



Pneumatic components (F.R.L. unit (large bore size))

To Use This Product Safely

Be sure to read this before use.

For general pneumatic components precautions, see Intro 27 for details.

Individual Precautions : F.R.L. Unit (Filter, Large Bore Regulator, Lubricator)

Design / Selection

1. Common

Warning

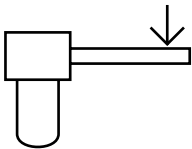
- Air Filters, lubricator plastic bowl, lubricator drip window, and pressure gauge lens. Material is polycarbonate. It cannot be used in environments containing synthetic oil, organic solvents, chemicals, cutting oil, screw locking agent, leakage detection solutions, or hot water, etc., or where these substances may come in contact with the product. Refer to P. 662 for details on plastic bowl chemical resistance.

Do not use in places directly exposed to ultraviolet rays.

Piping Load Torque

Do not apply piping load or torque to the body and piping parts.

	Rc 1/8, Rc 1/4	Rc 3/8, Rc 1/2, Rc 3/4	Rc1 or more
Max. Torque N·m	15	50	100



Storage

Do not store for a long period in high temperature, high humidity atmospheres or atmospheres outside the specifications range. It causes deterioration of resin and rubber parts, and clouding of resin bowls. If storing outside the specifications range, please contact us.

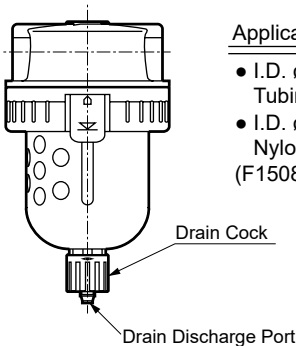
CAUTION

Using the F.R.L. correctly

- Avoid installing this product where it is subject to direct ultraviolet.
- Install the Air Filters and lubricator vertically with the bowl facing downward. Drainage discharge failure and dripping check may not be possible.

Plastic bowl drain piping

- The drain piping for the plastic bowl with manual drain cock has a barbed nipple, and can be directly installed. However, confirm that the drain cock is closed before inserting the tube. Avoid piping that applies lateral load to the bowl. The maximum tightening torque of the drain cock is 0.5 N·m.



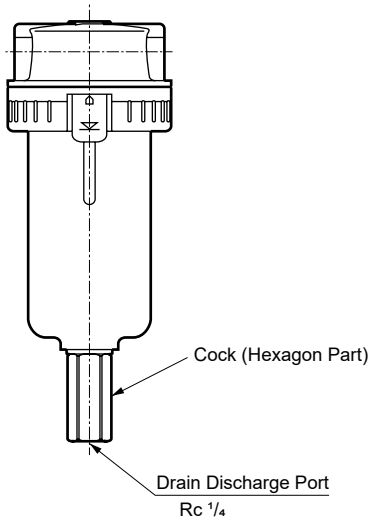
Applicable Tube

- I.D. ø5 Soft Vinyl Tubing
- I.D. ø5.7 to ø6 Nylon Tubing (F1508)

- The drain piping section of the metal bowl with auto-drain is Rc threads. Fittings When screwing in the pad, fix the metal part with the screw for the drain pipe.

Drain piping of metal bowl with auto-drain

- When screwing in fittings, etc., into the Rc 1/4 female thread, screw them in while holding the hexagonal part of the cock. When using the metal bowl with auto-drain, if the drain is piped with a tightening fitting, manual operation is not possible. Avoid piping that applies lateral load to the bowl.



High moisture levels

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

Ultra dry air

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

Water-lubricated compressor circuit

Be careful not to mix chlorine-based substances into the compressed air.

- Use the auto-drain under the Operating conditions below. It may cause malfunction.

"F" NO auto-drain (exhaust when not pressurized)

- A compatible compressor must be used at 0.75 kw and over (discharge flow rate 0.09 m³/min [ANR]). Immediately after compressor operation, air is purged together with initial drainage until 0.1 MPa rise.
- Set the Operating pressure to 0.1 MPa or more. F1 NC auto-drain (no exhaust when not pressurized)
- A compressor with a capacity of 0.75 kw or less can also be used.
- Set the Operating pressure to 0.15 MPa or more.
- Set the Operating pressure to 0.1 MPa or more.
- In Case of Using Piston Drain "D"
- Do not use this device on equipment that experiences impacts.
- Automatic discharge used for intermittent flow. Drainage is not discharged under Operating conditions where air flows constantly.
- For the Air Filters and lubricator, make sure that the bowl is vertical and facing downward.

2. Filter

CAUTION

- Do not select using the port size.

- Use the auto-drain piping as follows : It causes malfunction. The drain discharge piping should be I.D. ø5.7 or more, length 5 m or less, and avoid rising piping. Avoid piping that applies lateral load to the bowl.

- For the remote control dial Regulators, attach a pressure gauge to the body's gage port, and adjust the pilot pressure.

- Use a pre-filter before the Micro-mist separator filter/micro-naught type. Use a filter (5 µm) or submicron filter as the pre-filter.

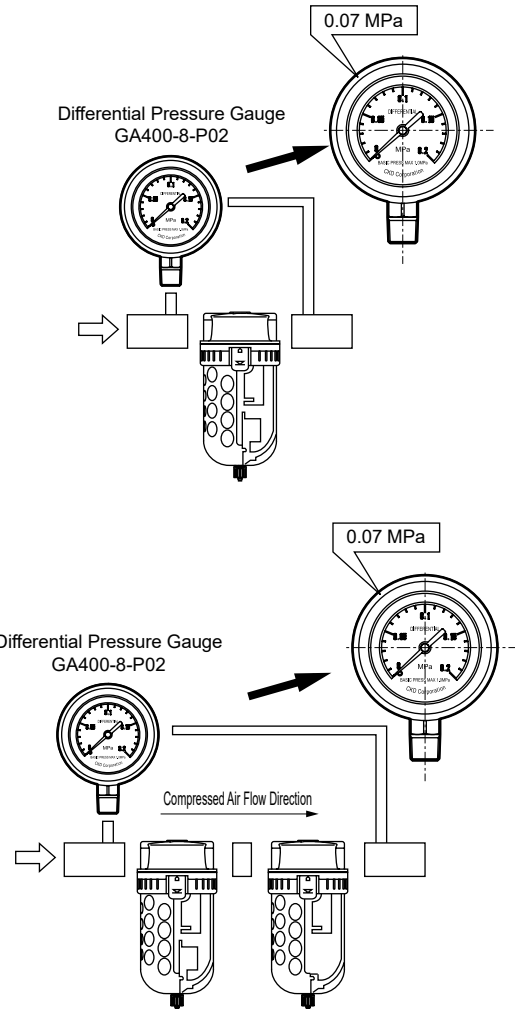
FRL Unit (large bore size)

Specific Precautions

- Use a micro-naught Micro-mist separator before the deodorizer Micro-mist separator Air Filters.

Filter

- Use a differential pressure gauge of GA400-8-P02 to measure pressure drop. Measure the pressure drop accurately.



- The deodorizer Micro-mist separator air filter adsorbs odors with activated carbon, so life cannot be measured. When the pressure drop of the Micro-mist separator type reaches 0.07 MPa, replace the mantle of the Micro-mist separator type at the same time.

- Submicron 0.3 µm element Cannot be regenerated by washing. When the pressure drop reaches 0.07 MPa, replace the Y element with a new one.

- The Micro-mist separator (oil removing filter) mantle (element) service life is reached when the pressure drops to 0.07 MPa. When it reaches the end of its life, replace the mantle with a new one. (Do not touch the urethane rubber foam layer when replacing the mantle.)

3. Regulator, F.R. unit

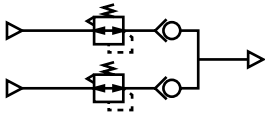
Warning

- Output pressure exceeding the Regulators' set pressure could result in damage or faulty operation of the secondary side devices. Be sure to install a safety device.
- The Regulators cannot process residual pressure (release secondary pressure) when the primary pressure is released. Use a regulator with a check valve when residual pressure must be processed.
- As the Regulators may not always be usable when used with a secondary side sealed circuit or balance circuit, consult with CKD.

CAUTION

- The set pressure changes from the initial set point due to the Operating environment and conditions, as well as aging of part materials. Check the pressure periodically and reset if it has changed.
- Vibrations may occur depending on the usage and piping conditions.
Lower the primary pressure if vibrations occur. Since it tends to occur when the flow rate is significantly less than the maximum flow rate, please select an appropriate size.
- The setting range for the Regulators' secondary pressure should be within 85% of that of the primary side.

- The dial Regulators cannot be used when the secondary pressure differs at high frequency or back pressure is applied on the secondary side with a balancer, etc.
- Dial Air Regulators Turn the adjusting knob clockwise to increase secondary pressure, and counterclockwise to lower pressure. Adjust pressure so the primary pressure is 0.1 MPa or more higher than set pressure. Do not use high frequency ON-OFF by air valve etc.
- After setting pressure, do not release primary pressure or depressurize.
- When using Regulators in parallel as below, do not use the OUT side as a closed circuit. If a closed circuit is required, install a check valve on the OUT side of each regulator.



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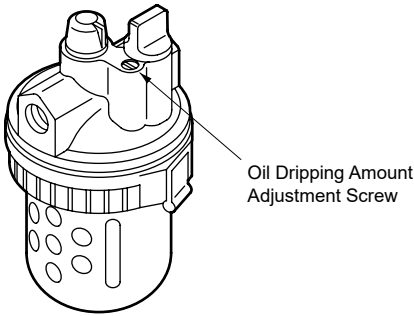
4. Lubricator

Warning

- Do not use as lubrication for air motor or bearings. Lubrication may not be possible when used very frequently, such as in a press machine.

CAUTION

- If the Operating air quantity is low for the lubricator, oil may not drip. Check the min. air quantity required for dripping oil. Check the oil drip rate once a day.
- The Econo-mist type has a check valve that allows the oil to be supplied in the pressurized state without stopping primary pressure. When refilling oil, make sure that the bowl is not pressurized before refilling. Check that the oil level in the bowl is between the upper and lower limits.
- Adjustment of the lubricator oil drip
 - Turn the adjusting screw to adjust oil drip. Check that the adjusting screw does not protrude past the body side. It is "dangerous" because the adjustment screw may pop out if it comes off.



For precautions regarding mounting, installation, adjustment, operation, and maintenance, please refer to the CKD Components Product Site(<https://www.ckd.co.jp/kiki/en/>) → 'model No.' → Instruction Manual.

Air Preparation Components

- F.R.L.
- Filter Regulator
- Filter
- Regulator
- Lubricator
- Drain Separator
- Mechanical Pressure SW
- Residual Pressure Exhaust Valve
- Slow Start Valve
- Antibacterial/Bacteria Removing Filter
- Ozone FR
- Siloxane/OzoneRemover
- Flame Resistant FR
- Oil-free Regulator
- Medium Pressure FR
- No copper/PTFEV Specification
- Air Unit Equipment
- Adapter Joiner
- Pressure Gauge
- Compact F.R.L.
- Large F.R.L.
- Precision Regulator
- Clean FR
- Electro-Pneumatic Regulator
- Air Booster
- Ending

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About Chemical Resistance of Plastics

- Warning

■ The chemical resistance of plastic parts is shown below.

■ Avoid using products in an atmosphere where chemicals are contained in compressed air or atmosphere, or where they could adhere to parts.

■ Use in the above state could lead to bowl damage and accidents.
- Avoid using with these chemicals or in an atmosphere containing these chemicals.

■ A metal bowl is available if these chemicals must be used.

Chemical resistance of plastic bowl/body

Use a metal bowl in an atmosphere containing the following chemicals.
Also, since some inspection liquids, sealants, and adhesives contain the following chemical components, please confirm when selecting.

Type of Chemical	Classification of Chemical	Main Chemical Products	General Usage Examples	Polycarbonate Bowl	Nylon Bowl	Nylon body
Inorganic Chemicals	Acid	Hydrochloric acid, sulfuric acid, hydrofluoric acid, phosphoric acid, chromic acid, etc.	Metal pickling solutions / Acidic degreasing solutions Coating treatment solution, etc.	x	x	x
	Alkaline	Alkalis such as caustic soda, caustic potash, calcium hydroxide, aqueous ammonia, sodium carbonate	Alkaline degreasing solution for metals Water-soluble cutting fluid, leak detection agent	x	○	○
	Inorganic Salts	Sodium sulfide, sodium nitrate, potassium dichromate, sodium sulfate, etc.		x	○	○
Organic Chemicals	Aromatic Hydrocarbon	Benzene, toluene, xylene, ethylbenzene, styrene, etc.	Contained in paint thinner (benzene, toluene, xylene)	x	x	x
	Chlorinated Aliphatic Group Hydrocarbons	Methyl chloride, Ethylene chloride, Methylene chloride, Acetylene chloride, Chloroform, Trichlene, Perchlorethylene, Carbon tetrachloride	Organic solvent-based washing solution for metals (trichlene, perchlene, carbon tetrachloride, etc.)	x	○	○
	Chlorinated Aromatic Group Hydrocarbons	Chlorobenzene, dichlorobenzene, benzene hexachloride (B/H/C), etc.	Pesticides	x	○	○
	Petroleum Components	Solvent naphtha, gasoline, kerosene		x	○	○
	Alcohol	Methyl alcohol, ethyl alcohol, cyclohexanol, benzyl alcohol	Used as an antifreeze agent Leak detection agent	x	x	x
	Phenol	Carbolic acid, cresol, naphthol, etc.	Disinfectant solution	x	x	x
	Ether	Methyl ether, methyl ethyl ether, ethyl ether	Additive for brake fluid	x	○	○
	Ketone	Acetone, methyl ethyl ketone, cyclohexanone, acetophenone, etc.		x	x	x
	Carboxylic Acid	Formic acid, acetic acid, butyric acid, acrylic acid, oxalic acid, phthalic acid, etc.	Dyes/oxalic acid for aluminum processing, phthalic acid for paint base and leakage detection agents	x	x	x
	Ester	Dimethyl phthalate (DMP)/diethyl phthalate (DEP), Dibutyl phthalate (DBP), dioctyl phthalate (DOP)	Lubricant, synthetic coolant, rust preventing agent additive plasticizer for synthetic resin	x	○	○
	Oxyacid	Glycolic acid, lactic acid, malic acid, citric acid, tartaric acid		x	x	x
	Nitro Compounds	Nitromethane, nitroethane, nitroethylene, nitrobenzene, etc.		x	○	○
	Amine	Methylamine, dimethylamine, ethylamine, aniline, acetanilide, etc.	Additive of brake oil	x	x	x
	Nitriles	Acetonitrile, acrylonitrile, benzonitrile, acetoisotrile, etc.	Raw material for nitrile rubber	x	○	○

○Mark : Usable X : Not available (Plastic will become damaged.)