Safety Precautions

Always read this section before use.
Refer to page 2 for general information of the cylinder, and to page 320 for general information of the cylinder switch.

Pencil shaped cylinder SCPD3 Series

Design & selection

1. Fine speed SCPD3-F

⚠CAUTION

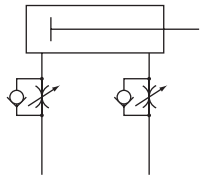
■ Use the product with no lubrication.
- Application of lubrication may cause changes in characteristics.

■ Assemble the speed controller near the cylinder.
- When installed at a distant place from the cylinder, the adjustment becomes unstable.
- For the speed control valve, SC-M3/M5-F, SC3W and SCD-M3/M5-F Series are recommended.

■ At the higher air pressure and the lower load factor, the speed generally becomes more stable.
- The load factor should be 50% or less.

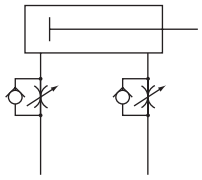
■ Stable speed control is achieved with a meter-out circuit.
- When fine speed activation is performed with operating direction PUSH for the sin gle rod cylinder, the popping out phenomenon occurs when operation starts if the load resistance is low. As a countermeasure, use a circuit of ⓑ, ⓒ or ⓓ. Note that circuit ⓓ is the most stable.

ⓐ



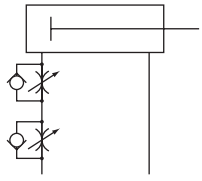
PUSH: Meter-out
PULL : Meter-out

ⓑ



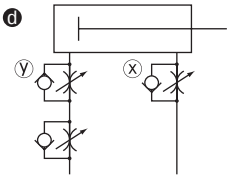
PUSH: Meter-in
PULL : Meter-in

ⓒ



PUSH: Meter-in
PULL : Meter-out

ⓓ

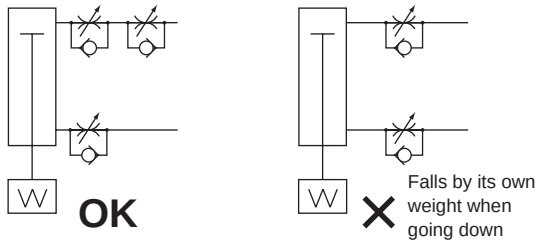


PUSH: Meter in-out
PULL : Meter-out

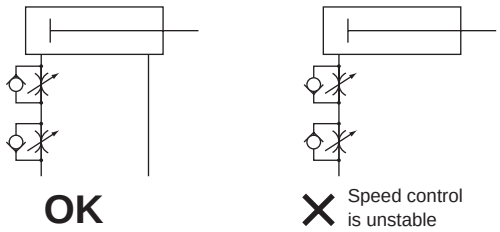
Speed adjustment method for PUSH operation of ⓓ circuit:
1. Set the speed with the speed controller x.
2. Restrict the speed with the speed controller y until there is no popping out.
3. Check the speed again.

Note 1: When comparing ⓑ, ⓒ, and ⓓ, operation is the most stable with ⓓ circuit.

(Note 2) For vertical mounting, combine the cylinder with a meter-out circuit, as it will fall under its own weight when a meter-in circuit is used.



(Note 3) Use the circuit as shown in the figure below for the serial connection of the speed control valves.



(Guidelines for pop-out generation)
Popping out occurs in the following cases.
• Thrust > Resistance
* Resistance: a force produced by a residual pressure on the outlet side (for fine speed, Inlet pressure = Residual pressure) + { When using horizontally : frictional force caused by load / When using vertically : load self-weight }

■ Do not apply a lateral load to the cylinder.
- With a lateral load, operation will become unstable.

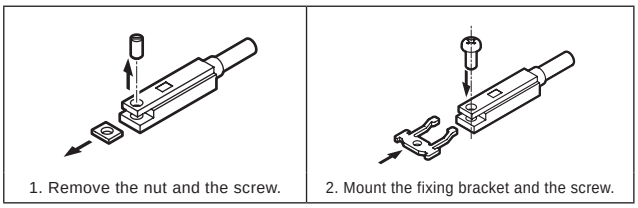
■ Avoid use in places subject to vibrations.
- The product will be adversely affected by vibration and operation will become unstable.

Installation & adjustment

1. Common

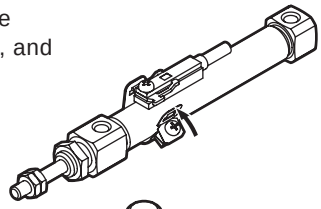
⚠ CAUTION

■ Mount T switch as shown in the following figure.
When using the standard T switch (SW-T*)

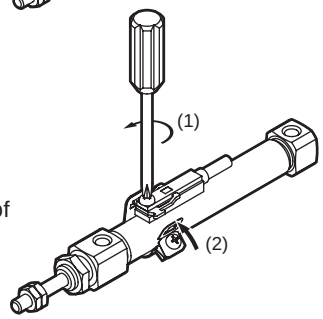


1. Remove the nut and the screw.
2. Mount the fixing bracket and the screw.

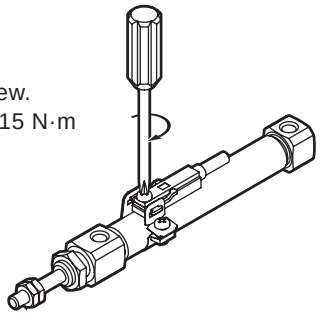
1. Insert the square hole of the band into the fixing bracket, and mount it on the cylinder.



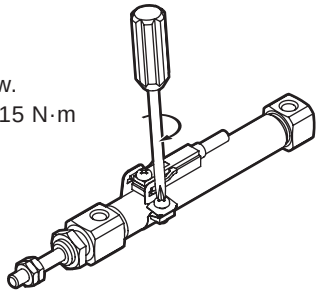
If the mounting is difficult, follow the steps below.
(1) Loosen the switch-side screw.
(2) Insert the square hole of the band into the fixing bracket.



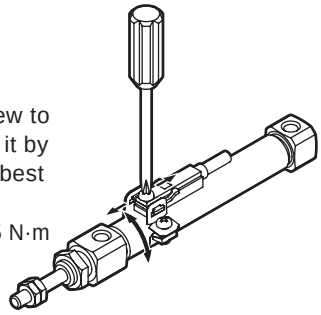
2. Tighten the switch-side screw.
Tightening torque: 0.1 to 0.15 N·m



3. Tighten the band-side screw.
Tightening torque: 0.1 to 0.15 N·m



4. When adjusting the switch mounting position
Loosen the switch-side screw to adjust the position, an d fix it by tightening the screw at the best position.
Tightening torque: 0.1 to 0.15 N·m



■ The cylinder switch could malfunction if cylinders with switch are installed adjacently in parallel. Check that the distances are provided between cylinders according to Table 1 below.

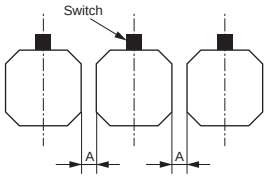


Table 1: Dimension A (mm)

Switch / Port size	T0/T5 reed	T2/T3 proximity
ø6	≥ 0 (*1)	≥ 3
ø10	≥ 0	≥ 3
ø16	≥ 0	≥ 3

*1 Keep separated by 3 mm or more for SCPS-6 axial port direction.

■ The cylinder switch could malfunction if cylinders with switch are installed adjacently in other ways. Check that the distances are provided between cylinders according to Table 2 below.

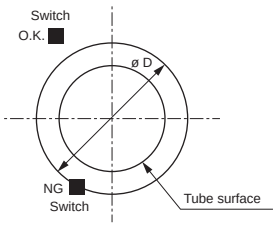


Table 2: Dimension D (mm)

Switch / Port size	T0/T5 reed	T2/T3 proximity
ø6	ø16.5 or more	ø 22.5 or more
ø10	ø 21 or more	ø 26.5 or more
ø16	ø 34 or more	ø 35 or more

■ Avoid strained piping such that a lateral force is applied to the cylinder tube.
The cylinder tube is inclined, and this could cause malfunctions.

■ When piping, be sure to use a hose nipple (with fixed throttle) or a speed controller.
Refer to page 949 for hose nipple.

■ Do not turn the cover.
- If the cover is turned when mounting the cylinder or screwing the pipe fitting into the port, damage of the cover connection could occur.

■ When fixing a workpiece onto the end of the piston rod, tighten so that torque is not applied to the cylinder body.

■ When tightening the hexagon nut, use the torque within the tightening torque range as below.
ø6: 1.46 N·m ±10%
ø10: 4.09 N·m ±10%
ø16: 8.78 N·m ±10%

During use & maintenance

1. Common

⚠ CAUTION

■ Because this cylinder is a non-disassemble type, do not apply excessive force to the end cover or tube.