the primary port and secondary port of the air filter, micro oil mist filter, or oil mist filter.

Note Reversing the IN port (primary) side and the OUT port (secondary) side connections damages the product and causes it to stop functioning.

• Flow mark

The following diagram shows the relationship of the direction of flow of the medium and the flow mark on the air filter, micro oil mist filter, and oil mist filter.



• Piping work

Connect steel pipes and fittings to the air filter, micro oil mist filter, or oil mist filter IN ports and OUT ports so that the weight and torque of the pipes do not affect the product. When tightening the piping, grip the main unit and tighten it to the torque recommended on page 38.

Note Applying unnecessary force or impact to the holder or bowl assembly may damage component parts.

• Installing brackets

To install brackets, do it in the following order.

1. Detach the bracket.
2. Screw on the mounting ring.

Note Tighten the mounting ring to less than 3.69 ft·lbf.

• Mounting ring

1. Tighten the mounting ring to less than 3.69 ft·lbf.
2. If you use a tool to tighten the mounting ring, be sure to firmly grip the opposite edges of the mounting ring.

Note If the mounting ring is not firmly gripped or too much torque is applied to it, component parts may be damaged.

Operation and maintenance inspections

• Clear plastic parts (holder and bowl assembly)

1. Do periodic inspections to look for cracks, scratches, or other deterioration in the clear plastic parts. If you detect any cracks, scratches, or other deterioration, immediately stop use.
2. If you find any cracks, scratches, or other deterioration in the bowl, replace the bowl assembly with a new one, because it may cause a breakdown.

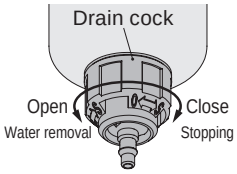
Note Cracks, scratches, or other deterioration may cause the bowl to break.

3. Replace the bowl assembly with a new one if it becomes dirty or the transparency is reduced. To wash the bowl holder, use diluted household cleaner to wash it and then rinse it off with water. See the reference materials on page 45 for details about the chemical resistance of the bowl holder material.
4. When replacing the seal kit, element, and bowl assembly, be careful not to lose component parts.
5. Refer to page 42 when replacing the seal kit, element, and bowl assembly.

• Drain cock operation

1. Turn the drain cock with your hand.
2. Use the following procedure to operate the drain cock.
   1. Turn the drain cock in the direction of [O].
   2. After the water and fluids have drained out, turn the drain cock in the direction of [S] until it clicks and locks.
3. Do not turn the drain cock more than 100° from the closed position, when you open it.

Note Turning the drain cock more than 100° may damage it.



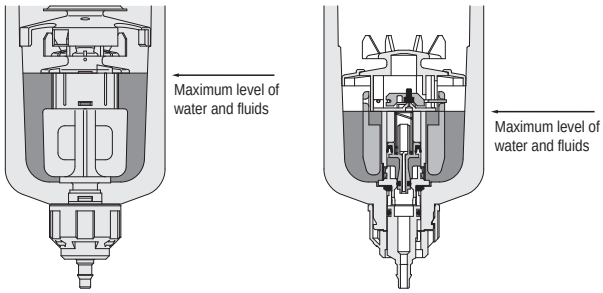
• Draining oil and fluid

1. If the regulator you are using has no auto drain (**-N**), be sure to drain the water and fluids before their volume reaches the level shown in the left side diagram below.

Note If the volume of water and fluids is greater than that shown in the left side diagram below, the water and fluids removal function is greatly reduced.

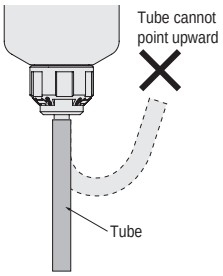
2. If the regulator you are using has an auto drain (**-A** or **-C**), the water and fluids that collects on the primary side is flushed all at once, do not let it exceed the maximum level as shown in the right side diagram below.

Note The auto drain may malfunction if the volume of water and fluids exceeds the maximum level as shown in the left side diagram below.



3. See the reference material on page 43 "Explanation of operation of auto drain system" regarding the auto drain operation principles.
4. A tube with an inner diameter of ϕ0.157 in. [4 mm] can be attached to the barbed fitting of the drain cock. Make sure the drain cock is closed (locked) before attaching the tube.
5. Cut the end of the tube to be connected to the barbed fitting of the drain cock straight across, and the barbed fitting must be inserted completely as shown in the diagram.
   Also, after installing the tube, lightly pull on it to check that it does not come off.
6. Do not allow the tube on the barbed fitting of the drain cock to become severely bent or twisted close to the fitting.

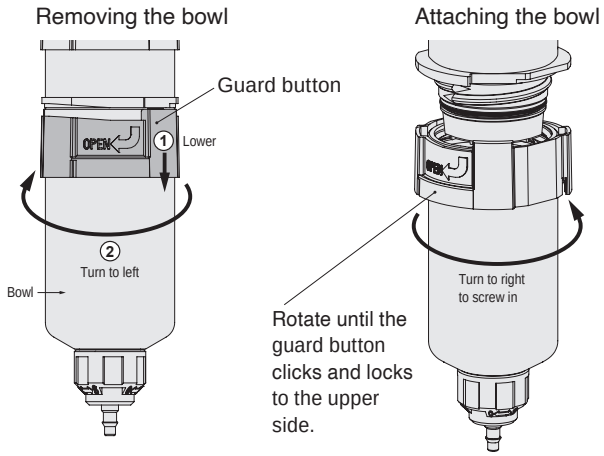
Note Lateral force may damage the barbed fitting.



• Attaching and removing the bowl assembly

1. Be sure to release any pressure in the system before attaching (or removing) the bowl assembly.
2. Use the procedure shown in the diagram below to attach (or remove) the bowl assembly.
3. Squeeze the guard button to attach (or remove) the bowl assembly.

Note If there is a bowl guard, it may fall off when you squeeze it.

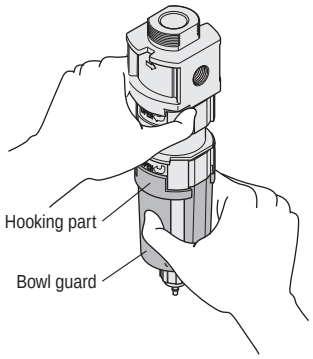


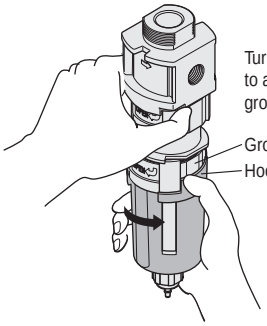
4. When attaching or removing the bowl assembly, move it vertically so you do not touch the internal component parts.

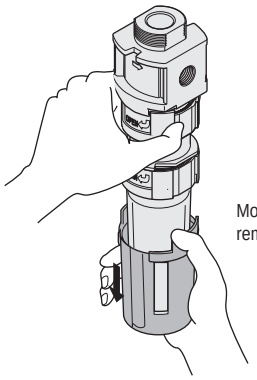
• Attaching and removing the bowl guard

1. Be sure to release any pressure in the system before attaching or removing the bowl guard.

2. Use the procedure shown in the diagram below to attach (or remove) the bowl guard.







3. Use the reverse of the procedure shown in the diagram above to attach the bowl guard.

• Replacing the seal kit, element, and bowl assembly

1. To replace the seal kit, element, and bowl assembly, remove the air filter, micro oil mist filter, or oil mist filter and do the work on a work table.

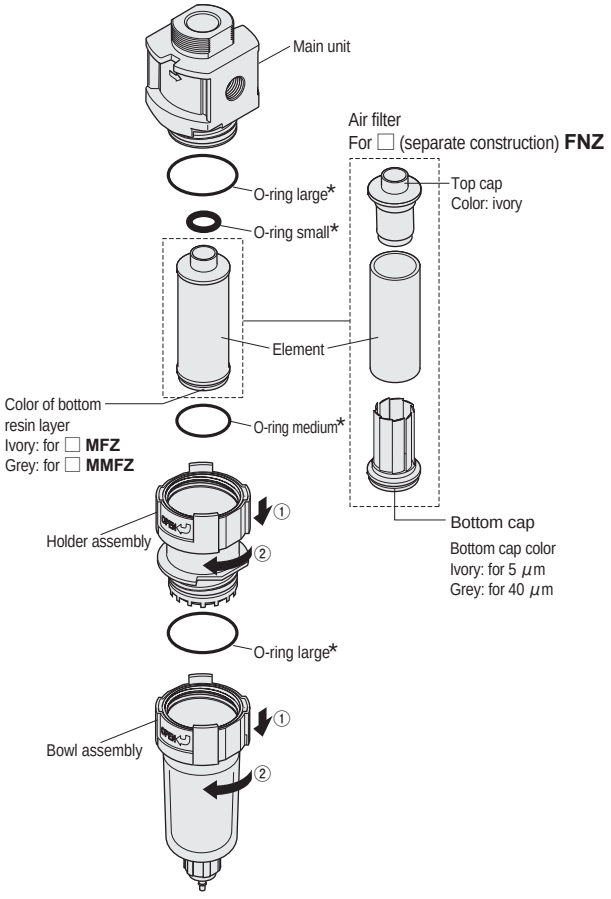
2. Periodically replace the element of the air filter, micro oil mist filter, or oil mist filter.

Note The service life of the element varies depending on the quality of air supplied to the IN port (primary) side. If the air supplied to the IN port (primary) side is highly contaminated with foreign matter, install a prefilter on the IN port (primary) side or change the air filter frequently. As a guideline, the replacement time for the element is one year after starting to use it.

Note Always assemble the component parts correctly.

• Assembly and disassembly diagrams

FNZ□·MFZ□·MMFZ□



The * mark indicates component parts of the seal kit.

Note The product is no longer under warranty if it is disassembled and reassembled.

Module adapter

Mounting (installation) and piping

• Mounting (installation)

1. Use the various modules and adapters when combining the relevant FRZ series models and the relevant iB-Cyclone* models.
*Refer to "FRZ series and iB-Cyclone system displays" on page ❸.

2. Refer to "List of models" on page 101 regarding combinations of the relevant models, modules, and adapters.

Note The FRZ3□, RZ3□, and IBCY30 cannot be used together.

3. When assembling the products, check the flow marks on the products and assemble them so the media flows in the same direction. See the "Handling Instructions and Precautions" for each product regarding the relationship of the flow marks and direction of flow of the medium being used (air filter, micro mist filter and oil mist filter on page 40).

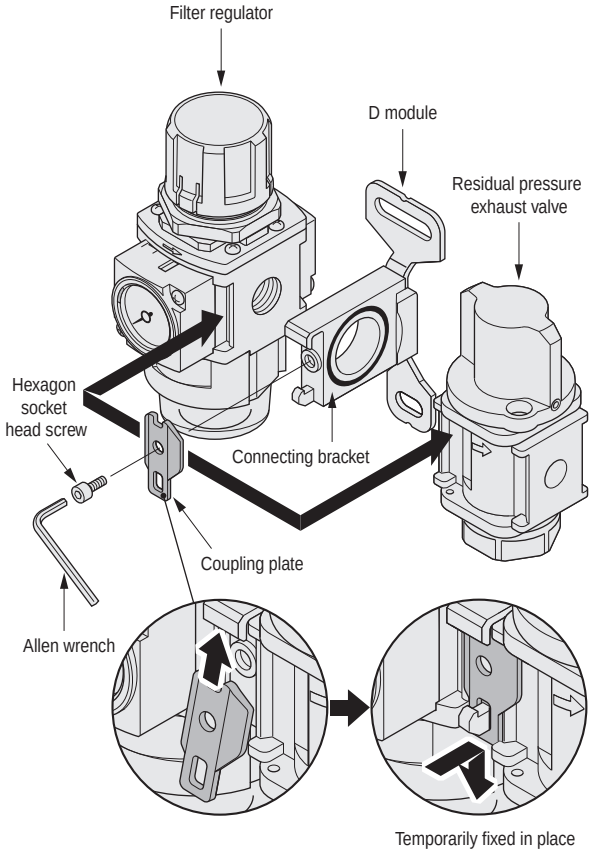
4. Use the following procedure to assemble the products using the modules and adapters.
① Attach the o-rings to the connecting bracket (2 places)

Note Not using an o-ring will result in air leaks.

② Temporarily fix the products to the coupling plate.
③ Tighten a hexagon socket head screw to 0.66 to 0.81 ft•lbf.

Note If torque exceeding the specifications is applied, it may damage component parts. Also, if torque below the specifications is used, the screw may come loose.

<Example assembly>



Pressure switch module

Mounting (installation) piping

• Mounting (installation)

1. The method to install the pressure switch modules is the same for the various modules and adapters. Refer to the "Handling Instructions and Precautions" for the modules and adapters.

2. Do not pull too hard on the wires or bend them too much. Also, when handling the products, carry them by the pressure switch side and do not apply too much force to the wires.

3. Be careful when handling the pressure switch modules, subjecting them to strong impact may cause damage or malfunction.

• Contact capacity

Use the specified load voltage and load current.

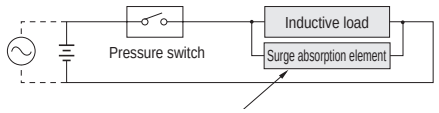
Note Using a load voltage or a load current that is outside the specifications may cause the contacts to fuse.

• Contact protection measure

The pressure switch module uses a reed sensor switch. Take the contact protection measures shown in the diagram below.

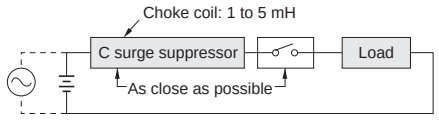
Note Contacts may fuse if measures to protect the contacts are not taken.

For connecting an inductive load (electromagnetic relay etc)



For DC ... Diode or CR, etc.
For AC ... CR etc.
Diode: Forward current should be more than the circuit current and the reverse current should be 10 times greater or more than the circuit voltage.
CR: C=0.01 to 0.1µF
R=1 to 4 kΩ

If a capacitive surge occurs (if wire length is 32.8 ft)



Medium and operating environment

• Operating environment

The pressure switch module uses a magnetically sensitive sensor switch.
Avoid large electric currents, such as locations where there is a strong magnetic field or near power lines.

Note Use in locations with strong external magnetic fields or near strong electric currents may cause the pressure switch module to malfunction.

Operation and maintenance inspections

● Detection pressure scale

1. Use a detection pressure scale as a guideline.

Note: Use a multi meter to confirm the output of the pressure switch module.

Note: To accurately set the detected pressure, use a separate pressure gauge.

2. Detection pressure scale is for the set value when the supplied pressure falls.

3. Detection pressure scale is for the set value when the OFF signal is detected.

Note: The ON signal is detected when the pressure exceeds the set pressure on the detection pressure scale by the response differential.

● Settings for the detection pressure

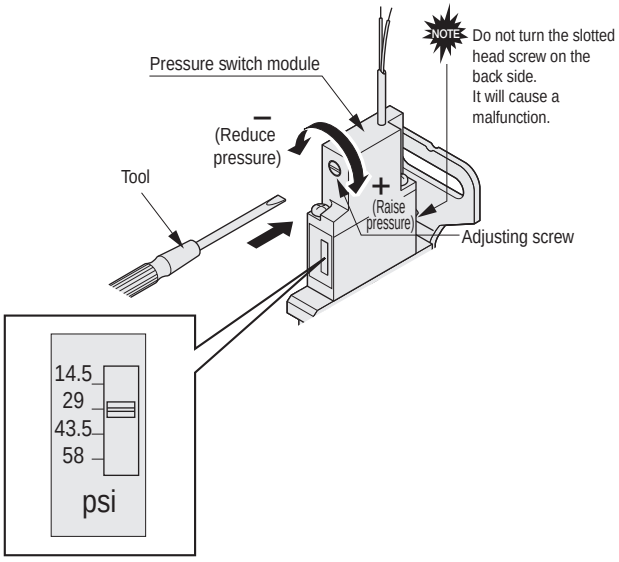
1. The detection pressure can be set to a value over the range of detection pressure, but always set it within the specified values.

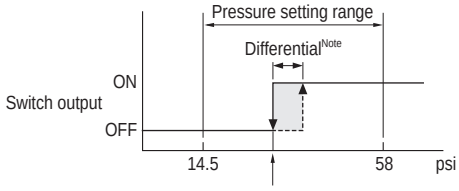
Note: Setting the pressure over the range of the detection pressure will damage component parts.

2. Use the following procedure to set the detection pressure.

① Turn the adjusting screw toward the "+" until the regulating indicator is aligned with the desired detection pressure on the scale.

② Supply pressure and use a multi meter to confirm that the signal indicates the desired pressure setting is detected.

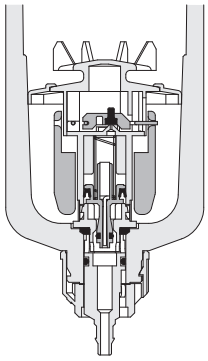
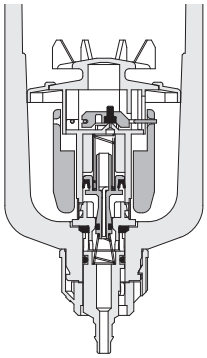
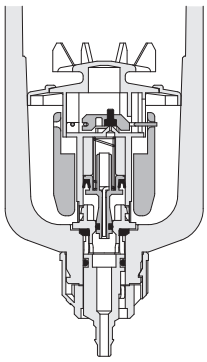
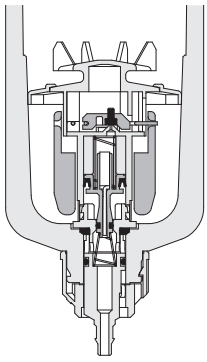
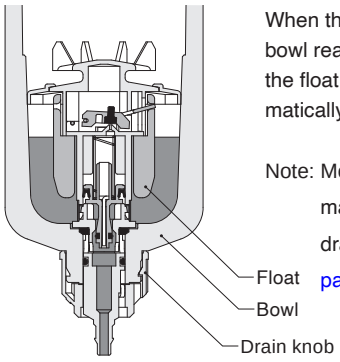
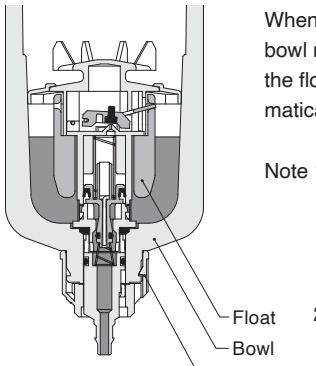
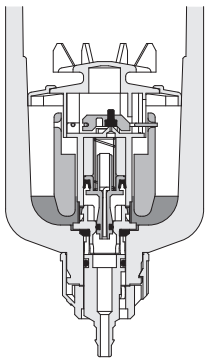
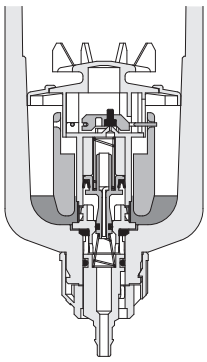




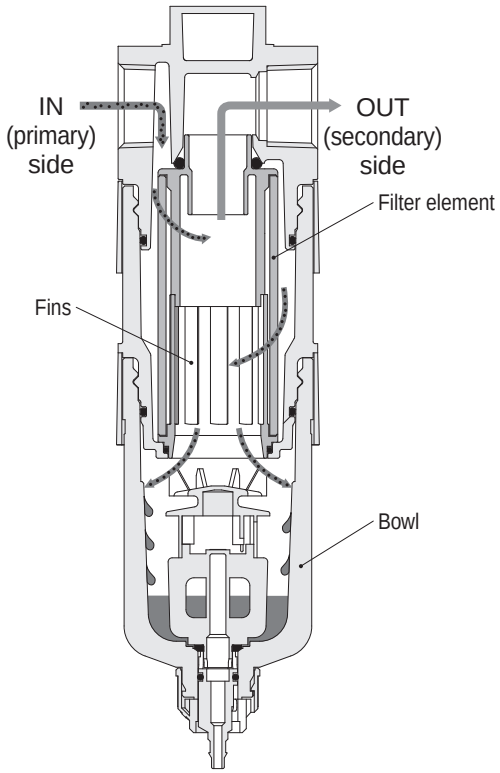
Value set on the detection pressure scale

Note: Response differential is less than 12 psi

●Explanation of operation of auto drain system

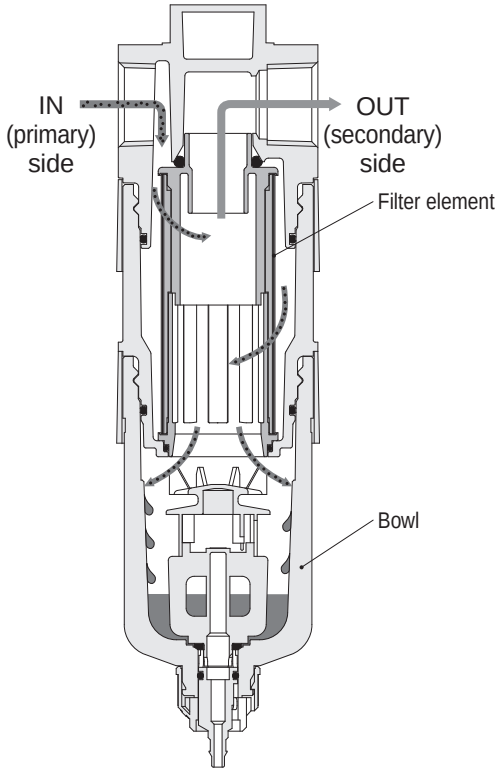
State \ Type	NO type	NC type
Not pressurized	 Open When unpressurized, the liquid outlet opens and the liquid drains naturally.	 Close When unpressurized, the liquid outlet closes and the liquid cannot drain. Note: Liquid does not drain when unpressurized, if there is a lot of liquid even in an unpressurized (low pressure) condition, it may be necessary to drain the liquid by hand.
Pressurized	 Close Air and liquid will be discharged from the liquid outlet until the pressure exceeds the minimum operating pressure (22 psi). The air and liquid will stop after stored pressure exceeds the minimum operating pressure. Note: A compressor with a small output may not reach full pressure, and there may be air output until the minimum operating pressure is exceeded.	 Close In the same way, when unpressurized, the liquid outlet closes and the liquid cannot drain.
Draining liquid	 Open When the level of liquid in the bowl reaches a specified level, the float lifts and the liquid automatically drains. Note: Moisture can be drained manually by turning the drain knob to the left. See page 41 for details.	 Open When the level of liquid in the bowl reaches a specified level, the float lifts and the liquid automatically drains. Note 1: Supply pressure is needed to operate the auto drain. A minimum of 22 psi is needed for the supply pressure. 2: Liquid can be drained manually by turning the drain knob See page 41 for details.
Draining liquid completed	 Close When the liquid drains, the float lowers and the liquid outlet closes, and liquid stops draining.	 Close When the liquid drains, the float lowers and the liquid outlet closes, and liquid stops draining.

●Principles of fluid and dirt removal from air filters



1. The element separates dirt from the air supplied from the IN port (primary) side.
2. Fluid aggregates due to the centrifugal separation from the swirling current created by the fins and collects in the bowl.
3. The air, from which the fluid and dirt have been separated, passes through the top part of the filter element to the OUT port (secondary).

●Principles of oil and dirt removal from micro oil mist filters and oil mist filters



1. The element separates oil and dirt from the air supplied from the IN port (primary) side.
2. Oil aggregates due to the centrifugal separation from the swirling current created by the fins and collects in the bowl.
3. The air, from which the oil has been separated, passes through the top part of the filter element to the OUT port (secondary).

●About the chemical resistance of polycarbonate

The chemicals in the following table degrade polycarbonate. Because of this, they may damage the bowl of the filter regulator or the front cover of the pressure gauge and cause an accident. The products cannot be used in locations where the chemicals in the following table are present in the compressed air, ambient air, or on surfaces. 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	Acid cleaning for metals, acid degreasing, and coating processing
	Alkali	Caustic soda, caustic potash, hydrated lime, ammonia water, 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, ethyl benzene, styrene	Paint thinner (Benzene, toluene, xylene)
	Chlorinated aliphatic hydrocarbons	Methyl chloride, ethylene chloride, methylene chloride, acetylene dichloride, chloroform, trichlene, tetrachloroethylene, carbon tetrachloride	Organic solvents for metal cleaning (trichlene, tetrachloroethylene, carbon tetrachloride)
	Chlorinated aromatic hydrocarbons	Chlorobenzene, dichlorobenzene, 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, methyl ethyl 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 medium (phthalic acid)
	Phthalic acid ester	Dimethyl phthalate (DMP), diethyl phthalate (DEP), dibutyl phthalate (DBP), dioctyl phthalate (DOP)	Lubricants, synthetic hydraulic fluids, corrosion resistant additives, synthetic resin plasticizer
	Oxyacid	Glycolic acid, lactic acid, malic acid, citric acid, tartaric acid	Food preservatives, acidulant
	Nitro compounds	Nitromethane, nitroethane, nitroethylene, nitrobenzene	Paint solvent, explosives
	Amine	Methylamine, dioctylamine, ethylamine, aniline, acetanilide	Brake fluid additive
	Nitrile	Acetonitrile, acrylonitrile, benzonitrile	Nitrile rubber materials

With water and fluids removal functions

FRZB Filter Regulator

Easy-to-use water and fluids removal functions inside a compact design!

Specialized 30 series
for standalone application

FRZB30

The 40 and 50 series
can be used in combination with the FRZ series

FRZB40

FRZB50

Down sizing
Improved flow rate characteristics allow a smaller configuration (close side-by-side spacing is possible).

Improved operability and maintainability
Improved knob operability and simple bowl installation and removal.

Pressure gauge, pressure switch
Supports □1.181 in. integrated pressure gauges, other pressure gauges, and pressure switches.

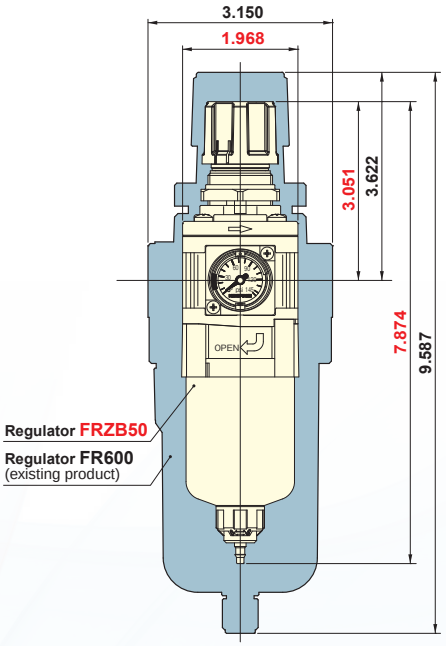
Supports a wide variety of environments
Ozone resistance specifications and NCU specifications (copper free)[Note] are standard.
Note: Excluding pressure switch and pressure gauge options.

CAUTION Read the safety precautions on page 7 before using this product.

Compact design

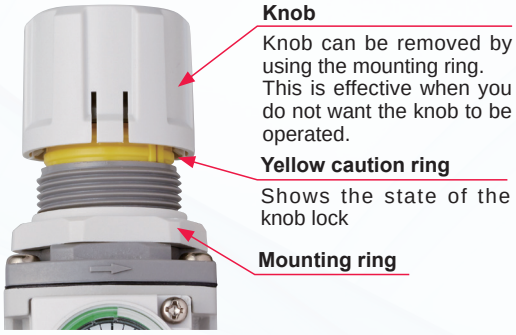
Improved flow rate characteristics enable a smaller configuration.

***Comparison of our FR600 and FRZB50 filter regulators.**



Improved knob operability

- The knob is ideally sized and shaped to turn smoothly with a light touch for easy operation. Also, the knob lock precision has been improved to reduce changes in pressure settings when the knob is locked.
- The status of the knob lock release can be checked with the yellow caution ring.



Drain cock specifications

Drain cock with fitting or auto drain types can be selected for the drain cock specifications.

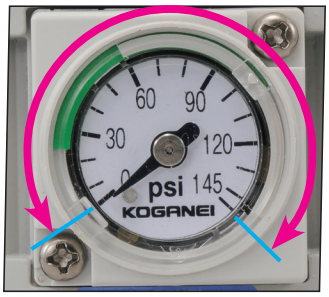
Auto drain type
NO (Normally open)
NC (Normally closed)

Drain cock with fitting

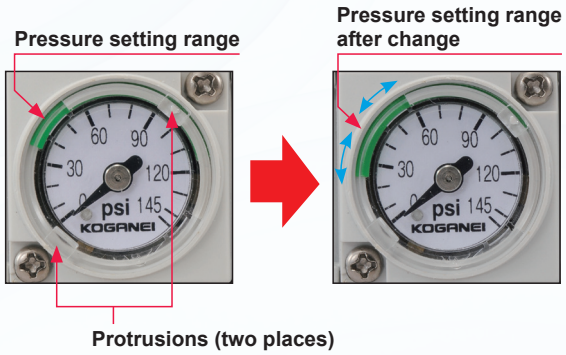
□1.181 in. series integrated pressure gauge

- □1.181 in. integrated pressure gauge is compact with almost nothing sticking out. Visibility is also improved with an easy to see 270° swing angle display.

270° swing angle



- PSI gauge and NPT thread specifications are also available now.
- Flexible change of the pressure setting range (the green part) is possible. Freely changeable upper and lower setting limits eliminate the need to remove the front cover (the transparent plastic part) and to use special tools.



The setting pressure range display can be changed as desired by rotating the protrusions (two locations) clockwise or counter clockwise.

*** Other pressure gauges and pressure switches are available. See the next page for details.**

Bowl guard (option)

Bowl guard option is available.

Pressure gauge, pressure switch

Can select various types of pressure gauges and pressure switches other than the □1.181 in. integrated pressure gauge. PSI GAUGE NEW

Order code G1-40-F11

ϕ1.575 in. pressure gauge
(145 psi specifications)

G3-40-F11

ϕ1.575 in. pressure gauge
(43.5 psi specifications)

G1S-40-F11

ϕ1.575 in. stainless steel Bourdon tube pressure gauge
(145 psi specifications)

G3S-40-F11

ϕ1.575 in. stainless steel Bourdon tube pressure gauge
(43.5 psi specifications)

Digital pressure switch
GS620-3W
(145 psi specifications)

GS1-50-F11-□-□

Pressure gauge with built-in switches
(145 psi specifications)

Bracket

The brackets can be used with all sizes of the FRZB filter regulators.
Brackets can also be used with the iB-Cyclone and FRZ series.

Panel mounting

A ϕ1.122 in. panel mounting hole can be used for all sizes of the filter regulators.

Note: There are limitations to the mounting (installation) orientation of the FRZB filter regulators.

Guide to related products

New-generation Filter Regulator

FRZ Series

Excellent for air lines with water and fluids already removed!

Specialized 30 series
for standalone application

Regulator
RZ30

Filter regulator
FRZ30

The 40 and 50 series
can be used in combinations

Regulator
RZ40

Filter regulator
FRZ40

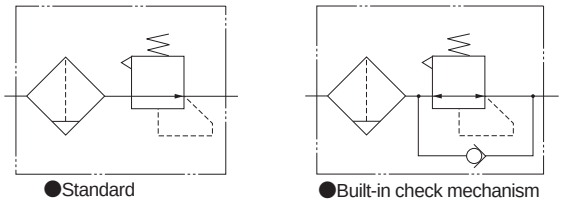
Regulator
RZ50

Filter regulator
FRZ50

Filter regulator

FRZB30-F11·FRZB31-F11·FRZB32-F11
FRZB40-F11·FRZB41-F11
FRZB50-F11·FRZB51-F11

Symbol



●Standard
●Low pressure

●Built-in check mechanism

Specifications

Item \ Model				
	Standard	FRZB30-F11	FRZB40-F11	FRZB50-F11
	Low pressure	FRZB31-F11	FRZB41-F11	FRZB51-F11
	Built-in check mechanism	FRZB32-F11	———	———
Medium		Air		
Port size		M5×0.8mm, NPT1/8, NPT1/4	NPT1/8, NPT1/4, NPT3/8	NPT1/4, NPT3/8, NPT1/2
Maximum operating pressure	psi	145		
Proof pressure	psi	218		
Operating temperature range (atmosphere and medium)	°F	41 to 140 (non-condensation)		
Filtration	μm	5		
Regulation method		Direct operation type and relief type	Internal pilot type and relief type	
Pressure setting range	psi	Standard/built-in check mechanism	7 to 123	
		Low pressure	7 to 58	
Relief start pressure	psi	Set pressure +7 or less		
Air consumption[Note 1]	ft³/min (SCFM)	—	0.18 or less	
Water storage capacity (for **-N**)	in³	0.79	0.98	1.65
Materials of major parts	Body	Die cast aluminum alloy		
	Bonnet and adapter	Polyacetal		
	Diaphragm	Base fabric + synthetic rubber		
	Bowl	Polycarbonate*		
	Filter element	Non-woven fabric		
	Bracket	Steel plate (electroless nickel plated)		
Mass (for standard specifications and largest port size)	lbf	0.44	0.53	0.73
Standard equipment		Mounting ring		
Options[Note 2, Note 3]		Auto drain (NO or NC), bowl guard (plastic assembled), □1.181 in. integrated pressure gauge (assembled), other pressure gauges (included parts), brackets (included parts)		

Note 1: Maximum value of specified range. Air consumption varies depending on the relationship of the primary pressure and the secondary pressure.
2: Supply pressure greater than 22 psi is needed to select the optional auto drain (supply pressure is needed to operate the auto drain).
3: Refer to the order codes and the specifications for each product starting on page 57 for details on the various types of options.

Order codes

FRZB □ – **F11** – □ – □ – □ – □ – □

NPT thread specifications

Model of body / Port size

Model of body	M5	NPT1/8	1/4	3/8	1/2	
30	M5	01	02			Standard
40		01	02	03		Standard
50			02	03	04	Standard
31	M5	01	02			Low pressure
41		01	02	03		Low pressure
51			02	03	04	Low pressure
32	M5	01	02			Built-in check mechanism

FRZB Filter Regulator

Bowl guard specifications
Blank — No bowl guard
PG — With bowl guard

Drain cock specifications
A — Auto drain type, drain cock NO type
C — Auto drain type, drain cock NC type
N — Drain cock with fitting

Pressure gauge specifications
Blank — No pressure gauge (pressure gauge connection port NPT1/4)
GP1 — No pressure gauge (pressure gauge connection port NPT1/8)
GN — No pressure gauge (No pressure gauge connection port)
G1C — 145 psi specifications, □1.181 in. integrated pressure gauge
G4C — 58 psi specifications, □1.181 in. integrated pressure gauge
G1 — 145 psi specifications, ϕ1.575 in. pressure gauge
G3 — 44 psi specifications, ϕ1.575 in. pressure gauge
G1S — 145 psi specifications, ϕ1.575 in. stainless Bourdon tube pressure gauge
G3S — 44 psi specifications, ϕ1.575 in. stainless Bourdon tube pressure gauge
GS6 — 145 psi specifications, digital pressure switch
GS1A — 145 psi specifications, □1.969 in. pressure gauge with built-in switch Lead wire for 24 VDC
GS1B — 145 psi specifications, □1.969 in. pressure gauge with built-in switch Lead wire for 100 VAC, 200 VAC
GS1C — 145 psi specifications, □1.969 in. pressure gauge with built-in switch With DIN type connector for 24 VDC
GS1D — 145 psi specifications, □1.969 in. pressure gauge with built-in switch With DIN type connector for 100 VAC, 200 VAC

Bracket
Blank — No bracket
B — With bracket

Note: Refer to order codes and dimensions on page 106 to 112 for information about the specifications for pressure gauges, digital pressure switches, pressure gauges with built-in pressure switches, and purchasing individual parts.

***PCT resin bowl for hash environments also available. Please contact Koganei for details.**

Order codes

●Order codes for brackets only

8Z-BK

*** Interchangeable brackets (compatible with multi-series FR15□, FR30□, and FR60□ filter regulators)**

8Z-BK□

Body size
30 —— **FR15□→FRZB3□**compatible
40 —— **FR30□→FRZB4□**compatible
50 —— **FR60□→FRZB5□**compatible

●Parts for maintenance

●Bowl assembly

BA-FRZB□-F11-□-□

Body size
30 —— For **FRZB3□**
40 —— For **FRZB4□**
50 —— For **FRZB5□**

Drain cock specifications
A —— Auto drain type, drain cock NO type
C —— Auto drain type, drain cock NC type
N —— Drain cock with fitting

Bowl guard specifications
Blank —— No bowl guard
PG —— With bowl guard

Auto drain type
NO type
NC type

Drain cock with fitting

With bowl guard

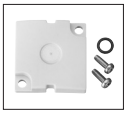
●Element

E-□ZB

Body size
30 —— For **FRZB3□**
40 —— For **FRZB4□**
50 —— For **FRZB5□**

●Pressure port plate

P-FRZ(without pressure gauge connection port)



1 O-ring and 2 small screws included

GP-FRZ□-F11(with pressure gauge connection port)

Port size
Blank —— NPT1/4
1 —— NPT1/8

1 O-ring and 2 small screws included

●Seal kit (various O-rings, 1 valve assembly, and 1 diaphragm assembly)

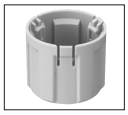
SRK-FRZ□

Body size
30 —— For **FRZ3□**
40 —— For **FRZ4□**
50 —— For **FRZ5□**

Refer to "Replacing the seal kit, element, and bowl assembly" on page 64 for the component parts of the seal kit.

●Knob

H-FRZ

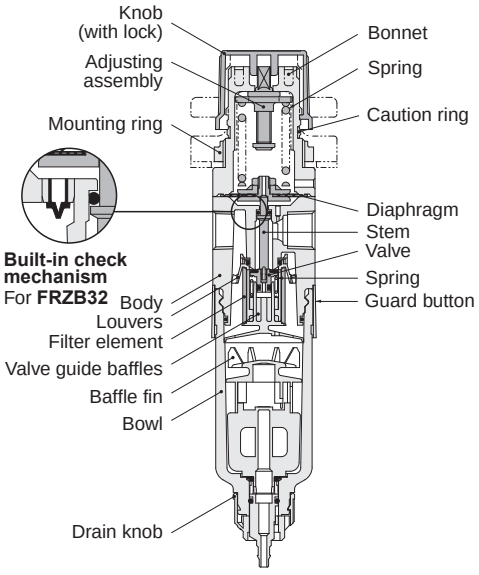


●Mounting ring

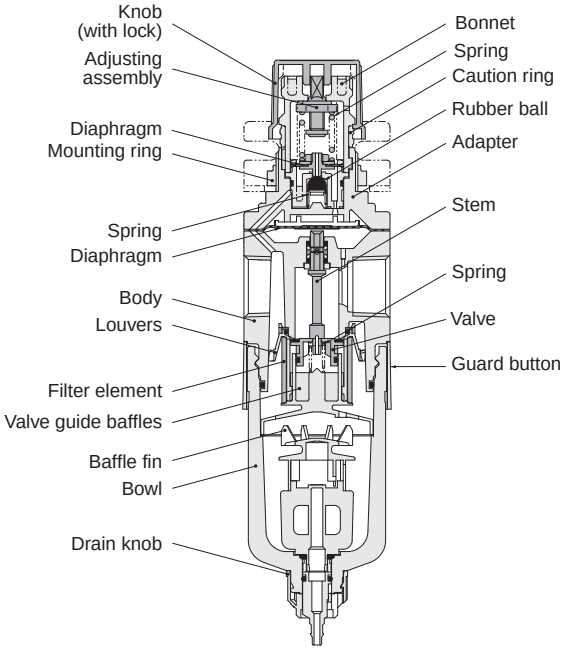
R-FRZ

Inner construction

FRZB3□



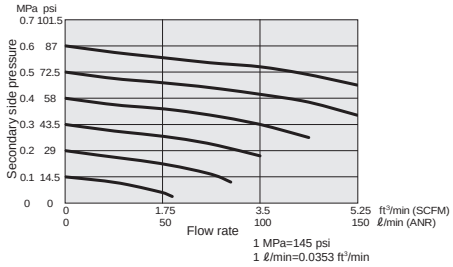
FRZB4□·FRZB5□



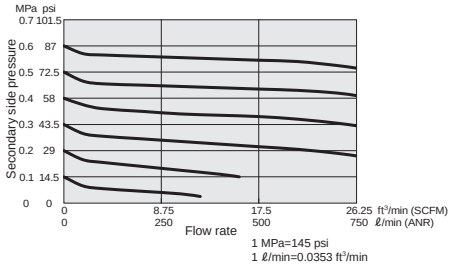
Flow rate characteristics

●Standard and built-in check mechanism

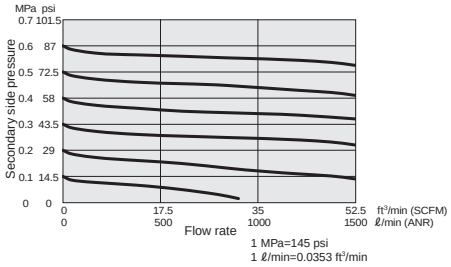
FRZB30-F11-M5
FRZB32-F11-M5



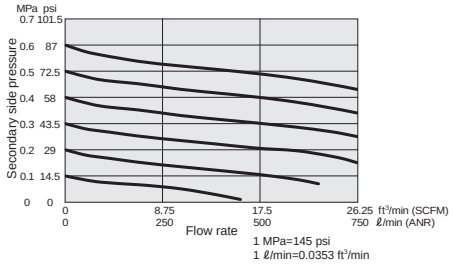
FRZB40-F11-01



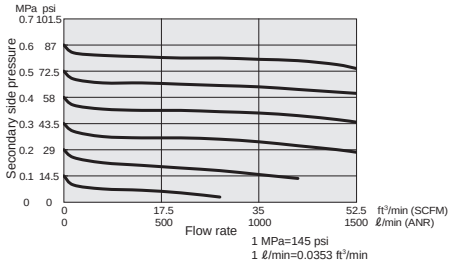
FRZB50-F11-02



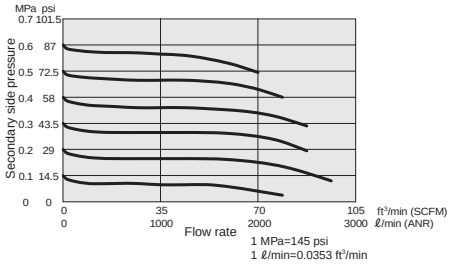
FRZB30-F11-01
FRZB32-F11-01



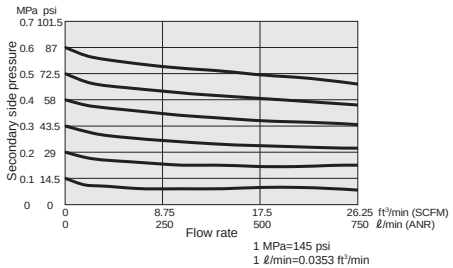
FRZB40-F11-02



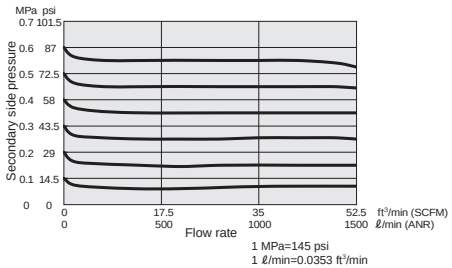
FRZB50-F11-03



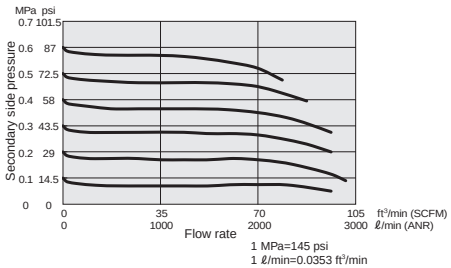
FRZB30-F11-02
FRZB32-F11-02



FRZB40-F11-03



FRZB50-F11-04

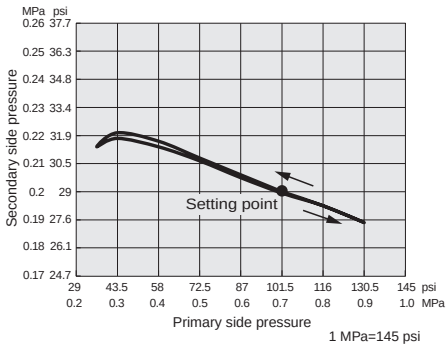


Remarks: Graphs show flow rate characteristics at 102 psi constant pressure on the primary side.

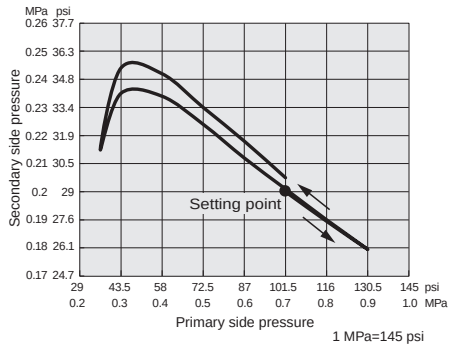
Pressure characteristics

●Standard and built-in check mechanism

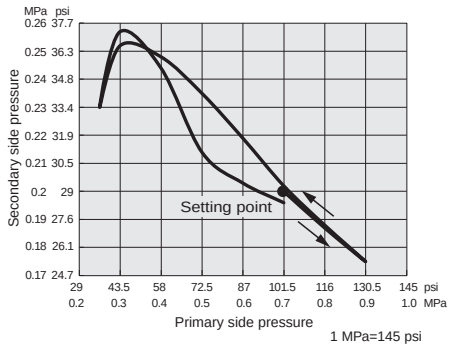
FRZB30-F11
FRZB32-F11



FRZB40-F11

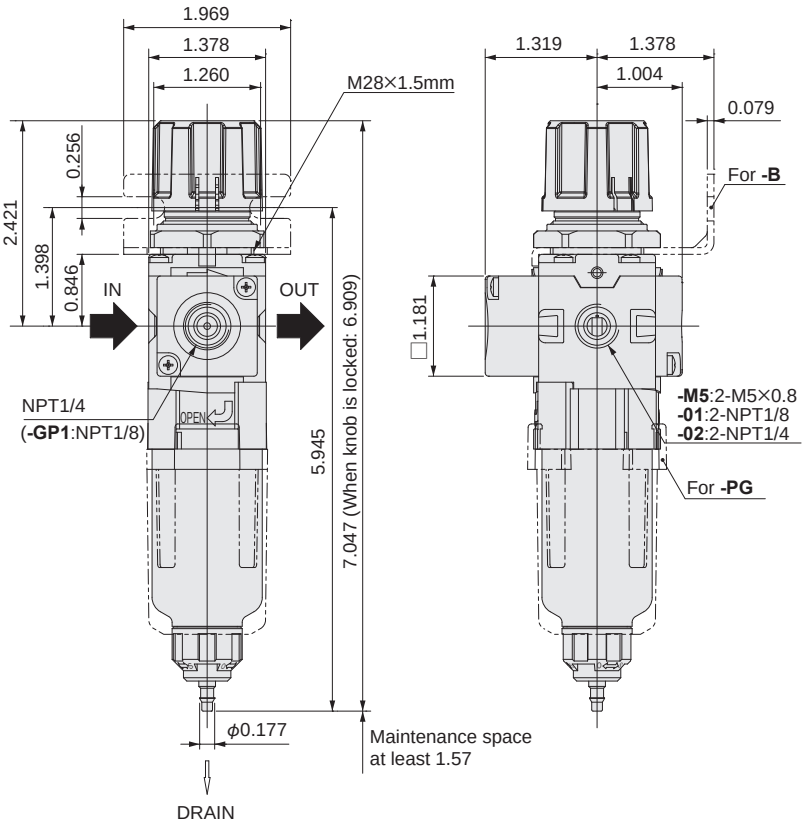


FRZB50-F11

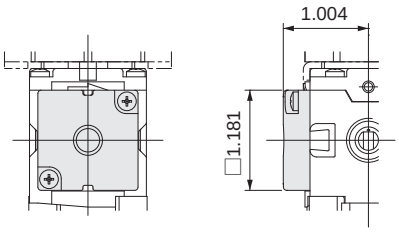


Filter regulator dimensions in.

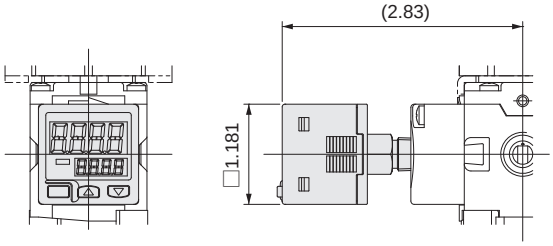
●**FRZB30-F11**
●**FRZB31-F11**
●**FRZB32-F11**



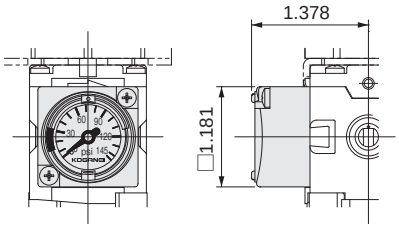
●**Pressure gauge options**



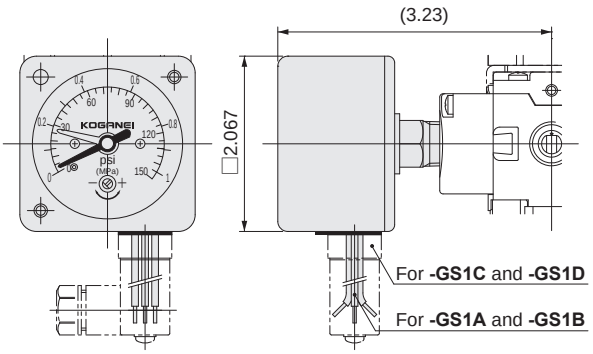
For **-GN**



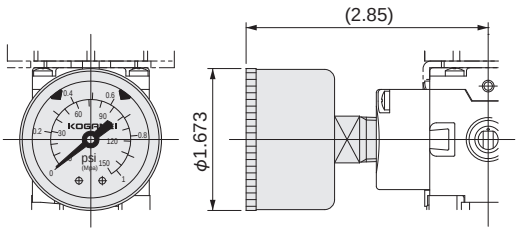
For **-GS6**



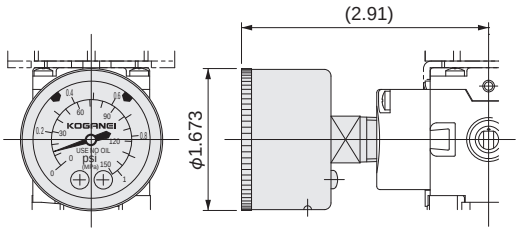
For **-G1C** and **-G4C**



For **-GS1A**, **-GS1B**, **-GS1C**, and **-GS1D**



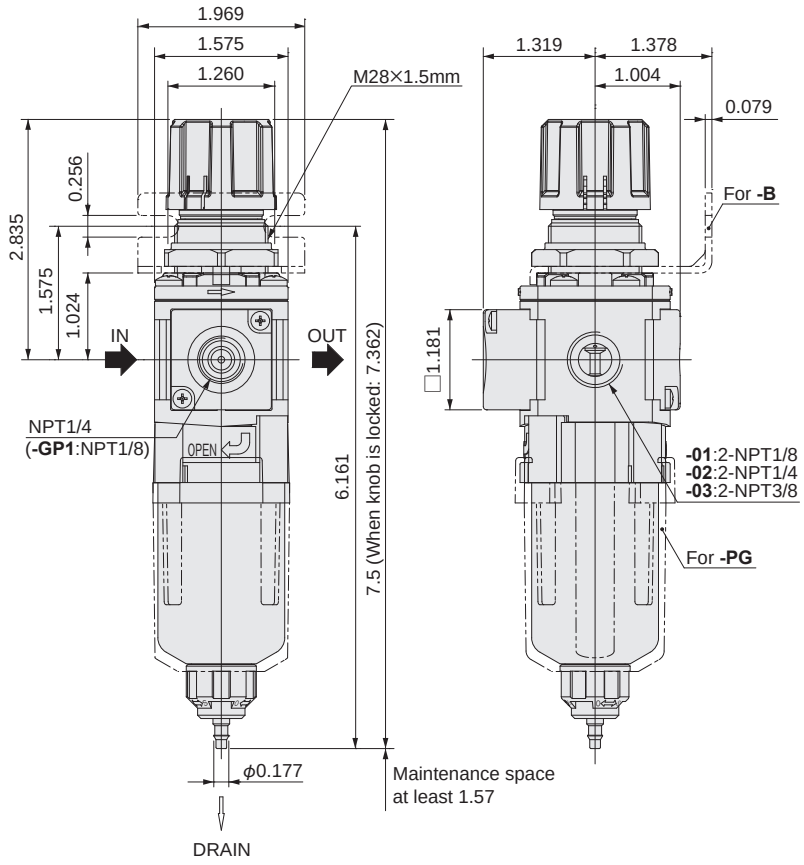
For **-G1** and **-G3**



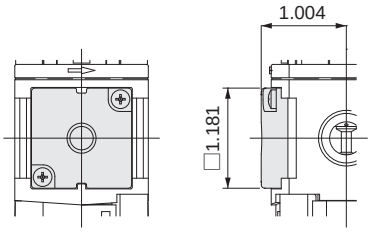
For **-G1S** and **-G3S**

Filter regulator dimensions in.

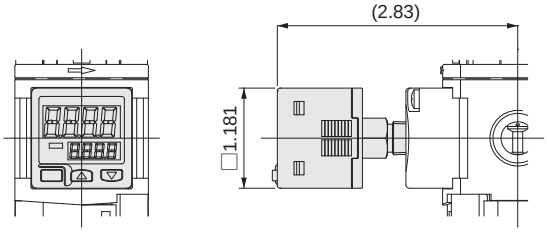
●FRZB40-F11
●FRZB41-F11



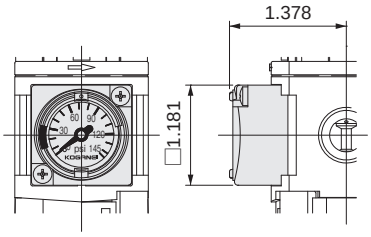
●Pressure gauge options



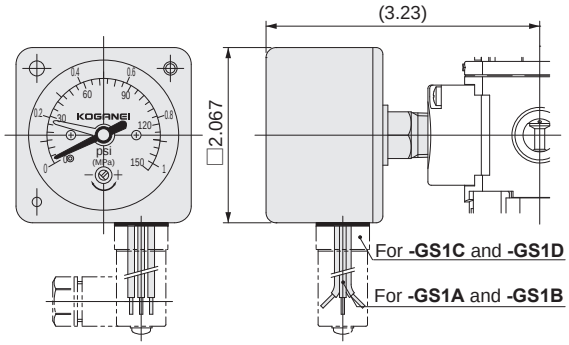
For **-GN**



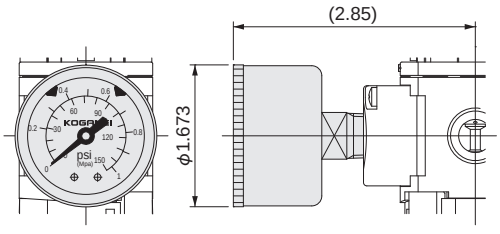
For **-GS6**



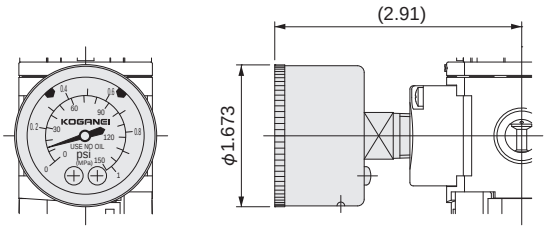
For **-G1C** and **-G4C**



For **-GS1A**, **-GS1B**, **-GS1C**, and **-G1S**

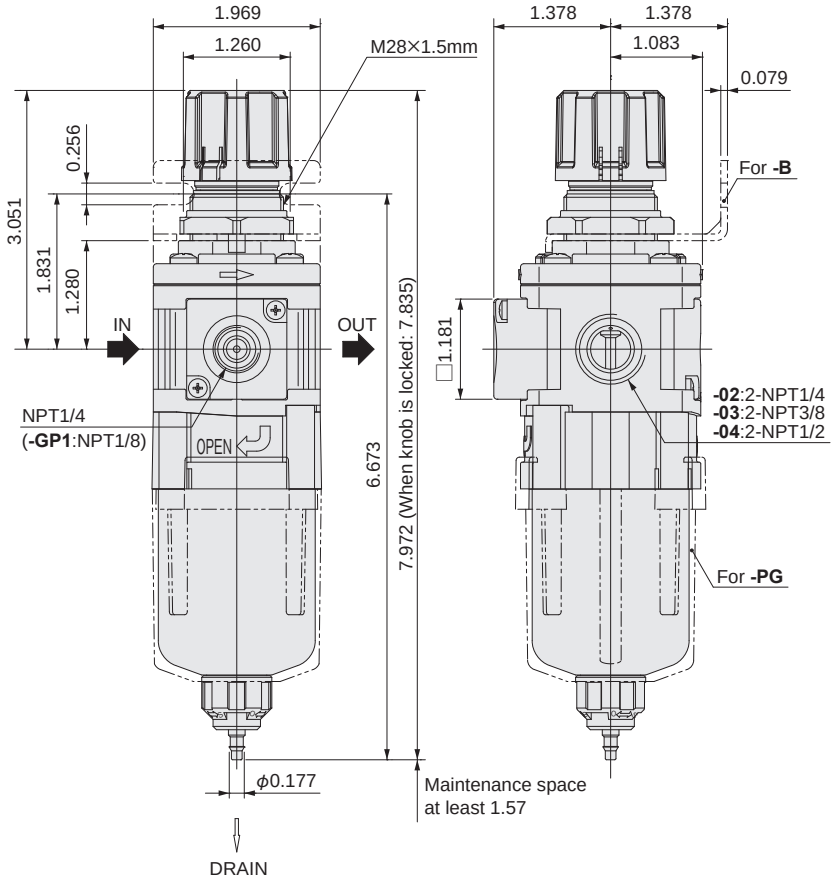


For **-G1** and **-G3**

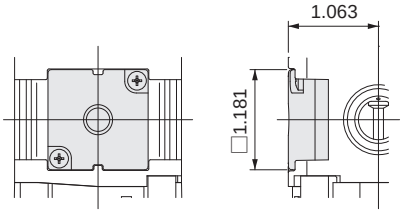


For **-G1S** and **-G3S**

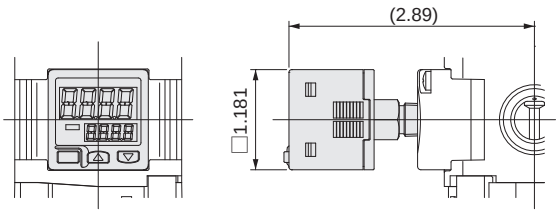
●FRZB50-F11
●FRZB51-F11



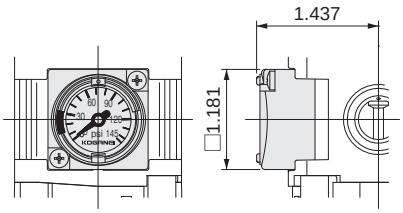
●Pressure gauge options



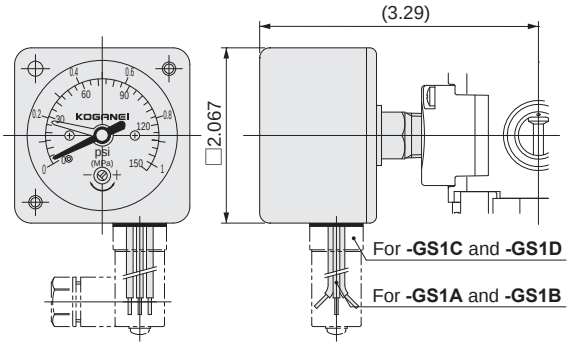
For **-GN**



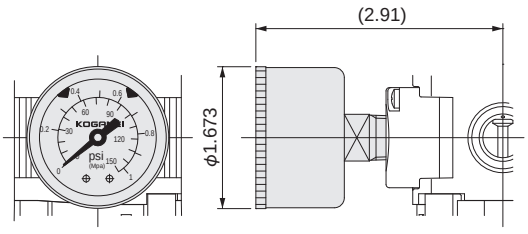
For **-GS6**



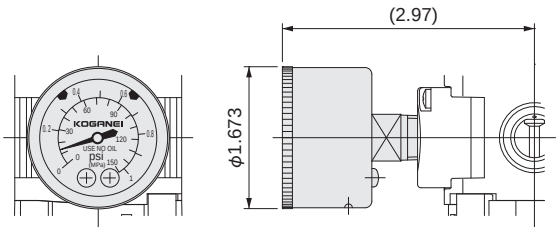
For **-G1C** and **-G4C**



For **-GS1A**, **-GS1B**, **-GS1C**, and **-GS1D**



For **-G1** and **-G3**



For **-G1S** and **-G3S**

For all FRZB Filter Regulators

Design and selection

●Selection

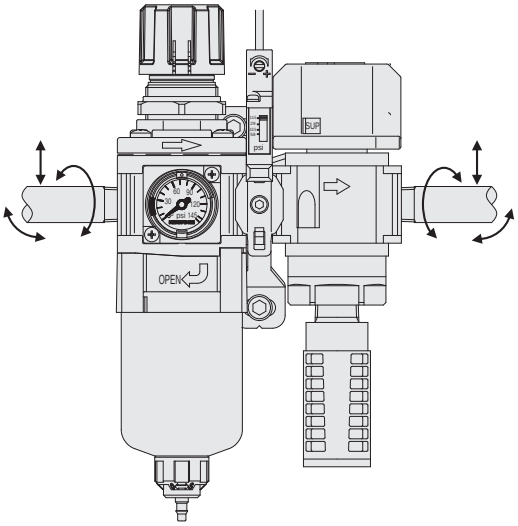
Look at the Handling Instructions and Precautions, Specifications, Various Characteristics, Dimensions, and other technical materials for each product to make the correct decision.

Mounting (installation) and piping

●Mounting (installation) direction, support, and securing

1. The products cannot be mounted (installed) if a bending moment or twisting moment is applied to the product or piping.

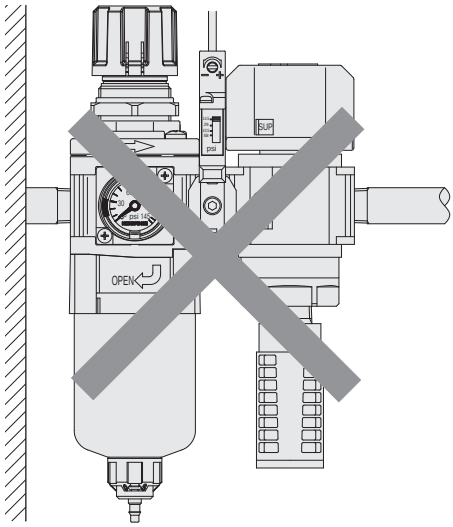
Note Applying bending moment or twisting moment may damage the product.



Note The muffler must be prepared by the user.

2. Do not attach piping so that just one side is fixed as shown in the following diagram. Support external piping separately.

Note Operating the knob and the moment caused by the OUT (secondary) side pipes may damage the product's piping connections.



3. Use the brackets to install the products.

4. When mounting (installing) products, always make sure they are secured and sufficiently supported.

Note If a product is not securely fixed in place, it may fall over, be dropped, or operate abnormally and cause an injury.

●Maintenance space requirements

Assure there is sufficient space for maintenance inspections and maintenance work.

See the dimension diagrams for each of the products regarding the maintenance space.

Note It there is not enough allowance for maintenance space, it is impossible to remove the bowl assembly and replace the filter.

Also, it is impossible to do maintenance inspections so the equipment may stop or the product may be damaged.

●Attaching steel pipes and fittings

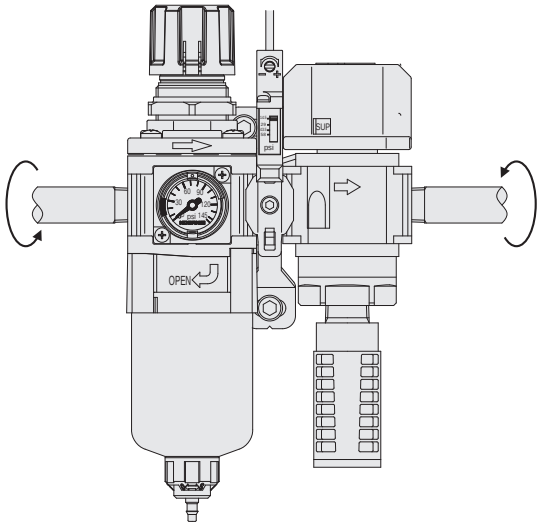
If steel pipes and fittings are attached to the threaded sections of the aluminum die-cast parts of the product, tighten them to the torque recommended in our standards.

Note Tightening with excessive torque may damage the product or injure workers or operators.

Recommended tightening torque ft•lbf

Connecting thread	M5	1/8	1/4	3/8	1/2
Torque	0.7 to 1.1	5.2 to 6.6	8.9 to 10.3	16.2 to 17.7	20.7 to 22.1

Note Use a tightening torque of 2.21 to 3.69 ft•lbf if the various pressure gauges are mounted on the NPT1/8 or NPT1/4 pressure port plate.



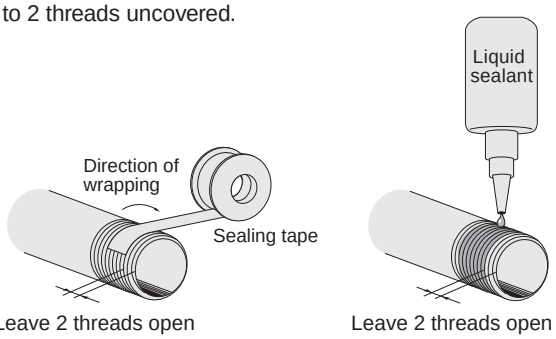
●Preventing contamination by foreign matter

1. Remove all foreign matter, such as metal chips, cutting oil, or dirt, from inside pipes with compressed air blow (flushing) and thorough washing before fitting the pipes.

2. Do not allow foreign matter, such as metal chips, or sealing tape from the piping threads, to get into the pipes when installing the pipes and fittings.

Note Foreign matter entering the piping may damage the product or reduce its performance and service life.

3. Wrap the sealing tape in the direction as shown in the diagram below leaving 1.5 to 2 threads uncovered. When using liquid sealant, apply a suitable amount and in the same way leave 1.5 to 2 threads uncovered.



Note If the sealing tape or sealant gets on the lip of pipes or fittings, bits of it may get into the pipes and cause air leaks.

4. If you are using liquid sealant, do not get it on the polycarbonate parts (the bowl of the filter regulator and the front cover of the pressure gauge).

Note If liquid sealant gets on the polycarbonate parts, it may damage them.

Medium and operating environment

●Usable medium

1. Use clean air (filtered to below 40 µm) for the medium. Contact the nearest Koganei sales office or overseas department if you are considering using something other than clean air.

Note Contact a Koganei sales office or overseas department if you are considering using something other than air.

2. Avoid using air that contains too much water and/or fluids.

Note Using air that contains too much water and/or fluids will cause the product's functions to stop after a short period and will reduce the product performance and service life.

3. If air that contains water and/or fluids is used, or if it is possible that they may be mixed in with the air being used, we recommend using the iB-Cyclone to reliably remove water and fluids.

Note If you use an iB-Cyclone, install an FRZ series filter regulator (without water and fluids removal functions) on the secondary side.

4. Do not use the product if the medium being used is prone to extreme pulsating or surging.

Note Medium prone to extreme pulsating or surges will cause the product's functions to stop after a short period and will reduce the product performance and service life.

●Operating environment

1. 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.
2. Cover the unit when using it in locations where it might be subject to excessive dust, dripping water, dripping oil, etc.
3. Do not use the product in environments subject to external vibration or impact.

Note External vibrations or shocks may result in damage to component parts.

4. Avoid piping that is rigid, such as steel piping, if vibrations are transmitted. Use flexible tubes so that the product is not subject to the vibrations.

●Medium and operating environment

1. The temperature of the medium and the ambient environment must be within the range in the specifications.

Note Using the product in an environment that is outside the specified temperature or with medium that is outside the specified temperature will cause the product's functions to stop after a short period and will reduce the product performance and service life.

2. Use a device, such as a freeze-type air dryer or after cooler, to lower the dew-point temperature of the medium to below the ambient temperature so condensation or frost does not occur in the secondary pipes.

Note If condensation or frost forms in the product, it may get into the secondary side.

3. Do not use medium in the product or use the product in an environment that includes corrosive components such as organic solvents, phosphate ester type hydraulic oil, sulfur dioxide, chlorine gas, freon gas, ozone, acids, alkaline, etc.

Note Using the product in an environment or with medium that is specified in the above item 3 will cause the product's functions to stop after a short period and will reduce the product performance and service life.

4. The bowl and the front cover of the pressure gauge of the filter regulator are polycarbonate. This product cannot be used in environments with the gases and fluids in item 3, nor thread-locking adhesive, leak detection fluid, hot water or where it may be exposed to them. This product also cannot be used in direct ultra-violet light. See page 68 for details.

Operation and maintenance inspections

●Method of use

Read the Handling Instructions and Precautions for each product for instructions on correct usage (Filter regulator page 60 to 66, and □1.181 in. integrated pressure gauge page 66).

●Maintenance (maintenance inspection)

1. Performance and functions may decrease as the pneumatic equipment ages. Always conduct daily inspections of the pneumatic equipment, and confirm that all requisite system functions are satisfied, to prevent accidents from happening.
2. Read the Handling Instructions and Precautions for instructions on maintenance and replacing maintenance parts (Filter regulator page 65 to 66).
3. The product must be disassembled and reassembled to use the seal kit.

Note The product is no longer under warranty if it is disassembled and reassembled.

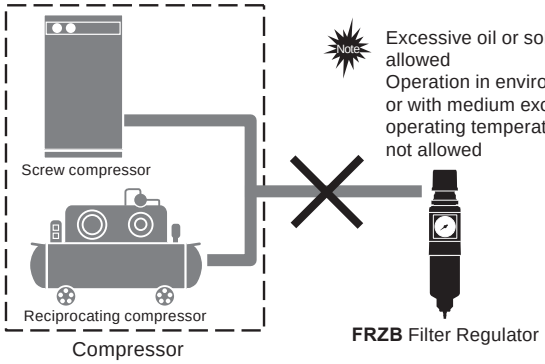
Filter regulator
(With water and fluids removal functions)

Design and selection

●Direct installation on compressor

Do not install the product directly on a compressor. Use sufficient countermeasures for temperature control, and removing oils and solids before use.

Note Not using countermeasures may cause the product's functions to stop after a short period and may reduce the product performance and service life.



●Water and fluids removal functions

1. The FRZB Filter Regulator's built-in water and fluids removal functions are simplified ones. Water and fluids removal efficiency varies according to conditions.

Note Use an iB-Cyclone to completely remove water and fluids.

2. See page 68 "Principles of water and fluids removal" regarding the water and fluids removal principles for the FRZB filter regulator series.

●Humidity and oil mist removal

1. Filter regulators cannot remove humidity.

Note Install a membrane type air dryer or something on the secondary side if dehumidifying is needed.

2. Filter regulators cannot remove oil mist.

Note Install a mist filter or something on the secondary side if oil mist removal is needed.

●Pressure setting

1. A safety device must be installed for equipment/devices installed on the OUT port (secondary) side of the filter regulator, when the equipment/device will be damaged or malfunction due to the pressure if the set pressure value is exceeded.
2. We recommend setting the pressure on the OUT port (secondary) side to less than 85% of the supply pressure setting on the IN port (primary) side.

Note If the pressure is set above 85%, the effect of the fluctuations in the IN port (primary) side pressure and flow rate are more prone to affect the OUT port (secondary) side pressure, and it becomes unstable.

3. It is not possible to install a valve on the IN port (primary) side of the internal pilot type filter regulator (such as models FRZB4□, FRZB5□) to repeatedly switch the pressure on the IN port (primary) side.

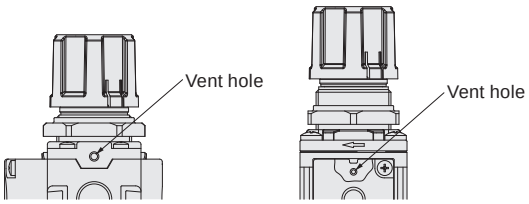
Note Changing the pressure of the IN port (primary) side may cause fluctuation in the OUT port (secondary) side set pressure.

4. The OUT port (secondary) side pressure may vary if air is not consumed for a long time or if a sealed circuit or balance circuit is used. Contact a Koganei sales office or overseas department.
5. Contact a Koganei sales office or overseas department if you are using a circuit that needs highly precise pressure regulation.

●OUT port (secondary) side pressure exhaust and vent hole

1. When the knob on the filter regulator is turned to reduce the OUT port (secondary) side pressure or when the OUT port (secondary) side pressure is higher than the set pressure and is exhausted, air is exhausted to the outside through the vent hole shown in the diagram.

Note There may be some vibration and noise caused by the exhaust.



For **FRZB3**□ For **FRZB4**□ and **FRZB5**□

2. Install a separate exhaust mechanism on the OUT port (secondary) side if an external force applied to an actuator or something on the OUT port (secondary) side of the filter regulator generates a sudden pressure increase.

Note The relief port is smaller than the diameter of the pipe and may not be able to adapt to the sudden rise in pressure of the OUT port (secondary) side.

Filter regulator (With water and fluids removal functions)

●Reverse flow from the OUT port (secondary) side to the IN port (primary) side (residual pressure exhaust)

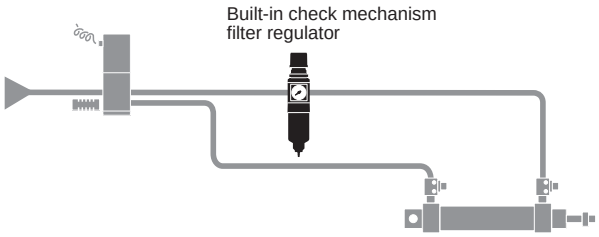
1. Select a filter regulator (such as model FRZB32) with built in check valve specifications for releasing residual pressure on the IN port (primary) side to reduce pressure on the OUT port (secondary) side of a direct operation type filter regulator (such as models FRZB30 and FRZB31).

   Note Reducing residual pressure on the secondary side with the standard specifications and low-pressure specifications may not be possible depending on the operating conditions.

2. The internal pilot type filter regulators (such as models FRZB4□ and FRZB5□) use the relief port on the OUT port (secondary) side to reduce residual pressure when the IN port (primary) side pressure is released.

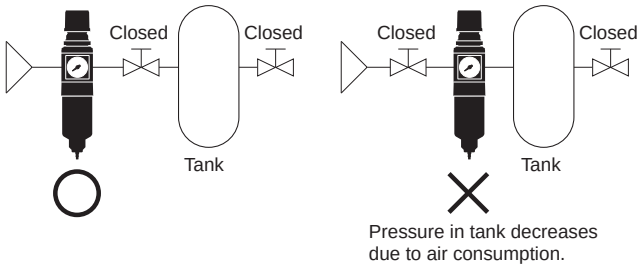
   Note Install a residual pressure exhaust valve on the OUT port (secondary) side because exhausting air requires some time if the volume of the flow path of the OUT port (secondary) side is large.

3. When using a built-in check mechanism specification filter regulator (such as model FRZB32) that is installed after the valve to adjust the thrust of the actuator, set the pressure on the OUT port (secondary) side of the built-in check mechanism specification filter regulator not to rise above the set pressure, which may be caused by the back pressure of the actuator. (As a guideline, the difference in pressure for the push side and the pull side of the actuator should be 43.5 psi or less.)



●Air consumption

1. The internal pilot type filter regulators (such as models FRZB4□ and FRZB5□) consume air while regulating pressure on the OUT port (secondary) side.
2. Air consumption varies depending on the relationship of the IN port (primary) side pressure and the OUT port (secondary) side pressure.
3. The internal pilot type filter regulators (such as models FRZB4□ and FRZB5□) reduce pressure by consuming air when the IN port (primary) side and OUT port (secondary) side are cut off and sealed.



Mounting (installation) and piping

●Mounting (installation) direction

Mount (install) FRZB filter regulators vertically so the knob is up and the drain port is down.

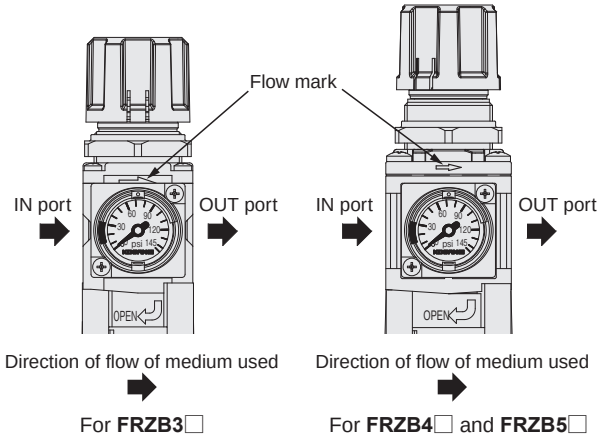
●Direction of flow

1. Connect the filter regulators so that the medium flows in the IN port (primary) side and flows out the OUT port (secondary) side.
2. Use the flow marks on the products to identify the primary port and secondary port of the filter regulator.

   Note Reversing the IN port (primary) side and the OUT port (secondary) side connections damages the product and causes it to stop functioning.

●Flow mark

The following diagram shows the relationship of the direction of flow of the medium and the flow mark on the filter regulator.



●Piping work

When connecting steel pipes and/or fittings to the filter regulator IN ports and/or OUT ports, install them so the weight and torque of the pipes do not affect the product. When tightening the piping, grip the main unit and tighten it to the torque recommended on page 58.

Note Applying unnecessary force or impact to the knob, bowl assembly, or pressure gauge may damage component parts.

●Installing brackets

To install brackets, do it in the following order.

① Remove the knob.
(For how to remove the knob see "Removing the knob" on page 63.)
② Attach the bracket.
③ Screw on the mounting ring.

Note Tighten the mounting ring to less than 3.69 ft•lbf.

④ Attach the knob.
(For how to attach the knob see "Attaching the knob" on page 63.)

●Panel mount

1. All the mounting holes for the filter regulator for the panel mount installation are ϕ1.122 in.

2. See the following table for the thickness of panels.

in.

Model	FRZB3□	FRZB4□	FRZB5□
Thickness	0.12 or less	0.28 or less	

Note Using a panel that is thicker than specified may make it impossible to secure the mounting ring or decrease the visibility of the yellow caution ring.

3. Use the following procedure to install with a panel mount.

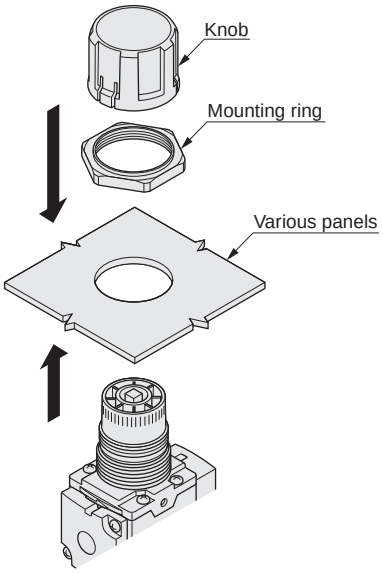
① Remove the knob.
(For how to remove the knob see "Removing the knob" on page 63.)

② Attach the filter regulator to the panel.

③ Screw on the mounting ring.

Note Tighten the mounting ring to less than 3.69 ft•lbf.

④ Attach the knob.
(For how to attach the knob see "Attaching the knob" on page 63.)



●Mounting ring

1. Tighten the mounting ring to less than 3.69 ft•lbf.

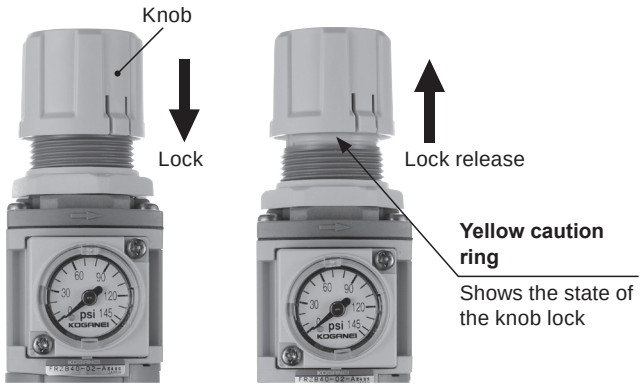
2. If you use a tool to tighten the mounting ring, be sure to firmly grip the opposite flats of the mounting ring.

Note If the mounting ring is not firmly gripped or too much torque is applied to it, component parts may be damaged.

Operation and maintenance inspections

●Locking and releasing the knob

1. The knobs on the filter regulators use a push lock mechanism. Use the procedure shown in the diagram below to lock and release the knob.



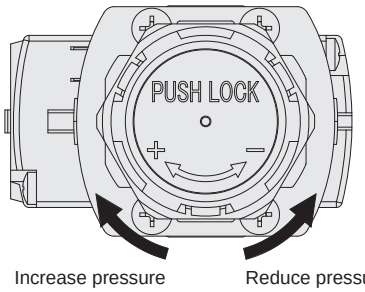
2. Always release the knob lock when regulating the pressure.

Note Turning the knob while it is locked may damage component parts.

3. Lock the knob after regulating the pressure.

●Pressure regulation

1. Pressure regulation is done as shown in the following diagram by turning the knob in the + direction to increase pressure and in the – direction to reduce it, as shown at the top of the knob.



2. Start at a low pressure and match it to the desired set pressure when regulating the pressure. If you exceed the desired pressure, lower the pressure again and start from a low pressure again to set the pressure.

Note Starting from a high pressure to set the desired pressure causes unstable pressure on the OUT port (secondary) side.

3. Use a pressure gauge to check the pressure on the IN port (primary) side and OUT port (secondary) side while regulating the pressure.

4. It is possible to increase the regulating pressure to exceed the upper limit of the operating pressure range by turning the knob to the upper limit of the + side, but keep the regulated pressure within the operating pressure setting range.

Note Turning the knob farther than necessary may damage component parts.

Filter regulator (With water and fluids removal functions)

●Removing the knob

Use the following procedure to remove the knob.

① Release the knob lock.
(For how to release the knob lock see "Locking and releasing the knob" on page 62.)

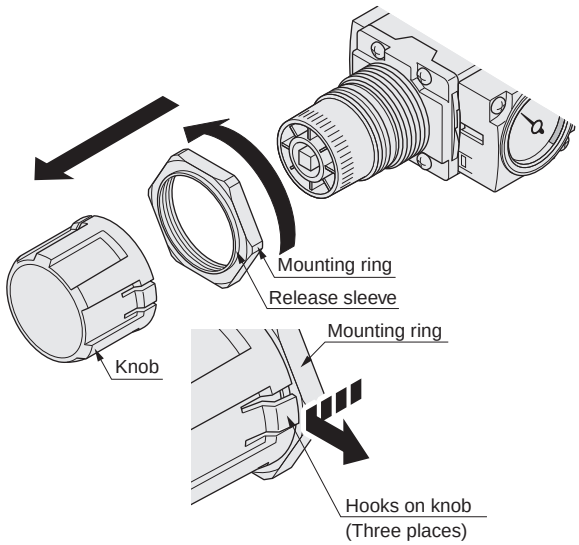
② Turn the mounting ring counterclockwise (in the direction of the arrow in the diagram below).

Note Turn the mounting ring until it comes off the threads.

③ Pull the mounting ring over in the direction of the knob.

Note The release sleeve of the mounting ring must be pulled up until it spreads the hooks (3 places) on the knob.

④ Pull off the knob and the mounting ring together.



●Attaching the knob

1. Use the following procedure to attach the knob.

① Release the pressure of the IN port (primary) side to the atmosphere.

② Screw on the mounting ring.

Note Installing the knob before screwing on the mounting ring makes it impossible to attach the mounting ring and makes the knob difficult to remove.

③ Press the knob in until the yellow caution ring is not visible.

Note Before pressing on the knob, align the square part of the adjusting assembly (refer to the exploded view on page 66) and the square indented portion of the inside of the base of the knob before pressing the knob on, so the knob is easier to press on.

2. Attaching the knob while the filter regulator IN port (primary) side pressure is being applied, may cause a temporary rise in pressure on the OUT port (secondary) side pressure.
Before attaching the knob, always release pressure on the IN port (primary) side to the atmosphere, because a temporary increase in pressure on the OUT port (secondary) side may occur which may damage equipment or devices on the OUT port (secondary) side or cause a malfunction.

Note It may damage the equipment or devices or injure workers or operators.

3. If it is impossible to release the pressure on the IN port (primary) side to the atmosphere, the pressure on the OUT port (secondary) side will rise temporarily, check for any effect it may have had on downstream equipment and devices, and then attach the knob.

●Replacing the □1.181 in. integrated pressure gauge and pressure port plate

1. Be sure to release any pressure in the system before replacing the □1.181 in. integrated pressure gauge or pressure port plate.

2. Use the following procedure to change the □1.181 in. integrated pressure gauge or pressure port plate.

① Remove the two small screws.

② Remove any metal chips from the female thread hole with compressed air blow.

Note If there are any metal chips left, they may break the threads or get on the o-ring and cause an air leak.

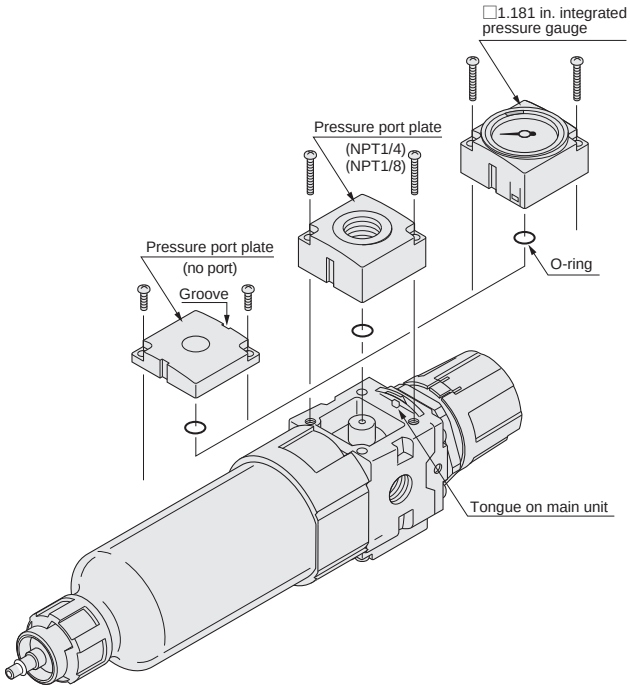
③ Put the O-ring on the □1.181 in. integrated pressure gauge or pressure port plate.

Note Not using an o-ring will result in air leaks.

④ Align the groove on the □1.181 in. integrated pressure gauge or pressure port plate with the tongue on the main unit and attach it.

⑤ Tighten the two mounting screws to 0.66 to 0.81 ft•lbf.

Note If torque exceeding the specifications is applied, the head of the screw or threads may be damaged and cause damage to component parts. Also, if torque below the specifications is used, the screw may come loose and cause an air leak.



●Drain cock operation

1. Turn the drain cock with your hand.

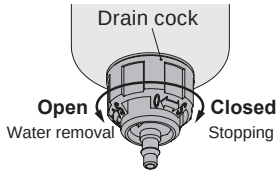
2. Use the following procedure to operate the drain cock.

① Turn the drain cock in the direction of [O].

② After the moisture (water) and fluid (sediment) has drained out, turn the drain cock in the direction of [S] until it clicks and locks.

3. Do not turn the drain cock more than 100° from the closed position, when you open it.

Note Turning the drain cock more than 100° may damage it.



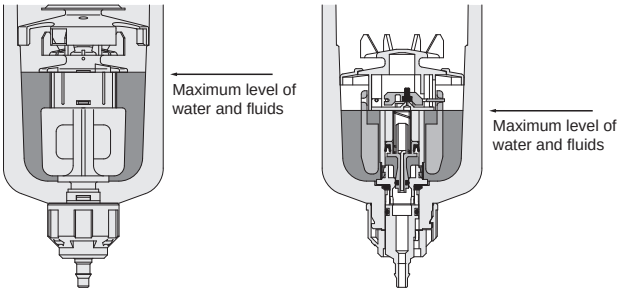
●Water and fluids removal

1. If the regulator you are using has no auto drain (**-N**), be sure to drain the water and fluids before their volume reaches the level shown in the left side diagram below.

Note If the volume of water and fluids is greater than that shown in the left side diagram below, the water and fluids removal function of the product is greatly reduced.

2. If the regulator you are using has an auto drain (**-A** or **-C**), the water and fluids that collects on the primary side is flushed all at once, do not let it exceed the maximum level as shown in the right side diagram below.

Note The auto drain may malfunction if the volume of water and fluids exceeds the maximum level as shown in the left side diagram below.



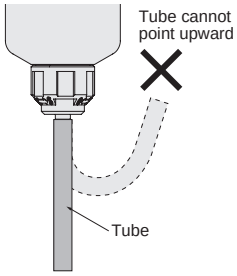
3. See page 67 "Explanation of operation of auto drain system" regarding the auto drain operation principles.

4. A tube with an inner diameter of ϕ0.157 in. [4mm] can be attached to the barbed fitting of the drain cock. Make sure the drain cock is closed (locked) before attaching the tube.

5. Cut the end of the tube to be connected to the barbed fitting of the drain cock straight across, and the barbed fitting must be inserted completely as shown in the diagram.
Also, after installing the tube, lightly pull on it to confirm that it does not come off.

6. Do not allow the tube on the barbed fitting of the drain cock to become severely bent or twisted close to the fitting.

Note Lateral force may damage the barbed fitting.



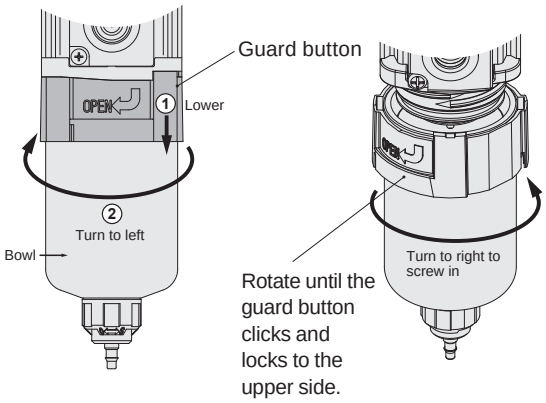
●Attaching and removing the bowl assembly

1. Be sure to release any pressure in the system before attaching (or removing) the bowl assembly.

2. Use the procedure shown in the upper right diagram to attach (or remove) the bowl assembly.

3. Squeeze the guard button to attach (or remove) the bowl assembly.

Note If there is a bowl guard, it may fall off when you squeeze it.

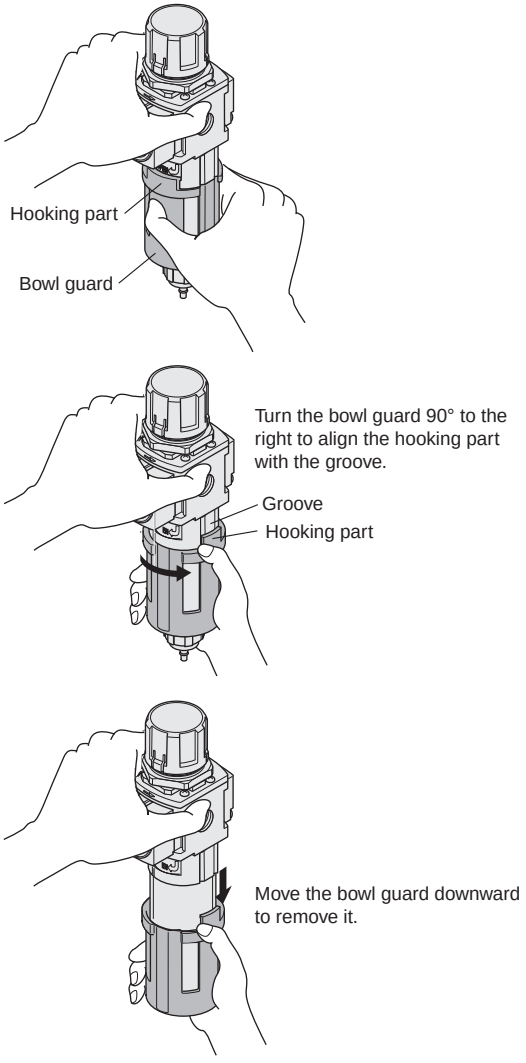


4. When attaching or removing the bowl assembly, move it vertically so you do not touch the internal component parts.

●Attaching and removing the bowl guard

1. Be sure to release any pressure in the system before attaching or removing the bowl guard.

2. Use the procedure shown in the diagram below to remove (or attach) the bowl guard.



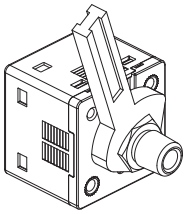
3. Use the reverse of the procedure shown in the diagram above to attach the bowl guard.

Filter regulator (With water and fluids removal functions)

●Installing provided options

1. Be sure to release any pressure in the system before attaching (or removing) the various pressure gauges.
2. When installing the various types of pressure gauges, always apply the wrench on the square or hexagonal part of the piping connections.

Note Gripping the body of the various pressure gauges to tighten them may damage component parts.



3. Use a tightening torque of 2.21 to 3.69 ft•lbf if the various pressure gauges are mounted on the NPT1/8 or NPT1/4 pressure port plate.

Note If torque exceeding the specifications is applied, it may damage component parts. Also, if torque below the specifications is used, the screw may come loose and cause an air leak.

4. There is a stopper on the female thread of the NPT1/4 and the NPT1/8 pressure port plates.

Note Further tightening after the stopper has been reached may damage component parts.

●Replacing the pressure port plate, knob, and mounting ring

1. When replacing the pressure port plate, refer to "Replacing the □1.181 in. integrated pressure gauge and pressure port plate" on page 63.
2. When replacing the knob and mounting ring, refer to "Removing the knob" and "Attaching the knob" on page 63.

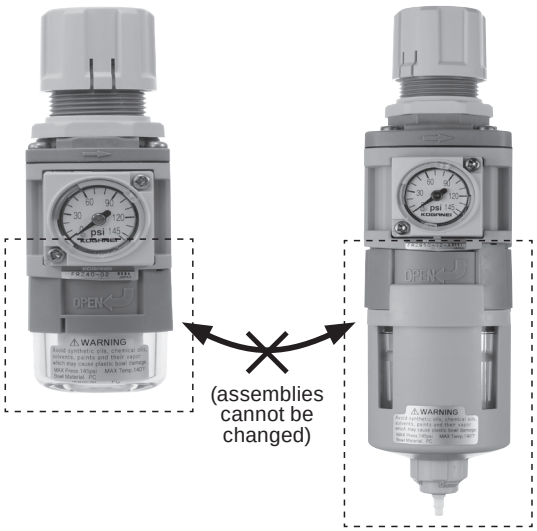
●Replacing the seal kit, element, and bowl assembly

1. To replace the seal kit, element, and bowl assembly, remove the filter regulator and do the work on a work table.
2. The o-rings and other sealing materials (except for the diaphragm) of the filter regulator are coated with grease.
3. Contact your nearest Koganei sales office or overseas department if you are considering re-coating the o-rings and other parts with grease.
   Recommended grease: Lithium Soap based No. 2 or equivalent
4. Periodically replace the element in the filter regulator.

Note The service life of the element varies depending on the quality of air supplied to the IN port (primary) side. If there is a lot of foreign matter in the air supply to the IN port (primary) side, install a pre-filter on the IN port (primary) side or change the element more often. As a guideline, change the element after a year of use.

5. It is not possible to combine a bowl assembly for an FRZB filter regulator (with water and fluids removal function) with FRZ series filter regulators (without water and fluids removal function).

Note They have different internal component parts, so their specifications do not match.



FRZ Series Filter Regulator (**FRZ3□ · FRZ4□ · FRZ5□**)

FRZB Filter Regulator (**FRZB3□ · FRZB4□ · FRZB5□**)

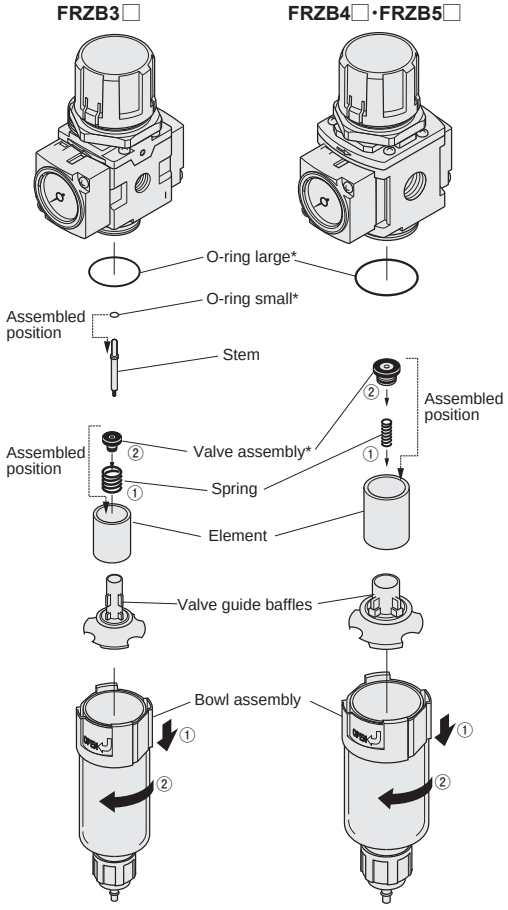
6. Do periodic inspections to look for cracks, scratches, or other deterioration in the clear plastic part of the bowl assembly. If you detect any cracks, scratches, or other deterioration, stop using the regulator and replace the bowl assembly with a new one.

Note Cracks, scratches, or other deterioration can cause the bowl to break.

7. Replace the bowl assembly with a new one if it becomes dirty or the transparency is significantly reduced. To wash the bowl, use diluted household neutral cleaner to wash it and then rinse it off with water.
   See page 68 for details about the chemical resistance of the bowl material.
8. When replacing the seal kit, element, and bowl assembly, be careful not to lose component parts.
9. Refer to page 66 when replacing the seal kit, element, and bowl assembly.

Note Always assemble the component parts correctly.

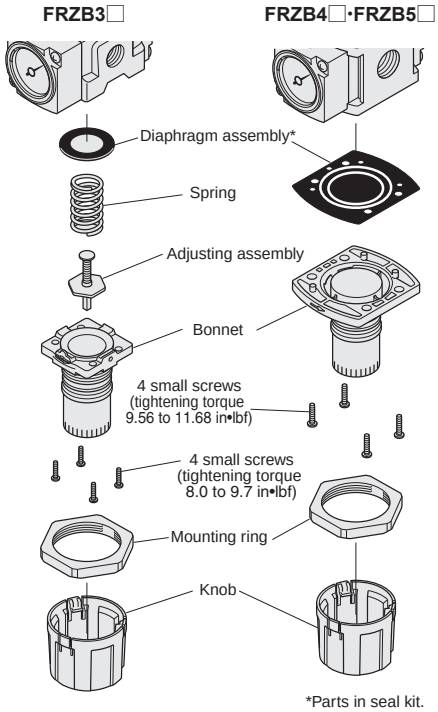
Filter regulator (with moisture removal function) bowl side



*Parts in seal kit.

Note
- The product is no longer under warranty if it is disassembled and reassembled.
- Regarding the O-rings in the seal kit: FRZB3□ can only use the large and small O-ring, the FRZB4□ and FRZB5□ can only use the large O-ring, the remaining O-rings are not used.

Filter regulator knob side



*Parts in seal kit.

Note The product is no longer under warranty if it is disassembled and reassembled.

□1.181 in. series integrated pressure gauge

Mounting (installation) and piping

●Mounting (installation)

Read the Handling Instructions and Precautions for the filter regulator when installing the □1.181 in. integrated pressure gauge to the filter regulator.

Medium and operating environment

●Surging, vibration, and shock

The □1.181 in. integrated pressure gauge is a precision device. It cannot be used if the medium surges, or external vibration or shock is applied.

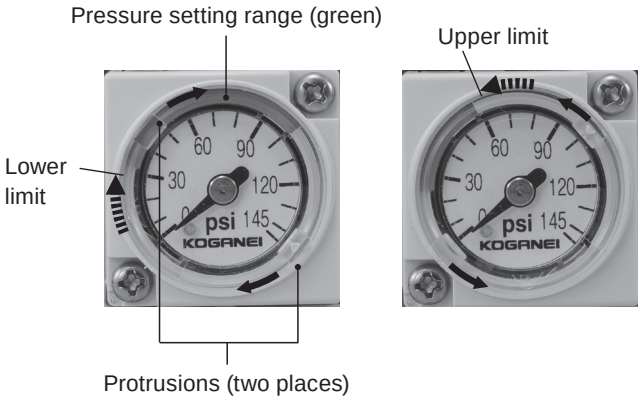
Note Surges in the medium, external vibrations or shocks may result in damage to component parts.

Operation and maintenance inspections

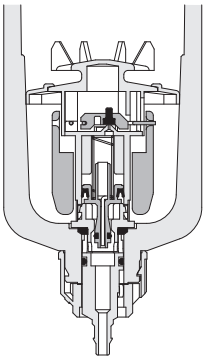
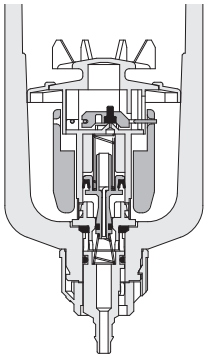
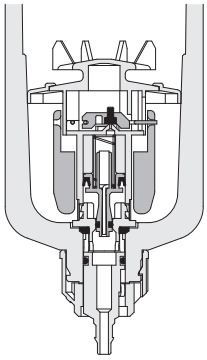
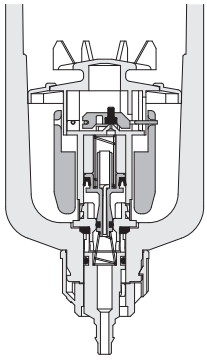
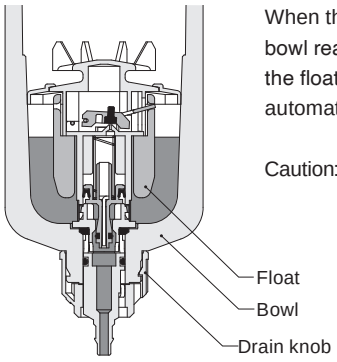
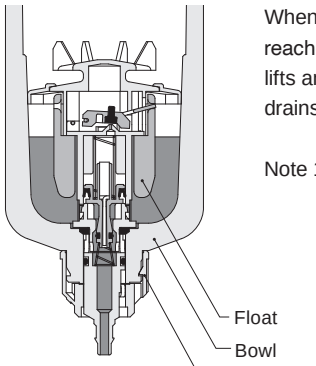
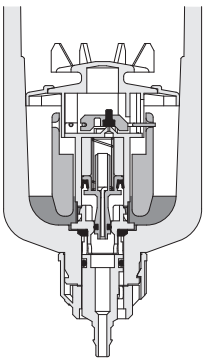
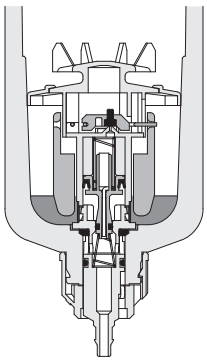
●Adjusting the range of the set pressure

1. Use the procedure below to adjust the range of the set pressure (the green portion).
① Adjust the lower limit of the range of the set pressure by rotating the protrusions (2 places) clockwise with your hand.
② Adjust the upper limit of the range of the set pressure by rotating the protrusions (2 places) counter clockwise with your hand.

Note Adjusting the range of the set pressure with a tool may damage component parts.

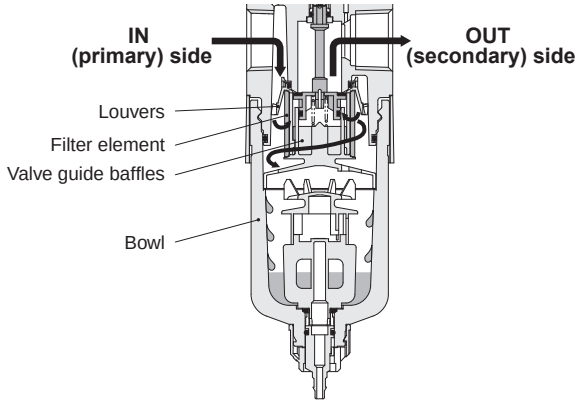


● Explanation of operation of auto drain system

State \ Type	NO type	NC type
Not pressurized	 Open When unpressurized, the liquid outlet opens and the liquid drains naturally.	 Closed When unpressurized, the liquid outlet closes and the liquid cannot drain. Caution: The liquid does not drain when unpressurized, if there is a lot of liquid even in an unpressurized (low pressure) condition, it may be necessary to drain the liquid by hand.
Pressurized	 Closed Air and liquid will be discharged from the liquid outlet until the pressure exceeds the minimum operating pressure (22 psi). The air and liquid will stop after stored pressure exceeds the minimum operating pressure. Caution: A compressor with a small output may not reach full pressure, and there may be exhaust air until the minimum operating pressure is exceeded.	 Closed In the same way, when unpressurized, the liquid outlet closes and the liquid cannot drain.
Draining the liquid	 Open When the level of liquid in the bowl reaches a specified level, the float lifts and the liquid automatically drains. Caution: The liquid can be drained manually by turning the drain knob to the left. See page 63 for details.	 Open When the level of liquid in the bowl reaches a specified level, the float lifts and the liquid automatically drains. Note 1: Supply pressure is needed to operate the auto drain. A minimum of 22 psi is needed for the supply pressure. 2: The liquid can be drained manually by turning the drain knob to the left. See page 63 for details.
Draining the liquid completed	 Closed When the liquid drains, the float lowers and the liquid outlet closes, and the liquid stops draining.	 Closed When the liquid drains, the float lowers and the liquid outlet closes, and the liquid stops draining.

Handling instructions and Precautions

●Principles of water and fluids removal



① Louvers create a swirling current in the air that enters through the IN port (primary) to separate the water and fluids from the air.
② The separated water and fluids passes through the gaps in the valve guide baffles and collects in the bowl.
③ The air, from which the water and fluids have been separated, passes through the filter element to the OUT port (secondary).

Reference data

●About the chemical resistance of polycarbonate

The chemicals in the following table degrade polycarbonate. Because of this, they may damage the bowl of the filter regulator or the front cover of the pressure gauge and cause an accident. The products cannot be used in locations where the chemicals in the following table are present in the compressed air, ambient air, or on surfaces. 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	Acid cleaning for metals, acid degreasing, and coating processing
	Alkali	Caustic soda, caustic potash, hydrated lime, ammonia water, 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, ethyl benzene, styrene	Paint thinner (Benzene, toluene, xylene)
	Chlorinated aliphatic hydrocarbons	Methyl chloride, ethylene chloride, methylene chloride, acetylene dichloride, chloroform, trichlene, tetrachloroethylene, carbon tetrachloride	Organic solvents for metal cleaning (trichlene, tetrachloroethylene, carbon tetrachloride)
	Chlorinated aromatic hydrocarbons	Chlorobenzene, dichlorobenzene, 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, methyl ethyl 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 medium (phthalic acid)
	Phthalic acid ester	Dimethyl phthalate (DMP), diethyl phthalate (DEP), dibutyl phthalate (DBP), dioctyl phthalate (DOP)	Lubricants, synthetic hydraulic fluids, corrosion resistant additives, synthetic resin plasticizer
	Oxyacid	Glycolic acid, lactic acid, malic acid, citric acid, tartaric acid	Food preservatives, acidulant
	Nitro compounds	Nitromethane, nitroethane, nitroethylene, nitrobenzene	Paint solvent, explosives
	Amine	Methylamine, dioctylamine, ethylamine, aniline, acetanilide	Brake fluid additive
	Nitrile	Acetonitrile, acrylonitrile, benzonitrile	Nitrile rubber materials

New-generation Filter Regulator

FRZ Series

Excellent for air lines with water and fluids already removed.

Specialized **30 series** for standalone application

Regulator RZ30

Filter regulator FRZ30

The **40 and 50 series** can be used in combinations

Regulator RZ40

Filter regulator FRZ40

Regulator RZ50

Filter regulator FRZ50

Down sizing
Improved flow rate characteristics allow a smaller configuration (close side-by-side spacing is possible).

Flexible installation
Water removal function is eliminated for more flexible installation.

Improved operability and maintainability
Improved knob operability and simple bowl installation and removal.

Pressure gauge, pressure switch
Supports □1.181 in. integrated pressure gauges, other pressure gauges, and pressure switches.

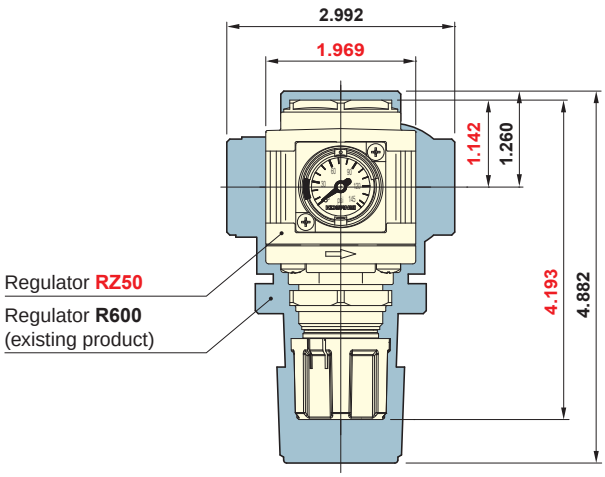
Supports a wide variety of environments
Ozone resistance specifications and NCU specifications (copper free)[Note] are standard.

Note: Excluding pressure switch and pressure gauge options.

Compact design

Improved flow rate characteristics enable a smaller configuration.

*Compared to the **R600** and **RZ50** Koganei Regulator.



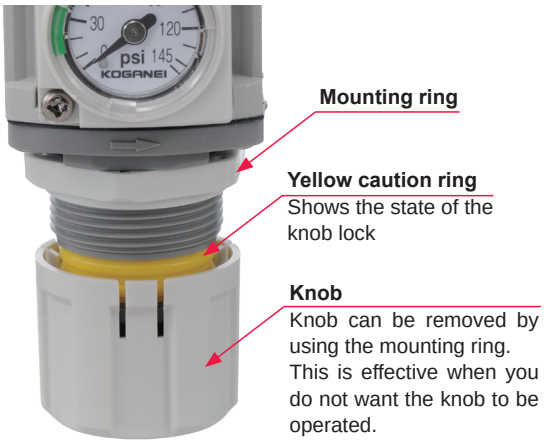
More flexible installation

Water and impurity removal functions have been eliminated for more flexible installation. Bowl can be mounted on the top or the sides.

Filter regulator
FRZ40

Improved knob operability

- The knob is sized and shaped to turn smoothly with a light touch for easy operation. Also, the knob lock precision has been improved to reduce changes in pressure settings when the knob is locked.
- The status of the lock release can be checked with the yellow caution ring.



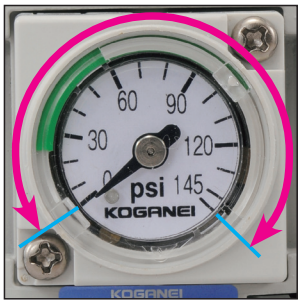
Improved maintainability

- The bowl can be removed and attached in two easy steps. The filter element can be replaced easily even in small narrow spaces.
- The filter element is a non-woven-fabric. Improved porosity and enlarged circumference area extend its operating life.

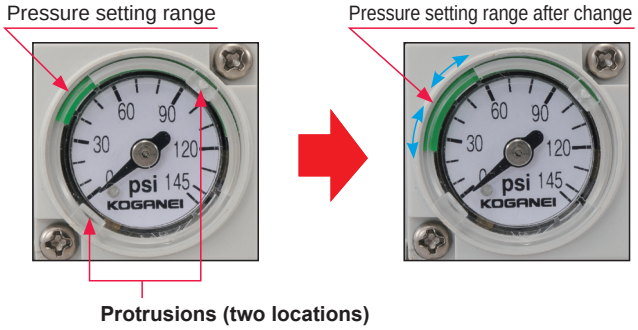
□1.181 in. series integrated pressure gauge

- □1.181 in. integrated pressure gauge is compact with almost nothing sticking out. Visibility is also improved with an easy to see 270° swing angle display.

270° swing angle



- Flexible change of the pressure setting range (the green part) is possible. Freely changeable upper and lower setting limits eliminate the need to remove the front cover (the transparent plastic part) and to use special tools.



The setting pressure range display can be changed as desired by rotating the protrusions (two locations) clockwise or counter clockwise.

*Other pressure gauges and pressure switches are available. See the next page for details.

Pressure gauge, pressure switch

Can select various types of pressure gauges and pressure switches other than the □1.181 in. integrated pressure gauge.

Order code G1-40-F11

ϕ1.575 in. pressure gauge
(145 psi specification)

G3-40-F11

ϕ1.575 in. pressure gauge
(43.5 psi specification)

G1S-40-F11

ϕ1.575 in. stainless steel
Bourdon tube pressure gauge
(145 psi specification)

G3S-40-F11

ϕ1.575 in. stainless steel
Bourdon tube pressure gauge
(43.5 psi specification)

Digital pressure switch
GS620-3W
(145 psi specifications)

GS1-50-F11-□-□

Pressure gauge with
built-in switches
(145 psi specification)

Pressure switch module

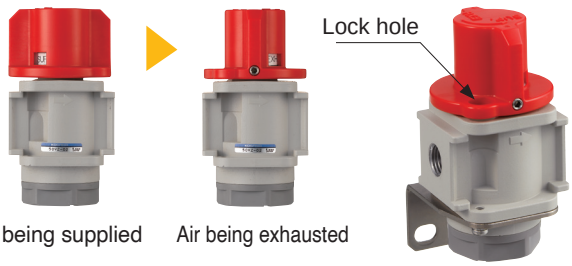
The pressure in the air line is easy to detect with the connecting bracket and integrated compact pressure switch. The set pressure can be adjusted from the front.

Note: Cannot be installed with the 30 series body size.

Residual pressure exhaust valve

The pressure in the air line can be exhausted through a 3-port valve. Better safety through a lock mechanism (with a lock hole) while exhausting residual pressure. Also, an easy to see red color is used for better visibility of the operating Knob.

Note: Cannot be installed with the 30 series body size.



Air being supplied Air being exhausted

Module adapter

These devices are used to connect devices for the 40 series and 50 series body sizes.

Note: Cannot be installed with the 30 series body size.

F module
(for connections)

D module
(for connections, with bracket)

S adapter
(for changing pipe size)

DS adapter
(for changing pipe size, with bracket)

Module bracket
(for module adapters)

Coupling plate
(replacement parts)

Bracket

The brackets can be used with all size filter regulators and regulators.

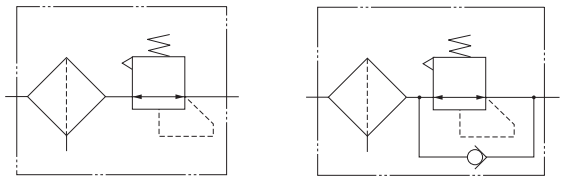
Panel mounting

A ϕ1.122 in. panel mounting hole can be used for all sizes of the filter regulators and regulators.

Filter regulator

FRZ30-F11·FRZ31-F11·FRZ32-F11
FRZ40-F11·FRZ41-F11
FRZ50-F11·FRZ51-F11

Symbol



●Standard
●Low pressure

●Built-in check mechanism

Specifications

Item \ Model		FRZ30-F11	FRZ40-F11	FRZ50-F11
	Standard	FRZ30-F11	FRZ40-F11	FRZ50-F11
	For low pressure	FRZ31-F11	FRZ41-F11	FRZ51-F11
	Built-in check mechanism	FRZ32-F11	———	———
Medium		Air		
Port size		M5×0.8mm, NPT1/8, NPT1/4	NPT1/8, NPT1/4, NPT3/8	NPT1/4, NPT3/8, NPT1/2
Maximum operating pressure	psi	145		
Proof pressure	psi	218		
Operating temperature range (atmosphere and media)	°F	41 to 140 (non-condensation)		
Filtration	μm	5		
Regulation method		Direct operation type and relief type	Internal pilot type and relief type	
Pressure setting range psi	Standard/built-in check mechanism	7 to 123		
	For low pressure	7 to 58		
Relief start pressure	psi	Set pressure +7 or less		
Air consumption[Note 1]	ft³/min (SCFM)	—	0.18 or less	
Materials of major parts	Body	Die cast aluminum alloy		
	Bonnet and adapter	Polyacetal		
	Diaphragm	Base fabric + synthetic rubber		
	Bowl	Polycarbonate		
	Filter element	Non-woven fabric		
	Bracket	Steel plate (electroless nickel plated)		
Mass (for standard specifications and largest port size)	lb	0.35	0.44	0.64
Standard equipment		Mounting ring		
Option[Note 2]		□1.181 in. integrated pressure gauge (assembled), other pressure gauges (included parts), brackets (included parts)		

Note 1: Maximum value of specified range. Air consumption varies depending on the relationship of the primary pressure and the secondary pressure.
2: Refer to the order codes and the specifications for each product starting on page 105 for details on the various types of options.

Order codes

FRZ □ – F11 – □ – □ – □

NPT thread specifications

Body Model / **Port size NPT**

Body Model	M5	1/8	1/4	3/8	1/2	
30	M5	01	02			Standard
40		01	02	03		Standard
50			02	03	04	Standard
31	M5	01	02			Low pressure
41		01	02	03		Low pressure
51			02	03	04	Low pressure
32	M5	01	02			Built-in check mechanism

Filter regulator

Bracket
Blank — No bracket
B — With bracket

Pressure gauge specifications
Blank — No pressure gauge (pressure gauge connection port NPT1/4)
GP1 — No pressure gauge (pressure gauge connection port NPT1/8)
GN — No pressure gauge (No pressure gauge connection port)
G1C — 145 psi specification □1.181 in. integrated pressure gauge
G4C — 58 psi specification □1.181 in. integrated pressure gauge
G1 — 145 psi specification ϕ1.575 in. pressure gauge
G3 — 44 psi specification ϕ1.575 in. pressure gauge
G1S — 145 psi specification ϕ1.575 in. stainless Bourdon tube pressure gauge
G3S — 44 psi specification ϕ1.575 in. stainless Bourdon tube pressure gauge
GS6 — 145 psi specification digital pressure switch
GS1A — 145 psi specification □1.969 in. pressure gauge with built-in switch Lead wire For 24 VDC
GS1B — 145 psi specification □1.969 in. pressure gauge with built-in switch Lead wire For 100 VAC, 200 VAC
GS1C — 145 psi specification □1.969 in. pressure gauge with built-in switch With DIN connector For 24 VDC
GS1D — 145 psi specification □1.969 in. pressure gauge with built-in switch With DIN connector For 100 VAC, 200 VAC

Note: Refer to order codes and dimensions on page 106 to 112 for information about the specifications for pressure gauges, pressure gauges with electronic switches, pressure gauges with built-in pressure switches, and purchasing individual parts.

●Order codes for brackets only

8Z-BK

Order codes

●Parts for maintenance

●Bowl assembly

BA-FRZ□-F11

Body size
30 ——For FRZ3□
40 ——For FRZ4□
50 ——For FRZ5□

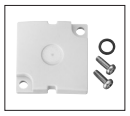
●Element

E-□Z

Body size
30 ——For FRZ3□
40 ——For FRZ4□
50 ——For FRZ5□

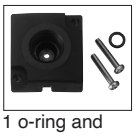
●Pressure port plate

P-FRZ (without pressure gauge connection port)



1 o-ring and
2 small screws

GP-FRZ□-F11 (with pressure gauge connection port)



Connection port diameter
Blank NPT1/4
1 NPT1/8

1 o-ring and
2 small screws

●Seal kit (various o-rings, 1 valve assembly, and 1 diaphragm assembly)

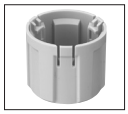
SRK-FRZ□

Body size
30 ——For FRZ3□
40 ——For FRZ4□
50 ——For FRZ5□

Refer to "Replacing the seal kit, element, and bowl assembly" on page 89 for the component parts of the seal kit.

●Knob

H-FRZ

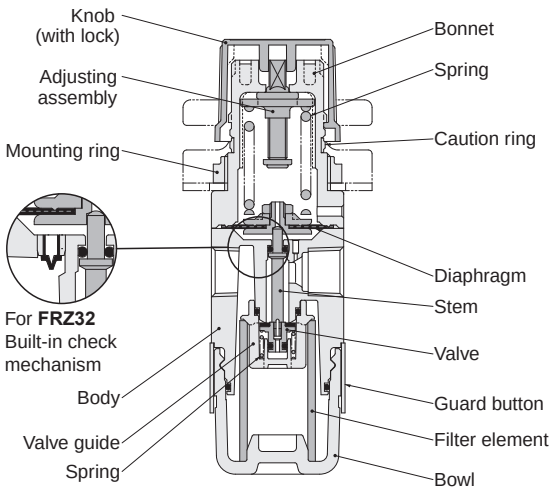


●Mounting ring

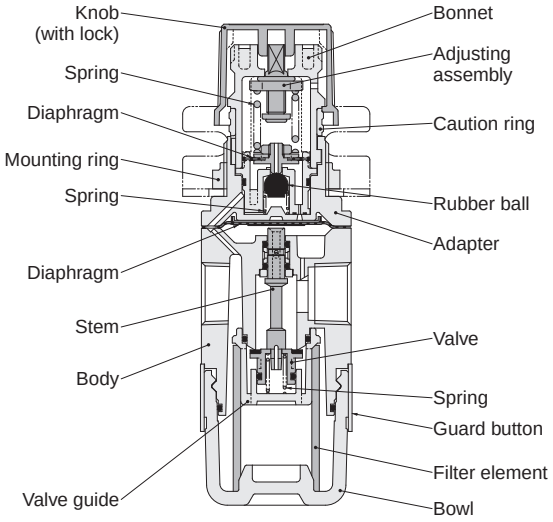
R-FRZ

Inner construction

FRZ3□



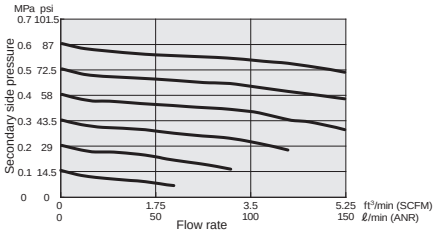
FRZ4□·FRZ5□



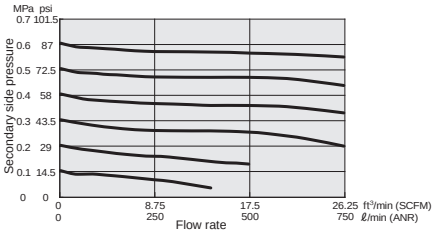
Flow rate characteristics

●Standard and built-in check mechanism

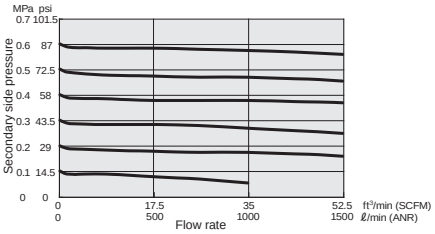
FRZ30-F11-M5
FRZ32-F11-M5



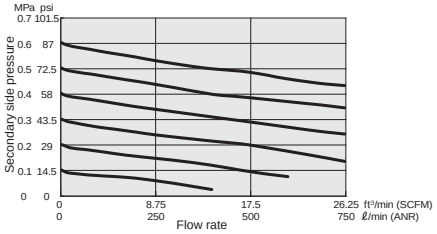
FRZ40-F11-01



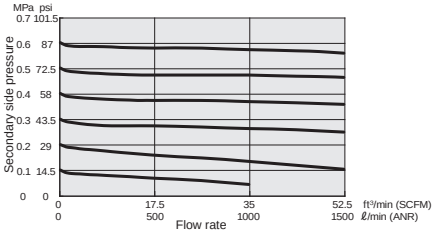
FRZ50-F11-02



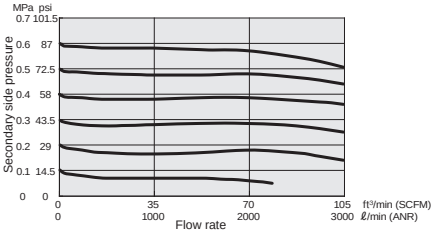
FRZ30-F11-01
FRZ32-F11-01



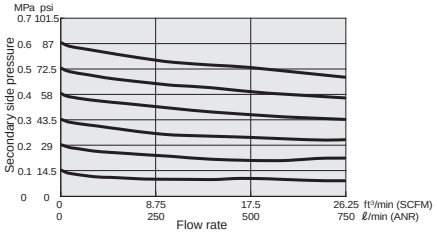
FRZ40-F11-02



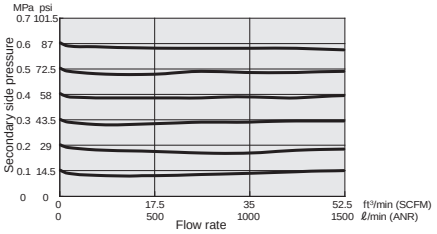
FRZ50-F11-03



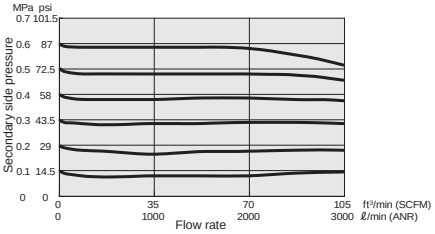
FRZ30-F11-02
FRZ32-F11-02



FRZ40-F11-03



FRZ50-F11-04

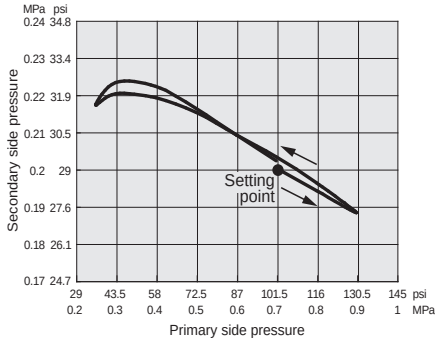


Remarks: Graphs show flow rate characteristics at 101.5 psi constant pressure on the primary side.

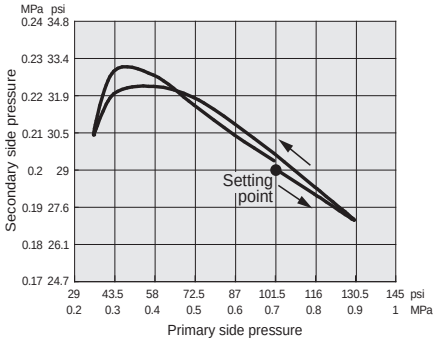
Pressure characteristics

●Standard and built-in check mechanism

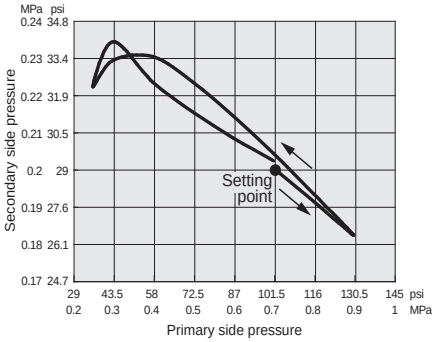
FRZ30-F11
FRZ32-F11



FRZ40-F11

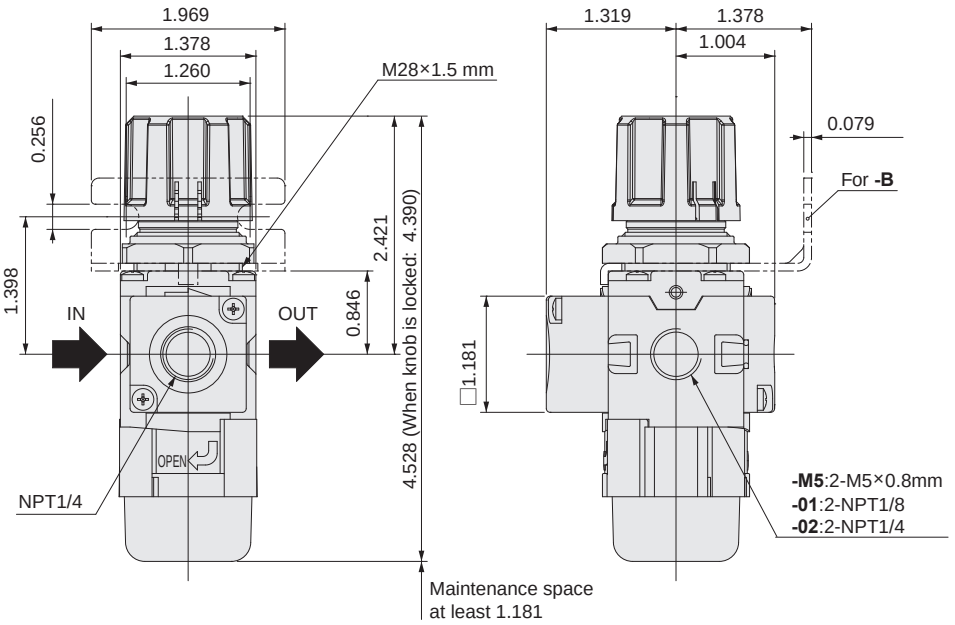


FRZ50-F11

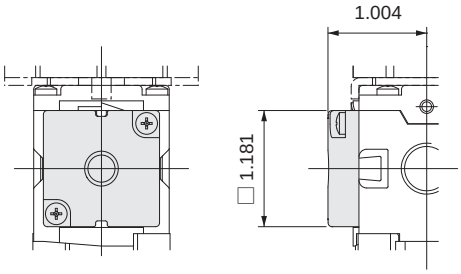


Filter regulator dimensions in.

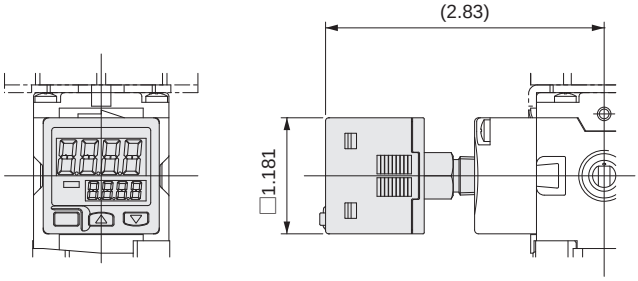
- **FRZ30-F11**
- **FRZ31-F11**
- **FRZ32-F11**



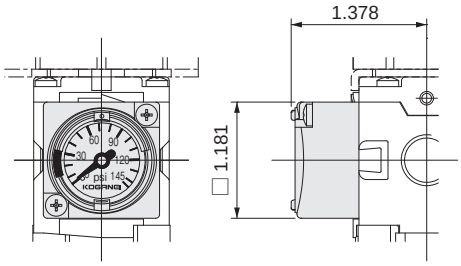
●Pressure gauge options



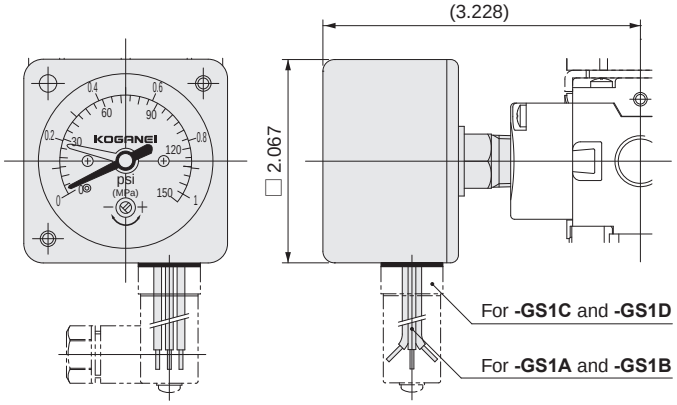
For **-GN**



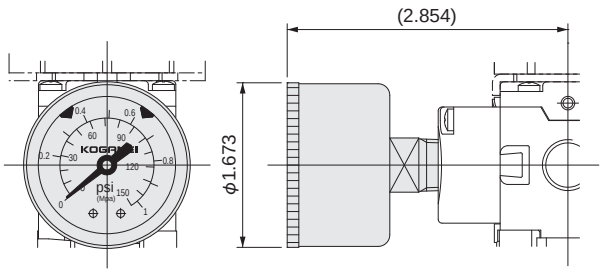
For **-GS6**



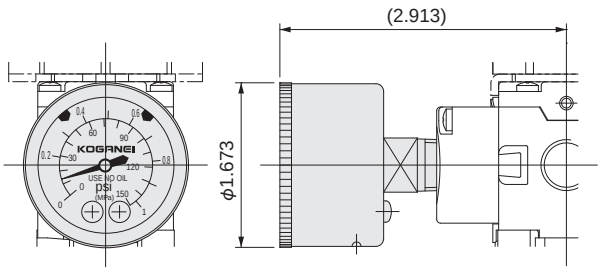
For **-G1C** and **-G4C**



For **-GS1A**, **-GS1B**, **-GS1C**, and **-GS1D**



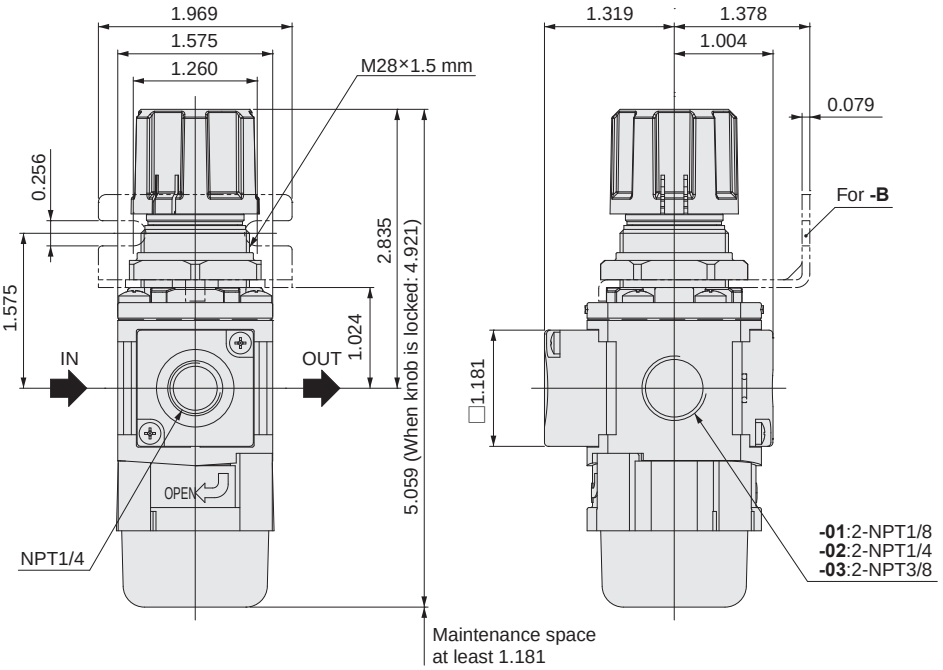
For **-G1** and **-G3**



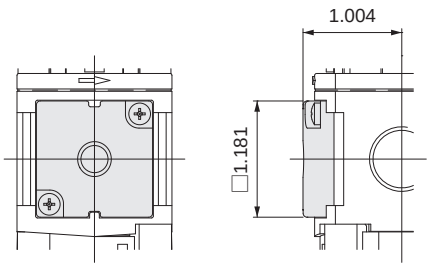
For **-G1S** and **-G3S**

Filter regulator dimensions in.

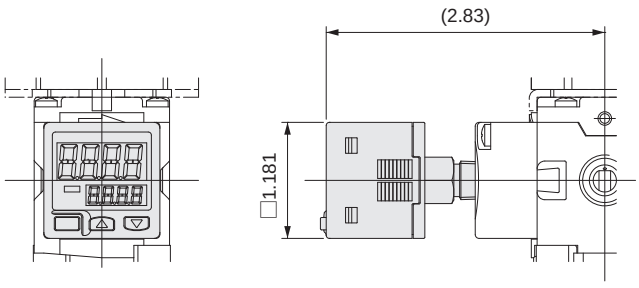
●**FRZ40-F11**
●**FRZ41-F11**



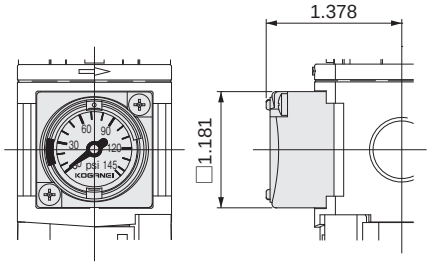
●**Pressure gauge options**



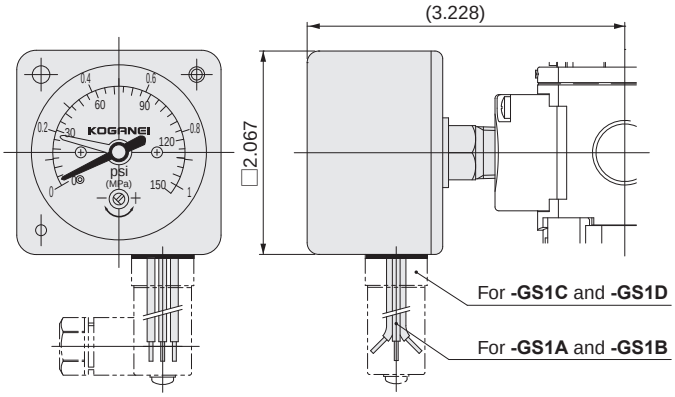
For **-GN**



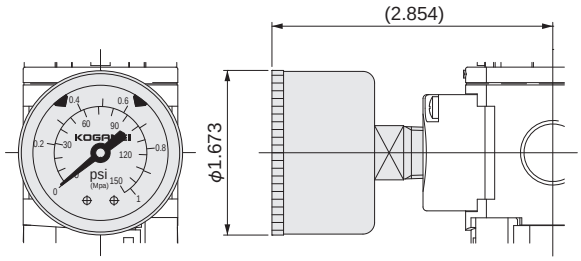
For **-GS6**



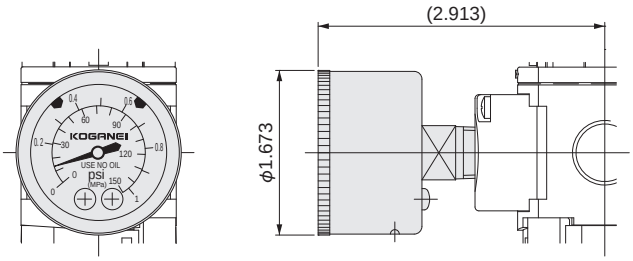
For **-G1C** and **-G4C**



For **-GS1A**, **-GS1B**, **-GS1C**, and **-GS1D**

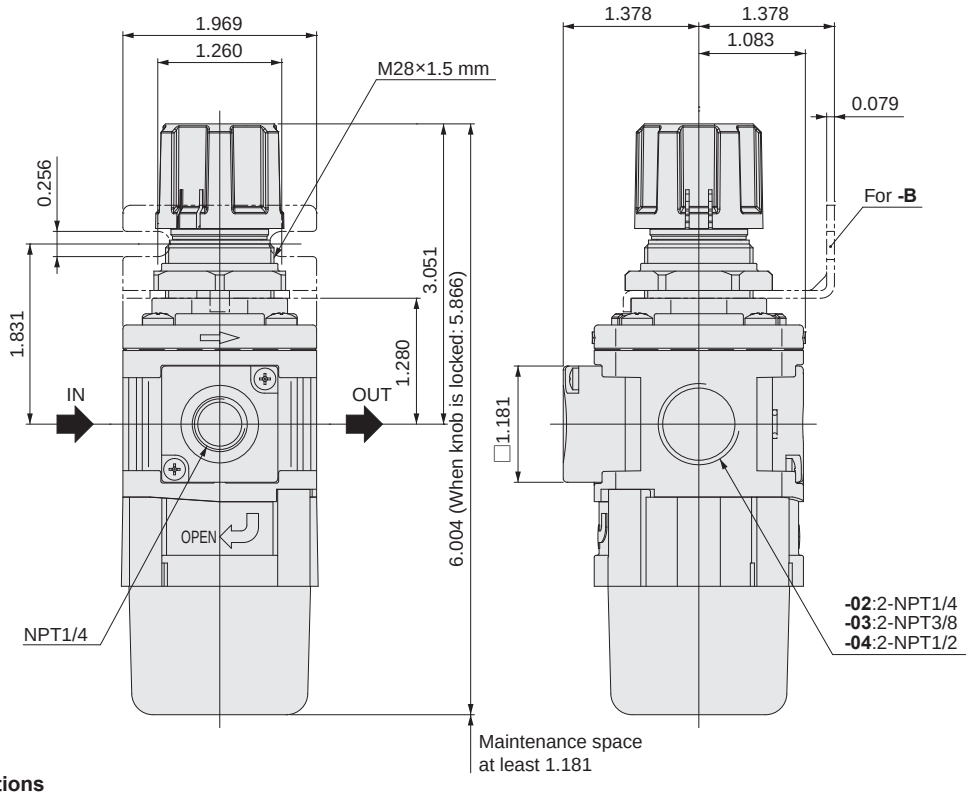


For **-G1** and **-G3**

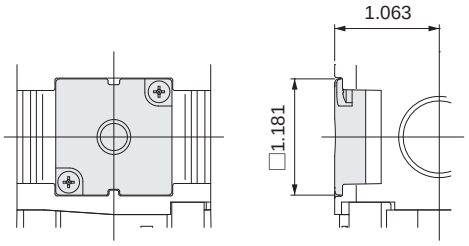


For **-G1S** and **-G3S**

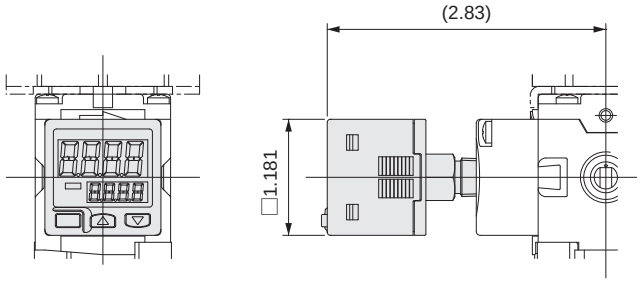
●FRZ50-F11
●FRZ51-F11



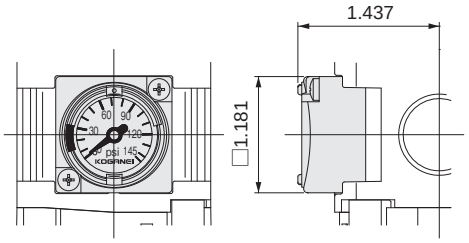
●Pressure gauge options



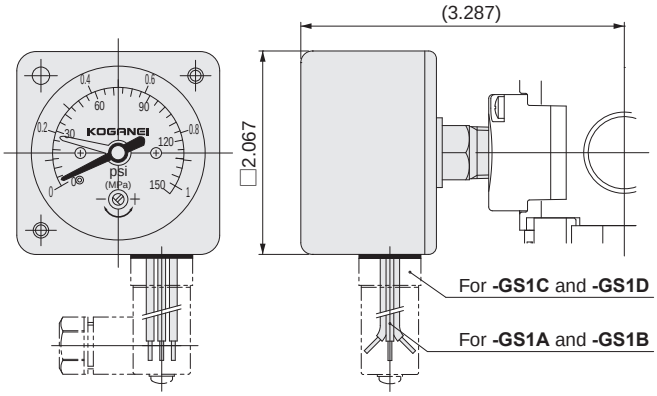
For **-GN**



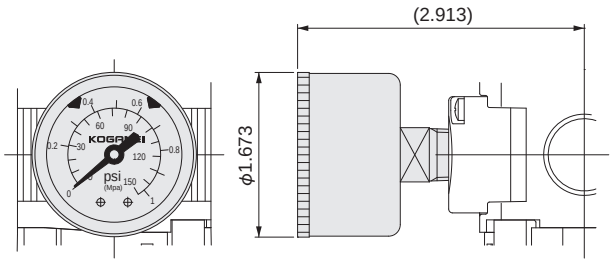
For **-GS6**



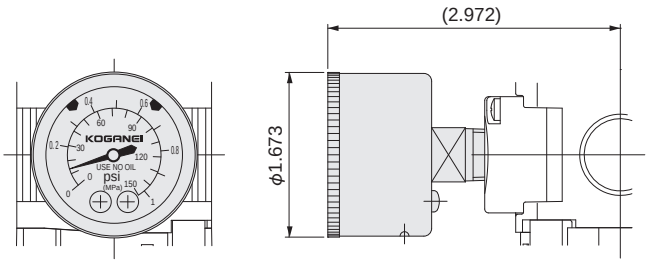
For **-G1C** and **-G4C**



For **-GS1A**, **-GS1B**, **-GS1C**, and **-GS1D**



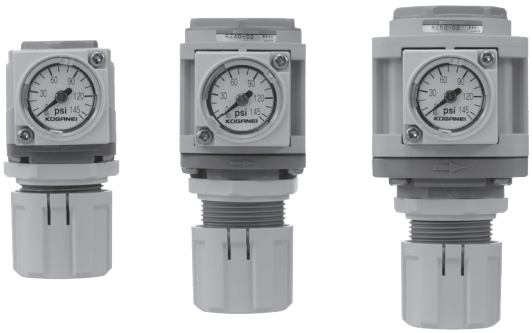
For **-G1** and **-G3**



For **-G1S** and **-G3S**

Regulator

RZ30-F11·RZ31-F11·RZ32-F11
RZ40-F11·RZ41-F11
RZ50-F11·RZ51-F11



Symbol

●Standard
●Low pressure

●Built-in check mechanism

Specifications

Item \ Model		RZ30-F11	RZ40-F11	RZ50-F11
	Standard	RZ30-F11	RZ40-F11	RZ50-F11
	For low pressure	RZ31-F11	RZ41-F11	RZ51-F11
	Built-in check mechanism	RZ32-F11	———	———
Medium		Air		
Port size		M5×0.8mm, NPT1/8, NPT1/4	NPT1/8, NPT1/4, NPT3/8	NPT1/4, NPT3/8, NPT1/2
Maximum operating pressure	psi	145		
Proof pressure	psi	218		
Operating temperature range (atmosphere and media)	°F	41 to 140 (non-condensation)		
Regulation method		Direct operation type and relief type	Internal pilot type and relief type	
Pressure setting range psi	Standard/built-in check mechanism			7 to 123
	For low pressure	7 to 58		
Relief start pressure psi		Set pressure +7 or less		
Air consumption[Note 1]	ft^3/min (SCFM)	—	0.18 or less	
Materials of major parts	Body	Die cast aluminum alloy		
	Bonnet and adapter	Polyacetal		
	Diaphragm	Base fabric + synthetic rubber		
	Bracket	Steel plate (electroless nickel plated)		
Mass (for standard specifications and largest port size)	lb	0.29	0.37	0.53
Standard equipment		Mounting ring		
Option[Note 2]		□1.181 in. integrated pressure gauge (assembled), other pressure gauges (included parts), brackets (included parts)		

Note 1: Maximum value of specified range. Air consumption varies depending on the relationship of the primary pressure and the secondary pressure.
2: Refer to the order codes and the specifications for each product starting on page 105 for details on the various types of options.

Order codes

RZ □ – F11 – □ – □ – □

NPT thread specifications

Bracket
Blank ——No bracket
B ——With bracket

Body Model	Port size M5	1/8	1/4	3/8	1/2	
30	M5	01	02			Standard
40		01	02	03		
50			02	03	04	
31	M5	01	02			Low pressure
41		01	02	03		
51			02	03	04	
32	M5	01	02			Built-in check mechanism

Regulator

Pressure gauge specifications
Blank—— No pressure gauge (pressure gauge connection port NPT1/4)
GP1 —— No pressure gauge (pressure gauge connection port NPT1/8)
GN —— No pressure gauge (No pressure gauge connection port)
G1C —— 145 psi specification □1.181 in. integrated pressure gauge
G4C —— 58 psi specification □1.181 in. integrated pressure gauge
G1 —— 145 psi specification ϕ1.575 in. pressure gauge
G3 —— 44 psi specification ϕ1.575 in. pressure gauge
G1S —— 145 psi specification ϕ1.575 in. stainless Bourdon tube pressure gauge
G3S —— 44 psi specification ϕ1.575 in. stainless Bourdon tube pressure gauge
GS6 —— 145 psi specification digital pressure switch
GS1A —— 145 psi specification □1.969 in. pressure gauge with built-in switch Lead wire For 24 VDC
GS1B —— 145 psi specification □1.969 in. pressure gauge with built-in switch Lead wire For 100 VAC, 200 VAC
GS1C —— 145 psi specification □1.969 in. pressure gauge with built-in switch With DIN connector For 24 VDC
GS1D —— 145 psi specification □1.969 in. pressure gauge with built-in switch With DIN connector For 100 VAC, 200 VAC

Note: Refer to order codes and dimensions on page 106 to 112 for information about the specifications for pressure gauges, pressure gauges with electronic switches, pressure gauges with built-in pressure switches, and purchasing individual parts.

●Order codes for brackets only

8Z-BK

Order codes

●Parts for maintenance

●Seal kit (various o-rings, 1 valve assembly, and 1 diaphragm assembly)

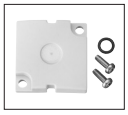
SRK-RZ□

Body size
30 ——**For RZ3□**
40 ——**For RZ4□**
50 ——**For RZ5□**

Refer to "Replacing the seal kit, element, and bowl assembly" on page 89 and 90 for the component parts of the seal kit.

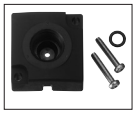
●Pressure port plate

P-FRZ (without pressure gauge connection port)



1 o-ring and
2 small screws

GP-FRZ-F11 (with pressure gauge connection port)

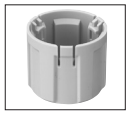


Connection port diameter
Blank NPT1/4
1 NPT1/8

1 o-ring and
2 small screws

●Knob

H-FRZ

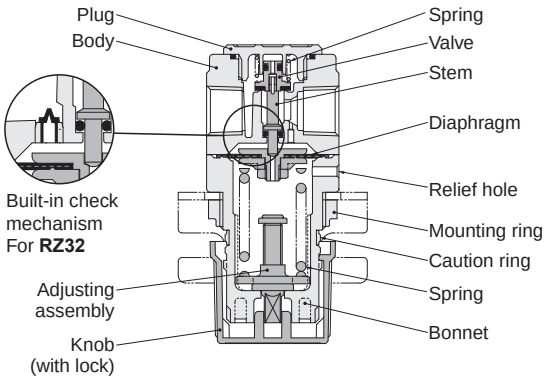


●Mounting ring

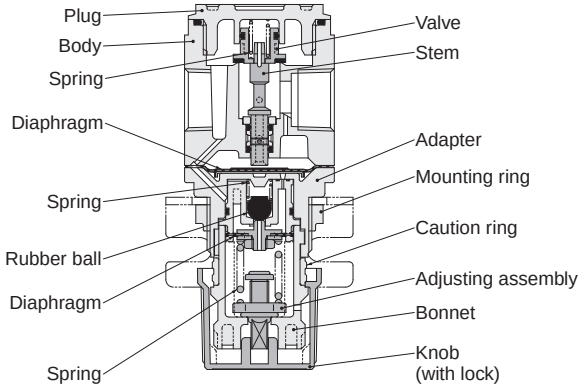
R-FRZ

Inner construction

RZ3□



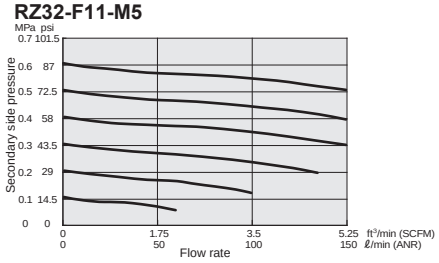
RZ4□·RZ5□



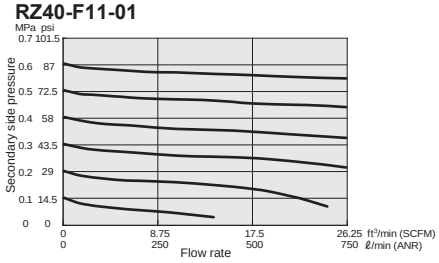
Flow rate characteristics

●Standard and built-in check mechanism

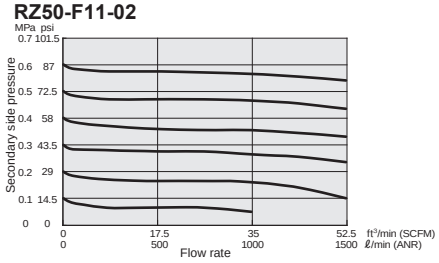
RZ30-F11-M5
RZ32-F11-M5



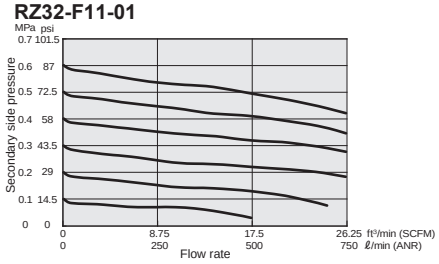
RZ40-F11-01



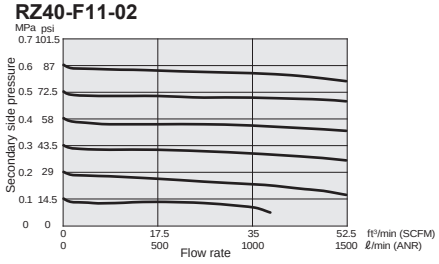
RZ50-F11-02



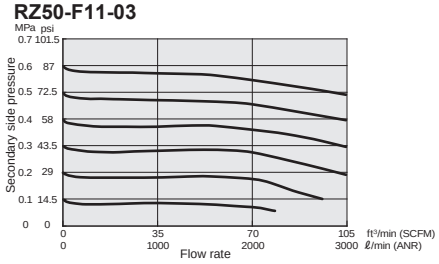
RZ30-F11-01
RZ32-F11-01



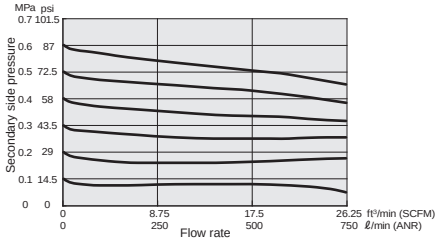
RZ40-F11-02



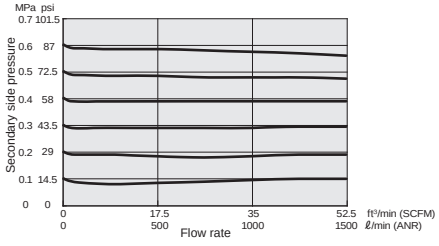
RZ50-F11-03



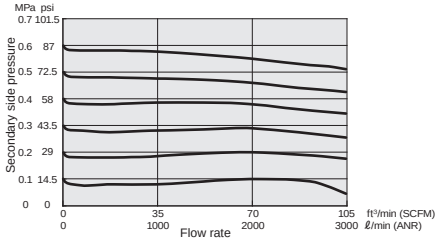
RZ30-F11-02
RZ32-F11-02



RZ40-F11-03



RZ50-F11-04

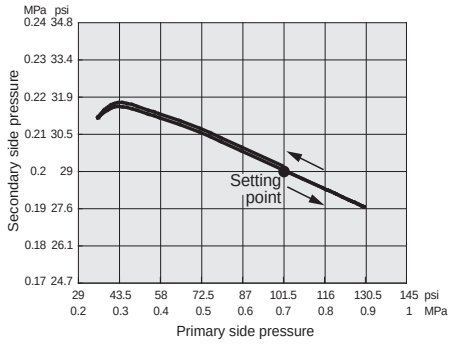


Remarks: Graphs show flow rate characteristics at 0.7 MPa constant pressure on the primary side.

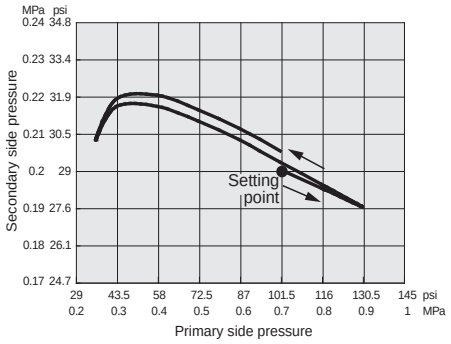
Pressure characteristics

●Standard and built-in check mechanism

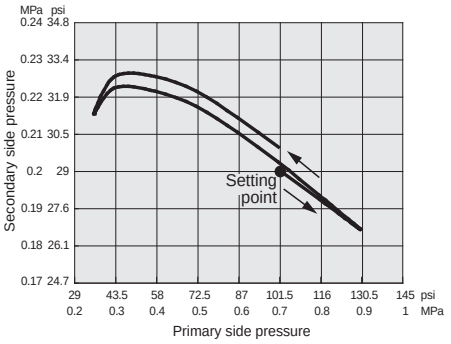
RZ30-F11
RZ32-F11



RZ40-F11

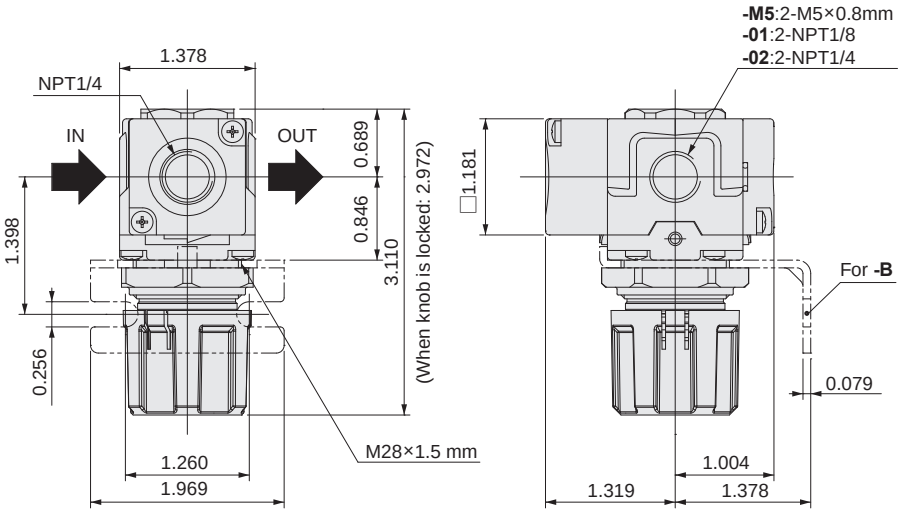


RZ50-F11

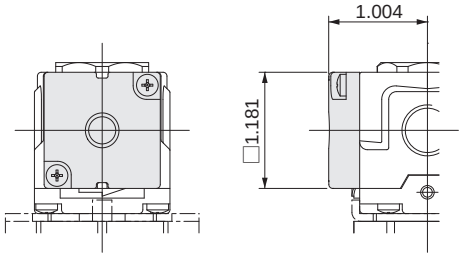


Regulator dimensions in.

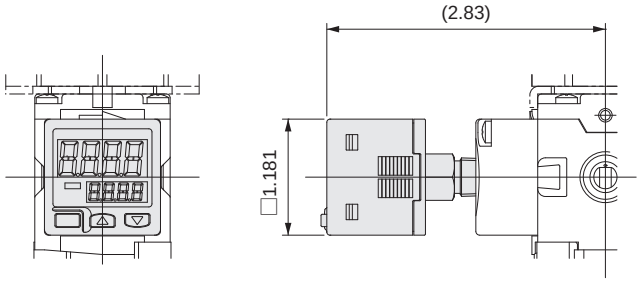
- **RZ30-F11**
- **RZ31-F11**
- **RZ32-F11**



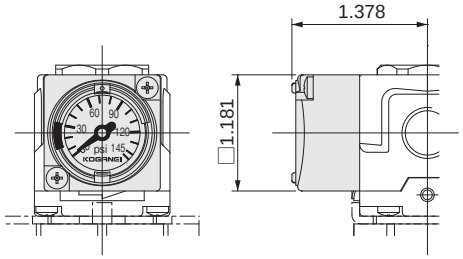
●Pressure gauge options



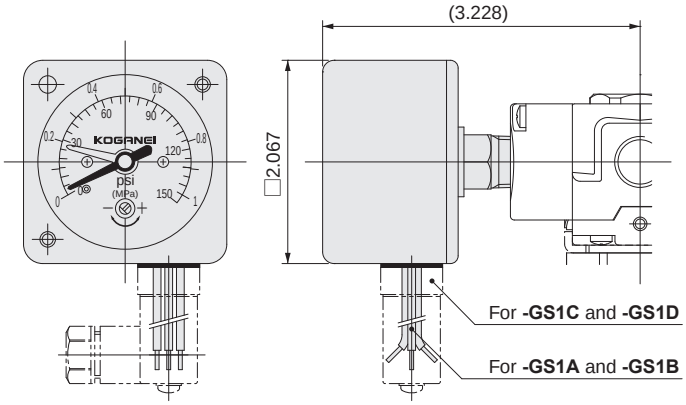
For **-GN**



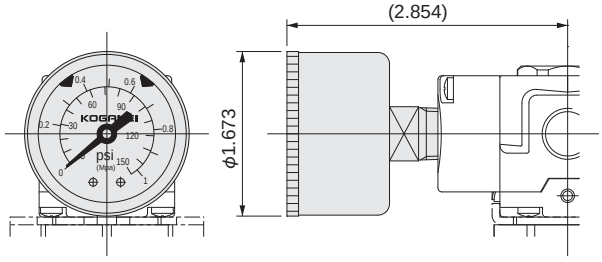
For **-GS6**



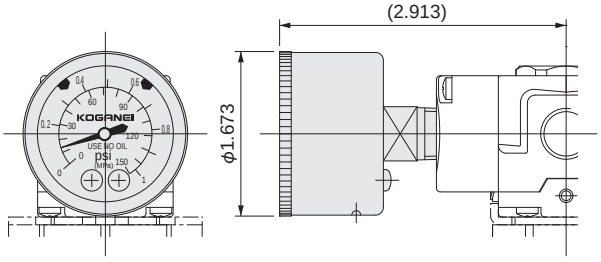
For **-G1C** and **-G4C**



For **-GS1A**, **-GS1B**, **-GS1C**, and **-GS1D**



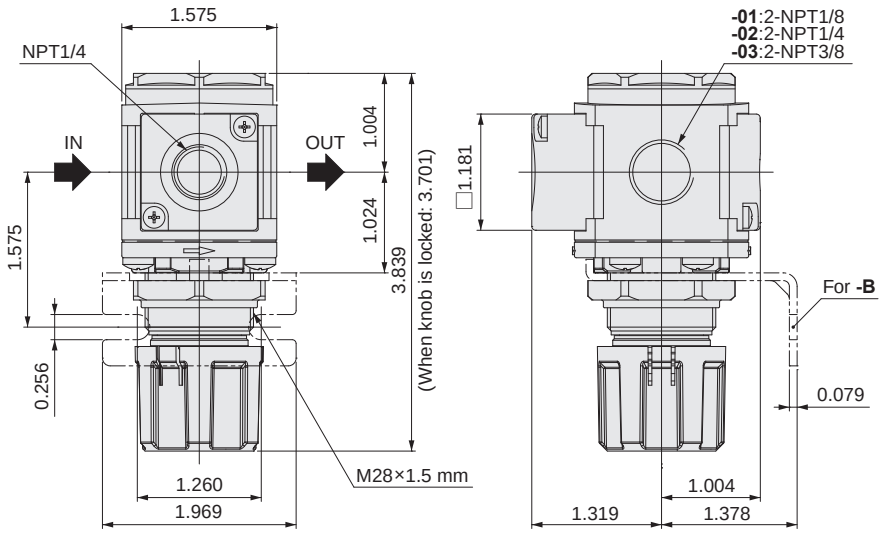
For **-G1** and **-G3**



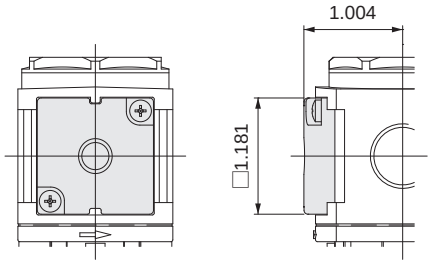
For **-G1S** and **-G3S**

Regulator dimensions in.

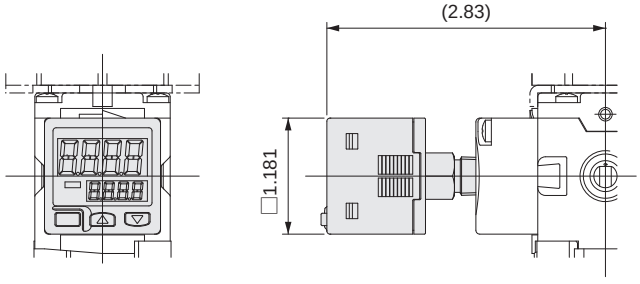
- **RZ40-F11**
- **RZ41-F11**



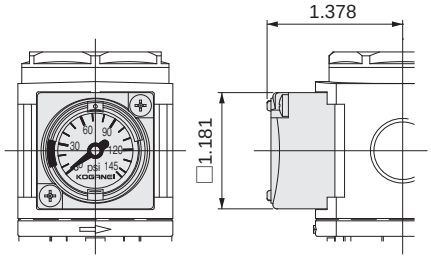
●Pressure gauge options



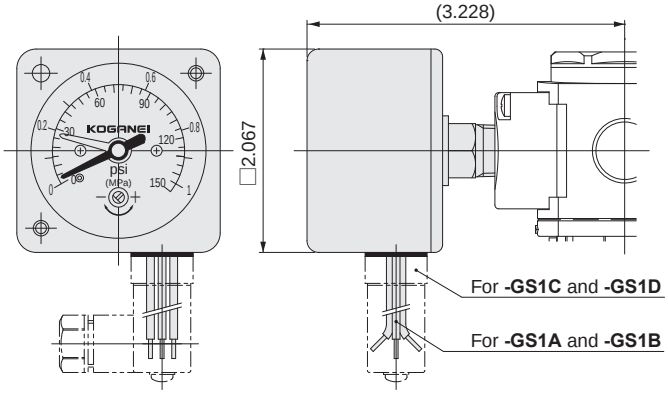
For **-GN**



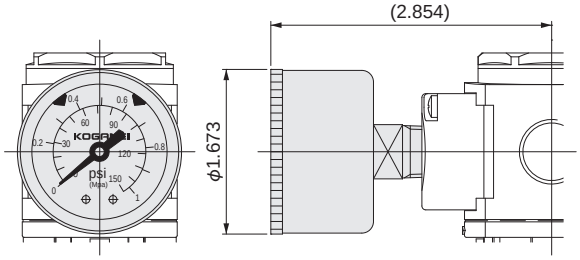
For **-GS6**



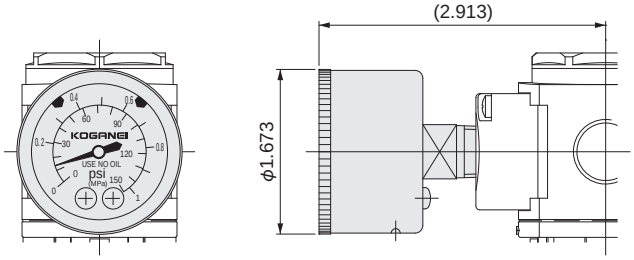
For **-G1C** and **-G4C**



For **-GS1A**, **-GS1B**, **-GS1C**, and **-GS1D**

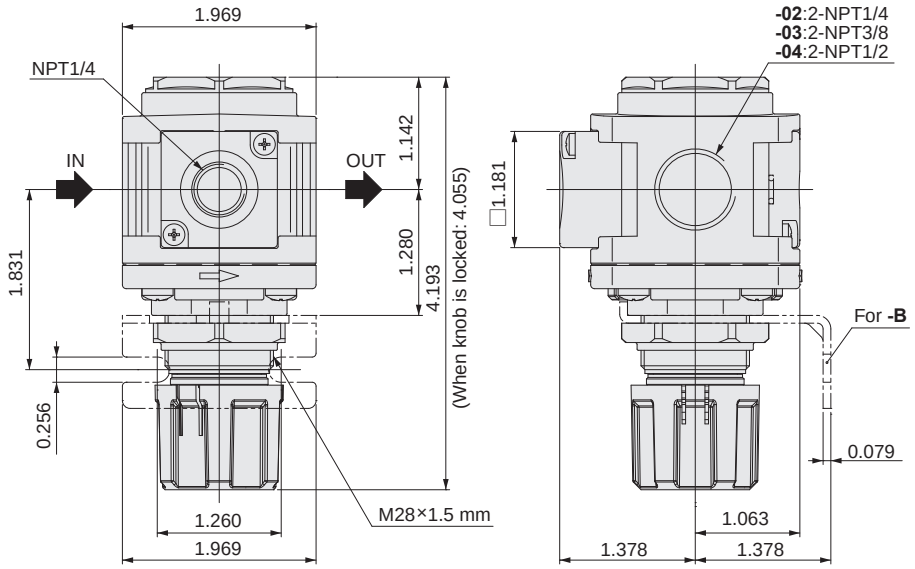


For **-G1** and **-G3**

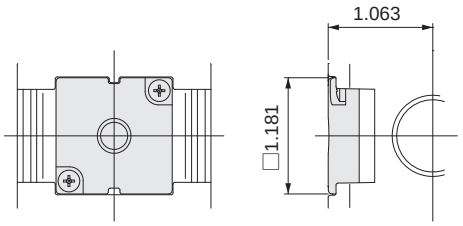


For **-G1S** and **-G3S**

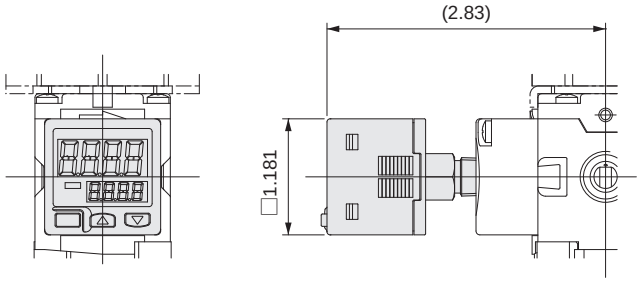
●RZ50-F11
●RZ51-F11



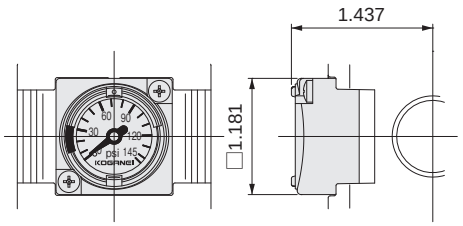
●Pressure gauge options



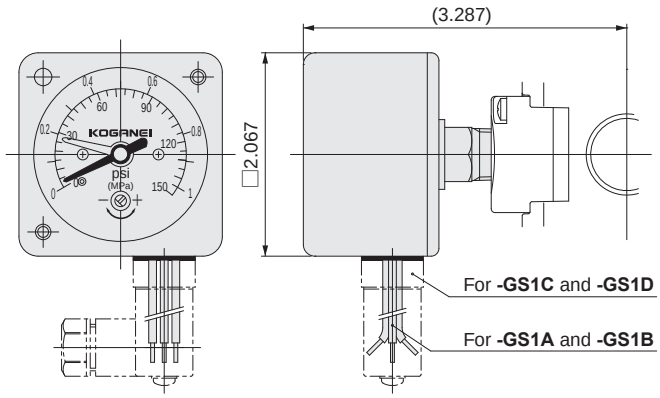
For **-GN**



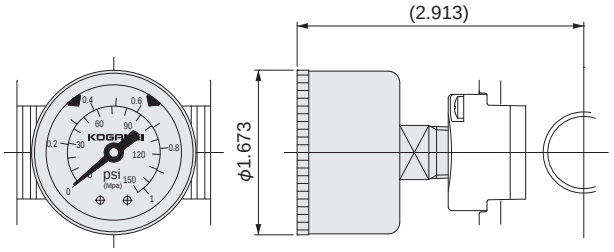
For **-GS6**



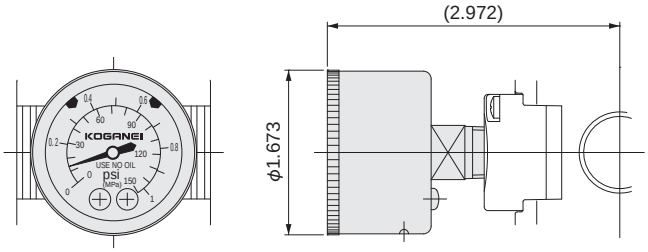
For **-G1C** and **-G4C**



For **-GS1A**, **-GS1B**, **-GS1C**, and **-GS1D**



For **-G1** and **-G3**



For **-G1S** and **-G3S**

Precautions for the FRZ series

Design and selection

●Selection

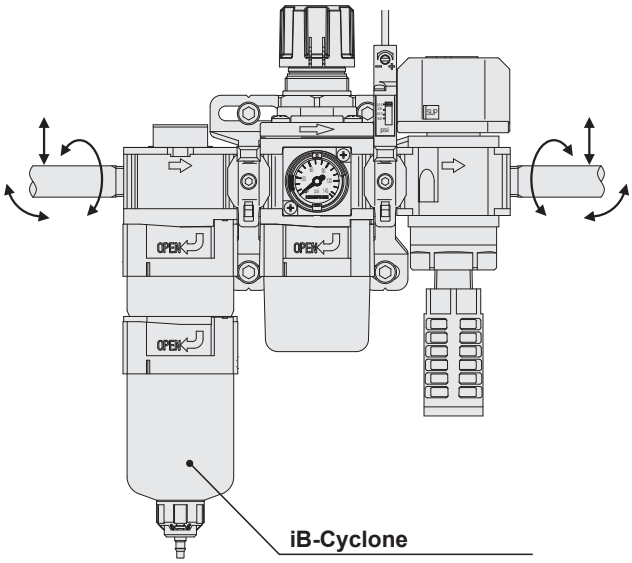
Look at the "Handling Instructions and Precautions", "Specifications", "Various Characteristics", "Dimensions", and other technical materials for each product to make the correct decision.

Mounting (installation) and piping

●Mounting (installation) direction, support, and securing

1. The products cannot be mounted (installed) if a bending moment or twisting moment is applied to the product or piping.

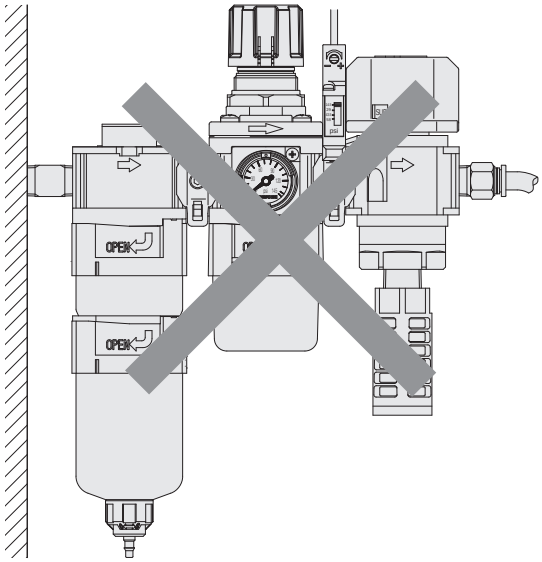
NOTE Applying bending moment or twisting moment may damage the product.



*See the back of the catalog.

2. Do not attach piping so that just one side is fixed as shown in the following diagram. Support external piping separately.

NOTE Operating the knob and the moment caused by the OUT (secondary) side pipes may damage the product's piping connections.



Note The muffler must be prepared by the user.

3. Use the D□ module or a bracket to install all the products.

4. The product can be mounted (installed) in any direction. It is also possible to install it with the bowl of the filter on top.

5. When mounting (installing) the product, always make sure it is secured and sufficiently supported.

NOTE If the product is not securely fixed in place, it may fall over, be dropped, or operate abnormally and may cause an injury.

●Maintenance space requirements

Assure there is sufficient space for maintenance inspections and maintenance work. See the dimension diagrams for each of the products regarding the maintenance space.

NOTE It there is not enough allowance for maintenance space, it will be impossible to remove the filter regulator bowl assembly and replace the filter.

NOTE If there is not enough allowance for maintenance space, it will be impossible to do maintenance inspections and maintenance work so the equipment may stop or the product may be damaged.

●Direction of flow

1. Connect the filter regulators and regulators so that the medium flows in the IN port (primary) side and out the OUT port (secondary) side.

2. Connect the residual pressure exhaust valves so that the medium flows from the 1 (P) port (primary) side to the 2 (A) port (secondary) side.

3. Use the flow marks on the products to identify the direction of flow of the medium in the filter regulators, regulators, and residual pressure exhaust valves.
See the "Handling Instructions and Precautions" for each product regarding the relationship of the flow marks and direction of flow of the medium being used filter regulators, regulators on page 86 and residual pressure exhaust valves on page 90.

NOTE Connecting the products so the medium flows in reverse will cause the product to stop functioning and damage it.

Precautions for the FRZ series

●Attaching steel pipes and fittings

If steel pipes and fittings are attached to the threaded sections of the aluminum die-cast parts of the product, tighten them to the torque recommended in our standards.

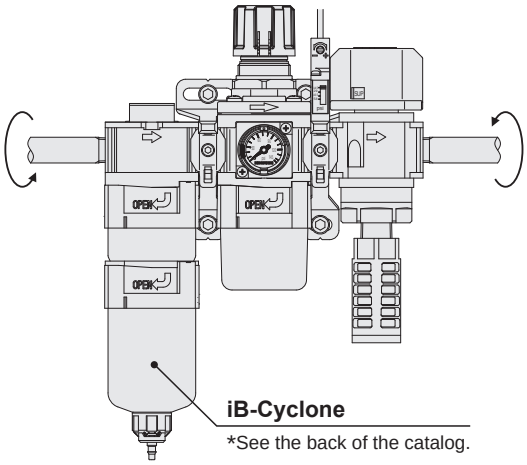
NOTE Tightening with excessive torque may damage the product or injure workers or operators.

Recommended tightening torque ft•lbf

Connecting thread	M5	1/8	1/4	3/8	1/2
Torque	0.74 to 1.11	5.2 to 6.6	8.9 to 10.3	16.2 to 17.7	20.7 to 22.1

NOTE Use a tightening torque of 2.21 to 3.69 ft•lbf if the various pressure gauges are mounted on the NPT1/4 pressure port plate.

NOTE If a muffler or something is attached to the 3 (R) port of the residual exhaust valve, tighten it to 1.33 to 1.63 ft•lbf.



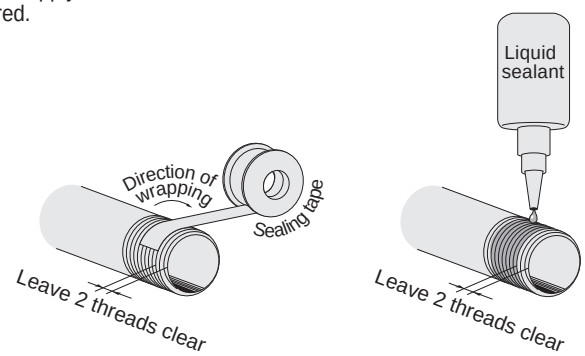
Note The muffler must be prepared by the user.

●Preventing contamination by foreign matter

1. Remove all foreign matter, such as metal chips, cutting oil, or dirt, from inside pipes with an air blower (flushing) and thorough washing before fitting the pipes.
2. Do not allow foreign matter, such as metal chips, or sealing tape from the piping threads, to get into the pipes when fitting the pipes.

NOTE Foreign matter entering the piping may damage the product or reduce its performance and service life.

3. Wrap the sealing tape in the direction as shown in the diagram below leaving 1.5 to 2 threads uncovered. When using liquid sealant, apply a suitable amount and leave 1.5 to 2.0 threads uncovered.



NOTE If the sealing tape or sealant gets on the lip of pipes and fittings, bits of it may get into the pipes and cause air leaks.

4. If you are using liquid sealant, do not get it on the polycarbonate parts (the bowl of the filter regulator and the front cover of the pressure gauge).

NOTE If liquid sealant gets on the polycarbonate parts, it may damage them.

Medium and operating environment

●Media

1. Use clean air (through 5 µm or smaller filter) for the supply medium. Contact the nearest Koganei sales office or overseas department if you are considering using something other than cleaned air.
2. Cannot use air that contains water and fluids.

NOTE Using air that contains water and fluids will cause the product's functions to stop after a short period and will reduce the product performance and service life.

3. If air that contains water and fluids is used, or if it is possible that they may be mixed in with the air being used, the water and fluids must be removed completely by installing a water and fluids removal device (such as the iB-Cyclone*) on the primary side. *See the back of the catalog.
4. Avoid using media that is prone to extreme pulsating or surging.

NOTE Medium prone to extreme pulsating or surges will cause the product's functions to stop after a short period and will reduce the product performance and service life.

●Operating environment

1. 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.
2. Cover the unit when using it in locations where it might be subject to excessive dust, dripping water, dripping oil, etc.
3. Do not use the product in environments subject to external vibration or impact.

NOTE External vibrations or shocks may result in damage to component parts.

4. Avoid piping that is rigid, such as steel piping, if vibrations are transmitted. Use flexible tubes so that the product is not subject to the vibrations.

●Medium and operating environment

1. The temperature of the medium and the ambient environment must be within the range in the specifications.

NOTE Using the product in an environment that is outside the specified temperature or with media that is outside the specified temperature will cause the product's functions to stop after a short period and will reduce the product performance and service life.

2. Do not use media 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, flon gas, ozone, acids, alkaline, etc.

NOTE Using the product in an environment or with media that is specified in the above item 2 will cause the product's functions to stop after a short period and will reduce the product performance and service life.

3. The bowl and the front cover of the pressure gauge of the filter regulator are polycarbonate. This product cannot be used in environments with the gases and fluids in item **2**, nor thread-locking adhesive, leak detection fluid, hot water or where it may be exposed to them. This product also cannot be used in direct ultra-violet light. See page 94 for details.

Operation and maintenance inspections

●Method of use

Read the "Handling Instructions and Precautions" for each product for instructions on correct usage (Filter regulator and regulator page 86 to 90, residual pressure exhaust valve page 90 and page 91, module adapters page 92, pressure switch module page 92 and page 93, □1.181 in. integrated pressure gauge page 93).

●Maintenance (maintenance inspection)

1. Performance and functions may decrease as the pneumatic equipment ages. Always conduct daily inspections of the pneumatic equipment, and confirm that all requisite system functions are satisfied, to prevent accidents from happening.
2. Read the "Handling Instructions and Precautions" for instructions on correctly doing maintenance and replacing maintenance parts (Filter regulator and regulators page 89 and page 90).
3. The product must be disassembled and reassembled to use the seal kit.

NOTE The product is no longer under warranty if it is disassembled or reassembled.

Filter regulator
Regulator

Design and selection

●Pressure setting

1. A safety device must be installed for equipment/devices installed on the OUT port (secondary) side of the filter regulator or the regulator, because the equipment/device will be damaged or malfunction due to the pressure if the set pressure value is exceeded.

2. We recommend setting the pressure on the OUT port (secondary) side to less than 85% of the supply pressure setting on the IN port (primary) side.

NOTE If the pressure is set above 85%, the effect of the fluctuations in the IN port (primary) side pressure and flow rate are more prone to affect the OUT port (secondary) side pressure, and it becomes unstable.

3. It is not possible to install a valve on the IN port (primary) side of the internal pilot type filter regulator or regulator (such as models FRZ4□, FRZ5□, RZ4□, RZ5□) to repeatedly switch the pressure on the IN port (primary) side.

NOTE Changing the pressure of the IN port (primary) side may cause fluctuation in the OUT port (secondary) side set pressure.

4. The OUT port (secondary) side pressure may fluctuate if air is not consumed for a long time or if a sealed circuit or balance circuit is used. Contact your nearest Koganei sales office or overseas department.

5. Contact your nearest Koganei sales office or overseas department if you are using a circuit that needs highly precise pressure regulation.

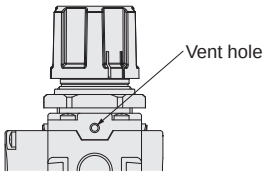
●OUT Port (secondary) side pressure exhaust and vent hole

1. When the knob on the filter regulator or regulator is turned to reduce the OUT port (secondary) side pressure or when the OUT port (secondary) side pressure is higher than the set pressure and is exhausted, air is exhausted to the outside through the vent hole shown in the diagram.

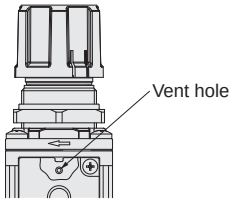
NOTE There may be some vibration and noise caused by the exhaust.

2. Install a separate exhaust mechanism on the OUT port (secondary) side if an external force applied to an actuator or something on the OUT port (secondary) side of the filter regulator or regulator generates a sudden pressure increase.

NOTE The relief port is smaller than the diameter of the pipe and may not be able to adapt to the sudden rise in pressure of the OUT port (secondary) side.



For **FRZ3** and **RZ3**



For **FRZ4**, **RZ4**, **FRZ5**, and **RZ5**

●Reverse flow from the OUT port (secondary) side to the IN port (primary) side (residual pressure exhaust)

1. Select the filter regulator or regulator (such as models FRZ32 and RZ32) with built in check mechanism specifications to release residual pressure on the IN port (primary) side to reduce pressure on the OUT port (secondary) side of the direct operation type filter regulator and regulator (such as models FRZ3□ and RZ3□).

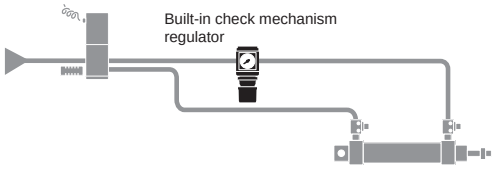
NOTE Residual pressure processing on the OUT port (secondary) side with the standard specifications and low-pressure specifications may not be possible depending on the operating conditions.

2. The internal pilot type filter regulators and regulators (such as models FRZ4□, FRZ5□, RZ4□, RZ5□) use the relief port on the OUT port (secondary) side to reduce residual pressure when the IN port (primary) side pressure is released.

3. When using a built-in check mechanism specification filter regulator or regulator (such as models FRZ32 or RZ32) installed after the valve to adjust the thrust of the actuator, set the pressure on the OUT port (secondary) side of the built-in check mechanism specification filter regulator or regulator not to rise above the set pressure, which may be caused by the back pressure of the actuator (As a guideline, the difference in pressure for the push side and the pull side of the actuator should be 43.5 psi or less.)

<Reference> Improving the system with a filter regulator or regulator with built-in check mechanism.

The filter regulator or regulator with built-in check mechanism releases pressure from the OUT port (secondary) side pressure to the IN port (primary) side as the main valve temporarily opens, because the pressure balance is disrupted when the built-in check valve is open as the IN port (primary) side pressure is lost. Due to easy change of the thrust of the pushing and pulling sides of the actuators, you can reduce air consumption by operating with low pressure on the side which does not need thrust.



●Water and fluids removal

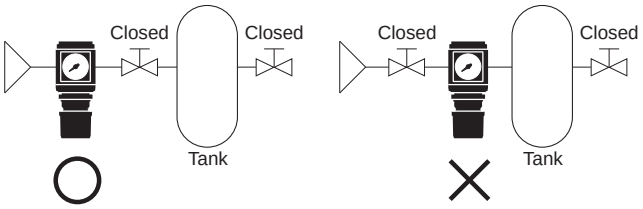
The filter regulator does not have a water and fluids removal function.

●Air consumption

1. The internal pilot type filter regulators and regulators (such as models FRZ4□, FRZ5□, RZ4□, RZ5□) consume air while regulating pressure on the OUT port (secondary) side.

2. Air consumption varies depending on the relationship of the IN port (primary) side pressure and the OUT port (secondary) side pressure.

3. The internal pilot type filter regulators and regulators (such as models FRZ4□, FRZ5□, RZ4□, RZ5□) reduce pressure by consuming air when the IN port (primary) side and OUT port (secondary) side are cut off and sealed.

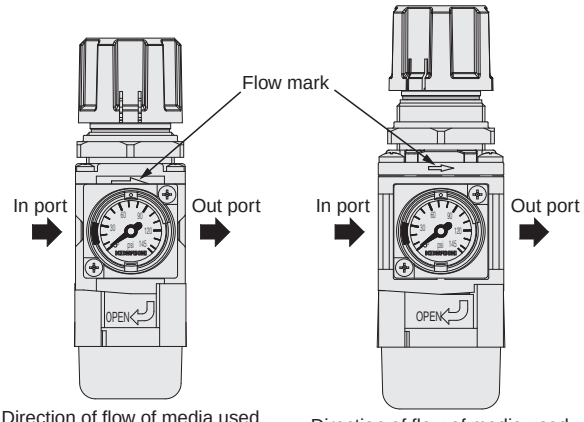


Pressure in tank decreases due to air consumption.

Mounting (installation) and piping

●Flow mark

The following diagram shows the relationship of the direction of flow of the media and the flow mark on the filter regulator or regulator.



Direction of flow of media used

For **FRZ3**□ and **RZ3**□

Direction of flow of media used

For **FRZ4**□, **FRZ5**□, **RZ4**□, and **RZ5**□

Filter regulator
Regulator

●Piping work

Connect pipes and fittings to the filter regulator and regulator IN ports and OUT ports so that the weight and torque of the pipes do not affect the product. When tightening the piping, grip the main unit and tighten it to the torque recommended on page 85.

NOTE Applying unnecessary force or impact to the knob, bowl assembly, or pressure gauge may damage component parts.

●Installing brackets

To install brackets, do it in the following order.

① Remove the knob.
(For how to remove the knob see "Removing the knob" on page 88.)
② Attach the bracket.
③ Screw on the mounting ring.

NOTE Tighten the mounting ring to less than 2.21 ft•lbf.

④ Attach the knob.
(For how to attach the knob see "Attaching the knob" on page 88.)

●Panel mount

1. All the mounting holes for the filter regulator and regulators for the panel mount installation are ϕ1.122 in.
2. See the following table for the thickness of panels.

in

Model	FRZ3□ RZ3□	FRZ4□ RZ4□	FRZ5□ RZ5□
Thickness	0.118 or less	0.276 or less	

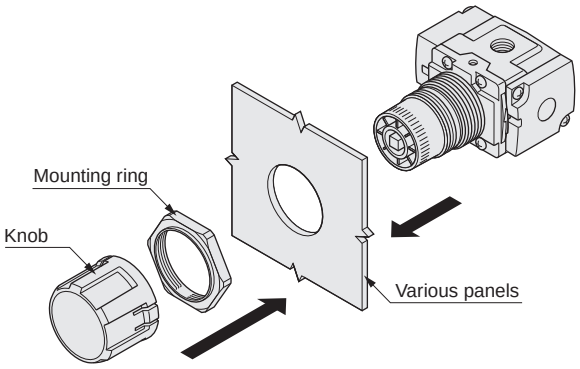
NOTE Using a panel that is thicker than specified may make it impossible to secure the mounting ring or decrease the visibility of the yellow caution ring.

3. Use the following procedure to install with a panel mount.

① Remove the knob.
(For how to remove the knob see "Removing the knob" on page 88.)
② Attach the filter regulator or regulator to the panel.
③ Screw on the mounting ring.

NOTE Tighten the mounting ring to less than 2.21 ft•lbf.

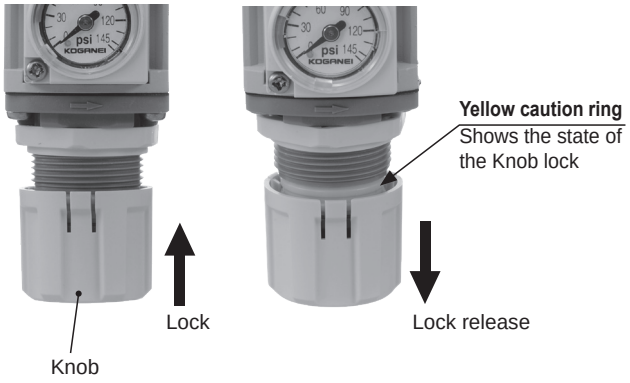
④ Attach the knob.
(For how to attach the knob see "Attaching the knob" on page 88.)



Operation and maintenance inspections

●Locking and releasing the knob

1. The Knobs on the filter regulators and regulators use a push lock mechanism.
Use the procedure shown below to lock and release the knob.



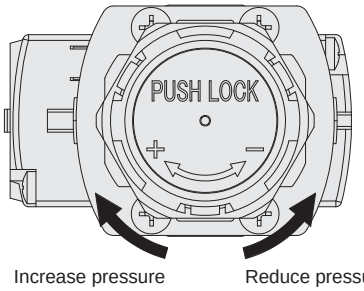
2. Always release the knob lock when regulating the pressure.

NOTE Turning the knob while it is locked may damage component parts.

3. Lock the knob after regulating the pressure.

●Pressure regulation

1. Pressure regulation is done as shown in the following diagram by turning the knob in the "+" direction to increase pressure and in the "–" direction, shown at the base of the knob, to reduce it.



2. Start at a low pressure and match it to the desired set pressure when regulating the pressure. If you exceed the desired pressure, lower the pressure again and start from a low pressure again to set the pressure.

NOTE Starting from a high pressure to set the desired pressure causes unstable pressure on the OUT port (secondary) side.

3. Use a pressure gauge to check the pressure on the IN port (primary) side and OUT port (secondary) side while regulating the pressure.
4. It is possible to increase the set pressure to exceed the upper limit of the pressure setting range by turning the knob to the upper limit of the "+" side, but keep the regulated pressure within the pressure setting range.

NOTE Turning the knob farther than necessary may damage component parts.

●Removing the knob

Use the following procedure to remove the knob.

① Release the knob lock.
(For how to release the knob lock see "Locking and releasing the knob lock" on page 87.)

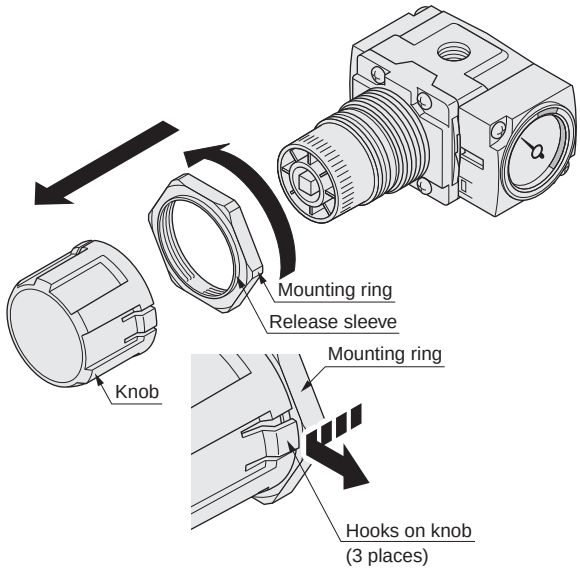
② Turn the mounting ring counterclockwise (in the direction of the arrow in the diagram below).

NOTE Turn the mounting ring until it comes off the threads.

③ Pull the mounting ring over in the direction of the knob.

NOTE The release sleeve of the mounting ring must be pulled up until it spreads the hooks (3 places) on the knob.

④ Pull off the knob and the mounting ring together.



●Attaching the knob

1. Use the following procedure to attach the knob.

① Release the pressure of the IN port (primary) side to the atmosphere.

② Screw on the mounting ring.

NOTE Installing the knob before screwing on the mounting ring makes it impossible to attach the mounting ring and makes the knob difficult to remove.

③ Press the knob in until the yellow caution ring is not visible.

NOTE Before pressing on the knob, align the square section of the adjusting assembly and the square indented portion of the base of the knob to make the knob easier to press on (on page 89).

2. Attaching the knob while the filter regulator or regulator IN ports (primary) side pressure is being supplied, may cause a temporary rise in pressure on the OUT port (secondary) side pressure.
Before attaching the knob, always release pressure on the IN port (primary) side to the atmosphere, because a temporary increase in pressure on the OUT port (secondary) side may occur which may damage equipment or devices on the OUT port (secondary) side or cause a malfunction.

NOTE It may damage the equipment or devices or injure workers or operators.

3. If it is impossible to release the pressure on the IN port (primary) side to the atmosphere, the pressure on the OUT port (secondary) side will rise temporarily, check for any effect it may have had on equipment and devices that are installed after the filter regulator or regulators, and then attach the knob.

●Changing the □1.181 in. integrated pressure gauge and pressure port plate

Use the following procedure to rotate the □1.181 in. integrated pressure gauge 180°, and to change the □1.181 in. integrated pressure gauge or pressure port plate.

① Remove the two small screws.

② Remove any metal chips from the female thread hole with an air blower.

NOTE If there are any metal chips left, they may break the threads or get on the o-ring and cause an air leak.

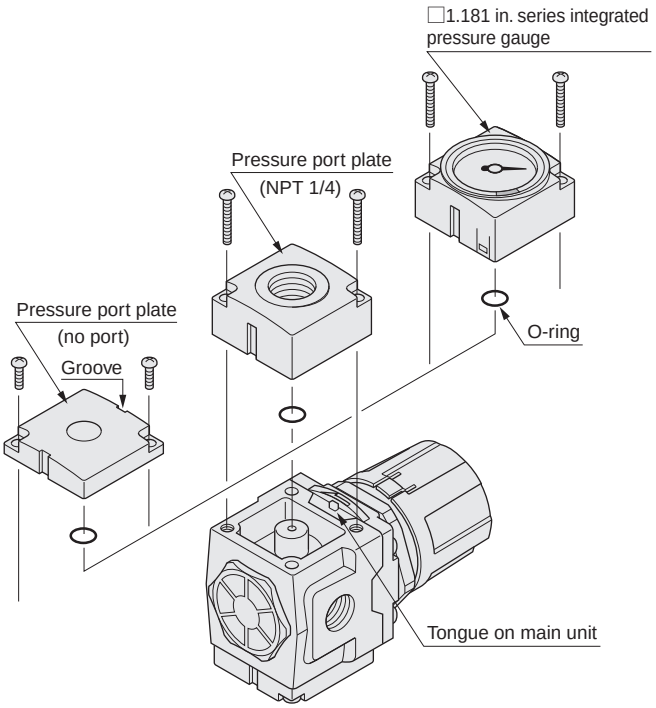
③ Put the o-ring on the □1.181 in. integrated pressure gauge or pressure port plate.

NOTE Not using an o-ring will result in air leaks.

④ Align the groove on the □1.181 in. integrated pressure gauge or pressure port plate with the tongue on the main unit and attach it.

⑤ Tighten the two mounting screws to 0.66 to 0.81 ft•lbf

NOTE If torque exceeding the specifications is applied, the head of the screw or threads may be damaged and cause damage to component parts. Also, if torque below the specifications is used, the screw may come loose and cause an air leak.



Filter regulator
Regulator

●Installing provided options

1. When installing the various types of pressure gauges, always apply the wrench on the square or hexagonal part of the piping connections.

NOTE Gripping the body of the various pressure gauges to tighten them may damage component parts.

2. Use a tightening torque of 2.21 to 3.69 ft•lbf if the various pressure gauges are mounted on the NPT1/4 port plate provided.

NOTE If torque exceeding the specifications is applied, it may damage component parts. Also, if torque below the specifications is used, the screw may come loose and cause an air leak.

3. There is a stopper on the NPT1/4 female thread of the NPT1/4 pressure port plate.

NOTE Further tightening after the stopper has been reached may damage component parts.

●Replacing the pressure port plate, knob, and mounting ring

1. When replacing the pressure port plate, refer to "Replacing the □1.181 in. integrated pressure gauge and pressure port plate" on page 88.

2. When replacing the knob and mounting ring, refer to "Removing the knob" and "Attaching the knob" on page 88.

●Replacing the seal kit, element, and bowl assembly

1. To replace the seal kit, element, and bowl assembly, remove the filter regulator or regulator and do the work on a work table.

2. The o-rings and other sealing materials (except for the diaphragm) of the filter regulator and regulator are coated with grease.

3. Contact your nearest Koganei sales office or overseas department if you are considering re-coating the o-rings and other parts.
Recommended grease: Lithium Soap based No. 2 or equivalent

4. Periodically replace the element in the filter regulator.

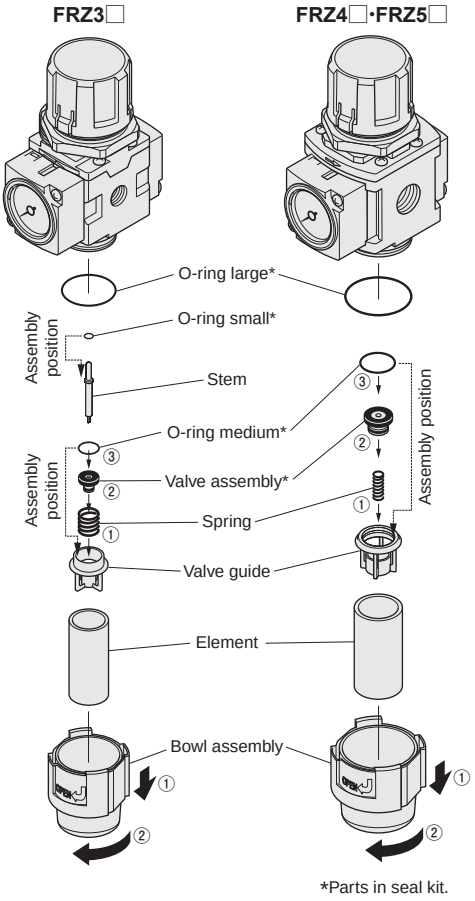
NOTE The service life of the element varies depending on the quality of air supplied to the IN port (primary) side. If there is a lot of foreign matter in the air supply to the IN port (primary) side, install a pre-filter on the IN port (primary) side or change the element more often. As a guideline, change the element after a year of use.

5. When replacing the seal kit, element, and bowl assembly, be careful not to lose component parts.

6. Refer to the diagram at right when replacing the seal kit, element, and bowl assembly.

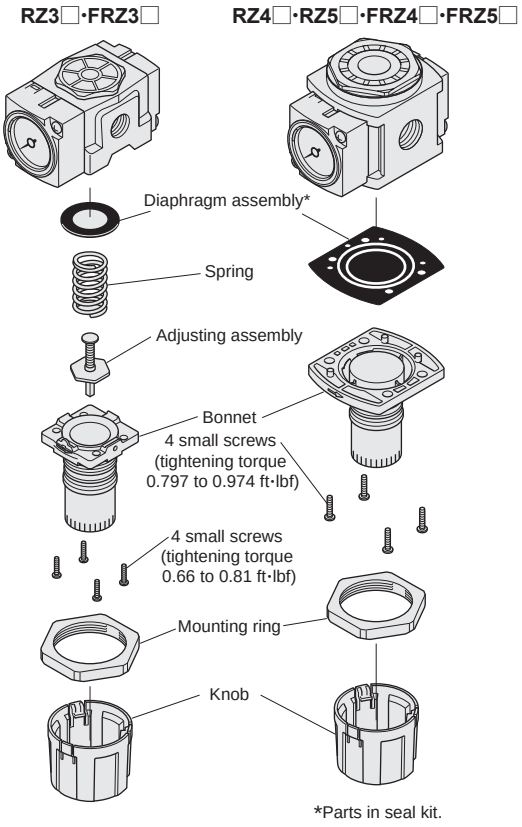
NOTE Always assemble the component parts correctly.

Filter regulator bowl side



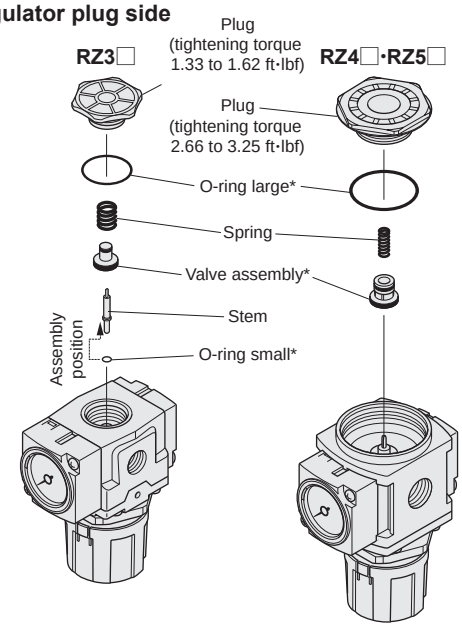
NOTE The product is no longer under warranty if it is disassembled or reassembled.

Regulator and filter regulator knob side



NOTE The product is no longer under warranty if it is disassembled or reassembled.

Regulator plug side



*Parts in seal kit.

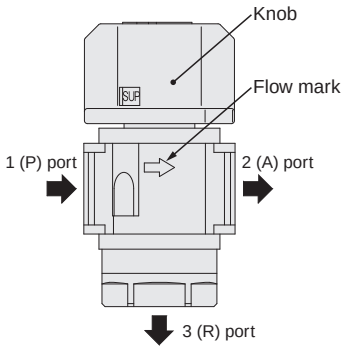
The product is no longer under warranty if it is disassembled or reassembled.

Residual pressure exhaust valve

Mounting (installation) and piping

●Flow mark

The following diagram shows the relationship of the direction of flow of the media and the flow mark on the residual pressure exhaust valve.



●Piping work

1. Connect pipes and fittings to the residual pressure exhaust valve 1 (P) port and 2 (A) port so that the weight and torque of the pipes do not affect the product. When tightening the piping, grip the main unit and tighten it to the torque recommended on page 85.

Applying unnecessary force or impact to the knob may damage component parts.

2. If a muffler or something is attached to the 3 (R) port of the residual exhaust valve, tighten it to 1.33 to 1.62 ft•lbf.

The muffler must be prepared by the user.

If torque exceeding the specifications is applied, it may damage component parts. Also, if torque below the specifications is used, the screw may come loose.

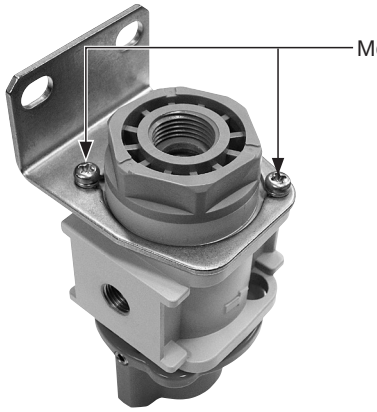
●Installing brackets

To install brackets, do it in the following order.

① Attach the bracket.

② Tighten the two mounting screws to 0.915 to 1.11 ft•lbf.

If torque exceeding the specifications is applied, the head of the screw or threads may be damaged and cause damage to component parts. Also, if torque below the specifications is used, the screw may come loose and cause an air leak.



Operation and maintenance inspections

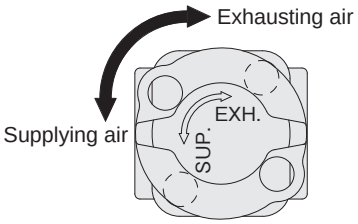
●State of air supply and exhaust

1. State of air supply is that air flows through from 1 (P) port (primary) side to 2 (A) port (secondary) side and is shut off at the 3 (R) port.

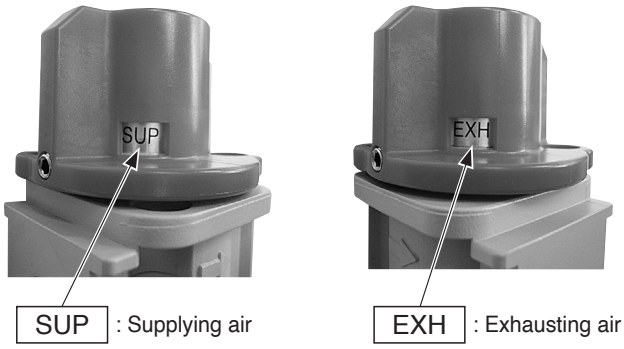
2. State of air exhaust is that air flows through from 2 (A) port (secondary) side to 3 (R) port and is shut off at 1 (P) port (primary) side.

●Switching the state of air supply and exhaust

1. To switch the air flow from supply to exhaust and vice versa, turn the knob 90° to "SUP", which is shown near the bottom of the knob, to supply air, or turn the knob 90° to "EXH" to exhaust air.



2. Check the window shown in the diagram below to see the state of the residual pressure exhaust valve. If "SUP" is showing, air is being supplied. If "EXH" is showing, air is being exhausted.



3. Turn the knob slowly to gradually supply or exhaust air.

NOTE 1(P) port (primary) side air cannot flow to 2 (A) port (secondary) side and 3 (R) port at the same time.

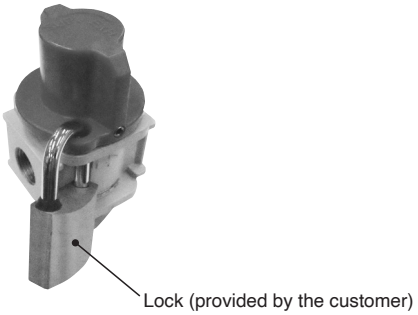
●Using the lock hole

1. The lock hole on the residual pressure exhaust valve is used to secure the air flow in a state of exhaust and to prevent changes to the state of the air supply.

NOTE Air cannot be supplied while the look hole is used.

2. The diameter of the lock hole is ϕ0.394 in.

3. A lock must be supplied separately.



Module adapter

Mounting (installation) and piping

●Mounting (installation)

1. Use the various modules and adapters when combining the relevant FRZ series models and the relevant iB-Cyclone* models.
*See the back of the catalog.

2. Refer to "List of models" on page 101 regarding combinations of the relevant models, modules, and adapters.

NOTE The FRZ3□, RZ3□, and IBCY30 cannot be used together.

3. When assembling the products, check the flow marks on the products and assemble them so the media flows in the same direction. See the "Handling Instructions and Precautions" for each product regarding the relationship of the flow marks and direction of flow of the medium being used (filter regulators, regulators on page 86 and residual pressure exhaust valves on page 90.

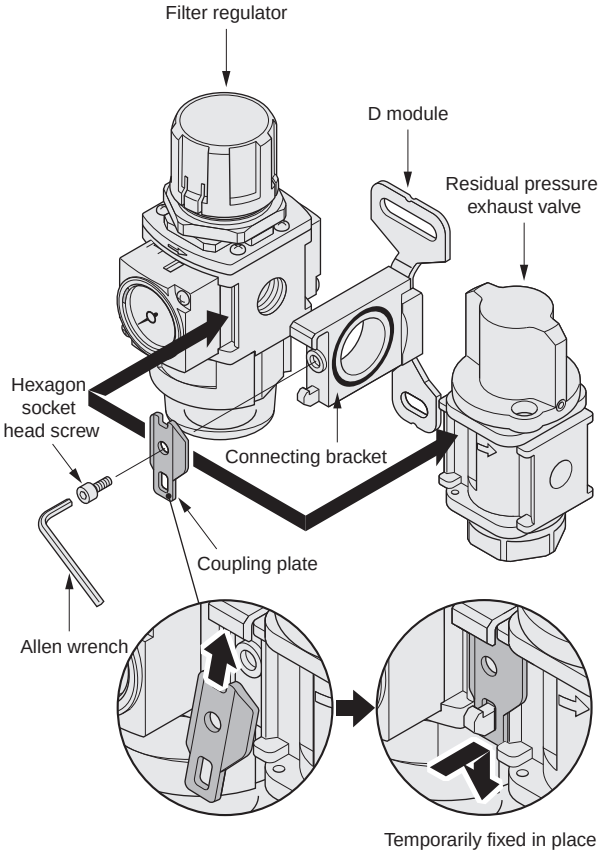
4. Use the following procedure to assemble the products using the modules and adapters.
① Attach the o-rings to the connecting bracket (2 places)

NOTE Not using an o-ring will result in air leaks.

② Temporarily fix the products to the coupling plate.
③ Tighten a hexagon socket head screw to 0.66 to 0.81 ft•lbf.

NOTE If torque exceeding the specifications is applied, it may damage component parts. Also, if torque below the specifications is used, the screw may come loose.

<Example assembly>



Pressure switch module

Mounting (installation) piping

●Mounting (installation)

1. The method to install the pressure switch modules is the same for the various modules and adapters. Refer to the "Handling Instructions and Precautions" for the modules and adapters.

2. Do not pull too hard on the wires or bend them too much. Also, when handling the products, carry them by the pressure switch side and do not apply too much force to the wires.

3. Be careful when handling the pressure switch modules, subjecting them to strong impact may cause damage or malfunction.

●Contact capacity

Use the specified load voltage and load current.

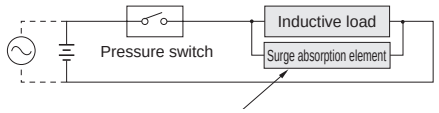
NOTE Using a load voltage or a load current that is outside the specifications may cause the contacts to fuse.

●Contact protection measure

The pressure switch module uses a reed sensor switch. Take the contact protection measures shown in the diagram below.

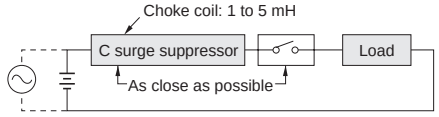
NOTE Contacts may fuse if measures to protect the contacts are not taken.

For connecting an inductive load (electromagnetic relay etc)



For DC ... Diode or CR, etc.
For AC ... CR etc.
Diode: Forward current should be more than the circuit current and the reverse current should be 10 times greater or more than the circuit voltage.
CR: C=0.01 to 0.1µF
R=1 to 4 kΩ

If a capacitive surge occurs (if wire length is 32.8 ft)



Medium and operating environment

●Operating environment

The pressure switch module uses a magnetically sensitive sensor switch.
Avoid large electric currents, such as locations where there is a strong magnetic field or near power lines.

NOTE Use in locations with strong external magnetic fields or near strong electric currents may cause the pressure switch module to malfunction.

Operation and maintenance inspections

●Detection pressure scale

1. Use a detection pressure scale as a guideline.

NOTE Use a multi meter to confirm the output of the pressure switch module.

NOTE To accurately set the detected pressure, use a separate pressure gauge.

2. Detection pressure scale is for the set value when the supplied pressure falls.

3. Detection pressure scale is for the set value when the OFF signal is detected.

NOTE The ON signal is detected when the pressure exceeds the set pressure on the detection pressure scale by the response differential.

●Settings for the detection pressure

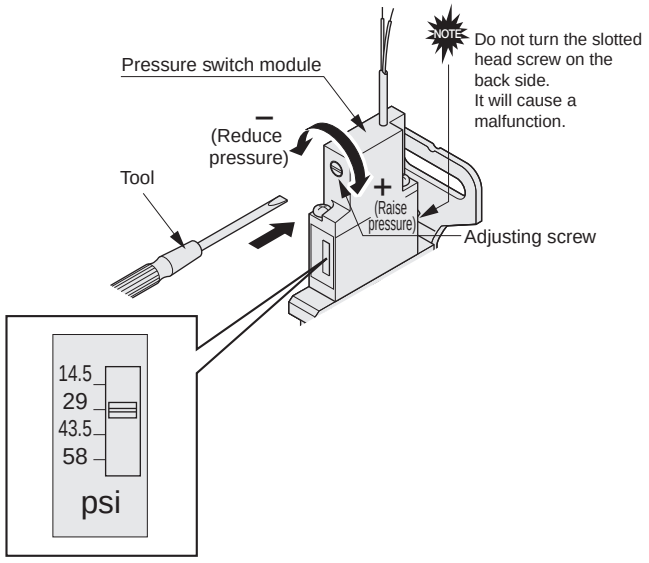
1. The detection pressure can be set to a value over the range of detection pressure, but always set it within the specified values.

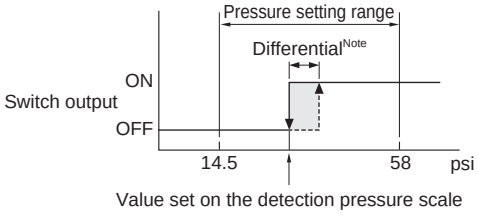
NOTE Setting the pressure over the range of the detection pressure will damage component parts.

2. Use the following procedure to set the detection pressure.

① Turn the adjusting screw toward the "+" until the regulating indicator is aligned with the desired detection pressure on the scale.

② Supply pressure and use a multi meter to confirm that the signal indicates the desired pressure setting is detected.





Value set on the detection pressure scale

Note: Response differential is less than 12 psi

□1.181 in. series integrated pressure gauge

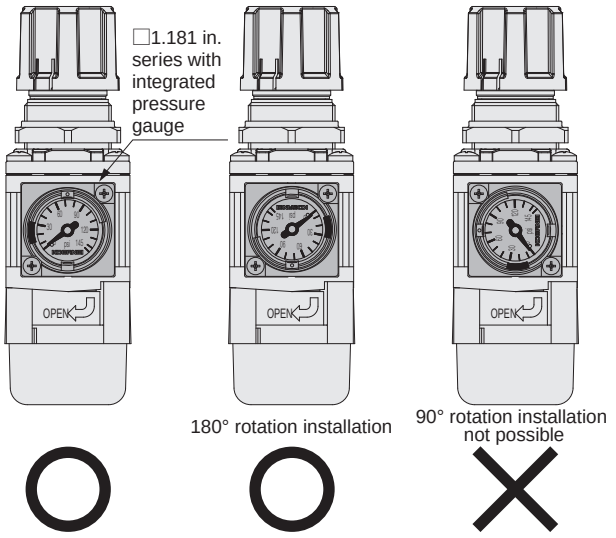
Mounting (installation) and piping

●Mounting (installation)

1. Read the "Handling Instructions and Precautions" for the filter regulator and regulator when installing the □1.181 in. integrated pressure gauge to the filter regulator or the regulator.

2. Install the □1.181 in. integrated pressure gauge to the filter regulator or regulator in the orientation shown in the diagram below.

NOTE It is possible to change the □1.181 in. integrated pressure gauge installation to a 180° orientation, but it is not possible to change it to a 90° orientation.



Medium and operating environment

●Surging, vibration, and shock

The □1.181 in. integrated pressure gauge is a precision device. It cannot be used if the medium surges, or external vibration or shock is applied.

NOTE Surges in the media, external vibrations or shocks may result in damage to component parts.

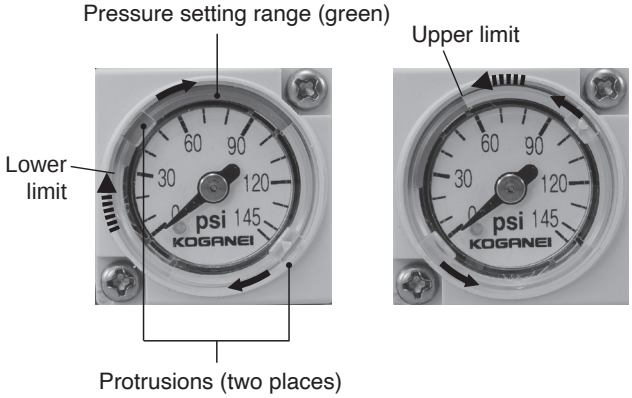
Operation and maintenance inspections

●Adjusting the range of the set pressure

1. Use the procedure below to adjust the range of the set pressure (the green portion).

1. Adjust the lower limit of the range of the set pressure by rotating the protrusions (2 places) clockwise with your hand.
2. Adjust the upper limit of the range of the set pressure by rotating the protrusions (2 places) clockwise with your hand.

NOTE Adjusting the range of the set pressure with a tool may damage component parts.



●About the chemical resistance of polycarbonate

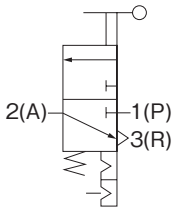
The chemicals in the following table degrade polycarbonate. Because of this, they may damage the bowl of the filter regulator or the front cover of the pressure gauge and cause an accident. The products cannot be used in locations where the chemicals in the following table are present in the compressed air, ambient air, or on surfaces. This does not mean that polycarbonate is chemically resistant to all chemicals not listed below.

Type	Classification	Chemical name	Application example
Inorganic compound	Acid	Chlorine, sulfuric acid, nitric acid, fluorine, phosphoric acid, chromic acid	Acid cleaning for metals, acid degreasing, and coating processing
	Alkali	Caustic soda, caustic potash, hydrated lime, ammonia water, 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, ethyl benzene, styrene	Paint thinner (Benzene, toluene, xylene)
	Chlorinated aliphatic hydrocarbons	Methyl chloride, ethylene chloride, methylene chloride, acetylene dichloride, 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, methyl ethyl 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 medium (phthalic acid)
	Phthalic acid ester	Dimethyl phthalate (DMP), diethyl phthalate (DEP), dibutyl phthalate (DBP), dioctyl phthalate (DOP)	Lubricants, synthetic hydraulic fluids, corrosion resistant additives, synthetic resin plasticizer
	Oxyacid	Glycolic acid, lactic acid, malic acid, citric acid, tartaric acid	Food preservatives, acidulant
	Nitro compounds	Nitromethane, nitroethane, nitroethylene, nitrobenzene	Paint solvent, explosives
	Aminos	Methylamine, dioctylamine, ethylamine, aniline, acetanilide	Brake fluid additive
	Nitrile	Acetonitrile, acrylonitrile, benzonitrile	Nitrile rubber materials

Residual pressure exhaust valve

50VZ-F11

Symbol



Specifications

Item \ Model				50VZ-F11-01	50VZ-F11-02	50VZ-F11-03	50VZ-F11-04
Media				Air			
Port size NPT	1 (P) and 2 (A)			1/8	1/4	3/8	1/2
	3 (R)			3/8			
Maximum operating pressure			psi	145			
Proof pressure			psi	218			
Operating temperature range (atmosphere and media)			°F	41 to 140			
Method of operation				Manually operated Knob			
Number of positions and ports				2 positions and 3 ports			
Operating torque of knob			ft•lbf	0.74			
Knob operation angle				90°			
Flow rate characteristics	1 (P) → 2 (A)	Sonic conductance C	$dm^3/(s \cdot bar)$	4.28	8.60	12.46	13.36
		Critical pressure ratio	b	0.23	0.38	0.21	0.31
		Effective area [Cv][Note]		1.19	2.39	3.46	3.71
	2 (A) →3 (R)	Sonic conductance C	$dm^3/(s \cdot bar)$	7.87	11.00		
		Critical pressure ratio	b	0.89	0.32		
		Effective area [Cv][Note]		2.19	3.06		
Materials of major parts	Body			Die cast aluminum alloy			
	Knob			Polyacetal			
Mass			lb	0.49	0.49	0.46	0.44
Options				Bracket {Steel plate (electroless nickel plated)}			

Note: The effective areas are calculated values, and they are not measured values.
Remark 1: Specified values are according to Koganei test standards.
2: The muffler must be provided by the user.

Order codes

50 VZ – **F11** – □ – □

NPT thread specifications

Bracket
Blank — No bracket
B — With bracket

Port size

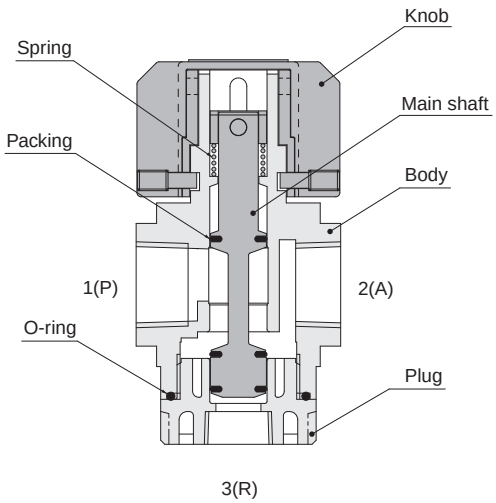
1/8	1/4	3/8	1/2
01	**02**	**03**	**04**

Residual pressure exhaust valve

●Order codes for bracket only

8Z-BV

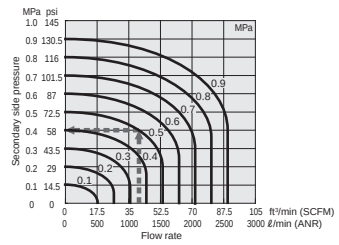
Inner construction



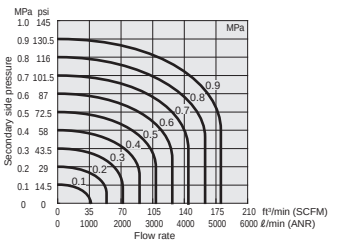
Flow rate characteristics

●Air supply flow rate

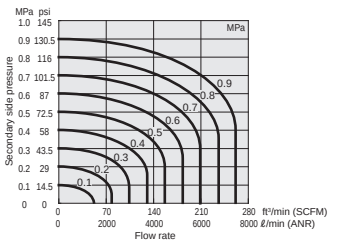
50VZ-F11-01



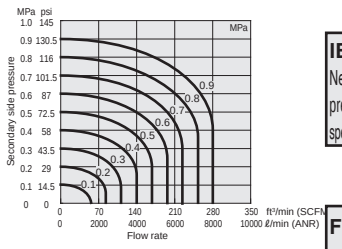
50VZ-F11-02



50VZ-F11-03



50VZ-F11-04



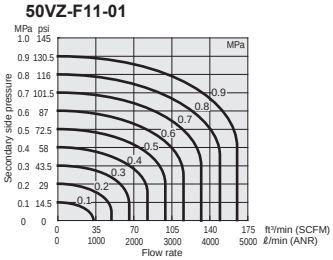
Explanation of diagrams

At supply pressure of 73 psi and flow rate of 40.6 ft³/min (SCFM) gives valve outlet pressure of 58 psi.

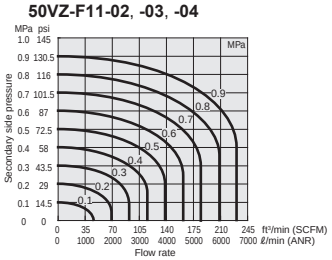
1 MPa = 145 psi
1 ℓ/min = 0.0353 ft³/min

●Exhaust flow rate

50VZ-F11-01



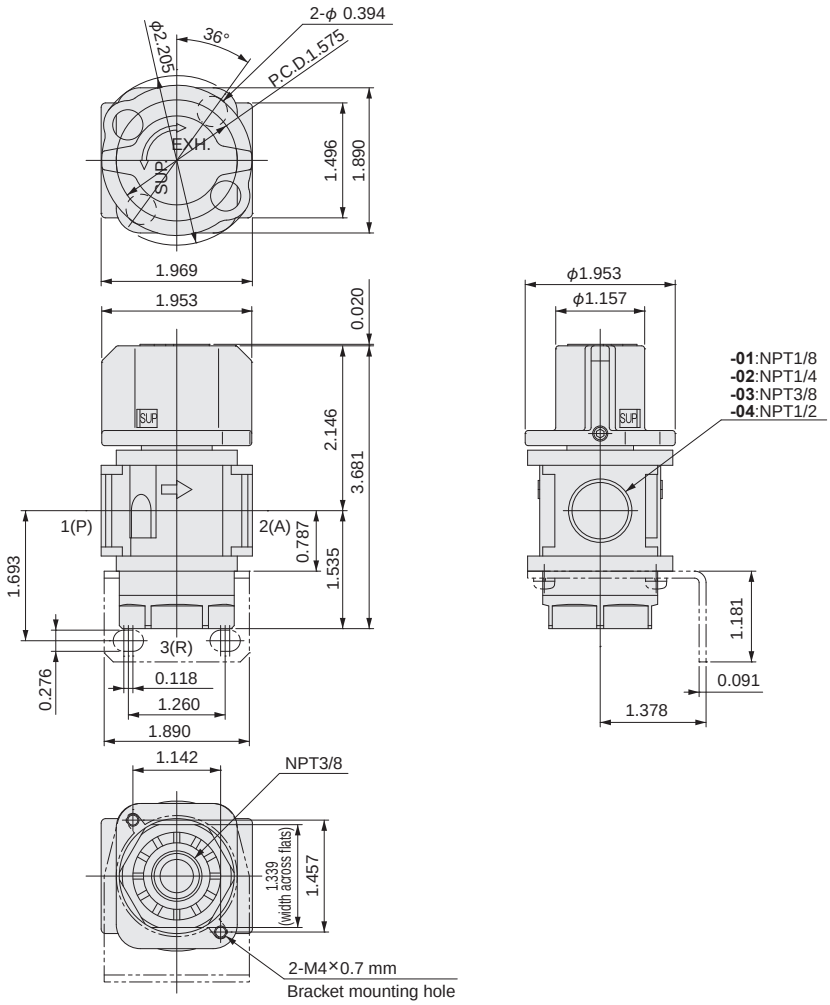
50VZ-F11-02, -03, -04

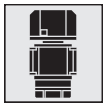


1 MPa = 145 psi
1 ℓ/min = 0.0353 ft³/min

Residual pressure exhaust valve dimensions in.

●50VZ-F11



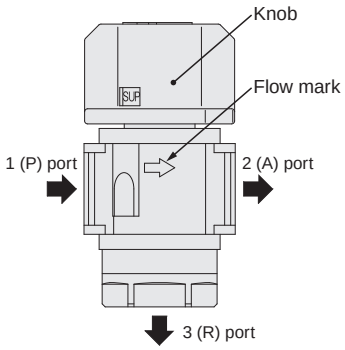


Residual pressure exhaust valve

Mounting (installation) and piping

●Flow mark

The following diagram shows the relationship of the direction of flow of the media and the flow mark on the residual pressure exhaust valve.



●Piping work

1. Connect pipes and fittings to the residual pressure exhaust valve 1 (P) port and 2 (A) port so that the weight and torque of the pipes do not affect the product. When tightening the piping, grip the main unit and tighten it to the torque recommended on page 85.

NOTE Applying unnecessary force or impact to the knob may damage component parts.

2. If a muffler or something is attached to the 3 (R) port of the residual exhaust valve, tighten it to 1.33 to 1.62 ft•lbf.

Note The muffler must be prepared by the user.

NOTE If torque exceeding the specifications is applied, it may damage component parts. Also, if torque below the specifications is used, the screw may come loose.

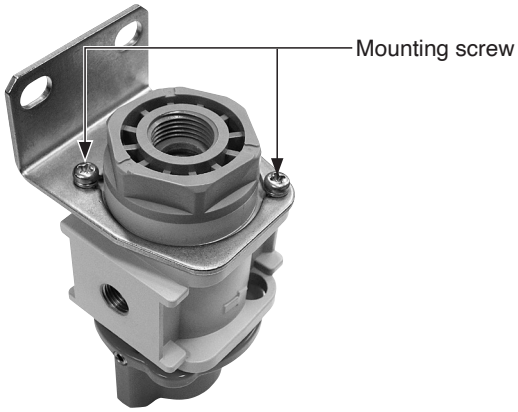
●Installing brackets

To install brackets, do it in the following order.

① Attach the bracket.

② Tighten the two mounting screws to 0.915 to 1.11 ft•lbf.

NOTE If torque exceeding the specifications is applied, the head of the screw or threads may be damaged and cause damage to component parts. Also, if torque below the specifications is used, the screw may come loose and cause an air leak.



Operation and maintenance inspections

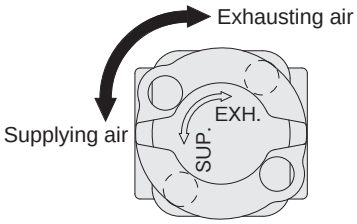
●State of air supply and exhaust

1. State of air supply is that air flows through from 1 (P) port (primary) side to 2 (A) port (secondary) side and is shut off at the 3 (R) port.

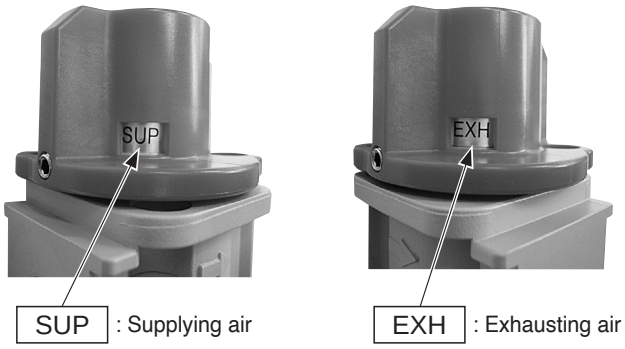
2. State of air exhaust is that air flows through from 2 (A) port (secondary) side to 3 (R) port and is shut off at 1 (P) port (primary) side.

●Switching the state of air supply and exhaust

1. To switch the air flow from supply to exhaust and vice versa, turn the knob 90° to "SUP", which is shown near the bottom of the knob, to supply air, or turn the knob 90° to "EXH" to exhaust air.



2. Check the window shown in the diagram below to see the state of the residual pressure exhaust valve. If "SUP" is showing, air is being supplied. If "EXH" is showing, air is being exhausted.



3. Turn the knob slowly to gradually supply or exhaust air.

NOTE 1(P) port (primary) side air cannot flow to 2 (A) port (secondary) side and 3 (R) port at the same time.

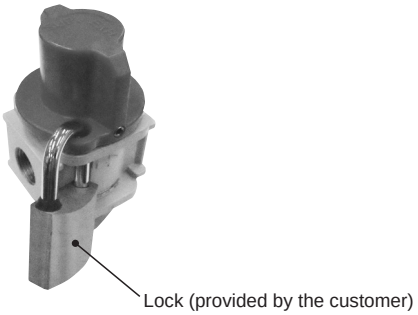
●Using the lock hole

1. The lock hole on the residual pressure exhaust valve is used to secure the air flow in a state of exhaust and to prevent changes to the state of the air supply.

NOTE Air cannot be supplied while the look hole is used.

2. The diameter of the lock hole is ϕ0.394 in.

3. A lock must be supplied separately.



Pressure switch module

Symbol

Specifications

Item		Model	8Z-PS□-F11	8Z-DPS□-F11
Media			Air	
Connection method			Specifically for FRZ series module installation	
Maximum operating pressure		psi	145	
Proof pressure		psi	218	
Operating temperature range (atmosphere and media)		°F	41 to 140 (non-condensation)	
Pressure setting range		psi	15 to 58	
Response differential		psi	12 or less	
Contact type			Reed contact of "a" contact (NO)	
Electrical Specifications	Wiring type		2 wire type	
	Load voltage		5 to 28 VDC, 85 to 115 VAC	
	Load current		DC 40 mA MAX., AC 20 mA MAX.	
	Internal voltage drop[Note 1]		0.1 V MAX (at load current of DC 40 mA)	
	Leakage current		0 mA	
	Response time		1 ms MAX	
	Insulation resistance		100 MΩ MIN. (500 VDC Megger, between case and lead wire terminal)	
	Dielectric strength		1500 VAC (50/60 Hz) in 1 minute (between case and lead wire terminal)	
	Shock resistance [Note 2]	G	30 (non-repeated)	
	Vibration resistance[Note 2]		9G (total amplitude 0.059 in 10 to 55 Hz) resonance frequency 2750 ±250 Hz	
	Lead wires[Note 3]		PCCV 0.2 SQ×2-wire (brown and blue)× ℓ	
	Contact protection measure[Note 4]		Required	
Mass		oz	2.12 (for wire length A: 39 in)	3.00 (for wire length A: 39 in)

Note 1: Internal voltage drop changes with the load current.
2: According to Koganei test standards.
3: Lead wire length ℓ: A; 39 in, B; 118 in
4: Refer to page 100 regarding contact protection measures.

Note: Pressure switch modules cannot be assembled with the filter regulator FRZ3□-F11 and the regulator RZ3□-F11.

Order codes

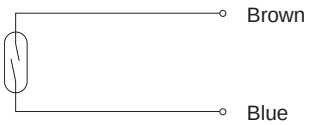
8Z – □ □ – F11

NPT thread specifications

Lead wire length
A —— 39 in
B —— 118 in

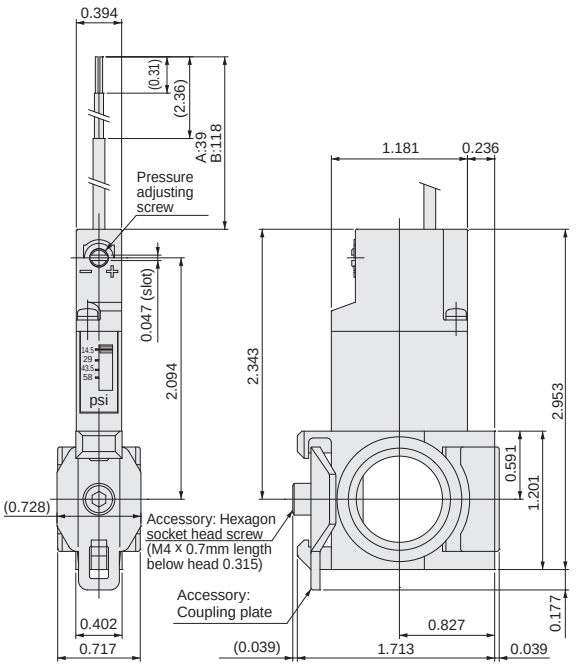
Module
PS —— Pressure switch module
DPS —— Pressure switch module (with bracket)

Internal circuit



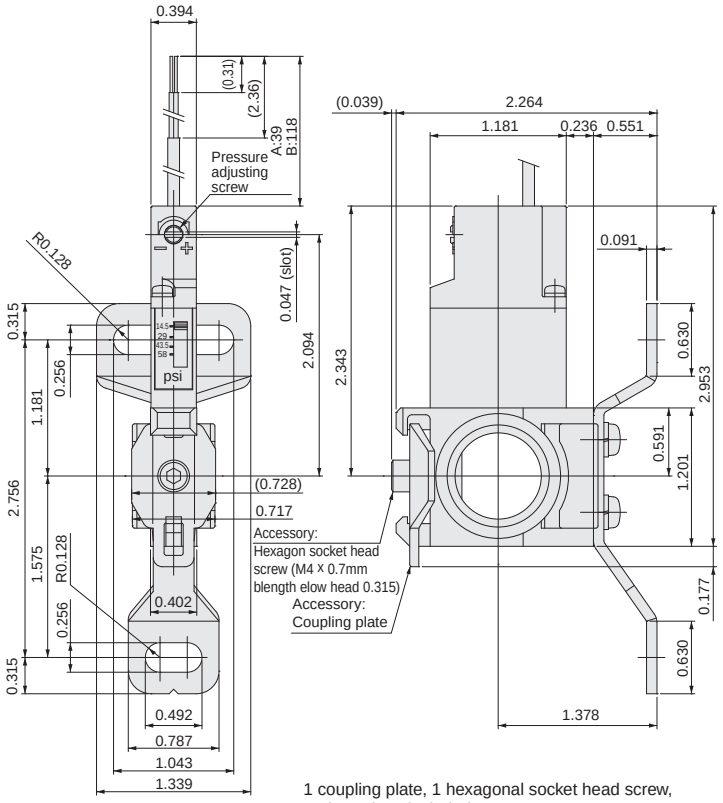
Pressure switch module dimensions in.

●8Z-PS□-F11



L coupling plate, 1 hexagonal socket head screw, and 2 o-rings included

●8Z-DPS□-F11



1 coupling plate, 1 hexagonal socket head screw, and 2 o-rings included

Pressure switch module

Mounting (installation) piping

●Mounting (installation)

1. The method to install the pressure switch modules is the same for the various modules and adapters. Refer to the "Handling Instructions and Precautions" for the modules and adapters.
2. Do not pull too hard on the wires or bend them too much. Also, when handling the products, carry them by the pressure switch side and do not apply too much force to the wires.
3. Be careful when handling the pressure switch modules, subjecting them to strong impact may cause damage or malfunction.

●Contact capacity

Use the specified load voltage and load current.

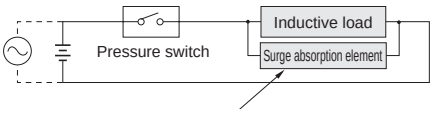
NOTE Using a load voltage or a load current that is outside the specifications may cause the contacts to fuse.

●Contact protection measure

The pressure switch module uses a reed sensor switch. Take the contact protection measures shown in the diagram below.

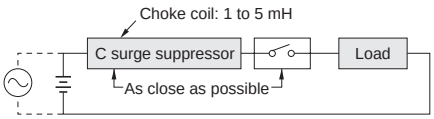
NOTE Contacts may fuse if measures to protect the contacts are not taken.

For connecting an inductive load (electromagnetic relay etc)



For DC ... Diode or CR, etc.
For AC ... CR etc.
Diode: Forward current should be more than the circuit current and the reverse current should be 10 times greater or more than the circuit voltage.
CR: C=0.01 to 0.1μF
R=1 to 4 kΩ

If a capacitive surge occurs (if wire length is 32.8 ft)



Medium and operating environment

●Operating environment

The pressure switch module uses a magnetically sensitive sensor switch.
Avoid large electric currents, such as locations where there is a strong magnetic field or near power lines.

NOTE Use in locations with strong external magnetic fields or near strong electric currents may cause the pressure switch module to malfunction.

Operation and maintenance inspections

●Detection pressure scale

1. Use a detection pressure scale as a guideline.

NOTE Use a multi meter to confirm the output of the pressure switch module.

NOTE To accurately set the detected pressure, use a separate pressure gauge.

2. Detection pressure scale is for the set value when the supplied pressure falls.
3. Detection pressure scale is for the set value when the OFF signal is detected.

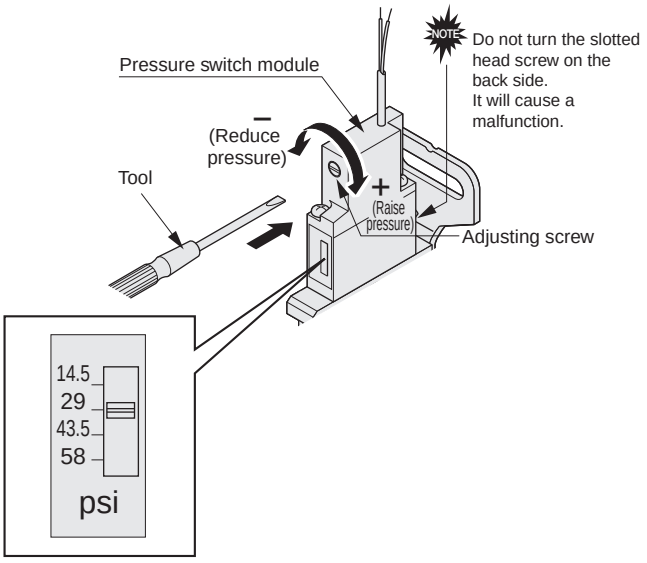
NOTE The ON signal is detected when the pressure exceeds the set pressure on the detection pressure scale by the response differential.

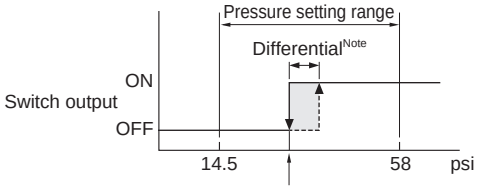
●Settings for the detection pressure

1. The detection pressure can be set to a value over the range of detection pressure, but always set it within the specified values.

NOTE Setting the pressure over the range of the detection pressure will damage component parts.

2. Use the following procedure to set the detection pressure.
① Turn the adjusting screw toward the "+" until the regulating indicator is aligned with the desired detection pressure on the scale.
② Supply pressure and use a multi meter to confirm that the signal indicates the desired pressure setting is detected.

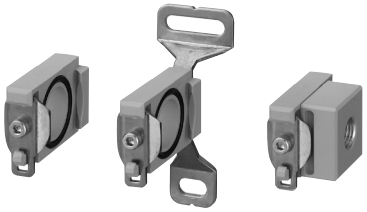


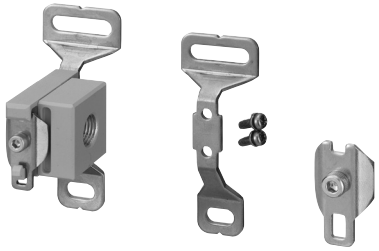


Value set on the detection pressure scale

Note: Response differential is less than 12 psi

Module adapter





Order codes

8Z – □

Module adapter

- **F** ——— F module (for connecting)[Note]
- **D** ——— D module (for connecting, with bracket)[Note]
- **DP** ——— Module bracket[Note]
- **FP** ——— Coupling plate[Note]

8Z – □ □ – **F11**

Port size[Note]

NPT1/8	NPT1/4	NPT3/8	NPT1/2
1	**2**	**3**	**4**

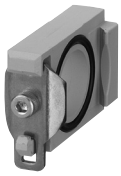
Module adapter

- **T** ——— T module (for branching)
- **DT** ——— DT module (for branching, with bracket)
- **S** ——— S adapter (for changing pipe size)
- **DS** ——— DS adapter (for changing pipe size, with bracket)

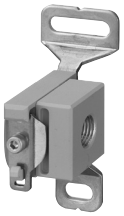
Note: The port size cannot be selected for the F module (F), D module (D), module bracket (DP), and coupling plate (FP).

Note: Modules and adapters cannot be assembled with the filter regulator FRZ3□-F11 and the regulator RZ3□-F11.

List of models

F module (for connecting)	D module (For connecting with bracket)
8Z-F 	**8Z-D** 

●Compatible models
Filter regulators: **FRZ40-F11**, **FRZ41-F11**, **FRZ50-F11**, **FRZ51-F11**
Regulators: **RZ40-F11**, **RZ41-F11**, **RZ50-F11**, **RZ51-F11**
Residual pressure exhaust valve: **50VZ-F11**
iB-Cyclone: **IBCY40-F11**, **IBCY50-F11**

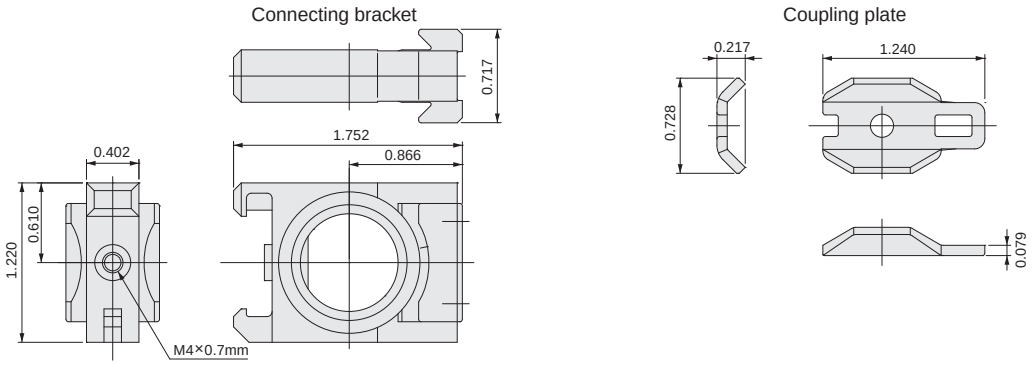
S adapter (for changing pipe size)	DS adapter (for changing pipe size, with bracket)	Module bracket	Coupling plate
8Z-S□-F11 	**8Z-DS□-F11** 	**8Z-DP** 	**8Z-FP** 

●Compatible models
Filter regulators: **FRZ40-F11**, **FRZ41-F11**, **FRZ50-F11**, **FRZ51-F11**
Regulators: **RZ40-F11**, **RZ41-F11**, **RZ50-F11**, **RZ51-F11**
Residual pressure exhaust valve: **50VZ-F11**
iB-Cyclone: **IBCY40-F11**, **IBCY50-F11**

[Materials of major parts] Connecting bracket, intermediate branch block, piping adapter: die cast aluminum alloy
Module bracket, coupling plate: Steel plate (electroless nickel plated)

F module dimensions in.

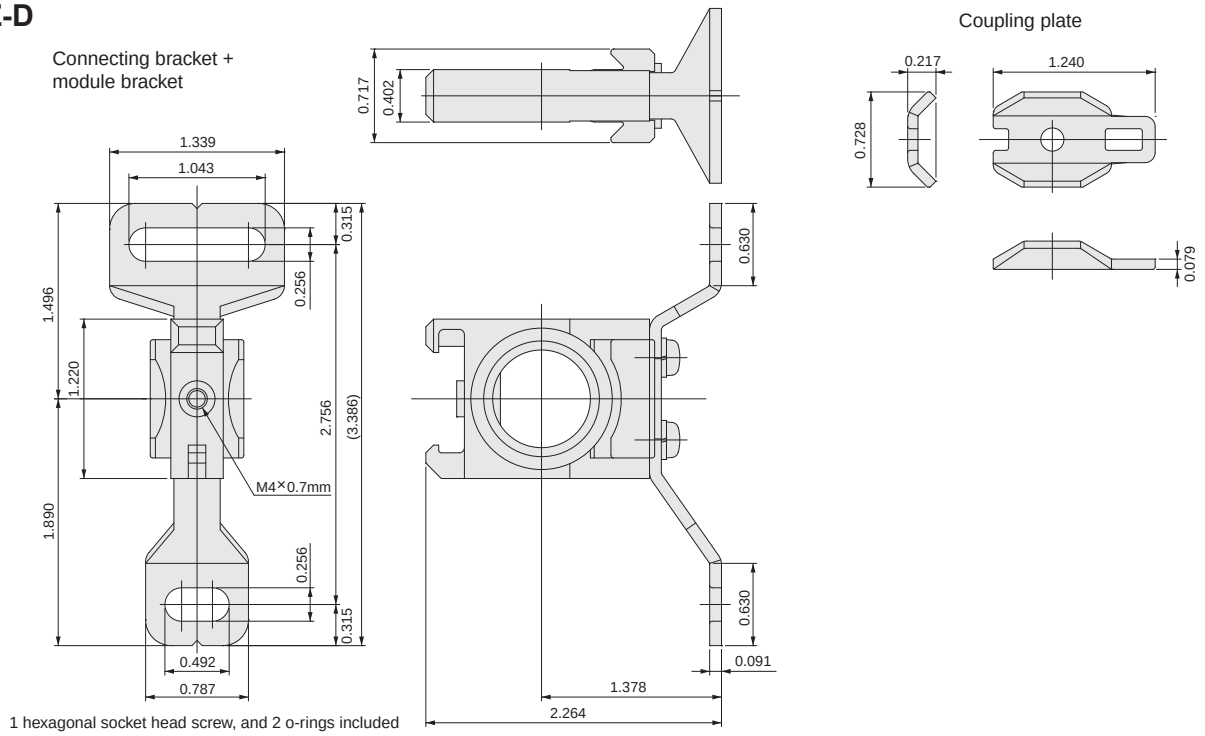
●8Z-F



1 hexagonal socket head screw, and 2 o-rings included

D module dimensions in.

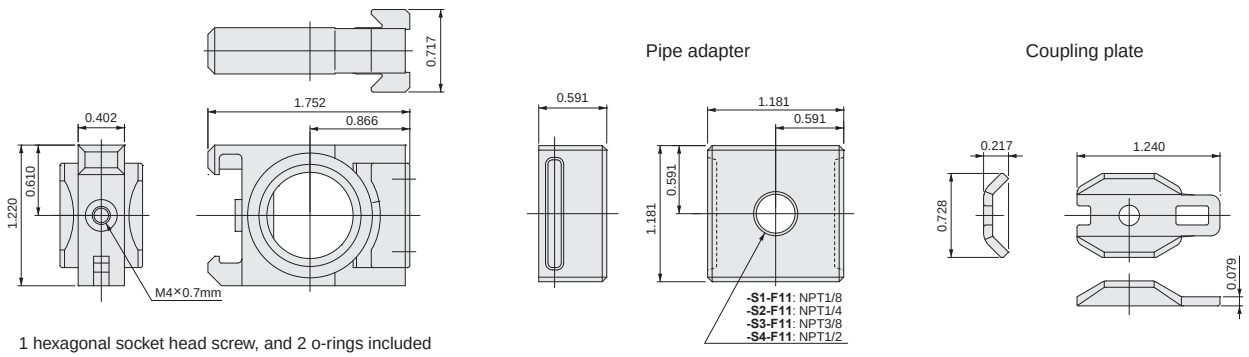
●8Z-D



1 hexagonal socket head screw, and 2 o-rings included

S adapter dimensions in.

●8Z-S□-F11

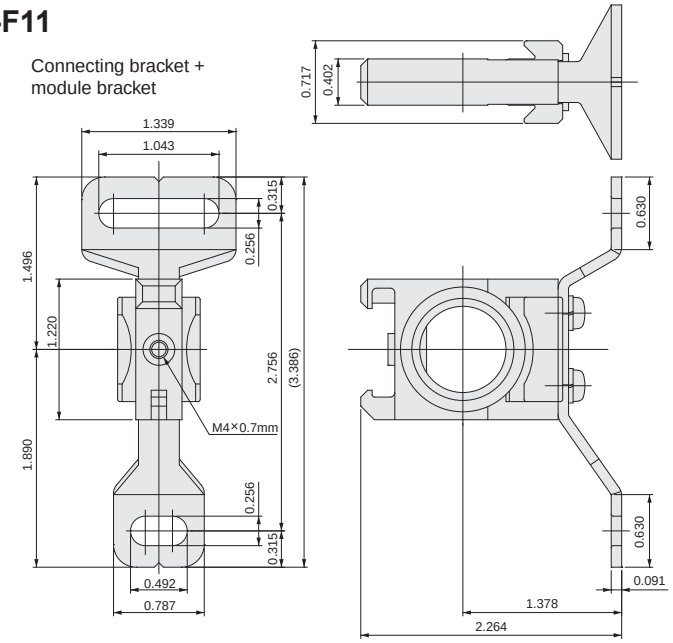


1 hexagonal socket head screw, and 2 o-rings included

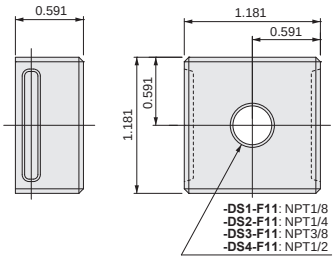
DS adapter dimensions in.

●8Z-DS□-F11

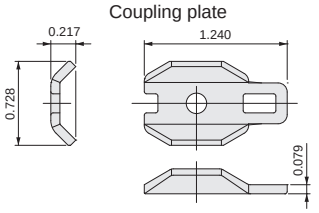
Connecting bracket + module bracket



Pipe adapter



Coupling plate

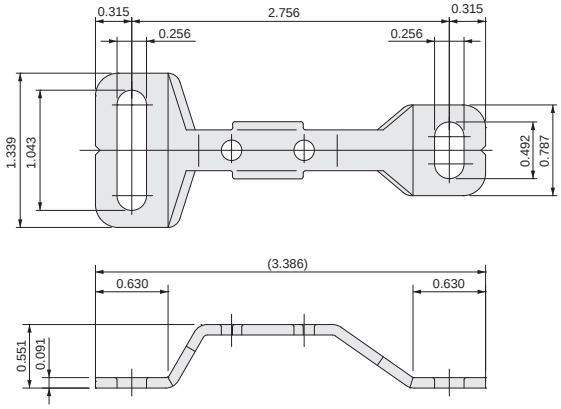


1 hexagonal socket head screw, and 2 o-rings included

Module bracket dimensions in.

●8Z-DP

Module bracket

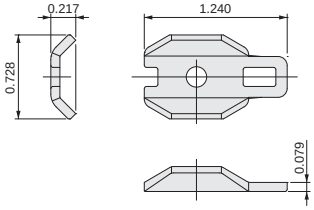


2 phillips head self-tapping screws and 2 washers included

Coupling plate dimensions in.

●8Z-FP

Coupling plate



1 hexagonal socket screw included

Module adapter

Mounting (installation) and piping

●Mounting (installation)

1. Use the various modules and adapters when combining the relevant FRZ series models and the relevant iB-Cyclone* models.
*See the back of the catalog.

2. Refer to "List of models" on page 101 regarding combinations of the relevant models, modules, and adapters.

NOTE The FRZ3□, RZ3□, and IBCY30 cannot be used together.

3. When assembling the products, check the flow marks on the products and assemble them so the media flows in the same direction. See the "Handling Instructions and Precautions" for each product regarding the relationship of the flow marks and direction of flow of the medium being used (filter regulators, regulators on page 86 and residual pressure exhaust valves on page 90.

4. Use the following procedure to assemble the products using the modules and adapters.

① Attach the o-rings to the connecting bracket (2 places)

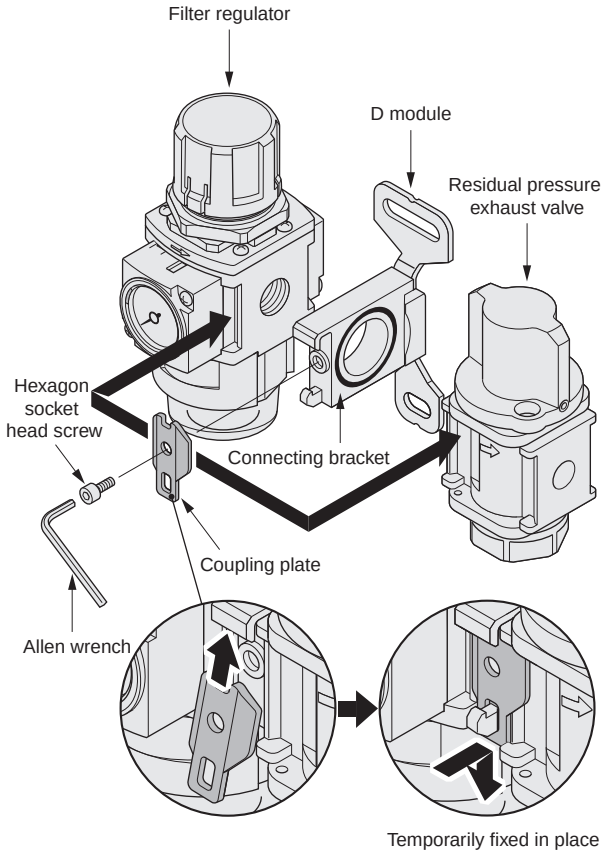
NOTE Not using an o-ring will result in air leaks.

② Temporarily fix the products to the coupling plate.

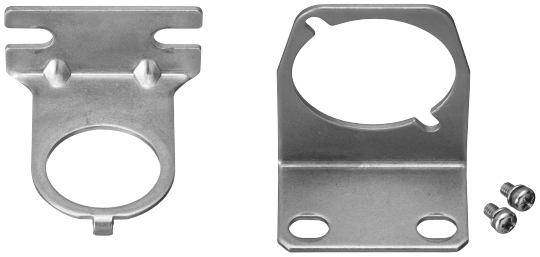
③ Tighten a hexagon socket head screw to 0.66 to 0.81 ft•lbf.

NOTE If torque exceeding the specifications is applied, it may damage component parts. Also, if torque below the specifications is used, the screw may come loose.

<Example assembly>



Bracket



Bracket shape and applicable devices

Applicable model		Bracket model	Remarks
Filter regulator	**FRZ3□**, **FRZ4□**, **FRZ5□**	**8Z-BK**	Option to support the product body.
Regulator	**RZ3□**, **RZ4□**, **RZ5□**	**8Z-BK**	Option to support the product body.
Residual pressure exhaust valve	**50VZ**	**8Z-BV**	Option to support the product body.

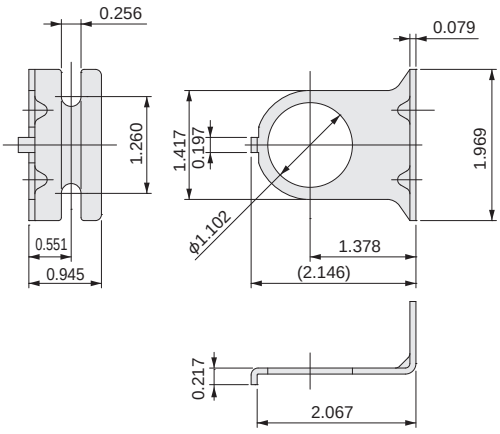
[Materials of major parts] Steel plate (electroless nickel plated)

Bracket dimensions in.

■For filter regulators and regulators

●8Z-BK

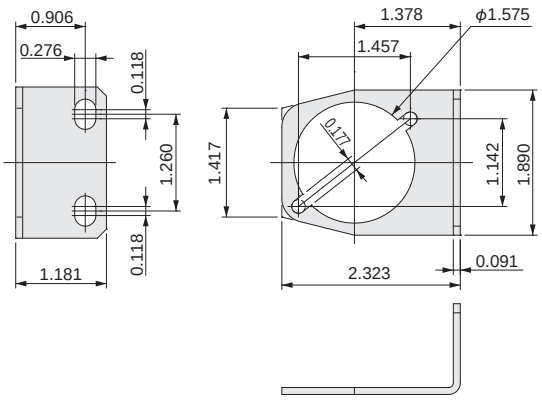
Bracket



■For residual pressure exhaust valve

●8Z-BV

Bracket



2 cross-head pan screws included

□1.181 in. integrated pressure gauge

G1C-30-F11·G4C-30-F11

● □1.181 in. integrated pressure gauge for FRZ series.

Symbol

Order codes

G □ C – 30 – F11

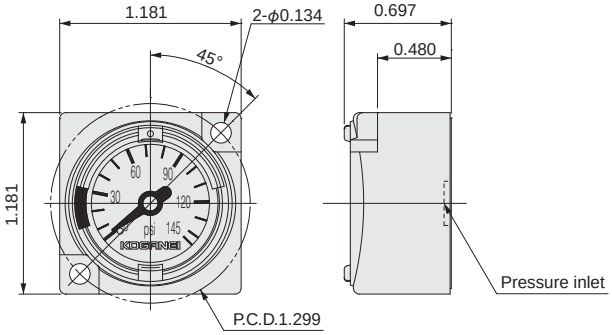
- **F11** — NPT thread specifications
- **30** — Outside dimensions: Outside dimensions □1.181 in.
- **□** — Pressure indicator range: **1** — Standard specifications 145 psi; **4** — Low pressure specifications 58 psi
- **G** — Pressure gauge

Specifications

Item		Model G1C-30-F11	Model G4C-30-F11
Media		Air	
Connection method		O-ring seal, M3×0.5mm (secured by 2 screws)	
Maximum operating pressure	psi	145	58
Operating temperature range (atmosphere and media)	°F	41 to 140 (non-condensation)	
Pressure indicator range	psi	0 to145	0 to 58
Display zone movable range	psi	0 to145	0 to 58
Display zone maximum set range	psi	72.5	29
Accuracy (for atmosphere and medium at 41 to 95°F)		F.S.±4%	F.S.±6%
Materials of major parts	Case	Polybutylene terephthalate	
	Front cover	Polycarbonate	
	Bourdon tube	Brass	
Mass	oz	1.06	
Applicable models		FRZ3□-F11, FRZ4□-F11, FRZ5□-F11, RZ3□-F11, RZ4□-F11, RZ5□-F11	

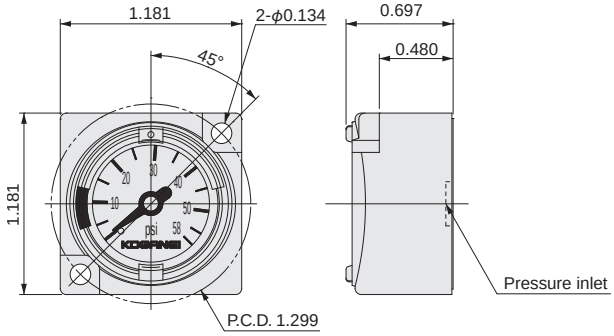
Pressure gauge dimensions in.

G1C-30-F11



2 phillips head self-tapping screws and 1 o-ring included

G4C-30-F11



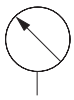
2 phillips head self-tapping screws and 1 o-ring included

Refer to page 93 regarding the handling instructions and precautions for the □1.181 in. integrated pressure gauge.

Pressure gauge

G1-40-F11·G3-40-F11

Symbol



Order codes

G □ – 40 – F11

F11 — NPT thread specifications

40 — Outside diameter
40 —— Outside diameter 1.575 in.

□ — Pressure indicator range
1 —— Standard specifications 145 psi
3 —— Low pressure specifications 43.5 psi

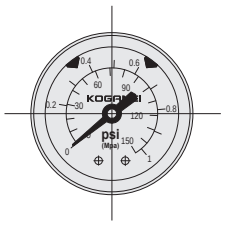
G — Pressure gauge

Specifications

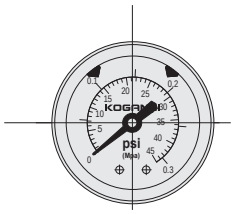
Item \ Model		G1-40-F11	G3-40-F11
Medium		Air	
Port size		NPT1/4 (M5×0.8)	
Pressure indicator range	psi	0 to 145	0 to 43.5
Accuracy		F.S.±3%	
Outside diameter	in	1.575	
Maximum operating pressure	psi	134.9	36.3
Operating temperature range (atmosphere and media)	°F	41 to 140 (non-condensation)	
Mass	oz	3.17	
Materials	Case	ABS	
	Connection port thread	Brass	
	Bourdon tube	Brass	

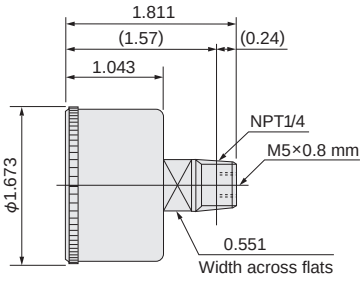
Pressure gauge dimensions in.

●G1-40-F11



●G3-40-F11





Handling instructions and precautions

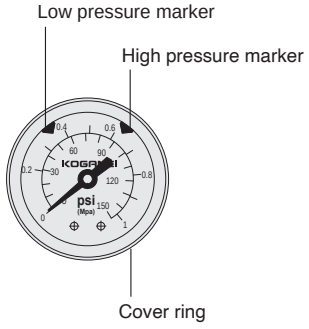
NOTE The pressure gauge is a precision measuring device.
Be careful of impacts and vibrations.

Mounting and piping

During mounting and piping operations, do not grab the pressure gauge body to tighten. For tightening, always use a wrench on the piping connection port's square portion. Use a tightening torque of 2.21 to 3.69 ft•lbf if the pressure gauges are mounted on the pressure port plate with NPT1/4.

Preset marker

You can set the preset marker. Rotate the cover ring to first set the low pressure and then set the high pressure.

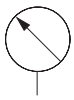


Pressure gauge

G1S-40-F11·G3S-40-F11

●**Stainless steel Bourdon tube pressure gauge.**

Symbol



Order codes

G □ S – 40 – F11

NPT thread specifications

Outside diameter
40 —— Outside diameter 1.575 in.

Pressure indicator range
1 —— Standard specifications 145 psi
3 —— Low pressure specifications 43.5 psi

Pressure gauge

Specifications

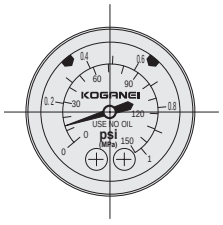
Item \ Model		G1S-40-F11	G3S-40-F11
Media		Air, N_2, O_2, CO_2, He, Ar	
Port size		NPT1/4	
Pressure indicator range	psi	0 to 145	0 to 43.5
Accuracy		F.S. ±2.5%	
Maximum operating pressure	psi	134.9	36.3
Operating temperature range	°F	41 to 140 (non-condensation)	
Mass	oz	3.21	

Materials

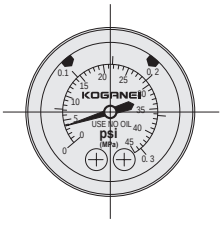
Name	Materials
Case	SPCC (painted black)
Connection port thread	SUS316
Bourdon tube	SUS316
Clear cover	Plastic (PC)

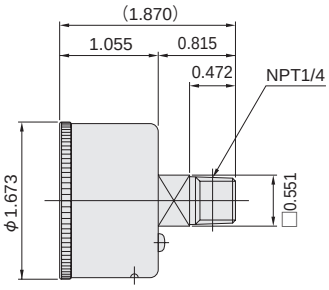
Pressure gauge dimensions in.

●**G1S-40-F11**
Standard specifications
145 psi



●**G3S-40-F11**
Low pressure specifications
43.5 psi





Handling instructions and precautions

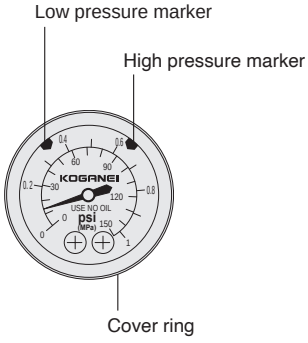
NOTE The pressure gauge is a precision measuring device.
Be careful of impacts and vibrations.

Mounting and piping

During mounting and piping operations, do not grab the pressure gauge body to tighten. For tightening, always use a wrench on the piping connection port's square portion. Use a tightening torque of 2.21 to 3.69 ft•lbf if the pressure gauges are mounted on the pressure port plate with NPT1/4.

Preset marker

You can set the preset marker. Rotate the cover ring to first set the low pressure and then set the high pressure.



Digital pressure switch

GS620-3W

Specifications

Item \ Type / Model		Standard / High-pressure type / GS620-3W
Indication of pressure		Gauge pressure
Rated pressure range		–14.5 to +145 psi
Pressure setting range		–14.5 to +145 psi
Proof pressure		218 psi
Applicable media		Non-corrosive gas
Supply voltage		12 to 24 VDC ±10%, ripple P-P 10% or less
Power consumption		Normal operation: 720 mW or less (current consumption 30 mA or less at 24 V supply voltage) ECO mode (at STD): 480 mW or less (current consumption 20 mA or less at 24 V supply voltage), ECO mode (at FULL): 360 mW or less (current consumption 15 mA or less at 24 V supply voltage)
Comparative output		PNP transistor open collector • Maximum inflowing current: 100 mA • Applied voltage: 30 VDC or less (between comparative output and 0 V) • Residual voltage: 2 V or less (at inflowing current 100 mA, however, cable must be less than 78.7 in. long)
	Output operation	Selectable, either NO or NC by key operation
	Output mode	EASY mode/hysteresis mode/window comparator mode
	Response differential (hysteresis)	Minimum 1 digit (variable)
	Repeatability	± 0.2% F.S. (within ± 2 digits)
	Response time	2.5 ms, 5 ms, 10 ms, 25 ms, 50 ms, 100 ms, 250 ms, 500 ms, 1000 ms, 5000 ms, selectable by key operation
	Short circuit protection	Equipped
Display		4 digits + 4 digits, 3-color LCD display (display refresh rate: 250 ms, 500 ms, 1000 ms, selectable by key operation)
	Displayed pressure range	–14.5 to +145 psi
Indicators		Orange LED (comparative output 1 operation indicator, comparative output 2 operation indicator: Lights up when comparative output is ON)
Environmental resistance	Protective structure	IP40 (IEC)
	Ambient temperature	14 to 122 °F, in storage: 14 to 140 °F
	Ambient humidity	35 to 85% RH (however, no condensation or freezing), in storage: 35 to 85% RH
	Dielectric strength	1000 VAC for one minute (between electrical connection part and case)
	Insulation resistance	50 MΩ or over at 500 VDC meggers (between electrical connection part and case)
	Vibration resistance	Endurance 10 to 500 Hz, total amplitude 0.118 in, 2 hours in each of the XYZ directions (with panel mounting: Endurance 10 to 150 Hz, total amplitude 0.0295 in., 2 hours in each of the XYZ directions)
	Shock resistance	Endurance 328 ft/s^2 (about 10 G), 3 times in each of the XYZ directions
Thermal characteristics		Within ±1% F.S. (reference at +68 °F)
Pressure port		M5×0.8 mm female thread and NPT1/8 male thread
Materials		Case: PBT (fiberglass reinforced), LCD display: Acrylic, pressure port: SUS303, mounting thread: brass (nickel plated), switches: silicon rubber
Connection method		Connectors
Wire length		Up to 328 ft long on a cable of 0.00047 in^2. or larger
Mass		Approximately 1.41 oz
Accessories		78.7 in. cable with connector: 1 pc.

Note: Unspecified measuring conditions use an ambient temperature of + 68 °F.

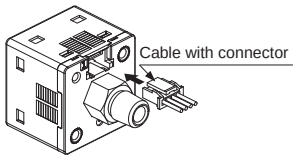
General precautions

Wiring

1. Always shut off the power supply before performing wiring work.
2. Confirm that the power source does not fluctuate over the rated power.
3. Be sure to ground to frame ground (F.G.) terminal of the power source when using a commercially available switching regulator.
4. When using equipment that could be sources of electric noise (such as switching regulators, inverter motors, etc.) near the pressure switch installation, be sure to ground the equipment's frame ground (F.G.) terminal.
5. Avoid wiring parallel to high voltage lines or power lines, or inside the same wiring conduits. Induction could cause erratic operation.
6. Incorrect wiring could cause malfunctions.
7. After completing wiring work, check to make sure that all connections are correct.

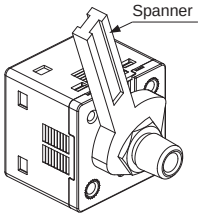
Connections

Do not apply stress directly to the connectors or to the wires coming out of the connectors.



Mounting and piping

Use a tightening torque of 2.21 to 3.69 ft•lbf when mounting on the pressure port plate with NPT1/8. For details, see page 89 "Installing provided options".



Other precautions

1. The GS6 series is for use with non-corrosive gases. Do not use with liquids or with corrosive gases.
2. Use within the rated pressure range.
3. Do not apply pressure in excess of the proof pressure. Doing so could damage the diaphragm and cause malfunctions.
4. Avoid using the product immediately after the power is turned on, while it is in a transitory state (about 0.5 sec).
5. Avoid use in very humid or dusty locations.
6. Be careful that the product does not come in direct contact with organic solvents, such as thinner, or water, oil, or grease.
7. Do not put pins or anything else in the pressure port. Doing so could damage the diaphragm and cause malfunctions.
8. Do not operate the keys with a pin or similar sharp object.

About the RUN mode

This is the normal operating mode.

Setting items	Description
Threshold value setting	You can directly change the ON/OFF threshold value by just pressing the UP key or DOWN key.
Zero adjust function	This function forces the pressure value to zero when the pressure port is open to the atmosphere.
Key lock function	This function prevents key operations.
Peak & bottom hold function	This function shows the peak and bottom values of changes in the pressure. The peak value appears in the main display, the bottom value appears in the sub display.

About the menu setting mode

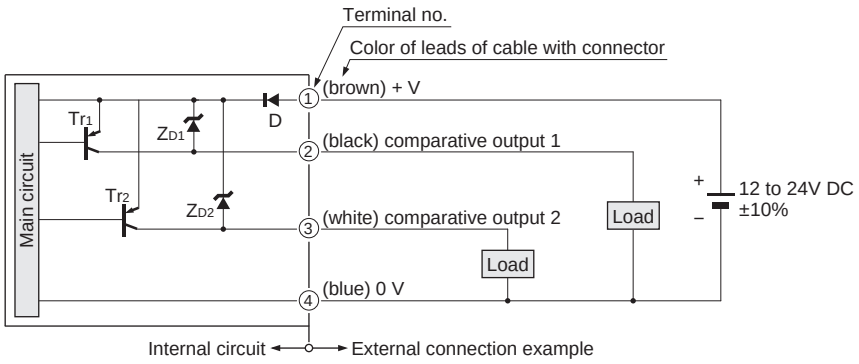
1. While in the RUN mode, press and hold the mode switch key for 2 seconds to switch to the menu setting mode.
2. Press and hold the mode switch key while doing settings to switch to the RUN mode. When this is done, the items you changed are set.

Setting items	Description
Comparative output 1 output mode settings	Sets the output mode of comparative output 1.
Comparative output 2 output mode settings	Sets the output mode of comparative output 2.
NO/NC switching	Sets either normally open (NO) or normally closed (NC).
Response time setting	Sets the response time. Select a response time from 2.5 ms, 5 ms, 10 ms, 25 ms, 50 ms, 100 ms, 250 ms, 500 ms, 1000 ms, or 5000 ms.
Main display color switching	You can switch the color of the main display. Set red/green or green/red depending on whether output is ON/OFF. Also, you can set whether the normal color is red or green.
Unit switching (high-pressure type only)	You can switch the units for the pressure .

Remarks: See the instruction manual provided with the product for details about setting the modes, functions and values.

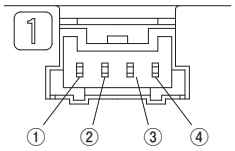
Input/output circuit and connections

Input/output circuit diagram



Code… D : Reverse current protection diode for power supply
Z_{D1}, Z_{D2} : Zener diodes for surge voltage absorption
Tr_1, Tr_2 : PNP output transistor

Terminal layout



Terminal no.	Name
①	+V
②	Comparative output 1
③	Comparative output 2
④	0V

Order codes

GS6 20 – 3W

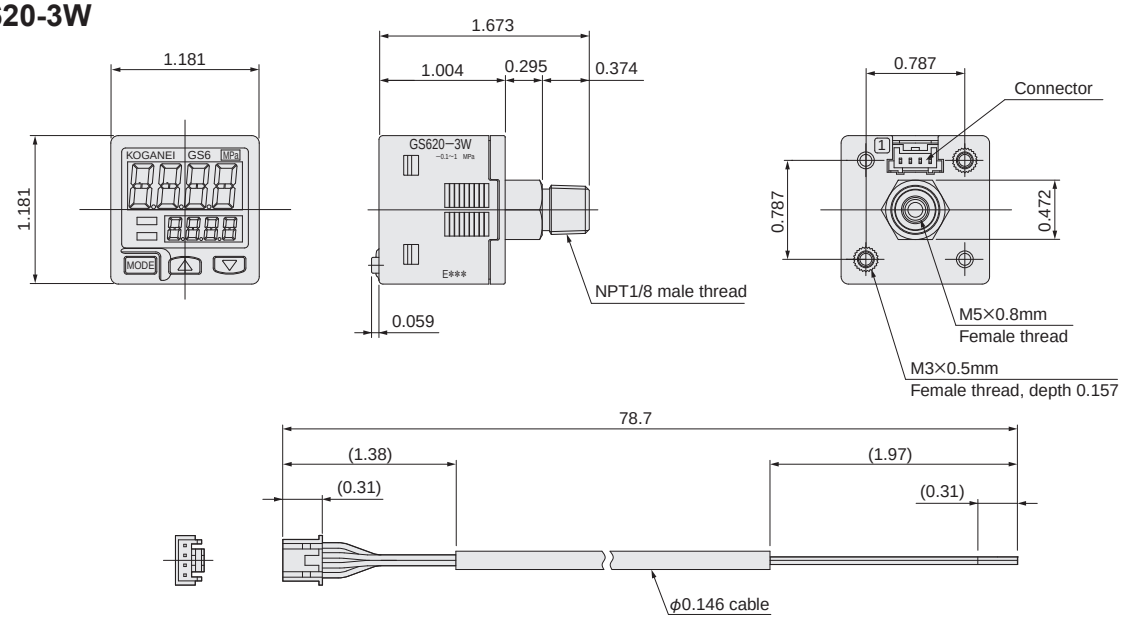
NPT thread specifications

Digital pressure switch

Operating pressure range
20： High-pressure type -14.5 to +145 psi

Dimensions in.

GS620-3W

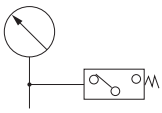


Pressure gauge with built-in switches

GS1-50-F11

- **The set pressure and operating pressure are indicated on the same pressure gauge. Panel mounting offers convenient centralized control and management built into the control panel.**
- **An indicator is standard equipment, to check the switch operation state. Wiring connection methods offered include a standard grommet (lead wire) type, and a DIN connector type as an option.**

Symbol



Order codes

GS1-50 - F11 - □ - □

NPT thread specifications

Wiring
Blank — Lead-wire type
T — DIN type connector

Voltage
AL — For 100 VAC, 200 VAC
DL — For 24 VDC

Pressure gauge with built-in switch
(outer diameter 1.969 in.)

Remarks: A model with built-in contact protection circuit (external surge absorption element) for AC is available. Contact your nearest Koganei sales office for details.

Specifications

Item			Model: GS1-50-F11-□-□
Media			Air
Maximum operating pressure		psi	120
Pressure gauge specifications	Operating temperature range (atmosphere and media)	°F	41 to 140
	Pressure indicator range	psi	0 to 145
	Indicator accuracy		F.S.±3%
Switch specifications	Pressure adjusting range	psi	14.5 to 120
	Regulating pressure indication error Note 1 and Note 3	psi	±7
	Repeatability Note 3	psi	±7 (41 to 113°F)
	Response differential	psi	10 or less
	Contact type		Micro switch a-contact (NO)
	Wiring — Standard		Lead wire Length: Approx. 19.7 in. (UL1007 AWG22)
	Wiring — Options		DIN connector
	Indicator		Standard equipment: LED for DC, neon lamp for AC
Shock resistance		G	1
Mounting direction			Any
Mass		oz	6.00 (with DIN connector 6.70)
Materials	Body		Aluminum die-casting
	Case		SPCC
	Connection port thread		Brass
	Bourdon tube		Brass

Notes 1: Shows when the pressure is rising.
2: Use a set pressure that has a differential of at least 14.5 psi with the supply pressure.
3: Regulating pressure indicator errors and repeatability errors could be accumulated. (maximum ±14.5 psi) Be careful during operations.

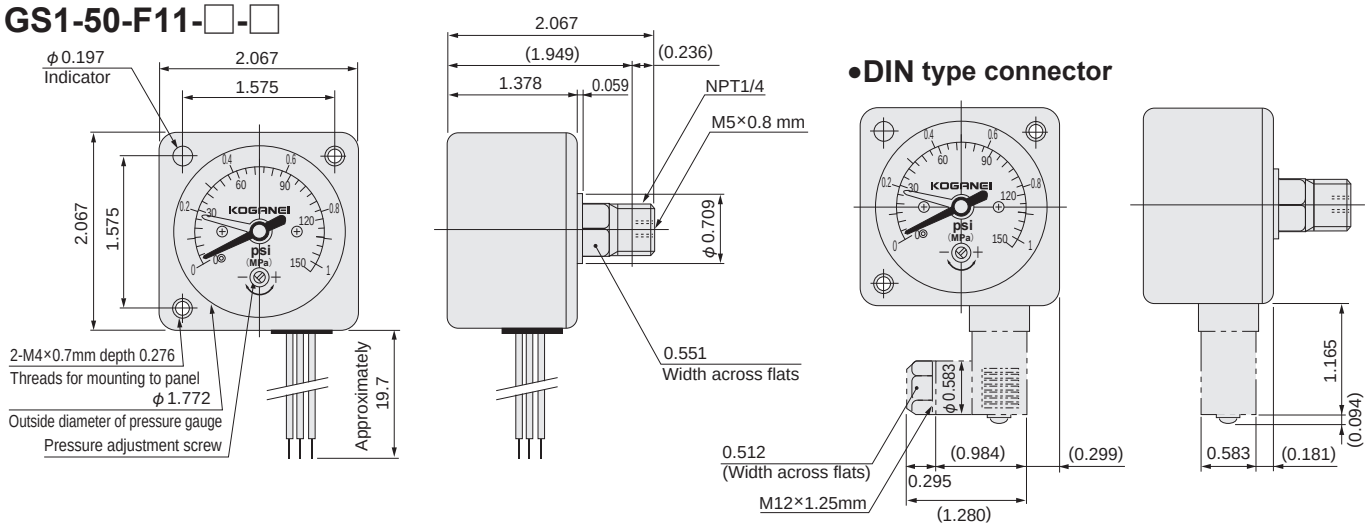
Micro switch rating

A

Operating current range \ Rated voltage		DC30V	AC125V	AC250V
Inductive load	Continuous	0.05 to 0.1	0.01 to 0.1	0.01 to 0.05
	Inrush	0.5 MAX.	0.5 MAX.	0.2 MAX.
Non-inductive load		0.01 to 0.5	0.01 to 0.3	0.01 to 0.2

Dimensions of pressure gauge with built-in switch in.

GS1-50-F11-□-□



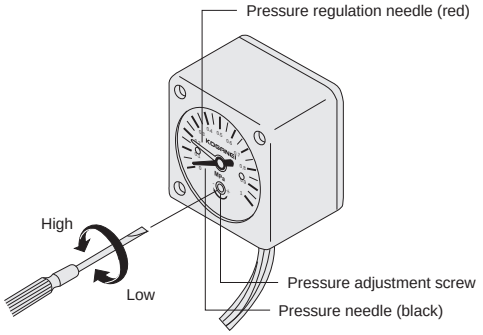
Pressure gauge with built-in switches

Mounting and piping

1. While any mounting direction is acceptable, install a throttle mechanism in cases where pressure pulsation is particularly severe, such as when mounted between a valve and an actuator. For mounting in locations subject to strong vibrations, consult us.
2. During mounting and piping operations, do not grab the pressure gauge body to tighten. For tightening, always use a wrench on the piping connection port hexagonal section. Use a tightening torque of 2.21 to 3.69 ft•lbf if the pressure gauges are mounted on the pressure port plate with NPT1/4.

Pressure regulation

Rotate the pressure adjustment screw, align the pressure regulation needle (red) to the set pressure, and set. Rotating the pressure adjustment screw to the left (counterclockwise) sets to a higher pressure, and rotating it to the right (clockwise) sets to a lower pressure. When the air pressure rises to the set pressure, the switch is activated, and when it falls to less than the setting pressure 10 psi (response differential), the switch is returned to the original state.



NOTE
1. To regulate the pressure, do not remove the cap on the lens surface, but insert a small screwdriver into a slit in the cap instead, and directly rotate the pressure adjustment screw.
2. The pressure needle has an indication error of ±7 psi. For fine-tuning adjustment, apply compressed air at the set pressure to check the switch triggering action.

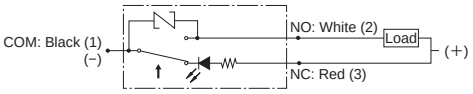
General precautions

1. Use this product to check the supply pressure. For use in precision control circuits, consult us.
2. Switch performance may be degraded in installation locations where the temperature is higher than 113°F or where the humidity is constantly 50% or less. For use in these kinds of places, consult us.
3. If there is silicon gas in the ambient atmosphere, it may cause a contact failure because the contact operation uses micro switches. If there is silicon oil or silicon products in the vicinity of the product, eliminate the source of the silicon gas or use a contact protection circuit (for AC).

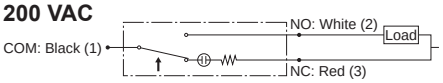
Wiring instructions

Pay attention to the NC and NO contacts and the colors of lead wires (in wires with connectors, the terminal numbers) for wiring. In the diagram below, the numbers in parentheses ( ) represent the terminal numbers, while the ⬆ shows the direction of rising pressure. The indicator lamp switches off when the value is at the set pressure or higher, and lights up as a warning when the value falls below the set pressure.

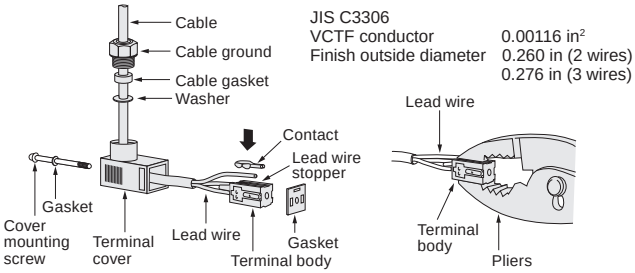
•24 VDC



•100 VAC, 200 VAC



•Wiring instructions with DIN connector

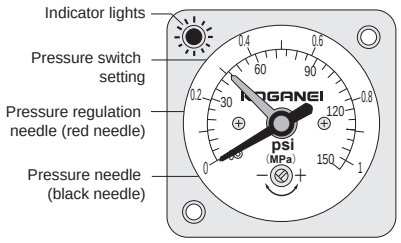


When peeling off the sheath (for cabtyre sheath only), pay attention to the lead wire bending direction. Setting the outer lead wires inside the terminal cover to be about 0.31 in longer than the inner wires can make it easier to mount the terminal body onto the terminal cover. Without peeling off their insulations, insert the lead wires into the terminal body until they bump up against the lead wire stopper, lower the contact from above to the lead wire, and use pliers to push them into firm contact, so that the contacts are touching the core wire.

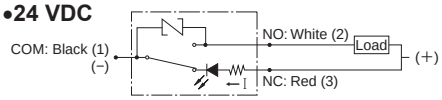
NOTE For the connector type, the connector wiring position at time of delivery is in the connecting thread side (back side).

Switch setting method and operations

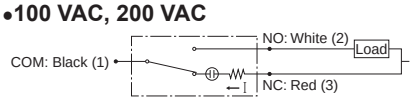
Setting example: Want the switch to activate when the pressure is at 43.5 psi or less.



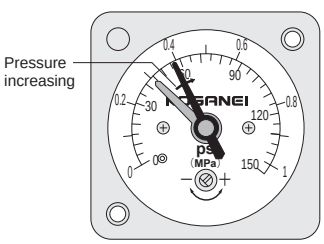
•24 VDC



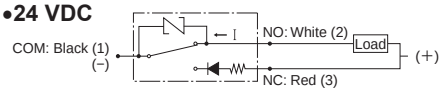
•100 VAC, 200 VAC



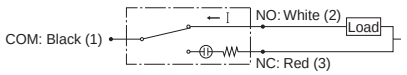
Set the pressure regulation needle (red needle) to 43.5 psi. When the pressure is in the range of 0 to 43.5 psi., the built-in switch remains at NC, as shown in the circuit diagram above, and the indicator lamp lights up.



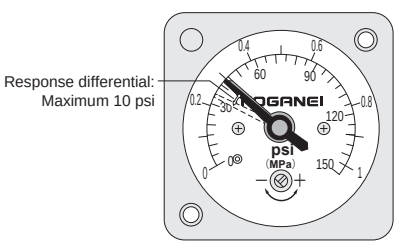
•24 VDC



•100 VAC, 200 VAC



When the pressure supply increases, close to the pressure regulation needle (red needle), the built-in switch flips to NO, as shown in the circuit diagram above, the load current flows, and the indicator lamp goes out. The position at this time is A. At this time switching position A has a maximum 14.5 psi differential in relation to the pressure needle (black needle) because of a pressure needle tolerance of ±7 psi and repeatability accuracy of ±7 psi have accumulated.



When the pressure falls, and the pressure needle (black needle) is higher than the pressure regulation needle (red needle), the internal switch changes to NC with a maximum response differential of 10 psi. When this happens, check the switching position and adjust the pressure regulation needle (red needle). Note that NC cannot be used as a load contact. Use the switching of NO to OFF by controlling a relay or other B-contact device.

●About chemical resistance

The chemicals in the following table degrade plastic parts. They may damage the various filter bowls, holders, and the front cover of the pressure gauges, 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 they are 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, ammonia water, 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 dichloride, 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, methyl ethyl 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, corrosion resistant additives, synthetic resin plasticizer
	Oxyacid	Glycolic acid, lactic acid, malic acid, citric acid, tartaric acid	Food preservatives, acidifiers
	Nitro compounds	Nitromethane, nitroethane, nitroethylene, nitrobenzene	Paint medium, explosives
	Amine	Methylamine, dioctylamine, ethylamine, aniline, acetanilide	Brake fluid additive
	Nitrile	Acetonitrile, acrylonitrile, benzonitrile	Nitrile rubber materials

Bowl material　　Oil resistance comparison table

Testing Procedure
A dumbbell-shaped multi-purpose test specimen (JIS K 7139: 2009) fixed under a certain bending stress is contacted with a reagent under the same conditions, and the condition of the test specimen is checked after a certain period of time.

Classification	Manufacturer/Reagent Name		PCT (Polycyclohexylene-dimethylene terephthalate)	PA (Nylon)	PC (Polycarbonate)
Alcohol	Isopropyl alcohol		○	×	×
Water-soluble cutting oil (Dilution ratio 10 times)	Nippon Quaker Chemical, Ltd.	Micro Cut 3653-N	○	○	○
		Micro Cut SRK-F	○	○	△
		Micro Cut 700RF	○	○	×
	Neos Corporation	Y1100P	○	○	○
		Y-103F	○	○	△
	Idemitsu Kosan Co., Ltd.	Daphne Alpha Cool EW	○	○	×
	NS Lubricants Co., Ltd.	C-3109HL	○	○	○
		RISCUT SY-64	○	○	×
Non-water-soluble cutting oil	Yushiro Chemical Industry Co., Ltd.	Yushiron Cut Arbus BZ322	○	○	△

The names of reagents in the table are registered trademarks of their respective companies.

PC may experience environmental stress cracking depending on the type of cutting fluid. Both PA and PCT tend to have strong resistance to cutting oils, but PCT is more suitable for environments where alcohol is used.

Note: This is under Koganei measurement conditions and does not guarantee performance. If you have any questions, please contact our overseas department.

Guideline
○: No cracks (from none to minor effect)
△: Cracks present (small)
Conditions may hasten failure
×: Cracks present (large)
May break down in a short period of time

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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