CKD

SM－346543-A／1

INSTRUCTION MANUAL

The clean equipment

Modular design

SELEX F.R

Filter・Regulator

W※000-P70,P74 Series

Reverse・Filter・Regulator

W※100-P70,P74 Series

Air Filter

F※000-P70,P74 Series

Regulator

R※000-P70,P74 Series

Reverse・Regulator

R※100-P70,P74 Series

- Please read this instruction manual carefully before using this product, particularly the section describing safety.
- Retain this instruction manual with the Product for further consultation whenever necessary.

CKD Corporation

For Safety Use

To use this product safety, basic knowledge of pneumatic equipment, including materials, piping, electrical system and mechanism, is required (to the level pursuant to JIS B 8370 Pneumatic System Rules).

We do not bear any responsibility for accidents caused by any person without such knowledge or arising from improper operation.

Our customers use this product for a very wide range of applications, and we cannot keep track of all of them. Depending on operating conditions, the product may fail to operate to maximum performance, or cause an accident. Thus, before placing an order, examine whether the product meets your application, requirements, and how to use it.

This product incorporates many functions and mechanisms to ensure safety. However, improper operation could result in an accident. To prevent such accidents, **read this operation manual carefully for proper operation.**

Observe the cautions on handling described in this manual, as well as the following instructions:

⚠ **DANGER :** Failure to pay attention to DANGER notices may cause a situation that results in a fatality or serious injury and that requires urgent addressing.

⚠ **WARNING :** Failure to pay attention to WARNING notices may result in a fatality or serious injury.

⚠ **CAUTION :** Failure to pay attention to CAUTION notices may result in injury or damage to equipment or facilities.

※1)IS0 4414 :Pneumatic fluid power・・・Recommendations for the application of equipment to transmission and control systems.

※2)JIS B 8370:General rule for pneumatic systems

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The clean equipment

Modular design

1. Design & Selection

⚠ WARNING

1) Use within the product's specification range.
The product in this catalog is designed for use only in a compressed air system. Use within pressures or temperatures exceeding the specification range may result in damage or operation faults.(Refer to specification)
Contact CKD before using fluids other than compressed air.
2) Avoid installing this product in rain, water or direct sunlight.
3) The ultraviolet rays don't use in the place to irradiate directly.
4) Do not use this product in a corrosive environment.
Use in such an environment could lead to damage or operation faults.
5) Consult with CKD if ozone is generated in supply air. An ozone-resistant series is available.
6) If the ambient temperature is less then 5 ℃, moisture in the circuit could freeze and lead to operation faults, etc. Remove moisture to prevent freezing.
7) Avoid using this product in environments was ozone is generated.
8) Air filter plastic bowl and pressure gauge lens
These parts are partly made of polycarbonate, and cannot be used in environments containing synthetic oil, organic solvents, chemicals, coolant, screw locking magnet, leak detection solutions or hot water, etc., or possible exposure to these substances.
Refer to page 11 for details on bowl chemical resistance.
9) 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.
10) The regulator cannot process residual pressure (remove secondary pressure) when primary pressure is released. Use a regulator with check value when residual pressure must be processed.
11) There are cases when the regulator cannot be used for secondary side sealing circuits or balance circuits. Consult CKD for these types of application.
12) Make sure that the piping load or torque is not applied on the body or piping.

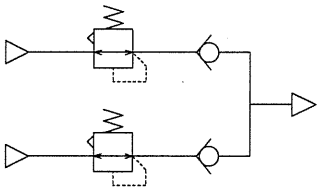
	2000 Series	3000·4000 Series	6000 Series
Max. torque N·m	30	50	100

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

Do not install the product in a place listed below.
Excessive vibration or impact exists.
The ambient temperature is beyond a range of 5°C - 50°C.
The air may be frozen.
The water drop or coolant is splashed onto the product.
The humidity is high and the temperature changes largely, causing dew condensation.
Sea breeze or seawater is splashed onto the product.

CAUTION

1) Confirm that the product will withstand the working environment.
2) Familiarize yourself with the use of compressed air before designing the pneumatic circuit.
3) Indicate the maintenance conditions in the device's instruction manual.
4) Small leaks that do not affect performance are tolerated because this product is used with compressed air. Contact CKD when no leaks are tolerable.
5) Large drainage
   Install the air dryer and drain separator before the air filter.
   If there is a large amount of drainage from the compressor, hot and highly humid air could shorten the device life or result in corrosion.
6) Dry air
   Rubber parts for the regulator could deteriorate quickly, so use of a fluorine rubber value assembly is recommended. Consult CKD when required.
7) Water-lubricated compressor circuit
   Make sure that chlorine-based substances, etc., do not enter compressed air.
8) Set secondary side pressure of the regulator to 85% or less of the primary side, or else the pressure drop could increase.
9) Consult with CKD if an automatic drain is required.
10) When using regulators in parallel as shown right, 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.



1) This product cannot be used in environments where functional obstacles could occur. Such environments include those reaching high temperatures, having a chemical atmosphere, or involving the pressure of chemicals, vibration, humidity, moisture, coolant, or gas or where ozone is generated.
2) The same functions as mechanical, hydraulic, and electrical methods cannot be anticipated if instantaneous service interruption and holding are required during an emergency stop.
   Pop-out, air discharge, or leakage due to air compression and expansion could occur. Design the circuit so that compressed air in the system can be discharged.
3) The product's function can drop markedly with working status, working environment, and maintenance, and can prevent safety from being attained. With correct maintenance, the product functions can be used to the fullest.

2. 1 Installation & Adjustment

⚠ CAUTION

1) Open the product in a clean room.
The product is packaged in a clean room, and should be the opened just before piping it in the clean room.

2) Check the arrow indicating the air inlet before connecting. A reverse connection could result in improper operation.

3) Pipe screw-in torque
Make sure that excessive torque is not applied on the body and piping when piping.

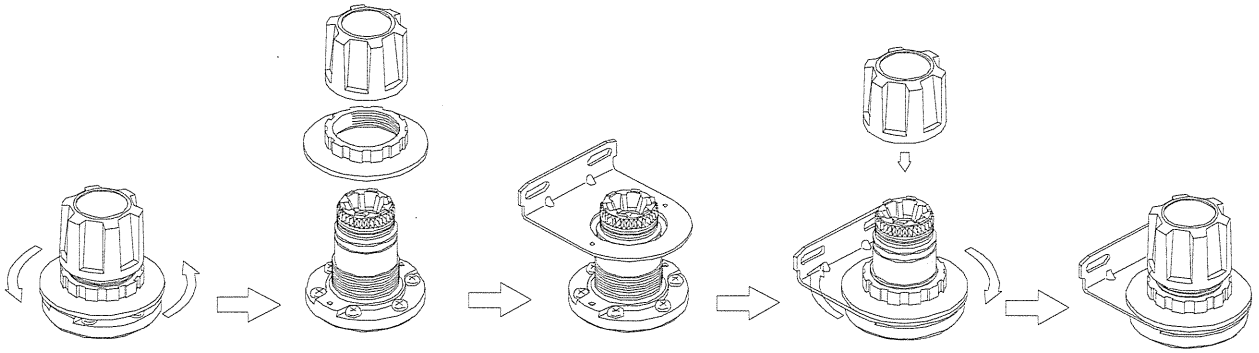
	2000 Series	3000·4000 Series	6000 Series
Max. torque N·m	15	30	70

4) When the panel-installing nut is loosened, the nut acts as a jack and allows the knob to be removed easily. Fix the nut to install in the panel. (When the L-type bracket is used, the body can be fixed securely.

5) Piping the polycarbonate bowl drain
Fix the cock's hexagonal face before screwing the joint, etc., into an Rc1/8 female thread component.

1) Check the exterior of the product for damage. Before starting operation, thoroughly read this instruction manual, as well as that supplied with the product.

4) In case of using L shape bracket (optionally accompanied), refer to the figures below for attaching the bracket. {Applicable to regulator and filter-regulator only.}



⚠ CAUTION

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

7) Regulator

Lightly tighten (0.6N · m or less) set screws for the embedded pressure gauge G401-OP, G401 and gauge plug.

When installing the pressure gauge with a safely mark on the gauge plug , or when installing a general screw-in pressure gauge, tighten with a torque of 10 to 15 N · m or less.

8) Drain with pressure detection port

F6000-□-Q · M6000-□-Q

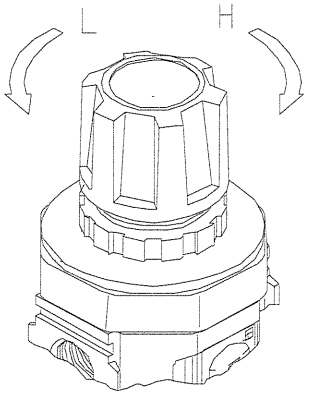
A drain with pressure detection port is available as an option for the F6000 and M6000 types.

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

6) Secondary side pressure adjustment (Regulator and Filter-regulator)

It unlocks the adjusting knob when it is pulled fully up.Turning the knob to the direction of H marking on the top of tke knob raises the secondary pressure higher while it lowers when the knob is turned toward L. After setting secondary pressure, push the knob down to have it locked.

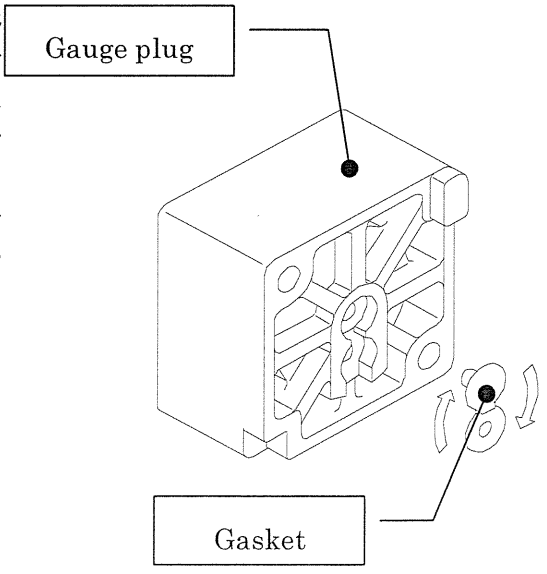
Do not move or swing the product holding the adjustment knob on the regulator.



7) Mounting a pressure gauge of Rc1/4

To mount the gauge onto the unit which is without gauge due to being option "T", take off the gauge plug and turn a gauge gasket on rear side of plug up side down so as to have pressure pass through the plug. Apply turning torque of pressure gauge 1.5N · m or less.

To take gauge plug off, remove four mo-unting screws using a cross cut tip screw driver (Nominal No.1). Applicable tighte-ning torque of screw is 0.6 N · m.

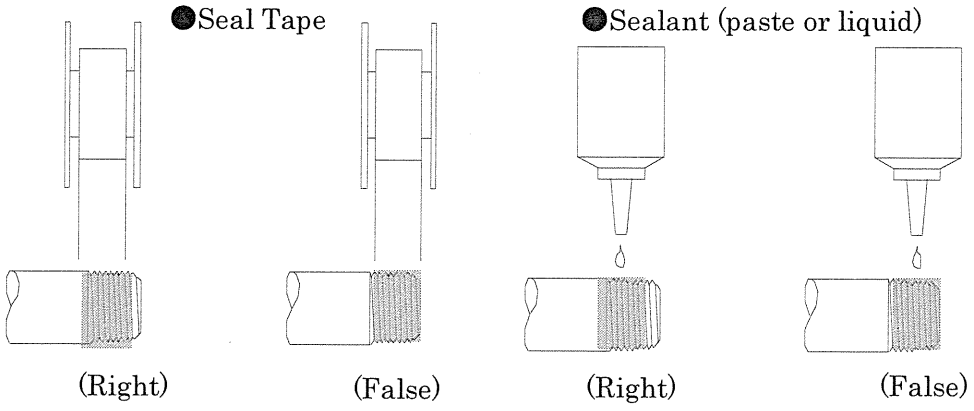


2.2 Piping

CAUTION

1) Do not remove the pneumatic component package or the piping port seat cap until just before piping the product.
2) When connecting pipes, wrap sealing tape in the opposite direction from threads starting 2mm inside from the end of piping threads.
3) Check that that pipe connected to the pneumatic component is not dislocated due to vibration, loosening, or pulling.
4) Do not install pneumatic components with a method that supports with pipes.
5) Ensure space around the pneumatic component for installation, removal, wiring, and piping work.
6) Pipe so that piping connection does not deviate by the device's movement, vibration, tension, etc.
7) Check that foreign matter, which enters during piping, does not enter pneumatic components.

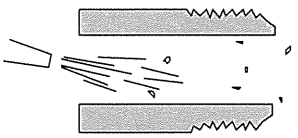
1) If the piping port cap is removed from the piping port before piping work is started, foreign matter could enter the pneumatic component from the piping port and result in faults or faulty operation.
2) If sealing tape protrudes from pipe threads, if could be cut when screwed in. This could cause the tape to enter the solenoid valve and lead to faults. When using a liquid sealant, check that it does not adhere to the plastic bowl, because it could damage the plastic bowl and cause a hazard.



3) Piping dislocation generates a hazardous state.

CAUTION

8) Flush air into the pipe to blow out foreign substances and chips before piping.



9) When supplying compressed air for the first time after connecting pipes, do not apply high pressure suddenly.

10) After connecting piping, check pipe connections for air leaks before supplying compressed air.

11) Tighten pipes with the appropriate torque.

12) Do n

ot remove the dust-proof seal on the piping port until just before piping the product.

8) Foreign matter entering during piping must not enter pneumatic components.

9) Piping connection could be dislocated or the piping tube fly off, leading to accidents.
Caution: If compressed air is supplied too slowly, sealing pressure may not be generated by the sealing mechanism in the solenoid valve. This can lead to air leaks.

10) Apply a leakage detection agent on pipe connections with a brush, and check for air leaks. Check that that the leak detection agent does not get on the plastic bowl because the plastic bowl could break and cause a hazard.

11) Pipes must be connected with the appropriate torque to prevent air leakages and screw damage.
First tighten the screw by hand to prevent damage to screw threads, then use a tool.
[Recommended value]

Thread size	Tightening torque (N·m)
M5	1 to 1.5 (Only R2※00 is 0.2 to 0.3)
Rc1/8	3 to 5
Rc1/4	6 to 8
Rc3/8	13 to 15
Rc1/2	16 to 18
Rc3/4	19 to 40
Rc1	41 to 70

12) If the seal is removed from the piping port before piping work is started, foreign matter could enter and result in faults or faulty operation.

3. Maintenance

WARNING

1) Check the air filter plastic bowl for cracks, damage, and other deterioration.
Cracks, damage or other deterioration could result in breakage, so if found replace with a new bowl.
2) Check the air filter plastic bowl for contamination.
3) Drain the drainage so that drainage does not accumulate past the upper limit of the air filter. The components could be damaged if the drainage flows to the secondary side.
4) Removing the filter bowl
Stop the compressed air, completely discharge pressure in the bowl, and confirm that there is no residual pressure before removing the bowl.

2) If parts are heavily contaminated or if transparency has dropped, replace with a new bowl.
Use a diluted neutral household detergent to wash parts, and then rinse well with clean water. Use of other agents could result in breakage.

4) Removing the filter bowl
Shut off the compressed air. Verify there is no pressure exists inside of the unit then the bowl away.

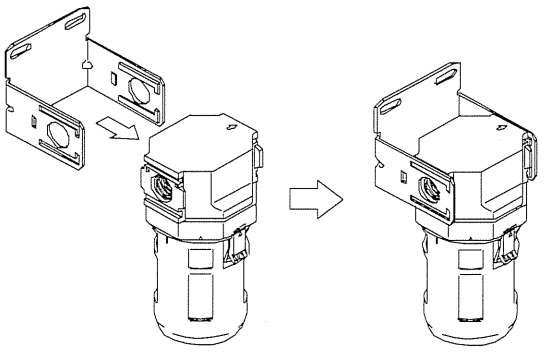
a) Turn the bowl for approx.45° either direction (till Δ marking on the latch meets Δ marking on the body) while pressing a latch.
b) Pull it down. Both bowl and bowl guard come off together.
c) Follow reversed sequence of steps to assemble it back.
d) Before pressurize the system, verify that the latch fits in the indentation of body firmly.

⚠ CAUTION

1) The pneumatic component must be disassembled and assembled by a qualified worker.
2) Read the relevant product instruction manual thoroughly and fully familiarize yourself with work before disassembling or assembling the pneumatic component.
3) Before servicing the product, turn power OFF, stop the compressed air supply, and check that there is no residual pressure.
4) Air quality
Use a CKD clean air system as designated for the application. Use compressed air that does not contain oxidized oil, tar, carbon, etc., from the air compressor. Use compressed air that does not contain solid foreign matter.
5) 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 releasing the lock.
6) Sub-micron 0.3 μ m filter
This filter cannot be washed and reused. When the pressure drops to 0.07MPa, replace the filter with new one.
7) W3000 to W4000 elements
The valve assembly can be removed, so inspect it also during maintenance. Take care not to lose springs, etc., during maintenance.

1) Personnel involved in this step must have passed the Pneumatic Pressure Skill Test Class 2 or higher.
2) Personnel must be fully familiar with pneumatic component structure and operational principles and safety requirements.
3) This is a requirement for ensuring safety. Do not release residual pressure inside the clean room.

In case of using C shape bracket (optionally accompanied), attach it to the unit before piping. Refer to the following figures for attaching the bracket.



Slide C shape bracket sideway making its projected rail matching with the grooved rail on the unit.

4 Chemical resistance of plastic

⚠ WARNING Chemical resistance of plastic

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 there types of chemicals or in an atmosphere containing these chemicals.
A metal bowl is available if these chemicals must be used.
Check whether the testing solutions, sealing agents and adhesives contain the following chemicals.

Types of chemicals	Classification	Major chemical products	General example	Polycarbonate	Nylon
Inorganic product	Acid	Hydrochloric acid, sulfuric acid, hydrofluoric acid, phosphoric acid, chromic acid, etc.	Pickling fluid for metal, acidic degreasing fluid, film treatment fluid	×	×
	Alkali	Alkali materials such as caustic soda, caustic potash, slaked lime, aqueous ammonia, sodium carbonate.	Water-soluble machining oil, leakage detecting agent	×	○
	Inorganic salt	Sodium sulfide, potassium nitrate, potassium dichromate, sodium sulfate, etc	Plating	×	○
Organic chemical	Aromatic Hydro-carbon	Benzene, toluene, xylene, ethyl-benzene, styrene, etc	Included in paint thinner.	×	×
	Chlorinated aliphatic hydro-carbon	Methyl chloride, ethylene chloride, methylene chloride, acetylene chloride, chloroform, trichlene, berklene, carbon tetrachloride	Organic solvent cleaning fluid for metal	×	○
	Chlorinated hydro-carbon	Chloro-benzene, dichloro-benzene, Hexachloro-ethane(B-H-C), etc.	Agricultural chemical	×	○
	Petroleum composition	Solvent naphtha, gasoline, kerosene	Degreasing for metal	×	○
	Alcohol	Methyl alcohol, ethyl alcohol, cyclohexanol, benzyl alcohol	Used in anti-freeze leakage detecting agent	×	×
	Phenol	Carbolic acid, cresol, naphthol, etc	Material for disinfection liquid	×	×
	Ether	Methyl ether, methyl ethyl ether, ethyl ether	Additive for brake fluid	×	○
	Ketone	Acetone, methyl ethyl ketone, cyclohexanone, acetophenone, etc		×	×
	Carboxylic acid	Formic acid, acetic acid, butyl acid, acrylic acid, oxalic acid, phthalic acid, etc	Aluminum treatment, paint-based material, leakage detecting agent	×	×
	Ester	Dimethyl phthalate(DMP),diethyl phthalate (DEP) dibutyl phthalate (DBP), dioctyl phthalate(DOP)	Additive for lubrication oil, synthetic hydraulic oil, rust preventive oil	×	○
	Hydroxy acid	Glycol acid, lactic acid, malic acid, citric acid, tartaric acid	Additive for food	×	×
	Nitro compound	Nitro methane, nitro ethane, nitro ethylene, nitro benzene		×	○
	Amine	Methyl-amine, dimethyl-amine, ethyl-amine, aniline, acetanilide, etc.	Additives for brake fluid, anti-static agent, dye for plastics	×	×
	Nitrile	Acetonitrile, acrylonitrile, benznitrile, acetisonitrile, etc	Raw material for nitrile rubber	×	○

5. The characteristic of the product

P70 series

1. The exhaust processing is possible.
   To make exhaust processing possible, it is equipped with the installation port (M5) with the standard to all the models to the relieving port of regulator or filter-regulator.
   It is possible for surplus air to exhaust to the outside of the clean room.

2. Low-dust grease is used.
   P70 series is using the low-dust grease. It makes a minimum suppress the pollution of the clean room.

3. Clean packed
   The product is packed in an electrostatic-discharge-proof (ESD-proof) bag at a clean bench.

P74 series

1. Copper, silicon, and halogen-based materials (fluorine, chlorine, oxalic) not used.

Refer to the catalog (catalog No. CB-033 (Pneumatic components for clean room Specification)) about the individual things of specification, form, the characteristic, the outside dimension.