



Pneumatic components (clean filter/clean exhaust filter/regulator)

# Safety precautions

Always read this section before use.

Refer to pages 764, 765 for pneumatic components general precautions.

Clean filter/clean exhaust filter/clean regulator series

## Design & selection

### 1. COMMON

#### ⚠ WARNING

- Use this product in accordance with the specifications range.
- This product is designed for industrial use. Do not use it in medical or human life related devices and circuits.

### 2. FCS Series

#### ⚠ WARNING

- Do not use this product in an atmosphere containing organic solvents or chemicals, etc., or where the product could come in contact with them. Not observing this could damage the polyamide housing.
- Use the stainless steel model in these environments.

#### ⚠ CAUTION

- Check the working circuit and working fluid.  
To prevent drop in filter performance, install dryer, air filter and oil mist filter on the primary side, and remove water or oil.
- Do not exceed max. working or differential pressure.  
Not observing this could damage the product or element membrane.
- Do not flow over the max. flow rate.  
Not observing this could degrade the filtration accuracy or damage element membrane.
- This device cannot be used as an absolute filter.  
FCS500 filtration is 99.99% within specified conditions. Do not use the product if foreign matter must strictly be kept out (e.g., direct blowing on wafers).
- Do not use where IN and OUT side pressure difference exceeds 0.1 MPa.  
Supplying air suddenly to the filter by blowing air with secondary side released to atmospheric pressure, etc., could make removal inefficient. Install a restriction valve on the filter's IN side to make the pressure difference 0.1 MPa or less.
- Alcohol is used in the manufacturing line of some parts of the product.

### 3. FAC Series

#### ⚠ WARNING

- Piping, load torque  
If lateral load or torque is applied to the body and piping when connecting pipes, piping part may be damaged, so use within required torque. Do not apply the lateral load for FAC10.

	FAC100	FAC200	FAC3000
Max. torque N·m	15	50	50

#### ⚠ CAUTION

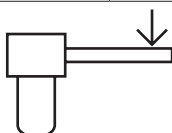
- Check the working circuit and working fluid.  
Install dryer, air filter and oil mist filter on the pneumatic pressure source side, and remove water and oil.
- Water droplets cannot be removed.  
The hydrophobic element membrane does not circulate when not pressurized. When pressurized, water flows to the discharge side.
- Use the product within max. working pressure and working temperature range.  
If any sources of heat are present near devices, check that the product's operating ambient temperature is not exceeded. Not observing this could damage the product or element membrane.
- Do not flow over the max. flow rate.  
Calculate the treating flow rate of solenoid valve and actuator, and select the model with the flow rate less than max. flow rate. Circulating air exceeding the max. flow rate could reduce the cleanness of exhaust air and damage the element membrane.
- Install where the device is not adversely affected by flying dust.
- Do not install where exhaust air blows directly onto the workpiece, etc.  
Contact CKD when using this device for filtering.
- In case of common piping, solenoid valve may malfunction due to back-flow. If this occurs, attach a check valve to prevent back-flow.  
Refer to the flow characteristics table in the catalog to check the relationship of the processing flow rate and primary side pressure, and use the range and circuit that are not affected by back-flow on the primary side.
- Do not use a clean exhaust filter if the supplied pressure is more than 0.1 MPa.  
If compressed air of 0.1 MPa and over is supplied to a clean exhaust filter, the removal efficiency may become lower.
- Alcohol is used in the manufacturing line of some parts of the product.

## 4. RC2000/2619

### ⚠ WARNING

- Output pressure exceeding the regulator's set pressure could result in damage or faulty operation of the secondary side devices. Be sure to install a safety device.
- As the regulator may not always be usable with the secondary side sealed circuit or balance circuit, consult with CKD.
- Piping, load torque  
Avoid applying piping load or torque to the body or pipes.

	Rc1/8, Rc1/4	Rc3/8, Rc1/2, Rc3/4	Rc1 and over
Max. torque N·m	15	50	100



## Mounting / Installation / adjustment

### 1. COMMON

### ⚠ CAUTION

- Open the package in a clean room.  
The product is packaged in a clean room. It is recommended that the package is opened immediately before making the piping in the clean room.
- Install the product avoiding direct sunlight.
- Flush and clean the pipes.  
Dirt or foreign materials in piping will lower product performance.
- Make sure that no foreign matter enters the pipes when connecting the pipes and fittings.  
When screwing in piping or fittings, check that swarf from port threads or sealant does not get inside. Dirt or foreign matter remaining in the piping will deteriorate product performance.
- Match the flow direction and the direction of the arrow on the product for correct connection.  
The RC2000 does not operate correctly if installed in reverse. With the FCS Series/FAC Series, service life is shortened.
- Securing of maintenance space  
Secure sufficient space for maintenance and inspection.
- Do not install this product in a location where it may be subject to vibrations or shocks.
- 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.

### ⚠ CAUTION

- Check the working circuit and working fluid.  
Circulating fluids containing solids or non-specified fluids could cause malfunctions. Connect a filter to the product's primary side so that solid matter does not enter.
- Pulsation may occur depending on the working conditions or piping conditions.  
Lower primary pressure if pulsation occurs.
- When the primary pressure is released, the secondary pressure flows to the primary side.  
If a problem occurs in another device due to the inflow of secondary-side fluid to the primary side, provide a circuit to retain the pressure.
- The setting range for the regulator's secondary side pressure should be within 85% of that of the primary side. Otherwise, the pressure drop may increase.

### ■ Water-lubricated compressor circuit

Take measures to prevent chlorine-based substances from entering the compressed air.

### 2. FCS Series

### ⚠ CAUTION

- Pipe so no excessive force is applied to the product.  
When piping or installing, do not apply tension, pressure, bending or external force from tube, etc.
- Select correct piping tube.  
Use CKD's soft nylon tube and urethane tube.  
Contact CKD for other fluorine resin tube, etc.
- Securely insert a tube into the push-in fitting before use.
- Use the tang of the connection part when piping.  
In case of R thread or Rc thread piping, put the wrench across the tang of the connection part. Do not put it on any other part when tightening.
- Apply appropriate torque when connecting pipes.

Connecting thread	Tightening torque N·m
M5	1 to 1.5
Rc1/8, R1/8	3 to 5
Rc1/4, R1/4	6 to 8
Rc3/8, R3/8	13 to 15

SCPD3
SCM
SSD2
MDC2
SMG
LCM
LCR
LCG
LCX
STM
STG
STR2
MRL2
GRC
Cylinder Switch
MN3E
MN4E
4GA/B
M4GA/B
MN4GA/B
F.R.(module unit)
Clean F.R
Precision R
Press gauge
Diff. press gauge
Electro-pneumatic R
Speed controller
Auxiliary valve
Fitting/tube
Clean air unit
Pressure sensor
Flow rate sensor
Valve for air blow
Ending

## Mounting / Installation / adjustment

### CAUTION

- When supplying compressed air after connecting pipes, do not apply high pressure suddenly.  
Connected piping could be dislocated and tubing could fly off.
- When using male thread piping for both IN and OUT sides, confirm that piping does not apply a lateral load or bending torque during installation.  
Not doing so could cause leaking.

### 3. FAC Series

### CAUTION

- Do not apply excessive force to the product when connecting piping.  
When piping, do not apply tension, pressure, bending, other forces from the pipe.
- Apply adequate torque when connecting pipes.  
(Below table is torque recommended value)

Port thread	Tightening torque N·m
R1/8	3 to 5
R1/4	6 to 8
R3/8, Rc3/8	13 to 15
R1/2, Rc1/2	16 to 18

- Tighten the hexagonal face when piping. (FAC100, FAC200)
- The direct mounting of individual wiring manifold of M4GA/M4GB Series supports direct connection.  
Mask the port P on the port R side with FAC mounted and supply air from the port P on the opposite side.

Model No.	FAC100	FAC200
M4GA1	○	
M4GA2	○	
M4GB2	○	
M4GA3		○
M4GB3		○

- Direct connection of discrete and direct mounting to DIN rail is not possible.
- Note that the external dimensions of FAC are larger than those of the bottom of manifold base.

### 4. RC2000

### CAUTION

- Open the package in a clean room.  
This product is packed in a double layer in a cleanroom.  
Open the first layer and take the product into the cleanroom.  
Open the second layer just before piping.
- When the panel mounting nut is loosened, the nut functions as a jack and enables the knob to be removed easily. Install the nut before installing the knob.

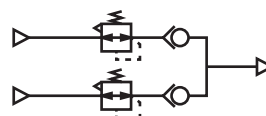
### 5. RC2000/2619

### CAUTION

- Use proper torque to tighten the pipes when connecting them.  
(The right table shows recommended tightening torque)

Port thread	Tightening torque N·m
M5	1.0 to 1.5
Rc1/8	3 to 5
Rc1/4	6 to 8
Rc3/8	13 to 15
Rc1/2	16 to 18

- Use a pressure gauge and pipe plug to block the pressure gauge connection port.
- When using regulators in parallel as shown below, do not use the OUT side as a closed circuit. If a closed circuit is required, install a check valve on OUT face of each regulator.



## During use & maintenance

SCPD3
SCM
SSD2
MDC2
SMG
LCM
LCR
LCG
LCX
STM
STG
STR2
MRL2
GRC
Cylinder Switch
MN3E MN4E
4GA/B
M4GA/B
MN4GA/B
F.R.(module unit)
<b>Clean F.R</b>
Precision R
Press.gauge Diff.press.gauge
Electro-pneumatic R
Speed controller
Auxiliary valve
Fitting/tube
Clean air unit
Pressure sensor
Flow rate sensor
Valve for air blow
Ending

### 1. COMMON

#### ⚠ WARNING

- Prevent the generated ozone from passing through the filter. Otherwise the filter element may be degraded. Take care especially when using an ozone generator (e.g., ionizer) together.
  - (1) Do not install it in the upstream of the filter.
  - (2) When installing it in the downstream of the filter, stop air while static electricity is neutralized since generated ozone may flow back.

- Check the filter periodically and replace it if necessary.

#### ⚠ CAUTION

- Do not disassemble or modify the products.
- Stop fluid supply and confirm that no residual pressure exists before starting maintenance.
- Read instructions and precautions enclosed with the product before use or maintenance.
- Storage
 

Do not store this product in a hot, humid atmosphere or atmospheric conditions outside of the specified range for a prolonged period of time. Resin or rubber parts could deteriorate, and the resin element housing could become discolored. Contact CKD before storing the product outside of the specified range.

### 2. FCS Series

#### ⚠ CAUTION

- Clogging will decrease performance, so inspection or maintenance, or components regularly. (FCS500 Series cannot be replaced.)
- Check the resin for cracks, damage, and other deterioration periodically.
 

Cracks, damage or other deterioration could result in breakage, so if found, replace with a new product or Stainless Steel type.
- While operating, do not apply vibration, impact, or other external force from tube.

### 3. FAC Series

#### ⚠ WARNING

- Do not use this product in an atmosphere containing organic solvents or chemicals, etc., or where the product may come in contact with these substances. The polycarbonate housing may be damaged.

- Do not use this product where electrostatic discharge could occur.

- Be sure to securely insert FAC10 into the push-in fitting before use.

#### ⚠ CAUTION

- Clogging will decrease performance, so inspection or maintenance, or components regularly.

### 4. RC2000/2619

#### ⚠ CAUTION

- Release the lock before adjusting pressure.
 

Turning a locked pressure adjustment knob could cause damage.
- Adjust pressure in the direction of pressure increase.
 

The correct pressure cannot be set if pressure is adjusted downward.
- The nonrelief cannot be depressurized until the secondary side is spent.
- 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.