



# Operation Manual

PRODUCT NAME

Pin Cylinder/Single Acting, Spring Return

MODEL / Series / Product Number

CJP\*4&16-\*Z

**SMC Corporation**

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# Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of "Caution," "Warning" or "Danger." They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)\*1), and other safety regulations.

\*1) ISO 4414: Pneumatic fluid power -- General rules relating to systems.

ISO 4413: Hydraulic fluid power -- General rules relating to systems.

IEC 60204-1: Safety of machinery -- Electrical equipment of machines .(Part 1: General requirements)

ISO 10218: Manipulating industrial robots -Safety.

etc.



## Caution

**Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.



## Warning

**Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.



## Danger

**Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

## Warning

### **1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results.

The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product.

This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

### **2. Only personnel with appropriate training should operate machinery and equipment.**

The product specified here may become unsafe if handled incorrectly.

The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

### **3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.

2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.

3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

### **4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.

2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.

3. An application which could have negative effects on people, property, or animals requiring special safety analysis.

4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.



# Safety Instructions

## Caution

### **The product is provided for use in manufacturing industries.**

The product herein described is basically provided for peaceful use in manufacturing industries.

If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.

If anything is unclear, contact your nearest sales branch.

## **Limited warranty and Disclaimer/Compliance Requirements**

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

### **Limited warranty and Disclaimer**

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.\*2)

Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.

This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

\*2) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.

Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

### **Compliance Requirements**

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction(WMD) or any other weapon is strictly prohibited.

2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulation of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

## Caution

### **SMC products are not intended for use as instruments for legal metrology.**

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country.

Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

# 1. Product specifications

## 1-1. Specifications

|                                |                              |                                       |               |   |
|--------------------------------|------------------------------|---------------------------------------|---------------|---|
| Bore size (mm)                 | 4                            | 6                                     | 10            | 16  |
| Standard stroke (mm)           | 5、10、15                      |                                       |               |   |
| Action                         | Single acting, Spring return |                                       |               |   |
| Maximum operating pressure     | 0.7MPa                       |                                       |               |   |
| Minimum operating pressure     | 0.3MPa                       | 0.2MPa                                | 0.15Pa        |   |
| Proof pressure                 | 1MPa                         |                                       |               |   |
| Ambient and fluid temperature  | -10 to 70°C (No freezing)    |                                       |               |   |
| Lubrication                    | Not required (Non-lube)      |                                       |               |   |
| Piston speed                   | 50 to 500mm/sec              |                                       |               |   |
| Cushion                        | None                         |                                       |               |   |
| Stroke length tolerance        | +1.0<br>0                    |                                       |               |   |
| Rod end style                  | With thread/ Without thread  |                                       |               |   |
| Mounting                       | Panel mounting type          |                                       | Embedded type |   |
| Accessory (Standard equipment) | Standard equipment           | Mounting nut (2)<br>Rod end nut (2) * |               | Mounting nut (1)<br>Gasket (1)<br>Rod end nut (2) * |
|                                | Option                       | Hose nipple (φ4 is excluded)          |               |   |

\* When rod end is threaded.

The Value in the brackets shows quantity.

\* For details about the hose nipple, refer to page 9.

## 1-2. Theoretical output

| Bore size (mm) | Operating direction | Operating pressure (MPa) |      |       |
|----------------|---------------------|--------------------------|------|-------|
|                |                     | 0.3                      | 0.5  | 0.7   |
| 4              | OUT                 | 0.97                     | 3.48 | 6.00  |
|                | IN                  | 1.0                      |      |       |
| 6              | OUT                 | 4.56                     | 10.2 | 15.9  |
|                | IN                  | 1.42                     |      |       |
| 10             | OUT                 | 17.6                     | 33.3 | 49.0  |
|                | IN                  | 2.45                     |      |       |
| 16             | OUT                 | 44.5                     | 84.7 | 124.9 |
|                | IN                  | 5.04                     |      |       |

## 1-3. Spring reaction force

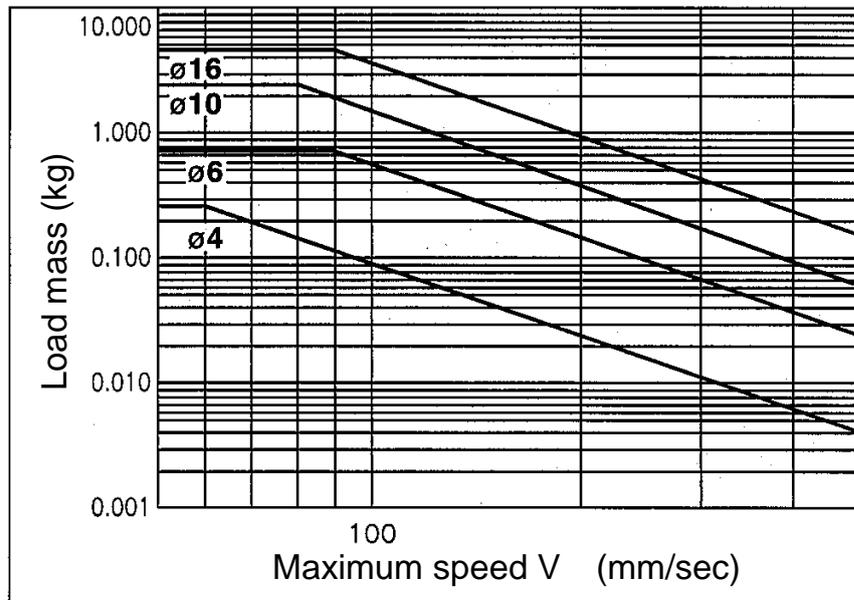
|                    |      |      |      |       |
|--------------------|------|------|------|-------|
| Bore size (mm)     | 4    | 6    | 10   | 16    |
| Retracted side (N) | 2.80 | 3.92 | 5.98 | 15.78 |
| Extended side (N)  | 1.00 | 1.42 | 2.45 | 5.04  |

\*Same spring force for each stroke.

### 1-4. Allowable kinetic energy

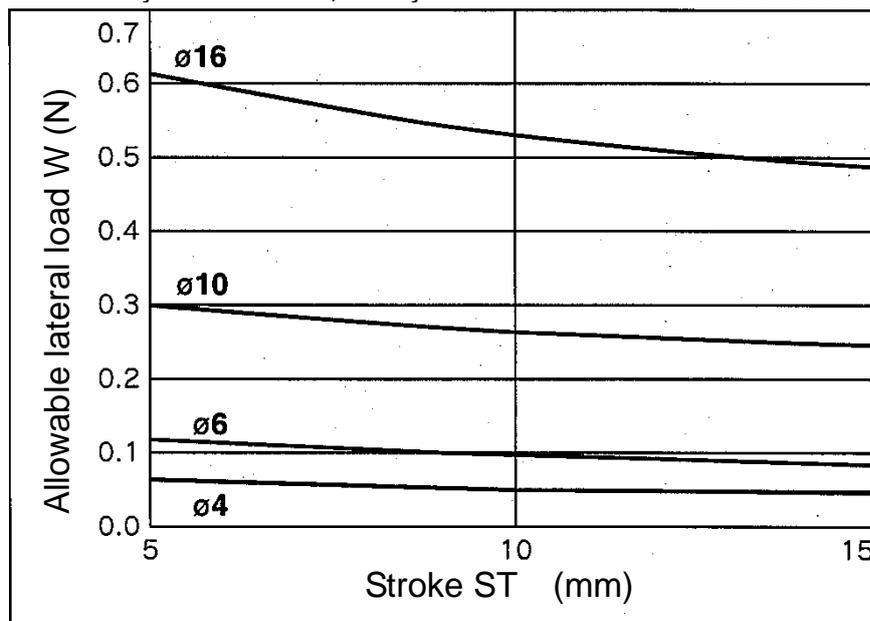
When driving an inertial load, operate a cylinder with kinetic energy within the allowable value. The range in the chart below that is delineated by bold solid lines indicates the relation between load mass and maximum driving speeds.

|                              |                      |                    |                    |                     |
|------------------------------|----------------------|--------------------|--------------------|---------------------|
| Bore size (mm)               | 4                    | 6                  | 10                 | 16                  |
| Piston speed (mm/sec)        | 50 to 500            |                    |                    |                     |
| Allowable kinetic energy (J) | $0.5 \times 10^{-3}$ | $3 \times 10^{-3}$ | $8 \times 10^{-3}$ | $19 \times 10^{-3}$ |



### 1-5. Allowable lateral load

Strictly observe the limiting range of lateral load on a piston rod. (Refer to the below graph.) If this product is used beyond the limits, it may shorten the machine life or cause damage.



## 2. Mounting - Installation

### 2-1. Design/Selection



#### Warning

- 1) **There is a danger of sudden action by cylinders if the sliding parts of machinery are twisted, etc., or changes in forces occur.**  
In such cases, human injury may occur, e.g. by hands or feet getting caught in the machinery, or damage to the machinery itself may occur. Therefore, the machine should be designed to operate smoothly and to avoid such dangers.
- 2) **If there is a chance that the product will pose a hazard to humans, install a protective over.**  
If the moving portion of the product will pose a hazard to humans or will damage machinery or equipment, provide a construction that prevents direct contact with those areas.
- 3) **Be certain that the secured portions will not loosen.**  
Be certain to adopt a reliable connecting method if the cylinder is used very frequently or if it is used in a location that is exposed to a large amount of vibration.
- 4) **Consider the possibility of a power source related malfunction.**  
For equipment that relies on power sources such as compressed air, electricity, or hydraulic pressure, adopt a countermeasure to prevent the equipment from causing a hazard to humans or damage to the equipment in the event of a malfunction.
- 5) **Consider the action of the cylinder in the event of an emergency stop.**  
Devise a safe system so that if a person engages the emergency stop or if a safety device is tripped during a system malfunction, such as a power outage, the movement of the cylinder will not cause a hazard to humans or damage the equipment.
- 6) **Avoid synchronized operation using cylinders only.**  
Even if multiple pneumatic cylinders are initially set to the same speed, their speeds may vary due to changes in operating conditions. Therefore, avoid designs where a single load is moved by synchronizing multiple cylinder operations.
- 7) **Consider the action of the cylinder when restarting after an emergency stop.**  
Devise a safe design so that the restarting of the cylinder will not pose a hazard to humans or damage the equipment. Install manually controlled equipment for safety when the actuator has to be reset to the starting position.
- 8) **Do not disassemble the product or make any modifications, including additional machining.**  
Doing so may cause human injury and/or an accident.
- 9) **When a cylinder is used in a clamping, suspending, or lifting mechanism**  
There is a danger of workpieces dropping if there is a decrease of thrust due to a drop in circuit pressure caused by a power outage, etc. Therefore, safety equipment should be installed to prevent damage to machinery and/or human injury.



#### Caution

- 1) **Operate the cylinder component parts within a range such that collision damage will not occur at the stroke end.**  
If the piston with moment of inertia collides with or stops at the stroke end due to the operating conditions, please consider this when selecting the cylinder and take into account the allowable kinetic energy.
- 2) **Use a speed controller to adjust the cylinder drive speed, gradually increasing from a low speed to the desired speed setting.**
- 3) **If pressure is applied to the external cylinder parts, there is a possibility that air will get inside the cylinder from the rod seal section. (Example: inside a chamber, etc.)**

## 2-2. Mounting



### Warning

#### 1) Operation manual

Install the product and operate it only after reading the operation manual carefully and understanding its contents. Also, keep the manual in a location where it can be referred to as necessary.

#### 2) Ensure sufficient space for maintenance activities.

When installing the products, allow access for maintenance and inspection.

#### 3) Precaution for tightening torque of the nut

Make sure that the mounting nut (for mounting cylinder) and rod end nut (for mounting load) are mounted at the maximum tightening torque or less as shown on page 15.

#### 4) Do not perform additional machining on the product.

Performing additional machining on the product can result in insufficient strength and cause damage to the product. This can lead to possible human injury or damage to the surrounding equipment.

#### 5) Fixed orifice

To loosen impact, a fixed orifice is incorporated in the hose nipple. Be sure not to enlarge the inside diameter of this orifice, because if the hole is enlarged, the cylinder operating speed may exceed the allowable speed (500mm/sec at no-load), which will result in an increased impact force to damage the cylinder. In applications where a no-load operating speed of more than 500mm/sec is required, the manufacturer should be consulted.



### Caution

#### 1) Be certain to align the rod axis with the load and direction of movement when connecting.

When not properly aligned, the rod and tube may be twisted, and damage may be caused due to wear on certain areas, such as the inner tube surface, bushings, rod surface, or seals.

#### 2) When an external guide is used, connect the rod end and the load in such a way that there is no interference at any point within the stroke.

#### 3) Do not scratch or gouge the sliding parts of the cylinder tube, piston rod, etc., by striking or grasping them with other objects.

If the piston sliding part is scratched by an object due to collision, the cylinder operation will be degraded. Even though the cylinder is operating correctly, the scratch will damage the bushing, which adversely affects the operation. As the cylinder tube I.D. is produced with a precise tolerance, if an object is dropped onto it or the damaged part of the cylinder affects the internal surface during installation, operation failure may occur.

#### 4) Do not use until you can confirm that equipment can operate properly.

Confirm correct mounting by performing function and leak tests properly after compressed air and power are connected following mounting or repair.

#### 5) Be very careful when handling the product.

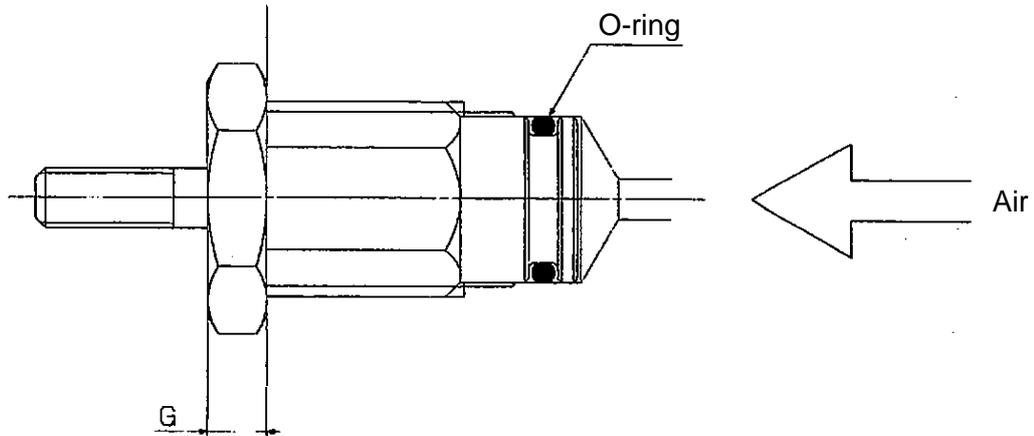
Depending on the handling method, there is a risk that the corners of the product will injure your hands, fingers, etc.

#### 6) Do not use it in such a way that a load could be applied to the piston rod during the retraction. The spring that is built into the cylinder provides only enough force to retract the piston rod. Thus, if a load is applied, the piston rod may not be able to retract to the end of the stroke.

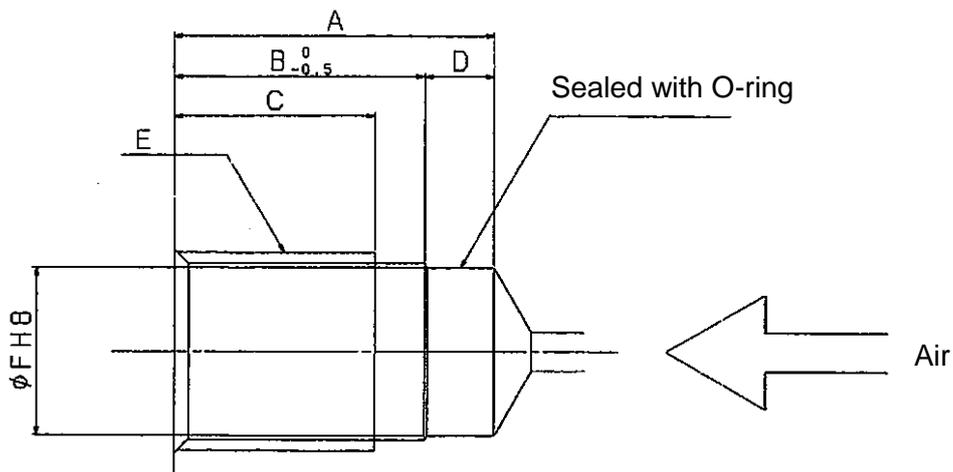
### 7) Recommended mounting hole dimensions for embedded type

The recommended mounting hole dimensions for embedded type are shown below.

#### When embedded



#### Machining dimensions for mounting



| Bore size (mm) | Stroke | A    | B    | C    | D   | E       | $\phi F$ | G |
|----------------|--------|------|------|------|-----|---------|----------|---|
| 4              | 5      | 12   | 8.5  | 6    | 3.5 | M8X1.0  | 6.5      | 3 |
|                | 10     | 20   | 16.5 | 14   |     |         |          |   |
|                | 15     | 28   | 24.5 | 22   |     |         |          |   |
| 6              | 5      | 16   | 12.5 | 10   | 3.5 | M10X1.0 | 8.5      | 3 |
|                | 10     | 23   | 19.5 | 17   |     |         |          |   |
|                | 15     | 30   | 26.5 | 24   |     |         |          |   |
| 10             | 5      | 17   | 13.5 | 10.5 | 3.5 | M15X1.5 | 12       | 4 |
|                | 10     | 23.5 | 20   | 17   |     |         |          |   |
|                | 15     | 30.5 | 27   | 24   |     |         |          |   |
| 16             | 5      | 19   | 14.5 | 11.5 | 4.5 | M22X1.5 | 19       | 5 |
|                | 10     | 25   | 20.5 | 17.5 |     |         |          |   |
|                | 15     | 31.5 | 27   | 24   |     |         |          |   |

Note) E and  $\phi F$  should be machined in a concentric manner.

## 2-3. Piping



### Caution

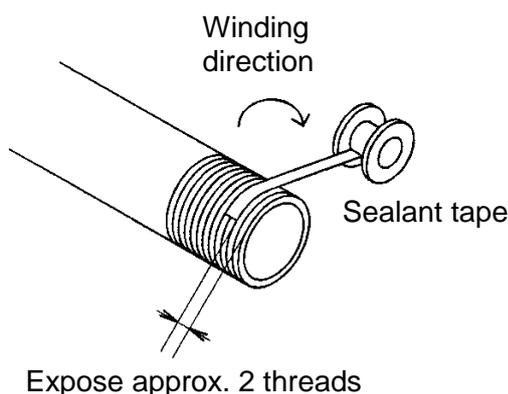
1) Refer to the Fittings and Tubing Precautions (web catalog) for handling One-touch fittings.

2) Preparation before piping

Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil, and other debris from inside the pipe.

3) Winding of sealant tape

When screwing piping or fittings into ports, ensure that chips from the pipe threads or sealing material do not enter the piping. Also, if sealant tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.



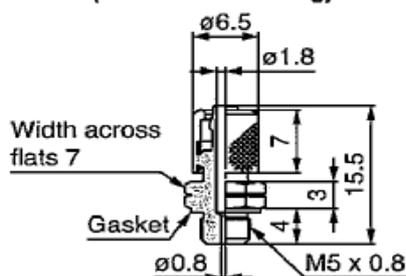
4) The following fittings are recommended for this cylinder connection. However, there may be case where the piston speed exceeds 500 mm/sec. even with the recommended fittings for this cylinder. Use a speed controller in such cases.

| Cylinder bore size | Applicable tubing O.D. | Fitting type                                  | Connection thread | Model      |
|--------------------|------------------------|---|-------------------|------------|
| ø4                 | ø2                     | One-touch fitting                             | M3 x 0.5          | KQ2□02-M3G |
|                    |                        | Miniature fitting                             |                   | M-3AU-2    |
| One-touch fitting  |                        | M5 x 0.8                                      | KQ2□02-M5N        |            |
| Miniature fitting  |                        |   | M-5AU-2           |            |
| ø6<br>ø10<br>ø16   | ø4/2.5                 | Dedicated hose nipple<br>(with fixed orifice) |                   | CJ-5H-4    |
|                    | ø6/4                   |   |                   | CJ-5H-6    |

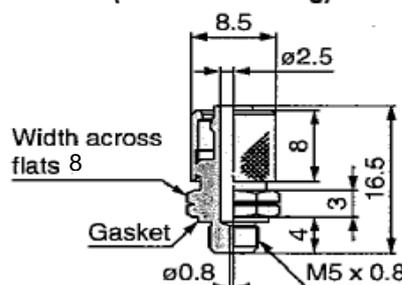
\* Please be aware that cylinder speed may slow down on the retracting side when using the above One-touch fittings and miniature fittings with a cylinder bore size of ø16.

### Hose nipple

**CJ-5H-4**  
(For ø4/ø2.5 tubing)



**CJ-5H-6**  
(For ø6/ø4 tubing)



In addition to the above fittings and hose nipples, the below fittings can also be attached to the cylinder. When using the below fittings be sure to provide a speed controller after adjusting it to 500 mm/sec or less.

| Cylinder bore size | Applicable tubing O.D. | Fitting type      | Connection thread | Model      |
|--------------------|------------------------|-------------------|-------------------|------------|
| ø4                 | 3.2                    | One-touch fitting | M3 x 0.5          | KQ2□23-M3G |
|                    | 4                      |                   |                   | KQ2□04-M3G |
| ø6<br>ø10<br>ø16   | 3.2                    |                   | M5 x 0.8          | KQ2□23-M5□ |
|                    | 4                      |                   |                   | KQ2□04-M5□ |
|                    | 6                      |                   |                   | KQ2□06-M5□ |

### Recommended Speed Controller

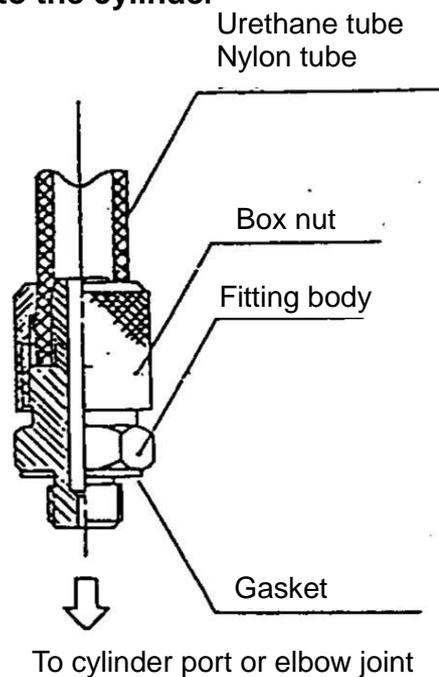
| Applicable tubing O.D. [mm] | Connection thread | Elbow type meter-in | Universal type meter-in | In-line type meter-in |
|-----------------------------|-------------------|---------------------|-------------------------|-----------------------|
| ø2                          | M3                | AS1211F-M3-02       | —                       | AS1002F-02            |
|                             | M5                | AS1211F-M5E-02A     | —                       |                       |
| ø3.2                        | M3                | AS1211F-M3-23       | AS1311F-M3-23           | AS1002F-23            |
|                             | M5                | AS1211F-M5E-23A     | AS1311F-M5E-23A         |                       |
| ø4                          | M3                | AS1211F-M3-04       | AS1311F-M3-04           | AS1002F-04            |
|                             | M5                | AS1211F-M5E-04A     | AS1311F-M5E-04A         |                       |
| ø6                          | M5                | AS1211F-M5E-06A     | AS1311F-M5E-06A         | AS1002F-06            |

\* For details about One-touch fittings, miniature fittings and speed controllers (applicable tubing O.D. ø2 only), refer to the **Web Catalog**.

Also, for details about speed controllers (applicable tubing O.D. ø3.2 to ø6), refer to the **Web Catalog**.

\* Refer to the Fittings and Tubing Precautions (**Web Catalog**) for handling One-touch fittings.

### 5) Piping connection to the cylinder



A hose nipple consists of two parts: a fitting body and a box nut.

There are two sizes, one is for O.D.4mm / I.D.2.5mm tube and the other is for O.D.6mm /

I.D.4mm. This nipple fits both nylon tube and urethane tube. Connection process of nylon or urethane tube is as follows.

- 1) Remove the box nut, pass nylon tube or urethane tube through the nut.
- 2) Insert the tube into the fitting body.
- 3) Fasten the nut to the body.

**6) When the cylinder direction is switched, select an appropriate solenoid valve for direction control from SMC stock. 3-Port solenoid valve is used for switching the valve.**

## 2-4. Lubrication



### Warning

#### 1) Lubricating non-lube type cylinders

These cylinders have been lubricated for life at the factory and can be used without any further lubrication. However, in the event that it is lubricated additionally, be sure to use the following one. Stopping lubrication later may lead to malfunctions because the new lubricant will cancel out the original lubricant. Therefore, lubrication must be continued once it has been started.

| Bore size (mm) | Kind of lubrication oil                          |
|----------------|--|
| 4              | Polyalphaolefin oil or equivalent oil            |
| 6、10、16        | class 1 turbine oil (with no additives) ISO VG32 |

## 2-5. Air supply



### Warning

#### 1) Type of fluids

Please consult with SMC when using the product in applications other than compressed air.

#### 2) When there is a large amount of drainage

Compressed air containing a large amount of drainage can cause the malfunction of pneumatic equipment. An air dryer or water separator should be installed upstream from filters.

#### 3) Drain flushing

If condensation in the drain bowl is not emptied on a regular basis, the bowl will overflow and allow the condensation to enter the compressed air lines. This causes the malfunction of pneumatic equipment. If the drain bowl is difficult to check and remove, the installation of a drain bowl with an auto drain option is recommended.

For compressed air quality, refer to the SMC Best Pneumatics No. 6 catalog.

#### 4) Use clean air.

Do not use compressed air that contains chemicals, synthetic oils that include organic solvents, salt, corrosive gases, etc., as it can cause damage or malfunction.



### Caution

**1) When extremely dry air is used as the fluid, degradation of the lubrication properties inside the equipment may occur, resulting in reduced reliability (or reduced service life) of the equipment. Please consult with SMC.**

#### 2) Install an air filter.

Install an air filter upstream near the valve. Select an air filter with a filtration size of 5 µm or smaller.

**3) Take measures to ensure air quality, such as by installing an aftercooler, air dryer, or water separator.**

Compressed air that contains a large amount of drainage can cause the malfunction of pneumatic equipment, such as valves. Therefore, take appropriate measures to ensure air quality, such as by providing an aftercooler, air dryer, or water separator.

**4) Ensure that the fluid and ambient temperatures are within the specified range.**

If the fluid temperature is 5°C or less, the moisture in the circuit could freeze, causing damage to the seals or equipment malfunction. Therefore, take appropriate measures to prevent freezing.

For compressed air quality, refer to the SMC Best Pneumatics No. 6 catalog.

**5) Precautionary measures against condensation**

Moisture condensation can occur inside pneumatic systems due to a drop in temperatures caused by the piping or operating conditions. This can degrade or wash away grease, resulting in a shortened service life or a malfunction.

For details, refer to the catalog "Precautionary measures against condensation in a pneumatic system" (CAT.P-E01-11).

## 2-6. Operating environment



### Warning

- 1) Do not use in an atmosphere containing corrosive gases, chemicals, sea water, water, water steam, or where there is direct contact with any of these.
- 2) Do not expose the product to direct sunlight for an extended period of time.
- 3) Do not use in a place subject to heavy vibration and/or shock.
- 4) Do not mount the product in locations where it is exposed to radiant heat.
- 5) In dusty locations or where water or oil, etc., splash on the equipment, take suitable measures to protect the rod.
- 6) A decrease in the base oil of grease may be accelerated by the properties of the compressed air used in pneumatic equipment, the external environment, operating conditions, etc., and the resulting drop in lubricating performance may have an effect on the equipment's service life.



### Caution

- 1) Internal lubricant or the base oil of grease may seep out of the cylinder depending on the operating conditions (an ambient temperature of 40°C or more, pressure retention, low-frequency actuation, etc.). Take great care when a clean environment is required.

## 2-7. Maintenance



### Warning

**1) Maintenance work**

If handled improperly, compressed air can be dangerous. Assembly, handling, repair, and element replacement of pneumatic systems should be performed by a knowledgeable and experienced person.

**2) Drain flushing**

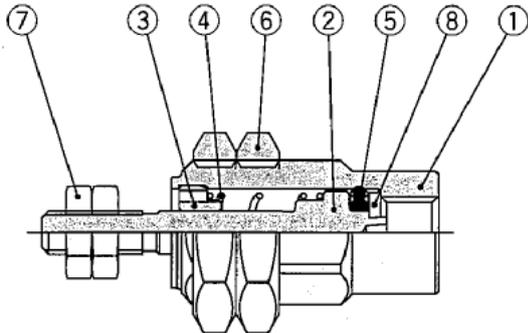
Remove drainage from air filters regularly.

**3) Removal of equipment, and supply/exhaust of compressed air**

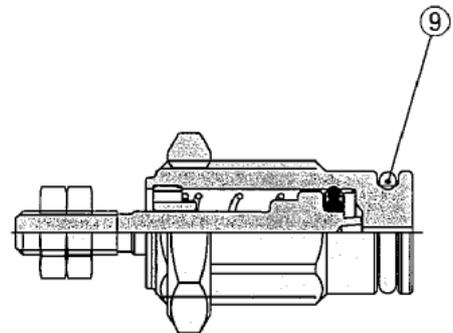
Before components are removed, first confirm that measures are in place to prevent workpieces from dropping, run-away equipment, etc. Then, cut off the supply pressure and electric power, and exhaust all compressed air from the system using the residual pressure release function. When machinery is restarted, proceed with caution after confirming that appropriate measures are in place to prevent sudden movement.

### 3. Construction - Description

**Panel Mount Type**



**Embedded Type**



#### Component Parts

| No. | Description   | Material        | Note                                |                            |                            |
|-----|---------------|-----------------|-------------------------------------|----------------------------|----------------------------|
| 1   | Tube          | Brass           | Electroless nickel plating          |                            |                            |
| 2   | Piston        | Stainless steel |                                     |                            |                            |
| 3   | Collar        | ø4, ø6, ø10     | Brass                               | ø4, ø6, ø10                | Electroless nickel plating |
|     |               | ø16             | Oil-impregnated sintered alloy      | ø16                        | —                          |
| 4   | Return spring | Steel wire      | Zinc chromating                     |                            |                            |
| 5   | Piston seal   | NBR             |                                     |                            |                            |
| 6   | Mounting nut  | ø4              | Brass                               | Electroless nickel plating |                            |
|     |               | ø6, ø10, ø16    | Steel                               | Zinc chromating            |                            |
| 7   | Rod end nut   | Steel           | Zinc chromating                     |                            |                            |
| 8   | Seal retainer | Stainless steel | Only applicable to ø6, ø10, and ø16 |                            |                            |
| 9   | Gasket        | NBR             | Embedded type only                  |                            |                            |

#### Replacement Parts: Gasket

| Bore size [mm] | Order no. | Contents    |
|----------------|-----------|-------------|
| 4              | CJPS4-G   | Above no. ⑨ |
| 6              | CJPS6-G   |             |
| 10             | CJPS10-G  |             |
| 16             | CJPS16-G  |             |

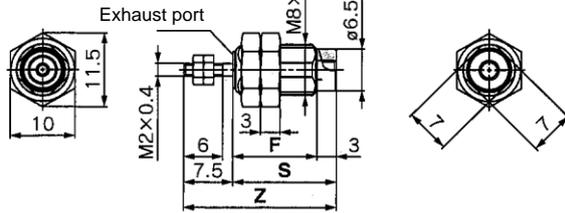
- \* For the embedded type
  - \* Since gaskets (10 pcs./set) do not include a grease pack (10 g), order it separately.
- Grease pack part number:**  
GR-S-010 (10 g)

# 4. Dimensions

## 4-1. Dimensions

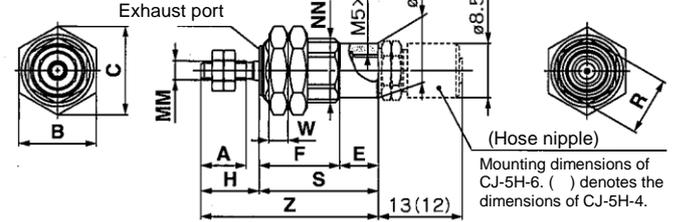
### Panel mounting type

#### CJPB4



Without rod end thread  
CJPB4-□-B

#### CJPB6/10/16

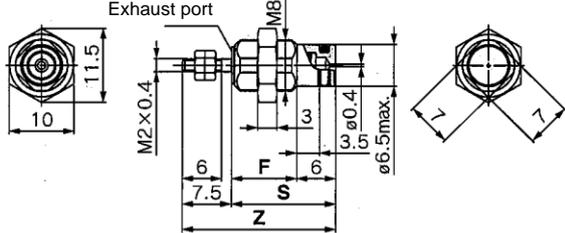


Without rod end thread  
CJPB□-□-B

| Bore size (mm) | A  | B  | C    | E | F               |                  |                  | G   | H   | MM     | NN      | R  | S               |                  |                  | W | Z               |                  |                  | Q |
|----------------|----|----|------|---|-----------------|------------------|------------------|-----|-----|--------|---------|----|-----------------|------------------|------------------|---|-----------------|------------------|------------------|---|
|                |    |    |      |   | 5 <sup>st</sup> | 10 <sup>st</sup> | 15 <sup>st</sup> |     |     |        |         |    | 5 <sup>st</sup> | 10 <sup>st</sup> | 15 <sup>st</sup> |   | 5 <sup>st</sup> | 10 <sup>st</sup> | 15 <sup>st</sup> |   |
| 4              | 6  | 10 | 11.5 | 3 | 13              | 21               | 29               | 6.5 | 7.5 | M2×0.4 | M8×1.0  | 7  | 16              | 24               | 32               | 3 | 23.5            | 31.5             | 39.5             | 2 |
| 6              | 7  | 12 | 13.9 | 6 | 12.5            | 19.5             | 26.5             | 8.5 | 9   | M3×0.5 | M10×1.0 | 9  | 18.5            | 25.5             | 32.5             | 3 | 27.5            | 34.5             | 41.5             | 3 |
| 10             | 10 | 19 | 22   | 6 | 14.5            | 21               | 28               | 12  | 12  | M4×0.7 | M15×1.5 | 13 | 20.5            | 27               | 34               | 4 | 32.5            | 39               | 46               | 5 |
| 16             | 12 | 27 | 31   | 7 | 16.5            | 22.5             | 29               | 19  | 14  | M5×0.8 | M22×1.5 | 20 | 23.5            | 29.5             | 36               | 5 | 37.5            | 43.5             | 50               | 6 |

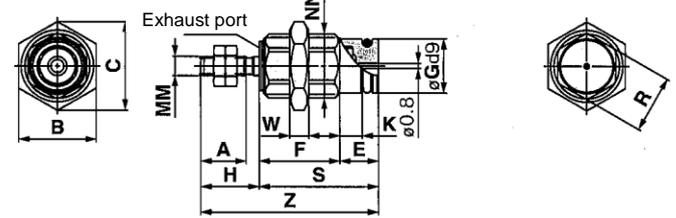
### Embedded type

#### CJPS4



Without rod end thread  
CJPS4-□-B

#### CJPS6/10/16



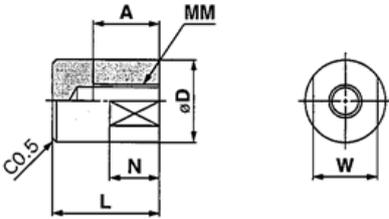
Without rod end thread  
CJPS□-□-B

| Bore size (mm) | A  | B  | C    | E | F               |                  |                  | G   | H   | K   | MM     | NN      | R  | S               |                  |                  | W | Z               |                  |                  | Q |
|----------------|----|----|------|---|-----------------|------------------|------------------|-----|-----|-----|--------|---------|----|-----------------|------------------|------------------|---|-----------------|------------------|------------------|---|
|                |    |    |      |   | 5 <sup>st</sup> | 10 <sup>st</sup> | 15 <sup>st</sup> |     |     |     |        |         |    | 5 <sup>st</sup> | 10 <sup>st</sup> | 15 <sup>st</sup> |   | 5 <sup>st</sup> | 10 <sup>st</sup> | 15 <sup>st</sup> |   |
| 4              | 6  | 10 | 11.5 | 6 | 10              | 18               | 26               | 6.5 | 7.5 | —   | M2×0.4 | M8×1.0  | 7  | 16              | 24               | 32               | 3 | 23.5            | 31.5             | 39.5             | 2 |
| 6              | 7  | 12 | 13.9 | 6 | 12.5            | 19.5             | 26.5             | 8.5 | 9   | 3.5 | M3×0.5 | M10×1.0 | 9  | 18.5            | 25.5             | 32.5             | 3 | 27.5            | 34.5             | 41.5             | 3 |
| 10             | 10 | 19 | 22   | 6 | 14.5            | 21               | 28               | 12  | 12  | 3.5 | M4×0.7 | M15×1.5 | 13 | 20.5            | 27               | 34               | 4 | 32.5            | 39               | 46               | 5 |
| 16             | 12 | 27 | 31   | 7 | 16.5            | 22.5             | 29               | 19  | 14  | 4.2 | M5×0.8 | M22×1.5 | 20 | 23.5            | 29.5             | 36               | 5 | 37.5            | 43.5             | 50               | 6 |

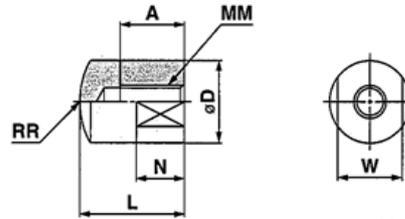
## 4-2. Accessory bracket dimensions

### Rod end cap

#### Flat type / CJ-CF□



#### Round type / CJ-CR□



Material : polyacetal(mm)

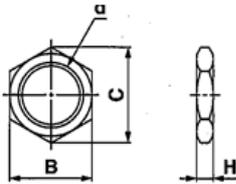
| Part no.  |            | Applicable bore size (mm) | A  | D  | L  | MM     | N | RR | W  |
|-----------|------------|---------------------------|----|----|----|--------|---|----|----|
| Flat type | Round type |                           |    |    |    |        |   |    |    |
| CJ-CF004  | CJ-CR004   | 4                         | 5  | 6  | 9  | M2×0.4 | 3 | 6  | 5  |
| CJ-CF006  | CJ-CR006   | 6                         | 6  | 8  | 11 | M3×0.5 | 5 | 8  | 6  |
| CJ-CF010  | CJ-CR010   | 10                        | 8  | 10 | 13 | M4×0.7 | 6 | 10 | 8  |
| CJ-CF016  | CJ-CR016   | 16                        | 10 | 12 | 15 | M5×0.8 | 7 | 12 | 10 |

\* When the rod end cap is ordered, the rod end nut will be not be supplied. (For mounting, please use the standard rod end nut.)

\* Note the rod end cap can only be mounted when the rod end nut is threaded.

### Accessory

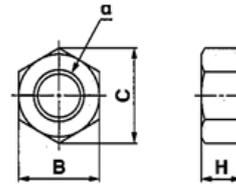
#### Mounting nut (standard) / SNPS-□C



Material : Steel(mm)

| Part no.  | Applicable bore size (mm) | d       | H | B  | C    | Maximum tightening torque (N · m) |
|-----------|---------------------------|---------|---|----|------|-----------------------------------|
| SNPS-004  | 4                         | M8×1.0  | 3 | 10 | 11.5 | 1.2                               |
| SNPS-006C | 6                         | M10×1.0 | 3 | 12 | 13.9 | 4.2                               |
| SNPS-010C | 10                        | M15×1.5 | 4 | 19 | 22   | 16.7                              |
| SNPS-016C | 16                        | M22×1.5 | 5 | 27 | 31   | 30.6                              |

#### Rod end nut (standard) / NTJ-004,NTP-□



Material : Steel(mm)

| Part no. | Applicable bore size (mm) | d      | H   | B   | C   | Maximum tightening torque (N · m) |
|----------|---------------------------|--------|-----|-----|-----|-----------------------------------|
| NTJ-004  | 4                         | M2×0.4 | 1.6 | 4   | 4.6 | 0.1                               |
| NTP-006  | 6                         | M3×0.5 | 1.8 | 5.5 | 6.4 | 0.3                               |
| NTP-010  | 10                        | M4×0.7 | 2.4 | 7   | 8.1 | 0.8                               |
| NTP-016  | 16                        | M5×0.8 | 3.2 | 8   | 9.2 | 1.6                               |

\*When rod end is threaded.

## 5. Troubleshooting

| Trouble  | Phenomenon                         | Possible cause  | Remedy   | Related section                 |
|--|------------------------------------|---|--|---------------------------------|
| -The operation is not smooth.<br>-The force output is reduced.<br>-The cylinder doesn't operate. | Air leakage (Piston seal leakage)  | The piston packing is worn due to grease washed away by water.  | Install air cleaning equipment, in the line.   | 2-5<br>2-7                      |
|  | A lack of pneumatic pressure       | 1) The pressure from the factory source is reduced.<br>2) The regulator setting has been displaced.<br>3) The piping is clogged.  | 1) Supply adequate pressure.<br>2) Set regulator properly.<br>3) Flush the piping.   | 1-1<br>2-3                      |
|  | Overload                           | The lateral load has been exceeded.   | Use within the allowable value.  | 1-5                             |
|  | Low operating speed                | The speed is lower than specified piston speed.   | Use within specifications.   | 1-1                             |
|  | Improper pneumatic circuit design. | The system construction is not suitable.  | Select adequate size of tube, fitting, directional control valve, speed controller etc.  | 2-2<br>2-3                      |
| -A part is damaged.  | Breakage of piston, tube.          | 1) The speed is too high due to insufficient adjustment of the speed controller.<br>2) The kinetic energy exceeds the allowable value.<br>3) The lateral load exceeds the allowable value.<br>4) An abnormal external force is applied. | 1) Adjust the speed with the speed controller again so that the speed will decrease within the specifications.<br>2) Use within the allowable value.<br>3) Use within the allowable value.<br>4) Mechanism interference, eccentric load and overload could cause deformation and damage of the cylinder. Remove these factors. | 1-1<br>1-4<br>1-5<br>2-1<br>2-2 |

| Revision history |
|------------------|
|------------------|

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