




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

# Safety precautions

Be sure to read this section before use.

Refer to Intro Page 63 for general precautions regarding pneumatic components and refer to “ Safety precautions” for detailed precautions for individual series.

Product-specific cautions: Clean filter/clean exhaust filter/clean regulator Series

## Design/selection

### 1. Common

#### WARNING

- Use the product in the range of conditions specified for the product.
- This product is designed for industrial use. Do not use for medical purposes, or in any equipment or circuit that concerns human life.

### 2. FCS 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. 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 the dryer, air filter and oil mist filter on the primary side, and remove water or oil.
- Do not exceed maximum working or differential pressure.  
Not observing this could damage the product or element membrane.
- Do not flow over the max. processing flow rate.  
Doing so may degrade the filtration accuracy and damage the element membrane.
- This device cannot be used as an absolute filter.  
Filtration accuracy of FCS500 is 99.99% within specified conditions.  
Do not use for applications where foreign matter is absolutely prohibited (e.g., direct blowing on wafers).
- Do not use where the IN/OUT pressure differential exceeds 0.1 MPa.  
Suddenly supplying air to the filter by blowing air with secondary side released to atmospheric pressure, etc., could make removal inefficient. In this case, install a restriction valve on the filter's IN side to keep the pressure difference to 0.1 MPa or less.
- Alcohol is used in the manufacturing line of some parts of this product.

### 3. FAC Series

#### WARNING

- Piping load torque  
If load or torque is applied to the body and piping when connecting pipes, the piping part may be damaged, so use the product within required torque.  
Do not apply lateral load to 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 source side to remove water and oil.
- Water droplets cannot be removed.  
The hydrophobic element membrane does not circulate non-pressurized water. When pressurized, water flows to the discharge side.
- Use the product within maximum working pressure and working temperature ranges.  
If any sources of heat are present near devices, check that the product's working temperature range is not exceeded. Not observing this could damage the product or element membrane.
- Do not flow over the max. processing flow rate.  
Calculate the processing flow rate of solenoid valve and actuator, and select a model not exceeding the maximum processing flow rate. Circulating air exceeding the max. processing 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.
- For common piping, the 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 within a 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 or over is supplied to a clean exhaust filter, removal efficiency may suffer.
- Alcohol is used in the manufacturing line of some parts of this product.

F.R.L.  
F.R.  
F (Filtr)  
R (Reg)  
L (Lub)  
Drain  
Separ  
Mech  
Press SW  
Res press  
exh valve  
SlowStart  
Anti-bac/Bac-  
remove Filtr  
Film  
Resist FR  
Oil-ProhR  
Med  
Press FR  
No Cu/  
PTFE FRL  
Outdrs FRL  
Adapter  
Joiner  
Press  
Gauge  
CompFRL  
LgFRL  
PrecsR  
VacF/R  
Clean FR  
ElecPneuR  
AirBoost  
Speed Ctrl  
Silncr  
CheckV/  
other  
Fit/Tube  
Nozzle  
Air Unit  
PresCompn  
Electro  
Press SW  
ContactSW  
AirSens  
PresSW  
Cool  
Air Flo  
Sens/Ctrl  
WaterRISens  
TotAirSys  
(Total Air)  
TotAirSys  
(Gamma)  
Gas  
generator  
RefrDry  
DesicDry  
HiPolymDry  
MainFiltr  
Dischrg  
etc  
Ending

# Clean filter/regulator Series

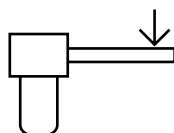
F.R.L.  
F.R.  
F (Filtr)  
R (Reg)  
L (Lub)  
Drain  
Separ  
Mech  
Press SW  
Res press  
exh valve  
SlowStart  
Anti-bac/Bac-  
remove Filtr  
Film  
Resist FR  
Oil-ProhR  
Med  
Press FR  
No Cu/  
PTFE FRL  
Outdrs FRL  
Adapter  
Joiner  
Press  
Gauge  
CompFRL  
LgFRL  
PrecsR  
VacF/R  
Clean FR  
ElecPneR  
AirBoost  
Speed Ctrl  
Silncr  
CheckV/  
other  
Fit/Tube  
Nozzle  
Air Unit  
PrecsCompn  
Electro  
Press SW  
ContactSW  
AirSens  
PresSW  
Cool  
Air Flo  
Sens/Ctrl  
WaterRtSens  
TotAirSys  
(Total Air)  
TotAirSys  
(Gamma)  
Gas  
generator  
RefrDry  
DesicDry  
HiPolymDry  
MainFiltr  
Dischrg  
etc  
Ending

## 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.

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



### 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.
- Pulsations may occur depending on the usage conditions and piping conditions.  
If pulsation is generated, lower the primary side pressure or restrict the secondary line.
- 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.
- If left for a long time with the primary pressure released, pulsation may be generated depending on the working and piping conditions.

## Mounting, installation and adjustment

### 1. Common

#### CAUTION

- Open the package in a cleanroom.  
This product is packed in a cleanroom. The package should be opened just before piping in the cleanroom.
- Install the product where it is not exposed to direct sunlight.
- Flush and clean the pipes.  
Dirt or foreign matter remaining in the piping will deteriorate 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 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.

- Water-lubricated compressor circuit  
Take measures to prevent chlorine-based substances from entering the compressed air.

### 2. FCS Series

#### CAUTION

- Perform piping so no excessive force is applied to the product.  
When piping or installing, do not apply tension, compression, bending or external force from tubes, etc.
- Select the appropriate piping tube.  
Use the CKD soft nylon tube and the urethane tube.  
Contact CKD regarding other fluorine resin tube, etc.
- Securely insert a tube into the push-in fitting before use.
- Use the width across flats of the connection part when piping.  
In the case of R thread or Rc thread piping, apply the wrench to the width across flats of the connection part. Do not apply it to any other part when tightening.
- Use appropriate torque to tighten the pipes when connecting them.

Port 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

## Mounting, installation and adjustment

### ⚠ CAUTION

- When supplying compressed air after connecting pipes, do not suddenly apply high pressure. Connected piping could be dislocated and tubing could fly off.
- When using male thread piping for both IN and OUT sides, confirm that the piping does not apply lateral load or bending torque during installation. Otherwise, leakage may occur.

### 3. FAC Series

### ⚠ CAUTION

- Do not apply excessive force to the product when connecting the piping. When piping, do not apply tension, compression, bending or other forces from the piping.
- Use appropriate torque to tighten the pipes when connecting them. (The following table shows the recommended torque values.)

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

### 4. RC2000

### ⚠ CAUTION

- Open the package in a cleanroom.  
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 acts as a jack and enables the knob to be removed easily. Install the nut before installing the knob.

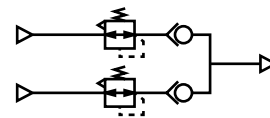
### 5. RC2000/2619

### ⚠ CAUTION

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

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 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.



F.R.L.
F.R.
F (Filtr)
R (Reg)
L (Lub)
Drain Separ
Mech Press SW
Res press exh valve
SlowStart
Anti-bac/Bac-remove Filtr
Film Resist FR
Oil-ProhR
Med Press FR
No Cu/ PTFE FRL
Outdrs FRL
Adapter Joiner Press Gauge
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneuR
AirBoost
Speed Ctrl
Silncr
CheckV/ other
Fit/Tube
Nozzle
Air Unit
PresCompn
Electro Press SW
ContactSW
AirSens
PresSW Cool
Air Flo Sens/Ctrl
WaterRISens
TotAirSys (Total Air)
TotAirSys (Gamma)
Gas generator
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending

## Use/maintenance

F.R.L.  
F.R.  
F (Filtr)  
R (Reg)  
L (Lub)  
Drain  
Separ  
Mech  
Press SW  
Res press  
exh valve  
SlowStart  
Anti-bac/Bac-  
remove Filtr  
Film  
Resist FR  
Oil-Prohr  
Med  
Press FR  
No Cu/  
PTFE FRL  
Outdrs FRL  
Adapter  
Joiner  
Press  
Gauge  
CompFRL  
LgFRL  
PrecsR  
VacF/R  
Clean FR  
ElecPneR  
AirBoost  
Speed Ctrl  
Silncr  
CheckV/  
other  
Fit/Tube  
Nozzle  
Air Unit  
PrecsCompn  
Electro  
Press SW  
ContactSW  
AirSens  
PresSW  
Cool  
Air Flo  
Sens/Ctrl  
WaterRtSens  
TotAirSys  
(Total Air)  
TotAirSys  
(Gamma)  
Gas  
generator  
RefrDry  
DesicDry  
HiPolymDry  
MainFiltr  
Dischrg  
etc  
Ending

### 1. Common

#### ⚠ CAUTION

- Do not disassemble or modify the product.
- Before conducting maintenance, stop the supply of the fluid and make sure that there is no residual pressure.
- Read the 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 when storing products exceeding specifications.

### 2. FCS Series

#### ⚠ 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) in combination.  
(1) Do not install in the upstream portion of the filter.  
(2) When installing downstream of the filter, stop air while static electricity is neutralized since generated ozone may flow back.
- Check the filter periodically and replace if necessary.

#### ⚠ CAUTION

- Clogging will decrease performance, so inspect and replace components regularly. (The FCS500 Series cannot be replaced.)
- Perform periodical inspections to check for cracks, scratches and other degradation of the transparent resin parts.  
Replace with a new product or SUS type if you find any damage.
- While operating, do not apply vibration, impact, tube flow, or other external force.

### 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.
- Do not use this product in an ozone generating environment.
- Securely insert the FAC10 into the push-in fitting before use.

#### ⚠ CAUTION

- Clogging will decrease performance, so inspect and replace components regularly.

### 4. RC2000/2619

#### ⚠ CAUTION

- Release the lock before adjusting the pressure.  
Forcibly turning a locked pressure adjustment knob could cause damage.
- Adjust pressure in the direction of the pressure increase.  
The correct pressure cannot be set if pressure is adjusted downward.
- Pressure reduction is not possible without consumption on the secondary side.
- The set pressure changes from the initial set point due to the working environment and conditions, as well as aging of part materials. Check the pressure regularly, and reset if conditions have changed.