Pneumatic components

Always read this section before use.

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.
- Take measures to prevent harm to operators or objects if this product fails.
- Understand compressed air features before designing a pneumatic circuit.
- For detailed cautions, refer to the catalog of each equipment.

⚠ 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.

2. Regulator

⚠ WARNING

- Always provide a safety system in locations where an output pressure that exceeds the regulator set pressure can cause damage to or malfunction in the secondary-side equipment.
- If the regulator cannot be used with the secondary side sealed circuit or balance circuit, contact CKD.
  Depending on use, such as when back pressure rises, set pressure may increase by 0.2 MPa.

⚠ CAUTION

- When the primary pressure is released, the secondary pressure flows to the primary side.
  If flowing of the secondary side fluid to the primary side causes faults in other devices, provide a circuit to maintain 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.
- When used in applications where primary pressure is 0.7 MPa and over, keep the difference between primary pressure and set pressure within 0.4 MPa.
  Pulsation could occur if the difference in pressures is large and secondary piping is large. If so, lower primary side pressure or restrict the secondary line. Contact CKD if the pulsation still does not cease.

3. Needle

⚠ CAUTION

- This valve cannot be used as a stop valve that has no leakage. Slight leakage is allowed in product specifications.

4. Air operated valve

⚠ WARNING

- This product cannot be used as an emergency shut-off valve.
  The valves listed in this catalog are not designed as valves to ensure safety such as emergency shutoff valves. When using in such a system, always take separate measures that will accurately ensure safety.

⚠ CAUTION

- External pilot air
  (1) Measure against drain - A large amount of drain (water, oxidized oil, tar and foreign matter) is contained in compressed air. This creates a factor that significantly reduces the reliability of the pneumatic components. As measures against drain, improve air quality (clean air) by dehumidifying with an after cooler or dryer, removing foreign matter with a filter, and removing tar with a tar removal filter, etc.
  (2) Filter - Install a filter with a 5 µm or less filter element.

5. Inline clean filter

⚠ 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.

⚠ CAUTION

- 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.
  Filtration accuracy 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).
- Alcohol is used in the manufacturing line of some parts of the product.

* For safety precautions for the digital pressure sensor (PPX-R10N-6M-P12), refer to "Pneumatic, Vacuum and Auxiliary Components (No.CB-024SA)."

Mounting / Installation / adjustment

1. COMMON

⚠ CAUTION

■ Open the package in a clean room.
- This product is packed in a cleanroom. It is recommended that the package is opened immediately before making the piping in the clean room.

■ Install the product avoiding direct sunlight.

■ Do not install this product in a location where it is subjected to vibrations or shocks.

■ Securing of maintenance space
- Secure sufficient space for maintenance and inspection.

■ Always thoroughly read the instruction manual before installing this product.

■ Check the flow direction with arrow and connect correctly.

■ Pipe so no excessive force is applied to the product.
- Do not apply tension, pressure, bending, or external force by tube etc., during installation and use.

■ 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.

■ When supplying compressed air for the first time after connecting pipes, do not apply high pressure suddenly.
- Connected piping could be dislocated and tubing could bounce.

■ Flush and clean the pipes when using the pipe.
- Dirt or foreign materials in piping will lower product performance.

■ Air quality: Compressed air of JIS B 8392-1: 2012 Class 1.3.1 is recommended.
- Use compressed air that does not contain oxidized oil, tar and carbon from the air compressor.
- Use CKD's clean air system components according to your application.

Compressed air quality grade by JIS B 8392-1: 2012

Grade	Solid particle				Humidity and moisture		Oil
	Max. number of particles in 1 m³ according to the particle size d (μm)			Mass concentration Cp	Pressure dew point	Water content concentration Cw	Total oil concentration
	0.1 < d ≦ 0.5	0.5 < d ≦ 1.0	1.0 < d ≦ 5.0	mg/m³	°C	g/m³	mg/m³
0	Conditions stricter than Grade 1 to be specified by user or supplier.						
1	≦ 20,000	≦ 400	≦ 10	-	≦ -70	-	≦ 0.01
2	≦ 400,000	≦ 6,000	≦ 100	-	≦ -40	-	≦ 0.1
3	-	≦ 90,000	≦ 1,000	-	≦ -20	-	≦ 1
4	-	-	≦ 10,000	-	≦ +3	-	≦ 5
5	-	-	≦ 100,000	-	≦ +7	-	-
6	-	-	-	0 < Cp ≦ 5	≦ +10	-	-
7	-	-	-	5 < Cp ≦ 10	-	Cw ≦ 0.5	-
8	-	-	-	-	-	0.5 < Cw ≦ 5	-
9	-	-	-	-	-	5 < Cw ≦ 10	-
X	-	-	-	Cp > 10	-	Cw > 10	> 5

Details have changed due to revision of JIS B 8392-1: 2003 to JIS B 8392-1: 2012.

For example,
"grade 1:2:1" means:
- Solid particles 0.1 to 0.5 μm are 20,000 particles or less, 0.5 to 1.0 μm are 400 particles or less, and 1.0 to 5.0 μm are 10 particles or less
- Pressure dew point -40°C or less
- Oil concentration 0.01 mg/m³ or less

■ Do not move or swing the product holding the adjustment knob, clean filter or pressure gauge on the regulator.
- Hold the body when carrying the product.

■ For detailed cautions, refer to the catalog of each equipment.

2. Needle

⚠ CAUTION

■ Do not turn the dial forcibly when fully closing or opening it. Do not use the lock nut to adjust the needle. Otherwise this could cause needle galling or damage.

■ Check that lock nuts are not loose.

■ Check the needle valve speed of rotation.
- Turning the needle too much may cause galling or damage although the product has a retainer mechanism. Check the number of rotations for the product used.

■ Fully close the needle, and open to adjust speed.
- The needle closes when turned to the right and opens when turned to the left.

3. Air operated valve

⚠ CAUTION

■ Check the supply port on the pilot operation side when piping.

Model No.	Pilot operation side supply port
CAU30-*V1*	X
CAU30-*V3*	X and Y

■ Refer to the table below for tightening torque of the pilot air piping.

Nominal pipe diameter	Recommended pipe tightening torque (N·m)
Rc1/8	7 to 9

■ Grease is applied to the pilot valve.
Perform an appropriate exhaust treatment of pilot air when using the single acting in a clean room.

4. Pressure gauge

⚠ CAUTION

■ Repeated sudden increases and decreases in pressure and pressure pulsation must be avoided because it could adversely affect pressure gauge life.

* For safety precautions for the digital pressure sensor (PPX-R10N-6M-P12), refer to “Pneumatic, Vacuum and Auxiliary Components (No.CB-024SA).”

During use & maintenance

1. COMMON

⚠ WARNING

■ Use within the max. working pressure and max. operating pressure ranges.

⚠ CAUTION

■ Carefully read the instruction manual before starting use and maintenance.

■ Before conducting maintenance, stop the supply of the fluid and make sure that there is no residual pressure.

■ Do not disassemble and modify the products.

■ Do not use products as footing or place any heavy objects on top of the products.

■ Storage

- Do not store this product in a hot, humid atmosphere or atmospheric conditions outface of the specified range for a prolonged period of time. Storing the product in such an environment can result in deterioration of the resin and rubber.
- Contact CKD when storing products outface of the specified range.

■ For detailed cautions, refer to the catalog of each equipment.

2. Air operated valve

⚠ WARNING

■ To ensure optimum use, inspect the product every six months. This frequency varies with the frequency of use.

⚠ CAUTION

■ If the product has not been in use for over one month, perform a test run before starting actual operation.

■ Pilot air pressure

Use the product with a pilot air pressure in the specified range.

3. Inline clean filter

⚠ 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 neutralizing static electricity since generated ozone may flow back.

■ Check the filter periodically and replace it if necessary.

⚠ CAUTION

■ Performance could drop if the filter element is clogged. Regularly inspect and replace the element.

■ 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.

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