



Pneumatic components (F.R.L. unit (precision))

# Safety Precautions

Be sure to read this section before use.

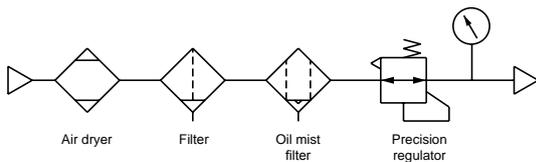
Refer to Intro Page 63 for precautions for general pneumatic components.

Product-specific cautions: Precision regulator RP1000/2000 Series

## Design/selection

### ⚠ WARNING

- Use the product in the range of conditions specified for the product.
- Working fluid must be clean air from which solids, water and oil have been sufficiently removed using a dryer, filter and oil mist filter. Never supply oiled air.  
As well, when secondary side pressure, etc., is turned OFF, air on the secondary side will pass through the regulator and be discharged from the EXH port. Thus, if secondary piping or load side interior is dirty, malfunction, characteristics deterioration, etc., may occur. Keep the inside of the pipes clean.



- Each product has an O-ring groove for modular connection on its OUT side. Select piping that can be sealed at or below the O-ring groove diameter.

Series	RP1000	RP2000
Groove diameter	ø17.6	ø25.4

### ⚠ CAUTION

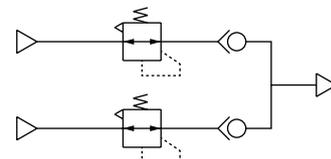
- Keep the pressure difference between the primary and secondary sides to 0.1 MPa or more. For RP1000-8-04, if the set pressure is 0.3 MPa or over, keep the pressure difference at 0.2 MPa or over. (Precautions for RP1000)  
When using under conditions where a small pressure difference exists between the primary and secondary sides, the secondary side pressure may pulsate. In this case, increase the secondary side capacity before use. Or set pressure in the depressurizing direction (high pressure → low pressure). Another method is to set the primary pressure to an extremely high level or to somewhat lower the setting pressure, and restrict the secondary side line. If pulsation continues, contact CKD. When using with a low friction cylinder having constant leakage, the secondary pressure may pulsate depending on the working conditions. In this case, restrict the secondary side line and decrease the pressure setting (high pressure → low pressure) to attenuate pulsation. Consult with CKD if the pulsation still does not cease.  
(Precautions for RP2000)  
If the pressure difference between the primary and secondary sides is large and secondary side piping is large, secondary pressure could pulsate during low flow. In this case, set the primary side to the secondary side pressure +0.1 to 0.2 MPa or restrict the secondary side line. If pulsation continues, contact CKD.
- If the regulator is repeatedly turned ON and OFF with the directional switching valve on the primary side, the set pressure may change greatly. Thus, the directional switching valve should be installed on the secondary side.
- 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.
- Do not operate the pressure adjustment knob while the primary side is released to the atmosphere, as performance could deteriorate.

## Mounting, installation and adjustment

### ⚠ CAUTION

- Check IN and OUT indications indicating the air inlet and outlet before connecting. A reverse connection could result in improper operation.
- Do not move or swing the product by the pressure adjustment knob.
- Do not install this product in a location where it may be subject to vibrations or shocks.
- Flush air pipes before connecting the regulator.

- Use sealing tape when piping. Do not use liquid and solid sealant. In addition, ensure that the sealing tape does not enter.
- When using in parallel as shown below, do not use the secondary side as a closed circuit. If a closed circuit is required, be sure to set a check valve on the secondary side.



- 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
- WaterR/Sens
- TotAirSys (Total Air)
- TotAirSys (Gamma)
- Gas generator
- RefrDry
- DesicDry
- HiPolymDry
- MainFiltr
- Dischrg etc
- Ending

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

- Install so that the EXH port is not plugged.
- When installing on a panel, completely loosen and remove the pressure adjustment knob, insert the body into the  $\varnothing 12.5$  panel hole, and fix it to the panel with the panel mounting nut. Then, turn the pressure adjustment knob to attach it to the body. Panel mounting nut recommended tightening torque 2 to 3N·m  
[Precautions for RP2000]  
If the product is installed horizontally with the panel mounting nut, the panel could be damaged by the weight of the product and vibration.

- Use appropriate torque to tighten the pipes when connecting them.
  - The purpose is to prevent air leakage and damage to bolts.
  - First tighten the bolts by hand to ensure that the threads are not damaged, then use a tool.

[Recommended values]

Port thread	Tightening torque N·m
Rc1/8	3 to 5
Rc1/4	6 to 8
Rc3/8	13 to 15

## During use/maintenance

### CAUTION

#### Working air quality

- Use only compressed air. Air containing corrosive gases, fluids or chemicals could result in improper pressure adjustment due to body damage or rubber deterioration.

#### Working environment

- Avoid use in the following environments.
  - When ambient temperature exceeds the range of -5 to 60°C.
  - Where air freezes.
  - Places where the unit will be exposed to dripping water and/or coolant.
  - Highly humid places where dew condenses due to temperature fluctuations.
  - Where salt air or splashing seawater contacts the product.
  - In atmospheres containing corrosive gases, liquids and chemicals.
  - Where the product is exposed to direct sunlight.
  - With the precision regulator RP1000, the set pressure fluctuates by approx. 0.12 kPa/°C. The pressure tends to drop when the temperature rises.

#### Precautions for use

- Air constantly leaks from the bleed port. This is necessary for precise pressure control, so do not plug the hole.
- Check primary pressure before setting pressure.
- Pressure higher than the primary pressure cannot be set.
- Turn the pressure adjustment knob clockwise to increase secondary pressure, and counterclockwise to lower pressure.
- Pressure is set in the depressurizing direction (high pressure → low pressure), enabling highly precise setting to be made.
- After adjusting pressure, tighten the lock nut, and then fix the knob.
- The precision regulator RP1000 exhaust valve has a metal seal, so a small amount of secondary side air will leak.

#### Maintenance precautions

- Pneumatic components must be disassembled and assembled by qualified personnel.
- Pneumatic Pressure Skill Test Class 2 or higher level is required.
- Read the relevant product instruction manual thoroughly and fully familiarize yourself with the task before disassembling or assembling pneumatic components.
- Personnel must be fully familiar with pneumatic component structure and operational principles and safety requirements.
- Before conducting maintenance, turn the power OFF, stop the supply of compressed air and make sure that there is no residual pressure.

