Pneumatic components (fitting/tube)

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.

Design/selection

⚠WARNING

■ Use the product within specifications.
Use with fluid other than compressed air or at a pressure or temperature exceeding the specifications could result in rupture, the tube coming off, or leakage.

■ Avoid installing this product outdoors or where it is exposed to direct sunlight.

■ Do not use the normal fitting if electrostatic discharge could build up. Otherwise system faults or failure could occur. Antistatic fitting and tubing should be used in locations such as this.

■ Do not constantly push down or apply a load onto the push ring for the push-in fitting.
- The tube may lose its holding capacity.
- When transporting an assembled product, avoid positions where the push ring is constantly pressed down.

⚠CAUTION

■ Confirm before use that the product will withstand the working environment.
- This product cannot be used in environments where functional obstacles could occur.
  Such environments include high temperatures, chemical atmospheres, or where chemical liquids, vibration, moisture, water dripping or gas is present. Environments where ozone is generated. Outdoors or where the product could be subject to direct sunlight; or where coolant or spatter could come in contact or where static electricity could pose a problem.

■ Confirm whether PTFE can be used.
- The sealant contains PTFE (tetrafluoroethylene resin) powder. Check that this poses no problems during use.

■ Consult with CKD if ozone is generated in the supplied air. (Ozone-proof products are available.)

■ Avoid using this product in hot or humid environments, or where it could be subject to direct sunlight. Install this product where the temperature is 40˚C or less.

■ Flame-resistant resin (equivalent to UL94 Standard V-0) is provided for GW Series body push ring, but not for the GWJ Series. Check specifications when selecting the product.

ZSP Series

■ Chemical resistance is SUS440 or equivalent. This product cannot be used when a higher chemical resistance is required.

■ Be sure to contact CKD when using in a corrosive atmosphere. The fitting body could be damaged under some conditions.

Mounting, installation and adjustment

⚠WARNING

■ Securely insert the tube until it contacts the fitting tube end, and check that it does not come off the fitting.

■ Stop air flow and confirm that there is no residual pressure before replacing the tube.

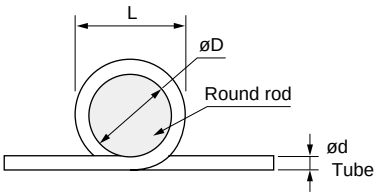
Piping

⚠CAUTION

■ Observe the following precautions when using nylon tubes or urethane tubes for piping material.
- Use the designated tube and CKD plastic plug (GWP Series). Do not use a metal plug as doing so may cause problems.
  Tube outer diameter accuracy
  · Polyamide tube.....Within ±0.1 mm
  · Polyurethane tube (to ø6).....Within ±0.1 mm
  (ø8 up).....Within $^{+0.1}_{-0.15}$ mm
  Use a tube with hardness of 92˚ or more. If a tube that does not satisfy the diameter accuracy or hardness is used, the chucking force may decrease, the tube may come off or be difficult to insert.
  Consult with CKD when using a non-designated tube or plug.
- Use flame-resistant tubes or metal steel pipes in an environment where spattering may occur.
- When using the standard push-in fitting on the spiral tube, fix the base of the tube with a hose clamp. Rotation may occur, causing a reduction in holding force.
- Cut the tube with a dedicated cutter and always at a right angle.
- Use the tubing so that it does not become worn or damaged. Tubing could collapse or rupture.
- A used tube could be deteriorated or deformed and so always use a new tube.
- Do not let the tube directly contact other surfaces, as there is a risk of wear or damage.

■ Do not use this product for applications involving constant rotation or oscillations, or in which tubes move violently.
- The elbow can be mounted by turning, but must not be used for constant rotating or oscillating applications. Fittings could be damaged.
- Provide sufficient allowance in the tube so that it does not bend sharply.

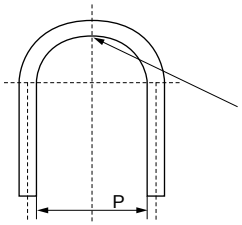
■ Use the tubing so that it is within the min. mounting radius and long enough to avoid sharp bends.
- Consider changes in tubing length caused by pressure when tubing is connected, and provide sufficient length within the minimum tube bending radius.
- Measuring method
  (1) Min. bending radius (JIS B 8381)
  Values are based on JIS B 8381.
  If tube is tightly wound around a round rod, indicate the rod radius when variation reaches 25%.



$$\eta = \left(1 - \frac{L-D}{2d}\right) \times 100$$

η: Deformation ratio (%)
d: Tube O.D. (mm)
L: Measuring volume (mm)
D: Round rod diameter (mm) (Twice the min. bending radius)

(2) Min. installation radius
To measure, simply bend the tube and confirm the radius when tube diameter deformation is 10%.



Minimum mounting pitch P when deformation rate is 10%.
Min. installation radius = P/2

■ Always flush just before piping pneumatic components.
- Any foreign matter that has entered during piping must not enter the pneumatic components. Remove all swarf and foreign debris generated during piping and tube insertion before use.

■ When supplying compressed air after connecting pipes, do not suddenly apply high pressure.
- The pipe connection could dislocate, causing the pipe to fly off, leading to accidents.

■ After connecting piping, check pipe connections for air leaks before supplying compressed air.
- Apply a leakage detection agent on pipe connections with a brush, and check for air leaks.

■ Tighten pipes with the appropriate torque.
- The purpose is to prevent air leakage and damage to bolts. First tighten the bolts by hand to ensure that threads are not damaged, then use a tool.
  Check that the tool's hexagon face and wrench are the correct size.

[Reference value]

Port thread	Tightening torque N·m
M3	0.3 to 0.6
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

* The above values apply when partner threads are JIS B 0203 piping tapered female threads (material C3604BD).

■ Connect piping so that connections are not dislocated by equipment movement, vibration, tension, etc.
- Control of actuator speed will be disabled if piping on the exhaust side of the pneumatic circuit is disengaged.
- When using the chuck holding mechanism, the chuck may be released, creating a hazardous state.
- Confirm that the tube has been inserted properly, and make sure that there is no tension during use.
  The tube could be dislocated or damaged if there is any tension.

■ Make sure that there is no torsion, tension or moment load applied to the fitting or the tube.

■ Do not tighten while pressure is applied.

■ Observe the following precautions when using nylon tubes or urethane tubes for piping material.
- Use flame-resistant tubes or metal steel pipes in an environment where spattering may occur.
- Use a hydraulic hose when piping is for both hydraulic and pneumatic use.
- Use a spigot fitting for high-temperature fluids. The push-in fitting cannot be used.

■ Check that the tubing is not worn or damaged.
- Tubing could collapse, rupture, or become dislocated.

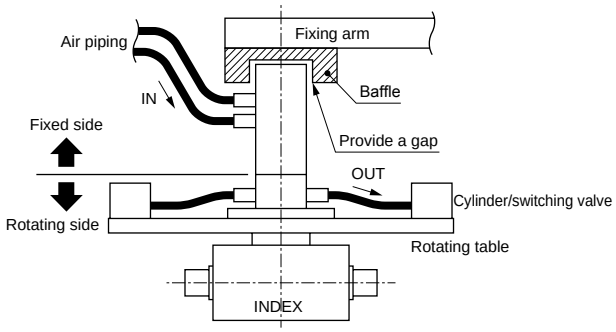
■ Use the designated tube.

■ Securely insert the tube completely to the end, and make sure that the tube cannot be pulled out.

RJF Series

⚠WARNING

■ Fixing method (fixed side)
Always provide a gap at the connection of the product (fixed side) and baffle to allow a slight shaft deviation. Applying an excessive load to the axis on the rotating side could result in damage or air leakage.



■ Fixing method (rotating side)
When using this product (rotating side) in a place with a particularly high movement frequency, always use an accurate tightening method. If the product's moving sections could pose a risk to humans, devices or systems, provide a structure so that those sections cannot be directly touched.

■ Secure sufficient space for maintenance and inspection.

Safety Precautions

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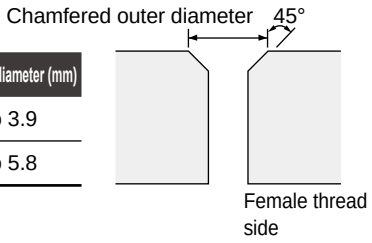
Mounting, installation and adjustment

⚠CAUTION

■ Cut the tube vertically with a dedicated cutter.

■ If the set screw is M3 or M5 port thread, the chamfered outer diameter of the female thread side must be within the following values.



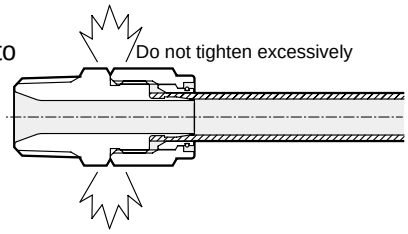
Port thread	Chamfered outer diameter (mm)
M3	ø3.3 to 3.9
M5	ø5.4 to 5.8

■ The effective cross-sectional area of the turn elbow (GWL*-*-T, GWL*-*-2T) varies based on the direction.

ZJ Series

■ Except for separating the main body and nut, do not disassemble or modify fitting components. Otherwise functions cannot be guaranteed.

■ The product body and nuts are made of the same material (SUS316).
When tightening, stop as soon as the body and nut come in contact.
Tightening the tubing too much could cause seizure at the thread part, making it difficult to remove the tube.



ZSP Series

■ When using a non-CKD tube, make sure that the outer diameter tolerance of the tube satisfies the specifications given in Table 1.

Table 1 Tube outer diameter tolerance

Tube	Outer ø dimension tolerance
Urethane tube	Nominal port size ±0.15
Nylon tube	Nominal port size ±0.1

■ Use the product within the recommended tightening torque range given in Table 2.

Table 2 Recommended tightening torque

Port thread	Tightening torque (N·m)
M5	1.0 to 1.5
R1/8	7 to 9
R1/4	12 to 14
R3/8	22 to 24
R1/2	28 to 30

■ Mounting is possible by rotating in an arbitrary direction, but do not use this product in applications involving constant rotation or oscillation.

Storage

■ Although the fitting is made of highly corrosion-resistant material, rust could spread from elsewhere. Avoid storing this part with products made of other materials, and store in a clean, dry place.

ZJ Series

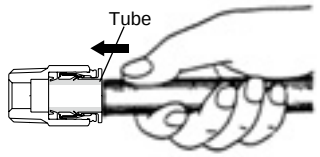
■ Store the product body with nuts as a set. If parts are stored separately, the body and nut threads or body protrusions (sealants) could be damaged or faults in connection or leaks could occur.

Use/maintenance

⚠CAUTION

Mounting and removal

Mounting



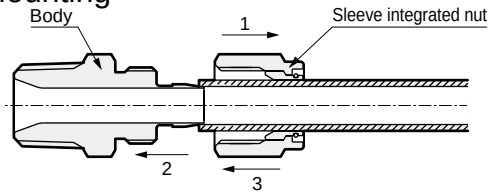
Push the tube in until it contacts the tube end. Check that the tube does not come off the fitting. Tube inserts 15 to 21 mm from the end of the fitting body. The end of the mounted tube must be cut at a right angle.

Removal

While pressing down on the push ring with your fingers, the tube can be removed by pulling on it.

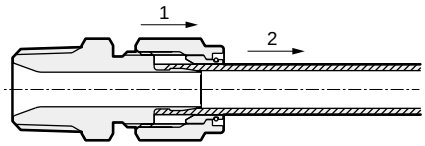
ZJ Series

Mounting



Pass tube through the sleeve integrated with the nut.
Insert tube into the main body, and tighten the sleeve integrated with the nut until it contacts the body.
Stop tightening the sleeve integrated with the nut when the body and nut come in contact.
Tightening the tubing too much could cause seizure at the thread part, making it difficult to remove the tube.

Removal



Loosen the sleeve integrated with the nut and pull out tube.
The sleeve integrated with the nut can be reused.