



Assembly Procedure

PRODUCT NAME

Air Cylinder

MODEL / Series / Product Number

CP96 * V32 & 125 – *

SMC Corporation



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.

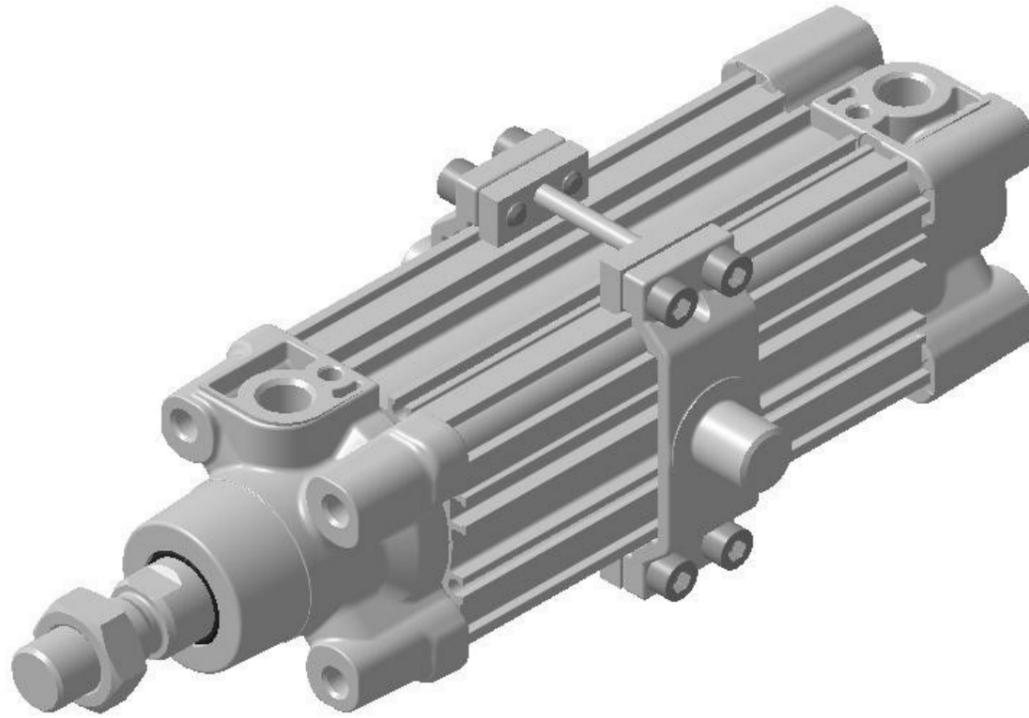
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulation of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Caution

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

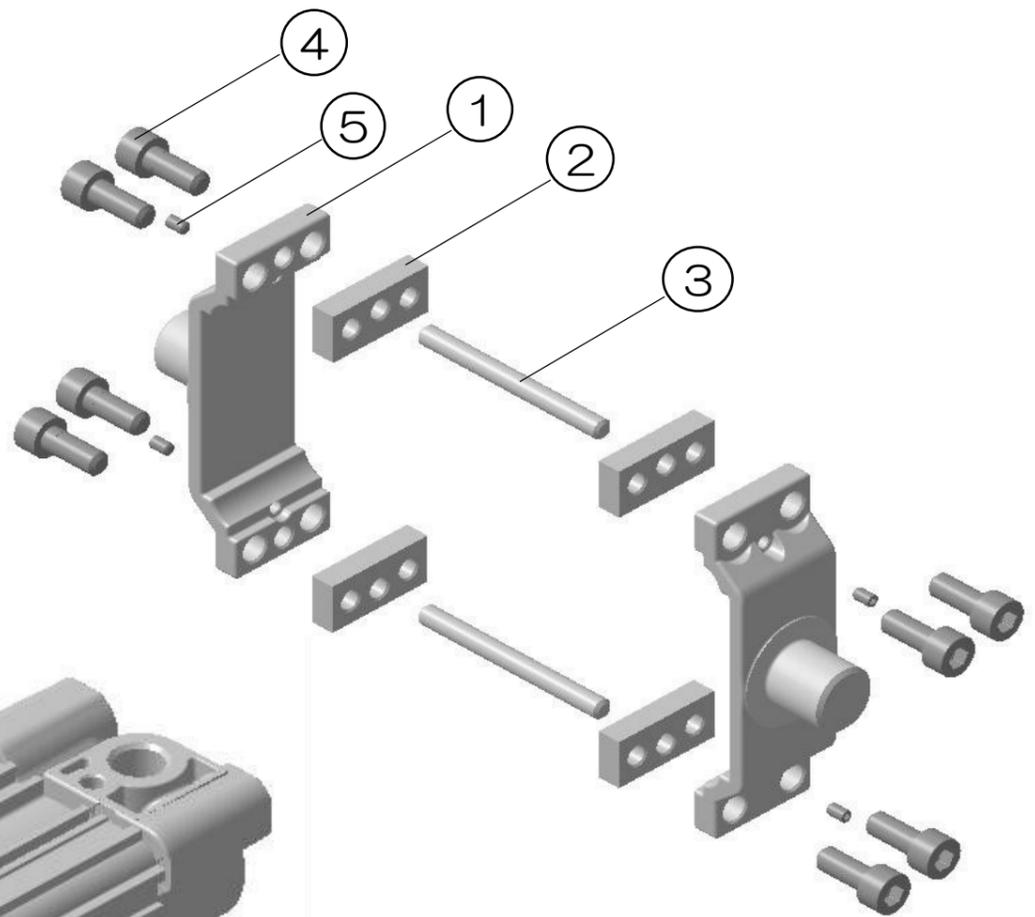
Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country.

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



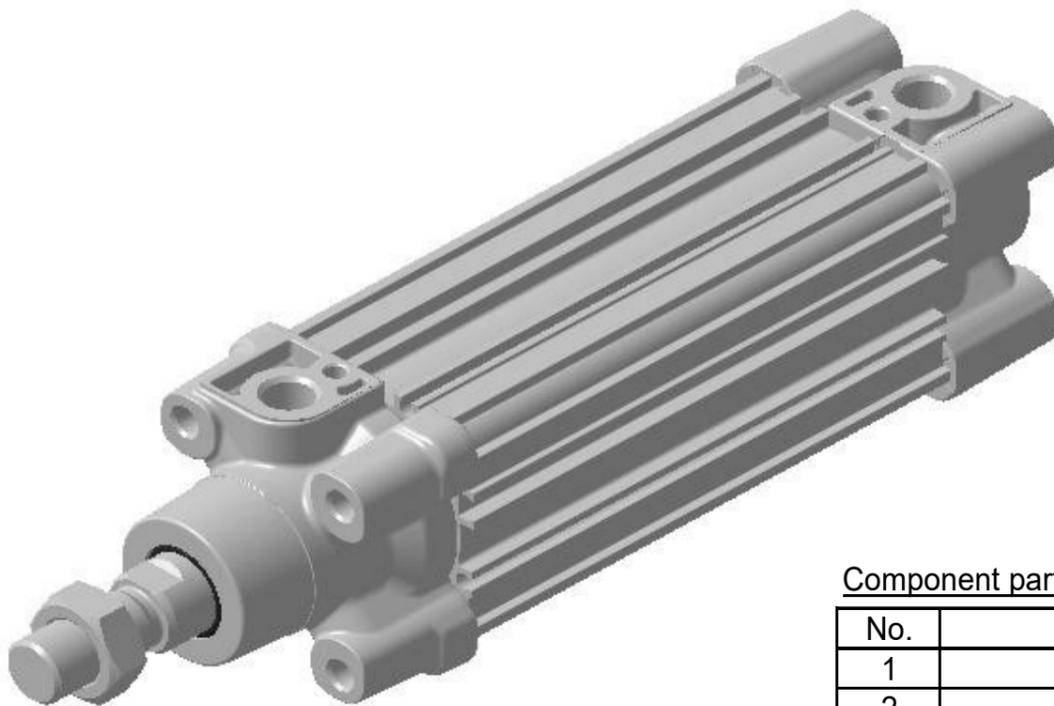
Product image (CP96S*V*-*)

Tube bore	Trunnion part number
ø32	V5032P
ø40	V5040P
ø50	V5050P
ø63	V5063P
ø80	V5080P
ø100	V5100P
ø125	V5125P



Component parts

No.	Description	Qty	Notes
1	Trunnion	2	
2	Retaining bracket	4	
3	Trunnion pin	2	
4	Hexagon socket head cap screw	8	
5	Set screw	4	ø32 to ø80
		8	ø100, ø125

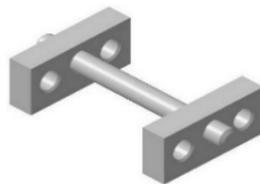
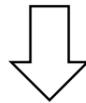
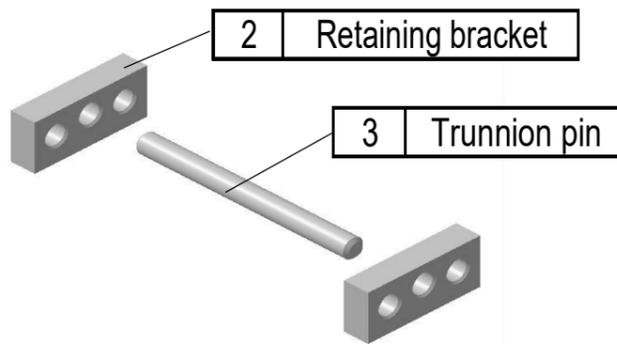


Assembly step

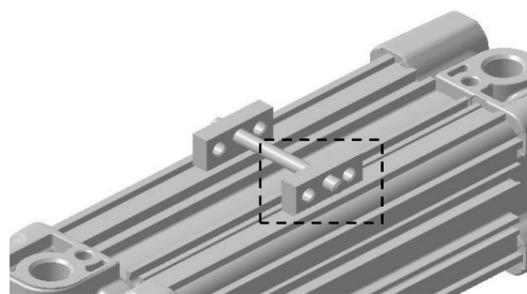
Illustration

Supplementary explanation / Cautions

1. Insert the trunnion pin to retaining brackets.

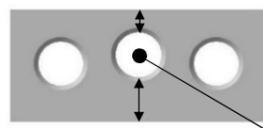


2. Place the trunnion pin with retaining brackets on the specified location of the cylinder.



Retaining bracket orientation

Narrow



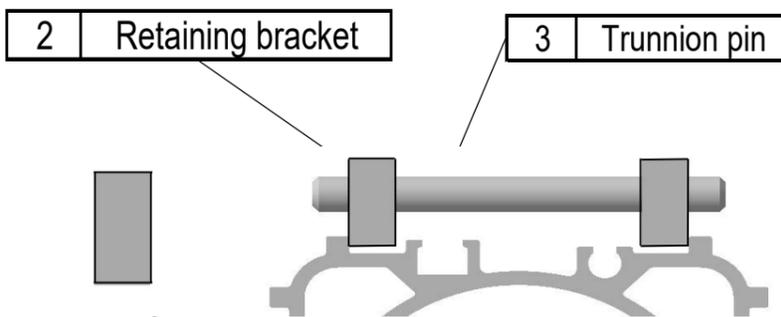
Wide

Trunnion pin hole

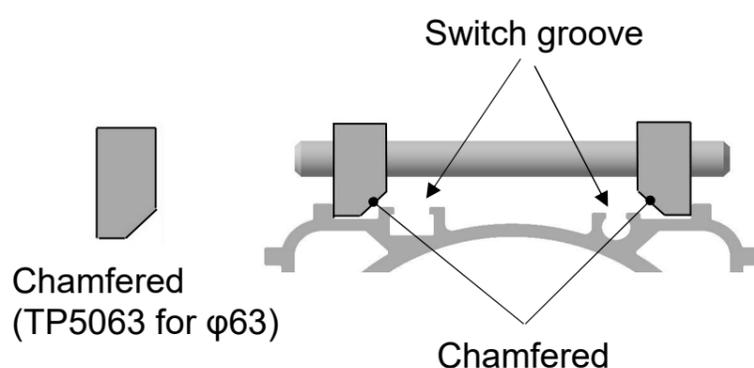
* Clean the protrusion of the cylinder tube in advance which is held by the trunnions and retaining brackets.

* There is a specific direction for the retaining bracket.

The side furthest from the trunnion pin hole faces the cylinder.



Not chamfered
(except TP5063 for φ63)



Chamfered
(TP5063 for φ63)

Switch groove

Chamfered

* There is direction for retaining bracket.

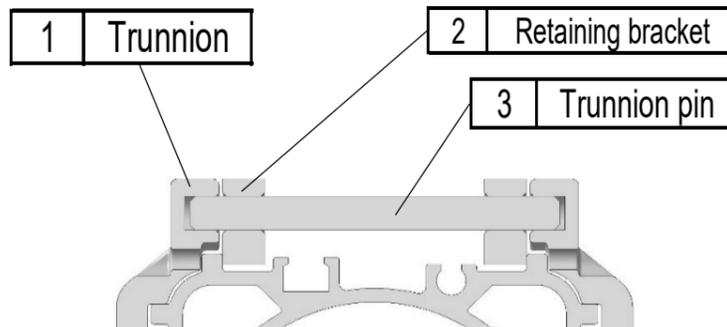
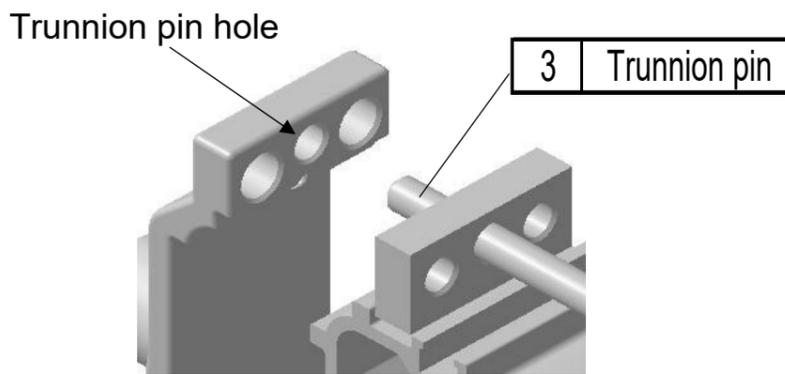
Retaining bracket for φ63 (TP5063) is chamfered. Chamfered side faces the side of the switch groove.

Assembly step

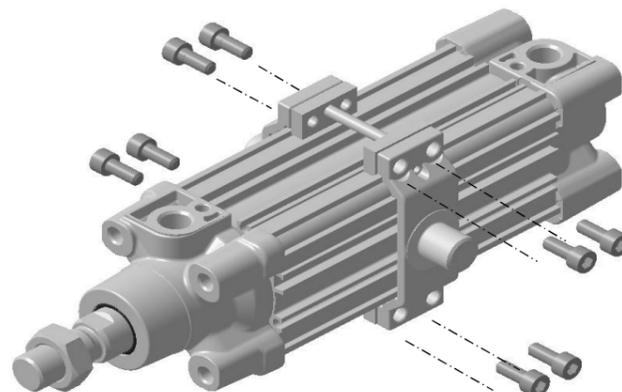
Illustration

Supplementary explanation / Cautions

3. Insert both ends of the trunnion pin (2 pcs.) to the holes of the trunnion (2pcs.).

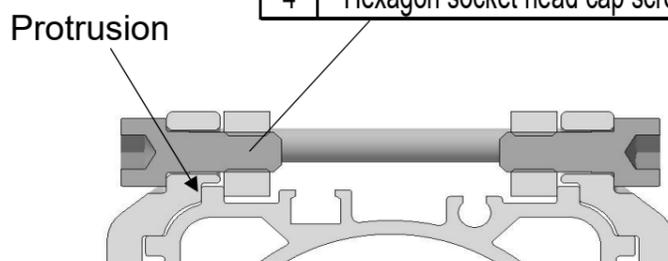


4. Screw the hexagon socket head cap screws (8 pcs.) in to hold the protrusion of the cylinder tube between the trunnions and the retaining brackets without tightening.

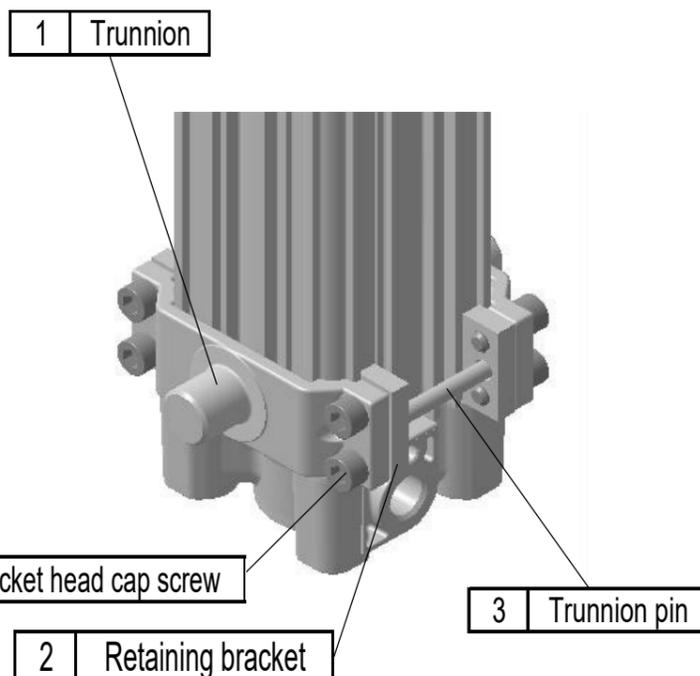


4 Hexagon socket head cap screw

4 Hexagon socket head cap screw



5. Place the cylinder with the head cover facing downward. Lightly tighten the hexagon socket head cap screws (8 pcs.) while having the trunnion contact with the head cover.



* Repeat this process for the trunnion pin and retaining bracket for the opposite side, taking care to ensure that the first side remains in position, then move to step 4.

Table 1: Size of hexagon socket head cap screw for mounting

Tube bore	Trunnion part number	Size of hexagon socket head cap screw
ø32	V5032P	M4X0.7X10L
ø40	V5040P	M6X1.0X15L
ø50	V5050P	M6X1.0X15L
ø63	V5063P	M8X1.25X20L
ø80	V5080P	M8X1.25X20L
ø100	V5100P	M10X1.5X25L
ø125	V5125P	M10X1.5X30L

* Lightly tighten the hexagon socket head cap screws so that the trunnion smoothly slides by hand.

* When it is difficult to place the head cover side facing downwards because of long stroke, place it horizontally for tightening temporarily.

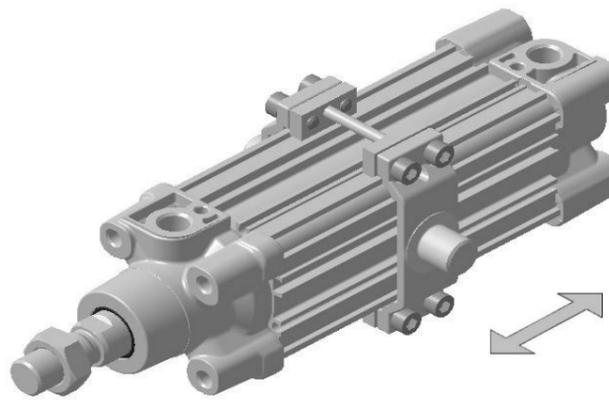
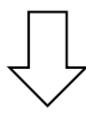
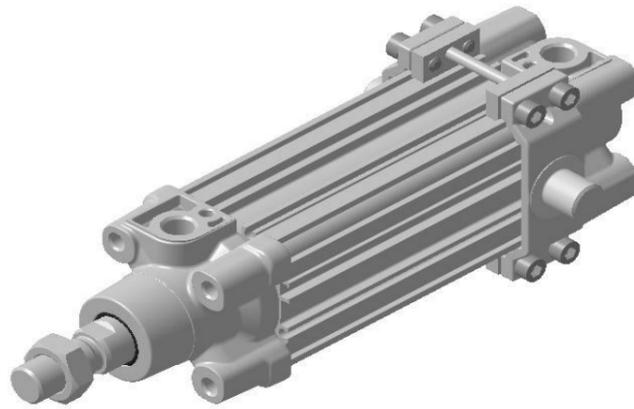
* When sliding the trunnion, be careful so that the finger or hand is not caught between the trunnion and cover.

Assembly step

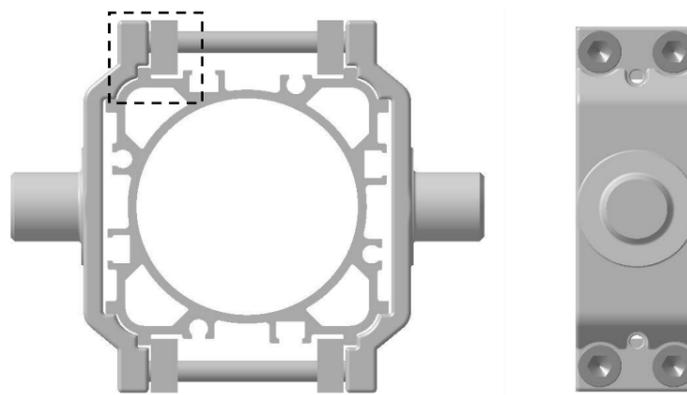
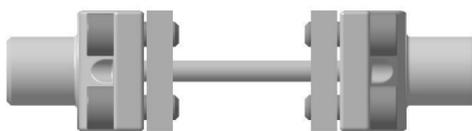
Illustration

Supplementary explanation /
Cautions

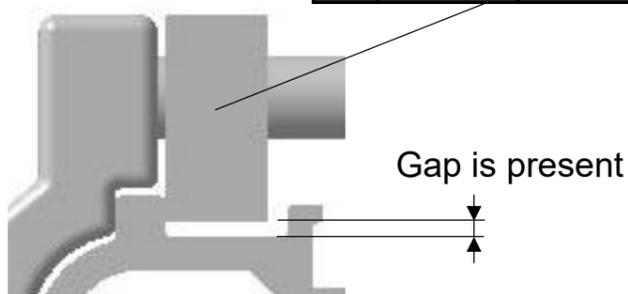
6. Slide the trunnions to the specified position. Tighten them with the hexagon socket head cap screws (8 pcs.). Make sure the trunnions do not move by hand.



Slide the trunnion to the specified location.



2 Retaining bracket



* Keep a gap between the cylinder tube and retaining bracket so that they do not contact each other (4 places).

Ideally, the retaining bracket and cylinder tube should remain parallel so that holding force is distributed evenly.

If the hexagon socket head cap bolt is tightened while the retaining bracket is contacting with the cylinder tube, the retaining bracket is pushed to the cylinder tube, causing the deformation of the cylinder tube, leading to the adverse effect on the cylinder.

Assembly step

Illustration

Supplementary explanation / Cautions

7. After confirming that the trunnions rotate properly within the application and the cylinder operate correctly, tighten the hexagon socket head cap screws (8 pcs.) to the specified tightening torque (Table 3). Then, tighten the set screws (4 pcs. or 8 pcs.) to the specified tightening torque (Table 3).

8. Confirm that the trunnions rotate properly within the application and the cylinder operate correctly again.

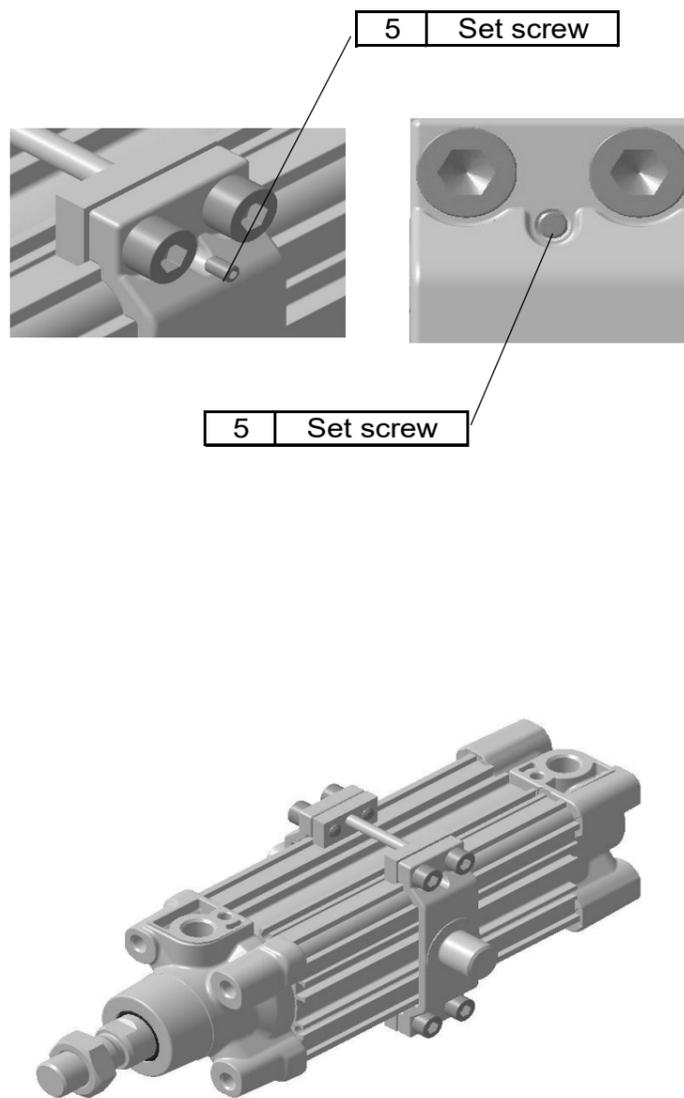


Table 2. Size of set screw

Tube bore	Trunnion part number	Size of set screw	Qty.
ø32	V5032P	M3X0.5X5L Flat point	4
ø40	V5040P	M3X0.5X5L Flat point	4
ø50	V5050P	M3X0.5X5L Flat point	4
ø63	V5063P	M4X0.7X5L Flat point	4
ø80	V5080P	M4X0.7X5L Flat point	4
ø100	V5100P	M5X0.8X5L W point	8
ø125	V5125P	M5X0.8X5L W point	8

Table 3 . Tightening torque

Tube bore	Trunnion part number	Tightening torque (+/-10%)	
		Hexagon socket head cap screw	Set screw
ø32	V5032P	3.0 N·m	0.9 N·m
ø40	V5040P	10.4 N·m	0.9 N·m
ø50	V5050P	10.4 N·m	0.9 N·m
ø63	V5063P	25.0 N·m	2.5 N·m
ø80	V5080P	25.0 N·m	2.5 N·m
ø100	V5100P	49.0 N·m	5.0 N·m
ø125	V5125P	49.0 N·m	5.0 N·m

* Make sure periodically that the hexagon socket head cap screws and set screws are not loose.

* The trunnion will be moved if a force exceeding the holding force of the trunnion is applied (Table 4). Adjust properly the air cushion of the cylinder.

Table 4. Holding force of trunnion

Tube bore	Trunnion part number	Holding force of trunnion
ø32	V5032P	3500N
ø40	V5040P	5000N
ø50	V5050P	5000N
ø63	V5063P	11000N
ø80	V5080P	11000N
ø100	V5100P	14000N
ø125	V5125P	14000N

Revision history

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