



To Use This Product Safely

Be sure to read this before use.

For general pneumatic components precautions, see Intro 27 and Detailed Precautions for Individual Series " ⚠ Safety precautions".

Design / Selection

⚠ Warning

■ Use the product within specifications. Do not use with fluids other than compressed air, or at pressures and temperatures outside the specification range, as this may cause bursting, tube disconnection, or leakage.

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

■ Do not use the normal Fittings if electrostatic discharge could build up. It causes system defects and failures. 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.

- Tubing may lose its holding capacity.
- When transporting an assembled product, do not keep the push ring pressed down.

⚠ CAUTION

■ Confirm that the product can withstand the operating environment before use.

- This product cannot be used in environments where functional obstacles could occur. For example, special environments with high temperature, chemical atmosphere, chemicals, vibration, humidity, water droplets, gas atmosphere, etc. Ozone generating environments. Outdoors, environments exposed to direct sunlight, environments directly exposed to cutting oil, coolant oil, spatter, environments where static electricity is a problem.

■ Confirm whether PTFE can be used.

- The sealant contains PTFE (tetrafluoroethylene resin) powder. Please confirm if there are any problems in use.

■ Consult with CKD if ozone is generated in the supplied air. (We have Ozone Resistant Series available.)

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

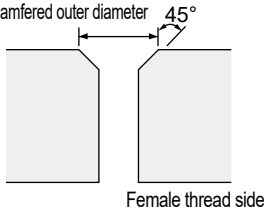
■ Flame-resistant resin (equivalent to UL94 Standard V-0) is provided for GW Series body push ring, but not for the GWJ Series. Check specifications when selecting the product.

■ 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. The fitting part may be damaged.
- Provide sufficient allowance in the tube so that it does not bend sharply

■ 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.

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



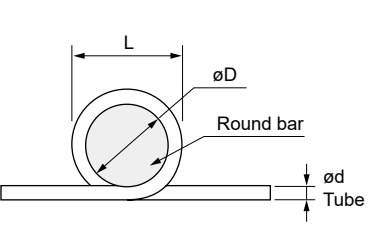
■ The effective cross-sectional area of the turn elbow (GWL □-□-T, GWL □-□-2T) changes depending on the direction.

■ Observe the following precautions when using nylon or Urethane Tubing tubes as the piping material.

- Use CKD tubes and plastic plugs (GWP Series). Do not use a metal plug as it may cause problems. When using tubes other than ours, use tubes with hardness of 92° or more with the following outer diameter accuracy.
 - Nylon tube Within ±0.1 mm
 - Urethane Tubing..... Within $\begin{smallmatrix} +0.1 \\ -0.15 \end{smallmatrix}$ mmDo not use tubes that do not satisfy diameter accuracy and hardness, as gripping force may decrease and come off, or conversely, insertion may become difficult.
- In atmospheres where spatter occurs, use flame-resistant tubing or metal steel pipes.
- When using the standard push-in fitting on the spiral tube, fix the base of the tube with a hose clamp. Rotation may occur, reducing holding capacity.
- Use the tubing so that it does not become worn or damaged. Tubing could collapse, rupture, or become dislocated.
- 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.

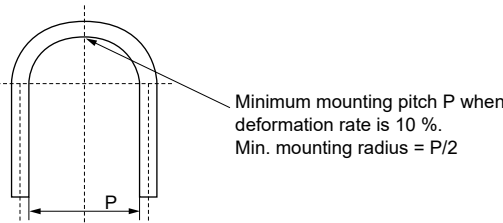
■ Use the tubing so that it is within the min. mounting radius and long enough to avoid sharp bends.

- 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)
Value measured based on JIS B 8381.
Indicates the radius value of the round bar when the deformation rate η becomes 25 % when the tube is tightly wound around the round bar.


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

η : Deformation rate (%)
 d : Tube O.D. (mm)
 L : Measured amount (mm)
 D : Round bar diameter (mm)
(2 times min. bending radius)

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



■ Do not apply torsion, tension or moment load to the tube.

■ Connect the 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.
- In the case of a chuck holding mechanism, the chuck will be released, creating a dangerous situation.
- Confirm that the tube has been inserted properly, and make sure that there is no tension during use. Tensile force causes tube disconnection and damage.

■ Observe the following precautions when using nylon or Urethane Tubing tubes as the piping material.

- In atmospheres where spatter occurs, use flame-resistant tubing or metal steel pipes.
- For combined oil/pneumatic piping, use hydraulic hoses.
- Use a spigot for high-temperature fluids. Push-in fittings cannot be used.

Joint / Tubing

Specific Precautions

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. Depending on the conditions, it may cause damage to the fitting body.

■ 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 O.D. Tolerance

Tube Type	O.D. Tolerance
Urethane Tubing	Nominal diameter ±0.15
Nylon Tubing	Nominal diameter ±0.1

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

Table 2 Recommended Tightening Torque

Connection 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 in an arbitrary direction is possible by rotating the unit 360°, but do not use this product in applications involving constant rotation or oscillations.

About Storage

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

For precautions regarding mounting, installation, adjustment, operation, and maintenance, please refer to the CKD Component Products Site (<https://www.ckd.co.jp/kiki/en/>) → 'model No.' → Instruction Manual.