



# Safety Precautions

Be sure to read this section before use.

Refer to Pneumatic Cylinders I for general information of the cylinder.

SCP\*3

CMK2

Product-specific cautions: Pencil shaped cylinder SCP\*3 Series

CMA2

## Design/selection

SCM

### 1. Rubber-air cushioned SCPD3-\*C

SCG

#### CAUTION

SCA2

- Note that, structurally, the stroke end position cannot be retained if air supply is cut off.

SCS2

When detecting the stroke end by switch, set the switch position with pneumatic pressure applied, as otherwise the position may be out of the detection range.

CKV2

CAV2/  
COVPIN2

### 2. Fine speed SCPD3-F

SSD2

#### CAUTION

SSG

- Use without lubrication.

- Applying lubrication may cause changes in characteristics.

SSD

- Assemble the speed controller near the cylinder.

- When installed at a distant place from the cylinder, the adjustment becomes unstable.

CAT

- For the speed controller, SC-M3/M5-F, SC3W and SCD-M3/M5-F Series are recommended.

MDC2

MVC

- At the higher air pressure and the lower load factor, the speed generally becomes more stable.

- Use at a 50% or less load factor.

SMG

MSD/  
MSDG

- Stable speed control is achieved with a meter-out circuit.

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

FC\*

STK

SRL3

SRG3

SRM3

SRT3

MRL2

MRG2

SM-25

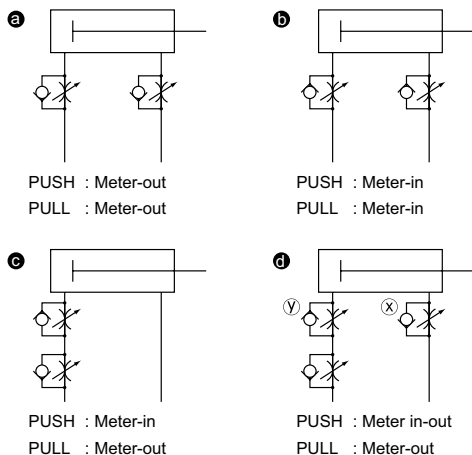
ShkAbs

FJ

FK

Spd  
Contr

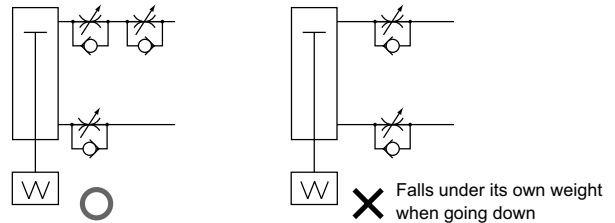
Ending



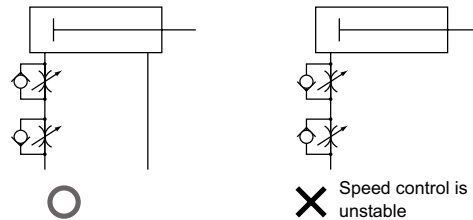
- d** Speed adjustment method for PUSH operation of circuit:
1. Set the speed with the speed controller x.
  2. Restrict the speed with the speed controller y until there is no popping out.
  3. Check the speed again.

(Note 1) When comparing **b** **c** **d**, the circuit **d** is the most stable.

(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 shown in the figure below for the serial connection of the speed controllers.



(Guidelines for pop-out generation)

Popping out occurs in the following cases.

- Thrust > Resistance

\* Resistance: Thrust caused by residual pressure on the exhaust side (in the fine, speed, suction 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.

### 3. SCP\*3-V with valve

#### CAUTION

- If the energizing time exceeds 20 minutes, the service life may be reduced.

- Do not use the meter-in speed controller.

The product may not operate at the min. working pressure due to the controlled flow rate.

Contact CKD for details.

## Mounting, installation and adjustment

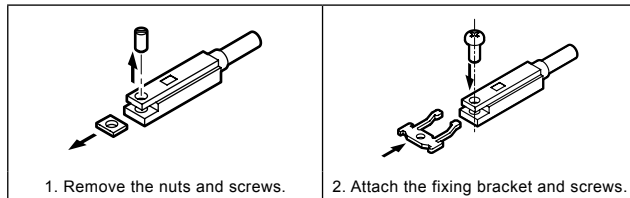
|                  |
|------------------|
| SCP*3            |
| CMK2             |
| CMA2             |
| SCM              |
| SCG              |
| SCA2             |
| SCS2             |
| CKV2             |
| CAV2/<br>COVP/N2 |
| SSD2             |
| SSG              |
| SSD              |
| CAT              |
| MDC2             |
| MVC              |
| SMG              |
| MSD/<br>MSDG     |
| FC*              |
| STK              |
| SRL3             |
| SRG3             |
| SRM3             |
| SRT3             |
| MRL2             |
| MRG2             |
| SM-25            |
| ShkAbs           |
| FJ               |
| FK               |
| Spd<br>Contr     |
| Ending           |

### 1. Common

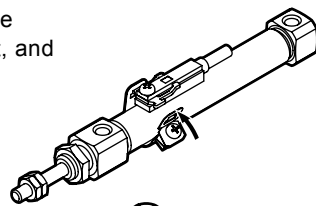
#### ⚠ CAUTION

- Mount the T switch as shown in the following figure.

When using the standard T switch (SW-T\*)

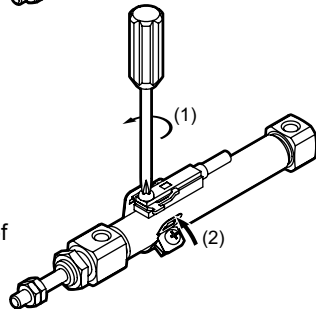


1. Insert the square hole of the band into the fixing bracket, and mount it on the cylinder.

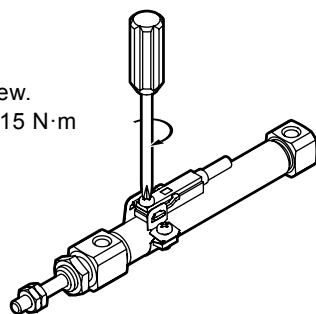


If the mounting is difficult, mount it according to the steps below.

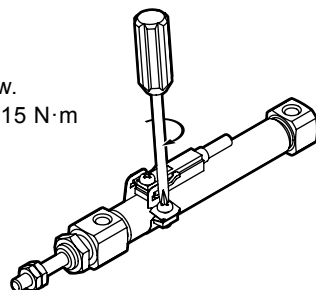
- (1) Loosen the switch-side screw.
- (2) Insert the square hole of the band into the fixing bracket.



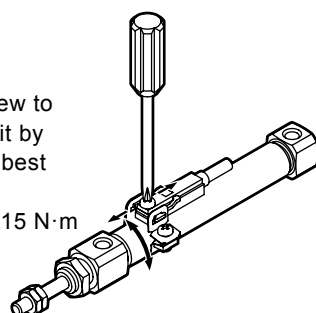
2. Loosen the switch-side screw.  
Tightening torque: 0.1 to 0.15 N·m



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



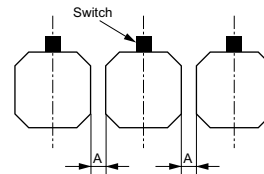
4. When adjusting the switch mounting position  
Loosen the switch-side screw to adjust the position, and fix it by tightening the screw at the best position.  
Tightening torque: 0.1 to 0.15 N·m



- 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 Bore size | T0/T5 Reed | T2/T3 Proximity |
|------------------|------------|-----------------|
| φ6               | ≥ 0 *1     | ≥ 3             |
| φ10              | ≥ 0        | ≥ 3             |
| φ16              | ≥ 0        | ≥ 3             |

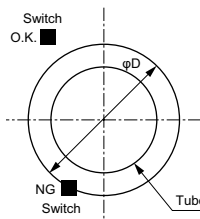


\*1 Keep separated by 3 mm or more for SCPs-6 axial port direction.

- 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 Bore size | T0/T5 Reed    | T2/T3 Proximity |
|------------------|---------------|-----------------|
| φ6               | φ16.5 or more | φ22.5 or more   |
| φ10              | φ21 or more   | φ26.5 or more   |
| φ16              | φ34 or more   | φ35 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 15 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 from 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 (No. 3 in internal structure and parts list on page 12), use the torque within the tightening torque range as below.

φ6 : 1.46 N·m ± 10%  
 φ10 : 4.09 N·m ± 10%  
 φ16 : 8.78 N·m ± 10%

SCP\*3

CMK2

## 2. Single acting SCPS/SCPS3/SCPH3

CMA2

### ⚠ CAUTION

SCM

■ Do not use the single acting cylinder in the way such that a load is applied when the piston rod is pulled for the push or when the piston rod is pushed for the pull type.

SCG

SCA2

Because the built-in spring in the cylinder has only a force for returning the piston rod, the rod cannot be returned to the stroke end when a load is applied.

SCS2

CKV2

■ For the single acting cylinder, because a breathing hole is provided on the cover surface, take care not to block the hole when installing the cylinder.

CAV2/  
COVPIN2

SSD2

Otherwise, malfunctions may result.

SSG

■ Do not leave the single acting cylinder pressurized.

SSD

If it is left pressurized for long periods, the piston rod may not return due to spring load when the pressure is released.

CAT

MDC2

MVC

SMG

MSD/  
MSDG

FC\*

STK

## 1. Common

SRL3

### ⚠ CAUTION

SRG3

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

SRM3

SRT3

MRL2

MRG2

SM-25

ShkAbs

FJ

FK

Spd  
Contr

Ending

## 3. Fine speed SCPD3-F

### ⚠ CAUTION

■ Perform adjustment such as centering so that a lateral load is not applied to the cylinder. Adjust and install the sliding guide so that it is not twisted.

- When the load or the resistance fluctuates, operation becomes unstable.
- With a large difference between static friction and kinematic friction of the guide, operation becomes unstable.

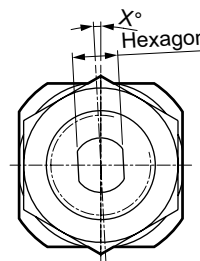
## 4. Rotation-stop SCPS3-M/SCPD3-M

### ⚠ CAUTION

■ For the rotation-stop, install it so that a rotation torque is not applied to the piston rod.

The bushing may be deformed and the service life may be shortened.

■ This product is manufactured so that the direction of the Hexagon of the piston rod is parallel to the side surface of the rod cover. However, this is not a guarantee of accuracy.



## Use/maintenance

## 2. Rubber-air cushioned SCPD3-\*C

### ⚠ CAUTION

■ Because of changes in the cushion stiffness when left for long periods, the stroke may become slightly shorter than the standard value at the low pressure setting. Perform a trial run, such as operating several times and performing back-and-forth operation at high supply pressure.