Safety Precautions

Always read this section before use.
Refer to 764, 765 for pneumatic components general precautions.

F.R. unit (modular design)

Design & selection

⚠WARNING

■ This product is designed for industrial use. Do not use it in medical or human life related devices and circuits.

■ Plastic bowl of air filter, lens of pressure gauge
Material includes polycarbonate. Do not use in the atmosphere with synthetic oil, organic solvent, chemical materials, coolant, screw locking adhesive, liquid soap, hot water, etc., or possible exposure to these substances.
Refer to page 810 for details for chemical resistance of plastic bowl.

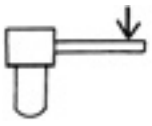
■ Install a safety device where an output pressure exceeding the regulator's set pressure value could result in damage or faulty operation of secondary side devices.

■ The regulator cannot process residual pressure (removing secondary pressure) when primary pressure is released. Use a regulator with a check valve when residual pressure must be processed.

■ If the regulator cannot be used with the secondary side sealed circuit or balance circuit, contact CKD.

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

	2000 Series	3000/4000 Series	6000 Series
Max. torque N·m	30	50	100



Use within the specified torque, even when using the piping adaptor.

■ O-ring grooves for module connection are provided on the OUT face of each product. Select piping that can be sealed with the O-ring groove diameter or less.

Series	2000 Series	3000 Series	4000 Series	6000 Series
groove diameter	ø25.4	ø25.4	ø25.4	ø41.2

⚠CAUTION

■ Large drainage
Install the air dryer and drain separator before the air filter.
If there is a large drainage from the compressor, hot and highly humid air could shorten the device's life or result in corrosion.

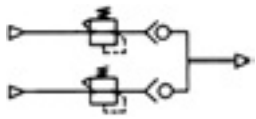
■ Dry air
Rubber parts for the regulator could deteriorate quickly, so use of a fluoro rubber valve assembly is recommended. Contact CKD when required.

■ Compressor circuit of water lubrication method
Take measures to prevent chlorine-based substances from entering the compressed air.

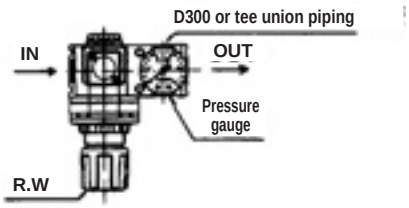
■ Set secondary pressure of the regulator to 85% or less on the primary side, or the pressure drop could increase.

■ Contact CKD when auto drains are required.

■ When using regulators in parallel as shown below, do not use the OUT side as a closed circuit. If a closed circuit is required, set a check valve at the regulator's OUT side.



■ When using this unit for a large flow, etc., install a pressure gauge as shown below so that secondary pressure is measured accurately.



Mounting / Installation / adjustment

⚠CAUTION

■ Open the package in a clean room.

● The products are wrapped in an antistatic sheet before packaged in a box. If you install the product in a clean room, we recommend you to take it out of the box outside the clean room before you bring it in and to open the package in the clean room.

■ Avoid using the product in an area exposed to direct sunlight.

■ Flush and wash pipes to be used.

Dirt or foreign materials in piping will lower product performance.

■ Check that foreign materials do not enter when tightening pipes or fittings.

Make sure that no piping screw chips or sealant material enters the pipes when connecting the pipes and fittings. Dirt or foreign matters in piping will lower product performance.

■ Set the regulator pressure to increase. After setting the pressure, lock the handle. Check primary pressure carefully before setting the pressure.

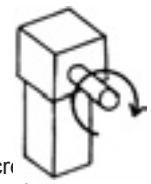
■ Check the arrow indicating the air inlet before connecting. If connected reversely, malfunction may be caused.

■ Air filter should be set with its case mounted face down and vertically. This can help when checking the drain works correctly without a failure of draining and dropping.

■ Pipe auto-drain piping as follows.

Make sure that excessive torque is not applied on the body and pipe when piping.

	2000 Series	3000/4000 Series	6000 Series
Max. torque N·m	15	30	70



■ Regulator

● Lightly tighten (0.6 N·m or less) mounting scr embedded pressure gauge G401 and gauge plug.

● When installing a general screw-in pressure gauge, tighten with a torque of 10 to 15 N·m or less.

● Do not move or swing the product holding the adjustment knob on the regulator.

■ Drain piping for polycarbonate bowl

・Fix the hexagon face of the cock before screwing the fitting, etc., into the Rc1/8 female screw.

・Do not apply too much torque or lateral load on drain discharge.

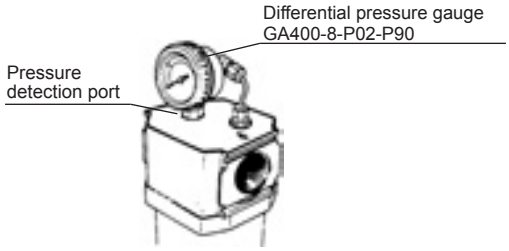
■ Piping the unit with detection port

F6000-*-Q/M6000-*-Q

A pressure detection port is available as an option for F6000 and M6000.

The life of the filter element or oil mist filter mantle assembly is visually checked by assembling the differential pressure gauge GA400-8-P02-P90 into the pressure detection port.

For F6000 and M6000, when selecting Options Q and X1 simultaneously and installing the differential pressure gauge GA400, use the piping material to raise the level of the gauge so as not to interfere each other.



To install correctly, confirm the positions of the differential pressure gage mounting port on the high/low pressure sides.

■ Do not apply a pressure exceeding a full scale of the pressure gage. (Pay special attention when using a pressure gage with a full scale of 0.2 or 0.4 MPa.)

■ Panel mount of regulator

Before mounting the panel and installing the L bracket, the knob must be removed.

(For 2000 series, it is not necessary to remove the knob.)

To remove the knob, turn it about three times in the H direction and then turn the nut in the way like jacking-up.

When turning the knob in the L direction from the setting pressure 0, the stopper will be activated to prohibit the knob from turning.

Applying a further torque in the L direction will make the knob to be locked and become inoperable.

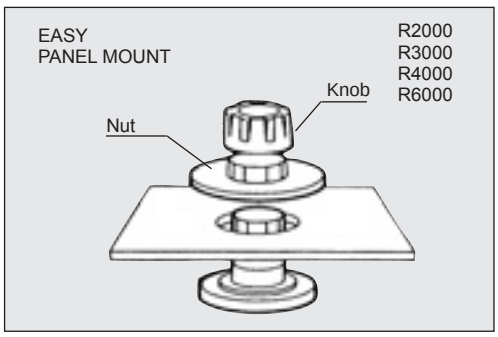
To avoid locking the knob, make sure to turn it three times in the H direction and then turn the nut.

At this time, do not turn the knob together.

Note that the knob could pop up vigorously when jacking up the knob with the nut.

Then, insert the cover part into the panel or the L bracket and fix it with the nut.

Lastly, insert the knob and tap it in.



Note: Before mounting a knob, a nut should be set.
(For R2000, the nut can be detached alone without dismounting the knob.)

During use & maintenance

⚠WARNING

■ Check the air filter plastic bowl regularly for cracks, damage, and other deterioration.
Replace the product when cracks, damage, and other deterioration is found.

■ Drain so that air filter drainage does not accumulate exceeding the upper limit.
Components could malfunction if drainage flows into the secondary side.

⚠CAUTION

■ Do not disassemble and modify the products.

■ Read instructions and precautions enclosed with the product before use or maintenance.

■ Pull the pressure adjustment knob and release the lock before setting the regulator pressure. The regulator could be damaged if the pressure is set without unlock.

■ Submicron 0.3 μm element
When the pressure drops to 0.07 MPa, replace the filter with a new one.

■ Oil mist filter
The mantle (element) life ends when pressure drops to 0.1 MPa. Replace the mantle when life is reached.

■ Turning the knob from 0 of the setting pressure in the L direction actuates the stopper to prevent the knob from turning around.
Note that applying a torque in the L direction forcedly will make the knob locked and inoperable.

■ Pulsation may occur depending on the working conditions or piping conditions. It is recommended to change the use or piping conditions such as lowering primary pressure if pulsation occurs.

■ If the regulator is released of the primary pressure and left for a long time, the setting pressure should be set back to zero. If not doing so, valve adhesion may occur to lead an external leakage.

■ The set pressure changes from the initial set value based on the working environment and conditions, as well as aging of part materials.
Periodically check the pressure, and should there be a change, reset the pressure accordingly.

■ On the regulator or the filter regulator with a pressure applied, releasing the primary pressure and then reapplying a pressure may rarely cause a relief leakage. When this happens, close the supply air pressure valve and evacuate the pressure thoroughly and then, after turning the pressure control knob in the pressure-decreasing direction until it stops, apply a primary pressure. Afterwards, turn the control knob in the pressure-increasing direction to readjust the secondary pressure.

Chemical resistance of plastic

⚠WARNING

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

Chemical resistance of plastic bowl/body

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

Chemicals	Category of chemicals	Main products of chemicals	General applications	Polycarbonate bowl	Nylon bowl	Nylon body
Inorganic chemicals	Acid	Hydrochloric acid, sulphuric acid, hydrofluoric acid, phosphoric acid, chromic acid, etc.	Acid washing of metals, acidic degreasing solution, film treatment liquid, etc.	×	×	×
	Alkaline	Alkali matters such as caustic soda, caustic potash, calcium hydroxide, aqueous ammonia, sodium carbonate	Alkaline degreasing solution for metals Soluble cutting oil, leakage detection agent	×	○	○
	Inorganic salt	Sodium sulfide, sodium nitrate, potassium bichromate, sulfate of soda, etc.		×	○	○
Organic chemicals	Aromatic hydrocarbon	Benzene, toluene, xylene, ethyl benzene, styrene, etc.	Contained in paint thinner (benzene, toluene, and xylene)	×	×	×
	Chlorine aliphatic hydrocarbon	Methyl chloride, ethylene chloride, methylene chloride, acetylene chloride, chloroform, trichlene, perchlene, carbon tetrachloride	Organic solvent-based washing solution for metals (trichlene, tetrachloroethylene, carbon tetrachloride)	×	○	○
	Chlorinated aromatic hydrocarbon	Chlorobenzene, dichlorobenzene, benzene hexachloride (B/H/C), etc.	Agricultural chemicals	×	○	○
	Petroleum components	Solvent naphtha, gasoline, kerosene		×	○	○
	Alcohol	Methyl alcohol, ethyl alcohol, cyclohexanol, benzyl alcohol	Used as anti-freezing agent, leakage detection agent	×	×	×
	Phenol	Carbolic acid, cresol, naphthol, etc.	Disinfectant solution	×	×	×
	Ether	Methyl ether, methyl ether ethyl, ethyl ether	Additive of brake oil	×	○	○
	Ketone	Acetone, methyl ethyl ketone, cyclohexanone, acetophenone, etc.		×	×	×
	Carboxylic acid	Formic acid, acetic acid, butyl acid, acrylic acid, oxalic acid, phthalic acid, etc.	Dyes/oxalic acid for aluminum processing, phthalic acid for paint base and leak-detection agents	×	×	×
	Ester	Dimethyl phthalate (DMP), diethyl phthalate (DEP), dibutyl phthalate (DBP), dioctyl phthalate (DOP)	Lubricant, synthetic coolant, rust-prevention agent additive plasticizer for synthetic resin.	×	○	○
	Oxyacid	Glycol acid, lactic acid, malic acid, citric acid, tartaric acid		×	×	×
	Nitro compound	Nitro methane, nitro ethane, nitro ethylene, nitro benzene, etc.		×	○	○
	Amine	Methylamine, diemethylamine, ethylamine, aniline, acetoacetanilide, etc.	Additive of brake oil	×	×	×
	Nitrile	Acetonitrile, acrylonitrile, benznitrile, acetoylidyne nitrile, etc.	Raw material for nitrile rubber benzonitrile, nitrile, etc.	×	○	○

○: Available, ×: Not available (plastic will be damaged.)